

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

C202886

CONTRACT AND  
CONTRACT BONDS

FOR CONTRACT NO. C202886

WBS 34923.3.1 STPNHF-1(10)

T.I.P NO. U-3324

COUNTY OF MOORE

THIS IS THE ROADWAY & STRUCTURE CONTRACT

ROUTE NUMBER US 1 LENGTH 0.939 MILES

LOCATION INTERSECTION OF SR-1309 (MORGANTON RD) AND US-1 (SANDHILLS  
BLVD) IN PINEHURST - SOUTHERN PINES.

CONTRACTOR ENGLISH CONSTRUCTION CO., INC.

ADDRESS P.O. BOX P7000

LYNCHBURG, VA 245057000

BIDS OPENED SEPTEMBER 18, 2012

CONTRACT EXECUTION OCT 09 2012

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

PROPOSAL

DATE AND TIME OF BID OPENING: **SEPTEMBER 18, 2012 AT 2:00 PM**

CONTRACT ID C202886  
WBS 34923.3.1

FEDERAL AID NO. STPNHF-1(10)

COUNTY MOORE

T.I.P. NO. U-3324

MILES 0.939

ROUTE NO. US 1

LOCATION INTERSECTION OF SR-1309 (MORGANTON RD) AND US-1 (SANDHILLS BLVD) IN PINEHURST - SOUTHERN PINES.

TYPE OF WORK GRADING, DRAINAGE, PAVING, SIGNALS, AND STRUCTURE.

**NOTICE:**

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS \$30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOT WITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING, REGARDLESS OF FUNDING SOURCES.

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

**THIS IS A ROADWAY & STRUCTURE PROPOSAL**

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

**PROPOSAL FOR THE CONSTRUCTION OF  
CONTRACT No. C202886 IN MOORE COUNTY, NORTH CAROLINA**

Date \_\_\_\_\_ 20\_\_\_\_

**DEPARTMENT OF TRANSPORTATION,  
RALEIGH, NORTH CAROLINA**

The Bidder has carefully examined the location of the proposed work to be known as Contract No. **C202886**; has carefully examined the plans and specifications, which are acknowledged to be part of the proposal, the special provisions, the proposal, the form of contract, and the forms of contract payment bond and contract performance bond; and thoroughly understands the stipulations, requirements and provisions. The undersigned bidder agrees to bound upon his execution of the bid and subsequent award to him by the Board of Transportation in accordance with this proposal to provide the necessary contract payment bond and contract performance bond within fourteen days after the written notice of award is received by him. The undersigned Bidder further agrees to provide all necessary machinery, tools, labor, and other means of construction; and to do all the work and to furnish all materials, except as otherwise noted, necessary to perform and complete the said contract in accordance with *the 2012 Standard Specifications for Roads and Structures* by the dates(s) specified in the Project Special Provisions and in accordance with the requirements of the Engineer, and at the unit or lump sum prices, as the case may be, for the various items given on the sheets contained herein.

The Bidder shall provide and furnish all the materials, machinery, implements, appliances and tools, and perform the work and required labor to construct and complete State Highway Contract No. **C202886** in Moore County, for the unit or lump sum prices, as the case may be, bid by the Bidder in his bid and according to the proposal, plans, and specifications prepared by said Department, which proposal, plans, and specifications show the details covering this project, and hereby become a part of this contract.

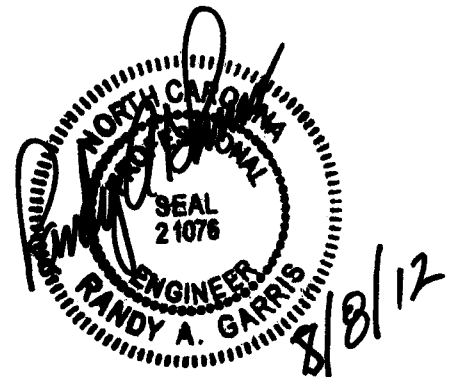
The published volume entitled *North Carolina Department of Transportation, Raleigh, Standard Specifications for Roads and Structures, January 2012* with all amendments and supplements thereto, is by reference incorporated into and made a part of this contract; that, except as herein modified, all the construction and work included in this contract is to be done in accordance with the specifications contained in said volume, and amendments and supplements thereto, under the direction of the Engineer.

If the proposal is accepted and the award is made, the contract is valid only when signed either by the Contract Officer or such other person as may be designated by the Secretary to sign for the Department of Transportation. The conditions and provisions herein cannot be changed except over the signature of the said Contract Officer.

The quantities shown in the itemized proposal for the project are considered to be approximate only and are given as the basis for comparison of bids. The Department of Transportation may increase or decrease the quantity of any item or portion of the work as may be deemed necessary or expedient.

An increase or decrease in the quantity of an item will not be regarded as sufficient ground for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided for the contract.

Accompanying this bid is a bid bond secured by a corporate surety, or certified check payable to the order of the Department of Transportation, for five percent of the total bid price, which deposit is to be forfeited as liquidated damages in case this bid is accepted and the Bidder shall fail to provide the required payment and performance bonds with the Department of Transportation, under the condition of this proposal, within 14 calendar days after the written notice of award is received by him, as provided in the *Standard Specifications*; otherwise said deposit will be returned to the Bidder.



*State Contract Officer*

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**PROJECT SPECIAL PROVISIONS****GENERAL****CONTRACT TIME AND LIQUIDATED DAMAGES:**

(8-15-00) (Rev. 12-18-07)

108

SP1 G07 A

The date of availability for this contract is **October 29, 2012**, except that work in jurisdictional waters and wetlands shall not begin until a meeting between the DOT, Regulatory Agencies, and the Contractor is held as stipulated in the permits contained elsewhere in this proposal. This delay in availability has been considered in determining the contract time for this project.

The completion date for this contract is **November 28, 2015**.

Except where otherwise provided by the contract, observation periods required by the contract will not be a part of the work to be completed by the completion date and/or intermediate contract times stated in the contract. The acceptable completion of the observation periods that extend beyond the final completion date shall be a part of the work covered by the performance and payment bonds.

The liquidated damages for this contract are **Two Hundred Dollars (\$200.00)** per calendar day. These liquidated damages will not be cumulative with any liquidated damages which may become chargeable under Intermediate Contract Time Number 1.

**INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES:**

(7-1-95) (Rev. 2-21-12)

108

SP1 G13 A

Except for that work required under the Project Special Provisions entitled *Planting, Reforestation* and/or *Permanent Vegetation Establishment*, included elsewhere in this proposal, the Contractor will be required to complete all work included in this contract and shall place and maintain traffic on same.

The date of availability for this intermediate contract time is **October 29, 2012**.

The completion date for this intermediate contract time is **June 1, 2015**.

The liquidated damages for this intermediate contract time are **One Thousand Dollars (\$1,000.00)** per calendar day.

Upon apparent completion of all the work required to be completed by this intermediate date, a final inspection will be held in accordance with Article 105-17 and upon acceptance, the Department will assume responsibility for the maintenance of all work except *Planting, Reforestation* and/or *Permanent Vegetation Establishment*. The Contractor will be responsible for and shall make corrections of all damages to the completed roadway caused by his planting operations, whether occurring prior to or after placing traffic through the project.

**INTERMEDIATE CONTRACT TIME NUMBER 2 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SP1 G14 A

The Contractor shall complete the required work of installing, maintaining, and removing the traffic control devices for lane closures and restoring traffic to the existing traffic pattern.

The Contractor shall not close or narrow a lane of traffic on **Morganton Road/SR 1309 (-Y6-)** during the following time restrictions:

**DAY AND TIME RESTRICTIONS**

**Monday through Friday  
from 7:00 A.M. to 9:00 A.M.  
and  
from 4:00 P.M. to 6:00 P.M.**

In addition, the Contractor shall not close or narrow a lane of traffic on **Morganton Road/SR 1309 (-Y6-)**, detain and/or alter the traffic flow on or during holidays, holiday weekends, special events, or any other time when traffic is unusually heavy, including the following schedules:

**HOLIDAY AND HOLIDAY WEEKEND LANE CLOSURE RESTRICTIONS**

1. For **unexpected occurrence** that creates unusually high traffic volumes, as directed by the Engineer.
2. For **New Year's Day**, between the hours of **6:00 a.m.** December 31st and **7:00 p.m.** January 2nd. If New Year's Day is on a Friday, Saturday, Sunday or Monday, then until **7:00 p.m.** the following Tuesday.
3. For **Easter**, between the hours of **6:00 a.m.** Thursday and **7:00 p.m.** Monday.
4. For **Memorial Day**, between the hours of **6:00 a.m.** Friday and **7:00 p.m.** Tuesday.
5. For **Independence Day**, between the hours of **6:00 a.m.** the day before Independence Day and **7:00 p.m.** the day after Independence Day.

If **Independence Day** is on a Friday, Saturday, Sunday or Monday, then between the hours of **6:00 a.m.** the Thursday before Independence Day and **7:00 p.m.** the Tuesday after Independence Day.

6. For **Labor Day**, between the hours of **6:00 a.m.** Friday and **7:00 p.m.** Tuesday.
7. For **Thanksgiving Day**, between the hours of **6:00 a.m.** Tuesday and **7:00 p.m.** Monday.

8. For **Christmas**, between the hours of **6:00 a.m.** the Friday before the week of Christmas Day and **7:00 p.m.** the following Tuesday after the week of Christmas Day.
9. For the **U.S. Open Championship and U.S. Women's Open Championship, held at Pinehurst Resort & Country Club from June 9, 2014 to June 23, 2014**, between the hours of **6:00 A.M.** the Friday before the **U.S. Open Championship and U.S. Women's Open Championship** and **7:00 P.M.** the day after the **U.S. Open Championship and U.S. Women's Open Championship**.

Holidays and holiday weekends shall include New Year's, Easter, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas. The Contractor shall schedule his work so that lane closures will not be required during these periods, unless otherwise directed by the Engineer.

The time of availability for this intermediate contract work shall be the time the Contractor begins to install all traffic control devices for lane closures according to the time restrictions listed herein.

The completion time for this intermediate contract work shall be the time the Contractor is required to complete the removal of all traffic control devices for lane closures according to the time restrictions stated above and place traffic in the existing traffic pattern.

The liquidated damages are **One Thousand Dollars (\$1,000.00)** per hour.

**INTERMEDIATE CONTRACT TIME NUMBER 3 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SP1 G14 A

The Contractor shall complete the required work of installing, maintaining, and removing the traffic control devices for lane closures and restoring traffic to the existing traffic pattern.

The Contractor shall not close or narrow a lane of traffic on **US 1 NB & SB (-L-)** during the following time restrictions:

**DAY AND TIME RESTRICTIONS**

**Monday through Sunday  
from 6:00 A.M. to 7:00 P.M.**

In addition, the Contractor shall not close or narrow a lane of traffic on **US 1 NB & SB (-L-)**, detain and/or alter the traffic flow on or during holidays, holiday weekends, special events, or any other time when traffic is unusually heavy, including the following schedules:

**HOLIDAY AND HOLIDAY WEEKEND LANE CLOSURE RESTRICTIONS**

1. For **unexpected occurrence** that creates unusually high traffic volumes, as directed by the Engineer.

2. For **New Year's Day**, between the hours of **6:00 a.m.** December 31st and **7:00 p.m.** January 2nd. If New Year's Day is on a Friday, Saturday, Sunday or Monday, then until **7:00 p.m.** the following Tuesday.
3. For **Easter**, between the hours of **6:00 a.m.** Thursday and **7:00 p.m.** Monday.
4. For **Memorial Day**, between the hours of **6:00 a.m.** Friday and **7:00 p.m.** Tuesday.
5. For **Independence Day**, between the hours of **6:00 a.m.** the day before Independence Day and **7:00 p.m.** the day after Independence Day.

If **Independence Day** is on a Friday, Saturday, Sunday or Monday, then between the hours of **6:00 a.m.** the Thursday before Independence Day and **7:00 p.m.** the Tuesday after Independence Day.

6. For **Labor Day**, between the hours of **6:00 a.m.** Friday and **7:00 p.m.** Tuesday.
7. For **Thanksgiving Day**, between the hours of **6:00 a.m.** Tuesday and **7:00 p.m.** Monday.
8. For **Christmas**, between the hours of **6:00 a.m.** the Friday before the week of Christmas Day and **7:00 p.m.** the following Tuesday after the week of Christmas Day.
9. For the **U.S. Open Championship and U.S. Women's Open Championship, held at Pinehurst Resort & Country Club from June 9, 2014 to June 23, 2014**, between the hours of **6:00 A.M.** the Friday before the **U.S. Open Championship and U.S. Women's Open Championship** and **7:00 P.M.** the day after the **U.S. Open Championship and U.S. Women's Open Championship**.

Holidays and holiday weekends shall include New Year's, Easter, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas. The Contractor shall schedule his work so that lane closures will not be required during these periods, unless otherwise directed by the Engineer.

The time of availability for this intermediate contract work shall be the time the Contractor begins to install all traffic control devices for lane closures according to the time restrictions listed herein.

The completion time for this intermediate contract work shall be the time the Contractor is required to complete the removal of all traffic control devices for lane closures according to the time restrictions stated above and place traffic in the existing traffic pattern.

The liquidated damages are **Five Hundred (\$500.00)** per hour.

**INTERMEDIATE CONTRACT TIME NUMBER 4 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SP1 G14 A

The Contractor shall complete the required work of installing, maintaining, and removing the traffic control devices for lane closures and restoring traffic to the existing traffic pattern. The Contractor shall not close or narrow a lane of traffic on **Murray Hill Road/SR 2054 (-Y1-) Henson Street/SR 2054 (-Y2-), Saunders Boulevard (SR 2053) and Old US 1 NB & SB** during the following time restrictions:

**DAY AND TIME RESTRICTIONS**

**Monday through Friday  
from 7:00 A.M. to 9:00 A.M.  
and  
from 4:00 P.M. to 6:00 P.M.**

In addition, the Contractor shall not close or narrow a lane of traffic on **Murray Hill Road/SR 2054 (-Y1-) Henson Street/SR 2054 (-Y2-), Saunders Boulevard (SR 2053) and Old US 1 NB & SB**, detain and/or alter the traffic flow on or during holidays, holiday weekends, special events, or any other time when traffic is unusually heavy, including the following schedules:

**HOLIDAY AND HOLIDAY WEEKEND LANE CLOSURE RESTRICTIONS**

1. For **unexpected occurrence** that creates unusually high traffic volumes, as directed by the Engineer.
2. For **New Year's Day**, between the hours of **6:00 a.m.** December 31st and **7:00 p.m.** January 2nd. If New Year's Day is on a Friday, Saturday, Sunday or Monday, then until **7:00 p.m.** the following Tuesday.
3. For **Easter**, between the hours of **6:00 a.m.** Thursday and **7:00 p.m.** Monday.
4. For **Memorial Day**, between the hours of **6:00 a.m.** Friday and **7:00 p.m.** Tuesday.
5. For **Independence Day**, between the hours of **6:00 a.m.** the day before Independence Day and **7:00 p.m.** the day after Independence Day.

If **Independence Day** is on a Friday, Saturday, Sunday or Monday, then between the hours of **6:00 a.m.** the Thursday before Independence Day and **7:00 p.m.** the Tuesday after Independence Day.

6. For **Labor Day**, between the hours of **6:00 a.m.** Friday and **7:00 p.m.** Tuesday.
7. For **Thanksgiving Day**, between the hours of **6:00 a.m.** Tuesday and **7:00 p.m.** Monday.

8. For **Christmas**, between the hours of **6:00 a.m.** the Friday before the week of Christmas Day and **7:00 p.m.** the following Tuesday after the week of Christmas Day.
9. For the **U.S. Open Championship and U.S. Women's Open Championship, held at Pinehurst Resort & Country Club from June 9, 2014 to June 23, 2014**, between the hours of **6:00 A.M.** the Friday before the **U.S. Open Championship and U.S. Women's Open Championship** and **7:00 P.M.** the day after the **U.S. Open Championship and U.S. Women's Open Championship**.

Holidays and holiday weekends shall include New Year's, Easter, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas. The Contractor shall schedule his work so that lane closures will not be required during these periods, unless otherwise directed by the Engineer.

The time of availability for this intermediate contract work shall be the time the Contractor begins to install all traffic control devices for lane closures according to the time restrictions listed herein.

The completion time for this intermediate contract work shall be the time the Contractor is required to complete the removal of all traffic control devices for lane closures according to the time restrictions stated above and place traffic in the existing traffic pattern.

The liquidated damages are **Five Hundred Dollars (\$500.00)** per hour.

**INTERMEDIATE CONTRACT TIME NUMBER 5 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SPI G14 D

The Contractor shall complete the required work of installing, maintaining and removing the traffic control devices for road closures and restoring traffic to the **current** traffic pattern. The Contractor shall not close **US 1 NB & SB and Old US 1 NB & SB** during the following time restrictions:

**DAY AND TIME RESTRICTIONS**

**Monday through Sunday  
from 6:00 A.M. to 10:00 P.M.**

The time of availability for this intermediate contract time will be the time the Contractor begins to install traffic control devices required for road closures according to the time restrictions stated herein.

The completion time for this intermediate contract time will be the time the Contractor is required to complete the removal of traffic control devices required for the road closures according to the time restrictions stated herein and restore traffic to the **current** traffic pattern

The liquidated damages are **One Thousand Dollars (\$1,000.00)** per **fifteen (15) minutes**.

**INTERMEDIATE CONTRACT TIME NUMBER 6 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SPI G14 D

The Contractor shall complete the required work of installing, maintaining and removing the traffic control devices for road closures and restoring traffic to the **current** traffic pattern. The Contractor shall not close **Existing Service Road along Old US 1 and Wisconsin Avenue** during the following time restrictions:

**DAY AND TIME RESTRICTIONS**

**Monday through Sunday  
from 6:00 A.M. to 10:00 P.M.**

The time of availability for this intermediate contract time will be the time the Contractor begins to install traffic control devices required for road closures according to the time restrictions stated herein.

The completion time for this intermediate contract time will be the time the Contractor is required to complete the removal of traffic control devices required for the road closures according to the time restrictions stated herein and restore traffic to the **current** traffic pattern

The liquidated damages are **Five Hundred Dollars (\$500.00)** per hour.

**INTERMEDIATE CONTRACT TIME NUMBER 7 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SPI G14 E

The Contractor shall complete the required work of installing, maintaining and removing the traffic control devices for road closures and restoring traffic to the existing traffic pattern.

The Contractor shall not close **Morganton Road/SR 1309 (-Y6-) and US 1 NB & SB (-L-)** during the following time restrictions:

**DAY AND TIME RESTRICTIONS**

**Monday through Sunday  
from 6:00 A.M. to 10:00 P.M.**

The maximum allowable time for **traffic shifts** is **thirty (30)** minutes for **Morganton Road/SR 1309 (-Y6-) and US 1 NB & SB (-L-)**. The Contractor shall reopen the travel lanes to traffic until the existing traffic queue is depleted.

The time of availability for this intermediate contract time will be the time the Contractor begins to install traffic control devices required for the road closures according to the time restrictions stated herein.

The completion time for this intermediate contract time will be the time the Contractor is required to complete the removal of traffic control devices required for the road closures according to the time restrictions stated herein and restore traffic to the existing traffic pattern.

The liquidated damages are **Two Thousand Five Hundred Dollars (\$2,500.00)** per **thirty (30)-minute** time period.



**INTERMEDIATE CONTRACT TIME NUMBER 8 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SPI G14 E

The Contractor shall complete the required work of installing, maintaining and removing the traffic control devices for road closures and restoring traffic to the existing traffic pattern.

The Contractor shall not close **Murray Hill Road/SR 2054 (-Y1-), Henson Street/SR 2054 (-Y2-), Saunders Boulevard (SR 2053) and Old US 1 NB & SB** during the following time restrictions:

**DAY AND TIME RESTRICTIONS**

**Monday through Friday  
from 7:00 A.M. to 9:00 A.M.  
and  
from 4:00 A.M. to 6:00 P.M.**

The maximum allowable time for **traffic shifts** is **thirty (30)** minutes for **Murray Hill Road/SR 2054 (-Y1-), Henson Street/SR 2054 (-Y2-), Saunders Boulevard (SR 2053) and Old US 1 NB & SB**. The Contractor shall reopen the travel lanes to traffic until the existing traffic queue is depleted.

The time of availability for this intermediate contract time will be the time the Contractor begins to install traffic control devices required for the road closures according to the time restrictions stated herein.

The completion time for this intermediate contract time will be the time the Contractor is required to complete the removal of traffic control devices required for the road closures according to the time restrictions stated herein and restore traffic to the existing traffic pattern.

The liquidated damages are **Five Hundred Dollars (\$500.00)** per **thirty (30)**-minute time period.

**INTERMEDIATE CONTRACT TIME NUMBER 9 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SPI G14 G

The Contractor shall complete the work required of **Phase I, Step 1 thru Step 5** for the **following roads** as shown on **Sheet TMP-3** and shall place and maintain traffic on same:

**-Y1-**

**-Y2-**

**Saunders Boulevard**

**-Y4-**

**-Y5- Station 10+00± to 18+17±**

**-L- Station 10+00± to 31+66±**

**-SBUS1- Station 10+00± to 26+01±**

The **date** of availability for this intermediate contract time **will be** the time the Contractor begins the work.

The completion **date** for this intermediate contract time **will be May 15, 2013.**

The liquidated damages are **Five Hundred Dollars (\$500.00)** per **calendar day.**

**INTERMEDIATE CONTRACT TIME NUMBER 10 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SP1 G14 F

The Contractor shall **complete the installation of the waterline along -Y1- (Murray Hill Road) in Phase I, Step 1** as shown on Sheet **TMP-3** and shall place and maintain traffic on same.

The time of availability for this intermediate contract time **will be the Friday at 6:00 P.M.** that the Contractor elects to begin the work.

The completion time for this intermediate contract time **will be the following Monday at 6:00 A.M.** after the time of availability.

The liquidated damages are **Five Hundred Dollars (\$500.00)** per hour.

**INTERMEDIATE CONTRACT TIME NUMBER 11 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SP1 G14 H

The Contractor shall complete the work required of **Phase I, Step 4** as shown on Sheet **TMP-3** and shall place and maintain traffic on same.

The date of availability for this intermediate contract time **will be** the date the Contractor elects to begin the work.

The completion date for this intermediate contract time **will be** the date which is **seven (7)** consecutive calendar days after and including the date the Contractor begins this work.

The liquidated damages are **Five Hundred Dollars (\$500.00)** per calendar day.

**INTERMEDIATE CONTRACT TIME NUMBER 12 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SP1 G14 H

The Contractor shall complete the work required of **Phase II, Step 1** as shown on Sheet **TMP-3A** and shall place and maintain traffic on same.

The date of availability for this intermediate contract time **will be** the date the Contractor elects to begin the work.

The completion date for this intermediate contract time **will be** the date which is **thirty (30)** consecutive calendar days after and including the date the Contractor begins this work.

The liquidated damages are **One Thousand Dollars (\$1,000.00)** per calendar day.

**PERMANENT VEGETATION ESTABLISHMENT:**

(2-16-12)

104

SP1 G16

Establish a permanent stand of the vegetation mixture shown in the contract. During the period between initial vegetation planting and final project acceptance, perform all work necessary to establish 80% coverage of permanent vegetation within the project limits, as well as, in borrow and waste pits. This work shall include erosion control device maintenance and installation, repair seeding and mulching, supplemental seeding and mulching, mowing, and fertilizer topdressing, as directed. All work shall be performed in accordance with the applicable section of the *2012 Standard Specifications*.

Once the Engineer has determined that 80% coverage of permanent vegetation has been established, the Contractor will be notified to remove the remaining erosion control devices that are no longer needed. The Contractor will be responsible for, and shall correct any areas disturbed by operations performed in permanent vegetation establishment and the removal of temporary erosion control measures, whether occurring prior to or after placing traffic on the project.

Payment for *Response for Erosion Control, Seeding and Mulching, Repair Seeding, Supplemental Seeding, Mowing, Fertilizer Topdressing, Silt Excavation, and Stone for Erosion Control* will be made at contract unit prices for the affected items. Work required that is not represented by contract line items will be paid in accordance with Articles 104-7 or 104-3 of the *2012 Standard Specifications*. No additional compensation will be made for maintenance and removal of temporary erosion control items.

**DELAY IN RIGHT OF ENTRY:**

(7-1-95)

108

SP1 G22 A

The Contractor will not be allowed right of entry to the parcels listed below before **September 30, 2012** unless otherwise permitted by the Engineer.

| <b><u>Parcel No.</u></b> | <b><u>Property Owner</u></b>                           |
|--------------------------|--------------------------------------------------------|
| 001                      | BB and T                                               |
| 002                      | Ronald H Goodrich                                      |
| 003                      | Value Line Properties                                  |
| 007                      | Our Saviour Lutheran Church<br>of Southern Pines, Inc. |

**MAJOR CONTRACT ITEMS:**

(2-19-02)

104

SP1 G28

The following listed items are the major contract items for this contract (see Article 104-5 of the *2012 Standard Specifications*):

| <b><u>Line #</u></b> | <b><u>Description</u></b>      |
|----------------------|--------------------------------|
| 253                  | Soldier Pile Retaining Walls   |
| 261                  | Reinforced Concrete Deck Slabs |

**SPECIALTY ITEMS:**

(7-1-95)(Rev. 1-17-12)

108-6

SP1 G37

Items listed below will be the specialty items for this contract (see Article 108-6 of the 2012 Standard Specifications).

| Line #                              | Description                 |
|-------------------------------------|-----------------------------|
| 70 thru 79                          | Guardrail                   |
| 80 thru 82                          | Fencing                     |
| 87 thru 101                         | Signing                     |
| 119 thru 127<br>and<br>129 thru 130 | Long-Life Pavement Markings |
| 128 and 131                         | Removable Tape              |
| 141 thru 142                        | Permanent Pavement Markers  |
| 144 thru 173                        | Lighting                    |
| 175 thru 189                        | Utility Construction        |
| 190 thru 218                        | Erosion Control             |
| 219 thru 252                        | Signals/ITS System          |

**FUEL PRICE ADJUSTMENT:**

(11-15-05) (Rev. 1-17-12)

109-8

SP1 G43

Revise the 2012 Standard Specifications as follows:

**Page 1-83, Article 109-8, Fuel Price Adjustments,** add the following:

The base index price for DIESEL #2 FUEL is **\$3.0348** per gallon. Where any of the following are included as pay items in the contract, they will be eligible for fuel price adjustment.

The pay items and the fuel factor used in calculating adjustments to be made will be as follows:

| Description                                      | Units   | Fuel Usage<br>Factor Diesel |
|--------------------------------------------------|---------|-----------------------------|
| Unclassified Excavation                          | Gal/CY  | 0.29                        |
| Borrow Excavation                                | Gal/CY  | 0.29                        |
| Class IV Subgrade Stabilization                  | Gal/Ton | 0.55                        |
| Aggregate Base Course                            | Gal/Ton | 0.55                        |
| Asphalt Concrete Base Course, Type _____         | Gal/Ton | 2.90                        |
| Asphalt Concrete Intermediate Course, Type _____ | Gal/Ton | 2.90                        |
| Asphalt Concrete Surface Course, Type _____      | Gal/Ton | 2.90                        |
| Open-Graded Asphalt Friction Course              | Gal/Ton | 2.90                        |
| Sand Asphalt Surface Course, Type _____          | Gal/Ton | 2.90                        |
| Aggregate for Cement Treated Base Course         | Gal/Ton | 0.55                        |
| Portland Cement for Cement Treated Base Course   | Gal/Ton | 0.55                        |
| ____ " Portland Cement Concrete Pavement         | Gal/SY  | 0.245                       |
| Concrete Shoulders Adjacent to ____ " Pavement   | Gal/SY  | 0.245                       |

**SCHEDULE OF ESTIMATED COMPLETION PROGRESS:**

(7-15-08) (Rev. 6-19-12)

108-2

SP1 G58

The Contractor's attention is directed to the Standard Special Provision entitled *Availability of Funds Termination of Contracts* included elsewhere in this proposal. The Department of Transportation's schedule of estimated completion progress for this project as required by that Standard Special Provision is as follows:

|      | <b><u>Fiscal Year</u></b> | <b><u>Progress (% of Dollar Value)</u></b> |
|------|---------------------------|--------------------------------------------|
| 2013 | (7/01/12 - 6/30/13)       | 37% of Total Amount Bid                    |
| 2014 | (7/01/13 - 6/30/14)       | 41% of Total Amount Bid                    |
| 2015 | (7/01/14 - 6/30/15)       | 22% of Total Amount Bid                    |

The Contractor shall also furnish his own progress schedule in accordance with Article 108-2 of the *2012 Standard Specifications*. Any acceleration of the progress as shown by the Contractor's progress schedule over the progress as shown above shall be subject to the approval of the Engineer.

**DISADVANTAGED BUSINESS ENTERPRISE:**

(10-16-07)(Rev. 1-17-12)

102-15(J)

SP1 G61

**Description**

The purpose of this Special Provision is to carry out the U.S. Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts financed in whole or in part with Federal funds. This provision is guided by 49 CFR Part 26.

**Definitions**

*Additional DBE Subcontractors* - Any DBE submitted at the time of bid that will not be used to meet the DBE goal. No submittal of a Letter of Intent is required.

*Committed DBE Subcontractor* - Any DBE submitted at the time of bid that is being used to meet the DBE goal by submission of a Letter of Intent. Or any DBE used as a replacement for a previously committed DBE firm.

*Contract Goal Requirement* - The approved DBE participation at time of award, but not greater than the advertised contract goal.

*DBE Goal* - A portion of the total contract, expressed as a percentage, that is to be performed by committed DBE subcontractor(s).

*Disadvantaged Business Enterprise (DBE)* - A firm certified as a Disadvantaged Business Enterprise through the North Carolina Unified Certification Program.

*Goal Confirmation Letter* - Written documentation from the Department to the bidder confirming the Contractor's approved, committed DBE participation along with a listing of the committed DBE firms.

*Manufacturer* - A firm that operates or maintains a factory or establishment that produces on the premises, the materials or supplies obtained by the Contractor.

*Regular Dealer* - A firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold to the public in the usual course of business. A regular dealer engages in, as its principal business and in its own name, the purchase and sale or lease of the products in question. A regular dealer in such bulk items as steel, cement, gravel, stone, and petroleum products need not keep such products in stock, if it owns and operates distribution equipment for the products. Brokers and packagers are not regarded as manufacturers or regular dealers within the meaning of this section.

*North Carolina Unified Certification Program (NCUCP)* - A program that provides comprehensive services and information to applicants for DBE certification, such that an applicant is required to apply only once for a DBE certification that will be honored by all recipients of USDOT funds in the state and not limited to the Department of Transportation only. The Certification Program is in accordance with 49 CFR Part 26.

*United States Department of Transportation (USDOT)* - Federal agency responsible for issuing regulations (49 CFR Part 26) and official guidance for the DBE program.

#### **Forms and Websites Referenced in this Provision**

*DBE Payment Tracking System* - On-line system in which the Contractor enters the payments made to DBE subcontractors who have performed work on the project.  
<https://apps.dot.state.nc.us/Vendor/PaymentTracking/>

*DBE-IS Subcontractor Payment Information* - Form for reporting the payments made to all DBE firms working on the project. This form is for paper bid projects only.  
<http://www.ncdot.org/doh/forms/files/DBE-IS.xls>

*RF-1 DBE Replacement Request Form* - Form for replacing a committed DBE.  
[https://apps.dot.state.nc.us/\\_includes/download/external.html?pdf=http%3A//www.ncdot.gov/doh/forms/files/RF-1.pdf](https://apps.dot.state.nc.us/_includes/download/external.html?pdf=http%3A//www.ncdot.gov/doh/forms/files/RF-1.pdf)

*SAF Subcontract Approval Form* - Form required for approval to sublet the contract.  
[http://www.ncdot.org/doh/operations/dp\\_chief\\_eng/constructionunit/saf.xls](http://www.ncdot.org/doh/operations/dp_chief_eng/constructionunit/saf.xls)

*JC-1 Joint Check Notification Form* - Form and procedures for joint check notification. The form acts as a written joint check agreement among the parties providing full and prompt disclosure of the expected use of joint checks.  
[https://apps.dot.state.nc.us/\\_includes/download/external.html?pdf=http%3A//www.ncdot.gov/doh/forms/files/JC-1.pdf](https://apps.dot.state.nc.us/_includes/download/external.html?pdf=http%3A//www.ncdot.gov/doh/forms/files/JC-1.pdf)

*Letter of Intent* - Form signed by the Contractor and the DBE subcontractor, manufacturer or regular dealer that affirms that a portion of said contract is going to be performed by the signed DBE for the amount listed at the time of bid.  
<http://www.ncdot.org/doh/preconstruct/ps/contracts/letterofintent.pdf>

*Listing of DBE Subcontractors Form* - Form for entering DBE subcontractors on a project that will meet this DBE goal. This form is for paper bids only.

<http://www.ncdot.gov/doh/preconstruct/ps/word/MISC2.doc>

*Subcontractor Quote Comparison Sheet* - Spreadsheet for showing all subcontractor quotes in the work areas where DBEs quoted on the project. This sheet is submitted with good faith effort packages.

[http://www.ncdot.gov/business/ocs/goodfaith/excel/Ex\\_Subcontractor\\_Quote\\_Comparison.xls](http://www.ncdot.gov/business/ocs/goodfaith/excel/Ex_Subcontractor_Quote_Comparison.xls)

### **DBE Goal**

The following DBE goal for participation by Disadvantaged Business Enterprises is established for this contract:

Disadvantaged Business Enterprises **10.0 %**

- (A) *If the DBE goal is more than zero*, the Contractor shall exercise all necessary and reasonable steps to ensure that DBEs participate in at least the percent of the contract as set forth above as the DBE goal.
- (B) *If the DBE goal is zero*, the Contractor shall make an effort to recruit and use DBEs during the performance of the contract. Any DBE participation obtained shall be reported to the Department.

### **Directory of Transportation Firms (Directory)**

Real-time information is available about firms doing business with the Department and firms that are certified through NCUCP in the Directory of Transportation Firms. Only firms identified in the Directory as DBE certified shall be used to meet the DBE goal. The Directory can be found at the following link. <https://partner.ncdot.gov/VendorDirectory/default.html>

The listing of an individual firm in the directory shall not be construed as an endorsement of the firm's capability to perform certain work.

### **Listing of DBE Subcontractors**

At the time of bid, bidders shall submit all DBE participation that they anticipate to use during the life of the contract. Only those identified to meet the DBE goal will be considered committed, even though the listing shall include both committed DBE subcontractors and additional DBE subcontractors. Additional DBE subcontractor participation submitted at the time of bid will be used toward the Department's overall race-neutral goal. Only those firms with current DBE certification at the time of bid opening will be acceptable for listing in the

bidder's submittal of DBE participation. The Contractor shall indicate the following required information:

(A) Electronic Bids

Bidders shall submit a listing of DBE participation in the appropriate section of Expedite, the bidding software of Bid Express®.

- (1) Submit the names and addresses of DBE firms identified to participate in the contract. If the bidder uses the updated listing of DBE firms shown in Expedite, the bidder may use the dropdown menu to access the name and address of the DBE firm.
- (2) Submit the contract line numbers of work to be performed by each DBE firm. When no figures or firms are entered, the bidder will be considered to have no DBE participation.
- (3) The bidder shall be responsible for ensuring that the DBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that DBE's participation will not count towards achieving the DBE goal.

(B) Paper Bids

**Blank forms will not be deemed to represent zero participation.** Bids submitted that do not have DBE participation indicated on the appropriate form will not be read publicly during the opening of bids. The Department will not consider these bids for award and the proposal will be rejected.

- (1) *If the DBE goal is more than zero,*
  - (a) Bidders, at the time the bid proposal is submitted, shall submit a listing of DBE participation, including the names and addresses on *Listing of DBE Subcontractors* contained elsewhere in the contract documents in order for the bid to be considered responsive. Bidders shall indicate the total dollar value of the DBE participation for the contract.
  - (b) If bidders have no DBE participation, they shall indicate this on the *Listing of DBE Subcontractors* by entering the word "None" or the number "0." This form shall be completed in its entirety.
  - (c) The bidder shall be responsible for ensuring that the DBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that DBE's participation will not count towards achieving the DBE goal.
- (2) *If the DBE goal is zero,* bidders, at the time the bid proposal is submitted, shall enter the word "None"; or the number "0"; or if there is participation, add the value on the *Listing of DBE Subcontractors* contained elsewhere in the contract documents.



**DBE Prime Contractor**

When a certified DBE firm bids on a contract that contains a DBE goal, the DBE firm is responsible for meeting the goal or making good faith efforts to meet the goal, just like any other bidder. In most cases, a DBE bidder on a contract will meet the DBE goal by virtue of the work it performs on the contract with its own forces. However, all the work that is performed by the DBE bidder and any other DBE subcontractors will count toward the DBE goal. The DBE bidder shall list itself along with any DBE subcontractors, if any, in order to receive credit toward the DBE goal.

For example, if the DBE goal is 45% and the DBE bidder will only perform 40% of the contract work, the prime will list itself at 40%, and the additional 5% shall be obtained through additional DBE participation with DBE subcontractors or documented through a good faith effort.

DBE prime contractors shall also follow Sections A and B listed under *Listing of DBE Subcontractor* just as a non-DBE bidder would.

**Written Documentation – Letter of Intent**

The bidder shall submit written documentation for each DBE that will be used to meet the DBE goal of the contract, indicating the bidder's commitment to use the DBE in the contract. This documentation shall be submitted on the Department's form titled *Letter of Intent*.

The documentation shall be received in the office of the State Contractor Utilization Engineer or at DBE@ncdot.gov no later than 12:00 noon of the sixth calendar day following opening of bids, unless the sixth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 12:00 noon on the next official state business day.

If the bidder fails to submit the Letter of Intent from each committed DBE to be used toward the DBE goal, or if the form is incomplete (i.e. both signatures are not present), the DBE participation will not count toward meeting the DBE goal. If the lack of this participation drops the commitment below the DBE goal, the Contractor shall submit evidence of good faith efforts, completed in its entirety, to the State Contractor Utilization Engineer or DBE@ncdot.gov no later than 12:00 noon on the eighth calendar day following opening of bids, unless the eighth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 12:00 noon on the next official state business day.

**Submission of Good Faith Effort**

If the bidder fails to meet or exceed the DBE goal, the apparent lowest responsive bidder shall submit to the Department documentation of adequate good faith efforts made to reach the DBE goal.

A hard copy and an electronic copy of this information shall be received in the office of the State Contractor Utilization Engineer or at DBE@ncdot.gov no later than 12:00 noon of the sixth calendar day following opening of bids unless the sixth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer the next official state business day. If the contractor cannot send the information electronically, then one complete set and 9 copies of this information shall be received under the same time constraints above.

Note: Where the information submitted includes repetitious solicitation letters, it will be acceptable to submit a representative letter along with a distribution list of the firms that were solicited. Documentation of DBE quotations shall be a part of the good faith effort submittal. This documentation may include written subcontractor quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

### **Consideration of Good Faith Effort for Projects with DBE Goals More Than Zero**

Adequate good faith efforts mean that the bidder took all necessary and reasonable steps to achieve the goal which, by their scope, intensity, and appropriateness, could reasonably be expected to obtain sufficient DBE participation. Adequate good faith efforts also mean that the bidder actively and aggressively sought DBE participation. Mere *pro forma* efforts are not considered good faith efforts.

The Department will consider the quality, quantity, and intensity of the different kinds of efforts a bidder has made. Listed below are examples of the types of actions a bidder will take in making a good faith effort to meet the goal and are not intended to be exclusive or exhaustive, nor is it intended to be a mandatory checklist.

- (A) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices through the use of the NCDOT Directory of Transportation Firms) the interest of all certified DBEs who have the capability to perform the work of the contract. The bidder must solicit this interest within at least 10 days prior to bid opening to allow the DBEs to respond to the solicitation. Solicitation shall provide the opportunity to DBEs within the Division and surrounding Divisions where the project is located. The bidder must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.
- (B) Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.
- (C) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

- (D) (1) Negotiating in good faith with interested DBEs. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.
- (2) A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidding contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.
- (E) Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associates and political or social affiliations (for example, union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.
- (F) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or bidder.
- (G) Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.
- (H) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; Federal, State, and local minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs. Contact within 7 days from the bid opening the Business Development Manager in the Business Opportunity and Work Force Development Unit to give notification of the bidder's inability to get DBE quotes.
- (I) Any other evidence that the bidder submits which shows that the bidder has made reasonable good faith efforts to meet the DBE goal.

In addition, the Department may take into account the following:

- (1) Whether the bidder's documentation reflects a clear and realistic plan for achieving the DBE goal.

- (2) The bidders' past performance in meeting the DBE goals.
- (3) The performance of other bidders in meeting the DBE goal. For example, when the apparent successful bidder fails to meet the DBE goal, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts the apparent successful bidder could have met the goal. If the apparent successful bidder fails to meet the DBE goal, but meets or exceeds the average DBE participation obtained by other bidders, the Department may view this, in conjunction with other factors, as evidence of the apparent successful bidder having made a good faith effort.

If the Department does not award the contract to the apparent lowest responsive bidder, the Department reserves the right to award the contract to the next lowest responsive bidder that can satisfy to the Department that the DBE goal can be met or that an adequate good faith effort has been made to meet the DBE goal.

### **Non-Good Faith Appeal**

The State Contractor Utilization Engineer will notify the contractor verbally and in writing of non-good faith. A contractor may appeal a determination of non-good faith made by the Goal Compliance Committee. If a contractor wishes to appeal the determination made by the Committee, they shall provide written notification to the State Contractual Services Engineer or at DBE@ncdot.gov. The appeal shall be made within 2 business days of notification of the determination of non-good faith.

### **Counting DBE Participation Toward Meeting DBE Goal**

#### **(A) Participation**

The total dollar value of the participation by a committed DBE will be counted toward the contract goal requirement. The total dollar value of participation by a committed DBE will be based upon the value of work actually performed by the DBE and the actual payments to DBE firms by the Contractor.

#### **(B) Joint Checks**

Prior notification of joint check use shall be required when counting DBE participation for services or purchases that involves the use of a joint check. Notification shall be through submission of Form JC-1 (*Joint Check Notification Form*) and the use of joint checks shall be in accordance with the Department's Joint Check Procedures.

#### **(C) Subcontracts (Non-Trucking)**

A DBE may enter into subcontracts. Work that a DBE subcontracts to another DBE firm may be counted toward the contract goal requirement. Work that a DBE subcontracts to a non-DBE firm does not count toward the contract goal requirement.

If a DBE contractor or subcontractor subcontracts a significantly greater portion of the work of the contract than would be expected on the basis of standard industry practices, it shall be presumed that the DBE is not performing a commercially useful function. The DBE may present evidence to rebut this presumption to the Department. The Department's decision on the rebuttal of this presumption is subject to review by the Federal Highway Administration but is not administratively appealable to USDOT.

(D) Joint Venture

When a DBE performs as a participant in a joint venture, the Contractor may count toward its contract goal requirement a portion of the total value of participation with the DBE in the joint venture, that portion of the total dollar value being a distinct clearly defined portion of work that the DBE performs with its forces.

(E) Suppliers

A contractor may count toward its DBE requirement 60 percent of its expenditures for materials and supplies required to complete the contract and obtained from a DBE regular dealer and 100 percent of such expenditures from a DBE manufacturer.

(F) Manufacturers and Regular Dealers

A contractor may count toward its DBE requirement the following expenditures to DBE firms that are not manufacturers or regular dealers:

- (1) The fees or commissions charged by a DBE firm for providing a *bona fide* service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a DOT-assisted contract, provided the fees or commissions are determined to be reasonable and not excessive as compared with fees and commissions customarily allowed for similar services.
- (2) With respect to materials or supplies purchased from a DBE, which is neither a manufacturer nor a regular dealer, count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site (but not the cost of the materials and supplies themselves), provided the fees are determined to be reasonable and not excessive as compared with fees customarily allowed for similar services.

**Commercially Useful Function**

(A) DBE Utilization

The Contractor may count toward its contract goal requirement only expenditures to DBEs that perform a commercially useful function in the work of a contract.

A DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE shall also be responsible with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a commercially useful function, the Department will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work, and any other relevant factors.

(B) DBE Utilization in Trucking

The following factors will be used to determine if a DBE trucking firm is performing a commercially useful function:

- (1) The DBE shall be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there shall not be a contrived arrangement for the purpose of meeting DBE goals.
- (2) The DBE shall itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
- (3) The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
- (4) The DBE may subcontract the work to another DBE firm, including an owner-operator who is certified as a DBE. The DBE who subcontracts work to another DBE receives credit for the total value of the transportation services the subcontracted DBE provides on the contract.
- (5) The DBE may also subcontract the work to a non-DBE firm, including from an owner-operator. The DBE who subcontracts the work to a non-DBE is entitled to credit for the total value of transportation services provided by the non-DBE subcontractor not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE subcontractors receives credit only for the fee or commission it receives as a result of the subcontract arrangement. The value of services performed under subcontract agreements between the DBE and the Contractor will not count towards the DBE contract requirement.
- (6) A DBE may lease truck(s) from an established equipment leasing business open to the general public. The lease must indicate that the DBE has exclusive use of and control over the truck. This requirement does not preclude the leased truck

from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. This type of lease may count toward the DBE's credit as long as the driver is under the DBE's payroll.

- (7) Subcontracted/leased trucks shall display clearly on the dashboard the name of the DBE that they are subcontracted/leased to and their own company name if it is not identified on the truck itself. Magnetic door signs are not permitted.

### **DBE Replacement**

When a Contractor has relied on a commitment to a DBE firm (or an approved substitute DBE firm) to meet all or part of a contract goal requirement, the contractor shall not terminate the DBE for convenience. This includes, but is not limited to, instances in which the Contractor seeks to perform the work of the terminated subcontractor with another DBE subcontractor, a non-DBE subcontractor, or with the Contractor's own forces or those of an affiliate. A DBE may only be terminated after receiving the Engineer's written approval based upon a finding of good cause for the termination.

All requests for replacement of a committed DBE firm shall be submitted to the Engineer for approval on Form RF-1 (*DBE Replacement Request*). If the Contractor fails to follow this procedure, the Contractor may be disqualified from further bidding for a period of up to 6 months.

The Contractor shall comply with the following for replacement of a committed DBE:

#### **(A) Performance Related Replacement**

When a committed DBE is terminated for good cause as stated above, an additional DBE that was submitted at the time of bid may be used to fulfill the DBE commitment. A good faith effort will only be required for removing a committed DBE if there were no additional DBEs submitted at the time of bid to cover the same amount of work as the DBE that was terminated.

If a replacement DBE is not found that can perform at least the same amount of work as the terminated DBE, the Contractor shall submit a good faith effort documenting the steps taken. Such documentation shall include, but not be limited to, the following:

- (1) Copies of written notification to DBEs that their interest is solicited in contracting the work defaulted by the previous DBE or in subcontracting other items of work in the contract.
- (2) Efforts to negotiate with DBEs for specific subbids including, at a minimum:
  - (a) The names, addresses, and telephone numbers of DBEs who were contacted.
  - (b) A description of the information provided to DBEs regarding the plans and specifications for portions of the work to be performed.

- (3) A list of reasons why DBE quotes were not accepted.
  - (4) Efforts made to assist the DBEs contacted, if needed, in obtaining bonding or insurance required by the Contractor.
- (B) Decertification Replacement
- (1) When a committed DBE is decertified by the Department after the SAF (*Subcontract Approval Form*) has been received by the Department, the Department will not require the Contractor to solicit replacement DBE participation equal to the remaining work to be performed by the decertified firm. The participation equal to the remaining work performed by the decertified firm will count toward the contract goal requirement.
  - (2) When a committed DBE is decertified prior to the Department receiving the SAF (*Subcontract Approval Form*) for the named DBE firm, the Contractor shall take all necessary and reasonable steps to replace the DBE subcontractor with another DBE subcontractor to perform at least the same amount of work to meet the DBE goal requirement. If a DBE firm is not found to do the same amount of work, a good faith effort must be submitted to NCDOT (see A herein for required documentation).

### **Changes in the Work**

When the Engineer makes changes that result in the reduction or elimination of work to be performed by a committed DBE, the Contractor will not be required to seek additional participation. When the Engineer makes changes that result in additional work to be performed by a DBE based upon the Contractor's commitment, the DBE shall participate in additional work to the same extent as the DBE participated in the original contract work.

When the Engineer makes changes that result in extra work, which has more than a minimal impact on the contract amount, the Contractor shall seek additional participation by DBEs unless otherwise approved by the Engineer.

When the Engineer makes changes that result in an alteration of plans or details of construction, and a portion or all of the work had been expected to be performed by a committed DBE, the Contractor shall seek participation by DBEs unless otherwise approved by the Engineer.

When the Contractor requests changes in the work that result in the reduction or elimination of work that the Contractor committed to be performed by a DBE, the Contractor shall seek additional participation by DBEs equal to the reduced DBE participation caused by the changes.

### **Reports and Documentation**

A SAF (*Subcontract Approval Form*) shall be submitted for all work which is to be performed by a DBE subcontractor. The Department reserves the right to require copies of actual subcontract agreements involving DBE subcontractors.



When using transportation services to meet the contract commitment, the Contractor shall submit a proposed trucking plan in addition to the SAF. The plan shall be submitted prior to beginning construction on the project. The plan shall include the names of all trucking firms proposed for use, their certification type(s), the number of trucks owned by the firm, as well as the individual truck identification numbers, and the line item(s) being performed.

Within 30 calendar days of entering into an agreement with a DBE for materials, supplies or services, not otherwise documented by the SAF as specified above, the Contractor shall furnish the Engineer a copy of the agreement. The documentation shall also indicate the percentage (60% or 100%) of expenditures claimed for DBE credit.

### **Reporting Disadvantaged Business Enterprise Participation**

The Contractor shall provide the Engineer with an accounting of payments made to all DBE firms, including material suppliers and contractors at all levels (prime, subcontractor, or second tier subcontractor). This accounting shall be furnished to the Engineer for any given month by the end of the following month. Failure to submit this information accordingly may result in the following action:

- (A) Withholding of money due in the next partial pay estimate; or
- (B) Removal of an approved contractor from the prequalified bidders' list or the removal of other entities from the approved subcontractors list.

While each contractor (prime, subcontractor, 2nd tier subcontractor) is responsible for accurate accounting of payments to DBEs, it shall be the prime contractor's responsibility to report all monthly and final payment information in the correct reporting manner.

Failure on the part of the Contractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from further bidding until the required information is submitted.

Failure on the part of any subcontractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from being approved for work on future DOT projects until the required information is submitted.

Contractors reporting transportation services provided by non-DBE lessees shall evaluate the value of services provided during the month of the reporting period only.

At any time, the Engineer can request written verification of subcontractor payments.

#### **(A) Electronic Bids Reporting**

The Contractor shall report the accounting of payments through the Department's DBE Payment Tracking System.

#### **(B) Paper Bids Reporting**

The Contractor shall report the accounting of payments on the Department's DBE-IS (*Subcontractor Payment Information*) with each invoice. Invoices will not be processed for payment until the DBE-IS is received.

**Failure to Meet Contract Requirements**

Failure to meet contract requirements in accordance with Subarticle 102-15(J) of the *2012 Standard Specifications* may be cause to disqualify the Contractor.

**CERTIFICATION FOR FEDERAL-AID CONTRACTS:**

(3-21-90)

SP1 G85

The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

- (A) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (B) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, *Disclosure Form to Report Lobbying*, in accordance with its instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by *Section 1352, Title 31, U.S. Code*. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such subrecipients shall certify and disclose accordingly.

**CONTRACTOR'S LICENSE REQUIREMENTS:**

(7-1-95)

102-14

SP1 G88

If the successful bidder does not hold the proper license to perform any plumbing, heating, air conditioning, or electrical work in this contract, he will be required to sublet such work to a contractor properly licensed in accordance with *Article 2 of Chapter 87 of the General Statutes* (licensing of heating, plumbing, and air conditioning contractors) and *Article 4 of Chapter 87 of the General Statutes* (licensing of electrical contractors).

**U.S. DEPARTMENT OF TRANSPORTATION HOTLINE:**

(11-22-94)

108-5

SP1 G100

To report bid rigging activities call: **1-800-424-9071**

The U.S. Department of Transportation (DOT) operates the above toll-free hotline Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the hotline to report such activities.

The hotline is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

**SUBSURFACE INFORMATION:**

(7-1-95)

450

SP1 G112 D

Subsurface information is available on the roadway and structure portions of this project.

**LOCATING EXISTING UNDERGROUND UTILITIES:**

(3-20-12)

105

SP1 G115

Revise the *2012 Standard Specifications* as follows:

**Page 1-43, Article 105-8, line 28, after the first sentence, add the following:**

Identify excavation locations by means of pre-marking with white paint, flags, or stakes or provide a specific written description of the location in the locate request.

**PORTABLE CONCRETE BARRIER - (Partial Payments for Materials):**

(7-1-95) (Rev. 8-16-11)

1170-4

SP1 G121

When so authorized by the Engineer, partial materials payments will be made up to 95 percent of the delivered cost of portable concrete barrier, provided that these materials have been delivered on the project and stored in an acceptable manner, and further provided the documents listed in Subarticle 109-5(C) of the *2012 Standard Specifications* have been furnished to the Engineer.

The provisions of Subarticle 109-5(B) of the *2012 Standard Specifications* will apply to the portable concrete barrier.

**MAINTENANCE OF THE PROJECT:**

(11-20-07) (Rev. 1-17-12)

104-10

SP1 G125

Revise the *2012 Standard Specifications* as follows:

**Page 1-35, Article 104-10 Maintenance of the Project, line 25, add the following after the first sentence of the first paragraph:**

All guardrail/guiderrail within the project limits shall be included in this maintenance.

**Page 1-35, Article 104-10 Maintenance of the Project, line 30**, add the following as the last sentence of the first paragraph:

The Contractor shall perform weekly inspections of guardrail and guiderail and shall report damages to the Engineer on the same day of the weekly inspection. *Where damaged guardrail or guiderail is repaired or replaced as a result of maintaining the project in accordance with this article, such repair or replacement shall be performed within 7 consecutive calendar days of such inspection report.*

**Page 1-35, Article 104-10 Maintenance of the Project, lines 42-44**, replace the last sentence of the last paragraph with the following:

The Contractor will not be directly compensated for any maintenance operations necessary, except for maintenance of guardrail/guiderail, as this work will be considered incidental to the work covered by the various contract items. The provisions of Article 104-7, Extra Work, and Article 104-8, Compensation and Record Keeping will apply to authorized maintenance of guardrail/guiderail. Performance of weekly inspections of guardrail/guiderail, and the damage reports required as described above, will be considered to be an incidental part of the work being paid for by the various contract items.

**TWELVE MONTH GUARANTEE:**

(7-15-03)

108

SP1 G145

- (A) The Contractor shall guarantee materials and workmanship against latent and patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve months following the date of final acceptance of the work for maintenance and shall replace such defective materials and workmanship without cost to the Department. The Contractor will not be responsible for damage due to faulty design, normal wear and tear, for negligence on the part of the Department, and/or for use in excess of the design.
- (B) Where items of equipment or material carry a manufacturer's guarantee for any period in excess of twelve months, then the manufacturer's guarantee shall apply for that particular piece of equipment or material. The Department's first remedy shall be through the manufacturer although the Contractor is responsible for invoking the warranted repair work with the manufacturer. The Contractor's responsibility shall be limited to the term of the manufacturer's guarantee. NCDOT would be afforded the same warranty as provided by the Manufacturer.

This guarantee provision shall be invoked only for major components of work in which the Contractor would be wholly responsible for under the terms of the contract. Examples would include pavement structures, bridge components, and sign structures. This provision will not be used as a mechanism to force the Contractor to return to the project to make repairs or perform additional work that the Department would normally compensate the Contractor for. In addition, routine maintenance activities (i.e. mowing grass, debris removal, ruts in earth shoulders,) are not parts of this guarantee.

Appropriate provisions of the payment and/or performance bonds shall cover this guarantee for the project.

To ensure uniform application statewide the Division Engineer will forward details regarding the circumstances surrounding any proposed guarantee repairs to the Chief Engineer for review and approval prior to the work being performed.

**GIFTS FROM VENDORS AND CONTRACTORS:**

(12-15-09)

107-1

SP1 G152

By Executive Order 24, issued by Governor Perdue, and *N.C.G.S. § 133-32*, it is unlawful for any vendor or contractor (i.e. architect, bidder, contractor, construction manager, design professional, engineer, landlord, offeror, seller, subcontractor, supplier, or vendor), to make gifts or to give favors to any State employee of the Governor's Cabinet Agencies (i.e. Administration, Commerce, Correction, Crime Control and Public Safety, Cultural Resources, Environment and Natural Resources, Health and Human Services, Juvenile Justice and Delinquency Prevention, Revenue, Transportation, and the Office of the Governor). This prohibition covers those vendors and contractors who:

- (A) Have a contract with a governmental agency; or
- (B) Have performed under such a contract within the past year; or
- (C) Anticipate bidding on such a contract in the future.

For additional information regarding the specific requirements and exemptions, vendors and contractors are encouraged to review Executive Order 24 and *N.C.G.S. § 133-32*.

Executive Order 24 also encouraged and invited other State Agencies to implement the requirements and prohibitions of the Executive Order to their agencies. Vendors and contractors should contact other State Agencies to determine if those agencies have adopted Executive Order 24.

**EROSION AND SEDIMENT CONTROL/STORMWATER CERTIFICATION:**

(1-16-07) (Rev 9-18-12)

105-16, 225-2, 16

SP1 G180

**General**

Schedule and conduct construction activities in a manner that will minimize soil erosion and the resulting sedimentation and turbidity of surface waters. Comply with the requirements herein regardless of whether or not a National Pollution discharge Elimination System (NPDES) permit for the work is required.

Establish a chain of responsibility for operations and subcontractors' operations to ensure that the *Erosion and Sediment Control/Stormwater Pollution Prevention Plan* is implemented and maintained over the life of the contract.

- (A) *Certified Supervisor* - Provide a certified Erosion and Sediment Control/Stormwater Supervisor to manage the Contractor and subcontractor operations, insure compliance with Federal, State and Local ordinances and regulations, and manage the Quality Control Program.

- (B) *Certified Foreman* - Provide a certified, trained foreman for each construction operation that increases the potential for soil erosion or the possible sedimentation and turbidity of surface waters.
- (C) *Certified Installer* - Provide a certified installer to install or direct the installation for erosion or sediment/stormwater control practices.
- (D) *Certified Designer* - Provide a certified designer for the design of the erosion and sediment control/stormwater component of reclamation plans and, if applicable, for the design of the project erosion and sediment control/stormwater plan.

### **Roles and Responsibilities**

- (A) *Certified Erosion and Sediment Control/Stormwater Supervisor* - The Certified Supervisor shall be Level II and responsible for ensuring the erosion and sediment control/stormwater plan is adequately implemented and maintained on the project and for conducting the quality control program. The Certified Supervisor shall be on the project within 24 hours notice from initial exposure of an erodible surface to the project's final acceptance. Perform the following duties:
  - (1) *Manage Operations* - Coordinate and schedule the work of subcontractors so that erosion and sediment control/stormwater measures are fully executed for each operation and in a timely manner over the duration of the contract.
    - (a) Oversee the work of subcontractors so that appropriate erosion and sediment control/stormwater preventive measures are conformed to at each stage of the work.
    - (b) Prepare the required National Pollutant Discharge Elimination System (NPDES) Inspection Record and submit to the Engineer.
    - (c) Attend all weekly or monthly construction meetings to discuss the findings of the NPDES inspection and other related issues.
    - (d) Implement the erosion and sediment control/stormwater site plans requested.
    - (e) Provide any needed erosion and sediment control/stormwater practices for the Contractor's temporary work not shown on the plans, such as, but not limited to work platforms, temporary construction, pumping operations, plant and storage yards, and cofferdams.
    - (f) Acquire applicable permits and comply with requirements for borrow pits, dewatering, and any temporary work conducted by the Contractor in jurisdictional areas.
    - (g) Conduct all erosion and sediment control/stormwater work in a timely and workmanlike manner.
    - (h) Fully perform and install erosion and sediment control/stormwater work prior to any suspension of the work.
    - (i) Coordinate with Department, Federal, State and Local Regulatory agencies on resolution of erosion and sediment control/stormwater issues due to the Contractor's operations.

- (j) Ensure that proper cleanup occurs from vehicle tracking on paved surfaces or any location where sediment leaves the Right-of-Way.
  - (k) Have available a set of erosion and sediment control/stormwater plans that are initialed and include the installation date of Best Management Practices. These practices shall include temporary and permanent groundcover and be properly updated to reflect necessary plan and field changes for use and review by Department personnel as well as regulatory agencies.
- (2) Requirements set forth under the NPDES Permit - The Department's NPDES Stormwater permit (NCS000250) outlines certain objectives and management measures pertaining to construction activities. The permit references *NCG010000, General Permit to Discharge Stormwater* under the NPDES, and states that the Department shall incorporate the applicable requirements into its delegated Erosion and Sediment Control Program for construction activities disturbing one or more acres of land. The Department further incorporates these requirements on all contracted bridge and culvert work at jurisdictional waters, regardless of size. Some of the requirements are, but are not limited to:
- (a) Control project site waste to prevent contamination of surface or ground waters of the state, i.e. from equipment operation/maintenance, construction materials, concrete washout, chemicals, litter, fuels, lubricants, coolants, hydraulic fluids, any other petroleum products, and sanitary waste.
  - (b) Inspect erosion and sediment control/stormwater devices and stormwater discharge outfalls at least once every 7 calendar days, twice weekly for construction related *Federal Clean Water Act, Section 303(d)* impaired streams with turbidity violations, and within 24 hours after a significant rainfall event of 0.5 inch that occurs within a 24 hour period.
  - (c) Maintain an onsite rain gauge or use the Department's Multi-Sensor Precipitation Estimate website to maintain a daily record of rainfall amounts and dates.
  - (d) Maintain erosion and sediment control/stormwater inspection records for review by Department and Regulatory personnel upon request.
  - (e) Implement approved reclamation plans on all borrow pits, waste sites and staging areas.
  - (f) Maintain a log of turbidity test results as outlined in the Department's Procedure for Monitoring Borrow Pit Discharge.
  - (g) Provide secondary containment for bulk storage of liquid materials.
  - (h) Provide training for employees concerning general erosion and sediment control/stormwater awareness, the Department's NPDES Stormwater Permit NCS000250 requirements, and the applicable requirements of the *General Permit, NCG010000*.
  - (i) Report violations of the NPDES permit to the Engineer immediately who will notify the Division of Water Quality Regional Office within 24 hours of becoming aware of the violation.

- (3) Quality Control Program - Maintain a quality control program to control erosion, prevent sedimentation and follow provisions/conditions of permits. The quality control program shall:
- (a) Follow permit requirements related to the Contractor and subcontractors' construction activities.
  - (b) Ensure that all operators and subcontractors on site have the proper erosion and sediment control/stormwater certification.
  - (c) Notify the Engineer when the required certified erosion and sediment control/stormwater personnel are not available on the job site when needed.
  - (d) Conduct the inspections required by the NPDES permit.
  - (e) Take corrective actions in the proper timeframe as required by the NPDES permit for problem areas identified during the NPDES inspections.
  - (f) Incorporate erosion control into the work in a timely manner and stabilize disturbed areas with mulch/seed or vegetative cover on a section-by-section basis.
  - (g) Use flocculants approved by state regulatory authorities where appropriate and where required for turbidity and sedimentation reduction.
  - (h) Ensure proper installation and maintenance of temporary erosion and sediment control devices.
  - (i) Remove temporary erosion or sediment control devices when they are no longer necessary as agreed upon by the Engineer.
  - (j) The Contractor's quality control and inspection procedures shall be subject to review by the Engineer. Maintain NPDES inspection records and make records available at all times for verification by the Engineer.
- (B) *Certified Foreman* - At least one Certified Foreman shall be onsite for each type of work listed herein during the respective construction activities to control erosion, prevent sedimentation and follow permit provisions:
- (1) Foreman in charge of grading activities
  - (2) Foreman in charge of bridge or culvert construction over jurisdictional areas
  - (3) Foreman in charge of utility activities

The Contractor may request to use the same person as the Level II Supervisor and Level II Foreman. This person shall be onsite whenever construction activities as described above are taking place. This request shall be approved by the Engineer prior to work beginning.

The Contractor may request to name a single Level II Foreman to oversee multiple construction activities on small bridge or culvert replacement projects. This request shall be approved by the Engineer prior to work beginning.



(C) *Certified Installers* - Provide at least one onsite, Level I Certified Installer for each of the following erosion and sediment control/stormwater crew:

- (1) Seeding and Mulching
- (2) Temporary Seeding
- (3) Temporary Mulching
- (4) Sodding
- (5) Silt fence or other perimeter erosion/sediment control device installations
- (6) Erosion control blanket installation
- (7) Hydraulic tackifier installation
- (8) Turbidity curtain installation
- (9) Rock ditch check/sediment dam installation
- (10) Ditch liner/matting installation
- (11) Inlet protection
- (12) Riprap placement
- (13) Stormwater BMP installations (such as but not limited to level spreaders, retention/detention devices)
- (14) Pipe installations within jurisdictional areas

If a Level I *Certified Installer* is not onsite, the Contractor may substitute a Level II Foreman for a Level I Installer, provided the Level II Foreman is not tasked to another crew requiring Level II Foreman oversight.

(D) *Certified Designer* - Include the certification number of the Level III-B Certified Designer on the erosion and sediment control/stormwater component of all reclamation plans and if applicable, the certification number of the Level III-A Certified Designer on the design of the project erosion and sediment control/stormwater plan.

### **Preconstruction Meeting**

Furnish the names of the *Certified Erosion and Sediment Control/Stormwater Supervisor*, *Certified Foremen*, *Certified Installers* and *Certified Designer* and notify the Engineer of changes in certified personnel over the life of the contract within 2 days of change.

### **Ethical Responsibility**

Any company performing work for the North Carolina Department of Transportation has the ethical responsibility to fully disclose any reprimand or dismissal of an employee resulting from improper testing or falsification of records.

### **Revocation or Suspension of Certification**

Upon recommendation of the Chief Engineer to the certification entity, certification for *Supervisor*, *Certified Foremen*, *Certified Installers* and *Certified Designer* may be revoked or suspended with the issuance of an *Immediate Corrective Action (ICA)*, *Notice of Violation (NOV)*, or *Cease and Desist Order* for erosion and sediment control/stormwater related issues.

The Chief Engineer may recommend suspension or permanent revocation of certification due to the following:

- (A) Failure to adequately perform the duties as defined within this certification provision.
- (B) Issuance of an ICA, NOV, or Cease and Desist Order.
- (C) Failure to fully perform environmental commitments as detailed within the permit conditions and specifications.
- (D) Demonstration of erroneous documentation or reporting techniques.
- (E) Cheating or copying another candidate's work on an examination.
- (F) Intentional falsification of records.
- (G) Directing a subordinate under direct or indirect supervision to perform any of the above actions.
- (H) Dismissal from a company for any of the above reasons.
- (I) Suspension or revocation of one's certification by another entity.

Suspension or revocation of a certification will be sent by certified mail to the certificant and the Corporate Head of the company that employs the certificant.

A certificant has the right to appeal any adverse action which results in suspension or permanent revocation of certification by responding, in writing, to the Chief Engineer within 10 calendar days after receiving notice of the proposed adverse action.

Chief Engineer  
1536 Mail Service Center  
Raleigh, NC 27699-1536

Failure to appeal within 10 calendar days will result in the proposed adverse action becoming effective on the date specified on the certified notice. Failure to appeal within the time specified will result in a waiver of all future appeal rights regarding the adverse action taken. The certificant will not be allowed to perform duties associated with the certification during the appeal process.

The Chief Engineer will hear the appeal and make a decision within 7 days of hearing the appeal. Decision of the Chief Engineer will be final and will be made in writing to the certificant.

If a certification is temporarily suspended, the certificant shall pass any applicable written examination and any proficiency examination, at the conclusion of the specified suspension period, prior to having the certification reinstated.

### **Measurement and Payment**

*Certified Erosion and Sediment Control/Stormwater Supervisor, Certified Foremen, Certified Installers and Certified Designer* will be incidental to the project for which no direct compensation will be made.

**PROCEDURE FOR MONITORING BORROW PIT DISCHARGE:**

(2-20-07)

105-16, 230, 801

SP1 G181

Water discharge from borrow pit sites shall not cause surface waters to exceed 50 NTUs (nephelometric turbidity unit) in streams not designated as trout waters and 10 NTUs in streams, lakes or reservoirs designated as trout waters. For lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTUs. If the turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased.

If during any operating day, the downstream water quality exceeds the standard, the Contractor shall do all of the following:

- (A) Either cease discharge or modify the discharge volume or turbidity levels to bring the downstream turbidity levels into compliance, or
- (B) Evaluate the upstream conditions to determine if the exceedance of the standard is due to natural background conditions. If the background turbidity measurements exceed the standard, operation of the pit and discharge can continue as long as the stream turbidity levels are not increased due to the discharge.
- (C) Measure and record the turbidity test results (time, date and sampler) at all defined sampling locations 30 minutes after startup and at a minimum, one additional sampling of all sampling locations during that 24-hour period in which the borrow pit is discharging.
- (D) Notify DWQ within 24 hours of any stream turbidity standard exceedances that are not brought into compliance.

During the Environmental Assessment required by Article 230-4 of the *2012 Standard Specifications*, the Contractor shall define the point at which the discharge enters into the State's surface waters and the appropriate sampling locations. Sampling locations shall include points upstream and downstream from the point at which the discharge enters these waters. Upstream sampling location shall be located so that it is not influenced by backwater conditions and represents natural background conditions. Downstream sampling location shall be located at the point where complete mixing of the discharge and receiving water has occurred.

The discharge shall be closely monitored when water from the dewatering activities is introduced into jurisdictional wetlands. Any time visible sedimentation (deposition of sediment) on the wetland surface is observed, the dewatering activity will be suspended until turbidity levels in the stilling basin can be reduced to a level where sediment deposition does not occur. Staining of wetland surfaces from suspended clay particles, occurring after evaporation or infiltration, does not constitute sedimentation. No activities shall occur in wetlands that adversely affect the functioning of a wetland. Visible sedimentation will be considered an indication of possible adverse impacts on wetland use.

The Engineer will perform independent turbidity tests on a random basis. These results will be maintained in a log within the project records. Records will include, at a minimum, turbidity test results, time, date and name of sampler. Should the Department's test results exceed those of the Contractor's test results, an immediate test shall be performed jointly with the results superseding the previous test results of both the Department and the Contractor.

The Contractor shall use the *NCDOT Turbidity Reduction Options for Borrow Pits Matrix*, available at <http://www.ncdot.org/doh/preconstruct/ps/contracts/letting.html> to plan, design, construct, and maintain BMPs to address water quality standards. Tier I Methods include stilling basins which are standard compensatory BMPs. Other Tier I methods are noncompensatory and shall be used when needed to meet the stream turbidity standards. Tier II Methods are also noncompensatory and are options that may be needed for protection of rare or unique resources or where special environmental conditions exist at the site which have led to additional requirements being placed in the DWQ's 401 Certifications and approval letters, Isolated Wetland Permits, Riparian Buffer Authorization or a DOT Reclamation Plan's Environmental Assessment for the specific site. Should the Contractor exhaust all Tier I Methods on a site exclusive of rare or unique resources or special environmental conditions, Tier II Methods may be required by regulators on a case by case basis per supplemental agreement.

The Contractor may use cation exchange capacity (CEC) values from proposed site borings to plan and develop the bid for the project. CEC values exceeding 15 milliequivalents per 100 grams of soil may indicate a high potential for turbidity and should be avoided when dewatering into surface water is proposed.

No additional compensation for monitoring borrow pit discharge will be paid.

**EMPLOYMENT:**

(11-15-11) (Rev. 1-17-12)

108, 102

SP1 G184

Revise the *2012 Standard Specifications* as follows:

**Page 1-20, Subarticle 102-15(O)**, delete and replace with the following:

**(O)** Failure to restrict a former Department employee as prohibited by Article 108-5.

**Page 1-65, Article 108-5 Character of Workmen, Methods, and Equipment, line 32**, delete all of line 32, the first sentence of the second paragraph and the first word of the second sentence of the second paragraph.

**STATE HIGHWAY ADMINISTRATOR TITLE CHANGE:**

(9-18-12)

SP1 G185

Revise the *2012 Standard Specifications* as follows:

Replace all references to "State Highway Administrator" with "Chief Engineer".

**PROJECT SPECIAL PROVISIONS****ROADWAY****CLEARING AND GRUBBING - METHOD III:**

(4-6-06) (Rev. 1-17-12)

200

SP2 R02B

Perform clearing on this project to the limits established by Method "III" shown on Standard Drawing No. 200.03 of the *2012 Roadway Standard Drawings*.

**LUMP SUM GRADING:**

(8-17-10)

226

SP2 R16

Lump sum grading shall be performed in accordance with Section 226 Comprehensive Grading of the *2012 Standard Specifications* except as follows:

Delete all references to Section 230, Borrow Excavation.

**SHOULDER AND FILL SLOPE MATERIAL:**

(5-21-02)

235, 560

SP2 R45 A

**Description**

Perform the required shoulder and slope construction for this project in accordance with the applicable requirements of Section 560 and Section 235 of the *2012 Standard Specifications*.

**Measurement and Payment**

Where the material has been obtained from an authorized stockpile or from a borrow source and *Borrow Excavation* is not included in the contract, no direct payment will be made for this work, as the cost of this work will be part of the work being paid at the contract lump sum price for *Grading*. If *Borrow Excavation* is included in this contract and the material has been obtained from an authorized stockpile or from a borrow source, measurement and payment will be as provided in Section 230 of the *2012 Standard Specifications* for *Borrow Excavation*.

**RIP-RAPPED ENERGY DISSIPATOR BASIN:****Description**

This work consists of the construction and maintenance of an armored outlet structure located at culvert outlets or ditch termini.

**Materials**

Refer to Division 10 of the *Standard Specifications*.

**Item**

Class I Riprap

Geotextile for Drainage, Type 2

**Section**

Section 1042

Section 1056

### Construction Methods

Riprap energy dissipators shall be constructed in accordance with the detail shown in the plans or as directed by the Engineer. From the outlet, invert of a culvert or bottom of a ditch excavation will drop to a specified depth. Excavation will continue to widen through the dissipator. Riprap shall be placed along the banks and bottom of the dissipator and along the apron.

Excavate ditch in accordance with Section 240 of the *Standard Specifications*.

The quantity of energy dissipator material may be affected by site conditions during construction of the project. The quantity of materials may be increased, decreased, or eliminated at the direction of the Engineer. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

### Measurement and Payment

*Energy Dissipator Basin* will be paid for per each. Such price and payment will be full compensation for all work covered by this section, including, but not limited to excavation, furnishing and placing stone, geotextile, materials, labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

| Pay Item                | Pay Unit |
|-------------------------|----------|
| Energy Dissipator Basin | Each     |

### **BRIDGE APPROACH FILLS:**

(10-19-10) (Rev. 1-17-12)

422

SP4 R02

### Description

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

### Materials

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

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

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

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

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

### **Construction Methods**

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

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

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

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

*Drawings.* For bridge approach fills for sub regional tier bridges, install 4" diameter continuous perforated PVC drain pipes in accordance with Standard Drawing No. 422.11 of the *2012 Roadway Standard Drawings*.

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

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

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

### **Measurement and Payment**

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

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

Payment will be made under:

#### **Pay Item**

Reinforced Bridge Approach Fill, Station \_\_\_\_  
Bridge Approach Fill - Sub Regional Tier, Station \_\_\_\_

#### **Pay Unit**

Lump Sum  
Lump Sum



**ASPHALT PAVEMENTS - SUPERPAVE:**

(6-19-12)

605

SP6 R01

Revise the 2012 *Standard Specifications* as follows:

**Page 6-3, Article 605-7 APPLICATION RATES AND TEMPERATURES**, replace this article, including Table 601-1, with the following:

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

**TABLE 605-1  
APPLICATION RATES FOR TACK COAT**

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

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

**TABLE 605-2  
APPLICATION TEMPERATURE FOR TACK COAT**

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

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

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

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

**<http://www.ncdot.org/doh/operations/materials/pdf/wma.pdf>**.

**ASPHALT BINDER CONTENT OF ASPHALT PLANT MIXES:**

(11-21-00) (Rev. 7-17-12)

609

SP6 R15

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

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

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

**ASPHALT PLANT MIXTURES:**

(7-1-95)

609

SP6 R20

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

**PRICE ADJUSTMENT - ASPHALT BINDER FOR PLANT MIX:**

(11-21-00)

620

SP6 R25

Price adjustments for asphalt binder for plant mix will be made in accordance with Section 620 of the *2012 Standard Specifications*.

The base price index for asphalt binder for plant mix is \$ **590.33** per ton.

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on **August 1, 2012**.

**FINAL SURFACE TESTING NOT REQUIRED:**

(5-18-04) (Rev. 5-15-12)

610

SP6 R45

Final surface testing is not required on this project.

**GUARDRAIL ANCHOR UNITS, TYPE 350:**

(4-20-04) (Rev. 8-16-11)

862

SP8 R65

**Description**

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

**Materials**

The Contractor may at his option, furnish any one of the guardrail anchor units or approved equal.

Guardrail anchor unit (ET-Plus) as manufactured by:

Trinity Industries, Inc.  
2525 N. Stemmons Freeway  
Dallas, Texas 75207  
Telephone: 800-644-7976

The guardrail anchor unit (SKT 350) as manufactured by:

Road Systems, Inc.  
3616 Old Howard County Airport  
Big Spring, Texas 79720  
Telephone: 915-263-2435

Prior to installation the Contractor shall submit to the Engineer:

- (A) FHWA acceptance letter for each guardrail anchor unit certifying it meets the requirements of NCHRP Report 350, Test Level 3, in accordance with Article 106-2 of the *2012 Standard Specifications*.
- (B) Certified working drawings and assembling instructions from the manufacturer for each guardrail anchor unit in accordance with Article 105-2 of the *2012 Standard Specifications*.

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

**Construction Methods**

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

**Measurement and Payment**

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

Payment will be made under:

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

**Pay Unit**  
Each

**VINYL COATED CHAIN LINK FENCE, \_\_\_" FABRIC:**

(1-1-02) (Rev.4-20-12)

SPI 8-37

Provide vinyl coated chain link fence that complies with the plans and Section 866 of the 2012 Standard Specifications. *Vinyl Coated Chain Link Fence, \_\_\_" Fabric* will be measured and paid in linear feet, of fence measured in place from center of each post or gate post to center of end post or gate post exclusive of gate sections, that has been completed and accepted.

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

Payment will be made under:

**Pay Item**

Vinyl Coated Chain Link Fence, \_\_\_" Fabric

**Pay Unit**

Linear Foot

**PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON:**

(10-15-02) (Rev. 10-20-09)

410

SP8 R105

**Description**

Construct and maintain preformed scour holes with spreader aprons at the locations shown on the plans and in accordance with the details in the plans. Work includes excavation, shaping and maintaining the hole and apron, furnishing and placing filter fabric, rip rap (class as specified in the plans) and permanent soil reinforcement matting.

**Materials****Item**

Plain Rip Rap

Filter Fabric

**Section**

1042

1056

The permanent soil reinforcement matting shall be permanent erosion control reinforcement mat and shall be constructed of synthetic or a combination of coconut and synthetic fibers evenly distributed throughout the mat between a bottom UV stabilized netting and a heavy duty UV stabilized top net. The matting shall be stitched together with UV stabilized polypropylene thread to form a permanent three dimensional structure. The mat shall have the following minimum physical properties:

| Property              | Test Method | Value Unit |
|-----------------------|-------------|------------|
| Light Penetration     | ASTM D6567  | 9 %        |
| Thickness             | ASTM D6525  | 0.40 in    |
| Mass Per Unit Area    | ASTM D6566  | 0.55 lb/sy |
| Tensile Strength      | ASTM D6818  | 385 lb/ft  |
| Elongation ( Maximum) | ASTM D6818  | 49 %       |
| Resiliency            | ASTM D1777  | >70 %      |

| Property                                     | Test Method               | Value Unit              |
|----------------------------------------------|---------------------------|-------------------------|
| UV Stability *                               | ASTM 4355                 | ≥80 %                   |
| Porosity (Permanent Net)                     | ECTC Guidelines           | ≥85 %                   |
| Maximum Permissible Shear Stress (Vegetated) | Performance Bench<br>Test | ≥8.0 lb/ft <sup>2</sup> |
| Maximum Allowable Velocity (Vegetated)       | Performance Bench<br>Test | ≥16.0 ft/s              |

\*ASTM D1682 Tensile Strength and % strength retention of material after 1,000 hours of exposure.

Submit a certification (Type 1, 2, or 3) from the manufacturer showing:

- (A) The chemical and physical properties of the mat used, and
- (B) Conformance of the mat with this specification.

### Construction Methods

All areas to be protected with the mat shall be brought to final grade and seeded in accordance with Section 1660 of the *2012 Standard Specifications*. The surface of the soil shall be smooth, firm, stable and free of rocks, clods, roots or other obstructions that would prevent the mat from lying in direct contact with the soil surface. Areas where the mat is to be placed will not need to be mulched.

### Measurement and Payment

*Preformed Scour Holes with Level Spreader Aprons* will be measured and paid as the actual number incorporated into the completed and accepted work. Such price and payment will be full compensation for all work covered by this provision.

Payment will be made under:

| Pay Item                                        | Pay Unit |
|-------------------------------------------------|----------|
| Preformed Scour Hole with Level Spreader Aprons | Each     |

### **STREET SIGNS AND MARKERS AND ROUTE MARKERS:**

(7-1-95)

900

SP9 R02

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

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

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

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

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

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

(1-17-12) (Rev. 8-21-12)

9, 14, 17

SP9 R05

##### **Description**

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

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

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

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

**Materials**

Refer to the *2012 Standard Specifications*.

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

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

[www.ncdot.org/doh/preconstruct/highway/geotech/leftmenu/Polymer.html](http://www.ncdot.org/doh/preconstruct/highway/geotech/leftmenu/Polymer.html)

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

- (A) Straight anchor rods,
- (B) Heavy hex top and leveling nuts and flat washers on exposed ends of rods, and
- (C) Nuts and either flat plates or washers on the other ends of anchor rods embedded in foundations.

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

**Construction Methods**

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

**(A) Drilled Piers**

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

If a drilled pier is under further investigation, do not grout core holes, backfill around the pier or perform any work on the drilled pier until the Engineer accepts the pier. If the drilled pier is accepted, dewater and grout core holes and backfill around the pier with approved material to finished grade. If the Engineer determines a pier is unacceptable,

remediation is required in accordance with Article 411-6 of the *2012 Standard Specifications*. No extension of completion date or time will be allowed for remediation of unacceptable drilled piers or post repair testing.

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

(B) Footings, Pedestals, Grade Beams and Wings

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

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

(C) Anchor Rod Assemblies

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

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

Arrange anchor rods symmetrically about center of base plate locations as shown in the plans. Set anchor rod elevations based on required projections above top of foundations. Securely brace and hold rods in the correct position, orientation and alignment with a steel template. Do not weld to reinforcing steel, temporary casings or anchor rods.

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

- (1) Turn leveling nuts onto anchor rods to a distance of one nut thickness between the top of foundation and bottom of leveling nuts. Place washers over anchor rods on top of leveling nuts.
- (2) Determine if nuts are level using a flat rigid template on top of washers. If necessary, lower leveling nuts to level the template in all directions or if applicable, lower nuts to tilt the template so the metal pole or upright truss will lean as shown in the plans. If leveling nuts and washers are not in full contact with the template, replace washers with galvanized beveled washers.
- (3) Verify the distance between the foundation and leveling nuts is no more than one nut thickness.
- (4) Place base plate with metal pole or upright truss over anchor rods on top of washers. High mount luminaires may be attached before erecting metal poles but do not attach cables, mast arms or trusses to metal poles or upright trusses at this time.
- (5) Place washers over anchor rods on top of base plate. Lubricate top nut bearing surfaces and exposed anchor rod threads above washers with beeswax, paraffin or other approved lubricant.
- (6) Turn top nuts onto anchor rods. If nuts are not in full contact with washers or washers are not in full contact with the base plate, replace washers with galvanized beveled washers.
- (7) Tighten top nuts to snug-tight with the full effort of one workman using a 12" wrench. Do not tighten any nut all at once. Turn top nuts in increments. Follow a star pattern cycling through each nut at least twice.
- (8) Repeat (7) for leveling nuts.
- (9) Replace washers above and below the base plate with galvanized beveled washers if the slope of any base plate face exceeds 1:20 (5%), any washer is not in firm contact with the base plate or any nut is not in firm contact with a washer. If any washers are replaced, repeat (7) and (8).
- (10) With top and leveling nuts snug-tight, mark each top nut on a corner at the intersection of 2 flats and a corresponding reference mark on the base plate. Mark top nuts and base plate with ink or paint that is not water-soluble. Use the turn-of-nut method for pretensioning. Do not pretension any nut all at once. Turn top nuts in increments for a total turn that meets the following nut rotation requirements:

| <b>NUT ROTATION REQUIREMENTS</b><br><b>(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:

| TORQUE REQUIREMENTS       |                    |
|---------------------------|--------------------|
| Anchor Rod Diameter, inch | Requirement, ft-lb |
| 7/8                       | 180                |
| 1                         | 270                |
| 1 1/8                     | 380                |
| 1 1/4                     | 420                |
| $\geq 1\ 1/2$             | 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 *2012 Standard Specifications*. No payment will be made for remediation of unacceptable drilled piers or post repair testing.

**MATERIALS:**

(2-21-12) (Rev. 9-18-12)

1005, 1081, 1092

SP10 R01

Revise the 2012 *Standard Specifications* as follows:**Page 10-5, Table 1000-1, REQUIREMENTS FOR CONCRETE**, replace with the following:

| <b>TABLE 1000-1<br/>REQUIREMENTS FOR CONCRETE</b> |                                                                  |                                   |                               |                                            |                               |                                                 |                          |                       |              |                      |              |
|---------------------------------------------------|------------------------------------------------------------------|-----------------------------------|-------------------------------|--------------------------------------------|-------------------------------|-------------------------------------------------|--------------------------|-----------------------|--------------|----------------------|--------------|
| <b>Class of<br/>Concrete</b>                      | <b>Min. Comp.<br/>Strength<br/>at 28 days</b>                    | <b>Maximum Water-Cement Ratio</b> |                               |                                            |                               | <b>Consistency<br/>Max. Slump</b>               |                          | <b>Cement Content</b> |              |                      |              |
|                                                   |                                                                  | <b>Air-Entrained<br/>Concrete</b> |                               | <b>Non Air-<br/>Entrained<br/>Concrete</b> |                               | <b>Vibrated</b>                                 | <b>Non-<br/>Vibrated</b> | <b>Vibrated</b>       |              | <b>Non- Vibrated</b> |              |
|                                                   |                                                                  | <b>Rounded<br/>Aggre-gate</b>     | <b>Angular<br/>Aggre-gate</b> | <b>Rounded<br/>Aggre-gate</b>              | <b>Angular<br/>Aggre-gate</b> |                                                 |                          | <b>Min.</b>           | <b>Max.</b>  | <b>Min.</b>          | <b>Max.</b>  |
| <i>Units</i>                                      | <i>psi</i>                                                       |                                   |                               |                                            |                               | <i>inch</i>                                     | <i>inch</i>              | <i>lb/cy</i>          | <i>lb/cy</i> | <i>lb/cy</i>         | <i>lb/cy</i> |
| AA                                                | 4,500                                                            | 0.381                             | 0.426                         | -                                          | -                             | 3.5                                             | -                        | 639                   | 715          | -                    | -            |
| AA Slip<br>Form                                   | 4,500                                                            | 0.381                             | 0.426                         | -                                          | -                             | 1.5                                             | -                        | 639                   | 715          | -                    | -            |
| Drilled Pier                                      | 4,500                                                            | -                                 | -                             | 0.450                                      | 0.450                         | -                                               | 5-7 dry<br>7-9 wet       | -                     | -            | 640                  | 800          |
| A                                                 | 3,000                                                            | 0.488                             | 0.532                         | 0.550                                      | 0.594                         | 3.5                                             | 4                        | 564                   | -            | 602                  | -            |
| B                                                 | 2,500                                                            | 0.488                             | 0.567                         | 0.559                                      | 0.630                         | 2.5                                             | 4                        | 508                   | -            | 545                  | -            |
| B Slip<br>Formed                                  | 2,500                                                            | 0.488                             | 0.567                         | -                                          | -                             | 1.5                                             | -                        | 508                   | -            | -                    | -            |
| Sand Light-<br>weight                             | 4,500                                                            | -                                 | 0.420                         | -                                          | -                             | 4                                               | -                        | 715                   | -            | -                    | -            |
| Latex<br>Modified                                 | 3,000<br>7 day                                                   | 0.400                             | 0.400                         | -                                          | -                             | 6                                               | -                        | 658                   | -            | -                    | -            |
| Flowable<br>Fill<br>excavatable                   | 150 max.<br>at 56 days                                           | as needed                         | as needed                     | as needed                                  | as needed                     | -                                               | Flow-<br>able            | -                     | -            | 40                   | 100          |
| Flowable<br>Fill<br>non-excavatable               | 125                                                              | as needed                         | as needed                     | as needed                                  | as needed                     | -                                               | Flow-<br>able            | -                     | -            | 100                  | as<br>needed |
| Pavement                                          | 4,500<br>design,<br>field<br><br>650<br>flexural,<br>design only | 0.559                             | 0.559                         | -                                          | -                             | 1.5<br>slip<br>form<br><br>3.0<br>hand<br>place | -                        | 526                   | -            | -                    | -            |
| Precast                                           | See Table<br>1077-1                                              | as needed                         | as needed                     | -                                          | -                             | 6                                               | as<br>needed             | as<br>needed          | as<br>needed | as<br>needed         | as<br>needed |
| Prestress                                         | per<br>contract                                                  | See Table<br>1078-1               | See<br>Table<br>1078-1        | -                                          | -                             | 8                                               | -                        | 564                   | as<br>needed | -                    | -            |

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

**TABLE 1005-1  
AGGREGATE GRADATION - COARSE AGGREGATE**

| Percentage of Total by Weight Passing |     |        |        |        |        |        |        |       |       |      |       |                   |                                                            |
|---------------------------------------|-----|--------|--------|--------|--------|--------|--------|-------|-------|------|-------|-------------------|------------------------------------------------------------|
| Std. Size #                           | 2"  | 1 1/2" | 1"     | 3/4"   | 1/2"   | 3/8"   | #4     | #8    | #10   | #16  | #40   | #200              | Remarks                                                    |
| 4                                     | 100 | 90-100 | 20-55  | 0-15   | -      | 0-5    | -      | -     | -     | -    | -     | A                 | Asphalt Plant Mix                                          |
| 46/7M                                 | 100 | 95-100 | -      | 35-70  | -      | 0-30   | 0-5    | -     | -     | -    | -     | A                 | Asphalt Plant Mix                                          |
| 5                                     | -   | 100    | 90-100 | 20-55  | 0-10   | 0-5    | -      | -     | -     | -    | -     | A                 | AST, Sediment Control Stone                                |
| 57                                    | -   | 100    | 95-100 | -      | 25-60  | -      | 0-10   | 0-5   | -     | -    | -     | A                 | AST, Str. Concrete, Shoulder Drain, Sediment Control Stone |
| 57M                                   | -   | 100    | 95-100 | -      | 25-45  | -      | 0-10   | 0-5   | -     | -    | -     | A                 | AST, Concrete Pavement                                     |
| 6M                                    | -   | -      | 100    | 90-100 | 20-55  | 0-20   | 0-8    | -     | -     | -    | -     | A                 | AST                                                        |
| 67                                    | -   | -      | 100    | 90-100 | -      | 20-55  | 0-10   | 0-5   | -     | -    | -     | A                 | AST, Str. Concrete, Asphalt Plant Mix                      |
| 78M                                   | -   | -      | -      | 100    | 98-100 | 75-100 | 20-45  | 0-15  | -     | -    | -     | A                 | Asphalt Plant Mix, AST, Str. Conc, Weep Hole Drains        |
| 14M                                   | -   | -      | -      | -      | -      | 100    | 35-70  | 5-20  | -     | 0-8  | -     | A                 | Asphalt Plant Mix, AST, Weep Hole Drains, Str. Concrete    |
| 9                                     | -   | -      | -      | -      | -      | 100    | 85-100 | 10-40 | -     | 0-10 | -     | A                 | AST                                                        |
| ABC                                   | -   | 100    | 75-97  | -      | 55-80  | -      | 35-55  | -     | 25-45 | -    | 14-30 | 4-12 <sup>B</sup> | Aggregate Base Course, Aggregate Stabilization             |
| ABC (M)                               | -   | 100    | 75-100 | -      | 45-79  | -      | 20-40  | -     | 0-25  | -    | -     | 0-12 <sup>B</sup> | Maintenance Stabilization                                  |
| Lightweight C                         | -   | -      | -      | -      | 100    | 80-100 | 5-40   | 0-20  | -     | 0-10 | -     | 0-2.5             | AST                                                        |

A. See Subarticle 1005-4(A).

B. See Subarticle 1005-4(B).

C. For Lightweight Aggregate used in Structural Concrete, see Subarticle 1014-2(E)(6).

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

**TABLE 1078-1  
REQUIREMENTS FOR CONCRETE**

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

Page 10-162, Subarticle 1081-1(A) Classifications, lines 4-7, delete the second and third sentences of the description for Type 3A.

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

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

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

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

Page 10-204, Subarticle 1092-2(A) Performance and Test Requirements, replace Table 1092-3 Minimum Coefficient of Retroreflection for NC Grade A with the following:

**TABLE 1092-3  
MINIMUM COEFFICIENT OF RETROREFLECTION FOR NC GRADE A  
(Candelas Per Lux Per Square Meter)**

| <b>Observation<br/>Angle, degrees</b> | <b>Entrance<br/>Angle,<br/>degrees</b> | <b>White</b> | <b>Yellow</b> | <b>Green</b> | <b>Red</b> | <b>Blue</b> | <b>Fluorescent<br/>Yellow Green</b> | <b>Fluorescent<br/>Yellow</b> |
|---------------------------------------|----------------------------------------|--------------|---------------|--------------|------------|-------------|-------------------------------------|-------------------------------|
| 0.2                                   | -4.0                                   | 525          | 395           | 52           | 95         | 30          | 420                                 | 315                           |
| 0.2                                   | 30.0                                   | 215          | 162           | 22           | 43         | 10          | 170                                 | 130                           |
| 0.5                                   | -4.0                                   | 310          | 230           | 31           | 56         | 18          | 245                                 | 185                           |
| 0.5                                   | 30.0                                   | 135          | 100           | 14           | 27         | 6           | 110                                 | 81                            |
| 1.0                                   | -4.0                                   | 120          | 60            | 8            | 16         | 3.6         | 64                                  | 48                            |
| 1.0                                   | 30.0                                   | 45           | 34            | 4.5          | 9          | 2           | 36                                  | 27                            |

**HIGH STRENGTH CONCRETE FOR DRIVEWAYS:**

(11-21-00) (Rev. 1-17-12)

848

SP10 R02

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

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

**SELECT MATERIAL, CLASS III, TYPE 3:**

(1-17-12)

1016, 1044

SP10 R05

Revise the *2012 Standard Specifications* as follows:

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

**Type 3 Select Material**

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

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

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

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

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

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

Subdrain coarse aggregate shall meet Class V select material.

**TEMPORARY SHORING:**

(2-20-07) (Rev. 7-17-12)

SP11 R02

**Description**

Temporary shoring includes cantilever, braced and anchored shoring and temporary mechanically stabilized earth (MSE) walls. Temporary shoring does not include trench boxes. At the Contractor's option, use any type of temporary shoring unless noted otherwise in the plans or as directed. Design and construct temporary shoring based on actual elevations and shoring



dimensions in accordance with the contract and accepted submittals. Construct temporary shoring at locations shown in the plans and as directed. Temporary shoring is required to maintain traffic when a 2:1 (H:V) slope from the top of an embankment or bottom of an excavation will intersect the existing ground line less than 5 ft from the edge of pavement of an open travelway. This provision does not apply to pipe, inlet or utility installation unless noted otherwise in the plans.

Positive protection includes concrete barrier and temporary guardrail. Provide positive protection for temporary shoring at locations shown in the plans and as directed. Positive protection is required if temporary shoring is located in the clear zone in accordance with the *AASHTO Roadside Design Guide*.

(A) Cantilever and Braced Shoring

Cantilever shoring consists of steel sheet piles or H-piles with timber lagging. Braced shoring consists of sheet piles or H-piles with timber lagging and bracing such as beams, plates, walers, struts, rakers, etc. Define “piles” as sheet piles or H-piles.

(B) Anchored Shoring

Anchored shoring consists of sheet piles with walers or H-piles with timber lagging anchored with ground or helical anchors. Driven anchors may be accepted at the discretion of the Engineer. A ground anchor consists of a grouted steel bar or multi-strand tendon with an anchorage. A helical anchor consists of a lead section with a central steel shaft and at least one helix steel plate followed by extensions with only central shafts (no helixes) and an anchorage. Anchorages consist of steel bearing plates with washers and hex nuts for bars or steel wedge plates and wedges for strands. Use a prequalified Anchored Wall Contractor to install ground anchors. Define “anchors” as ground, helical or driven anchors.

(C) Temporary MSE Walls

Temporary MSE walls include temporary geosynthetic and wire walls. Define “temporary wall” as a temporary MSE wall. Define “reinforcement” as geotextile, geogrid, welded wire grid or metallic strip reinforcement.

Temporary geosynthetic walls consist of geotextile or geogrid reinforcement wrapped behind welded wire facing. Define “temporary geotextile wall” as a temporary geosynthetic wall with geotextile reinforcement and “temporary geogrid wall” as a temporary geosynthetic wall with geogrid reinforcement.

Temporary wire walls consist of welded wire grid or metallic strip reinforcement connected to welded wire facing. Define “Wire Wall Vendor” as the vendor supplying the temporary wire wall.

**(D) Embedment**

Define “embedment” for cantilever, braced and anchored shoring as the pile depth below the grade in front of shoring. Define “embedment” for temporary walls as the wall height below the grade in front of walls.

**(E) Positive Protection**

Define “unanchored or anchored portable concrete barrier” as portable concrete barrier (PCB) that meets Standard Drawing No. 1170.01 of the *2012 Roadway Standard Drawings*. Define “concrete barrier” as unanchored or anchored PCB or an approved equal. Define “temporary guardrail” as temporary steel beam guardrail that meets Standard Drawing No. 862.02 of the *2012 Roadway Standard Drawings*.

**Materials**

Refer to the *2012 Standard Specifications*.

| <b>Item</b>                    | <b>Section</b> |
|--------------------------------|----------------|
| Anchor Pins                    | 1056-2         |
| Concrete Barrier Materials     | 1170-2         |
| Flowable Fill, Excavatable     | 1000-6         |
| Geotextiles                    | 1056           |
| Neat Cement Grout              | 1003           |
| Portland Cement Concrete       | 1000           |
| Select Material                | 1016           |
| Steel Beam Guardrail Materials | 862-2          |
| Steel Plates                   | 1072-2         |
| Steel Sheet Piles and H-Piles  | 1084           |
| Untreated Timber               | 1082-2         |
| Welded Wire Reinforcement      | 1070-3         |
| Wire Staples                   | 1060-8(D)      |

Provide Type 6 material certifications for shoring materials in accordance with Article 106-3 of the *2012 Standard Specifications*. Use Class IV select material (standard size No. ABC) for temporary guardrail. Use nonshrink neat cement grout or Class A concrete that meets Article 450-2 of the *2012 Standard Specifications* for drilled-in piles. Use untreated timber with a thickness of at least 3" and a bending stress of at least 1,000 psi for timber lagging. Provide steel bracing that meets ASTM A36.

**(A) Shoring Backfill**

Use Class II, Type 1, Class III, Class V or Class VI select material or material that meets AASHTO M 145 for soil classification A-2-4 with a maximum PI of 6 for shoring backfill except do not use A-2-4 soil for backfill around culverts.

**(B) Anchors**

Store anchor materials on blocking a minimum of 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 anchor materials so materials are kept clean and free of damage. Damaged or deformed materials will be rejected.

**(1) Ground Anchors**

Use high-strength deformed steel bars that meet AASHTO M 275 or seven-wire strands that meet ASTM A886 or Article 1070-5 of the *2012 Standard Specifications*. Splice bars in accordance with Article 1070-9 of the *2012 Standard Specifications*. Do not splice strands. Use bondbreakers, spacers and centralizers that meet Article 6.3.5 of the *AASHTO LRFD Bridge Construction Specifications*.

**(2) Helical Anchors**

Use helical anchors with an ICC Evaluation Service, Inc. (ICC-ES) report. Helical anchors without an ICC-ES report may be approved at the discretion of the Engineer. Provide couplers, thread bar adapters and bolts recommended by the Anchor Manufacturer to connect helical anchors together and to piles.

**(3) Anchorages**

Provide steel plates for bearing plates and steel washers, hex nuts, wedge plates and wedges recommended by the Anchor Manufacturer.

**(C) Temporary Walls****(1) Welded Wire Facing**

Use welded wire reinforcement for welded wire facing, struts and wires. For temporary wire walls, provide welded wire facing supplied by the Wire Wall Vendor or a manufacturer approved or licensed by the vendor. For temporary wire walls with separate reinforcement and facing components, provide connectors (e.g., bars, clamps, plates, etc.) and fasteners (e.g., bolts, nuts, washers, etc.) required by the Wire Wall Vendor.

**(2) Geotextiles**

Provide Type 2 geotextile for separation and retention geotextiles. Provide Type 5 geotextile for geotextile reinforcement with wide width tensile strengths at ultimate in accordance with the accepted submittals.

## (3) Geogrid Reinforcement

Handle and store geogrids in accordance with Article 1056-2 of the *2012 Standard Specifications*. Define “machine direction” (MD) and “cross-machine direction” (CD) for geogrids in accordance with ASTM D4439. Provide geogrids for geogrid reinforcement with short-term design strengths in accordance with the accepted submittals.

Use geogrids with a roll width of at least 4 ft and an “approved” or “approved for provisional use” status code. Geogrids are approved for short-term design strengths for a 3-year design life in the MD and CD based on material type. The list of approved geogrids with short-term design strengths is available from: [www.ncdot.org/doh/operations/materials/soils/gep.html](http://www.ncdot.org/doh/operations/materials/soils/gep.html)

Define material type from the website above for shoring backfill as follows:

| Material Type    | Shoring Backfill                              |
|------------------|-----------------------------------------------|
| Borrow           | A-2-4 Soil                                    |
| Fine Aggregate   | Class II, Type 1 or Class III Select Material |
| Coarse Aggregate | Class V or VI Select Material                 |

If an approved geogrid does not list a short-term design strength in the MD for the shoring backfill used, do not use the geogrid for geogrid reinforcement. If an approved geogrid does not list a short-term design strength in the CD for the shoring backfill used, do not install the geogrid with the MD parallel to the wall face.

## (4) Welded Wire Grid and Metallic Strip Reinforcement

Provide welded wire grid and metallic strip reinforcement supplied by the Wire Wall Vendor or a manufacturer approved or licensed by the vendor. Use welded wire grid reinforcement (“mesh”, “mats” and “ladders”) that meet Article 1070-3 of the *2012 Standard Specifications* and metallic strip reinforcement (“straps”) that meet ASTM A572 or A1011.

**Preconstruction Requirements**

## (A) Concrete Barrier

Define “clear distance” behind concrete barrier as the horizontal distance between the barrier and edge of pavement. The minimum required clear distance for concrete barrier is shown in the plans. At the Contractor’s option or if the minimum required clear distance is not available, set concrete barrier next to and up against traffic side of temporary shoring except for barrier above temporary walls. Concrete barrier with the minimum required clear distance is required above temporary walls.

## (B) Temporary Guardrail

Define “clear distance” behind temporary guardrail as the horizontal distance between guardrail posts and temporary shoring. At the Contractor’s option or if clear distance for cantilever, braced and anchored shoring is less than 4 ft, attach guardrail to traffic side of shoring as shown in the plans. Place ABC in clear distance and around guardrail posts instead of pavement. Do not use temporary guardrail above temporary walls.

## (C) Temporary Shoring Designs

Before beginning temporary shoring design, survey existing ground elevations in the vicinity of shoring locations to determine actual design heights (H). Submit 8 copies of working drawings and 3 copies of design calculations and a PDF copy of each for temporary shoring designs in accordance with Article 105-2 of the *2012 Standard Specifications*. Submit working drawings showing plan views, shoring profiles, typical sections and details of temporary shoring design and construction sequence. Do not begin shoring construction until a design submittal is accepted.

Have cantilever and braced shoring designed, detailed and sealed by an engineer licensed in the state of North Carolina. Use a prequalified Anchored Wall Design Consultant to design anchored shoring. Provide anchored shoring designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for an Anchored Wall Design Consultant. Include details in anchored shoring working drawings of anchor locations and lock-off loads, unit grout/ground bond strengths for ground anchors or minimum installation torque and torsional strength rating for helical anchors and if necessary, obstructions extending through shoring or interfering with anchors. Include details in the anchored shoring construction sequence of pile and anchor installation, excavation and anchor testing.

Use a prequalified MSE Wall Design Consultant to design temporary walls. Provide temporary wall designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for the MSE Wall Design Consultant. Include details in temporary wall working drawings of geotextile and reinforcement types, locations and directions and obstructions extending through walls or interfering with reinforcement.

## (1) Soil Parameters

Design temporary shoring for the assumed soil parameters and groundwater elevations shown in the plans. Assume the following soil parameters for shoring backfill:

(a) Unit weight ( $\gamma$ ) = 120 lb/cf;

| (b) | Friction Angle ( $\phi$ ) | Shoring Backfill                              |
|-----|---------------------------|-----------------------------------------------|
|     | 30°                       | A-2-4 Soil                                    |
|     | 34°                       | Class II, Type 1 or Class III Select Material |
|     | 38°                       | Class V or VI Select Material                 |

(c) Cohesion ( $c$ ) = 0 lb/sf.

(2) Traffic Surcharge

Design temporary shoring for a traffic surcharge of 250 lb/sf if traffic will be above and within H of shoring. This traffic surcharge does not apply to construction traffic. Design temporary shoring for any construction surcharge if construction traffic will be above and within H of shoring. For LRFD shoring designs, apply traffic (live load) surcharge in accordance with Figure C11.5.5-3 of the *AASHTO LRFD Bridge Design Specifications*.

(3) Cantilever, Braced and Anchored Shoring Designs

Use shoring backfill for fill sections and voids between cantilever, braced and anchored shoring and the critical failure surface. Use concrete or grout for embedded portions of drilled-in H-piles. Do not use drilled-in sheet piles.

Define “top of shoring” for cantilever, braced and anchored shoring as where the grade intersects the back of sheet piles or H-piles and timber lagging. Design cantilever, braced and anchored shoring for a traffic impact load of 2,000 lb/ft applied 18" above top of shoring if concrete barrier is above and next to shoring or temporary guardrail is above and attached to shoring. For anchored shoring designs, apply traffic impact load as horizontal load ( $P_{HI}$ ) in accordance with Figure 3.11.6.3-2(a) of the *AASHTO LRFD specifications*.

Extend cantilever, braced and anchored shoring at least 32" above top of shoring if shoring is designed for traffic impact. Otherwise, extend shoring at least 6" above top of shoring.

Design cantilever, braced and anchored shoring for a maximum deflection of 3" if the horizontal distance to the closest edge of pavement or structure is less than H. Otherwise, design shoring for a maximum deflection of 6". Design cantilever and braced shoring in accordance with the plans and *AASHTO Guide Design Specifications for Bridge Temporary Works*.

Design anchored shoring in accordance with the plans and Article 11.9 of the *AASHTO LRFD Bridge Design Specifications*. Use a resistance factor of 0.80 for tensile resistance of anchors with bars, strands or shafts. Extend the unbonded length for ground anchors and the shallowest helix for helical anchors at least 5 ft behind the critical failure surface. Do not extend anchors beyond right-of-way or easement limits. If existing or future obstructions such as foundations, guardrail posts, pavements, pipes, inlets or utilities will interfere with anchors, maintain a clearance of at least 6" between obstructions and anchors.

(4) Temporary Wall Designs

Use shoring backfill in the reinforced zone of temporary walls. Separation geotextiles are required between shoring backfill and backfill, natural ground or culverts along the sides of the reinforced zone perpendicular to the wall face. For Class V or VI select material in the reinforced zone, separation geotextiles are also required between shoring backfill and backfill or natural ground on top of and at the back of the reinforced zone.

Design temporary walls in accordance with the plans and Article 11.10 of the *AASHTO LRFD Bridge Design Specifications*. Embed temporary walls at least 18" except for walls on structures or rock as determined by the Engineer. Use a uniform reinforcement length throughout the wall height of at least 0.7H or 6 ft, whichever is greater. Extend the reinforced zone at least 6" beyond end of reinforcement. Do not locate the reinforced zone outside right-of-way or easement limits.

Use the simplified method for determining maximum reinforcement loads in accordance with the AASHTO LRFD specifications. For geotextile reinforcement, use geotextile properties approved by the Department or default values in accordance with the AASHTO LRFD specifications. For geogrid reinforcement, use approved geogrid properties available from the website shown elsewhere in this provision. Use geosynthetic properties for the direction reinforcement will be installed, a 3-year design life and the shoring backfill type in the reinforced zone.

Do not use more than 4 different reinforcement strengths for each temporary geosynthetic wall. Design temporary geotextile walls for a reinforcement coverage ratio ( $R_c$ ) of 1.0 and temporary geogrid walls for an  $R_c$  of at least 0.8. For geogrid reinforcement with an  $R_c$  of less than 1.0, use a maximum horizontal clearance between geogrids of 3 ft and stagger reinforcement so geogrids are centered over gaps in the reinforcement layer below.

For temporary geosynthetic walls, use "L" shaped welded wire facing with 18" to 24" long legs. Locate geotextile or geogrid reinforcement so reinforcement layers are at the same level as the horizontal legs of welded wire facing. Use vertical reinforcement spacing equal to facing height. Wrap geotextile or geogrid reinforcement behind welded wire facing and extend reinforcement at least 3 ft back behind facing into shoring backfill.

For temporary wire walls with separate reinforcement and facing components, attach welded wire grid or metallic strip reinforcement to welded wire facing with a connection approved by the Department. For temporary geogrid and wire walls, retain shoring backfill at welded wire facing with retention geotextiles and extend geotextiles at least 3 ft back behind facing into backfill.

(D) Preconstruction Meeting

The Engineer may require a shoring preconstruction meeting to discuss the construction, inspection and testing of the temporary shoring. If required, schedule this meeting after all shoring submittals have been accepted. The Resident, District or Bridge Maintenance Engineer, Bridge or Roadway Construction Engineer, Geotechnical Operations Engineer, Contractor and Shoring Contractor Superintendent will attend this preconstruction meeting.

**Construction Methods**

Control drainage during construction in the vicinity of shoring. Direct run off away from shoring and shoring backfill. Contain and maintain backfill and protect material from erosion.

Install positive protection in accordance with the contract and accepted submittals. Use PCB in accordance with Section 1170 of the *2012 Standard Specifications* and Standard Drawing No. 1170.01 of the *2012 Roadway Standard Drawings*. Use temporary guardrail in accordance with Section 862 of the *2012 Standard Specifications* and Standard Drawing No. 862.01, 862.02 and 862.03 of the *2012 Roadway Standard Drawings*.

**(A) Tolerances**

Construct shoring with the following tolerances:

- (1) Horizontal wires of welded wire facing are level in all directions,
- (2) Shoring location is within 6" of horizontal and vertical alignment shown in the accepted submittals, and
- (3) Shoring plumbness (batter) is within 2° of vertical.

**(B) Cantilever, Braced and Anchored Shoring Installation**

If overexcavation behind cantilever, braced or anchored shoring is shown in the accepted submittals, excavate before installing piles. Otherwise, install piles before excavating for shoring. Install cantilever, braced or anchored shoring in accordance with the construction sequence shown in the accepted submittals. Remove piles and if applicable, timber lagging when shoring is no longer needed.

**(1) Pile Installation**

Install piles with the minimum required embedment and extension in accordance with Subarticles 450-3(D) and 450-3(E) of the *2012 Standard Specifications* except that a pile driving equipment data form is not required. Piles may be installed with a vibratory hammer as approved by the Engineer.

Do not splice sheet piles. Use pile excavation to install drilled-in H-piles. After filling holes with concrete or grout to the elevations shown in the accepted submittals, remove any fluids and fill remaining portions of holes with flowable fill. Cure concrete or grout at least 7 days before excavating.

Notify the Engineer if refusal is reached before pile excavation or driven piles attain the minimum required embedment. When this occurs, a revised design submittal may be required.

**(2) Excavation**

Excavate in front of piles from the top down in accordance with the accepted submittals. For H-piles with timber lagging and braced and anchored shoring, excavate in staged horizontal lifts with a maximum height of 5 ft. Remove



flowable fill and material in between H-piles as needed to install timber lagging. Position lagging with at least 3" of contact in the horizontal direction between the lagging and pile flanges. Do not excavate the next lift until timber lagging for the current lift is installed and if applicable, bracing and anchors for the current lift are accepted. Backfill behind cantilever, braced or anchored shoring with shoring backfill.

(3) Anchor Installation

If applicable, install foundations located behind anchored shoring before installing anchors. Fabricate and install ground anchors in accordance with the accepted submittals, Articles 6.4 and 6.5 of the *AASHTO LRFD Bridge Construction Specifications* and the following unless otherwise approved:

- (a) Materials in accordance with this provision are required instead of materials conforming to Articles 6.4 and 6.5.3 of the AASHTO LRFD Specifications,
- (b) Encapsulation-protected ground anchors in accordance with Article 6.4.1.2 of the AASHTO LRFD specifications are not required, and
- (c) Corrosion protection for unbonded lengths of ground anchors and anchorage covers are not required.

Install helical anchors in accordance with the accepted submittals and Anchor Manufacturer's instructions. Measure torque during installation and do not exceed the torsional strength rating of the helical anchor. Attain the minimum required installation torque and penetration before terminating anchor installation. When replacing a helical anchor, embed last helix of the replacement anchor at least 3 helix plate diameters past the location of the first helix of the previous anchor.

(4) Anchor Testing

Proof test and lock-off anchors in accordance with the accepted submittals and Article 6.5.5 of the *AASHTO LRFD Bridge Construction Specifications* except for the acceptance criteria in Article 6.5.5.5. For the AASHTO LRFD specifications, "ground anchor" refers to a ground or helical anchor and "tendon" refers to a bar, strand or shaft.

(a) Anchor Acceptance

Anchor acceptance is based in part on the following criteria.

- (i) For ground and helical anchors, total movement is less than 0.04" between the 1 and 10 minute readings or less than 0.08" between the 6 and 60 minute readings.
- (ii) For ground anchors, total movement at maximum test load exceeds 80% of the theoretical elastic elongation of the unbonded length.

(b) Anchor Test Results

Submit 2 copies of anchor test records including movement versus load plots for each load increment within 24 hours of completing each row of anchors. The Engineer will review the test records to determine if the anchors are acceptable.

If the Engineer determines an anchor is unacceptable, revise the anchor design or installation methods. Submit a revised anchored shoring design for acceptance and provide an acceptable anchor with the revised design or installation methods. If required, replace the anchor or provide additional anchors with the revised design or installation methods.

(C) Temporary Wall Installation

Excavate as necessary for temporary walls in accordance with the plans and accepted submittals. If applicable, install foundations located in the reinforced zone before placing shoring backfill or reinforcement unless otherwise approved. Notify the Engineer when foundation excavation is complete. Do not place shoring backfill or reinforcement until excavation dimensions and foundation material are approved.

Erect welded wire facing with no negative batter (wall face leaning forward) so the wall position is as shown in the plans and accepted submittals. Set welded wire facing adjacent to each other in the horizontal and vertical direction to completely cover the wall face with facing. Stagger welded wire facing to create a running bond by centering facing over joints in the row below.

Wrap geotextile reinforcement and retention geotextiles behind welded wire facing as shown in the plans and accepted submittals and cover geotextiles with at least 3" of shoring backfill. Overlap adjacent geotextile reinforcement and retention and separation geotextiles at least 18" with seams oriented perpendicular to the wall face. Hold geotextiles in place with wire staples or anchor pins as needed.

Place reinforcement within 3" of locations shown in the plans and accepted submittals and in slight tension free of kinks, folds, wrinkles or creases. Install reinforcement with the direction shown in the plans and accepted submittals. For temporary wire walls with separate reinforcement and facing components, attach welded wire grid or metallic strip reinforcement to welded wire facing as shown in the accepted submittals. Do not splice or overlap reinforcement so seams are parallel to the wall face. Contact the Engineer when unanticipated existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with reinforcement.

Place shoring backfill in the reinforced zone in 8" to 10" thick lifts. Compact A-2-4 soil and Class II, Type 1 and Class III select material in accordance with Subarticle 235-3(C) of the *2012 Standard Specifications*. Use only hand operated compaction equipment to compact backfill within 3 ft of welded wire facing. At a distance greater than 3 ft, compact shoring backfill with at least 4 passes of an 8 ton to 10 ton vibratory roller in a direction parallel to the wall face. Smooth wheeled or rubber tired rollers are also acceptable for compacting backfill. Do not use sheepsfoot, grid rollers or other types of

compaction equipment with feet. Do not displace or damage reinforcement when placing and compacting shoring backfill. End dumping directly on geotextile or geogrid reinforcement is not permitted. Do not operate heavy equipment on reinforcement until it is covered with at least 8" of shoring backfill. Replace any damaged reinforcement to the satisfaction of the Engineer.

Backfill for temporary walls outside the reinforced zone in accordance with Article 410-8 of the *2012 Standard Specifications*. Bench temporary walls into the sides of excavations where applicable. For temporary geosynthetic walls with top of wall within 5 ft of finished grade, remove top facing and incorporate top reinforcement layer into fill when placing fill in front of wall. Temporary walls remain in place permanently unless otherwise required.

### **Measurement and Payment**

*Temporary Shoring* will be measured and paid in square feet. Temporary walls will be measured as the square feet of exposed wall face area. Cantilever, braced or anchored shoring will be measured as the square feet of exposed shoring face area with the shoring height equal to the difference between the top and bottom of shoring elevations. Define "top of shoring" as where the grade intersects the back of sheet piles or H-piles and timber lagging. Define "bottom of shoring" as where the grade intersects front of sheet piles or H-piles and timber lagging. No measurement will be made for any embedment, shoring extension above top of shoring or pavement thickness above temporary walls.

The contract unit price for *Temporary Shoring* will be full compensation for providing shoring designs, submittals and materials, excavating, backfilling, hauling and removing excavated materials and supplying all labor, tools, equipment and incidentals necessary to construct temporary shoring.

No payment will be made for temporary shoring not shown in the plans or required by the Engineer including shoring for OSHA reasons or the Contractor's convenience. No value engineering proposals will be accepted based solely on revising or eliminating shoring locations shown in the plans or estimated quantities shown in the bid item sheets as a result of actual field measurements or site conditions.

PCB will be measured and paid in accordance with Section 1170 of the *2012 Standard Specifications*. No additional payment will be made for anchoring PCB for temporary shoring. Costs for anchoring PCB will be incidental to temporary shoring.

Temporary guardrail will be measured and paid for in accordance with Section 862 of the *2012 Standard Specifications*.

Payment will be made under:

#### **Pay Item**

Temporary Shoring

#### **Pay Unit**

Square Foot

**STANDARD SHORING: (1-17-12)****Description**

Standard shoring includes standard temporary shoring and standard temporary mechanically stabilized earth (MSE) walls. At the Contractor's option, use standard shoring as noted in the plans or as directed. When using standard shoring, a temporary shoring design submittal is not required. Construct standard shoring based on actual elevations and shoring dimensions in accordance with the contract and Standard Drawing No. 1801.01 or 1801.02.

Define "standard temporary shoring" as cantilever shoring that meets the standard temporary shoring drawing (Standard Drawing No. 1801.01). Define "standard temporary wall" as a temporary MSE wall with geotextile or geogrid reinforcement that meets the standard temporary wall drawing (Standard Drawing No. 1801.02). Define "standard temporary geotextile wall" as a standard temporary wall with geotextile reinforcement and "standard temporary geogrid wall" as a standard temporary wall with geogrid reinforcement. Define "geosynthetics" as geotextiles or geogrids.

Provide positive protection for standard shoring at locations shown in the plans and as directed. See *Temporary Shoring* provision for positive protection types and definitions.

**Materials**

Refer to the *Standard Specifications*.

| <b>Item</b>                    | <b>Section</b> |
|--------------------------------|----------------|
| Anchor Pins                    | 1056-2         |
| Concrete Barrier Materials     | 1170-2         |
| Flowable Fill, Excavatable     | 1000-6         |
| Geotextiles                    | 1056           |
| Neat Cement Grout              | 1003           |
| Portland Cement Concrete       | 1000           |
| Select Material                | 1016           |
| Steel Beam Guardrail Materials | 862-2          |
| Steel Sheet Piles and H-Piles  | 1084           |
| Untreated Timber               | 1082-2         |
| Welded Wire Reinforcement      | 1070-3         |
| Wire Staples                   | 1060-8(D)      |

Provide Type 6 material certifications for shoring materials. Use Class IV select material (standard size No. ABC) for temporary guardrail.

For drilled-in H-piles, use nonshrink neat cement grout or Class A concrete that meets Article 1000-4 of the *Standard Specifications* except as modified herein. Provide concrete with a slump of 6" to 8". Use an approved high-range water reducer to achieve this slump.

Based on actual shoring height, positive protection, groundwater elevation, slope or surcharge case and traffic impact at each standard temporary shoring location, use sheet piles with the

minimum required section modulus or H-piles with the sizes shown in Standard Drawing No. 1801.01. Use untreated timber with a thickness of at least 3" and a bending stress of at least 1,000 psi for timber lagging.

**(A) Shoring Backfill**

Use Class II, Type 1, Class III, Class V or Class VI select material or material that meets AASHTO M 145 for soil classification A-2-4 with a maximum PI of 6 for shoring backfill except do not use the following:

- (1) A-2-4 soil for backfill around culverts,
- (2) A-2-4 soil in the reinforced zone of standard temporary walls with a back slope and
- (3) Class VI select material in the reinforced zone of standard temporary geotextile walls.

**(B) Standard Temporary Walls**

Use welded wire reinforcement for welded wire facing, struts and wires with the dimensions and minimum wire sizes shown in Standard Drawing No. 1801.02. Provide Type 2 geotextile for separation and retention geotextiles. Define "machine direction" (MD) and "cross-machine direction" (CD) for geosynthetics in accordance with ASTM D4439. Do not use more than 4 different reinforcement strengths for each standard temporary wall.

**(1) Geotextile Reinforcement**

Provide Type 5 geotextile for geotextile reinforcement with a mass per unit area of at least 8 oz/sy in accordance with ASTM D5261. Based on actual wall height, groundwater elevation, slope or surcharge case and shoring backfill type in the reinforced zone at each standard temporary geotextile wall location, provide geotextile reinforcement with wide width tensile strengths at ultimate in the MD as shown in Standard Drawing No. 1801.02. Also provide geotextile reinforcement with wide width tensile strengths at ultimate in the CD as shown in Standard Drawing No. 1801.02 if reinforcement is installed with the MD parallel to the wall face.

**(2) Geogrid Reinforcement**

Handle and store geogrids in accordance with Article 1056-2 of the *Standard Specifications*. Based on actual wall height, groundwater elevation, slope or surcharge case and shoring backfill type in the reinforced zone at each standard temporary geogrid wall location, provide geogrids for geogrid reinforcement with short-term design strengths in the MD as shown in Standard Drawing No. 1801.02. Also provide geogrids for geogrid reinforcement with short-term design strengths in the CD as shown in Standard Drawing No. 1801.02 if reinforcement is installed with the MD parallel to the wall face.

Use geogrids with a roll width of at least 4 ft and an “approved” or “approved for provisional use” status code. Geogrids are approved for short-term design strengths for a 3-year design life in the MD and CD based on material type. The list of approved geogrids with short-term design strengths is available from: [www.ncdot.org/doh/operations/materials/soils/gep.html](http://www.ncdot.org/doh/operations/materials/soils/gep.html)

Define material type from the website above for shoring backfill as follows:

| <b>Material Type</b> | <b>Shoring Backfill</b>                       |
|----------------------|-----------------------------------------------|
| Borrow               | A-2-4 Soil                                    |
| Fine Aggregate       | Class II, Type 1 or Class III Select Material |
| Coarse Aggregate     | Class V or VI Select Material                 |

If an approved geogrid does not list a short-term design strength in the MD for the shoring backfill used, do not use the geogrid for geogrid reinforcement. If an approved geogrid does not list a short-term design strength in the CD for the shoring backfill used, do not install the geogrid with the MD parallel to the wall face.

### **Preconstruction Requirements**

#### **(A) Concrete Barrier**

Define “clear distance” behind concrete barrier as the horizontal distance between the barrier and edge of pavement. The minimum required clear distance for concrete barrier is shown in the plans. At the Contractor’s option or if the minimum required clear distance is not available, set concrete barrier next to and up against traffic side of standard shoring except for barrier above standard temporary walls. Concrete barrier with the minimum required clear distance is required above standard temporary walls.

#### **(B) Temporary Guardrail**

Define “clear distance” behind temporary guardrail as the horizontal distance between guardrail posts and standard shoring. At the Contractor’s option or if clear distance for standard temporary shoring is less than 4 ft, attach guardrail to traffic side of shoring as shown in the plans. Place ABC in clear distance and around guardrail posts instead of pavement. Do not use temporary guardrail above standard temporary walls.

#### **(C) Standard Shoring Selection Forms**

Before beginning standard shoring construction, survey existing ground elevations in the vicinity of standard shoring locations to determine actual shoring or wall heights (H). Submit a standard shoring selection form for each location at least 7 days before starting standard shoring construction. Standard shoring selection forms are available from: [www.ncdot.org/doh/preconstruct/highway/geotech/formdet/](http://www.ncdot.org/doh/preconstruct/highway/geotech/formdet/)

#### **(D) Preconstruction Meeting**

The Engineer may require a shoring preconstruction meeting to discuss the construction and inspection of the standard shoring. If required, schedule this meeting after all standard shoring selection forms have been submitted. The Resident, District or Bridge Maintenance Engineer, Bridge or Roadway Construction Engineer, Geotechnical

Operations Engineer, Contractor and Shoring Contractor Superintendent will attend this preconstruction meeting.

### **Construction Methods**

Construct standard shoring in accordance with the *Temporary Shoring* provision.

#### **(A) Standard Temporary Shoring Installation**

Based on actual shoring height, positive protection, groundwater elevation, slope or surcharge case and traffic impact at each standard temporary shoring location, install piles with the minimum required embedment and extension for each shoring section in accordance with Standard Drawing No. 1801.01. For concrete barrier above and next to standard temporary shoring and temporary guardrail above and attached to standard temporary shoring, use "surcharge case with traffic impact" in accordance with Standard Drawing No. 1801.01. Otherwise, use "slope or surcharge case with no traffic impact" in accordance with Standard Drawing No. 1801.01. If refusal is reached before driven piles attain the minimum required embedment, use drilled-in H-piles with timber lagging for standard temporary shoring.

#### **(B) Standard Temporary Walls Installation**

Based on actual wall height, groundwater elevation, slope or surcharge case, geotextile or geogrid reinforcement and shoring backfill type in the reinforced zone at each standard temporary wall location, construct walls with the minimum required reinforcement length and number of reinforcement layers for each wall section in accordance with Standard Drawing No. 1801.02. For standard temporary walls with pile foundations in the reinforced zone, drive piles through reinforcement after constructing temporary walls.

For standard temporary walls with interior angles less than 90°, wrap geosynthetics at acute corners as directed by the Engineer. Place geosynthetics as shown in Standard Drawing No. 1801.02. Place separation geotextiles between shoring backfill and backfill, natural ground or culverts along the sides of the reinforced zone perpendicular to the wall face. For Class V or VI select material in the reinforced zone, place separation geotextiles between shoring backfill and backfill or natural ground on top of and at the back of the reinforced zone.

### **Measurement and Payment**

Standard shoring will be measured and paid in accordance with the *Temporary Shoring* provision.

### **TRUCK MOUNTED CHANGEABLE MESSAGE SIGNS:**

(8-21-12)

1101.02

SP11 R10

Revise the 2012 Roadway Standard Drawings as follows:

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

11- TRUCK MOUNTED CHANGEABLE MESSAGE SIGNS (TMCMS) USED ON SHADOW VEHICLES FOR "IN LANE" ACTIVITIES SHALL BE A MINIMUM OF

43" X 73". THE DISPLAY PANEL SHALL HAVE FULL MATRIX CAPABILITY WITH THE CAPABILITY TO PROVIDE 2 MESSAGE LINES WITH 7 CHARACTERS PER LINE WITH A MINIMUM CHARACTER HEIGHT OF 18". FOR ADDITIONAL MESSAGING, CONTACT THE WORK ZONE TRAFFIC CONTROL SECTION.

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

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

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

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

**PERMANENT SEEDING AND MULCHING:**

(7-1-95)

1660

SP16 R02

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

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

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

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



**Law Enforcement:**

2-19-09

SPI

**Description**

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

**Construction Methods**

Use uniformed Law Enforcement Officers and marked Law Enforcement vehicles equipped with blue lights mounted on top of the vehicle, and Law Enforcement vehicle emblems to direct or control traffic as required by the plans or by the Engineer.

**Measurement and Payment**

Law Enforcement will be measured and paid for in the actual number of hours that each Law Enforcement Officer is provided during the life of the project as approved by the Engineer. There will be no direct payment for marked Law Enforcement vehicles as they are considered incidental to the pay item.

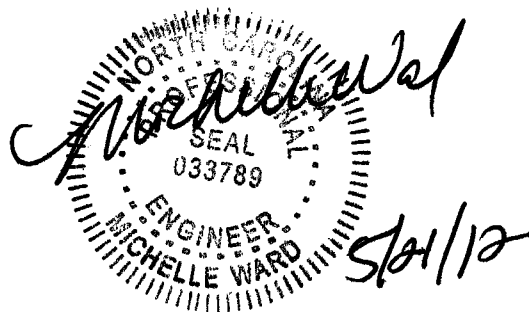
Payment will be made under:

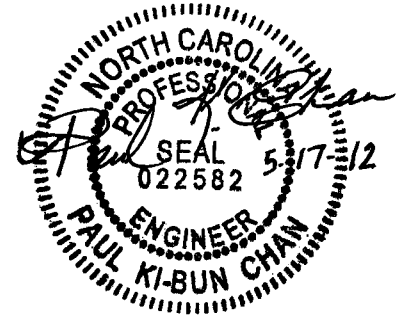
**Pay Item**

Law Enforcement

**Pay Unit**

Hour



PROJECT SPECIAL PROVISIONS  
LIGHTING

## 1.00 DESCRIPTION

The work covered by this Section consists of furnishing, installing, connecting, and placing into satisfactory operating condition roadway lighting at locations shown on the plans. Perform all work in accordance with these Special Provisions, the Plans, the National Electrical Code, and North Carolina Department of Transportation "Standard Specifications for Roads and Structures" (Standard Specifications).

Perform all work in conformance with Division 14 of the Standard Specifications except as modified or added to by these Special Provisions. Install all bore pits outside the clear zone, as defined in the AASHTO Roadside Design Guide or as directed by the Engineer.

In addition to the requirements of Division 1400, other specific Sections of the Standard Specifications applicable to the work on this project are listed below.

|              |                                             |
|--------------|---------------------------------------------|
| Section 1401 | High Mount Standard and Portable Drive Unit |
| Section 1403 | High Mount Luminares                        |
| Section 1404 | Light Standards                             |
| Section 1405 | Standard Foundation                         |
| Section 1406 | Light Standard Luminares                    |
| Section 1407 | Electric Service Pole and Lateral           |
| Section 1408 | Light Control System                        |
| Section 1409 | Electrical Duct                             |
| Section 1410 | Feeder Circuits                             |
| Section 1411 | Electrical Junction Boxes                   |

## 2.00 HIGH MOUNT FOUNDATIONS

## 2.10 DESCRIPTION

High mount foundations for high mount standards consist of drilled piers or footings with pedestals, conduit and anchor rod assemblies. Construct high mount foundations in accordance with the contract and either *Roadway Standard Drawings* No. 1402.01 or the accepted submittals. Define "high mount standard foundation" as a drilled pier including the conduit and anchor rod assembly that meets Standard Drawing No. 1402.01.

## 2.20 MATERIALS

Use high mount foundation materials that meet the *Foundations and Anchor Rod Assemblies for Metal Poles* provision found in the Roadway Project Special Provisions.

## 2.30 HIGH MOUNT STANDARD FOUNDATIONS

Construct high mount standard foundations for the wind zone and high mount heights shown in the plans unless the following assumed site conditions are not applicable to high mount locations:

- A. Soil with unit weight ( $\gamma$ )  $\geq$  120 lb/cf and friction angle ( $\phi$ )  $\geq$  30°,
- B. Groundwater at least 7 ft below finished grade and
- C. Slope of finished grade 6:1 (H:V) or flatter.

A subsurface investigation and high mount foundation design are required if the Engineer determines these assumed site conditions do not apply to a high mount location and the high mount cannot be moved. Subsurface conditions requiring a high mount foundation design 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 or high mount foundation designs.

## 2.40 SUBSURFACE INVESTIGATIONS

Use a prequalified geotechnical consultant to perform one standard penetration test (SPT) boring in accordance with ASTM D1586 at each high mount location requiring a subsurface investigation. Rough grade high mount locations to within 2 ft 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 8.0 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.

## 2.50 HIGH MOUNT FOUNDATION DESIGNS

Design high mount foundations for the wind zone and high mount heights shown in the plans and the slope of finished grade and subsurface conditions at each high mount location. Design drilled piers, footings and pedestals in accordance with the 4<sup>th</sup> Edition of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*.

Design drilled piers for side resistance only in accordance with Section 4.6 of the *AASHTO Standard Specifications for Highway Bridges*. Use the computer software LPILE version 5.0 or later manufactured by Ensoft, Inc. to analyze drilled piers. Provide drilled pier designs with a horizontal deflection of less than 0.5" at top of piers.

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 lb/sf for footings.

Submit boring logs, working drawings and design calculations for acceptance in accordance with Article 105-2 of the *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 high mount foundation design submittals. Have high mount foundations designed, detailed and sealed by an engineer licensed in the state of North Carolina.

## 2.60 CONSTRUCTION METHODS

Grade a 3 ft diameter level work area around high mount locations with cut and fill slopes as shown on Standard Drawing No. 1402.01. Construct drilled piers, footings and pedestals and install anchor rod assemblies for high mount foundations in accordance with the *Foundations and Anchor Rod Assemblies for Metal Poles* provision.

## 2.70 MEASUREMENT AND PAYMENT

*High Mount Foundations* will be measured and paid in cubic yards. High mount standard foundations will be measured as the cubic yards of concrete shown on Standard Drawing No. 1402.01 for the high mount height and wind zone shown in the plans. All other high mount foundations will be measured as the cubic yards of foundation concrete for drilled piers, footings and pedestals shown on the accepted submittals. The contract unit price for *High Mount Foundations* will be full compensation for providing labor, tools, equipment and foundation materials, stabilizing or shoring excavations and supplying concrete, reinforcing steel, conduit, anchor rod assemblies and any incidentals necessary to construct high mount foundations. Subsurface investigations and high mount foundation designs required by the Engineer will be paid as extra work in accordance with Article 104-7 of the *Standard Specifications*.

Payment will be made under:

High Mount Foundations.....Cubic Yard

May 31, 2012



Project: U-3324  
County: Moore

**PROJECT SPECIAL PROVISIONS**  
Utility Construction

Revise the 2012 Standard Specifications as follows:

**Utility Owner's Contact Information:**

**Page 15-1; Sub-article 1500-2 Cooperation with the Utility Owner, paragraph 2, add the following sentences:**

The utility owner is the Town of Southern Pines. The contact person is Mr. Brent Lockamy and he can be reached by phone at (910)692-1983.

**Page 15-6; Subarticle 1510-3 (B) Testing and Sterilization, change the allowable leakage formula to:**

$$W=LD (P)^{1/2}/148,000$$

**Page 15-6; Subarticle 1510-3 (B) Testing and Sterilization; seventh paragraph delete the words (concurrently or) in the following sentence.**

Testing, cleaning and sterilization may be performed ~~concurrently or~~ consecutively.

**Breakdown and Rebuild Manhole**

Manholes that will require rebuilding shall have the frame and cover removed, the flat top manhole section removed, and necessary manhole wall removed. Reconstruction shall include rebuilding manhole wall, and providing new eccentric cone, steps, and manhole frame and cover. All work shall meet the approval of the Engineer.

Manhole construction shall also conform to the applicable requirements of Section 840 of the Standard Specifications.

Payment for removing and providing new manhole frame and cover, removing flat top manhole section and providing new eccentric cone, providing new steps, and removing and rebuilding manhole wall will be based on a unit price for each manhole.

**Measurement and Payment**

*Breakdown and Rebuild Manhole* will each be measured and paid for as each. Such price and payment will be full compensation for all work covered by this provision, including but not limited to labor, materials, breaking down manhole, new manhole construction, manhole pargetting, steps, excavation, backfilling, and incidentals necessary to complete the work as required.

Payment will made under:

| <b>Pay Item</b>               | <b>Pay Unit</b> |
|-------------------------------|-----------------|
| Breakdown and Rebuild Manhole | Each            |

PROJECT SPECIAL PROVISIONS

## Utility

UTILITIES BY OTHERS:

## General:

The following utility companies have facilities that will be in conflict with the construction of this project.

- A) Progress Energy Corp. - Power (Distribution)
- B) CenturyLink - Telephone
- C) Time Warner - Cable TV
- D) Piedmont Natural Gas Company - Natural Gas

The conflicting facilities of these concerns will be adjusted prior to the date of availability, unless otherwise noted and are therefore listed in these special provisions for the benefit of the Contractor. All utility work listed herein will be done by the utility owner. All utilities are shown on the plans from the best available information.

The Contractor's attention is directed to Article 105-8 of the Standard Specifications.

## Utilities Requiring Adjustment:

## A) Progress Energy Corp. - Power (Distribution)

- 1) Progress Energy Corp. will relocate its poles and lines within the project limits to the locations shown on the Utilities by Others Plans beginning October 15, 2012 and completing relocation by December 15, 2012.
- 2) Contact person for Progress Energy is Mr. J. B. Jones at 910-206-1966 or 919-625-2725 (cell).

## B) CenturyLink - Telephone

- 1) Embarq will abandon some of its facilities and attach them to the poles installed by Progress Energy at the locations shown on the Utilities by Others Plans beginning December 15, 2012 and completing them by January 30, 2013.
- 2) Contact person for CenturyLink is Mr. Kevin Godwin at 1-910-366-2142.

## C) Time Warner Cable TV

- 1) Time Warner Cable TV will abandon some of its facilities and attach them to the new poles installed by Progress Energy at the locations shown on the Utility by

August 3, 2012

Others Plans beginning January 15, 2013 and completing them by February 15, 2013.

- 2) Contact person for Time Warner Cable TV is Mr. Bob Bennett at 252-265-4168 or 919-625-2725 (cell).

D) Piedmont Natural Gas Company – Natural Gas

- 1) Piedmont Natural Gas Company will adjust its lines at locations as shown on the Utilities by Others Plans prior to the date of availability.
- 2) In the area of -Y6- (Morganton Road) and Ramp A Piedmont Natural Gas Company will relocate its' existing 2" gas main with a new 2" gas main at the locations shown on the Utilities by Others Plans. Contractor to give Piedmont Natural Gas Company two (2) week's notice as to when the clearing and rough grading will be completed. Piedmont Natural Gas Company will complete its work in two (2) weeks.
- 3) Contact person for Piedmont Natural Gas Company is Mr. Chad Clark at 910-334-9010.



U-3324

**Project Special Provisions  
Erosion Control**

Moore County

**STABILIZATION REQUIREMENTS:**

Stabilization for this project shall comply with the time frame guidelines as specified by the NCG-010000 general construction permit effective August 3, 2011 issued by the North Carolina Department of Environment and Natural Resources Division of Water Quality. Temporary or permanent ground cover stabilization shall occur within 7 calendar days from the last land-disturbing activity, with the following exceptions in which temporary or permanent ground cover shall be provided in 14 calendar days from the last land-disturbing activity:

- Slopes between 2:1 and 3:1, with a slope length of 10 ft. or less
- Slopes 3:1 or flatter, with a slope of length of 50 ft. or less
- Slopes 4:1 or flatter

The stabilization timeframe for High Quality Water (HQW) Zones shall be 7 calendar days with no exceptions for slope grades or lengths. High Quality Water Zones (HQW) Zones are defined by North Carolina Administrative Code 15A NCAC 04A.0105 (25). Temporary and permanent ground cover stabilization shall be achieved in accordance with the provisions in this contract and as directed.

**SEEDING AND MULCHING:****(East)**

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

## All Roadway Areas

**March 1 - August 31**

50# Tall Fescue  
10# Centipede  
25# Bermudagrass (hulled)  
500# Fertilizer  
4000# Limestone

**September 1 - February 28**

50# Tall Fescue  
10# Centipede  
35# Bermudagrass (unhulled)  
500# Fertilizer  
4000# Limestone

## Waste and Borrow Locations

**March 1 – August 31**

75# Tall Fescue  
25# Bermudagrass (hulled)  
500# Fertilizer  
4000# Limestone

**September 1 - February 28**

75# Tall Fescue  
35# Bermudagrass (unhulled)  
500# Fertilizer  
4000# Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

### Approved Tall Fescue Cultivars

|                            |                        |              |                    |
|----------------------------|------------------------|--------------|--------------------|
| 2 <sup>nd</sup> Millennium | Duster                 | Magellan     | Rendition          |
| Avenger                    | Endeavor               | Masterpiece  | Scorpion           |
| Barlexas                   | Escalade               | Matador      | Shelby             |
| Barlexas II                | Falcon II, III, IV & V | Matador GT   | Signia             |
| Barrera                    | Fidelity               | Millennium   | Silverstar         |
| Barrington                 | Finesse II             | Montauk      | Southern Choice II |
| Biltmore                   | Firebird               | Mustang 3    | Stetson            |
| Bingo                      | Focus                  | Olympic Gold | Tarheel            |
| Bravo                      | Grande II              | Padre        | Titan Ltd          |
| Cayenne                    | Greenkeeper            | Paraiso      | Titanium           |
| Chapel Hill                | Greystone              | Picasso      | Tomahawk           |
| Chesapeake                 | Inferno                | Piedmont     | Tacer              |
| Constitution               | Justice                | Pure Gold    | Trooper            |
| Chipper                    | Jaguar 3               | Prospect     | Turbo              |
| Coronado                   | Kalahari               | Quest        | Ultimate           |
| Coyote                     | Kentucky 31            | Rebel Exeda  | Watchdog           |
| Davinci                    | Kitty Hawk             | Rebel Sentry | Wolfpack           |
| Dynasty                    | Kitty Hawk 2000        | Regiment II  |                    |
| Dominion                   | Lexington              | Rembrandt    |                    |

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. A different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis and as directed.

### Native Grass Seeding And Mulching

(West)

Native Grass Seeding and Mulching shall be performed on the disturbed areas of wetlands and riparian areas, and adjacent to Stream Relocation and/or trout stream construction within a 50 foot zone on both sides of the stream or depression, measured from top of stream bank or center of depression. The stream bank of the stream relocation shall be seeded by a method that does not alter the typical cross section of the stream bank. Native Grass Seeding and Mulching shall also be performed in the permanent soil reinforcement mat section of preformed scour holes, and in other areas as directed.

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

**August 1 - June 1**

18# Creeping Red Fescue  
 8# Big Bluestem  
 6# Indiangrass  
 4# Switchgrass  
 35# Rye Grain  
 500# Fertilizer  
 4000# Limestone

**May 1 – September 1**

18# Creeping Red Fescue  
 8# Big Bluestem  
 6# Indiangrass  
 4# Switchgrass  
 25# German or Browntop Millet  
 500# Fertilizer  
 4000# Limestone

**Approved Creeping Red Fescue Cultivars:**

Aberdeen

Boreal

Epic

Cindy Lou

Fertilizer shall be 10-20-20 analysis. A different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis and as directed.

Native Grass Seeding and Mulching shall be performed in accordance with Section 1660 of the *Standard Specifications* and vegetative cover sufficient to restrain erosion shall be installed immediately following grade establishment.

**Measurement and Payment**

Native Grass *Seeding and Mulching* will be measured and paid for in accordance with Article 1660-8 of the *Standard Specifications*.

All areas seeded and mulched shall be tacked with asphalt. Crimping of straw in lieu of asphalt tack shall not be allowed on this project.

**CRIMPING STRAW MULCH:**

Crimping shall be required on this project adjacent to any section of roadway where traffic is to be maintained or allowed during construction. In areas within six feet of the edge of pavement, straw is to be applied and then crimped. After the crimping operation is complete, an additional application of straw shall be applied and immediately tacked with a sufficient amount of undiluted emulsified asphalt.

Straw mulch shall be of sufficient length and quality to withstand the crimping operation.

Crimping equipment including power source shall be subject to the approval of the Engineer providing that maximum spacing of crimper blades shall not exceed 8".

**TEMPORARY SEEDING:**

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet

or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

#### **FERTILIZER TOPDRESSING:**

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20 grade and shall be applied at the rate of 500 pounds per acre. A different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis and as directed.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. A different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis and as directed.

#### **SUPPLEMENTAL SEEDING:**

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

#### **MOWING:**

The minimum mowing height on this project shall be 4 inches.

#### **LAWN TYPE APPEARANCE:**

All areas adjacent to lawns must be hand finished as directed to give a lawn type appearance. Remove all trash, debris, and stones  $\frac{3}{4}$ " and larger in diameter or other obstructions that could interfere with providing a smooth lawn type appearance. These areas shall be reseeded to match their original vegetative conditions, unless directed otherwise by the Field Operations Engineer.

#### **SODDING (ZOYSIA):**

##### **Description**

This work consists of placing sod in areas as directed. The sod shall be prepared in accordance with the requirements of Section 1664 of the *Standard Specifications* and the requirements of this section.



## Materials

Only "approved sod" (trade designation) consisting of 100% El Toro Zoysia sod shall be used. The sod, machine cut to the supplier's standard "big roll" sod width and length, shall be a 5/8" minimum depth, excluding top growth and thatch, at the time of cutting. Before cutting, the sod shall be uniformly mowed at a height of 3/4" to 1". Standard sod sections shall be sufficiently strong to support their own weight and retain their size and shape when suspended vertically from a firm grasp on the upper 10% of the section.

The Contractor shall obtain a certificate or limited permit issued by the North Carolina Department of Agriculture and Consumer Services (1-800-206-9333) or (919-733-6932) stating that the sod has been found to be free of injurious plant pests.

Sod shall be delivered on site within 24 hours of being cut (harvested) and be covered by acceptable means during delivery. A certificate from the sod producer stating the date and time of sod cutting shall accompany the sod when it arrives at the project site.

The Contractor shall provide sufficient water to meet the requirements of this section.

## Construction Methods

### (A) Soil Preparation

Remove litter and other debris. Mow and satisfactorily dispose of weeds or other unacceptable growth on the areas to be sodded.

Prior to beginning preparation of the soil to receive sod, all eroded, uneven and rough areas shall be contour graded and/or filled with soil as directed. The soil shall be scarified or otherwise loosened to a depth of not less than 5". Clods shall be broken and the top 2" to 3" of soil shall be worked into an acceptable soil bed by the use of soil pulverizers, drags, or harrows.

After soil preparation, lime and fertilizer shall be uniformly distributed by mechanical means and thoroughly mixed with the top 5" of the soil by disking, harrowing, or other approved methods. In lieu of an NCDA&CS soil report, the rates of lime and fertilizer per acre are as follows:

|       |                     |
|-------|---------------------|
| 500#  | 10-20-20 Fertilizer |
| 4000# | Limestone           |

The area shall then be harrowed, dragged, raked, or prepared by other approved methods which will give a lawn type finish. All trash, debris and stones larger than 1-1/2" in diameter or other obstructions that could interfere with the placing of the sod shall also be removed. The finished surface shall be moistened with water prior to placing the sod as directed.

(B) Sod Placement

Sod handling and placement shall be a continuous process of cutting, transporting and installing including repairing seams and voids. Sod shall always be installed within 48 hours after being cut. Sod shall be watered within 2 hours of installation.

Any sod or portions of sod rejected by the Engineer during the initial placement shall be removed from the project and replaced with acceptable sod immediately. The Contractor shall cease any and all other placement of sod on the project until rejected sod has been replaced.

After sod has been placed, and staked where necessary, according to Section 1664 of the *Standard Specifications*, it shall then be rolled or tamped carefully and firmly by means acceptable to the Engineer to ensure proper soil contact. If rolled, roller shall weigh 150 lb/ft of roller width. Use of rubber tired equipment to roll shall not be allowed. Metal staples, 12" long unless otherwise approved, shall be made of 11-gauge new steel wire so as not to bend when pinned or driven through the sod. Extreme care shall be taken to prevent the installed sod from being torn or displaced. After rolling or tamping the sod, it shall be watered uniformly and thoroughly with a minimum of 1" of water, 5.6 gallons per square yard, applied immediately after installation of sod. In no case shall the time interval between sod placement and initial watering exceed 2 hours. Water shall be placed to the required quantity through sequential passes to insure proper coverage and to prevent runoff. A minimum of ¼" should be placed on each pass.

(C) Maintenance

The Contractor shall be responsible for all watering and other maintenance (except mowing) as required to maintain the livability of the sod from installation until final acceptance, including monitoring the sod to ensure all watering and other maintenance is performed as required.

The Contractor shall be responsible for all watering and other maintenance required to maintain the livability and health of the sod from installation until completion of the 60-day observation period. Additional water shall be applied as needed and as directed to maintain the livability of the sod. Each additional watering event shall be a minimum of 0.5" of water, 2.8 gallons per square yard, uniformly applied over the sodded area and may be placed in a series of passes to prevent runoff, with a minimum of ¼" on each pass.

Any sod or portions of sod rejected by the Engineer after placement, but prior to beginning the observation period, shall be removed from the project and replaced with acceptable sod. Satisfactory replacement of sod shall begin within 10 days of notification. Failure to replace and repair damaged or dead sod as directed may result in sanctions under Article 108-7 or Article 108-8 of the *Standard Specifications*.

(D) Observation Period

Sodding shall be inspected by the Roadside Environmental Field Operations Engineer to begin and end the 60-day observation period.

The Contractor shall maintain responsibility for the sod for a 60-day observation period beginning upon the satisfactory completion and acceptance of all work required in the plans or as directed. The Contractor shall guarantee the sod under the payment and performance bond in accordance with Article 109-10 of the *Standard Specifications*.

After the first 30 days of the 60-day observation period, the Contractor and Engineer shall meet to review the project and identify dead or damaged sod to be replaced. The Contractor, at no additional expense to the Department, shall satisfactorily replace any sod that is not in a living and healthy condition as determined by the Engineer. Replacement sod shall be furnished and installed in accordance with the same requirements as for initial sodding operation, except that the amounts of limestone, sulfur, and water may be readjusted as directed. Satisfactory replacement of sod shall begin within 10 days of notification. Failure to replace and repair damaged or dead sod as directed may result in sanctions under Article 108-7 or Article 108-8 of the *Standard Specifications*. Upon completion and acceptance of the sod repairs, the remaining 30 days of the observation period shall begin.

(E) Acceptance

At the end of the 60-day observation period, the sod furnished and installed under this contract must be in a living and healthy condition, as determined by the Engineer. Acceptance of sod will be either at the end of the 60-day observation period or at final acceptance of the project, whichever is later. The sod shall be weed free at time of final acceptance.

**Measurement and Payment**

*Sodding* will be measured and paid for in accordance with Article 1664-5 of the *Standard Specifications*.

*Water* will be measured and paid for in accordance with Article 1664-5 of the *Standard Specifications*.

**TREE PROTECTION AREA:**

**Description**

**The Department (especially the Division Resident Engineer and the Roadside Environmental Field Operations Engineer) is dedicating much effort to preserve the existing trees that do not have to be removed for the interchange construction. The Contractor will assist the department by educating its employees, subcontractors and others conducting work in the vicinity, of the efforts and the preservation measures required herein.**

This work consists of furnishing, installing, maintaining, and removing a *Tree Protection Fence* as directed to denote the Tree Protection Areas where existing trees are to be preserved. Liquidated damages will also be assessed for loss of existing trees that were to be preserved. In addition, the Contractor is directed to make every effort to avoid and/or minimize damaging other trees outside of the *Tree Protection Fence* to the maximum extent practicable. This

includes not parking equipment and/or storing materials under the trees, which could cause damage to the root zones of the trees.

## **Materials**

The *Tree Protection Fence* shall consist of a polyethylene or polypropylene fence that is a highly visible preconstructed safety fence approved by the Engineer. The fence material shall have an ultraviolet coating.

Either wood posts or steel posts may be used. Wood posts shall be hardwood with a wedge or pencil tip at one end, and shall be at least 5 ft. in length with a minimum nominal 2" x 2" cross section. Steel posts shall be at least 5 ft. in length, and have a minimum weight of 0.85 lb/ft of length.

Use a durable, weatherproof lightweight material to fabricate "Tree Protection Area" signs. Signs will be a minimum of 5 square feet and lettering will be a minimum of 2" tall and text will be clearly legible. Each sign will contain the following wording:

### **Tree Protection Area Do Not Enter**

The wording will be repeated in Spanish on the same sign. Use a white background with red lettering. Submit sample material (or sign) of appropriate colors to the Engineer for approval prior to fabrication.

## **Construction Methods**

### **A. Tree Protection Fence**

*Tree Protection Fence* will be installed after slope-stake line is staked and prior to all other work. Delineate the Tree Protection Area with *Tree Protection Fence* installed at the direction of the Roadside Environmental Field Operations Engineer. Be sure to clearly label the area with the warning signs mounted on the fence. Erect fence to conform to the general contour of the ground. Do not remove existing plant material or perform any grading unless indicated on the plans or as directed. Avoid soil compaction within tree protection area. Do not use heavy equipment and stay outside the perimeter of the tree protection area where possible. No trespassing will be allowed in the Tree Protection Area except for designated parties approved by the Engineer for the purpose of tree care and litter pickup.

Posts shall be set at a maximum spacing of 10 ft., maintained in a vertical position and hand set or set with a post driver. If hand set, all backfill material shall be thoroughly tamped. Wood posts may be sharpened to a dull point if power driven. Posts damaged by power driving shall be removed and replaced prior to final acceptance. The tops of all wood posts shall be cut at a 30-degree angle. The wood posts may, at the option of the Contractor, be cut at this angle either before or after the posts are erected.



The fence geotextile shall be attached to the wood posts with one 2" galvanized wire staple across each cable or to the steel posts with wire or other acceptable means.

In sections where signs will be located, reinforce top of the fabric by weaving a 12 gauge galvanized wire in the fabric and firmly attach to a post at each end of the section. Attach signs to the fence fabric at all four corners using appropriate method for fence fabric and sign material that is chosen.

Maintain the *Tree Protection Fence* with required signs in good condition, fully upright with no loose attachments or missing links for the duration of the project. Signs must be visible and legible throughout the duration of the contract. Routine mowing and litter pickup as required will be conducted by the designated party. **The Engineer must approve in writing access for the Contractor, for anything other than routine vegetation maintenance, prior to entering the Tree Protection Area.** Approval must be made for each access occurrence.

If the *Tree Protection Fence* is not in an upright secure position, without gaps and properly signed, work will be suspended wholly or in part until the fence is properly repaired and in a condition satisfactory to the Engineer. Such suspension of work will not be considered justification for additional compensation in accordance with Section 104 of the *Standard Specifications*, or extension of the contract time.

Install erosion control devices in a timely manner in the vicinity of the Tree Protection Area to prevent sedimentation from accumulating that may endanger the tree root zone. Accomplish seedbed preparation and seeding, both temporary and permanent, in a continuous process so that runoff from slopes to this vicinity is prevented.

Branches that protrude into the construction area that interfere with construction operations will be tied back if possible or pruned if not. Follow pruning techniques as established in ANSI Z133.1 and perform pruning by a certified professional arborist. Submit itemized description of proposed work along with arborist credentials to the Engineer for approval prior to conducting work.

Demolition, ground disturbing activities or construction that occurs within a radius three times the drip line of the tree(s) will be done with utmost care. All grading will be accomplished in such a manner to avoid standing water or saturated soils around root systems of trees that are to remain. In areas to be cut or excavated, prevent shredding, tearing or exposing roots by excavating a trench not less than 6" wide and to the maximum depth of the cut up to 24", and hand saw any roots that are 2" or greater in diameter to make a smooth clean cut. If necessary, dig out enough soil to reach an undamaged portion of the root to make the smooth cut. To prevent drying out of roots, immediately cover any exposed root surfaces with 6" of approved mulch until final grade construction operations dictate removal.

As a last item of work after interchange construction and all related work is completed and at the direction of the Engineer, remove the *Tree Protection Fence*, backfill post holes and remove and properly dispose of fence materials off the construction site. While performing this work do not use heavy equipment and stay on the outside perimeter of the Tree Protection Area where possible to avoid soil compaction within root zone.

All of these activities are considered requirements for construction of the *Tree Protection Fence* and no additional compensation will be made for these activities.

#### B. Liquidated Damages

It is mutually recognized that protection of the trees within the Tree Protection Area is an essential element of the contract. Injury or damage to the trees will result in damages to the public because of esthetic and environmental loss, and costs to the Department for removal and replacement of the trees. Injury or damage to the trees may or may not be immediately evident, and costs may be incurred after completion and acceptance of the work. It is therefore agreed that in view of the difficulty of making a precise determination of such damages, a sum of money in the amount of \$5,000.00 will be charged against the Contractor for each and every violation of the Tree Protection Area, not as a penalty but as liquidated damages. The following are considered to be a violation of the Tree Protection Area:

- Operating, parking, refueling, repairing or maintenance of vehicles or equipment within the Tree Protection Area.
- Stockpiling materials in the Tree Protection Area.
- Release of petroleum products, fuels, paints, or lubricants anywhere within the vicinity or areas that drain into the vicinity of the Tree Protection Area.
- Application or release of herbicides, fertilizers or chemicals that may be toxic to plant life in the vicinity or areas that drain into the vicinity of the Tree Protection Area.
- Discharge of wash-water from concrete trucks in the vicinity or areas that drain into the vicinity of the Tree Protection Area.
- Burning trash, debris or vegetation in the vicinity of the Tree Protection Area.

In any suit for the collection of or involving the assessment of liquidated damages, the reasonableness of the amount stipulated in the contract will be presumed. The liquidated damages referred to herein are intended to be and are cumulative, and will be in addition to every other remedy now or hereafter enforceable by law, in equity, by statute, or under the contract.

If a careless or other action that is not authorized by the Engineer causes apparent injury to a tree within the Tree Protection Area, the contractor will be liable for the value of the tree. The value of the trees will be charged against him and will be deducted from the payment for the work.

The value of a tree will be \$75.00 per caliper inch, without regard to condition, location or species of the tree. The diameter of a tree will be measured in inches at a height of 4.5 ft. above the ground. Multi-stemmed tree diameter will be the combined diameter of all stems. Measurement of the diameter will be made at the locations described above depending on stem size.

#### Measurement and Payment

*Tree Protection Fence* will be measured and paid for as the actual number of linear feet of fence installed in place and accepted. Such payment will be full compensation for the work as described above, including but not limited to furnishing, installing, maintaining and removing the *Tree Protection Fence* and signs.

Payment will be made under:

**Pay Item**

Tree Protection Fence

**Pay Unit**

Linear Foot

**RESPONSE FOR EROSION CONTROL:**

**Description**

Furnish the labor, materials, tools and equipment necessary to move personnel, equipment, and supplies to the project necessary for the pursuit of any or all of the following work as shown herein, by an approved subcontractor.

| <b>Section</b> | <b>Erosion Control Item</b>      | <b>Unit</b> |
|----------------|----------------------------------|-------------|
| 1605           | Temporary Silt Fence             | LF          |
| 1606           | Special Sediment Control Fence   | LF/TON      |
| 1615           | Temporary Mulching               | ACR         |
| 1620           | Seed - Temporary Seeding         | LB          |
| 1620           | Fertilizer - Temporary Seeding   | TN          |
| 1631           | Matting for Erosion Control      | SY          |
| SP             | Coir Fiber Mat                   | SY          |
| 1640           | Coir Fiber Baffles               | LF          |
| SP             | Permanent Soil Reinforcement Mat | SY          |
| 1660           | Seeding and Mulching             | ACR         |
| 1661           | Seed - Repair Seeding            | LB          |
| 1661           | Fertilizer - Repair Seeding      | TON         |
| 1662           | Seed - Supplemental Seeding      | LB          |
| 1665           | Fertilizer Topdressing           | TON         |
| SP             | Safety/Highly Visible Fencing    | LF          |
| SP             | Response for Erosion Control     | EA          |

**Construction Methods**

Provide an approved subcontractor who performs an erosion control action as described in the NPDES Inspection Form SPPP30. Each erosion control action may include one or more of the above work items.

## Measurement and Payment

*Response for Erosion Control* will be measured and paid for by counting the actual number of times the subcontractor moves onto the project, including borrow and waste sites, and satisfactorily completes an erosion control action described in Form 1675. The provisions of Article 104-5 of the *Standard Specifications* will not apply to this item of work.

Payment will be made under:

| Pay Item                     | Pay Unit |
|------------------------------|----------|
| Response for Erosion Control | Each     |

## HIGH QUALITY WATERS:

### Description

The UT to McDeeds Creek has been identified as high quality waters. This designation requires special procedures to be used for clearing and grubbing, temporary stream crossings, and grading operations within the High Quality Water Zone and as designated by the Engineer. The High Quality Water Zones are identified on the plans as Environmentally Sensitive Areas. This also requires special procedures to be used for seeding and mulching and staged seeding.

The High Quality Water Zone/Environmentally Sensitive Area shall be defined as a 50-foot buffer zone on both sides of the stream measured from top of streambank.

### Construction Methods

#### (A) Clearing and Grubbing

In areas identified as High Quality Water Zones/Environmentally Sensitive Areas, the Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations as described in Article 200-1 of the *Standard Specifications*. Only clearing operations (not grubbing) shall be allowed in this buffer zone until immediately prior to beginning grading operations. Erosion control devices shall be installed immediately following the clearing operation.

#### (B) Grading

Once grading operations begin in identified High Quality Water Zones/ Environmentally Sensitive Areas, work shall progress in a continuous manner until complete. All construction within these areas shall progress in a continuous manner such that each phase is complete and areas are permanently stabilized prior to beginning of next phase. Failure on the part of the Contractor to complete any phase of construction in a continuous manner in High Quality Water Zones/ Environmentally Sensitive Areas will be just cause for the Engineer to direct the suspension of work in accordance with Article 108-7 of the *Standard Specifications*.

(C) Temporary Stream Crossings

Any crossing of streams within the limits of this project shall be accomplished in accordance with the requirements of Subarticle 107-13(B) of the *Standard Specifications*.

(D) Seeding and Mulching

Seeding and mulching shall be performed in accordance with Section 1660 of the *Standard Specifications* and vegetative cover sufficient to restrain erosion shall be installed immediately following grade establishment.

Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. No appreciable time shall lapse into the contract time without stabilization of slopes, ditches and other areas within the High Quality Water Zones/Environmentally Sensitive Areas.

(E) Stage Seeding

The work covered by this section shall consist of the establishment of a vegetative cover on cut and fill slopes as grading progresses. Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measured along the slope, or greater than 2 acres in area. Each stage shall not exceed the limits stated above.

Additional payments will not be made for the requirements of this section, as the cost for this work shall be included in the contract unit prices for the work involved.

**MINIMIZE REMOVAL OF VEGETATION:**

The Contractor shall minimize removal of vegetation at stream banks and disturbed areas within the project limits as directed.

**STOCKPILE AREAS:**

The Contractor shall install and maintain erosion control devices sufficient to contain sediment around any erodible material stockpile areas as directed.

**ACCESS AND HAUL ROADS:**

At the end of each working day, the Contractor shall install or re-establish temporary diversions or earth berms across access/haul roads to direct runoff into sediment devices. Silt fence sections that are temporarily removed shall be reinstalled across access/haul roads at the end of each working day.

**WASTE AND BORROW SOURCES:**

Payment for temporary erosion control measures, except those made necessary by the Contractor's own negligence or for his own convenience, will be paid for at the appropriate contract unit price for the devices or measures utilized in borrow sources and waste areas.

No additional payment will be made for erosion control devices or permanent seeding and mulching in any commercial borrow or waste pit. All erosion and sediment control practices that may be required on a commercial borrow or waste site will be done at the Contractor's expense.

**TEMPORARY DIVERSION:**

This work consists of installation, maintenance, and cleanout of *Temporary Diversions* in accordance with Section 1630 of the *Standard Specifications*. The quantity of excavation for installation and cleanout will be measured and paid for as *Silt Excavation* in accordance with Article 1630-4 of the *Standard Specifications*.

**SAFETY FENCE AND JURISDICTIONAL FLAGGING:****Description**

*Safety Fence* shall consist of furnishing materials, installing and maintaining polyethylene or polypropylene fence along the outside riparian buffer, wetland, or water boundary, or other boundaries located within the construction corridor to mark the areas that have been approved to infringe within the buffer, wetland, endangered vegetation, culturally sensitive areas or water. The fence shall be installed prior to any land disturbing activities.

Interior boundaries for jurisdictional areas noted above shall be delineated by stakes and highly visible flagging.

Jurisdictional boundaries at staging areas, waste sites, or borrow pits, whether considered outside or interior boundaries shall be delineated by stakes and highly visible flagging.

**Materials****(A) Safety Fencing**

Polyethylene or polypropylene fence shall be a highly visible preconstructed safety fence approved by the Engineer. The fence material shall have an ultraviolet coating.

Either wood posts or steel posts may be used. Wood posts shall be hardwood with a wedge or pencil tip at one end, and shall be at least 5 ft. in length with a minimum nominal 2" x 2" cross section. Steel posts shall be at least 5 ft. in length, and have a minimum weight of 0.85 lb/ft of length.

(B) Boundary Flagging

Wooden stakes shall be 4 feet in length with a minimum nominal 3/4" x 1-3/4" cross section. The flagging shall be at least 1" in width. The flagging material shall be vinyl and shall be orange in color and highly visible.

**Construction Methods**

No additional clearing and grubbing is anticipated for the installation of this fence. The fence shall be erected to conform to the general contour of the ground.

(A) Safety Fencing

Posts shall be set at a maximum spacing of 10 ft., maintained in a vertical position and hand set or set with a post driver. If hand set, all backfill material shall be thoroughly tamped. Wood posts may be sharpened to a dull point if power driven. Posts damaged by power driving shall be removed and replaced prior to final acceptance. The tops of all wood posts shall be cut at a 30-degree angle. The wood posts may, at the option of the Contractor, be cut at this angle either before or after the posts are erected.

The fence geotextile shall be attached to the wood posts with one 2" galvanized wire staple across each cable or to the steel posts with wire or other acceptable means.

Place construction stakes to establish the location of the safety fence in accordance with Article 105-9 or Article 801-1 of the *Standard Specifications*. No direct pay will be made for the staking of the safety fence. All stakeouts for safety fence shall be considered incidental to the work being paid for as "Construction Surveying", except that where there is no pay item for construction surveying, all safety fence stakeout will be performed by state forces.

The Contractor shall be required to maintain the safety fence in a satisfactory condition for the duration of the project as determined by the Engineer.

(B) Boundary Flagging

Boundary flagging delineation of interior boundaries shall consist of wooden stakes on 25 feet maximum intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 6" into the ground. Interior boundaries may be staked on a tangent that runs parallel to buffer but must not encroach on the buffer at any location. Interior boundaries of hand clearing shall be identified with a different colored flagging to distinguish it from mechanized clearing.

Boundary flagging delineation of interior boundaries will be placed in accordance with Article 105-9 or Article 801-1 of the *Standard Specifications*. No direct pay will be made for delineation of the interior boundaries. This delineation will be considered incidental to the work being paid for as *Construction Surveying*, except that where there is no pay item or construction surveying the cost of boundary flagging delineation shall be included in the unit prices bid for the various items in the contract. Installation for delineation of all jurisdictional boundaries at

staging areas, waste sites, or borrow pits shall consist of wooden stakes on 25 feet maximum intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 6" into the ground. Additional flagging may be placed on overhanging vegetation to enhance visibility but does not substitute for installation of stakes.

Installation of boundary flagging for delineation of all jurisdictional boundaries at staging areas, waste sites, or borrow pits shall be performed in accordance with Subarticle 230-4(B)(3)(d) or Subarticle 802-2(F) of the *Standard Specifications*. No direct pay will be made for this delineation, as the cost of same shall be included in the unit prices bid for the various items in the contract.

The Contractor shall be required to maintain alternative stakes and highly visible flagging in a satisfactory condition for the duration of the project as determined by the Engineer.

### **Measurement and Payment**

*Safety Fence* will be measured and paid as the actual number of linear feet of polyethylene or polypropylene fence installed in place and accepted. Such payment will be full compensation including but not limited to furnishing and installing fence geotextile with necessary posts and post bracing, staples, tie wires, tools, equipment and incidentals necessary to complete this work.

Payment will be made under:

| <b>Pay Item</b> | <b>Pay Unit</b> |
|-----------------|-----------------|
| Safety Fence    | Linear Foot     |

### **PERMANENT SOIL REINFORCEMENT MAT:**

#### **Description**

This work consists of furnishing and placing *Permanent Soil Reinforcement Mat*, of the type specified, over previously prepared areas as directed.

#### **Materials**

The product shall be a permanent erosion control reinforcement mat and shall be constructed of synthetic or a combination of coconut and synthetic fibers evenly distributed throughout the mat between a bottom UV stabilized netting and a heavy duty UV stabilized top net. The matting shall be stitched together with UV stabilized polypropylene thread to form a permanent three-dimensional structure. The mat shall have the following minimum physical properties:

| <b>Property</b>      | <b>Test Method</b> | <b>Value</b> | <b>Unit</b> |
|----------------------|--------------------|--------------|-------------|
| Light Penetration    | ASTM D6567         | 9            | %           |
| Thickness            | ASTM D6525         | 0.40         | in          |
| Mass Per Unit Area   | ASTM D6566         | 0.55         | lb/sy       |
| Tensile Strength     | ASTM D6818         | 385          | lb/ft       |
| Elongation (Maximum) | ASTM D6818         | 49           | %           |



|                                              |                        |       |                    |
|----------------------------------------------|------------------------|-------|--------------------|
| Resiliency                                   | ASTM D1777             | >70   | %                  |
| UV Stability *                               | ASTM D4355             | ≥80   | %                  |
| Porosity (Permanent Net)                     | ECTC Guidelines        | ≥85   | %                  |
| Maximum Permissible Shear Stress (Vegetated) | Performance Bench Test | ≥8.0  | lb/ft <sup>2</sup> |
| Maximum Allowable Velocity (Vegetated)       | Performance Bench Test | ≥16.0 | ft/s               |

\*ASTM D1682 Tensile Strength and % strength retention of material after 1000 hours of exposure.

Submit a certification (Type 1, 2, or 3) from the manufacturer showing:

- (A) the chemical and physical properties of the mat used, and
- (B) conformance of the mat with this specification.

### **Construction Methods**

Matting shall be installed in accordance with Subarticle 1631-3(B) of the *Standard Specifications*.

All areas to be protected with the mat shall be brought to final grade and seeded in accordance with Section 1660 of the *Standard Specifications*. The surface of the soil shall be smooth, firm, stable and free of rocks, clods, roots or other obstructions that would prevent the mat from lying in direct contact with the soil surface. Areas where the mat is to be placed will not need to be mulched.

### **Measurement and Payment**

*Permanent Soil Reinforcement Mat* will be measured and paid for as the actual number of square yards measured along the surface of the ground over which Permanent Soil Reinforcement Mat is installed and accepted. Overlaps will not be included in the measurement, and will be considered as incidental to the work. Such payment shall be full compensation for furnishing and installing the mat, including overlaps, and for all required maintenance.

Payment will be made under:

| <b>Pay Item</b>                  | <b>Pay Unit</b> |
|----------------------------------|-----------------|
| Permanent Soil Reinforcement Mat | Square Yard     |

### **EARTHEN DAM WITH SKIMMER:**

#### **Description**

Provide an earthen dam with a skimmer attached to a barrel pipe at the outlet of a proposed roadway ditch to remove sediment from construction site runoff at locations shown in the erosion control plans. See the Earthen Dam with Skimmer Detail sheet provided in the erosion control

plans. Work includes constructing earthen dam, installation of coir fiber baffles, furnishing, installation and cleanout of Faircloth Skimmer or other approved equivalent device, providing and placing stone pad on bottom of ditch underneath skimmer device, providing and placing geotextile emergency spillway liner, providing coir fiber mat stabilization for the skimmer outlet, removing earthen dam, coir fiber baffles, geotextile liner and skimmer device, and disposing of excess materials.

## **Materials**

| <b>Item</b>                               | <b>Section</b> |
|-------------------------------------------|----------------|
| Stone for Erosion Control, Class B        | 1042           |
| Geotextile for Soil Stabilization, Type 4 | 1056           |
| Staples                                   | 1060-8         |
| Coir Fiber Mat                            | 1060-14        |
| Coir Fiber Baffle                         | 1640           |

Provide appropriately sized Faircloth skimmer or other approved equivalent device.

Provide Schedule 40 PVC pipe with a length of 6 ft. to attach to the skimmer and the coupling connection to serve as the arm pipe. For skimmer sizes of 2.5 in. and smaller, the arm pipe diameter shall be 1.5 inches. For skimmer sizes of 3 in. and larger, refer to manufacturer recommendation.

Provide 4" diameter Schedule 40 PVC pipe to attach to coupling connection of Faircloth skimmer to serve as the barrel pipe through the earthen dam.

Anchors: Staples, stakes, or reinforcement bars shall be used as anchors.

### **Wooden Stakes:**

Provide hardwood stakes 12"- 24" long with a 2" x 2" nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

### **Steel Reinforcement Bars:**

Provide uncoated #10 steel reinforcement bars 24" nominal length. The bars shall have a 4" diameter bend at one end with a 4" straight section at the tip to catch and secure the coir fiber mat.

### **Staples:**

Provide staples made of 0.125" diameter new steel wire formed into a *u* shape not less than 12" in length with a throat of 1" in width.

## Construction Methods

Excavate proposed ditch according to the roadway plans and cross sections with ditch surface free of obstructions, debris, and pockets of low-density material. Construct earthen dam and install the emergency spillway according to the Earthen Dam with Skimmer Detail sheet in the erosion control plans. Construct the coir fiber baffles according to *Roadway Standard Drawings* No. 1640.01 and Section 1640 of the *Standard Specifications*. Accumulated silt behind the earthen dam and baffles shall be removed regularly and as directed.

Install Faircloth skimmer or other approved equivalent device according to manufacturer recommendations. Install 4" Schedule 40 PVC pipe into dam on the lower side of basin 1 ft. from the bottom of the basin and according to the detail, and attach the 6 ft. arm pipe to the coupling connection and Faircloth skimmer according to manufacturer recommendations. Attach the rope included with the skimmer to the tee between the vent socket and the tube inlet, and the other end to a wooden stake or metal post. Clean out skimmer device when it becomes clogged with sediment and/or debris and is unable to float at the top of water impounded in the ditch. Take appropriate measures to avoid ice accumulation in the skimmer device. Construct a stone pad of Class B stone directly underneath the skimmer device at bottom of ditch. The pad shall be a minimum of 12" in height, and shall have a minimum cross sectional area of 4 ft. by 4 ft.

Line emergency spillway with geotextile unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury edges of geotextile in a trench at least 5" deep and tamp firmly. If geotextile for the emergency spillway is not one continuous piece of material, make horizontal overlaps a minimum of 18" with upstream geotextile overlapping the downstream geotextile. Secure geotextile with eleven gauge wire staples shaped into a *u* shape with a length of not less than 12" and a throat not less than 1" in width. Place staples along outer edges and throughout the geotextile a maximum of 3 ft. horizontally and vertically. Geotextile shall be placed to the bottom and across the entire width of the ditch according to the Earthen Dam with Skimmer Detail.

At the skimmer outlet, provide a smooth soil surface free from stones, clods, or debris that will prevent contact of the coir fiber matting with the soil. Unroll the matting and apply without stretching such that it will lie smoothly but loosely on the soil surface. Wooden stakes, reinforcement bars, or staples may be used as anchors in accordance with the details in the plans and as directed. Place anchors across the matting at the ends approximately 1 ft. apart. Place anchors along the outer edges and down the center of the matting 3 ft. apart.

## Measurement and Payment

The construction of the earthen dam will be paid for as *Borrow Excavation* as provided in Section 230 of the *Standard Specifications* or included in the lump sum price for grading.

*Silt Excavation* will be measured and paid for in accordance with Article 1630-4 of the *Standard Specifications*, as calculated from the typical section throughout the length of the ditch as shown on the final approved plans.

*Geotextile for Soil Stabilization* will be measured and paid for in accordance with Article 270-4 of the *Standard Specifications*.

*Coir Fiber Baffles* will be measured and paid for in accordance with Article 1640-4 of the *Standard Specifications*.

\_\_\_" *Skimmer* will be measured in units of each. \_\_\_" *Skimmer* will be measured and paid for as the maximum number of each size skimmer acceptably installed and in use at any one time during the life of the project. Barrel and arm pipe, cleanout, relocation and reinstallation of \_\_\_" *Skimmer* is considered incidental to the measurement of the quantity of \_\_\_" *Skimmer* and no separate payment will be made. No separate payment shall be made if \_\_\_" Skimmer, barrel and/or arm pipe(s) are damaged by ice accumulation.

*Coir Fiber Mat* will be measured and paid for as the actual number of square yards measured along the surface of the ground over which coir fiber mat is installed and accepted.

*Stone for Erosion Control, Class* \_\_\_ will be measured and paid for in accordance with Article 1610-4 of the *Standard Specifications*.

No measurement will be made for other items or for over excavation or stockpiling.

Payment will be made under:

| <b>Pay Item</b> | <b>Pay Unit</b> |
|-----------------|-----------------|
| ___" Skimmer    | Each            |
| Coir Fiber Mat  | Square Yard     |

### **WATTLES WITH POLYACRYLAMIDE (PAM):**

#### **Description**

Wattles are tubular products consisting of excelsior fibers encased in synthetic netting. Wattles are used on slopes or channels to intercept runoff and act as a velocity break. Wattles are to be placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation of wattles, matting installation, PAM application, and removing wattles.

#### **Materials**

Wattle shall meet the following specifications:

|                                     |                                |
|-------------------------------------|--------------------------------|
| 100% Curled Wood (Excelsior) Fibers |                                |
| Minimum Diameter                    | 12 in.                         |
| Minimum Density                     | 2.5 lb/ft <sup>3</sup> +/- 10% |
| Net Material                        | Synthetic                      |
| Net Openings                        | 1 in. x 1 in.                  |
| Net Configuration                   | Totally Encased                |

Minimum Weight      20 lb. +/- 10% per 10 ft. length

Anchors: Stakes shall be used as anchors.

#### Wooden Stakes:

Provide hardwood stakes a minimum of 2-ft. long with a 2 in. x 2 in. nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving down into the underlying soil.

Matting shall meet the requirements of Article 1060-8 of the *Standard Specifications*, or shall meet specifications provided elsewhere in this contract.

Provide staples made of 0.125" diameter new steel wire formed into a *u* shape not less than 12" in length with a throat of 1" in width.

Polyacrylamide (PAM) shall be applied in powder form and shall be anionic or neutrally charged. Soil samples shall be obtained in areas where the wattles will be placed, and from offsite material used to construct the roadway, and analyzed for the appropriate PAM flocculant to be utilized with each wattle. The PAM product used shall be listed on the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Water Quality (DWQ) web site as an approved PAM product for use in North Carolina.

#### Construction Methods

Wattles shall be secured to the soil by wire staples approximately every 1 linear foot and at the end of each section of wattle. A minimum of 4 stakes shall be installed on the downstream side of the wattle with a maximum spacing of 2 linear feet along the wattle, and according to the detail. Install a minimum of 2 stakes on the upstream side of the wattle according to the detail provided in the plans. Stakes shall be driven into the ground a minimum of 10 in. with no more than 2 in. projecting from the top of the wattle. Drive stakes at an angle according to the detail provided in the plans.

Only install wattle(s) to a height in ditch so flow will not wash around wattle and scour ditch slopes and according to the detail provided in the plans and as directed. Overlap adjoining sections of wattles a minimum of 6 in.

Installation of matting shall be in accordance with the detail provided in the plans, and in accordance with Article 1631-3 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

Apply PAM over the lower center portion of the wattle where the water is going to flow over at a rate of 2 ounces per wattle, and 1 ounce of PAM on matting on each side of the wattle. PAM applications shall be done during construction activities after every rainfall event that is equal to or exceeds 0.50 in.

The Contractor shall maintain the wattles until the project is accepted or until the wattles are removed, and shall remove and dispose of silt accumulations at the wattles when so directed in accordance with the requirements of Section 1630 of the *Standard Specifications*.

### Measurement and Payment

*Wattles* will be measured and paid for by the actual number of linear feet of wattles which are installed and accepted. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to install the *Wattles*.

Matting will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

*Polyacrylamide(PAM)* will be measured and paid for by the actual weight in pounds of PAM applied to the wattles. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to apply the *Polyacrylamide(PAM)*.

Payment will be made under:

#### Pay Item

Polyacrylamide(PAM)  
Wattle

#### Pay Unit

Pound  
Linear Foot

#### **SILT FENCE WATTLE BREAK:**

(8-21-12)

1605,1630

#### Description

Silt fence wattle breaks are tubular products consisting of excelsior fibers encased in synthetic netting and used in conjunction with temporary silt fence at the toe of fills to intercept runoff. Silt fence wattle breaks are to be placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation, maintenance and removing silt fence wattle breaks.

#### Materials

Wattle shall meet the following specifications:

|                                     |                     |
|-------------------------------------|---------------------|
| 100% Curled Wood (Excelsior) Fibers |                     |
| Minimum Diameter                    | 12"                 |
| Minimum Length                      | 10 ft               |
| Minimum Density                     | 2.5 lb/cf $\pm$ 10% |
| Net Material                        | Synthetic           |
| Net Openings                        | 1" x 1"             |
| Net Configuration                   | Totally Encased     |

|                |                                   |
|----------------|-----------------------------------|
| Minimum Weight | 20 lb. $\pm$ 10% per 10 ft length |
|----------------|-----------------------------------|

Stakes shall be used as anchors. Provide hardwood stakes a minimum of 2-ft long with a 2" x 2" nominal square cross section. One end of the stake shall be sharpened or beveled to facilitate driving down into the underlying soil.

Provide staples made of 0.125" diameter new steel wire formed into a U-shape not less than 12" in length with a throat of 1" in width.

### Construction Methods

Excavate a trench the entire length of each wattle with a depth of 1" to 2" for the wattle to be placed. Secure silt fence wattle breaks to the soil by wire staples approximately every linear foot and at the end of each wattle. Install at least 4 stakes on the downslope side of the wattle with a maximum spacing of 2 linear feet, and according to the detail. Install at least 2 stakes on the upslope side of the silt fence wattle break according to the detail provided in the plans. Drive stakes into the ground at least 10" with no more than 2" projecting from the top of the wattle. Drive stakes at an angle according to the detail provided in the plans.

Install temporary silt fence in accordance with Section 1605 of the *2012 Standard Specifications* and overlap each downslope side of silt fence wattle break by 6".

Maintain the silt fence wattle breaks until the project is accepted or until the silt fence wattle breaks are removed, and remove and dispose of silt accumulations at the silt fence wattle breaks when so directed in accordance with Section 1630 of the *2012 Standard Specifications*.

### Measurement and Payment

*Wattle* will be measured and paid as the actual number of linear feet of wattles installed and accepted. Such price and payment will be full compensation for all work covered by this provision, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to install the silt fence wattle break.

Payment will be made under:

| Pay Item | Pay Unit    |
|----------|-------------|
| Wattle   | Linear Foot |

### **TEMPORARY ROCK SILT CHECK TYPE A WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM):**

#### Description

Temporary Rock Silt Checks Type A with Excelsior Matting and Polyacrylamide (PAM) are devices utilized in temporary and permanent ditches to reduce runoff velocity and incorporate PAM into the construction runoff to increase settling of sediment particles and reduce turbidity of runoff. Temporary Rock Silt Checks Type A with Excelsior Matting and PAM are to be

placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation of Temporary Rock Silt Checks Type A, matting installation, PAM application, and removing Temporary Rock Silt Checks Type A with Excelsior Matting and PAM.

### **Materials**

Structural stone shall be class B stone that meets the requirements of Section 1042 of the *Standard Specifications* for Stone for Erosion Control, Class B.

Sediment control stone shall be #5 or #57 stone, which meets the requirements of Section 1005 of the *Standard Specifications* for these stone sizes.

Matting shall meet the requirements of Excelsior Matting in Subarticle 1060-8(B) of the *Standard Specifications*, or shall meet specifications provided elsewhere in this contract.

Polyacrylamide (PAM) shall be applied in powder form and shall be anionic or neutrally charged. Soil samples shall be obtained in areas where the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM will be placed, and from offsite material used to construct the roadway, and analyzed for the appropriate PAM flocculant to be utilized with each Temporary Rock Silt Check Type A. The PAM product used shall be listed on the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Water Quality (DWQ) web site as an approved PAM product for use in North Carolina.

### **Construction Methods**

Temporary Rock Silt Checks Type A shall be installed in accordance with Subarticle 1633-3(A) of the *Standard Specifications*, Roadway Standard Drawing No. 1633.01 and the detail provided in the plans.

Installation of matting shall be in accordance with the detail provided in the plans, and anchored by placing Class B stone on top of the matting at the upper and lower ends.

Apply PAM at a rate of 3.5 ounces over the center portion of the Temporary Rock Silt Checks Type A and matting where the water is going to flow over. PAM applications shall be done during construction activities and after every rainfall event that is equal to or exceeds 0.50 in.

The Contractor shall maintain the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM until the project is accepted or until the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM are removed, and shall remove and dispose of silt accumulations at the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM when so directed in accordance with the requirements of Section 1630 of the *Standard Specifications*.



**Measurement and Payment**

*Temporary Rock Silt Checks Type A* will be measured and paid for in accordance with Article 1633-5 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

Matting will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

*Polyacrylamide(PAM)* will be measured and paid for by the actual weight in pounds of PAM applied to the Temporary Rock Silt Checks Type A. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to apply the *Polyacrylamide(PAM)*.

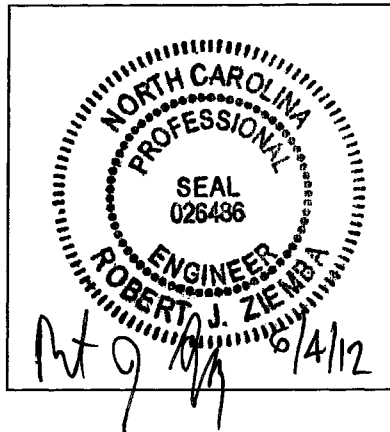
Payment will be made under:

**Pay Item**

Polyacrylamide(PAM)

**Pay Unit**

Pound

**U-3324**

# Project Special Provisions (Version 12.1) Signals and Intelligent Transportation Systems

Prepared By: RJZ  
4-Jun-12

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## 1. SIGNAL HEADS

### 1.1. MATERIALS

#### A. General:

Fabricate vehicle signal head housings and end caps from die-cast aluminum. Fabricate 16-inch pedestrian signal head housings and end caps from die-cast aluminum. Provide visor mounting screws, door latches, and hinge pins fabricated from stainless steel. Provide interior screws, fasteners, and metal parts fabricated from stainless steel or corrosion resistant material.

Fabricate tunnel and traditional visors from sheet aluminum.

Paint all surfaces inside and outside of signal housings and doors. Paint outside surfaces of tunnel and traditional visors, messenger cable mounting assemblies, pole and pedestal mounting assemblies, and pedestrian pushbutton housings. Have electrostatically-applied, fused-polyester paint in highway yellow (Federal Standard 595C, Color Chip Number 13538) a minimum of 2.5 to 3.5 mils thick. Do not apply paint to the latching hardware or rigid vehicle signal head mounting brackets for mast-arm attachments.

Have the interior surfaces of tunnel and traditional visors painted an alkyd urea black synthetic baking enamel with a minimum gloss reflectance and meeting the requirements of MIL-E-10169, "Enamel Heat Resisting, Instrument Black."

For pole mounting, provide side of pole mounting assemblies with framework and all other hardware necessary to make complete, watertight connections of the signal heads to the poles and pedestals. Fabricate the mounting assemblies and frames from aluminum with all necessary hardware, screws, washers, etc. to be stainless steel. Provide mounting fittings that match the positive locking device on the signal head with the serrations integrally cast into the brackets. Provide upper and lower pole plates that have a 1 ¼-inch vertical conduit entrance hubs with the hubs capped on the lower plate and 1 ½-inch horizontal hubs. Ensure that the assemblies provide rigid attachments to poles and pedestals so as to allow no twisting or swaying of the signal heads. Ensure that all raceways are free of sharp edges and protrusions, and can accommodate a minimum of ten Number 14 AWG conductors.

For pedestal mounting, provide a post-top slipfitter mounting assembly that matches the positive locking device on the signal head with serrations integrally cast into the slipfitter. Provide stainless steel hardware, screws, washers, etc. Provide a minimum of six 3/8 X 3/4-inch long square head bolts for attachment to pedestal. Provide a center post for multi-way slipfitters.

For light emitting diode (LED) traffic signal modules, provide the following requirements for inclusion on the Department's Qualified Products List for traffic signal equipment.

1. Sample submittal,
2. Third-party independent laboratory testing results for each submitted module with evidence of testing and conformance with all of the Design Qualification Testing specified in section 6.4 of each of the following Institute of Transportation Engineers (ITE) specifications:
  - Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement
  - Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement
  - Pedestrian Traffic Control Signal Indications –Light Emitting Diode (LED) Signal Modules.

(Note: The Department currently recognizes two approved independent testing laboratories. They are Intertek ETL Semko and Light Metrics, Incorporated with Garwood Laboratories. Independent laboratory tests from other laboratories may be considered as part of the QPL submittal at the discretion of the Department,

3. Evidence of conformance with the requirements of these specifications,
4. A manufacturer's warranty statement in accordance with the required warranty, and
5. Submittal of manufacturer's design and production documentation for the model, including but not limited to, electrical schematics, electronic component values, proprietary part numbers, bill of materials, and production electrical and photometric test parameters.
6. Evidence of approval of the product to bear the Intertek ETL Verified product label for LED traffic signal modules.

In addition to meeting the performance requirements for the minimum period of 60 months, provide a written warranty against defects in materials and workmanship for the modules for a period of 60 months after installation of the modules. During the warranty period, the manufacturer must provide new replacement modules within 45 days of receipt of modules that have failed at no cost to the State. Repaired or refurbished modules may not be used to fulfill the manufacturer's warranty obligations. Provide manufacturer's warranty documentation to the Department during evaluation of product for inclusion on Qualified Products List (QPL).

#### **B. Vehicle Signal Heads:**

Comply with the ITE standard "Vehicle Traffic Control Signal Heads". Provide housings with provisions for attaching backplates.

Provide visors that are 10 inches in length for 12-inch vehicle signal heads.

Provide a termination block with one empty terminal for field wiring for each indication plus one empty terminal for the neutral conductor. Have all signal sections wired to the termination block. Provide barriers between the terminals that have terminal screws with a minimum Number 8 thread size and that will accommodate and secure spade lugs sized for a Number 10 terminal screw.

Mount termination blocks in the yellow signal head sections on all in-line vehicle signal heads. Mount the termination block in the red section on five-section vehicle signal heads.

Furnish vehicle signal head interconnecting brackets. Provide one-piece aluminum brackets less than 4.5 inches in height and with no threaded pipe connections. Provide hand holes on the bottom of the brackets to aid in installing wires to the signal heads. Lower brackets that carry no wires and are used only for connecting the bottom signal sections together may be flat in construction.

For messenger cable mounting, provide messenger cable hangers, wire outlet bodies, balance adjusters, bottom caps, wire entrance fitting brackets, and all other hardware necessary to make complete, watertight connections of the vehicle signal heads to the messenger cable. Fabricate mounting assemblies from malleable iron or steel and provide serrated rings made of aluminum. Provide messenger cable hangers and balance adjusters that are galvanized before being painted. Fabricate balance adjuster eyebolt and eyebolt nut from stainless steel or galvanized malleable iron. Provide messenger cable hangers with U-bolt clamps. Fabricate washers, screws, bolts, clevis pins, cotter pins, nuts, and U-bolt clamps from stainless steel.

For mast-arm mounting, provide rigid vehicle signal head mounting brackets and all other hardware necessary to make complete, watertight connections of the vehicle signal heads to the mast arms and to provide a means for vertically adjusting the vehicle signal heads to proper alignment. Fabricate the mounting assemblies from aluminum, and provide serrated rings made of aluminum.

Provide stainless steel cable attachment assemblies to secure the brackets to the mast arms. Ensure all fastening hardware and fasteners are fabricated from stainless steel.

Provide LED vehicular traffic signal modules (hereafter referred to as modules) that consist of an assembly that uses LEDs as the light source in lieu of an incandescent lamp for use in traffic signal sections. Use LEDs that are aluminum indium gallium phosphorus (AlInGaP) technology for red and yellow indications and indium gallium nitride (InGaN) for green indications. Install the ultra bright type LEDs that are rated for 100,000 hours of continuous operation from -40°F to +165°F. Design modules to have a minimum useful life of 60 months and to meet all parameters of this specification during this period of useful life.

For the modules, provide spade terminals crimped to the lead wires and sized for a #10 screw connection to the existing terminal block in a standard signal head. Do not provide other types of crimped terminals with a spade adapter.

Ensure the power supply is integral to the module assembly. On the back of the module, permanently mark the date of manufacture (month & year) or some other method of identifying date of manufacture.

Tint the red, yellow and green lenses to correspond with the wavelength (chromaticity) of the LED. Transparent tinting films are unacceptable. Provide a lens that is integral to the unit with a smooth outer surface.

### 1. LED Circular Signal Modules:

Provide modules in the following configurations: 12-inch circular sections, and 8-inch circular sections. All makes and models of LED modules purchased for use on the State Highway System shall appear on the current NCDOT Traffic Signal Qualified Products List (QPL).

Provide the manufacturer's model number and the product number (assigned by the Department) for each module that appears on the 2012 or most recent Qualified Products List. In addition, provide manufacturer's certification in accordance with Article 106-3 of the *Standard Specifications*, that each module meets or exceeds the ITE "Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement" dated June 27, 2005 (hereafter referred to as VTCSH Circular Supplement) and other requirements stated in this specification.

Provide modules that meet the following requirements when tested under the procedures outlined in the VTCSH Circular Supplement:

| Module Type            | Max. Wattage at 165° F | Nominal Wattage at 77° F |
|------------------------|------------------------|--------------------------|
| 12-inch red circular   | 17                     | 11                       |
| 12-inch green circular | 15                     | 15                       |

For yellow circular signal modules, provide modules tested under the procedures outlined in the VTCSH Circular Supplement to insure power required at 77° F is 22 Watts or less for the 12-inch circular module.

Note: Use a wattmeter having an accuracy of  $\pm 1\%$  to measure the nominal wattage and maximum wattage of a circular traffic signal module. Power may also be derived from voltage, current and power factor measurements.

### 2. LED Arrow Signal Modules

Provide 12-inch omnidirectional arrow signal modules. All makes and models of LED modules purchased for use on the State Highway System shall appear on the current NCDOT Traffic Signal Qualified Products List (QPL).

Provide the manufacturer's model number and the product number (assigned by the Department) for each module that appears on the 2012 or most recent Qualified Products List. In addition, provide manufacturer's certification in accordance with Article 106-3 of the *Standard Specifications*, that each module meets or exceeds the requirements for 12-inch omnidirectional modules specified in the ITE "Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement" dated July 1, 2007 (hereafter referred to as VTCSH Arrow Supplement) and other requirements stated in this specification.

Provide modules that meet the following requirements when tested under the procedures outlined in the VTCSH Arrow Supplement:

| Module Type         | Max. Wattage at 165° F | Nominal Wattage at 77° F |
|---------------------|------------------------|--------------------------|
| 12-inch red arrow   | 12                     | 9                        |
| 12-inch green arrow | 11                     | 11                       |

For yellow arrow signal modules, provide modules tested under the procedures outlined in the VTCSH Arrow Supplement to insure power required at 77° F is 12 Watts or less.

Note: Use a wattmeter having an accuracy of  $\pm 1\%$  to measure the nominal wattage and maximum wattage of an arrow traffic signal module. Power may also be derived from voltage, current and power factor measurements.

### C. Signal Cable:

Furnish 16-4 and 16-7 signal cable that complies with IMSA specification 20-1 except provide the following conductor insulation colors:

- For 16-4 cable: white, yellow, red, and green
- For 16-7 cable: white, yellow, red, green, yellow with black stripe tracer, red with black stripe tracer, and green with black stripe tracer. Apply continuous stripe tracer on conductor insulation with a longitudinal or spiral pattern.

Provide a ripcord to allow the cable jacket to be opened without using a cutter. IMSA specification 19-1 will not be acceptable. Provide a cable jacket labeled with the IMSA specification number and provide conductors constructed of stranded copper.

## 2. COMMUNICATIONS SYSTEM SUPPORT EQUIPMENT

### 2.1. DESCRIPTION

Furnish communications system support equipment with all necessary hardware in accordance with the plans and specifications.

### 2.2. MATERIALS

#### A. General:

Furnish equipment with test probes/leads, batteries (for battery-operated units), line cords (for AC-operated units), and carrying cases. Provide operating instructions and maintenance manuals with each item.

Before starting any system testing or training, furnish all communications system support equipment.

#### B. Wireless Radio Support Equipment

##### 1. Lightning Arrestor

Furnish wireless radio lightning arrestors identical to the type installed in the traffic signal controller cabinets to be used for emergency restoration of the transient voltage suppression equipment.

### 2.3. MEASUREMENT AND PAYMENT

Actual number of wireless radio lightning arrestors furnished and accepted.

Payment will be made under:

Furnish Wireless Lightning Arrestor .....Each

## 3. TRAFFIC SIGNAL SUPPORTS

### 3.1. METAL TRAFFIC SIGNAL SUPPORTS – ALL POLES

#### A. General:

Furnish and install metal strain poles and metal poles with mast arms, grounding systems, and all necessary hardware. The work covered by this special provision includes requirements for the design, fabrication, and installation of both standard and custom/site specifically designed metal traffic signal supports and associated foundations.

Provide metal traffic signal support systems that contain no guy assemblies, struts, or stay braces. Provide designs of completed assemblies with hardware that equals or exceeds AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals* 4th Edition, 2001 (hereafter called 4th Edition AASHTO), including the latest interim specifications. Provide assemblies with a round or near-round (18 sides or more) cross-section, or a multi sided cross section with no less than six sides. The sides may be straight, convex, or concave.

Pole heights shown on signal plans are estimated from available data for bid purposes. Prior to furnishing metal signal poles, use field measurements and adjusted cross-sections to determine whether pole heights are sufficient to obtain required clearances. If pole heights are not sufficient, the Contractor should immediately notify the Engineer of the required revised pole heights.

Ensure that metal signal poles permit cables to be installed inside poles and any required mast arms. For holes in the poles and arms used to accommodate cables, provide full-circumference grommets. Arm flange plate wire access holes should be deburred, non grommited, and oversized to fit around the 2" diameter grommited shaft flange plate wire access hole.

After fabrication, have steel poles, required mast arms, and all parts used in the assembly hot-dip galvanized per section 1076. Design structural assemblies with weep holes large enough and properly located to drain molten zinc during galvanization process. Provide hot-dip galvanizing on structures that meets or exceeds ASTM Standard A-123. Provide galvanizing on hardware that meets or exceeds ASTM Standard A-153. Ensure that threaded material is brushed and retapped as necessary after galvanizing. Perform repair of damaged galvanizing that complies with the following:

Repair of Galvanizing .....Article 1076-6

Standard Drawings for Metal Poles are available that supplement these project special provisions. These drawings are located on the Department's website:

<http://www.ncdot.gov/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html>

Comply with article 1098-1B "General Requirements" of the 2012 *STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES*, hereinafter referred to as the *Standard Specifications* for submittal requirements. Furnish shop drawings for approval. Provide the copies of



detailed shop drawings for each type of structure as summarized below. Ensure that shop drawings include material specifications for each component and identify welds by type and size on the drawing details, not in table format. Do not release structures for fabrication until shop drawings have been approved by NCDOT. Provide an itemized bill of materials for all structural components and associated connecting hardware on the drawings.

Comply with article 1098-1A "General Requirements" of the *Standard Specifications* for Qualified Products List (QPL) submittals. All shop drawings must include project location description, signal inventory number(s) and a project number or work order number on the drawings.

Summary of information required for metal pole review submittal:

| Item                                         | Hardcopy Submittal | Electronic Submittal | Comments / Special Instructions                                                                                                                                                          |
|----------------------------------------------|--------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sealed, Approved Signal Plan/Loading Diagram | 1                  | 1                    | All structure design information needs to reflect the latest approved signal plans                                                                                                       |
| Custom Pole Shop Drawings                    | 4 sets             | 1 set                | Submit drawings on 11" x 17" format media<br>Show NCDOT inventory number(s) in or above the title block                                                                                  |
| Standard Pole Shop Drawings (from the QPL)   | 4 sets             | 1 set                | Submit drawings on 11" x 17" format media<br>Show NCDOT inventory number(s) in or above the title block                                                                                  |
| Structure Calculations                       | 1 set              | 1 set                | Not required for Standard QPL Poles                                                                                                                                                      |
| Standard Pole Foundation Drawings            | 1 set              | 1 set                | Submit drawings on 11" x 17" format media. Submit a completed Standard Foundation Selection form for each pole using foundation table on Metal Pole Drawing M-8.                         |
| Custom Foundation Drawings                   | 4 sets             | 1 set                | Submit drawings on 11" x 17" format media. If QPL Poles are used, include the corresponding QPL pole shop drawings with this submittal.                                                  |
| Foundation Calculations                      | 1                  | 1                    | Not required for Standard QPL Poles                                                                                                                                                      |
| Soil Boring Logs and Report                  | 1                  | 1                    | Report should include a location plan and a soil classification report including soil capacity, water level, hammer efficiency, soil bearing pressure, soil density, etc. for each pole. |

**NOTE** – All shop drawings and custom foundation design drawings must be sealed by a professional Engineer licensed in the state of North Carolina. All geotechnical information must be sealed by either a Professional Engineer or geologist licensed in the state of North Carolina. Include a title block and revision block on the shop drawings and foundation designs showing the NCDOT inventory number.

Shop drawings and foundation drawings may be submitted together or separately for approval. However, shop drawings must be approved before foundations can be reviewed. Foundation designs will be returned without review if the associated shop drawing has not been approved. Incomplete submittals will be returned without review.

## B. Materials:

Fabricate metal pole and arm shaft from coil or plate steel to meet the requirements of ASTM A 595 Grade A tubes. For structural steel shapes, plates and bars use A572 Gr 50 min or ASTM A709 Gr 50 min.. Provide pole and arm shafts that are round in cross section or multisided tubular shapes and have a uniform linear taper of 0.14 in/ft. Construct shafts from one piece of single ply plate or coil so there are no circumferential weld splices. Galvanize in accordance with AASHTO M 111 and/or ASTM A 123 or an approved equivalent.

Use the submerged arc process or other NCDOT previously approved process suitable for pole shaft and arms to continuously weld pole shafts and arm shafts along their entire length. The longitudinal seam weld will be finished flush to the outside contour of the base metal. Ensure shafts have no circumferential welds except at the lower end joining the shaft to the pole base and arm base. Provide welding that conforms to Article 1072-20 of the *Standard Specifications*, except that no field welding on any part of the pole will be permitted unless approved by a qualified engineer.

Refer to Metal Pole Standard Drawing Sheets M2 through M5 for fabrication details. Fabricate anchor bases from plate steel meeting, as a minimum, the requirements of ASTM A 36M or cast steel meeting the requirements of ASTM A 27M Grade 485-250, AASHTO M270 Gr 36 or an approved equivalent. Conform to the applicable bolt pattern and orientation as shown on Metal Pole Standard Drawing Sheet M2.

Ensure all hardware is galvanized steel or stainless steel. The Contractor is responsible for ensuring that the designer/fabricator specifies connecting hardware and/or materials that do not create a dissimilar metal corrosive reaction.

Unless otherwise required by the design, ensure each anchor rod is 2" diameter and 60" length. Provide 10" minimum thread projection at the top of the rod, and 8" minimum at the bottom of the rod. Use anchor rod assembly and drilled pier foundation materials that meet the *Foundations and Anchor Rod Assemblies for Metal Poles* provision.

For each structural bolt and other steel hardware, hot dip galvanizing shall conform to the requirements of AASHTO M 232 (ASTM A 153). Ensure end caps for poles or mast arms are constructed of cast aluminum conforming to Aluminum Alloy 356.0F.

Provide a circular anchor bolt lock plate that will be secured to the anchor bolts at the embedded end with 2 washers and 2 nuts. Provide a base plate template that matches the bolt circle diameter of the anchor bolt lock plate. Construct plates and templates from 1/4" minimum thick steel with a minimum width of 4". Galvanizing is not required.

Provide 4 heavy hex nuts and 4 flat washers for each anchor bolt. For nuts, use AASHTO M291 grade 2H, DH, or DH3 or equivalent material. For flat washers, use AASHTO M293 or equivalent material.

### C. Construction Methods:

Erect signal support poles only after concrete has attained a minimum allowable compressive strength of 3000 psi. Install anchor rod assemblies in accordance with the *Foundations and Anchor Rod Assemblies for Metal Poles* provision.

For further construction methods, see construction methods for Metal Strain Pole, or Metal Pole with Mast Arm.

Connect poles to grounding electrodes and bond them to the electrical service grounding electrodes.

For holes in the poles used to accommodate cables, install grommets before wiring pole or arm. Do not cut or split grommets.

Attach the terminal compartment cover to the pole by a sturdy chain or cable. Ensure the chain or cable is long enough to permit the cover to hang clear of the compartment opening when the cover is removed, and is strong enough to prevent vandalism. Ensure the chain or cable will not interfere with service to the cables in the pole base.

Attach cap to pole with a sturdy chain or cable. Ensure the chain or cable is long enough to permit the cap to hang clear of the opening when the cap is removed.

Perform repair of damaged galvanizing that complies with the *Standard Specifications*, Article 1076-6 "Repair of Galvanizing."

Install galvanized wire mesh around the perimeter of the base plate to cover the gap between the base plate and top of foundation for debris and pest control.

Install a 1/4" thick plate for concrete foundation tag to include: concrete grade, depth, diameter, and reinforcement sizes of the installed foundation.

### 3.2. METAL STRAIN POLE

#### A. Materials:

Provide either steel or aluminum poles as indicated on the plans.

##### Comply with the following for Aluminum Poles:

- Have poles fabricated from Aluminum Association Alloy 6061-T6, 6063-T6, or approved equivalent. The structural requirement does not pertain to castings that are decorative only.
- Have shafts tapered by spinning and cold-working a seamless extruded tube of the aluminum alloy.
- Have shafts with no circumferential welds except at the lower end joining the shaft to the base.
- Ensure aluminum poles are properly protected from damage prior to shipment.
- Have bases of the shaft fabricated in accordance with the Aluminum Association Alloy 356.0-T6, and of adequate strength, shape and size, and capable of withstanding the design load of the shaft.
- Have aluminum surfaces in contact with concrete or dissimilar metal coated with bituminous paint.

##### Comply with the following for Steel Poles:

- Have shafts of the tapered tubular type and fabricated of steel conforming to ASTM A-595 Grade A or an approved equivalent.
- Have galvanization in accordance with AASHTO M 111 (ASTM A 123).
- Have shafts that are continuously welded for the entire length by the submerged arc process, and with exposed welds ground or rolled smooth and flush with the base metal. Provide welding that conforms to Article 1072-20 per *Standard Specification* except that no field welding on any part of the pole will be permitted.
- Have anchor bases for steel poles fabricated from plate steel meeting as a minimum the requirements of ASTM A 36M or cast steel meeting the requirements of ASTM A 27M Grade 485-250 or an approved equivalent.

For each strain pole, provide 2 messenger cable (span wire) clamps and associated hardware for attachment of support cable of the messenger cable suspension. Ensure that diameter of the clamp is appropriate to its location on the pole and that the diameter of the clamps is appropriately designed to be adjustable from 1'-6" below the top, down to 6'-6" below the top of the pole. Do not attach more than one support cable to a messenger cable clamp.

For strain poles, provide a minimum of three (3) 2 inch (50 mm) holes equipped with an associated coupling and weatherhead on the messenger cable load side of the pole to accommodate passage of signal cables from inside the pole to the suspension. Provide galvanized threaded plugs for all unused couplings at pole entrance points. Refer to Metal Pole Standard Drawing Sheet M3 for fabrication details.

Provide a grounding lug(s) in the approximate vicinity of the messenger cable clamp for bonding and grounding messenger cable. Lugs must accept #4 or #6 AWG wire to bond messenger cables to the pole in order to provide an effective ground fault circuit path. Refer to Metal Pole Standard Drawing Sheet M6 for construction details.

Have poles permanently stamped above the hand holes with the identification tag details as shown on Metal Pole Standard Drawing Sheet M2.

Provide liquid tight flexible metal conduit (Type LFMC), liquid tight flexible nonmetallic conduit (Type LFNC), high density polyethylene conduit (Type HDPE), or approved equivalent to isolate conductors feeding luminaires.

Fabricate poles from a single piece of steel or aluminum with single line seam weld with no transverse butt welds. Fabrication of two ply pole shafts is unacceptable with the exception of fluted shafts. Provide tapers for all shafts that begin at base and that have diameters which decrease uniformly at the rate of not more than 0.14 inch per foot (11.7 millimeters per meter) of length.

Ensure that allowable pole deflection does not exceed that allowed per 4<sup>th</sup> Edition AASHTO. For messenger cable poles (with primarily transverse loads), ensure that maximum deflection at the top of the pole does not exceed 2.5 percent of the pole height. For mast arm poles (with primarily moment loads), ensure that maximum angular rotation of the top of the pole does not exceed 1° 40'.

Provide four anchor nuts and four washers for each anchor bolt. Ensure that anchor bolts have required diameters, lengths, and positions, and will develop strengths comparable to their respective poles.

Provide a terminal compartment with cover and screws in each pole that encompasses the hand hole and contains a 12-terminal barrier type terminal block. Provide two terminal screws with a removable shorting bar between them for each termination. Furnish terminal compartment covers attached to the pole by a sturdy chain or cable approved by the Engineer. Ensure that the chain or cable is long enough to permit the cover to hang clear of the compartment opening when the cover is removed, and is strong enough to prevent vandals from being able to disconnect the cover from the pole. Ensure that the chain or cable will not interfere with service to the cables in the pole base.

Install grounding lugs that will accept #4 or #6 AWG wire to electrically bond messenger cables to the pole. Refer to Metal Pole Standard Drawing Sheet M6 for construction details.

For each pole, provide a 1/2 inch minimum thread diameter, coarse thread stud and nut for grounding which will accommodate #6 AWG ground wire. Ensure that the lug is electrically bonded to the pole and is conveniently located inside the pole at the hand hole.

Provide a removable pole cap with stainless steel attachment screws for the top of each pole. Ensure that the cap is cast aluminum conforming to Aluminum Association Alloy 356.0F. Furnish cap attached to the pole with a sturdy chain or cable approved by the Engineer. Ensure that the chain or cable is long enough to permit the cap to hang clear of the pole-top opening when the cap is removed.

When required by the plans, furnish couplings 42 inches above the bottom of the base for mounting of pedestrian pushbuttons. Provide mounting points consisting of 1-1/2 inch internally threaded half-couplings that comply with the NEC and that are mounted within the poles. Ensure that couplings are essentially flush with the outside surfaces of the poles and are installed before any required galvanizing. Provide a threaded plug in each mounting point. Ensure that the surface of the plug is essentially flush with the outer end of the mounting point when installed and has a recessed hole to accommodate a standard wrench.

**B. Construction Methods:**

Install metal poles, hardware, and fittings as shown on the manufacturer's installation drawings. Install metal poles so that when the pole is fully loaded it is within 2 degrees of vertical. Install poles with the manufacturer's recommended "rake." Use threaded leveling nuts to establish rake if required.

**3.3. METAL POLE WITH MAST ARM**

Provide signal support mast arm assemblies. Comply with the previous Section – Metal Strain Pole – except as noted herein.

Provide pole plates and associated gussets and fittings for attachment of required mast arms. As part of each mast arm attachment, provide a cable passage hole in the pole to allow passage of signal cables from the pole to the arm.

Ensure that allowable mast arm deflection does not exceed that allowed per 4<sup>th</sup> Edition AASHTO. Also when arm is fully loaded, tip of the arm shall not go below the arm attachment point with the pole for all load conditions per 4<sup>th</sup> Edition AASHTO.

Furnish all arm plates and necessary attachment hardware, including bolts and brackets.

Provide two extra bolts for each arm.

Provide grommet holes on the arms to accommodate cables for the signals.

Provide arms with weatherproof connections for attaching to the shaft of the pole.

Provide hardware that is galvanized steel, stainless steel, or corrosive-resistant aluminum.

Provide a removable end cap with stainless steel attachment screws for the end of each mast arm. Ensure that the cap is cast aluminum conforming to Aluminum Association Alloy 356.0F. Furnish cap attached to the arm with a sturdy chain or cable approved by the Engineer. Ensure that the chain or cable is long enough to permit the cap to hang clear of the arm end opening when the cap is removed.

**Comply with the following for Aluminum Arms:**

- Conform to Aluminum Association Alloy 6061-T6, 6063-T6 or approved equivalent.
- Conform to the welding requirements of the aluminum poles.
- Have satin brush finished and furnish individually wrapped.

**Comply with the following for Steel Luminaire Arms:**

- In addition to tapered tube, luminaire arms may be standard weight black steel pipe conforming to ASTM A 53-90a, Type E or Type S, Grade B or an approved equivalent.

- Conform to the welding requirements of the steel poles.
- After all fabricating, cutting, punching, and welding are completed, luminaire arms should be hot-dipped galvanized inside and outside.
- In accordance with the National Electrical Code (NEC) Article 230.2(E), provide identification of the electrical source provider for the luminaire feeder circuit with contact information on a permanent label located in the pole hand hole in the vicinity of the feeder circuit raceway.

#### **A. Materials:**

Fabrication of two ply pole shafts and arms is unacceptable with the exception of fluted members.

After all fabricating, cutting, punching, and welding are completed, hot-dip galvanize the structure in accordance with the AASHTO M 111 or equivalent.

#### **B. Construction Methods:**

Install horizontal-type arms with sufficient manufactured rise to keep arm from deflecting below the arm attachment height.

Attach cap to the mast arm with a sturdy chain or cable. Ensure that the chain or cable is long enough to permit the cap to hang clear of the arm opening when the cap is removed.

For mast arm poles, use full penetration welds with back-up ring at the pole base and at the arm base connection.

### **3.4. DRILLED PIER FOUNDATIONS FOR METAL TRAFFIC SIGNAL POLES**

Analysis procedures and formulas shall be based on AASHTO, ACI code and per FHWA manuals. Design methods based on engineering publications or research papers needs to have prior approval from NCDOT. The Department reserves the right to accept or disapprove any method used for the analysis.

Use a Factor of Safety of 1.33 for torsion and 2.0 for bending for the foundation design.

Foundation design for lateral load shall not exceed 1" lateral deflection at top of foundation.

Design all custom foundations to carry the maximum capacity of each metal pole. For standard case strain poles only, if a custom foundation is designed, use the actual moment reactions from the Standard Foundation Selection Table shown on Standard Drawing No. M8.

When poor soil conditions are encountered which could create an excessively large foundation design, consideration may be given to allowing an exemption to the maximum capacity design. The contractor must gain approval from the engineer before reducing a foundation's capacity. On projects where poor soil is known to be present, it is advisable that the contractor consider getting foundations approved before releasing poles for fabrication.

#### **A. Description:**

Furnish and install foundations for NCDOT metal poles with all necessary hardware in accordance with the plans and specifications.

Metal Pole Standards have been developed and implemented by NCDOT for use at signalized intersections in North Carolina. If the plans call for a standard pole, then a standard foundation may be selected from the plans. However, the Contractor is not required to use a standard foundation. If the Contractor chooses to design a non-standard site-specific foundation for a standard pole or if the plans call for a non-standard site-specific pole, design the foundation to conform to the applicable provisions in the NCDOT Metal Pole Standards and Section B4 (Non-Standard Foundation Design) below. If non-standard site specific foundations are designed for standard QPL approved strain poles, the foundation designer must use the design moment specified by load case on Metal Pole Standard Drawing Sheet M8. Failure to conform to this requirement will be grounds for rejection of the design.

If the Contractor chooses to design a non-standard foundation for a standard pole and the soil test results indicate a standard foundation is feasible for the site, the Contractor will be paid the cost of the standard foundation (drilled pier and wing wall, if applicable). Any additional costs associated with a non-standard site-specific foundation including additional materials, labor and equipment will be considered incidental to the cost of the standard foundation. All costs for the non-standard foundation design will also be considered incidental to the cost of the standard foundation.

## **B. Soil Test and Foundation Determination:**

### **1. General:**

Drilled piers are reinforced concrete sections, cast-in-place against in situ, undisturbed material. Drilled piers are of straight shaft type and vertical.

Some standard drilled piers for supporting poles with mast arms may require wing walls to resist torsional rotation. Based upon this provision and the results of the required soil test, a drilled pier length and wing wall requirement may be determined and constructed in accordance with the plans.

For non-standard site-specific poles, the contractor-selected pole fabricator will determine if the addition of wing walls is necessary for the supporting foundations.

### **2. Soil Test:**

Perform a soil test at each proposed metal pole location. Complete all required fill placement and excavation at each signal pole location to finished grade before drilling each boring. Soil tests performed that are not in compliance with this requirement may be rejected and will not be paid. Drill one boring to a depth of 26 feet within a 25 foot radius of each proposed foundation.

Perform standard penetration tests (SPT) in accordance with ASTM D 1586 at depths of 1, 2.5, 5, 7.5, 10, 15, 20 and 26 feet. Discontinue the boring if one of the following occurs:

- A total of 100 blows have been applied in any 2 consecutive 6-in. intervals.
- A total of 50 blows have been applied with < 3-in. penetration.

Describe each intersection as the “Intersection of (Route or SR #), (Street Name) and (Route or SR #), (Street Name), \_\_\_\_\_ County, Signal Inventory No. \_\_\_\_\_”. Label borings with “B- N, S, E, W, NE, NW, SE or SW” corresponding to the quadrant location within the intersection. Pole numbers should be made available to the Drill Contractor. Include pole numbers in the boring label if they are available. If they are not available, ensure the boring labels can be cross-referenced to corresponding pole numbers. For each boring, submit a legible (hand written or typed) boring log signed and sealed by a licensed Geologist or Professional Engineer registered in North Carolina. Include on each boring the SPT blow counts and N-values at each depth, depth of the boring, and a general description of the soil types encountered.

**3. Standard Foundation Determination:**

Use the following method for determining the Design N-value:

$$N_{AVG} = \frac{(N@1' + N@2.5' + \dots + N@Deepest \text{ Boring Depth})}{\text{Total Number of N-values}}$$

$$Y = (N@1')^2 + (N@2.5')^2 + \dots + (N@Deepest \text{ Boring Depth})^2$$

$$Z = (N@1' + N@2.5' + \dots + N@Deepest \text{ Boring Depth})$$

$$N_{STD \text{ DEV}} = \left[ \frac{(\text{Total Number of N-values} \times Y) - Z^2}{(\text{Total Number of N-values}) \times (\text{Total Number of N-values} - 1)} \right]^{0.5}$$

**Design N-value** equals lesser of the following two conditions:

$$N_{AVG} - (N_{STD \text{ DEV}} \times 0.45)$$

Or

$$\text{Average of First Four N-Values} = \frac{(N@1' + N@2.5' + N@5' + N@7.5')}{4}$$

*Note: If less than 4 N-values are obtained because of criteria listed in Section 2 above, use average of N-values collected for second condition. Do not include the N-value at the deepest boring depth for above calculations if the boring is discontinued at or before the required boring depth because of criteria listed in Section 2 above. Use N-value of zero for weight of hammer or weight of rod. If N-value is greater than 50, reduce N-value to 50 for calculations.*

If standard NCDOT strain poles are shown on the plans and the Contractor chooses to use standard foundations, determine a drilled pier length, "L," for each signal pole from the Standard Foundations Chart (sheet M 8) based on the Design N-value and the predominant soil type. For each standard pole location, submit a completed "Metal Pole Standard Foundation Selection Form" signed by the Contractor's representative. Signature on form is for verification purposes only. Include the Design N-value calculation and resulting drilled pier length, "L," on each form.

If non-standard site-specific poles are shown on the plans, submit completed boring logs collected in accordance with Section 2 (Soil Test) above along with pole loading diagrams from the plans to the contractor-selected pole fabricator to assist in the pole and foundation design.

If one of the following occurs, the Standard Foundations Chart shown on the plans may not be used and a non-standard foundation may be required. In such case, contact the Engineer.

- The Design N-value is less than 4.
- The drilled pier length, "L", determined from the Standard Foundations Chart, is greater than the depth of the corresponding boring.

In the case where a standard foundation cannot be used, the Department will be responsible for the additional cost of the non-standard foundation.

Foundation designs are based on level ground around the traffic signal pole. If the slope around the edge of the drilled pier is steeper than 8:1 (H:V) or the proposed foundation will be less than 10 feet from the top of an embankment slope, the Contractor is responsible for providing slope information to the foundation designer and to the Engineer so it can be considered in the design.

The "Metal Pole Standard Foundation Selection Form" may be found at:

<http://www.ncdot.gov/doh/preconstruct/highway/geotech/formdet/misc/MetalPole.pdf>



If assistance is needed, contact the Engineer.

#### **4. Non-Standard Foundation Design:**

Design non-standard foundations based upon site-specific soil test information collected in accordance with Section 2 (Soil Test) above. Design drilled piers for side resistance only in accordance with Section 4.6 of the *AASHTO Standard Specifications for Highway Bridges*. Use the computer software LPILE version 5.0 or later manufactured by Ensoft, Inc. to analyze drilled piers. Use the computer software gINT version 8.0 or later manufactured by Bentley Systems, Inc. with the current NCDOT gINT library and data template to produce SPT boring logs. Provide a drilled pier foundation for each pole with a length and diameter that result in a horizontal lateral movement of less than 1 inch at the top of the pier and a horizontal rotational movement of less than 1 inch at the edge of the pier. Contact the Engineer for pole loading diagrams for standard poles to be used for non-standard foundation designs. Submit any non-standard foundation designs including drawings, calculations, and soil boring logs to the Engineer for review and approval before construction.

#### **C. Drilled Pier Construction:**

Construct drilled pier foundations in accordance with the *Foundations and Anchor Rod Assemblies for Metal Poles* provision.

### **3.5. CUSTOM DESIGN OF TRAFFIC SIGNAL SUPPORTS**

#### **A. General:**

Design traffic signal supports with foundations consisting of metal strain poles or metal poles with mast arms.

The lengths of the metal signal poles shown on the plans are estimated from available data for bid purposes. Determine the actual length of each pole from field measurements and adjusted cross-sections. Furnish the revised pole heights to the Engineer. Use all other dimensional requirements shown on the plans.

Ensure each pole includes an identification tag with information and location positions as defined on Metal Pole Standard Drawing Sheets M2, M3 and M4. All pole shaft tags must include the NCDOT Inventory number followed by the pole number shown on the traffic signal or ITS (non-signalized locations) plan.

Design all traffic signal support structures using the following 4th Edition AASHTO specifications:

- Design for a 50 year service life as recommended by Table 3-3.
- Use the wind pressure map developed from 3-second gust speeds, as provided in Article 3.8.
- Ensure signal support structures include natural wind gust loading and truck-induced gust loading in the fatigue design, as provided for in Articles 11.7.3 and 11.7.4, respectively. Designs need not consider periodic galloping forces.
- Assume the natural wind gust speed in North Carolina is 11.2 mph. For natural wind fatigue stress calculations, utilize a drag coefficient ( $C_d$ ) computed for 11.2 mph wind velocity and not the basic wind speed velocity.
- Design for Category II fatigue, as provided for in Article 11.6, unless otherwise specified.
- Calculate all stresses using applicable equations from Section 5. The Maximum allowable stress ratios for all signal support designs are 0.9.
- Conform to article 10.4.2 and 11.8 for all deflection requirements.

Ensure that the design permits cables to be installed inside poles and mast arms.

Unless otherwise specified by special loading criteria, the computed surface area for ice load on signal heads is:

- 3-section, 12-inch, Surface area: 26.0 ft<sup>2</sup> (17.0 ft<sup>2</sup> without back plate)
- 4-section, 12-inch, Surface area: 32.0 ft<sup>2</sup> (21.0 ft<sup>2</sup> without back plate)
- 5-section, 12-inch, Surface area: 42.0 ft<sup>2</sup> (29.0 ft<sup>2</sup> without back plate)

The ice loading for signal heads defined above includes the additional surface area that back plates will induce. Special loading criteria may be specified in instances where back plates will not be installed on signal heads. Refer to the Loading Schedule on each Metal Pole Loading Diagram for revised signal head surface areas. The pole designer should revise ice loads accordingly in this instance. Careful examination of the plans when this is specified is important as this may impact sizing of the metal support structure and foundation design which could affect proposed bid quotes. All maximum stress ratios of 0.9 still apply.

Assume the combined minimum weight of a messenger cable bundle (including messenger cable, signal cable and detector lead-in cables) is 1.3 lbs/ft. Assume the combined minimum diameter of this cable bundle is 1.3 inches.

Ensure that designs provide a removable pole cap with stainless steel attachment screws for each pole top and mast arm end.

#### **B. Metal Poles:**

Submit design drawings for approval including pre-approved QPL pole drawings. Show all the necessary details and calculations for the metal poles including the foundation and connections. Include signal inventory number on design drawings. Include as part of the design calculations the ASTM specification numbers for the materials to be used. Provide the types and sizes of welds on the design drawings. Include a Bill of Materials on design drawings. Ensure design drawings and calculations are signed, dated, and sealed by the responsible professional engineer licensed in the state of North Carolina. Immediately bring to the attention of the Engineer any structural deficiency that becomes apparent in any assembly or member of any assembly as a result of the design requirements imposed by these specifications, the plans, or the typical drawings. Said Professional Engineer is wholly responsible for the design of all poles and arms. Review and acceptance of these designs by the Department does not relieve the said Professional Engineer of his responsibility. Do not fabricate the assemblies until receipt of the Department's approval of the design drawings.

For mast arm poles, provide designs with provisions for pole plates and associated gussets and fittings for mast arm attachment. As part of each mast arm attachment, provide a grommited 2" diameter hole on the shaft side of the connection to allow passage of the signal cables from the pole to the arm.

Where ice is present, assume wind loads as shown in Figure 3-5 of the 4th Edition AASHTO Specification for Group III loading.

For each strain pole, provide two messenger cable clamps and associated hardware to attach the messenger support cable. Ensure that the diameter of the clamps is appropriately designed to be adjustable from 18 inches below the top, down to 6'-6" below the top of the pole. Do not attach more than one messenger support cable to a messenger cable clamp.

Provide a grounding lug(s) in the approximate vicinity of the messenger cable clamp for bonding and grounding messenger cable. Lugs must accept #4 or #6 AWG wire to bond messenger cables to the pole in order to provide an effective ground fault circuit path. Refer to Metal Pole Standard Drawing Sheet M6 for construction details.

Design tapers for all pole shafts that begin at the base with diameters that decrease uniformly at the rate of 0.14 inch per foot of length.

Design a base plate on each pole. The minimum base plate thickness for all poles is determined by the following criteria:

Case 1 Circular or rectangular solid base plate with the upright pole welded to the top surface of base plate with full penetration butt weld, and where no stiffeners are provided. A base plate with a small center hole, which is less than 1/3 of the upright diameter, and located concentrically with the upright pole, may be considered as a solid base plate.

The magnitude of bending moment in the base plate, induced by the anchoring force of each anchor bolt is  $M = (P \times D_1) / 2$ , where

M = bending moment at the critical section of the base plate induced by one anchor bolt

P = anchoring force of each anchor bolt

$D_1$  = horizontal distance between the anchor bolt center and the outer face of the upright, or the difference between the bolt circle radius and the outside radius of the upright

Locate the critical section at the face of the anchor bolt and perpendicular to the bolt circle radius. The overlapped part of two adjacent critical sections is considered ineffective.

Case 2 Circular or rectangular base plate with the upright pole socketed into and attached to the base plate with two lines of fillet weld, and where no stiffeners are provided, or any base plate with a center hole that is larger in diameter than 1/3 of the upright diameter.

The magnitude of bending moment induced by the anchoring force of each anchor bolt is  $M = P \times D_2$ ,

where P = anchoring force of each anchor bolt

$D_2$  = horizontal distance between the face of the upright and the face of the anchor bolt nut

Locate the critical section at the face of the anchor bolt top nut and perpendicular to the radius of the bolt circle. The overlapped part of two adjacent critical sections is considered ineffective.

If the base plate thickness calculated for Case 2 is less than Case 1, use the thickness calculated for Case 1.

The following additional owner requirements apply concerning pole base plates.

- Ensure that whichever case governs as defined above, the anchor bolt diameter is set to match the base plate thickness. If the minimum diameter required for the anchor bolt exceeds the thickness required for the base plate, set the base plate thickness equal to the required bolt diameter.
- For dual mast arm supports, or for single mast arm supports 50' or greater, use a minimum 8 bolt orientation with 2" diameter anchor bolts, and a 2" thick base plate.
- For all metal poles with mast arms, use a full penetration groove weld with a backing ring to connect the pole upright component to the base. Refer to Metal Pole Standard Drawing Sheet M4.

Ensure that designs have anchor bolt holes with a diameter 1/4 inch larger than the anchor bolt diameters in the base plate.

Ensure that the anchor bolts have the required diameters, lengths, and positions, and will develop strengths comparable to their respective poles.

Provide designs with a 6 x 12-inch hand hole with a reinforcing frame for each pole.

Provide designs with a terminal compartment with cover and screws in each pole that encompasses the hand hole and contains provisions for a 12-terminal barrier type terminal block.

For each pole, provide designs with provisions for a 1/2 inch minimum thread diameter, coarse thread stud and nut for grounding which will accommodate a #6 AWG ground wire. Ensure the lug is electrically bonded to the pole and is conveniently located inside the pole at the hand hole.

When required, design couplings on the pole for mounting pedestrian pushbuttons at a height of 42 inches above the bottom of the base. Provide mounting points consisting of 1-1/2 inch internally threaded half-couplings that comply with the NEC that are mounted within the poles. Ensure the couplings are essentially flush with the outside surfaces of the poles and are installed before any required galvanizing. Provide a threaded plug for each half coupling. Ensure that the surface of the plug is essentially flush with the outer end of the mounting point when installed and has a recessed hole to accommodate a standard wrench.

### **C. Mast Arms:**

Design all arm plates and necessary attachment hardware, including bolts and brackets as required by the plans.

Design for grommets holes on the arms to accommodate the cables for the signals if specified.

Design arms with weatherproof connections for attaching to the shaft of the pole.

Always use a full penetration groove weld with a backing ring to connect the mast arm to the pole. Refer to Metal Pole Standard Drawing Sheet M5.

Capacity of tapped flange plate must be sufficient to develop the full capacity of the connecting bolts. In all cases the flange plate of both arm and shaft must be at least as thick as the arm connecting bolts are in diameter.

## **3.6. POLE NUMBERING SYSTEM**

### **A. New Poles**

Attach an identification tag to each pole shaft and mast arm section as shown on Metal Pole Standard Drawing Sheet M2 "Typical Fabrication Details Common To All Metal Poles".

## **3.7. MEASUREMENT AND PAYMENT**

Actual number of metal poles with single mast arms furnished, installed, and accepted.

Actual number of metal poles with dual mast arms furnished, installed, and accepted.

Actual number of soil tests with SPT borings drilled furnished and accepted.

Actual volume of concrete poured in cubic yards of drilled pier foundation furnished, installed and accepted.

Actual number of designs for mast arms with metal poles furnished and accepted.

No measurement will be made for foundation designs prepared with metal pole designs, as these will be considered incidental to designing signal support structures.

### **Payment will be made under:**

|                                       |            |
|---------------------------------------|------------|
| Metal Pole with Single Mast Arm ..... | Each       |
| Metal Pole with Dual Mast Arm.....    | Each       |
| Soil Test .....                       | Each       |
| Drilled Pier Foundation.....          | Cubic Yard |

Mast Arm with Metal Pole Design .....Each

#### 4. CONTROLLERS WITH CABINETS

##### 4.1. MATERIALS – TYPE 2070L CONTROLLERS

Conform to CALTRANS *Transportation Electrical Equipment Specifications* (TEES) (dated August 16, 2002, plus Errata 1 dated October 27, 2003 and Errata 2 dated June 08, 2004) except as required herein.

Furnish Model 2070L controllers. Ensure that removal of the CPU module from the controller will place the intersection into flash.

The Department will provide software at the beginning of the burning-in period. Contractor shall give 5 working days notice before needing software. Program software provided by the Department.

Provide model 2070L controllers with the latest version of OS9 operating software and device drivers, composed of the unit chassis and at a minimum the following modules and assemblies:

- MODEL 2070 1B, CPU Module, Single Board
- MODEL 2070-2A, Field I/O Module (FI/O)
- MODEL 2070-3B, Front Panel Module (FP), Display B (8x40)
- MODEL 2070-4A, Power Supply Module, 10 AMP
- MODEL 2070-7A, Async Serial Com Module (9-pin RS-232)

Furnish one additional MODEL 2070-7A, Async Serial Com Module (9-pin RS-232) for all master controller locations.

For each master location and central control center, furnish a U.S. Robotics V.92 or approved equivalent auto-dial/auto-answer external modem to accomplish the interface to the Department-furnished microcomputers. Include all necessary hardware to ensure telecommunications.

##### 4.2. MATERIALS – GENERAL CABINETS

Provide a moisture resistant coating on all circuit boards.

Provide one 20 mm diameter radial lead UL-recognized metal oxide varistor (MOV) between each load switch field terminal and equipment ground. Electrical performance is outlined below.

| PROPERTIES OF MOV SURGE PROTECTOR            |                          |
|----------------------------------------------|--------------------------|
| Maximum Continuous Applied Voltage at 185° F | 150 VAC (RMS)<br>200 VDC |
| Maximum Peak 8x20µs Current at 185° F        | 6500 A                   |
| Maximum Energy Rating at 185° F              | 80 J                     |
| Voltage Range 1 mA DC Test at 77° F          | 212-268 V                |
| Max. Clamping Voltage 8x20µs, 100A at 77° F  | 395 V                    |
| Typical Capacitance (1 MHz) at 77° F         | 1600 pF                  |

Provide a power line surge protector that is a two-stage device that will allow connection of the radio frequency interference filter between the stages of the device. Ensure that a maximum continuous current is at least 10A at 120V. Ensure that the device can withstand a minimum of 20 peak surge current occurrences at 20,000A for an 8x20 microsecond waveform. Provide a maximum

clamp voltage of 395V at 20,000A with a nominal series inductance of 200μh. Ensure that the voltage does not exceed 395V. Provide devices that comply with the following:

| Frequency (Hz) | Minimum Insertion Loss (dB) |
|----------------|-----------------------------|
| 60             | 0                           |
| 10,000         | 30                          |
| 50,000         | 55                          |
| 100,000        | 50                          |
| 500,000        | 50                          |
| 2,000,000      | 60                          |
| 5,000,000      | 40                          |
| 10,000,000     | 20                          |
| 20,000,000     | 25                          |

#### **4.3. MATERIALS – TYPE 170E CABINETS**

##### **A. Type 170 E Cabinets General:**

Conform to the city of Los Angeles' Specification No. 54-053-08, *Traffic Signal Cabinet Assembly Specification* (dated July 2008), except as required herein.

Furnish model 336S pole mounted cabinets configured for 8 vehicle phases, 4 pedestrian phases, and 6 overlaps. When overlaps are required, provide auxiliary output files for the overlaps. Do not reassign load switches to accommodate overlaps unless shown on electrical details. Provide 336S pole mounted cabinets that are 46" high with 40" high internal rack assemblies.

Furnish model 332 base mounted cabinets configured for 8 vehicle phases, 4 pedestrian phases, and 6 overlaps. When overlaps are required, provide auxiliary output files for the overlaps. Do not reassign load switches to accommodate overlaps unless shown on electrical details.

Provide model 200 load switches, model 222 loop detector sensors, model 252 AC isolators, and model 242 DC isolators according to the electrical details. As a minimum, provide one (1) model 2018 conflict monitor, one (1) model 206L power supply unit, two (2) model 204 flashers, one (1) DC isolator (located in slot I14), and four (4) model 430 flash transfer relays (provide seven (7) model 430 flash transfer relays if auxiliary output file is installed) with each cabinet.

##### **B. Type 170 E Cabinet Electrical Requirements:**

Provide a cabinet assembly designed to ensure that upon leaving any cabinet switch or conflict monitor initiated flashing operation, the controller starts up in the programmed start up phases and start up interval.

Furnish two sets of non-fading cabinet wiring diagrams and schematics in a paper envelope or container and placed in the cabinet drawer.

All AC+ power is subject to radio frequency signal suppression.

Provide surge suppression in the cabinet for each type of cabinet device. Provide surge protection for the full capacity of the cabinet input file. Provide surge suppression devices that operate properly over a temperature range of -40° F to +185° F. Ensure the surge suppression devices provide both common and differential modes of protection.

Provide a pluggable power line surge protector that is installed on the back of the PDA (power distribution assembly) chassis to filter and absorb power line noise and switching transients. Ensure the device incorporates LEDs for failure indication and provides a dry relay contact closure for the purpose of remote sensing. Ensure the device meets the following specifications:

Peak Surge Current (Single pulse, 8x20μs).....20,000A

|                                          |                      |
|------------------------------------------|----------------------|
| Occurrences (8x20 $\mu$ s waveform)..... | 10 minimum @ 20,000A |
| Maximum Clamp Voltage.....               | 395VAC               |
| Operating Current.....                   | 15 amps              |
| Response Time.....                       | < 5 nanoseconds      |

Provide a loop surge suppressor for each set of loop terminals in the cabinet. Ensure the device meets the following specifications:

|                                            |                 |
|--------------------------------------------|-----------------|
| Peak Surge Current (6 times, 8x20 $\mu$ s) |                 |
| (Differential Mode).....                   | 400A            |
| (Common Mode).....                         | 1,000A          |
| Occurrences (8x20 $\mu$ s waveform).....   | 500 min @ 200A  |
| Maximum Clamp Voltage                      |                 |
| (Differential Mode @400A).....             | 35V             |
| (Common Mode @1,000A).....                 | 35V             |
| Response Time.....                         | < 5 nanoseconds |
| Maximum Capacitance.....                   | 35 pF           |

Provide a data communications surge suppressor for each communications line entering or leaving the cabinet. Ensure the device meets the following specifications:

|                                                      |                               |
|------------------------------------------------------|-------------------------------|
| Peak Surge Current (Single pulse, 8x20 $\mu$ s)..... | 10,000A                       |
| Occurrences (8x20 $\mu$ s waveform).....             | 100 min @ 2,000A              |
| Maximum Clamp Voltage.....                           | Rated for equipment protected |
| Response Time.....                                   | < 1 nanosecond                |
| Maximum Capacitance.....                             | 1,500 pF                      |
| Maximum Series Resistance.....                       | 15 $\Omega$                   |

Provide a DC signal surge suppressor for each DC input channel in the cabinet. Ensure the device meets the following specifications:

|                                                      |                |
|------------------------------------------------------|----------------|
| Peak Surge Current (Single pulse, 8x20 $\mu$ s)..... | 10,000A        |
| Occurrences (8x20 $\mu$ s waveform).....             | 100 @ 2,000A   |
| Maximum Clamp Voltage.....                           | 30V            |
| Response Time.....                                   | < 1 nanosecond |

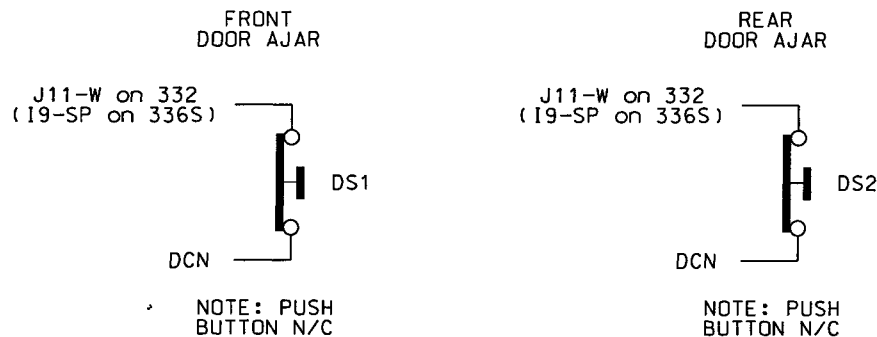
Provide a 120 VAC signal surge suppressor for each AC+ interconnect signal input. Ensure the device meets the following specifications:

|                                                      |                       |
|------------------------------------------------------|-----------------------|
| Peak Surge Current (Single pulse, 8x20 $\mu$ s)..... | 20,000A               |
| Maximum Clamp Voltage.....                           | 350VAC                |
| Response Time.....                                   | < 200 nanoseconds     |
| Discharge Voltage.....                               | <200 Volts @ 1,000A   |
| Insulation Resistance.....                           | $\geq$ 100 M $\Omega$ |

Provide conductors for surge protection wiring that are of sufficient size (ampacity) to withstand maximum overcurrents which could occur before protective device thresholds are attained and current flow is interrupted.

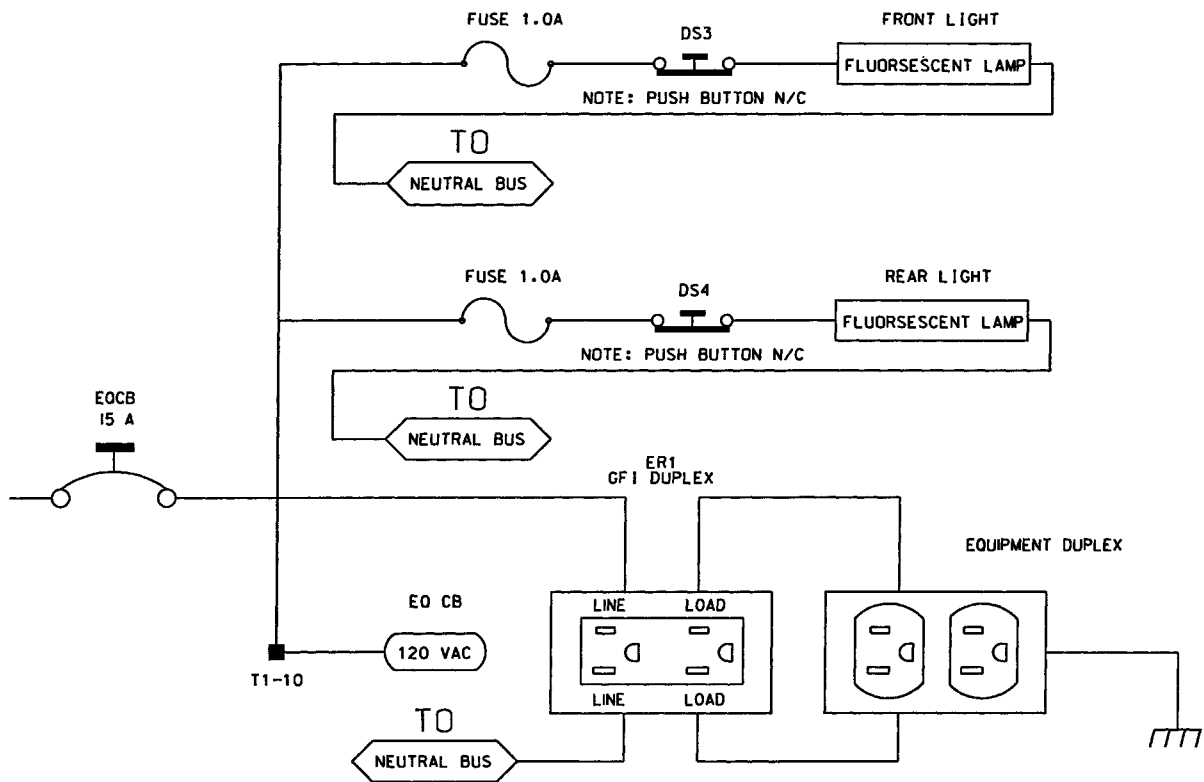
If additional surge protected power outlets are needed to accommodate fiber transceivers, modems, etc., install a UL listed, industrial, heavy-duty type power outlet strip with a minimum rating of 15 A / 125 VAC, 60 Hz. Provide a strip that has a minimum of 3 grounded outlets. Ensure the power outlet strip plugs into one of the controller unit receptacles located on the rear of the PDA. Ensure power outlet strip is mounted securely; provide strain relief if necessary.

Provide a door switch in the front and a door switch in the rear of the cabinet that will provide the controller unit with a Door Ajar alarm when either the front or the rear door is open. Ensure the door switches apply DC ground to the Input File when either the front door or the rear door is open.



Furnish a fluorescent fixture in the rear across the top of the cabinet and another fluorescent fixture in the front across the top of the cabinet at a minimum. Ensure that the fixtures provide sufficient light to illuminate all terminals, labels, switches, and devices in the cabinet. Conveniently locate the fixtures so as not to interfere with a technician's ability to perform work on any devices or terminals in the cabinet. Provide a protective diffuser to cover exposed bulbs. Install 16 watt T-4 lamps in the fluorescent fixtures. Provide a door switch to provide power to each fixture when the respective door is open. Wire the fluorescent fixtures to the 15 amp ECB (equipment circuit breaker).





Furnish a police panel with a police panel door. For model 336S cabinets, mount the police panel on the rear door. Ensure that the police panel door permits access to the police panel when the main door is closed. Ensure that no rainwater can enter the cabinet even with the police panel door open. Provide a police panel door hinged on the right side as viewed from the front. Provide a police panel door lock that is keyed to a standard police/fire call box key. In addition to the requirements of LA Specification No. 54-053-08, provide the police panel with a toggle switch connected to switch the intersection operation between normal stop-and-go operation (AUTO) and manual operation (MANUAL). Ensure that manual control can be implemented using inputs and software such that the controller provides full programmed clearance times for the yellow clearance and red clearance for each phase while under manual control.

Provide a 1/4-inch locking phone jack in the police panel for a hand control to manually control the intersection. Provide sufficient room in the police panel for storage of a hand control and cord.

Ensure the 336S cabinet Input File is wired as follows:

| 336S Cabinet<br>Port-Bit/C-1 Pin Assignment |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|---------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Slot #                                      | 1         | 2         | 3         | 4         | 5         | 6         | 7         | 8         | 9         | 10        | 11        | 12        | 13        | 14        |
| C-1 (Spares)                                | 59        | 60        | 61        | 62        | 63        | 64        | 65        | 66        | 75        | 76        | 77        | 78        | 79        | 80        |
| Port C-1                                    | 3-2<br>56 | 1-1<br>39 | 3-4<br>58 | 1-3<br>41 | 3-1<br>55 | 1-2<br>40 | 3-3<br>57 | 1-4<br>42 | 2-5<br>51 | 5-5<br>71 | 5-6<br>72 | 5-1<br>67 | 5-2<br>68 | 6-7<br>81 |
| Port C-1                                    | 2-1<br>47 | 1-5<br>43 | 2-3<br>49 | 1-7<br>45 | 2-2<br>48 | 1-6<br>44 | 2-4<br>50 | 1-8<br>46 | 2-6<br>52 | 5-7<br>73 | 5-8<br>74 | 5-3<br>69 | 5-4<br>70 | 6-8<br>82 |

For model 332 base mounted cabinets, ensure terminals J14-E and J14-K are wired together on the rear of the Input File. Connect TB9-12 (J14 Common) on the Input Panel to T1-2 (AC-) on the rear of the PDA.

Provide detector test switches mounted at the top of the cabinet rack or other convenient location which may be used to place a call on each of eight phases based on the chart below. Provide three positions for each switch: On (place call), Off (normal detector operation), and Momentary On (place momentary call and return to normal detector operation after switch is released). Ensure that the switches are located such that the technician can read the controller display and observe the intersection.

Connect detector test switches for cabinets as follows:

| 336S Cabinet           |           | 332 Cabinet            |           |
|------------------------|-----------|------------------------|-----------|
| Detector Call Switches | Terminals | Detector Call Switches | Terminals |
| Phase 1                | I1-F      | Phase 1                | I1-W      |
| Phase 2                | I2-F      | Phase 2                | I4-W      |
| Phase 3                | I3-F      | Phase 3                | I5-W      |
| Phase 4                | I4-F      | Phase 4                | I8-W      |
| Phase 5                | I5-F      | Phase 5                | J1-W      |
| Phase 6                | I6-F      | Phase 6                | J4-W      |
| Phase 7                | I7-F      | Phase 7                | J5-W      |
| Phase 8                | I8-F      | Phase 8                | J8-W      |

Provide the PCB 28/56 connector for the conflict monitor unit (CMU) with 28 independent contacts per side, dual-sided with 0.156 inch contact centers. Provide the PCB 28/56 connector contacts with solder eyelet terminations. Ensure all connections to the PCB 28/56 connector are soldered to the solder eyelet terminations.

Ensure that all cabinets have the CMU connector wired according to the 332 cabinet connector pin assignments (include all wires for auxiliary output file connection). Wire pins 13, 16, R, and U of the CMU connector to a separate 4 pin plug, P1, as shown below. Provide a second plug, P2, which will mate with P1 and is wired to the auxiliary output file as shown below. Provide an additional plug, P3, which will mate with P1 and is wired to the pedestrian yellow circuits as shown below. When no auxiliary output file is installed in the cabinet, provide wires for the green and yellow inputs for channels 11, 12, 17, and 18, the red inputs for channels 17 and 18, and the wires for the P2 plug. Terminate the two-foot wires with ring type lugs, insulated, and bundled for optional use.

| PIN | P1       |         | P2       |         | P3       |         |
|-----|----------|---------|----------|---------|----------|---------|
|     | FUNCTION | CONN TO | FUNCTION | CONN TO | FUNCTION | CONN TO |
| 1   | CH-9G    | CMU-13  | OLA-GRN  | A123    | 2P-YEL   | 114     |
| 2   | CH-9Y    | CMU-16  | OLA-YEL  | A122    | 4P-YEL   | 105     |
| 3   | CH-10G   | CMU-R   | OLB-GRN  | A126    | 6P-YEL   | 120     |
| 4   | CH-10Y   | CMU-U   | OLB-YEL  | A125    | 8P-YEL   | 111     |

Connect the P20 terminal assembly (red monitor board) to a connector installed on the front of the type 2018 enhanced conflict monitor through a 3-1/2 foot 20-wire ribbon cable. Ensure that the ribbon cable connector and the connector on the conflict monitor are keyed to ensure proper connection. Ensure that removal of the P20 ribbon cable will cause the conflict monitor to recognize a latching fault condition and place the cabinet into flashing operation.

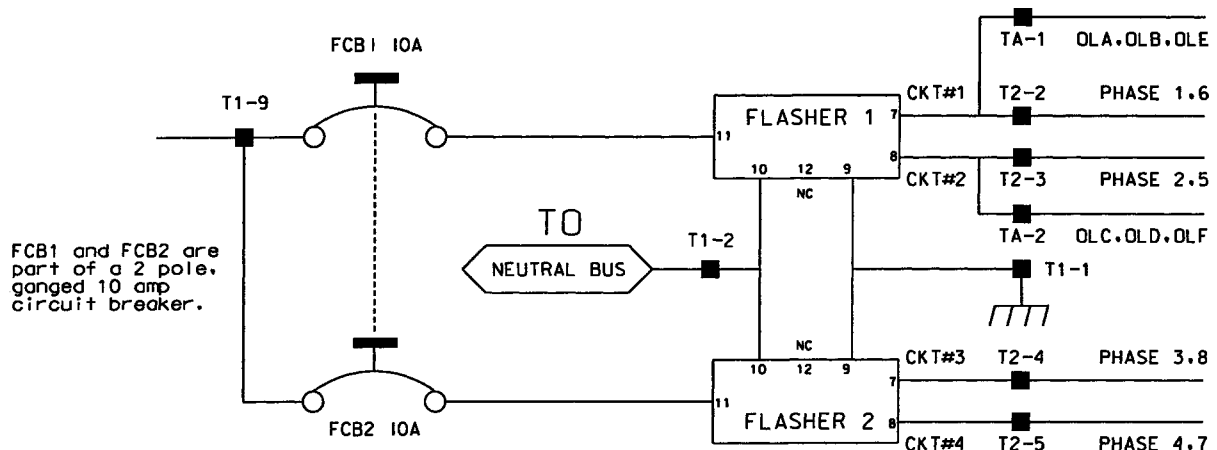
Wire the P20 connector to the traffic signal red displays to provide inputs to the conflict monitor as shown below. Ensure the pedestrian Don't Walk circuits are wired to channels 13 through 16 of the P20 connector. When no auxiliary output file is installed in the cabinet, provide wires for channels 9 through 12 reds. Terminate the two-foot wires with ring type lugs, insulated, and bundled for optional use.

| Pin # | Function           | Pin # | Function      |
|-------|--------------------|-------|---------------|
| 1     | Channel 15 Red     | 11    | Channel 9 Red |
| 2     | Channel 16 Red     | 12    | Channel 8 Red |
| 3     | Channel 14 Red     | 13    | Channel 7 Red |
| 4     | GND                | 14    | Channel 6 Red |
| 5     | Channel 13 Red     | 15    | Channel 5 Red |
| 6     | Special Function 2 | 16    | Channel 4 Red |
| 7     | Channel 12 Red     | 17    | Channel 3 Red |
| 8     | Special Function 1 | 18    | Channel 2 Red |
| 9     | Channel 10 Red     | 19    | Channel 1 Red |
| 10    | Channel 11 Red     | 20    | Red Enable    |

Ensure the controller unit outputs to the auxiliary output file are pre-wired to the C5 connector. When no auxiliary output file is installed in the cabinet, connect the C5 connector to a storage socket located on the Input Panel or on the rear of the PDA.

In addition to the requirements of LA Specification No. 54-053-08, ensure relay K1 on the Power Distribution Assembly (PDA) is a four pole relay and K2 on the PDA is a two pole relay.

Provide a two pole, ganged circuit breaker for the flash bus circuit. Ensure the flash bus circuit breaker is an inverse time circuit breaker rated for 10 amps at 120 VAC with a minimum of 10,000 RMS symmetrical amperes short circuit current rating. Do not provide the auxiliary switch feature on the flash bus circuit breaker. Ensure the ganged flash bus circuit breaker is certified by the circuit breaker manufacturer to provide gang tripping operation.



Ensure auxiliary output files are wired as follows:

| AUXILIARY OUTPUT FILE<br>TERMINAL BLOCK TA ASSIGNMENTS |                                                       |
|--------------------------------------------------------|-------------------------------------------------------|
| POSITION                                               | FUNCTION                                              |
| 1                                                      | Flasher Unit #1, Circuit 1/FTR1 (OLA, OLB)/FTR3 (OLE) |
| 2                                                      | Flasher Unit #1, Circuit 2/FTR2 (OLC, OLD)/FTR3 (OLF) |
| 3                                                      | Flash Transfer Relay Coils                            |
| 4                                                      | AC -                                                  |
| 5                                                      | Power Circuit 5                                       |
| 6                                                      | Power Circuit 5                                       |
| 7                                                      | Equipment Ground Bus                                  |
| 8                                                      | NC                                                    |

Provide four spare load resistors mounted in each cabinet. Ensure each load resistor is rated as shown in the table below. Wire one side of each load resistor to AC-. Connect the other side of each resistor to a separate terminal on a four (4) position terminal block. Mount the load resistors and terminal block either inside the back of Output File No. 1 or on the upper area of the Service Panel.

| ACCEPTABLE LOAD RESISTOR VALUES |           |
|---------------------------------|-----------|
| VALUE (ohms)                    | WATTAGE   |
| 1.5K – 1.9 K                    | 25W (min) |
| 2.0K – 3.0K                     | 10W (min) |

Provide Model 200 load switches, Model 204 flashers, Model 242 DC isolators, Model 252 AC isolators, and Model 206L power supply units that conform to CALTRANS' *"Transportation Electrical Equipment Specifications"* dated March 12, 2009 with Erratum 1.

### C. Type 170 E Cabinet Physical Requirements:

Do not mold, cast, or scribe the name "City of Los Angeles" on the outside of the cabinet door as specified in LA Specification No. 54-053-08. Do not provide a Communications Terminal Panel as specified in LA Specification No. 54-053-08. Do not provide terminal block TBB on the Service Panel. Do not provide Cabinet Verification Test Program software or associated test jigs as specified in LA Specification No. 54-053-08.

Furnish unpainted, natural, aluminum cabinet shells. Ensure that all non-aluminum hardware on the cabinet is stainless steel or a Department approved non-corrosive alternate.

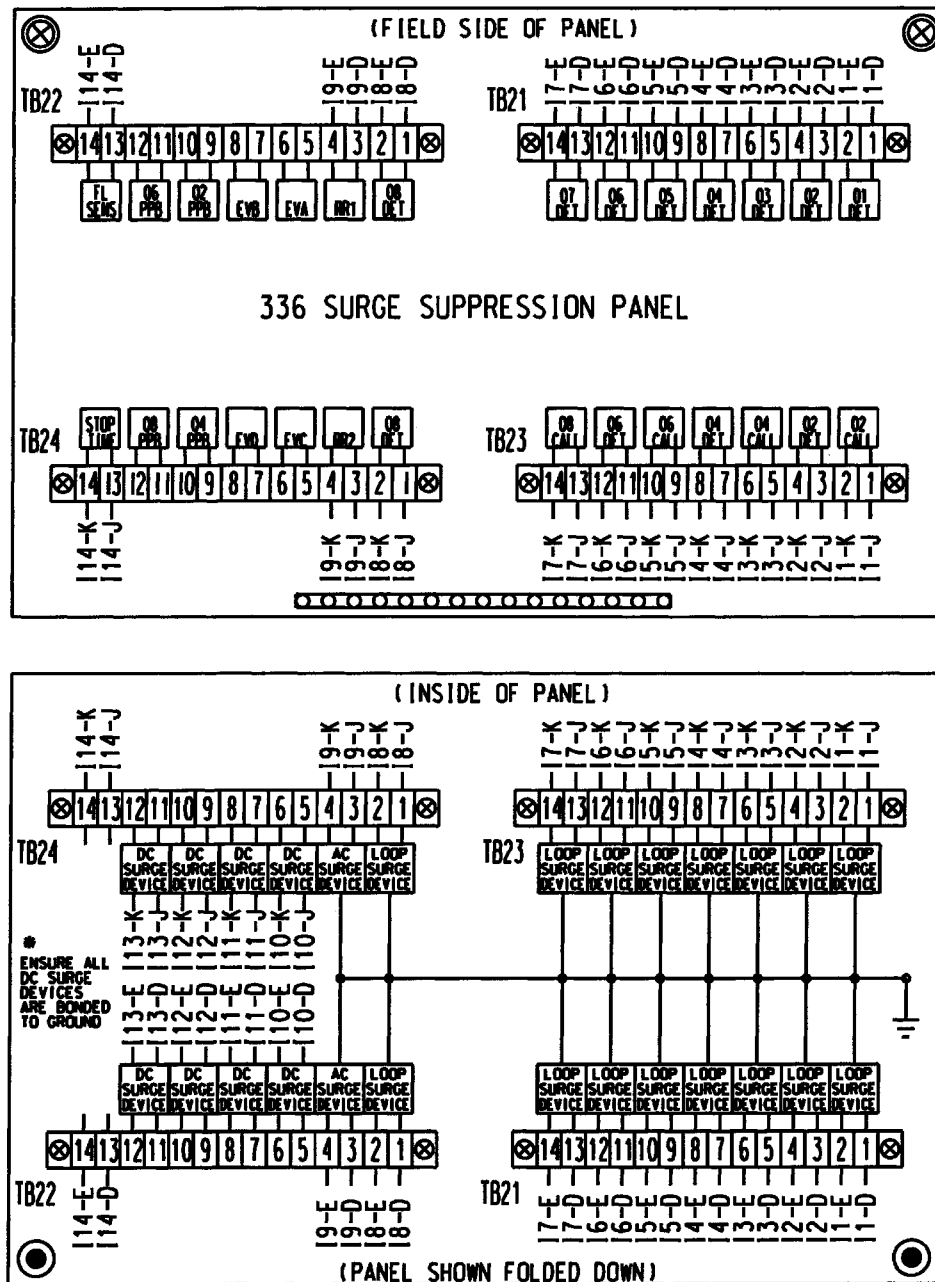
Ensure the lifting eyes, gasket channels, police panel, and all supports welded to the enclosure and doors are fabricated from 0.125 inch minimum thickness aluminum sheet and meet the same standards as the cabinet and doors.

Provide front and rear doors with latching handles that allow padlocking in the closed position. Furnish 0.75 inch minimum diameter stainless steel handles with a minimum 0.5 inch shank. Place the padlocking attachment at 4.0 inches from the handle shank center to clear the lock and key. Provide an additional 4.0 inches minimum gripping length.

Provide Corbin #2 locks on the front and rear doors. Provide one (1) Corbin #2 and one (1) police master key with each cabinet. Ensure main door locks allow removal of keys in the locked position only.

Provide a surge protection panel with 16 loop surge protection devices and designed to allow sufficient free space for wire connection/disconnection and surge protection device replacement. For model 332 cabinets, provide an additional 20 loop surge protection devices. Provide an additional two AC+ interconnect surge devices to protect one slot and eight DC surge protection devices to protect four slots. Provide no protection devices on slot I14.

For pole mounted cabinets, mount surge protection devices for the AC+ interconnect inputs, inductive loop detector inputs, and low voltage DC inputs on a swing down panel assembly fabricated from sturdy aluminum. Attach the swing down panel to the bottom rear cabinet rack assembly using thumb screws. Ensure the swing down panel allows for easy removal of the input file without removing the surge protection panel assembly or its parts. Have the surge protection devices mounted horizontally on the panel and soldered to the feed through terminals of four 14 position terminal blocks with #8 screws mounted on the other side. Ensure the top row of terminals is connected to the upper slots and the bottom row of terminals is connected to the bottom slots. Provide a 15 position copper equipment ground bus attached to the field terminal side (outside) of the swing down panel for termination of loop lead-in shield grounds. Ensure that a Number 4 AWG green wire connects the surge protection panel assembly ground bus to the main cabinet equipment ground.



For base mounted cabinets, mount surge protection panels on the left side of the cabinet as viewed from the rear. Attach each panel to the cabinet rack assembly using bolts and make it easily removable. Mount the surge protection devices in vertical rows on each panel and connect the devices to one side of 12 position, double row terminal blocks with #8 screws. For each surge protection panel, terminate all grounds from the surge protection devices on a copper equipment ground bus attached to the surge protection panel. Wire the terminals to the rear of a standard input file using spade lugs for input file protection.

Provide permanent labels that indicate the slot and the pins connected to each terminal that may be viewed from the rear cabinet door. Label and orient terminals so that each pair of inputs is next to each other. Indicate on the labeling the input file (I or J), the slot number (1-14) and the terminal pins of the input slots (either D & E for upper or J & K for lower).

Provide a minimum 14 x 16 inch pull out, hinged top shelf located immediately below controller mounting section of the cabinet. Ensure the shelf is designed to fully expose the table surface outside the controller at a height approximately even with the bottom of the controller. Ensure the shelf has a storage bin interior which is a minimum of 1 inch deep and approximately the same dimensions as the shelf. Provide an access to the storage area by lifting the hinged top of the shelf. Fabricate the shelf and slide from aluminum or stainless steel and ensure the assembly can support the 2070L controller plus 15 pounds of additional weight. Ensure shelf has a locking mechanism to secure it in the fully extended position and does not inhibit the removal of the 2070L controller or removal of cards inside the controller when fully extended. Provide a locking mechanism that is easily released when the shelf is to be returned to its non-use position directly under the controller.

#### **D. Model 2018 Enhanced Conflict Monitor:**

Furnish Model 2018 Enhanced Conflict Monitors that provide monitoring of 18 channels. Ensure each channel consists of a green, yellow, and red field signal input. Ensure that the conflict monitor meets or exceeds CALTRANS' Transportation Electrical Equipment Specifications dated March 12, 2009 with Erratum 1 (hereafter referred to as CALTRANS' 2009 TEES) for a model 210 monitor unit and other requirements stated in this specification.

Ensure the conflict monitor is provided with an 18 channel conflict programming card. Pin EE and Pin T of the conflict programming card shall be connected together. Pin 16 of the conflict programming card shall be floating. Ensure that the absence of the conflict programming card will cause the conflict monitor to trigger (enter into fault mode), and remain in the triggered state until the programming card is properly inserted and the conflict monitor is reset.

Provide a conflict monitor that incorporates LED indicators into the front panel to dynamically display the status of the monitor under normal conditions and to provide a comprehensive review of field inputs with monitor status under fault conditions. Ensure that the monitor indicates the channels that were active during a conflict condition and the channels that experienced a failure for all other per channel fault conditions detected. Ensure that these indications and the status of each channel are retained until the Conflict Monitor is reset. Furnish LED indicators for the following:

- AC Power (Green LED indicator)
- VDC Failed (Red LED indicator)
- WDT Error (Red LED indicator)
- Conflict (Red LED indicator)
- Red Fail (Red LED indicator)
- Dual Indication (Red LED indicator)
- Yellow/Clearance Failure (Red LED indicator)
- PCA/PC Ajar (Red LED indicator)
- Monitor Fail/Diagnostic Failure (Red LED indicator)
- 54 Channel Status Indicators (1 Red, 1 Yellow, and 1 Green LED indicator for each of the 18 channels)

Provide a switch to set the Red Fail fault timing. Ensure that when the switch is in the ON position the Red Fail fault timing value is set to 1350 +/- 150ms (2018 mode). Ensure that when the switch is in the OFF position the Red Fail fault timing value is set to 850 +/- 150ms (210 mode).

Provide a switch to set the Watchdog fault timing. Ensure that when the switch is in the ON position the Watchdog fault timing value is set to 1.0 +/- 0.1s (2018 mode). Ensure that when the switch is in the OFF position the Watchdog fault timing value is set to 1.5 +/- 0.1s (210 mode).

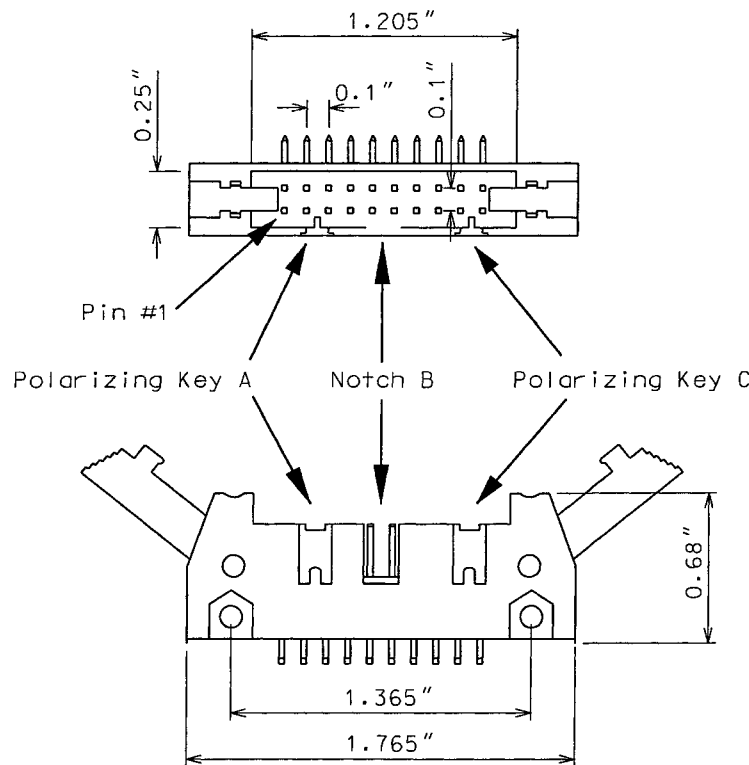
Provide a jumper or switch to set the AC line brown-out levels. Ensure that when the jumper is present or the switch is in the ON position the AC line dropout voltage threshold is 98 +/- 2 Vrms, the AC line restore voltage threshold is 103 +/- 2 Vrms, and the AC line brown-out timing value is set to 400 +/- 50ms (2018 mode). Ensure that when the jumper is not present or the switch is in the OFF position the AC line dropout voltage threshold is 92 +/- 2 Vrms, the AC line restore voltage threshold is 98 +/- 2 Vrms, and the AC line brown-out timing value is set to 80 +/- 17ms (210 mode).

Provide a jumper or switch that will enable and disable the Watchdog Latch function. Ensure that when the jumper is not present or the switch is in the OFF position the Watchdog Latch function is disabled. In this mode of operation, a Watchdog fault will be reset following a power loss, brownout, or power interruption. Ensure that when the jumper is present or the switch is in the ON position the Watchdog Latch function is enabled. In this mode of operation, a Watchdog fault will be retained until a Reset command is issued.

Provide a jumper that will reverse the active polarity for pin #EE (output relay common). Ensure that when the jumper is not present pin #EE (output relay common) will be considered 'Active' at a voltage greater than 70 Vrms and 'Not Active' at a voltage less than 50 Vrms (Caltrans mode). Ensure that when the jumper is present pin #EE (output relay common) will be considered 'Active' at a voltage less than 50 Vrms and 'Not Active' at a voltage greater than 70 Vrms (Failsafe mode).

In addition to the connectors required by CALTRANS' 2009 TEES, provide the conflict monitor with a red interface connector mounted on the front of the monitor. Ensure the connector is a 20 pin, right angle, male connector with latching clip locks and polarizing keys. Ensure the right angle solder tails are designed for a 0.062" thick printed circuit board. Keying of the connector shall be between pins 3 and 5, and between 17 and 19. Ensure the connector has two rows of pins with the odd numbered pins on one row and the even pins on the other row. Ensure the connector pin row spacing is 0.10" and pitch is 0.10". Ensure the mating length of the connector pins is 0.24". Ensure the pins are finished with gold plating 30μ" thick.





Ensure the red interface connector pins on the monitor have the following functions:

| Pin # | Function       | Pin # | Function           |
|-------|----------------|-------|--------------------|
| 1     | Channel 15 Red | 2     | Channel 16 Red     |
| 3     | Channel 14 Red | 4     | Chassis Ground     |
| 5     | Channel 13 Red | 6     | Special Function 2 |
| 7     | Channel 12 Red | 8     | Special Function 1 |
| 9     | Channel 10 Red | 10    | Channel 11 Red     |
| 11    | Channel 9 Red  | 12    | Channel 8 Red      |
| 13    | Channel 7 Red  | 14    | Channel 6 Red      |
| 15    | Channel 5 Red  | 16    | Channel 4 Red      |
| 17    | Channel 3 Red  | 18    | Channel 2 Red      |
| 19    | Channel 1 Red  | 20    | Red Enable         |

Ensure that the removal of the P-20 red interface ribbon cable will cause the monitor to recognize a latching fault condition and place the cabinet into flashing operation.

Provide Special Function 1 and Special Function 2 inputs to the unit which shall disable only Red Fail Monitoring when either input is sensed active. A Special Function input shall be sensed active when the input voltage exceeds 70 Vrms with a minimum duration of 550 ms. A Special Function input shall be sensed not active when the input voltage is less than 50 Vrms or the duration is less than 250 ms. A Special Function input is undefined by these specifications and may or may not be sensed active when the input voltage is between 50 Vrms and 70 Vrms or the duration is between 250 ms and 550 ms.

Ensure the conflict monitor recognizes field signal inputs for each channel that meet the following requirements:

- consider a Red input greater than 70 Vrms and with a duration of at least 500 ms as an “on” condition;
- consider a Red input less than 50 Vrms or with a duration of less than 200 ms as an “off” condition (no valid signal);
- consider a Red input between 50 Vrms and 70 Vrms or with a duration between 200 ms and 500 ms to be undefined by these specifications;
- consider a Green or Yellow input greater than 25 Vrms and with a duration of at least 500 ms as an “on” condition;
- consider a Green or Yellow input less than 15 Vrms or with a duration of less than 200 ms as an “off” condition; and
- consider a Green or Yellow input between 15 Vrms and 25 Vrms or with a duration between 200 ms and 500 ms to be undefined by these specifications.

Provide a conflict monitor that recognizes the faults specified by CALTRANS’ 2009 TEES and the following additional faults. Ensure the conflict monitor will trigger upon detection of a fault and will remain in the triggered (in fault mode) state until the unit is reset at the front panel or through the external remote reset input for the following failures:

1. **Red Monitoring or Absence of Any Indication (Red Failure):** A condition in which no “on” voltage signal is detected on any of the green, yellow, or red inputs to a given monitor channel. If a signal is not detected on at least one input (R, Y, or G) of a conflict monitor channel for a period greater than 1000 ms when used with a 170 controller and 1500 ms when used with a 2070L controller, ensure monitor will trigger and put the intersection into flash. If the absence of any indication condition lasts less than 750 ms when used with a 170 controller and 1200 ms when used with a 2070L controller, ensure conflict monitor will not trigger. Red fail monitoring shall be enabled on a per channel basis by the use of switches located on the conflict monitor. Have red monitoring occur when all of the following input conditions are in effect:
  - a) Red Enable input to monitor is active (Red Enable voltages are “on” at greater than 70 Vrms, off at less than 50 Vrms, undefined between 50 and 70 Vrms), and
  - b) Neither Special Function 1 nor Special Function 2 inputs are active.
  - c) Pin #EE (output relay common) is not active
2. **Short/Missing Yellow Indication Fault (Clearance Error):** Yellow indication following a green is missing or shorter than 2.7 seconds (with  $\pm 0.1$ -second accuracy). If a channel fails to detect an “on” signal at the Yellow input for a minimum of 2.7 seconds ( $\pm 0.1$  second) following the detection of an “on” signal at a Green input for that channel, ensure that the monitor triggers and generates a clearance/short yellow error fault indication. Short/missing yellow (clearance) monitoring shall be enabled on a per channel basis by the use of switches located on the conflict monitor. This fault shall not occur when the channel is programmed for Yellow Inhibit, when the Red Enable signal is inactive or pin #EE (output relay common) is active.
3. **Dual Indications on the Same Channel:** In this condition, more than one indication (R,Y,G) is detected as “on” at the same time on the same channel. If dual indications are detected for a period greater than 500 ms, ensure that the conflict monitor triggers and displays the proper failure indication (Dual Ind fault). If this condition is detected for less than 200 ms, ensure that the monitor does not trigger. G-Y-R dual indication monitoring shall be enabled on a per channel basis by the use of switches located on the conflict monitor.

G-Y dual indication monitoring shall be enabled for all channels by use of a switch located on the conflict monitor. This fault shall not occur when the Red Enable signal is inactive or pin #EE (output relay common) is active.

4. **Configuration Settings Change:** The configuration settings are comprised of (as a minimum) the permissive diode matrix, dual indication switches, yellow disable jumpers, any option switches, any option jumpers, and the Watchdog Enable switch. Ensure the conflict monitor compares the current configuration settings with the previous stored configuration settings on power-up, on reset, and periodically during operation. If any of the configuration settings are changed, ensure that the conflict monitor triggers and causes the program card indicator to flash. Ensure that configuration change faults are only reset by depressing and holding the front panel reset button for a minimum of three seconds. Ensure the external remote reset input does not reset configuration change faults.

Ensure the conflict monitor will trigger and the AC Power indicator will flash at a rate of  $2 \text{ Hz} \pm 20\%$  with a 50% duty cycle when the AC Line voltage falls below the “drop-out” level. Ensure the conflict monitor will resume normal operation when the AC Line voltage returns above the “restore” level. Ensure the AC Power indicator will remain illuminated when the AC voltage returns above the “restore” level. Should an AC Line power interruption occur while the monitor is in the fault mode, then upon restoration of AC Line power, the monitor will remain in the fault mode and the correct fault and channel indicators will be displayed.

Provide a flash interval of at least 6 seconds and at most 10 seconds in duration following a power-up, an AC Line interruption, or a brownout restore. Ensure the conflict monitor will suspend all fault monitoring functions, close the Output relay contacts, and flash the AC indicator at a rate of  $4 \text{ Hz} \pm 20\%$  with a 50% duty cycle during this interval. Ensure the termination of the flash interval after at least 6 seconds if the Watchdog input has made 5 transitions between the True and False state and the AC Line voltage is greater than the “restore” level. If the watchdog input has not made 5 transitions between the True and False state within  $10 \pm 0.5$  seconds, the monitor shall enter a WDT error fault condition.

Ensure the conflict monitor will monitor an intersection with a minimum of four approaches using the four-section Flashing Yellow Arrow (FYA) vehicle traffic signal as outlined by the NCHRP 3-54 research project for protected-permissive left turn signal displays. Ensure the conflict monitor will operate in the FYA mode and FYAc (Compact) mode as specified below to monitor each channel for the following fault conditions: Conflict, Red Fail, Dual Indication, and Clearance. Provide a switch to select between the FYA mode and FYAc mode. Provide a switch to select each FYA phase movement for monitoring.

#### FYA mode

| FYA Signal Head       | Phase 1          | Phase 3           | Phase 5           | Phase 7           |
|-----------------------|------------------|-------------------|-------------------|-------------------|
| Red Arrow             | Channel 9 Red    | Channel 10 Red    | Channel 11 Red    | Channel 12 Red    |
| Yellow Arrow          | Channel 9 Yellow | Channel 10 Yellow | Channel 11 Yellow | Channel 12 Yellow |
| Flashing Yellow Arrow | Channel 9 Green  | Channel 10 Green  | Channel 11 Green  | Channel 12 Green  |
| Green Arrow           | Channel 1 Green  | Channel 3 Green   | Channel 5 Green   | Channel 7 Green   |

**FYAc mode**

| FYA Signal Head       | Phase 1          | Phase 3          | Phase 5          | Phase 7           |
|-----------------------|------------------|------------------|------------------|-------------------|
| Red Arrow             | Channel 1 Red    | Channel 3 Red    | Channel 5 Red    | Channel 7 Red     |
| Yellow Arrow          | Channel 1 Yellow | Channel 3 Yellow | Channel 5 Yellow | Channel 7 Yellow  |
| Flashing Yellow Arrow | Channel 1 Green  | Channel 3 Green  | Channel 5 Green  | Channel 7 Green   |
| Green Arrow           | Channel 9 Green  | Channel 9 Yellow | Channel 10 Green | Channel 10 Yellow |

Ensure that the conflict monitor will log at least nine of the most recent events detected by the monitor in non-volatile EEPROM memory (or equivalent). For each event, record at a minimum the time, date, type of event, status of each field signal indication with RMS voltage, and specific channels involved with the event. Ensure the conflict monitor will log the following events: monitor reset, configuration, previous fault, and AC line. Furnish the signal sequence log that shows all channel states (Greens, Yellows, and Reds) and the Red Enable State for a minimum of 2 seconds prior to the current fault trigger point. Ensure the display resolution of the inputs for the signal sequence log is not greater than 50 ms.

Provide a RS-232C/D compliant port (DB-9 female connector) on the front panel of the conflict monitor in order to provide communications from the conflict monitor to the 170/2070L controller or to a Department-furnished laptop computer. Electrically isolate the port interface electronics from all monitor electronics, excluding Chassis Ground. Ensure that the controller can receive all event log information through a controller Asynchronous Communications Interface Adapter (Type 170E) or Async Serial Comm Module (2070L). Provide a Windows based graphic user interface software to communicate directly through the same monitor RS-232C/D compliant port to retrieve and view all event log information to a Department-furnished laptop computer. The RS-232C/D compliant port on the monitor shall allow the monitor to function as a DCE device with pin connections as follows:

| <b>Conflict Monitor RS-232C/D (DB-9 Female) Pinout</b> |                 |            |
|--------------------------------------------------------|-----------------|------------|
| <b>Pin Number</b>                                      | <b>Function</b> | <b>I/O</b> |
| 1                                                      | DCD             | O          |
| 2                                                      | TX Data         | O          |
| 3                                                      | RX Data         | I          |
| 4                                                      | DTR             | I          |
| 5                                                      | Ground          | -          |
| 6                                                      | DSR             | O          |
| 7                                                      | CTS             | I          |
| 8                                                      | RTS             | O          |
| 9                                                      | NC              | -          |

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**MONITOR BOARD EDGE CONNECTOR**


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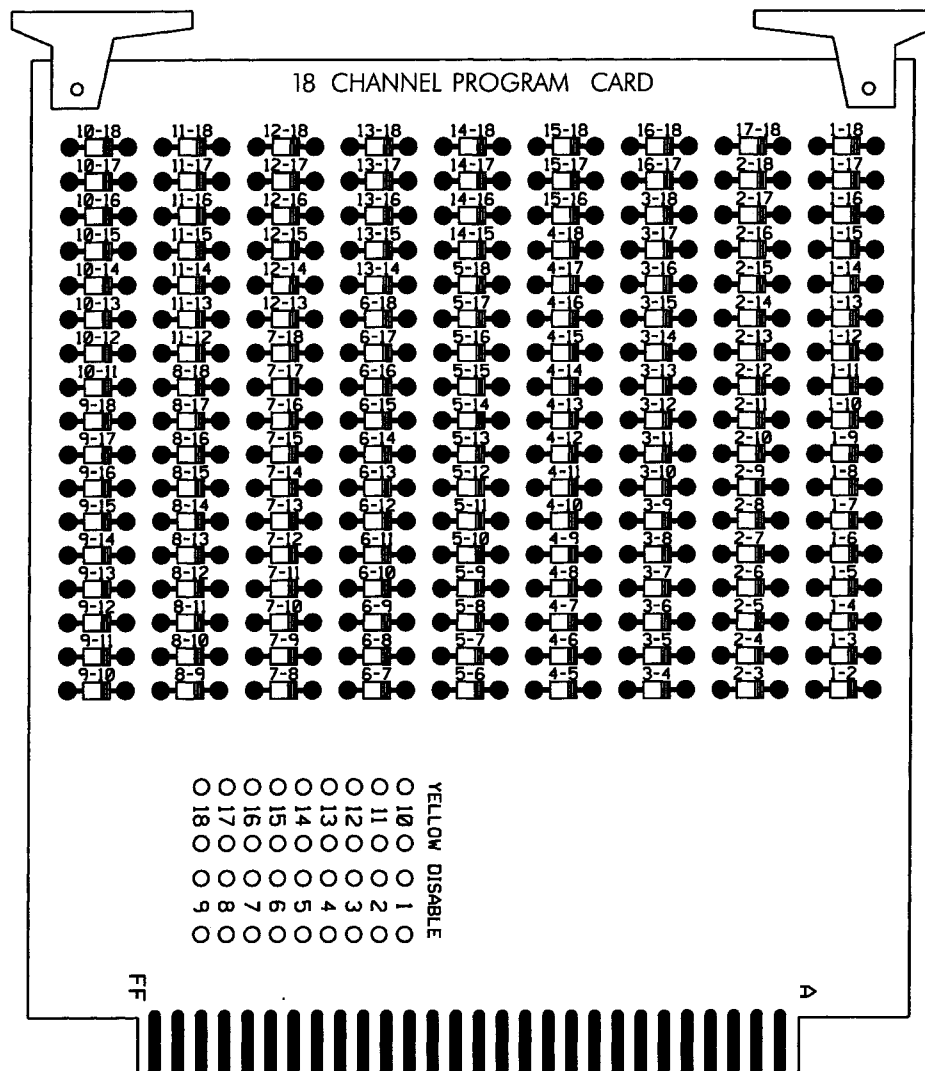
| <b>Pin #</b> | <b>Function (Back Side)</b> | <b>Pin #</b> | <b>Function (Component Side)</b> |
|--------------|-----------------------------|--------------|----------------------------------|
| 1            | Channel 2 Green             | A            | Channel 2 Yellow                 |
| 2            | Channel 13 Green            | B            | Channel 6 Green                  |
| 3            | Channel 6 Yellow            | C            | Channel 15 Green                 |
| 4            | Channel 4 Green             | D            | Channel 4 Yellow                 |
| 5            | Channel 14 Green            | E            | Channel 8 Green                  |
| 6            | Channel 8 Yellow            | F            | Channel 16 Green                 |
| 7            | Channel 5 Green             | H            | Channel 5 Yellow                 |
| 8            | Channel 13 Yellow           | J            | Channel 1 Green                  |
| 9            | Channel 1 Yellow            | K            | Channel 15 Yellow                |
| 10           | Channel 7 Green             | L            | Channel 7 Yellow                 |
| 11           | Channel 14 Yellow           | M            | Channel 3 Green                  |
| 12           | Channel 3 Yellow            | N            | Channel 16 Yellow                |
| 13           | Channel 9 Green             | P            | Channel 17 Yellow                |
| 14           | Channel 17 Green            | R            | Channel 10 Green                 |
| 15           | Channel 11 Yellow           | S            | Channel 11 Green                 |
| 16           | Channel 9 Yellow            | T            | Channel 18 Yellow                |
| 17           | Channel 18 Green            | U            | Channel 10 Yellow                |
| --           |                             | --           |                                  |
| 18           | Channel 12 Yellow           | V            | Channel 12 Green                 |
| 19           | Channel 17 Red              | W            | Channel 18 Red                   |
| 20           | Chassis Ground              | X            | Not Assigned                     |
| 21           | AC-                         | Y            | DC Common                        |
| 22           | Watchdog Timer              | Z            | External Test Reset              |
| 23           | +24VDC                      | AA           | +24VDC                           |
| 24           | Tied to Pin 25              | BB           | Stop Time (Output)               |
| 25           | Tied to Pin 24              | CC           | Not Assigned                     |
| 26           | Not Assigned                | DD           | Not Assigned                     |
| 27           | Relay Output, Side #3, N.O. | EE           | Relay Output, Side #2, Common    |
| 28           | Relay Output, Side #1, N.C. | FF           | AC+                              |

-- Slotted for keying between Pins 17/U and 18/V

**CONFLICT PROGRAM CARD PIN ASSIGNMENTS**

| <b>Pin #</b> | <b>Function (Back Side)</b> | <b>Pin #</b> | <b>Function (Component Side)</b> |
|--------------|-----------------------------|--------------|----------------------------------|
| 1            | Channel 2 Green             | A            | Channel 1 Green                  |
| 2            | Channel 3 Green             | B            | Channel 2 Green                  |
| 3            | Channel 4 Green             | C            | Channel 3 Green                  |
| 4            | Channel 5 Green             | D            | Channel 4 Green                  |
| 5            | Channel 6 Green             | E            | Channel 5 Green                  |
| 6            | Channel 7 Green             | F            | Channel 6 Green                  |
| 7            | Channel 8 Green             | H            | Channel 7 Green                  |
| 8            | Channel 9 Green             | J            | Channel 8 Green                  |
| 9            | Channel 10 Green            | K            | Channel 9 Green                  |
| 10           | Channel 11 Green            | L            | Channel 10 Green                 |
| 11           | Channel 12 Green            | M            | Channel 11 Green                 |
| 12           | Channel 13 Green            | N            | Channel 12 Green                 |
| 13           | Channel 14 Green            | P            | Channel 13 Green                 |
| 14           | Channel 15 Green            | R            | Channel 14 Green                 |
| 15           | Channel 16 Green            | S            | Channel 15 Green                 |
| 16           | N/C                         | T            | PC AJAR                          |
| 17           | Channel 1 Yellow            | U            | Channel 9 Yellow                 |
| 18           | Channel 2 Yellow            | V            | Channel 10 Yellow                |
| 19           | Channel 3 Yellow            | W            | Channel 11 Yellow                |
| 20           | Channel 4 Yellow            | X            | Channel 12 Yellow                |
| 21           | Channel 5 Yellow            | Y            | Channel 13 Yellow                |
| 22           | Channel 6 Yellow            | Z            | Channel 14 Yellow                |
| 23           | Channel 7 Yellow            | AA           | Channel 15 Yellow                |
| 24           | Channel 8 Yellow            | BB           | Channel 16 Yellow                |
| --           |                             | --           |                                  |
| 25           | Channel 17 Green            | CC           | Channel 17 Yellow                |
| 26           | Channel 18 Green            | DD           | Channel 18 Yellow                |
| 27           | Channel 16 Green            | EE           | PC AJAR (Program Card)           |
| 28           | Yellow Inhibit Common       | FF           | Channel 17 Green                 |

-- Slotted for keying between Pins 24/BB and 25/CC



## 5. POWDER COAT FOR METAL POLES AND MAST ARMS

### 5.1. DESCRIPTION

Powder coat all metal signal poles and mast arms with metal signal poles and all necessary hardware for the new signalized intersections located on Morganton Road in accordance with the plans and specifications.

### 5.2. MATERIALS

Furnish signal support metal poles and mast arms with metal poles, grounding systems, and all necessary hardware. Furnish metal poles and metal poles and mast arms that have a high density, low gloss polyester, thermosetting resin powder coat finish that is **black** in color applied over a hot-dipped galvanized surface.

Provide a removable pole cap with stainless steel attachment screws for the top of each pole. Furnish removable pole caps that have a high density, low gloss polyester, thermosetting resin powder coat finish that is **black** in color applied over a hot-dipped galvanized surface.

Furnish housings for mounting of pedestrian pushbuttons. Provide housings that have a high density, low gloss polyester, thermosetting resin powder coat finish that is **black** in color applied over a hot-dipped galvanized surface.

**5.3. MEASUREMENT AND PAYMENT**

Actual number of **black** powder coating for single mast arm assemblies furnished, installed, and accepted.

Actual number of **black** powder coating for double mast arm assemblies furnished, installed, and accepted.

**Payment will be made under:**

|                                                       |      |
|-------------------------------------------------------|------|
| Powder Coat for Single Mast Arm with Metal Pole.....  | Each |
| Powder Coat for Double Mast Arm with Metal Pole ..... | Each |



**Project Special Provisions  
Structures**

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*Jesse McArthur Bailey*  
6/24/12

**PROJECT SPECIAL PROVISIONS**  
**STRUCTURES**

**PROJECT U-3324**

**MOORE COUNTY**

**MAINTENANCE AND PROTECTION OF TRAFFIC**  
**BENEATH PROPOSED STRUCTURE AT STATION 21+37.80 -Y6-**

**(8-13-04)**

**1.0 GENERAL**

Maintain traffic on US 1 as shown in Traffic Control Plans and as directed by the Engineer.

Provide a minimum temporary vertical clearance of 16'-7" at all times during construction.

Submit plans and calculations for review and approval for protecting traffic and bracing girders, as described herein, at the above station before beginning work at this location. Have the drawings and design calculations prepared, signed, and sealed by a North Carolina Registered Professional Engineer. The approval of the Engineer will not relieve the Contractor of the responsibility for the safety of the method or equipment.

**2.0 PROTECTION OF TRAFFIC**

Protect traffic from any operation that affords the opportunity for construction materials, equipment, tools, etc. to be dropped into the path of traffic beneath the structure. Based on Contractor means and methods determine and clearly define all dead and live loads for this system, which, at a minimum, shall be installed between beams or girders over any travelway or shoulder area where traffic is maintained. Install the protective system before beginning any construction operations over traffic. In addition, for these same areas, keep the overhang falsework in place until after the rails have been poured.

**3.0 BRACING GIRDERS**

Brace girders to resist wind forces, weight of forms and other temporary loads, especially those eccentric to the vertical axis of the member during all stages of erection and construction. Before casting of intermediate diaphragms, decks, or connecting steel diaphragms do not allow the horizontal movement of girders to exceed ½ inch.

**4.0 BASIS OF PAYMENT**

Payment at the contract unit prices for the various pay items will be full compensation for the above work.

**POT BEARINGS****(9-30-11)****1.0 GENERAL**

This item consists of furnishing, fabrication and installation of pot bearings in accordance with AASHTO LRFD Bridge Design Specifications, the Standard Specifications, the recommendations of the manufacturer and the details shown on the plans and as specified herein.

Fixed pot bearings consist of a sole plate, a disc of elastomer in a steel cylinder with a snug fitting steel piston, masonry plate, anchor bolts, nuts and washers. Expansion pot bearings consist of a sole plate, a top steel plate with a polished stainless steel sheet facing bearing on a fixed pot bearing with a layer of virgin polytetrafluoroethylene (PTFE) material on its top, masonry plate, anchor bolt assembly which includes anchor bolts, nuts, washers, pipe sleeves, a closure plate, grout and various sizes of standard pipe and any other necessary material as detailed on the plans.

**2.0 MATERIALS**

Use pot bearings produced by the same manufacturer.

Use AASHTO M270 Grade 50W (345W) for all steel in the pot bearings. Clean, coat, and seal the plates in the pot bearing assemblies except for the areas with special facings and the internal surfaces of pot, in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)". Metallization of the internal surfaces of the pot is permitted provided these surfaces are then polished to a surface smoother than 60 micro inches. The surfaces shall be coated to a thickness of 8 mils minimum on all external parts. Repair surfaces that are abraded or damaged after the application of metallizing in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)".

Galvanize all fill plates specified on the plans. Provide anchor bolts and nuts in accordance with the Standard Specifications.

When the maximum plan dimension of the sheet is 12" or less, provide a stainless steel sheet in expansion pot bearings that is at least 16 gage or 1/16". When the maximum plan dimension is greater than 12", provide a stainless steel sheet that is at least 11 gage or 1/8". Ensure that all stainless steel sheets are in conformance with ASTM A240/A167 Type 304 and polished to a minimum #8 mirror surface finish.

Blast clean the surface of the plate that will be attached to the stainless sheet to a near white condition in accordance with the Standard Specifications. Position and clamp the back of the stainless sheet that is to be in contact with the steel plate on the steel plate. Apply the stainless steel to the blast cleaned surface of the steel plate as soon as possible after blasting and before any visible oxidation of the blast cleaned surface occurs. Weld the stainless sheet continuously around its perimeter using a tungsten inert gas, wire-fed welder.

For the PTFE sheet, used as a mating surface for the stainless sheet, provide an unfilled virgin PTFE Sheet (Recessed) or a glass-fiber filled PTFE sheet, resulting from skiving billets formed under hydraulic pressure and heat. Provide resin that conforms to the requirements of ASTM D4894 or D4895.

To bond the PTFE and the piston, use heat cured high temperature epoxy capable of withstanding temperature of -320°F to 500°F.

Provide a neoprene or natural rubber elastomer with a durometer hardness of 50 that allows for a minimum rotation of 0.02 radians. Place a 1/64" thick unfilled PTFE disc or other approved lubricant that is not detrimental to the elastomer on either side of the elastomer inside the bearing. Use a brass sealing ring with the neoprene or natural rubber elastomer.

### **3.0 DESIGN**

Have the manufacturer design the pot bearings for the loads and movements shown on the contract plans. However, use the anchor bolt size, length, spacing and masonry plate thickness as shown on the contract plans and provide an overall height of the bearing assembly that is at least the height shown on the contract plans, but no more than 1/2 inch greater than this height. Either combine, cast as a single piece, or weld together the sole plate and top plate/piston and the cylinder with the masonry plate.

When designing the bearings, use the following allowable bearing stresses:

- On confined elastomer: 3500 psi
- On PTFE Sliding Surface, filled or unfilled PTFE (recessed): 3500 psi

Submit eight sets of shop drawings and one set of design calculations for review, comments and acceptance. Have a North Carolina Registered Professional Engineer check and seal the shop drawings and design calculations.

After the Engineer reviews the drawings and, if necessary, corrections are made, submit one 22" x 34" reproducible set of the working drawings.

### **4.0 SAMPLING AND TESTING**

#### **A. Sampling**

The manufacturer is responsible for randomly selecting and testing sample bearings from completed lots of bearings. The manufacturer is also responsible for certifying that the completed bearings and their components have been tested and are in compliance with the requirements of this Special Provision. The manufacturer shall furnish results of the tests to the Materials and Tests Engineer.

## B. Testing

### 1. Proof Load Test

Load a test bearing to 150% of the bearing's rated design capacity and simultaneously subject it to a rotational range of 0.02 radians (1.146°) for a period of 1 hour.

Have the bearing visually examined both during the test and upon disassembly after the test. Any resultant visual defects, such as extruded or deformed elastomer or PTFE, damaged seals or rings, or cracked steel is cause for rejection.

Keep the steel bearing plate and steel piston in continuous and uniform contact for the duration of the test. Any observed lift-off is cause for rejection.

### 2. Sliding Coefficient of Friction

For all guided and non-guided expansion type bearings, measure the sliding coefficient of friction at the bearing's design capacity in accordance with the test method described below, and on the fifth and fiftieth cycles, at a sliding speed of 1 in/min.

Calculate the sliding coefficient of friction as the horizontal load required to maintain continuous sliding of one bearing, divided by the bearing's vertical design capacity.

The test results are evaluated as follows:

- A maximum measured sliding coefficients of friction of 3%.
- A visual examination both during and after the test. Any resultant visual defects, such as bond failure, physical destruction, cold flow of PTFE to the point of debonding, or damaged components is cause for rejection of the lot.

Using undamaged test bearings in the work is permitted.

### 3. Test Method

For the test method and equipment, meet the following requirements:

- a. Arrange the test to determine the coefficient of friction on the first movement of the manufactured bearing.
- b. Clean the bearing surface prior to testing.
- c. Conduct the test at maximum working stress for the PTFE surface with the test load applied continuously for 12 hours prior to measuring friction.

- d. Determine the first movement static and dynamic coefficient of friction of the test bearing at a sliding speed of less than 1 in/min, not to exceed:
 

|      |               |
|------|---------------|
| 0.04 | unfilled PTFE |
| 0.08 | filled PTFE   |
- e. Subject the bearing specimen to 100 movements of at least 1 inch of relative movement and, if the test facility permits, the full design movement at a speed of less than 1 ft/min. Following this test determine the static and kinetic coefficient of friction again. The specimen is considered a failure if it exceeds the values measured in (d) above or if it shows any signs of bond failure or other defects.

Bearings represented by test specimens passing the above requirements are approved for use in the structure subject to on-site inspection for visible defects.

## **5.0 INSTALLATION**

Prior to shipment, seal the joint between the steel piston and the steel cylinder with a bead of caulk. Store pot bearings delivered to the bridge site under cover on a platform above the ground surface. Protect the bearings from injury at all times and, before placing the bearings, dry and clean all dirt, oil, grease or other foreign substances from the bearing. Do not disassemble the bearings during installation, except at the manufacturer's direction. Place the bearings in accordance with the recommendations of the manufacturer, Contract Drawings, and as directed by the Engineer. If there is any discrepancy between the recommendations of the manufacturer, Special Provisions, and Contract Drawings, the Engineer is the sole judge in reconciling any such discrepancy.

Provide preformed bearing pads under the masonry plates in accordance with Article 1079-1 of the Standard Specifications.

Do not install any bearing before the Engineer approves it.

## **6.0 BASIS OF PAYMENT**

Payment will be at the lump sum contract price bid for "Pot Bearings" which price will be full compensation for furnishing all labor, materials, tools, equipment and incidentals required to complete the work in accordance with the Standard Specifications, this Special Provision, the manufacturer's requirements and as directed by the Engineer.

## **OPTIONAL DISC BEARINGS**

**(9-30-11)**

### **1.0 GENERAL**

This item consists of furnishing, fabrication and installation of disc bearings in accordance with AASHTO LRFD Bridge Design Specifications, the Standard Specifications, the recommendations of the manufacturer and as specified herein. In addition, all plan notes

pertaining to furnishing and installing pot bearing assemblies shall also apply to disc bearing assemblies, except as noted herein.

Disc Bearings consist of a polyether urethane structural element (disc) confined by upper and lower steel bearing plates. Equip disc bearings with a shear restriction mechanism to prevent movement of the disc. Supply disc bearings as fixed bearings and guided expansion bearings as designated by the Contract Documents.

Fixed disc bearings allow rotation but no longitudinal or transverse movement in the bearing plane. Fixed bearings consist of a sole plate, an elastomer disc, upper bearing plate, lower bearing plate, masonry plate, anchor bolts, nuts and washers.

Guided expansion disc bearings allow rotation and only longitudinal movement in the bearing plane. Guided expansion disc bearings consist of a sole plate, a top steel plate with a polished stainless steel sheet facing bearing on a fixed disc bearing with a layer of virgin polytetrafluoroethylene (PTFE) material on its top, masonry plate, anchor bolt assembly which includes anchor bolts, nuts, washers, pipe sleeves, a closure plate, grout and various sizes of standard pipe and any other necessary material as detailed on the plans. To allow longitudinal movement, bond a polytetrafluoroethylene (PTFE) sheet to the upper steel bearing plate. Support a sliding steel top bearing plate with the upper steel bearing plate. Face the mating surface of the sliding steel top bearing plate with polished stainless steel. Use either a guide bar or keyway system to restrict transverse movement. Face the sliding surfaces of the guide bar or keyway systems with either PTFE sheets or stainless steel.

## 2.0 MATERIALS

Use disc bearings produced by the same manufacturer.

Use AASHTO M270 Grade 50W (345W) for all steel in the disc bearings. Clean, coat, and seal the plates in the disc bearing assemblies except for the areas with special facings and the areas that come in contact with the elastomer disc, in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)". The surfaces shall be coated to a thickness of 8 mils minimum on all external parts. Repair surfaces that are abraded or damaged after the application of metallizing in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)".

Provide anchor bolts and nuts in accordance with the Standard Specifications.

When the maximum plan dimension of the sheet is 12" or less, provide a stainless steel sheet in expansion disc bearings that is at least 16 gage or 1/16". When the maximum plan dimension is greater than 12", provide a stainless steel sheet that is at least 11 gage or 1/8". Ensure that all stainless steel sheets are in conformance with ASTM A240/A167 Type 304 and polished to a minimum #8 mirror surface finish.

Blast clean the surface of the plate that will be attached to the stainless sheet to a near white condition in accordance with the Standard Specifications. Position and clamp the back of the stainless sheet that is to be in contact with the steel plate on the steel plate. Apply the stainless steel to the blast cleaned surface of the steel plate as soon as possible after blasting

and before any visible oxidation of the blast cleaned surface occurs. Weld the stainless sheet continuously around its perimeter using a tungsten inert gas, wire-fed welder.

For the PTFE sheet, used as a mating surface for the stainless sheet, provide an unfilled virgin PTFE Sheet (Recessed) or a glass-fiber filled PTFE sheet, resulting from skiving billets formed under hydraulic pressure and heat. Provide resin that conforms to the requirements of ASTM D4894 or D4895.

To bond the PTFE and the bearing plate, use heat cured high temperature epoxy capable of withstanding temperature of  $-320^{\circ}\text{F}$  to  $500^{\circ}\text{F}$ .

Mold the polyether urethane structural element from a polyether urethane compound. Conform the physical properties of the polyether urethane to the following requirements:

| Physical Property                                              | ASTM Test Method | Requirements |      |
|----------------------------------------------------------------|------------------|--------------|------|
|                                                                |                  | Min.         | Max. |
| Hardness, Type D Durometer                                     | D2240            | 60           | 64   |
| Tensile Stress psi<br>At 100% elongation<br>At 200% elongation | D412             | 2000<br>3700 | ---- |
| Tensile Strength psi                                           | D412             | 5000         | ---- |
| Ultimate Elongation %                                          | D412             | 220          | ---- |
| Compression Set %<br>22 hrs. at $158^{\circ}\text{F}$          | D395             | ----         | 40   |

### 3.0 DESIGN

Design the disc bearings for the loads and movements shown on the contract plans. However, use the anchor bolt size, length, spacing and masonry plate thickness as shown on the contract plans and provide an overall height of the bearing assembly that is at least the height shown on the contract plans, but no more than 1/2 inch greater than this height. Either combine and cast the sole plate and top plate/upper bearing plate and the lower bearing plate and masonry plate as a single unit or weld together prior to the installation of the disc.

When designing the bearings, use the following allowable bearing stresses:

- On polyether urethane structural element: 5000 psi
- On PTFE Sliding Surface, filled or unfilled PTFE (recessed): 3500 psi



Submit eight sets of shop drawings and one set of design calculations for review, comments and acceptance. Have a North Carolina Registered Professional Engineer check and seal the shop drawings and design calculations.

After the Engineer reviews the drawings and, if necessary, corrections are made, submit one 22" x 34" reproducible set of the working drawings.

#### **4.0 SAMPLING AND TESTING**

##### **A. Sampling**

The manufacturer is responsible for randomly selecting and testing sample bearings from completed lots of bearings. The manufacturer is also responsible for certifying that the completed bearings and their components have been tested and are in compliance with the requirements of this Special Provision. The manufacturer shall furnish the results of the tests to the Materials and Tests Engineer.

##### **B. Testing**

###### **1. Proof Load Test**

Load a test bearing to 150% of the bearing's rated design capacity and simultaneously subject it to a rotational range of 0.02 radians (1.146°) for a period of 1 hour.

Have the bearing visually examined both during the test and upon disassembly after the test. Any resultant visual defects, such as extruded or deformed elastomer or PTFE, damaged seals or rings, or cracked steel is cause for rejection.

Keep continuous and uniform contact between the polyether urethane element and the bearing plates and between the sliding steel top plate and the upper bearing plate for the duration of the test. Any observed lift-off is cause for rejection.

###### **2. Sliding Coefficient of Friction**

For all guided and non-guided expansion type bearings, measure the sliding coefficient of friction at the bearing's design capacity in accordance with the test method described below, and on the fifth and fiftieth cycles, at a sliding speed of 1 in/min.

Calculate the sliding coefficient of friction as the horizontal load required to maintain continuous sliding of one bearing, divided by the bearing's vertical design capacity.

The test results are evaluated as follows:

- A maximum measured sliding coefficient of friction of 3%.
- A visual examination both during and after the test. Any resultant visual defects, such as bond failure, physical destruction, cold flow of PTFE to the point of debonding, or damaged components is cause for rejection of the lot.

Using undamaged test bearings in the work is permitted.

### 3. Test Method

The test method and equipment shall meet the following requirements:

- f. Arrange the test to determine the coefficient of friction on the first movement of the manufactured bearing.
- g. Clean the bearing surface prior to testing.
- h. Conduct the test at maximum working stress for the PTFE surface with the test load applied continuously for 12 hours prior to measuring friction.
- i. Determine the first movement static and dynamic coefficient of friction of the test bearing at a sliding speed of less than 1 in/min, not to exceed:
  - 0.04 unfilled PTFE
  - 0.08 filled PTFE
- j. Subject the bearing specimen to 100 movements of at least 1 inch of relative movement and, if the test facility permits, the full design movement at a speed of less than 1 ft/min. Following this test determine the static and kinetic coefficient of friction again. The specimen is considered a failure if it exceeds the values measured in (d) above or if it shows any signs of bond failure or other defects.

Bearings represented by test specimens passing the above requirements are approved for use in the structure subject to on-site inspection for visible defects.

## 5.0 INSTALLATION

Store disc bearings delivered to the bridge site under cover on a platform above the ground surface. Protect the bearings from injury at all times and, before placing the bearings, dry and clean all dirt, oil, grease or other foreign substances from the bearing. Do not disassemble the bearings during installation, except at the manufacturer's direction. Place the bearings in accordance with the recommendations of the manufacturer, Contract Drawings, and as directed by the Engineer. If there is any discrepancy between the recommendations of the manufacturer, Special Provisions, and Contract Drawings, the Engineer is the sole judge in reconciling any such discrepancy.

Provide preformed bearing pads under the masonry plates in accordance with Article 1079-1 of the Standard Specifications.

Do not install any bearing before the Engineer approves it.

## **6.0 BASIS OF PAYMENT**

Payment for all optional disc bearings will be at the lump sum contract price bid for “Pot Bearings” which includes full compensation for furnishing all disc bearings, labor, materials, tools, equipment, testing and incidentals required to complete the work in accordance with the Standard Specifications, this Special Provision, the manufacturer’s requirements and as directed by the Engineer.

## **THERMAL SPRAYED COATINGS (METALLIZATION)**

**(9-30-11)**

### **1.0 DESCRIPTION**

Apply a thermal sprayed coating (TSC) and sealer to metal surfaces as specified herein when called for on the plans or by other Special Provisions, or when otherwise approved by the Engineer in accordance with the SSPC-CS 23.00/AWS C2.23/NACE No. 12 Specification. Only Arc Sprayed application methods are used to apply TSC coatings, the Engineer must approve other methods of application.

### **2.0 QUALIFICATIONS**

Only use NCDOT approved TSC Contractors meeting the following requirements:

1. The capability of blast cleaning steel surfaces to SSPC SP-5 and SP-10 Finishes.
2. Employ Spray Operator(s) qualified in accordance with AWS C.16/C2.16M2002 and Quality Control Inspector(s) who have documented training in the applicable test procedures of ASTM D-3276 and SSPC-CS 23.00.

A summary of the contractor’s related work experience and the documents verifying each Spray Operator’s and Quality Control Inspector’s qualifications are submitted to the Engineer before any work is performed.

### **3.0 MATERIALS**

Provide wire in accordance with the metallizing equipment manufacturer’s recommendations. Use the wire alloy specified on the plans which meets the requirements in Annex C of the SSPC-CS 23.00 Specification. Have the contractor provide a certified analysis (NCDOT Type 2 Certification) for each lot of wire material.

Apply an approved sealer to all metallized surfaces in accordance with Section 9 of SSPC-CS 23. The sealer must either meet SSPC Paint 27 or is an alternate approved by the Engineer.

#### 4.0 SURFACE PREPARATION AND TSC APPLICATION

Grind flame cut edges to remove the carbonized surface prior to blasting. Bevel all flame cut edges in accordance with Article 442-10(D) regardless of included angle. Blast clean surfaces to be metallized with grit or mineral abrasive in accordance with Steel Structures Painting Council SSPC SP-5/10(as specified) to impart an angular surface profile of 2.5 - 4.0 mils. Surface preparation hold times are in accordance with Section 7.32 of SSPC-CS 23. If flash rusting occurs prior to metallizing, blast clean the metal surface again. Apply the thermal sprayed coating only when the surface temperature of the steel is at least 5°F above the dew point.

At the beginning of each work period or shift, conduct bend tests in accordance with Section 6.5 of SSPC-CS 23.00. Any disbonding or delamination of the coating that exposes the substrate requires corrective action, additional testing, and the Engineer's approval before resuming the metallizing process.

Apply TSC with the alloy to the thickness specified on the plans or as provided in the table below. All spot results (the average of 3 to 5 readings) must meet the minimum requirement. No additional tolerance (as allowed by SSPC PA-2) is permitted. (For Steel Beams: For pieces with less than 200 ft<sup>2</sup> measure 2 spots/surface per piece and for pieces greater than 200 ft<sup>2</sup> add 1 additional spots/surface for each 500 ft<sup>2</sup>).

| Application            | Thickness | Alloy                  | Seal Coat |
|------------------------|-----------|------------------------|-----------|
| Pot Bearings           | 8 mil     | 85/15 Zinc (W-Zn-Al-2) | 0.5 mil   |
| Armored Joint Angles   | 8 mil     | 85/15 Zinc (W-Zn-Al-2) | 0.5 mil   |
| Modular Joints         | 8 mil     | 99.99% Zn (W-Zn-1)     | 0.5 mil   |
| Expansion Joint Seals  | 8 mil     | 99.99% Zn (W-Zn-1)     | 0.5 mil   |
| Optional Disc Bearings | 8 mil     | 85/15 Zinc (W-Zn-Al-2) | 0.5 mil   |

When noted on the plans or as specified in the above chart, apply the sealer to all metallized surfaces in accordance with the manufacturer's recommendations and these provisions. Apply the seal coat only when the air temperature is above 40°F and the surface temperature of the steel is at least 5°F above the dew point. If the sealer is not applied within eight hours after the final application of TSC, the applicator verifies acceptable TSC surfaces and obtains approval from the Engineer before applying the sealer.

## 5.0 INSPECTION FREQUENCY

The TSC Contractor must conduct the following tests at the specified frequency and the results documented in a format approved by the Engineer.

| Test/Standard                            | Location                        | Frequency                                                                                                    | Specification                                                                                                                                                                                                             |
|------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient Conditions                       | Site                            | Each Process                                                                                                 | 5°F above the dew point                                                                                                                                                                                                   |
| Abrasive Properties                      | Site                            | Each Day                                                                                                     | Size, angularity, cleanliness                                                                                                                                                                                             |
| Surface Cleanliness<br>SSPC Vis 1        | All Surfaces                    | Visual All Surfaces                                                                                          | SSPC-SP-10 Atmospheric Service<br>SSPC-SP - 5 Immersion Service                                                                                                                                                           |
| Surface Profile<br>ASTM D-4417 Method C  | Random Surfaces                 | 3 per 500 ft <sup>2</sup>                                                                                    | 2.5 - 4.0 mils                                                                                                                                                                                                            |
| Bend Test<br>SSPC-CS 23.00               | Site                            | 5 per shift                                                                                                  | Pass Visual                                                                                                                                                                                                               |
| Thickness<br>SSPC PA-2R<br>SSPC-CS 23.00 | Each Surface                    | Use the method in PA-2 Appendix 3 for Girders and Appendix 4 for frames and miscellaneous steel. See Note 1. | Zn - 8 mils minimum<br>Al - 8 mils minimum<br>Zn Al - 8 mils minimum<br>Areas with more than twice the minimum thickness are inspected for compliance to the adhesion and cut testing requirements of this specification. |
| Adhesion ASTM 4541                       | Random Surfaces<br>Splice Areas | 1 set of 3 per 500 ft <sup>2</sup>                                                                           | Zn > 500 psi<br>Al > 1000 psi<br>Zn Al > 750 psi                                                                                                                                                                          |
| Cut Test - SSPC-CS 23.00                 | Random Surfaces                 | 3 sets of 3 per 500 ft <sup>2</sup>                                                                          | No peeling or delamination                                                                                                                                                                                                |
| Job Reference Std.<br>SSPC-CS 23.00      | Site                            | 1 per job                                                                                                    | Meets all the above requirements                                                                                                                                                                                          |

## 6.0 REPAIRS

All Repairs are to be performed in accordance with the procedures below, depending on whether the repair surface is hidden or exposed. As an exception to the following, field welded splices on joint angles and field welding bearing plates to girders may be repaired in accordance with the procedures for hidden surfaces.

**For hidden surfaces (including but not limited to interior girders, interior faces of exterior girders, and below-grade sections of piles):**

1. Welding of metallized surfaces may be performed only if specifically permitted by the Engineer. Remove metallizing at the location of field welds by blast cleaning (SSPC SP-6 finish), or hand (SSPC SP-2 finish) or power tool cleaning (SSPC SP-3 finish) just prior to welding. Clean sufficiently to prevent contamination of the weld. All repairs to welded connections are metallized in accordance with SSPC CS 23.00.
2. Minor areas less than or equal to  $0.1 \text{ ft}^2$  exposing the substrate are metallized in accordance with SSPC CS 23.00 or painted in accordance with ASTM A780, "Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings."
3. Large areas greater than  $0.1 \text{ ft}^2$  exposing the substrate are metallized in accordance with SSPC CS 23.00.
4. Damaged (burnished) areas not exposing the substrate with less than the specified coating thickness are metallized in accordance with SSPC CS 23.00 or painted in accordance with ASTM A780, "Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings."
5. Damaged (burnished) areas not exposing the substrate with more than the specified coating thickness are not repaired.
6. Defective coating is repaired by either method 2 or 3 depending on the area of the defect.

**For Exposed Surfaces (including but not limited to exterior faces of exterior girders and above-grade sections of piles):**

1. Welding of metallized surfaces may be performed only if specifically permitted by the Engineer. Remove metallization at the location of field welds by blast cleaning (SSPC SP-6 finish), or hand (SSPC SP-2 finish) or power tool cleaning (SSPC SP-3 finish) just prior to welding. Clean sufficiently to prevent contamination of the weld. All repairs to welded connections are metallized in accordance with SSPC CS 23.00.
2. All areas exposing the substrate are metallized in accordance with SSPC CS 23.00
3. Defective coating is repaired by either method 2 or 3 depending on the area of the defect.

## **7.0 TWELVE MONTH OBSERVATION PERIOD**

The contractor maintains responsibility for the coating system for a twelve (12) month observation period beginning upon the satisfactory completion of all the work required in the plans or as directed by the engineer. The contractor must guarantee the coating system under the payment and performance bond (refer to Article 109-10). To successfully complete the observation period, the coating system must meet the following requirements after twelve(12) months service:

- No visible rust, contamination or application defect is observed in any coated area.
- Painted surfaces have a uniform color and gloss.
- Surfaces have an adhesion of no less than 500 psi when tested in accordance with ASTM D-4541.

## **8.0 BASIS OF PAYMENT**

The contract price bid for the bridge component to which the coating is applied will be full compensation for the thermal sprayed coating.

# **FALSEWORK AND FORMWORK**

**(4-5-12)**

## **1.0 DESCRIPTION**

Use this Special Provision as a guide to develop temporary works submittals required by the Standard Specifications or other provisions; no additional submittals are required herein. Such temporary works include, but are not limited to, falsework and formwork.

Falsework is any temporary construction used to support the permanent structure until it becomes self-supporting. Formwork is the temporary structure or mold used to retain plastic or fluid concrete in its designated shape until it hardens. Access scaffolding is a temporary structure that functions as a work platform that supports construction personnel, materials, and tools, but is not intended to support the structure. Scaffolding systems that are used to temporarily support permanent structures (as opposed to functioning as work platforms) are considered to be falsework under the definitions given. Shoring is a component of falsework such as horizontal, vertical, or inclined support members. Where the term "temporary works" is used, it includes all of the temporary facilities used in bridge construction that do not become part of the permanent structure.

Design and construct safe and adequate temporary works that will support all loads imposed and provide the necessary rigidity to achieve the lines and grades shown on the plans in the final structure.

## **2.0 MATERIALS**

Select materials suitable for temporary works; however, select materials that also ensure the safety and quality required by the design assumptions. The Engineer has authority to reject material on the basis of its condition, inappropriate use, safety, or nonconformance

with the plans. Clearly identify allowable loads or stresses for all materials or manufactured devices on the plans. Revise the plan and notify the Engineer if any change to materials or material strengths is required.

### 3.0 DESIGN REQUIREMENTS

#### A. Working Drawings

Provide working drawings for items as specified in the contract, or as required by the Engineer, with design calculations and supporting data in sufficient detail to permit a structural and safety review of the proposed design of the temporary work.

On the drawings, show all information necessary to allow the design of any component to be checked independently as determined by the Engineer.

When concrete placement is involved, include data such as the drawings of proposed sequence, rate of placement, direction of placement, and location of all construction joints. Submit the number of copies as called for by the contract.

When required, have the drawings and calculations prepared under the guidance of, and sealed by, a North Carolina Registered Professional Engineer who is knowledgeable in temporary works design.

If requested by the Engineer, submit with the working drawings manufacturer's catalog data listing the weight of all construction equipment that will be supported on the temporary work. Show anticipated total settlements and/or deflections of falsework and forms on the working drawings. Include falsework footing settlements, joint take-up, and deflection of beams or girders.

As an option for the Contractor, overhang falsework hangers may be uniformly spaced, at a maximum of 36 inches, provided the following conditions are met:

| Member Type (PCG) | Member Depth, (inches) | Max. Overhang Width, (inches) | Max. Slab Edge Thickness, (inches) | Max. Screenshot Wheel Weight, (lbs.) | Bracket Min. Vertical Leg Extension, (inches) |
|-------------------|------------------------|-------------------------------|------------------------------------|--------------------------------------|-----------------------------------------------|
| II                | 36                     | 39                            | 14                                 | 2000                                 | 26                                            |
| III               | 45                     | 42                            | 14                                 | 2000                                 | 35                                            |
| IV                | 54                     | 45                            | 14                                 | 2000                                 | 44                                            |
| MBT               | 63                     | 51                            | 12                                 | 2000                                 | 50                                            |
| MBT               | 72                     | 55                            | 12                                 | 1700                                 | 48                                            |

Overhang width is measured from the centerline of the girder to the edge of the deck slab.

For Type II, III & IV prestressed concrete girders (PCG), 45-degree cast-in-place half hangers and rods must have a minimum safe working load of 6,000 lbs.



For MBT prestressed concrete girders, 45-degree angle holes for falsework hanger rods shall be cast through the girder top flange and located, measuring along the top of the member, 1'-2 1/2" from the edge of the top flange. Hanger hardware and rods must have a minimum safe working load of 6,000 lbs.

The overhang bracket provided for the diagonal leg shall have a minimum safe working load of 3,750 lbs. The vertical leg of the bracket shall extend to the point that the heel bears on the girder bottom flange, no closer than 4 inches from the bottom of the member. However, for 72-inch members, the heel of the bracket shall bear on the web, near the bottom flange transition.

Provide adequate overhang falsework and determine the appropriate adjustments for deck geometry, equipment, casting procedures and casting conditions.

If the optional overhang falsework spacing is used, indicate this on the falsework submittal and advise the girder producer of the proposed details. Failure to notify the Engineer of hanger type and hanger spacing on prestressed concrete girder casting drawings may delay the approval of those drawings.

Falsework hangers that support concentrated loads and are installed at the edge of thin top flange concrete girders (such as bulb tee girders) shall be spaced so as not to exceed 75% of the manufacturer's stated safe working load. Use of dual leg hangers (such as Meadow Burke HF-42 and HF-43) are not allowed on concrete girders with thin top flanges. Design the falsework and forms supporting deck slabs and overhangs on girder bridges so that there will be no differential settlement between the girders and the deck forms during placement of deck concrete.

When staged construction of the bridge deck is required, detail falsework and forms for screed and fluid concrete loads to be independent of any previous deck pour components when the mid-span girder deflection due to deck weight is greater than 3/4".

Note on the working drawings any anchorages, connectors, inserts, steel sleeves or other such devices used as part of the falsework or formwork that remains in the permanent structure. If the plan notes indicate that the structure contains the necessary corrosion protection required for a Corrosive Site, epoxy coat, galvanize or metalize these devices. Electroplating will not be allowed. Any coating required by the Engineer will be considered incidental to the various pay items requiring temporary works.

Design falsework and formwork requiring submittals in accordance with the 1995 AASHTO *Guide Design Specifications for Bridge Temporary Works* except as noted herein.

### 1. Wind Loads

Table 2.2 of Article 2.2.5.1 is modified to include wind velocities up to 110 mph. In addition, Table 2.2A is included to provide the maximum wind speeds by county in North Carolina.

**Table 2.2 - Wind Pressure Values**

| Height Zone<br>feet above ground | Pressure, lb/ft <sup>2</sup> for Indicated Wind Velocity, mph |    |    |     |     |
|----------------------------------|---------------------------------------------------------------|----|----|-----|-----|
|                                  | 70                                                            | 80 | 90 | 100 | 110 |
| 0 to 30                          | 15                                                            | 20 | 25 | 30  | 35  |
| 30 to 50                         | 20                                                            | 25 | 30 | 35  | 40  |
| 50 to 100                        | 25                                                            | 30 | 35 | 40  | 45  |
| over 100                         | 30                                                            | 35 | 40 | 45  | 50  |

### 2. Time of Removal

The following requirements replace those of Article 3.4.8.2.

Do not remove forms until the concrete has attained strengths required in Article 420-16 of the Standard Specifications and these Special Provisions.

Do not remove forms until the concrete has sufficient strength to prevent damage to the surface.

**Table 2.2A - Steady State Maximum Wind Speeds by Counties in North Carolina**

| COUNTY     | 25 YR<br>(mph) | COUNTY      | 25 YR<br>(mph) | COUNTY       | 25 YR<br>(mph) |
|------------|----------------|-------------|----------------|--------------|----------------|
| Alamance   | 70             | Franklin    | 70             | Pamlico      | 100            |
| Alexander  | 70             | Gaston      | 70             | Pasquotank   | 100            |
| Alleghany  | 70             | Gates       | 90             | Pender       | 100            |
| Anson      | 70             | Graham      | 80             | Perquimans   | 100            |
| Ashe       | 70             | Granville   | 70             | Person       | 70             |
| Avery      | 70             | Greene      | 80             | Pitt         | 90             |
| Beaufort   | 100            | Guilford    | 70             | Polk         | 80             |
| Bertie     | 90             | Halifax     | 80             | Randolph     | 70             |
| Bladen     | 90             | Harnett     | 70             | Richmond     | 70             |
| Brunswick  | 100            | Haywood     | 80             | Robeson      | 80             |
| Buncombe   | 80             | Henderson   | 80             | Rockingham   | 70             |
| Burke      | 70             | Hertford    | 90             | Rowan        | 70             |
| Cabarrus   | 70             | Hoke        | 70             | Rutherford   | 70             |
| Caldwell   | 70             | Hyde        | 110            | Sampson      | 90             |
| Camden     | 100            | Iredell     | 70             | Scotland     | 70             |
| Carteret   | 110            | Jackson     | 80             | Stanley      | 70             |
| Caswell    | 70             | Johnston    | 80             | Stokes       | 70             |
| Catawba    | 70             | Jones       | 100            | Surry        | 70             |
| Cherokee   | 80             | Lee         | 70             | Swain        | 80             |
| Chatham    | 70             | Lenoir      | 90             | Transylvania | 80             |
| Chowan     | 90             | Lincoln     | 70             | Tyrell       | 100            |
| Clay       | 80             | Macon       | 80             | Union        | 70             |
| Cleveland  | 70             | Madison     | 80             | Vance        | 70             |
| Columbus   | 90             | Martin      | 90             | Wake         | 70             |
| Craven     | 100            | McDowell    | 70             | Warren       | 70             |
| Cumberland | 80             | Mecklenburg | 70             | Washington   | 100            |
| Currituck  | 100            | Mitchell    | 70             | Watauga      | 70             |
| Dare       | 110            | Montgomery  | 70             | Wayne        | 80             |
| Davidson   | 70             | Moore       | 70             | Wilkes       | 70             |
| Davie      | 70             | Nash        | 80             | Wilson       | 80             |
| Duplin     | 90             | New Hanover | 100            | Yadkin       | 70             |
| Durham     | 70             | Northampton | 80             | Yancey       | 70             |
| Edgecombe  | 80             | Onslow      | 100            |              |                |
| Forsyth    | 70             | Orange      | 70             |              |                |

**B. Review and Approval**

The Engineer is responsible for the review and approval of temporary works' drawings.

Submit the working drawings sufficiently in advance of proposed use to allow for their review, revision (if needed), and approval without delay to the work.

The time period for review of the working drawings does not begin until complete drawings and design calculations, when required, are received by the Engineer.

Do not start construction of any temporary work for which working drawings are required until the drawings have been approved. Such approval does not relieve the Contractor of the responsibility for the accuracy and adequacy of the working drawings.

**4.0 CONSTRUCTION REQUIREMENTS**

All requirements of Section 420 of the Standard Specifications apply.

Construct temporary works in conformance with the approved working drawings. Ensure that the quality of materials and workmanship employed is consistent with that assumed in the design of the temporary works. Do not weld falsework members to any portion of the permanent structure unless approved. Show any welding to the permanent structure on the approved construction drawings.

Provide tell-tales attached to the forms and extending to the ground, or other means, for accurate measurement of falsework settlement. Make sure that the anticipated compressive settlement and/or deflection of falsework does not exceed 1 inch. For cast-in-place concrete structures, make sure that the calculated deflection of falsework flexural members does not exceed 1/240 of their span regardless of whether or not the deflection is compensated by camber strips.

**A. Maintenance and Inspection**

Inspect and maintain the temporary work in an acceptable condition throughout the period of its use. Certify that the manufactured devices have been maintained in a condition to allow them to safely carry their rated loads. Clearly mark each piece so that its capacity can be readily determined at the job site.

Perform an in-depth inspection of an applicable portion(s) of the temporary works, in the presence of the Engineer, not more than 24 hours prior to the beginning of each concrete placement. Inspect other temporary works at least once a month to ensure that they are functioning properly. Have a North Carolina Registered Professional Engineer inspect the cofferdams, shoring, sheathing, support of excavation structures, and support systems for load tests prior to loading.

**B. Foundations**

Determine the safe bearing capacity of the foundation material on which the supports for temporary works rest. If required by the Engineer, conduct load tests to verify proposed bearing capacity values that are marginal or in other high-risk situations.

The use of the foundation support values shown on the contract plans of the permanent structure is permitted if the foundations are on the same level and on the same soil as those of the permanent structure.

Allow for adequate site drainage or soil protection to prevent soil saturation and washout of the soil supporting the temporary works supports.

If piles are used, the estimation of capacities and later confirmation during construction using standard procedures based on the driving characteristics of the pile is permitted. If preferred, use load tests to confirm the estimated capacities; or, if required by the Engineer conduct load tests to verify bearing capacity values that are marginal or in other high risk situations.

The Engineer reviews and approves the proposed pile and soil bearing capacities.

**5.0 REMOVAL**

Unless otherwise permitted, remove and keep all temporary works upon completion of the work. Do not disturb or otherwise damage the finished work.

Remove temporary works in conformance with the contract documents. Remove them in such a manner as to permit the structure to uniformly and gradually take the stresses due to its own weight.

**6.0 METHOD OF MEASUREMENT**

Unless otherwise specified, temporary works will not be directly measured.

**7.0 BASIS OF PAYMENT**

Payment at the contract unit prices for the various pay items requiring temporary works will be full compensation for the above falsework and formwork.

**SUBMITTAL OF WORKING DRAWINGS****(2-10-12)****1.0 GENERAL**

Submit working drawings in accordance with Article 105-2 of the *Standard Specifications* and this provision. For this provision, “submittals” refers to only those listed in this provision. The list of submittals contained herein does not represent a list of required submittals for the project. Submittals are only necessary for those items as required by the contract. Make submittals that are not specifically noted in this provision directly to the Resident Engineer. Either the Structure Design Unit or the Geotechnical Engineering Unit or both units will jointly review submittals.

If a submittal contains variations from plan details or specifications or significantly affects project cost, field construction or operations, discuss the submittal with and submit all copies to the Resident Engineer. State the reason for the proposed variation in the submittal. To minimize review time, make sure all submittals are complete when initially submitted. Provide a contact name and information with each submittal. Direct any questions regarding submittal requirements to the Resident Engineer, Structure Design Unit contacts or the Geotechnical Engineering Unit contacts noted below.

In order to facilitate in-plant inspection by NCDOT and approval of working drawings, provide the name, address and telephone number of the facility where fabrication will actually be done if different than shown on the title block of the submitted working drawings. This includes, but is not limited to, precast concrete items, prestressed concrete items and fabricated steel or aluminum items.

**2.0 ADDRESSES AND CONTACTS**

For submittals to the Structure Design Unit, use the following addresses:

**Via US mail:**

Mr. G. R. Perfetti, P. E.  
State Bridge Design Engineer  
North Carolina Department  
of Transportation  
Structure Design Unit  
1581 Mail Service Center  
Raleigh, NC 27699-1581

Attention: Mr. P. D. Lambert, P. E.

**Via other delivery service:**

Mr. G. R. Perfetti, P. E.  
State Bridge Design Engineer  
North Carolina Department  
of Transportation  
Structure Design Unit  
1000 Birch Ridge Drive  
Raleigh, NC 27610

Attention: Mr. P. D. Lambert, P. E.

Submittals may also be made via email.

Send submittals to:

[plambert@ncdot.gov](mailto:plambert@ncdot.gov) (Paul Lambert)

Send an additional e-copy of the submittal to the following address:

[jgaither@ncdot.gov](mailto:jgaither@ncdot.gov) (James Gaither)

[jlbolden@ncdot.gov](mailto:jlbolden@ncdot.gov) (James Bolden)

For submittals to the Geotechnical Engineering Unit, use the following addresses:

For projects in Divisions 1-7, use the following Eastern Regional Office address:

Via US mail:

Mr. K. J. Kim, Ph. D., P. E.  
Eastern Regional Geotechnical  
Manager  
North Carolina Department  
of Transportation  
Geotechnical Engineering Unit  
Eastern Regional Office  
1570 Mail Service Center  
Raleigh, NC 27699-1570

Via other delivery service:

Mr. K. J. Kim, Ph. D., P. E.  
Eastern Regional Geotechnical  
Manager  
North Carolina Department  
of Transportation  
Geotechnical Engineering Unit  
Eastern Regional Office  
3301 Jones Sausage Road, Suite 100  
Garner, NC 27529

For projects in Divisions 8-14, use the following Western Regional Office address:

Via US mail:

Mr. John Pilipchuk, L. G., P. E.  
Western Regional Geotechnical  
Manager  
North Carolina Department  
of Transportation  
Geotechnical Engineering Unit  
Western Regional Office  
5253 Z Max Boulevard  
Harrisburg, NC 28075

Via other delivery service:

Mr. John Pilipchuk, L. G., P. E.  
Western Region Geotechnical  
Manager  
North Carolina Department  
of Transportation  
Geotechnical Engineering Unit  
Western Regional Office  
5253 Z Max Boulevard  
Harrisburg, NC 28075

The status of the review of structure-related submittals sent to the Structure Design Unit can be viewed from the Unit's web site, via the "Contractor Submittal" link.

Direct any questions concerning submittal review status, review comments or drawing markups to the following contacts:

|                             |              |                                                                                                              |
|-----------------------------|--------------|--------------------------------------------------------------------------------------------------------------|
| Primary Structures Contact: | Paul Lambert | (919) 707 – 6407<br>(919) 250 – 4082 facsimile<br><a href="mailto:plambert@ncdot.gov">plambert@ncdot.gov</a> |
|-----------------------------|--------------|--------------------------------------------------------------------------------------------------------------|

|                                |                               |                                      |
|--------------------------------|-------------------------------|--------------------------------------|
| Secondary Structures Contacts: | James Gaither<br>James Bolden | (919) 707 – 6409<br>(919) 707 – 6408 |
|--------------------------------|-------------------------------|--------------------------------------|

Eastern Regional Geotechnical Contact (Divisions 1-7):

|           |                                                                                                      |
|-----------|------------------------------------------------------------------------------------------------------|
| K. J. Kim | (919) 662 – 4710<br>(919) 662 – 3095 facsimile<br><a href="mailto:kkim@ncdot.gov">kkim@ncdot.gov</a> |
|-----------|------------------------------------------------------------------------------------------------------|

**Western Regional Geotechnical Contact (Divisions 8-14):**

John Pilipchuk (704) 455 – 8902  
(704) 455 – 8912 facsimile  
jpilipchuk@ncdot.gov

**3.0 SUBMITTAL COPIES**

Furnish one complete copy of each submittal, including all attachments, to the Resident Engineer. At the same time, submit the number of hard copies shown below of the same complete submittal directly to the Structure Design Unit and/or the Geotechnical Engineering Unit.

The first table below covers “Structure Submittals”. The Resident Engineer will receive review comments and drawing markups for these submittals from the Structure Design Unit. The second table in this section covers “Geotechnical Submittals”. The Resident Engineer will receive review comments and drawing markups for these submittals from the Geotechnical Engineering Unit.

Unless otherwise required, submit one set of supporting calculations to either the Structure Design Unit or the Geotechnical Engineering Unit unless both units require submittal copies in which case submit a set of supporting calculations to each unit. Provide additional copies of any submittal as directed.



**STRUCTURE SUBMITTALS**

| <b>Submittal</b>                                                       | <b>Copies<br/>Required by<br/>Structure<br/>Design Unit</b> | <b>Copies<br/>Required by<br/>Geotechnical<br/>Engineering<br/>Unit</b> | <b>Contract Reference<br/>Requiring Submittal <sup>1</sup></b>                              |
|------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Arch Culvert Falsework                                                 | 5                                                           | 0                                                                       | Plan Note, SN Sheet &<br>“Falsework and Formwork”                                           |
| Box Culvert Falsework <sup>7</sup>                                     | 5                                                           | 0                                                                       | Plan Note, SN Sheet &<br>“Falsework and Formwork”                                           |
| Cofferdams                                                             | 6                                                           | 2                                                                       | Article 410-4                                                                               |
| Foam Joint Seals <sup>6</sup>                                          | 9                                                           | 0                                                                       | “Foam Joint Seals”                                                                          |
| Expansion Joint Seals<br>(hold down plate type with base<br>angle)     | 9                                                           | 0                                                                       | “Expansion Joint Seals”                                                                     |
| Expansion Joint Seals<br>(modular)                                     | 2, then 9                                                   | 0                                                                       | “Modular Expansion Joint<br>Seals”                                                          |
| Expansion Joint Seals<br>(strip seals)                                 | 9                                                           | 0                                                                       | “Strip Seals”                                                                               |
| Falsework & Forms <sup>2</sup><br>(substructure)                       | 8                                                           | 0                                                                       | Article 420-3 & “Falsework<br>and Formwork”                                                 |
| Falsework & Forms<br>(superstructure)                                  | 8                                                           | 0                                                                       | Article 420-3 & “Falsework<br>and Formwork”                                                 |
| Girder Erection over Railroad                                          | 5                                                           | 0                                                                       | Railroad Provisions                                                                         |
| Maintenance and Protection of<br>Traffic Beneath Proposed<br>Structure | 8                                                           | 0                                                                       | “Maintenance and<br>Protection of Traffic<br>Beneath Proposed Structure<br>at Station ____” |
| Metal Bridge Railing                                                   | 8                                                           | 0                                                                       | Plan Note                                                                                   |
| Metal Stay-in-Place Forms                                              | 8                                                           | 0                                                                       | Article 420-3                                                                               |
| Metalwork for Elastomeric<br>Bearings <sup>4,5</sup>                   | 7                                                           | 0                                                                       | Article 1072-8                                                                              |
| Miscellaneous Metalwork <sup>4,5</sup>                                 | 7                                                           | 0                                                                       | Article 1072-8                                                                              |
| Optional Disc Bearings <sup>4</sup>                                    | 8                                                           | 0                                                                       | “Optional Disc Bearings”                                                                    |

|                                                                            |                           |   |                                                                                                |
|----------------------------------------------------------------------------|---------------------------|---|------------------------------------------------------------------------------------------------|
| Overhead and Digital Message Signs (DMS) (metalwork and foundations)       | 13                        | 0 | Applicable Provisions                                                                          |
| Placement of Equipment on Structures (cranes, etc.)                        | 7                         | 0 | Article 420-20                                                                                 |
| Pot Bearings <sup>4</sup>                                                  | 8                         | 0 | “Pot Bearings”                                                                                 |
| Precast Concrete Box Culverts                                              | 2, then<br>1 reproducible | 0 | “Optional Precast Reinforced Concrete Box Culvert at Station ____”                             |
| Prestressed Concrete Cored Slab (detensioning sequences) <sup>3</sup>      | 6                         | 0 | Article 1078-11                                                                                |
| Prestressed Concrete Deck Panels                                           | 6 and<br>1 reproducible   | 0 | Article 420-3                                                                                  |
| Prestressed Concrete Girder (strand elongation and detensioning sequences) | 6                         | 0 | Articles 1078-8 and 1078-11                                                                    |
| Removal of Existing Structure over Railroad                                | 5                         | 0 | Railroad Provisions                                                                            |
| Revised Bridge Deck Plans (adaptation to prestressed deck panels)          | 2, then<br>1 reproducible | 0 | Article 420-3                                                                                  |
| Revised Bridge Deck Plans (adaptation to modular expansion joint seals)    | 2, then<br>1 reproducible | 0 | “Modular Expansion Joint Seals”                                                                |
| Sound Barrier Wall (precast items)                                         | 10                        | 0 | Article 1077-2 & “Sound Barrier Wall”                                                          |
| Sound Barrier Wall Steel Fabrication Plans <sup>5</sup>                    | 7                         | 0 | Article 1072-8 & “Sound Barrier Wall”                                                          |
| Structural Steel <sup>4</sup>                                              | 2, then 7                 | 0 | Article 1072-8                                                                                 |
| Temporary Detour Structures                                                | 10                        | 2 | Article 400-3 & “Construction, Maintenance and Removal of Temporary Structure at Station ____” |
| TFE Expansion Bearings <sup>4</sup>                                        | 8                         | 0 | Article 1072-8                                                                                 |

**FOOTNOTES**

1. References are provided to help locate the part of the contract where the submittals are required. References in quotes refer to the provision by that name. Articles refer to the *Standard Specifications*.
2. Submittals for these items are necessary only when required by a note on plans.
3. Submittals for these items may not be required. A list of pre-approved sequences is available from the producer or the Materials & Tests Unit.
4. The fabricator may submit these items directly to the Structure Design Unit.
5. The two sets of preliminary submittals required by Article 1072-8 of the *Standard Specifications* are not required for these items.
6. Submittals for Fabrication Drawings are not required. Submittals for Catalogue Cuts of Proposed Material are required. See Section 5.A of the referenced provision.
7. Submittals are necessary only when the top slab thickness is 18" or greater.

**GEOTECHNICAL SUBMITTALS**

| <b>Submittal</b>                                      | <b>Copies<br/>Required by<br/>Geotechnical<br/>Engineering<br/>Unit</b> | <b>Copies<br/>Required by<br/>Structure<br/>Design Unit</b> | <b>Contract Reference<br/>Requiring Submittal <sup>1</sup></b> |
|-------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------|
| Drilled Pier Construction Plans <sup>2</sup>          | 1                                                                       | 0                                                           | Subarticle 411-3(A)                                            |
| Crosshole Sonic Logging (CSL)<br>Reports <sup>2</sup> | 1                                                                       | 0                                                           | Subarticle 411-5(A)(2)                                         |
| Pile Driving Equipment Data<br>Forms <sup>2,3</sup>   | 1                                                                       | 0                                                           | Subarticle 450-3(D)(2)                                         |
| Pile Driving Analyzer (PDA)<br>Reports <sup>2</sup>   | 1                                                                       | 0                                                           | Subarticle 450-3(F)(3)                                         |
| Retaining Walls <sup>4</sup>                          | 8 drawings,<br>2 calculations                                           | 2 drawings                                                  | Applicable Provisions                                          |
| Temporary Shoring <sup>4</sup>                        | 5 drawings,<br>2 calculations                                           | 2 drawings                                                  | “Temporary Shoring” &<br>“Temporary Soil Nail<br>Walls”        |

**FOOTNOTES**

- References are provided to help locate the part of the contract where the submittals are required. References in quotes refer to the provision by that name. Subarticles refer to the *Standard Specifications*.
- Submit one hard copy of submittal to the Resident or Bridge Maintenance Engineer. Submit a second copy of submittal electronically (PDF via email) or by facsimile, US mail or other delivery service to the appropriate Geotechnical Engineering Unit regional office. Electronic submission is preferred.
- The Pile Driving Equipment Data Form is available from:  
[www.ncdot.org/doh/preconstruct/highway/geotech/formdet/](http://www.ncdot.org/doh/preconstruct/highway/geotech/formdet/)  
See second page of form for submittal instructions.
- Electronic copy of submittal is required. See referenced provision.

**CRANE SAFETY****(8-15-05)**

Comply with the manufacturer specifications and limitations applicable to the operation of any and all cranes and derricks. Prime contractors, sub-contractors, and fully operated rental companies shall comply with the current Occupational Safety and Health Administration regulations (OSHA).

Submit all items listed below to the Engineer prior to beginning crane operations involving critical lifts. A critical lift is defined as any lift that exceeds 75 percent of the manufacturer's crane chart capacity for the radius at which the load will be lifted or requires the use of more than one crane. Changes in personnel or equipment must be reported to the Engineer and all applicable items listed below must be updated and submitted prior to continuing with crane operations.

**CRANE SAFETY SUBMITTAL LIST**

- A. **Competent Person:** Provide the name and qualifications of the "Competent Person" responsible for crane safety and lifting operations. The named competent person will have the responsibility and authority to stop any work activity due to safety concerns.
- B. **Riggers:** Provide the qualifications and experience of the persons responsible for rigging operations. Qualifications and experience should include, but not be limited to, weight calculations, center of gravity determinations, selection and inspection of sling and rigging equipment, and safe rigging practices.
- C. **Crane Inspections:** Inspection records for all cranes shall be current and readily accessible for review upon request.
- D. **Certifications:** By July 1, 2006, crane operators performing critical lifts shall be certified by NC CCO (National Commission for the Certification of Crane Operators), or satisfactorily complete the Carolinas AGC's Professional Crane Operator's Proficiency Program. Other approved nationally accredited programs will be considered upon request. All crane operators shall also have a current CDL medical card. Submit a list of anticipated critical lifts and corresponding crane operator(s). Include current certification for the type of crane operated (small hydraulic, large hydraulic, small lattice, large lattice) and medical evaluations for each operator.

**GROUT FOR STRUCTURES****(9-30-11)****1.0 DESCRIPTION**

This special provision addresses grout for use in pile blockouts, grout pockets, shear keys, dowel holes and recesses for structures. This provision does not apply to grout placed in post-tensioning ducts for bridge beams, girders, or decks. Mix and place grout in accordance with the manufacturer's recommendations, the applicable sections of the Standard Specifications and this provision.

## **2.0 MATERIAL REQUIREMENTS**

Use a Department approved pre-packaged, non-shrink, non-metallic grout. Contact the Materials and Tests Unit for a list of approved pre-packaged grouts and consult the manufacturer to determine if the pre-packaged grout selected is suitable for the required application.

When using an approved pre-packaged grout, a grout mix design submittal is not required.

The grout shall be free of soluble chlorides and contain less than one percent soluble sulfate. Supply water in compliance with Article 1024-4 of the Standard Specifications.

Aggregate may be added to the mix only where recommended or permitted by the manufacturer and Engineer. The quantity and gradation of the aggregate shall be in accordance with the manufacturer's recommendations.

Admixtures, if approved by the Department, shall be used in accordance with the manufacturer's recommendations. The manufacture date shall be clearly stamped on each container. Admixtures with an expired shelf life shall not be used.

The Engineer reserves the right to reject material based on unsatisfactory performance.

Initial setting time shall not be less than 10 minutes when tested in accordance with ASTM C266.

Test the expansion and shrinkage of the grout in accordance with ASTM C1090. The grout shall expand no more than 0.2% and shall exhibit no shrinkage. Furnish a Type 4 material certification showing results of tests conducted to determine the properties listed in the Standard Specifications and to assure the material is non-shrink.

Unless required elsewhere in the contract the compressive strength at 3 days shall be at least 5000 psi. Compressive strength in the laboratory shall be determined in accordance with ASTM C109 except the test mix shall contain only water and the dry manufactured material. Compressive strength in the field will be determined by molding and testing 4" x 8" cylinders in accordance with AASHTO T22. Construction loading and traffic loading shall not be allowed until the 3 day compressive strength is achieved.

When tested in accordance with ASTM C666, Procedure A, the durability factor of the grout shall not be less than 80.

## **3.0 SAMPLING AND PLACEMENT**

Place and maintain components in final position until grout placement is complete and accepted. Concrete surfaces to receive grout shall be free of defective concrete, laitance, oil, grease and other foreign matter. Saturate concrete surfaces with clean water and remove excess water prior to placing grout.

Do not place grout if the grout temperature is less than 50°F or more than 90°F or if the air temperature measured at the location of the grouting operation in the shade away from artificial heat is below 45°F.

Provide grout at a rate that permits proper handling, placing and finishing in accordance with the manufacturer's recommendations unless directed otherwise by the Engineer. Use grout free of any lumps and undispersed cement. Agitate grout continuously before placement.

Control grout delivery so the interval between placing batches in the same component does not exceed 20 minutes.

The Engineer will determine the locations to sample grout and the number and type of samples collected for field and laboratory testing. The compressive strength of the grout will be considered the average compressive strength test results of 3 cube or 2 cylinder specimens at 28 days.

#### **4.0 BASIS OF PAYMENT**

No separate payment will be made for "Grout for Structures". The cost of the material, equipment, labor, placement, and any incidentals necessary to complete the work shall be considered incidental to the structure item requiring grout.

### **CLASSIC CONCRETE BRIDGE RAIL**

**(SPECIAL)**

#### **1.0 General**

The "Classic Concrete Bridge Rail" shall be in accordance with applicable parts of the Standard Specifications, the details shown on the plans and as outlined in these special provisions. Plans for the bridge rails are detailed for cast in place concrete and must be placed using conventional forms.

#### **2.0 Concrete Mix**

Concrete for the bridge rail shall meet the requirements for class AA concrete with exception noted below:

The maximum size coarse aggregate used in the concrete mix shall be #78M. The slump shall be within the range of 5" to 8" when tested in accordance with AASHTO T119. A high range water reducer shall be used. The quantity of high range water reducer per pound of cement shall be within the range recommended on the current list of approved admixtures issued by M&T Unit.

**3.0 Construction**

The bridge rails shall be placed to the established shape, line, grade and dimensions shown on the plans.

Joints in the rails shall be constructed at the locations and of the type specified on the plans.

**4.0 Finishing**

All exposed surfaces which are not satisfactory to the Engineer as to uniformity of color and texture or because of excessive patching shall be corrected as required by the Engineer. All surfaces of the bridge rails shall be given a Class I surface finish in accordance with the Standard Specifications unless directed otherwise by the Engineer.

**5.0 Measurement**

The quantity to be paid for under this item shall be the actual number of linear feet of "Classic Concrete Bridge Rail", complete in place and accepted, measured continuously along the top surface of completed rail from end to end without deductions for spaces between sections.

**6.0 Payment**

The quantity, measured as described above, will be paid for at the contract unit price per linear foot bid for "Classic Concrete Bridge Rail", which price and payment shall be full compensation for all materials, admixtures, forms, falsework, curing, surface finish, tools, labor, equipment and incidentals necessary to complete the item.

**CONCRETE BARRIER RAIL WITH MOMENT SLAB****(1-17-12)****1.0 GENERAL**

Construct concrete barrier rail connected to moment slabs to resist traffic impact above retaining walls. Construct concrete barrier rail with moment slab in accordance with the contract and accepted submittals.

**2.0 MATERIALS**

Refer to Division 10 of the *Standard Specifications*.

| <b>Item</b>              | <b>Section</b> |
|--------------------------|----------------|
| Barrier Delineators      | 1088-2         |
| Portland Cement Concrete | 1000           |
| Reinforcing Steel        | 1070           |

Use Class AA concrete for concrete barrier rail and Class A concrete for moment slabs. Provide epoxy coated reinforcing steel that meets Article 1070-7 of the *Standard Specifications* for concrete barrier rail.



### 3.0 CONSTRUCTION METHODS

Construct concrete barrier rail with moment slab in accordance with the plans and accepted submittals. Construct cast-in-place reinforced concrete moment slabs in accordance with Section 420 of the *Standard Specifications* and concrete barrier rail in accordance with Subarticle 460-3(C) of the *Standard Specifications*. Do not remove forms until concrete attains a compressive strength of at least 2,400 psi.

### 4.0 MEASUREMENT AND PAYMENT

*Concrete Barrier Rail with Moment Slab* will be measured and paid in linear feet. Concrete barrier rail with moment slab will be measured as the length of concrete barrier rail above retaining walls. The contract unit price for *Concrete Barrier Rail with Moment Slab* will be full compensation for submittals, labor, tools, equipment and concrete barrier rail with moment slab materials, excavating, backfilling, hauling and removing excavated materials and supplying any incidentals necessary to construct concrete barrier rail with moment slab.

Payment will be made under:

#### Pay Item

Concrete Barrier Rail with Moment Slab

#### Pay Unit

Linear Foot

## MECHANICALLY STABILIZED EARTH RETAINING WALLS

(7-17-12)

### 1.0 GENERAL

Construct mechanically stabilized earth (MSE) retaining walls consisting of steel or geogrid reinforcement in the reinforced zone connected to vertical facing elements. The facing elements may be precast concrete panels or segmental retaining wall (SRW) units unless required otherwise in the plans or the *NCDOT Policy for Mechanically Stabilized Earth Retaining Walls* prohibits the use of SRW units. At the Contractor's option, use coarse or fine aggregate in the reinforced zone of MSE retaining walls except do not use fine aggregate for walls subject to scour, walls that support or are adjacent to railroads or walls with design heights greater than 35 ft or internal acute corners less than 45°. Provide reinforced concrete coping as required. Design and construct MSE retaining walls based on actual elevations and wall dimensions in accordance with the contract and accepted submittals. Use a prequalified MSE Wall Installer to construct MSE retaining walls.

Define "MSE wall" as a mechanically stabilized earth retaining wall and "MSE Wall Vendor" as the vendor supplying the chosen MSE wall system. Define a "segmental retaining wall" as an MSE wall with SRW units and an "abutment wall" as an MSE wall with bridge foundations in the reinforced zone. Define "reinforcement" as steel or geogrid reinforcement and "aggregate" as coarse or fine aggregate. Define "panel" as a precast concrete panel and "coping" as precast or cast-in-place concrete coping.

Use an approved MSE wall system in accordance with the plans, NCDOT MSE wall policy and any NCDOT restrictions for the chosen system. Value engineering proposals for other MSE wall systems will not be considered. Do not use segmental retaining walls or MSE wall systems with an “approved for provisional use” status code for critical walls or MSE walls connected to critical walls. Critical walls are defined in the NCDOT MSE wall policy. The list of approved MSE wall systems and NCDOT MSE wall policy are available from:

[www.ncdot.org/doh/preconstruct/highway/geotech/msewalls](http://www.ncdot.org/doh/preconstruct/highway/geotech/msewalls)

## 2.0 MATERIALS

Refer to the *Standard Specifications*.

| Item                              | Section   |
|-----------------------------------|-----------|
| Aggregate                         | 1014      |
| Anchor Pins                       | 1056-2    |
| Curing Agents                     | 1026      |
| Geotextiles, Type 2               | 1056      |
| Joint Materials                   | 1028      |
| Portland Cement Concrete, Class A | 1000      |
| Precast Retaining Wall Coping     | 1077      |
| Reinforcing Steel                 | 1070      |
| Retaining Wall Panels             | 1077      |
| Segmental Retaining Wall Units    | 1040-4    |
| Shoulder Drain Materials          | 816-2     |
| Wire Staples                      | 1060-8(D) |

Provide Type 2 geotextile for filtration and separation geotextiles. Use Class A concrete for cast-in-place coping, leveling concrete and pads.

Provide panels and SRW units produced by a manufacturer approved or licensed by the MSE Wall Vendor. Unless required otherwise in the contract, produce panels with a smooth flat final finish that meets Article 1077-11 of the *Standard Specifications*. Accurately locate and secure reinforcement connectors in panels and maintain required concrete cover. Produce panels within 1/4" of the panel dimensions shown in the accepted submittals.

Damaged panels or SRW units with excessive discoloration, chips or cracks as determined by the Engineer will be rejected. Do not damage reinforcement connection devices or mechanisms in handling or storing panels and SRW units.

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. Handle and store geogrids in

accordance with Article 1056-2 of the *Standard Specifications*. Load, transport, unload and store MSE wall materials so materials are kept clean and free of damage.

#### A. Aggregate

Use standard size No. 57, 57M, 67 or 78M that meets Table 1005-1 of the *Standard Specifications* for coarse aggregate except do not use No. 57 or 57M stone in the reinforced zone of MSE walls with geogrid reinforcement. Use the following for fine aggregate:

1. Standard size No. 1S, 2S, 2MS or 4S that meets Table 1005-2 of the *Standard Specifications* or
2. Gradation that meets Class III, Type 3 select material in accordance with Article 1016-3 of the *Standard Specifications*.

Fine aggregate is exempt from mortar strength and siliceous particle content referenced in Subarticles 1014-1(E) and 1014-1(H) of the *Standard Specifications*. Provide fine aggregate that meets the following requirements:

| FINE AGGREGATE REQUIREMENTS         |       |                                     |                        |                        |            |
|-------------------------------------|-------|-------------------------------------|------------------------|------------------------|------------|
| Reinforcement or Connector Material | pH    | Resistivity                         | Chlorides              | Sulfates               | Organics   |
| Steel                               | 5-10  | $\geq 3,000 \Omega \cdot \text{cm}$ | $\leq 100 \text{ ppm}$ | $\leq 200 \text{ ppm}$ | $\leq 1\%$ |
| Polyester Type (PET) Geogrid        | 5-8   | N/A*                                | N/A*                   | N/A*                   | $\leq 1\%$ |
| Polyolefin Geogrid                  | 4.5-9 | N/A*                                | N/A*                   | N/A*                   | $\leq 1\%$ |

\* Resistivity, chlorides and sulfates are not applicable to geogrid.

Use fine aggregate from a source that meets the *Mechanically Stabilized Earth Wall Fine Aggregate Sampling and Testing Manual*. Perform organic content tests in accordance with AASHTO T 267 instead of Subarticle 1014-1(D) of the *Standard Specifications*. Perform electrochemical tests in accordance with the following test procedures:

| Property    | Test Method  |
|-------------|--------------|
| pH          | AASHTO T 289 |
| Resistivity | AASHTO T 288 |
| Chlorides   | AASHTO T 291 |
| Sulfates    | AASHTO T 290 |

#### B. Reinforcement

Provide steel or geogrid reinforcement supplied by the MSE Wall Vendor or a manufacturer approved or licensed by the vendor. Use approved reinforcement for the chosen MSE wall system. The list of approved reinforcement for each MSE wall system is available from the website shown elsewhere in this provision.

### Steel Reinforcement

Provide Type 1 material certifications in accordance with Article 106-3 of the *Standard Specifications* for steel reinforcement. Use welded wire grid reinforcement (“mesh”, “mats” and “ladders”) that meet Article 1070-3 of the *Standard Specifications* and metallic strip reinforcement (“straps”) that meet ASTM A572 or A1011. Galvanize steel reinforcement in accordance with Section 1076 of the *Standard Specifications*.

### Geogrid Reinforcement

Define “machine direction” (MD) for geogrids in accordance with ASTM D4439. Provide Type 1 material certifications for geogrid strengths in the MD in accordance with Article 1056-3 of the *Standard Specifications*. Test geogrids in accordance with ASTM D6637.

### C. Bearing Pads

Use bearing pads that meet Section 3.6.1.a of the *FHWA Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume I* (Publication No. FHWA-NHI-10-024).

### D. Miscellaneous Components

Miscellaneous components may include connectors (e.g., anchors, bars, clamps, pins, plates, ties, etc.), fasteners (e.g., bolts, nuts, washers, etc.) and any other MSE wall components not included above. Galvanize steel components in accordance with Section 1076 of the *Standard Specifications*. Provide approved miscellaneous components for the chosen MSE wall system. The list of approved miscellaneous components for each MSE wall system is available from the website shown elsewhere in this provision.

## 3.0 PRECONSTRUCTION REQUIREMENTS

### A. MSE Wall Surveys

The Retaining Wall Plans show a plan view, typical sections, details, notes and an elevation or profile view (wall envelope) for each MSE wall. Before beginning MSE wall design, survey existing ground elevations shown in the plans and other elevations in the vicinity of MSE wall locations as needed. Based on these elevations, finished grades and actual MSE wall dimensions and details, submit revised wall envelopes for acceptance. Use accepted wall envelopes for design.

### B. MSE Wall Designs

Submit 11 copies of working drawings and 3 copies of design calculations and a PDF copy of each for MSE wall designs at least 30 days before the preconstruction meeting.

Do not begin MSE wall construction until a design submittal is accepted.

Use a prequalified MSE Wall Design Consultant to design MSE walls. Provide designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for the MSE Wall Design Consultant.

Design MSE walls in accordance with the plans, *AASHTO LRFD Bridge Design Specifications* and any NCDOT restrictions for the chosen MSE wall system unless otherwise required. Design MSE walls for seismic if walls are located in seismic zone 2 based on Figure 2-1 of the *Structure Design Manual*. Use a uniform reinforcement length throughout the wall height of at least 0.7H with H as defined for the embedment requirements in this provision or 6 ft, whichever is greater, unless shown otherwise in the plans. Extend the reinforced zone at least 6" beyond end of reinforcement. Do not locate drains, the reinforced zone or leveling pads outside right-of-way or easement limits.

Use the simplified method for determining maximum reinforcement loads and approved design parameters for the chosen MSE wall system or default values in accordance with the AASHTO LRFD specifications. Design steel components including reinforcement and connectors for the design life noted in the plans and aggregate type in the reinforced zone. Use corrosion loss rates for galvanizing in accordance with the AASHTO LRFD specifications for nonaggressive backfill and carbon steel corrosion rates in accordance with the following:

#### CARBON STEEL CORROSION RATES

| Aggregate Type<br>(in the reinforced zone) | Corrosion Loss Rate<br>(after zinc depletion) |
|--------------------------------------------|-----------------------------------------------|
| Coarse                                     | 0.47 mil/year                                 |
| Fine (except abutment walls)               | 0.58 mil/year                                 |
| Fine (abutment walls)                      | 0.70 mil/year                                 |

For geogrid reinforcement and connectors, use approved geogrid properties for the design life noted in the plans and aggregate type in the reinforced zone.

When noted in the plans, design MSE walls for a live load (traffic) surcharge of 250 lb/sf in accordance with Figure C11.5.5-3(b) of the AASHTO LRFD specifications. For steel beam guardrail with 8 ft posts or concrete barrier rail above MSE walls, analyze top 2 reinforcement layers for traffic impact loads in accordance

with Section 7.2 of the FHWA MSE wall manual shown elsewhere in this provision except use the following for geogrid reinforcement rupture:

$$\phi T_{al} R_c \geq T_{max} + (T_I / RF_{CR})$$

Where,

- $\phi$  = resistance factor for tensile resistance in accordance with Section 7.2.1 of the FHWA MSE wall manual,  
 $T_{al}$  = long-term geogrid design strength approved for chosen MSE wall system,  
 $R_c$  = reinforcement coverage ratio = 1 for continuous geogrid reinforcement,  
 $T_{max}$  = factored static load in accordance with Section 7.2 of the FHWA MSE wall manual,  
 $T_I$  = factored impact load in accordance with Section 7.2 of the FHWA MSE wall manual and  
 $RF_{CR}$  = creep reduction factor approved for chosen MSE wall system.

If existing or future obstructions such as foundations, guardrail, fence or handrail posts, moment slabs, pavements, pipes, inlets or utilities will interfere with reinforcement, maintain a clearance of at least 3" between obstructions and reinforcement unless otherwise approved. Locate reinforcement layers so all of reinforcement length is within 3" of corresponding connection elevations.

Use 6" thick cast-in-place unreinforced concrete leveling pads beneath panels and SRW units that are continuous at steps and extend at least 6" in front of and behind bottom row of panels or SRW units. Unless required otherwise in the plans, embed top of leveling pads in accordance with the following requirements:

| <b>EMBEDMENT REQUIREMENTS</b>          |                                                                       |                                                 |
|----------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------|
| <b>Front Slope<sup>1</sup> (H:V)</b>   | <b>Minimum Embedment Depth<sup>2</sup><br/>(whichever is greater)</b> |                                                 |
| 6:1 or flatter (except abutment walls) | H/20                                                                  | 1 ft for $H \leq 10$ ft<br>2 ft for $H > 10$ ft |
| 6:1 or flatter (abutment walls)        | H/10                                                                  | 2 ft                                            |
| > 6:1 to < 3:1                         | H/10                                                                  | 2 ft                                            |
| 3:1 to 2:1                             | H/7                                                                   | 2 ft                                            |

1. Front slope is as shown in the plans.
2. Define "H" as the maximum design height plus embedment per wall with the design height and embedment as shown in the plans.

When noted in the plans, locate a continuous aggregate shoulder drain along base of reinforced zone behind aggregate. Provide wall drainage systems consisting of drains and outlet components in accordance with Standard Drawing No. 816.02 of the *Roadway Standard Drawings*.

For MSE walls with panels, place at least 2 bearing pads in each horizontal panel joint so the final horizontal joint opening is between 5/8" and 7/8". Additional bearing pads may be required for panels wider than 5 ft as determined by the Engineer. Cover joints at back of panels with filtration geotextiles at least 12" wide.

For segmental retaining walls, fill SRW unit core spaces with coarse aggregate and between and behind SRW units with coarse aggregate for a horizontal distance of at least 18".

Separation geotextiles are required between aggregate and overlying fill or pavement sections except when concrete pavement, full depth asphalt or cement treated base is placed directly on aggregate. Separation geotextiles may also be required between coarse aggregate and backfill or natural ground as determined by the Engineer.

Unless required otherwise in the plans, use reinforced concrete coping at top of walls. Extend coping at least 6" above where the grade intersects back of coping unless required otherwise in the plans. Use coping dimensions shown in the plans and cast-in-place concrete coping for segmental retaining walls and when noted in the plans. At the Contractor's option, connect cast-in-place concrete coping to panels and SRW units with dowels or extend coping down back of MSE walls. Also, connect cast-in-place leveling concrete for precast concrete coping to panels with dowels. When concrete barrier rail is required above MSE walls, use concrete barrier rail with moment slab as shown in the plans.

Submit working drawings and design calculations for acceptance in accordance with Article 105-2 of the *Standard Specifications*. Submit working drawings showing plan views, wall profiles with required resistances, typical sections with reinforcement and connection details, aggregate locations and types, geotextile locations and details of leveling pads, panels or SRW units, coping, bin walls, slip joints, etc. If necessary, include details on working drawings for concrete barrier rail with moment slab, reinforcement splices if allowed for the chosen MSE wall system, reinforcement connected to end bent caps and obstructions extending through walls or interfering with reinforcement, leveling pads, barriers or moment slabs. Submit design calculations for each wall section with different surcharge loads, geometry or material parameters. At least one analysis is required for each wall section with different reinforcement lengths. When designing MSE walls with computer software other than MSEW, use MSEW version 3.0 with update 14.2 or later, manufactured by ADAMA Engineering, Inc. to verify the design. At least one MSEW analysis is required per 100 ft of wall length with at least one MSEW analysis for the wall section with the longest reinforcement. Submit electronic MSEW input files and PDF output files with design calculations.

### C. Preconstruction Meeting

Before starting MSE wall construction, hold a preconstruction meeting to discuss the construction and inspection of the MSE walls. Schedule this meeting after all MSE wall submittals have been accepted. The Resident or Bridge Maintenance Engineer,

Bridge Construction Engineer, Geotechnical Operations Engineer, Contractor and MSE Wall Installer Superintendent will attend this preconstruction meeting.

#### **4.0 CORROSION MONITORING**

Corrosion monitoring is required for MSE walls with steel reinforcement. The Engineer will determine the number of monitoring locations and where to install the instrumentation. Contact the Materials and Tests (M&T) Unit before beginning wall construction. M&T will provide the corrosion monitoring instrumentation kits and if necessary, assistance with installation.

#### **5.0 SITE ASSISTANCE**

Unless otherwise approved, provide an MSE Wall Vendor representative to assist and guide the MSE Wall Installer on-site for at least 8 hours when the first panels or SRW units and reinforcement layer are placed. If problems are encountered during construction, the Engineer may require the vendor representative to return to the site for a time period determined by the Engineer.

#### **6.0 CONSTRUCTION METHODS**

Control drainage during construction in the vicinity of MSE walls. Direct run off away from MSE walls, aggregate and backfill. Contain and maintain aggregate and backfill and protect material from erosion.

Excavate as necessary for MSE walls in accordance with the accepted submittals. If applicable and at the Contractor's option, use temporary shoring for wall construction instead of temporary slopes to construct MSE walls. Define "temporary shoring for wall construction" as temporary shoring not shown in the plans or required by the Engineer including shoring for OSHA reasons or the Contractor's convenience.

Unless required otherwise in the plans, install foundations located in the reinforced zone before placing aggregate or reinforcement. Notify the Engineer when foundation excavation is complete. Do not place leveling pad concrete, aggregate or reinforcement until excavation dimensions and foundation material are approved.

Construct cast-in-place concrete leveling pads at elevations and with dimensions shown in the accepted submittals and in accordance with Section 420 of the *Standard Specifications*. Cure leveling pads at least 24 hours before placing panels or SRW units.

Erect and support panels and stack SRW units with no negative batter (wall face leaning forward) so the final wall position is as shown in the accepted submittals. Place SRW units with a maximum vertical joint width of 3/8".

Set panels with a vertical joint width of 3/4". Place bearing pads in horizontal panel joints and cover all panel joints with filtration geotextiles as shown in the accepted submittals. Attach filtration geotextiles to back of panels with adhesives, tapes or other approved methods.



Stagger panels and SRW units to create a running bond by centering panels or SRW units over joints in the row below as shown in the accepted submittals. Construct MSE walls with the following tolerances:

- A. SRW units are level from front to back and between units when checked with a 3 ft long level,
- B. Final wall face is within 3/4" of horizontal and vertical alignment shown in the accepted submittals when measured along a 10 ft straightedge and
- C. Final wall plumbness (batter) is within 0.5° of vertical unless otherwise approved.

Place reinforcement at locations and elevations shown in the accepted submittals and within 3" of corresponding connection elevations. Install reinforcement with the direction shown in the accepted submittals. Place reinforcement in slight tension free of kinks, folds, wrinkles or creases. Reinforcement may be spliced once per reinforcement length if shown in the accepted submittals. Use reinforcement pieces at least 6 ft long. Contact the Engineer when unanticipated existing or future obstructions such as foundations, guardrail, fence or handrail posts, pavements, pipes, inlets or utilities will interfere with reinforcement. To avoid obstructions, deflect, skew or modify reinforcement as shown in the accepted submittals.

Place aggregate in the reinforced zone in 8" to 10" thick lifts. Compact fine aggregate in accordance with Subarticle 235-3(C) of the *Standard Specifications*. Use only hand operated compaction equipment to compact aggregate within 3 ft of panels or SRW units. At a distance greater than 3 ft, compact aggregate with at least 4 passes of an 8 ton to 10 ton vibratory roller in a direction parallel to the wall face. Smooth wheeled or rubber tired rollers are also acceptable for compacting aggregate. Do not use sheepsfoot, grid rollers or other types of compaction equipment with feet. Do not displace or damage reinforcement when placing and compacting aggregate. End dumping directly on geogrids is not permitted. Do not operate heavy equipment on reinforcement until it is covered with at least 8" of aggregate. Replace any damaged reinforcement to the satisfaction of the Engineer.

Backfill for MSE walls outside the reinforced zone in accordance with Article 410-8 of the *Standard Specifications*. If a drain is required, install wall drainage systems as shown in the accepted submittals and in accordance with Section 816 of the *Standard Specifications*.

Place and construct coping and leveling concrete as shown in the accepted submittals. Construct leveling concrete in accordance with Section 420 of the *Standard Specifications*. Construct cast-in-place concrete coping in accordance with Subarticle 452-3(C) of the *Standard Specifications*. When single faced precast concrete barrier is required in front of and against MSE walls, stop coping just above barrier so coping does not interfere with placing barrier up against wall faces.

When separation geotextiles are required, overlap adjacent geotextiles at least 18" and hold separation geotextiles in place with wire staples or anchor pins as needed. Seal joints above and behind MSE walls between coping and ditches or concrete slope protection with silicone sealant.

**7.0 MEASUREMENT AND PAYMENT**

*MSE Retaining Wall No. \_\_* will be measured and paid in square feet. MSE walls will be measured as the square feet of exposed wall face area with the height equal to the difference between top and bottom of wall elevations. Define “top of wall” as top of coping or top of panels or SRW units for MSE walls without coping. Define “bottom of wall” as shown in the plans and no measurement will be made for portions of MSE walls embedded below bottom of wall elevations.

The contract unit price for *MSE Retaining Wall No. \_\_* will be full compensation for providing designs, submittals, labor, tools, equipment and MSE wall materials, excavating, backfilling, hauling and removing excavated materials and supplying site assistance, leveling pads, panels, SRW units, reinforcement, aggregate, wall drainage systems, geotextiles, bearing pads, coping, miscellaneous components and any incidentals necessary to construct MSE walls. The contract unit price for *MSE Retaining Wall No. \_\_* will also be full compensation for reinforcement connected to and aggregate behind end bent caps in the reinforced zone, if required.

No separate payment will be made for temporary shoring for wall construction. Temporary shoring for wall construction will be incidental to the contract unit price for *MSE Retaining Wall No. \_\_*.

The contract unit price for *MSE Retaining Wall No. \_\_* does not include the cost for ditches, fences, handrails, barrier or guardrail associated with MSE walls as these items will be paid for elsewhere in the contract.

Where it is necessary to provide backfill material behind the reinforced zone from sources other than excavated areas or borrow sources used in connection with other work in the contract, payment for furnishing and hauling such backfill material will be paid as extra work in accordance with Article 104-7 of the *Standard Specifications*. Placing and compacting such backfill material is not considered extra work but is incidental to the work being performed.

Payment will be made under:

**Pay Item**

MSE Retaining Wall No. \_\_

**Pay Unit**

Square Foot

**SOLDIER PILE RETAINING WALLS****(5-15-12)****1.0 GENERAL**

Construct soldier pile retaining walls consisting of driven or drilled-in steel H-piles with either precast concrete panels in between piles or a cast-in-place reinforced concrete face attached to front of piles unless required otherwise in the plans. Timber lagging is typically used for temporary support of excavations during construction. Provide cast-in-place

reinforced concrete coping as required. Design and construct soldier pile retaining walls based on actual elevations and wall dimensions in accordance with the contract and accepted submittals. Use a prequalified Cantilever Wall Contractor to construct soldier pile retaining walls. Define "soldier pile wall" as a soldier pile retaining wall. Define "panel" as a precast concrete panel and "concrete facing" as a cast-in-place reinforced concrete face. Define "pile" as a steel H-pile and "coping" as cast-in-place concrete coping.

## 2.0 MATERIALS

Refer to the *Standard Specifications*.

| Item                         | Section   |
|------------------------------|-----------|
| Anchor Pins                  | 1056-2    |
| Curing Agents                | 1026      |
| Flowable Fill, Excavatable   | 1000-6    |
| Geosynthetics                | 1056      |
| Joint Materials              | 1028      |
| Masonry                      | 1040      |
| Neat Cement Grout, Nonshrink | 1003      |
| Portland Cement Concrete     | 1000      |
| Reinforcing Steel            | 1070      |
| Retaining Wall Panels        | 1077      |
| Select Material, Class VI    | 1016      |
| Shoulder Drain Materials     | 816-2     |
| Steel H-Piles                | 1084-1    |
| Untreated Timber             | 1082-2    |
| Welded Stud Shear Connectors | 1072-6    |
| Wire Staples                 | 1060-8(D) |

Provide Type 2 geotextile for separation geotextiles and Class VI select material (standard size No. 57 stone) for leveling pads and backfilling. Use Class A concrete for concrete facing and coping and Class A concrete that meets Article 450-2 of the *Standard Specifications* for drilled-in piles. Use untreated timber with a thickness of at least 3" and a bending stress of at least 1,000 psi for timber lagging.

Unless required otherwise in the contract, produce panels with a smooth flat final finish that meets Article 1077-11 of the *Standard Specifications*. When noted in the plans, produce panels with an exposed aggregate finish that meets Article 1077-12 of the *Standard Specifications*. Produce panels within 1/4" of the panel dimensions shown in the accepted submittals. Damaged panels with excessive discoloration, chips or cracks as determined by the Engineer will be rejected.

For soldier pile walls with panels, galvanize piles in accordance with Section 1076 of the *Standard Specifications*. When noted in the plans, paint galvanized piles in accordance with Article 442-12 of the *Standard Specifications*. Apply the following system to paint galvanized piles gray with waterborne paints that meet Article 1080-11 of the *Standard*

*Specifications.* For painting galvanized piles other colors, contact the Materials and Tests (M&T) Unit for an appropriate paint system.

| <b>GRAY PAINT SYSTEM FOR GALVANIZED PILES</b> |              |                                      |             |
|-----------------------------------------------|--------------|--------------------------------------|-------------|
| <b>Coat</b>                                   | <b>Color</b> | <b>Dry/Wet Film Thickness (Mils)</b> |             |
|                                               |              | <b>Min.</b>                          | <b>Max.</b> |
| Intermediate                                  | Brown        | 3.0 DFT                              | 5.0 DFT     |
| Stripe                                        | White        | 4.0 WFT                              | 7.0 WFT     |
| Topcoat                                       | Gray         | 2.0 DFT                              | 4.0 DFT     |
| Total                                         |              | 5.0 DFT                              | 9.0 DFT     |

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 soldier pile wall materials so materials are kept clean and free of damage.

### **3.0 PRECONSTRUCTION REQUIREMENTS**

#### **A. Soldier Pile Wall Surveys**

The Retaining Wall Plans show a plan view, typical sections, details, notes and an elevation or profile view (wall envelope) for each soldier pile wall. Before beginning soldier pile wall design, survey existing ground elevations shown in the plans and other elevations in the vicinity of soldier pile wall locations as needed. Based on these elevations, finished grades and actual soldier pile wall dimensions and details, submit revised wall envelopes for acceptance. Use accepted wall envelopes for design.

#### **B. Soldier Pile Wall Designs**

Submit 11 copies of working drawings and 3 copies of design calculations and a PDF copy of each for soldier pile wall designs at least 30 days before the preconstruction meeting. Do not begin soldier pile wall construction until a design submittal is accepted.

Use a prequalified Cantilever Wall Design Consultant to design soldier pile walls. Provide designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for the Cantilever Wall Design Consultant.

Design soldier pile walls in accordance with the plans and Article 11.8 of the *AASHTO LRFD Bridge Design Specifications* unless otherwise required. Design soldier pile walls for seismic if walls are located in seismic zone 2 based on Figure 2-1 of the *Structure Design Manual*. Design soldier pile walls for a maximum deflection of 2" or 1.5% of H, whichever is less, with H as shown in the plans.

When noted in the plans, design soldier pile walls for a live load (traffic) surcharge of 250 lb/sf in accordance with Article 11.5.5 of the *AASHTO LRFD specifications*. For steel beam guardrail with 8 ft posts above soldier pile walls, analyze walls for a

horizontal load ( $P_{H1}$ ) of 300 lb/ft of wall in accordance with Figure 3.11.6.3-2(a) of the AASHTO LRFD specifications. For concrete barrier rail above soldier pile walls, analyze walls for a  $P_{H1}$  of 500 lb/ft of wall in accordance with Figure 3.11.6.3-2(a).

Use a maximum H-pile spacing of 10 ft. At the Contractor's option, use driven or drilled-in piles for soldier pile walls with concrete facing unless otherwise required. For soldier pile walls with panels, use drilled-in piles unless noted otherwise in the plans. Use concrete or grout for embedded portions of drilled-in piles. Install drilled-in piles by excavating holes with diameters that will result in at least 3" of clearance all around piles.

Provide temporary support of excavations for excavations more than 4 ft deep and timber lagging in accordance with the *AASHTO Guide Design Specifications for Bridge Temporary Works*. At the Contractor's option and when noted in the plans, provide temporary slopes instead of temporary support of excavations. Do not extend temporary slopes outside right-of-way or easement limits. Except for fill sections or when using temporary slopes, backfill voids behind panels, lagging and piles with No. 57 stone. Place separation geotextile between No. 57 stone and overlying fill or pavement sections except when concrete pavement, full depth asphalt or cement treated base is placed directly on stone.

At the Contractor's option, use panels or concrete facing unless required otherwise in the plans. Design panels and concrete facing in accordance with the plans and Section 5 of the *AASHTO LRFD Bridge Design Specifications*. Provide reinforcing steel of sufficient density to satisfy Article 5.7.3.4 of the AASHTO LRFD specifications. Attach concrete facing to front of H-piles with welded stud shear connectors. Use panels or concrete facing at least 6" thick and extend facing at least 6" above where the grade intersects back of concrete facing unless required otherwise in the plans.

Use No. 57 stone for aggregate leveling pads. Use 6" thick leveling pads beneath panels and concrete facing. Unless required otherwise in the plans, embed top of leveling pads at least 12" below bottom of walls shown in the plans.

Provide wall drainage systems consisting of geocomposite drain strips, drains and outlet components. Place drain strips with a horizontal spacing of no more than 10 ft and center strips between adjacent piles. Attach drain strips to front of timber lagging or back of panels or concrete facing and connect strips to leveling pads. Locate a continuous aggregate shoulder drain along the base of panels or concrete facing in front of piles and leveling pads. Provide drains and outlet components in accordance with Standard Drawing No. 816.02 of the *Roadway Standard Drawings*.

Unless required otherwise in the plans, use cast-in-place reinforced concrete coping at top of soldier pile walls with panels. Extend coping at least 6" above where the grade intersects back of coping unless required otherwise in the plans. Use coping dimensions shown in the plans. At the Contractor's option, connect coping to panels with dowels or extend coping down back of panels. When concrete barrier rail is required above soldier pile walls, use concrete barrier rail with moment slab as shown

in the plans.

Submit working drawings and design calculations for acceptance in accordance with Article 105-2 of the *Standard Specifications*. Submit working drawings showing plan views, wall profiles with pile locations, typical sections and details of piles, drainage, temporary support, leveling pads, panels and concrete facing. If necessary, include details on working drawings for coping, concrete barrier rail with moment slab and obstructions extending through walls or interfering with piles, barriers or moment slabs. Submit design calculations including deflection calculations for each wall section with different surcharge loads, geometry or material parameters. Include analysis of temporary conditions in design calculations. When designing soldier pile walls with computer software, a hand calculation is required for the tallest wall section.

#### C. Soldier Pile Wall Construction Plan

Submit 4 copies and a PDF copy of a soldier pile wall construction plan at least 30 days before the preconstruction meeting. Do not begin soldier pile wall construction until the construction plan submittal is accepted. Provide project specific information in the soldier pile wall construction plan including a detailed construction sequence. For driven piles, submit proposed pile driving methods and equipment in accordance with Subarticle 450-3(D)(2) of the *Standard Specifications*. For drilled-in piles, submit installation details including drilling equipment and methods for stabilizing and filling holes. Provide details in the construction plan of excavations including temporary support and any other information shown in the plans or requested by the Engineer.

If alternate construction procedures are proposed or necessary, a revised soldier pile wall construction plan submittal may be required. If the work deviates from the accepted submittal without prior approval, the Engineer may suspend soldier pile wall construction until a revised plan is accepted.

#### D. Preconstruction Meeting

Before starting soldier pile wall construction, hold a preconstruction meeting to discuss the construction and inspection of the soldier pile walls. Schedule this meeting after all soldier pile wall submittals have been accepted. The Resident or Bridge Maintenance Engineer, Bridge Construction Engineer, Geotechnical Operations Engineer, Contractor and Cantilever Wall Contractor Superintendent will attend this preconstruction meeting.

### 4.0 CONSTRUCTION METHODS

Control drainage during construction in the vicinity of soldier pile walls. Direct run off away from soldier pile walls and areas above and behind walls. Contain and maintain No. 57 stone and backfill and protect material from erosion.

Notify the Engineer before blasting in the vicinity of soldier pile walls. Perform blasting in accordance with the contract. Unless required otherwise in the plans, install foundations located behind soldier pile walls before beginning wall construction if the horizontal

distance to the closest foundation is less than the height of the tallest wall section.

Install soldier pile walls in accordance with the accepted submittals and as directed. Do not excavate behind soldier pile walls unless a temporary slope is shown in the accepted submittals. If overexcavation occurs and is not approved, repair walls with an approved method and a revised soldier pile wall design or construction plan may be required.

#### A. Piles

If a temporary slope is shown in the accepted submittals, excavate the slope before installing piles. Otherwise, install piles before excavating for soldier pile walls. Weld stud shear connectors to piles in accordance with Article 1072-6 of the *Standard Specifications*.

Install piles within 1" of horizontal and vertical alignment shown in the accepted submittals and with no negative batter (piles leaning forward). Minimize alignment variations between piles for soldier pile walls with concrete facing since variations can result in thicker concrete facing in some locations in order to provide the minimum required facing thickness elsewhere. Locate piles so the minimum required concrete facing thickness, if applicable, and roadway clearances are maintained for variable pile alignments.

Install piles with the minimum required embedment in accordance with Subarticles 450-3(D) and 450-3(E) of the *Standard Specifications*. Piles may be installed with a vibratory hammer as approved by the Engineer. Do not splice piles. If necessary, cut off piles at elevations shown in the accepted submittals along a plane normal to the pile axis.

Use pile excavation to install drilled-in piles. If overexcavation occurs, fill to required elevations with No. 57 stone before setting piles. After filling holes with concrete or grout to the elevations shown in the accepted submittals, remove any fluids and fill remaining portions of holes with flowable fill. Cure concrete or grout at least 7 days before excavating.

Notify the Engineer if refusal is reached before pile excavation or driven piles attain the minimum required embedment. When this occurs, a revised soldier pile wall design or construction plan submittal may be required.

#### B. Excavation

If a temporary slope is shown in the accepted submittals, excavate the slope as shown. Otherwise, excavate in front of piles from the top down in accordance with the accepted submittals. Excavate in staged horizontal lifts with a maximum height of 5 ft. Use timber lagging or an alternate approved method for temporary support of excavations in accordance with the accepted submittals.

Install temporary support within 24 hours of excavating each lift unless otherwise approved. The installation may be delayed if it can be demonstrated that delays will

not adversely affect excavation stability. If excavation faces will be exposed for more than 24 hours, use polyethylene sheets anchored at top and bottom of lifts to protect excavation faces from changes in moisture content.

If an excavation becomes unstable at any time, suspend soldier pile wall construction and temporarily stabilize the excavation by immediately placing an earth berm up against the unstable excavation face. When this occurs, repair walls with an approved method and a revised soldier pile wall design or construction plan may be required.

Remove flowable fill and material in between piles as necessary to install timber lagging. Position lagging with at least 3" of contact in the horizontal direction between the lagging and pile flanges. Do not excavate the next lift until temporary support for the current lift is accepted.

#### C. Wall Drainage Systems

Install wall drainage systems as shown in the accepted submittals and in accordance with Section 816 of the *Standard Specifications*. Place geocomposite drain strips with the geotextile side facing away from wall faces. Secure drain strips so strips are in continuous contact with surfaces to which they are attached and allow for full flow the entire height of soldier pile walls. Discontinuous drain strips are not allowed. If splices are needed, overlap drain strips at least 12" so flow is not impeded. Connect drain strips to leveling pads by embedding strip ends at least 4" into No. 57 stone.

#### D. Leveling Pads, Panels, Coping and Concrete Facing

Construct aggregate leveling pads at elevations and with dimensions shown in the accepted submittals. Compact leveling pads with a vibratory compactor to the satisfaction of the Engineer.

Set panels against pile flanges as shown in the accepted submittals. Position panels with at least 2" of contact in the horizontal direction between the panels and pile flanges. If contact cannot be maintained, remove panels, fill gaps with joint filler and reset panels. Securely support panels until enough No. 57 stone or backfill is placed to hold panels in place.

Construct coping as shown in the accepted submittals and Subarticle 452-3(C) of the *Standard Specifications*. When single faced precast concrete barrier is required in front of and against soldier pile walls, stop coping just above barrier so coping does not interfere with placing barrier up against wall faces.

Construct concrete facing in accordance with the accepted submittals and Section 420 of the *Standard Specifications*. Do not remove forms until concrete attains a compressive strength of at least 2,400 psi. Unless required otherwise in the plans, provide a Class 2 surface finish for concrete facing that meets Subarticle 420-17(F) of the *Standard Specifications*. Construct concrete facing joints at a maximum spacing of 30 ft unless required otherwise in the plans. Make 1/2" thick expansion joints that meet Article 420-10 of the *Standard Specifications* for every third joint and 1/2" deep



grooved contraction joints that meet Subarticle 825-11(B) for the remaining joints. Stop reinforcing steel for concrete facing 2" on either side of expansion joints.

If a brick veneer is required, construct brick masonry in accordance with Section 830 of the *Standard Specifications*. Anchor brick veneers to soldier pile walls with approved brick to concrete type anchors in accordance with the manufacturer's instructions. Space anchors no more than 16" apart in the vertical direction and no more than 32" apart in the horizontal direction with each row of anchors staggered 16" from the row above and below.

Seal joints above and behind soldier pile walls between coping or concrete facing and ditches or concrete slope protection with silicone sealant.

#### E. Backfill

For fill sections or if a temporary slope is shown in the accepted submittals, backfill behind piles, panels and concrete facing in accordance with Article 410-8 of the *Standard Specifications*. Otherwise, backfill voids behind panels, lagging and piles with No. 57 stone as shown in the accepted submittals. Ensure all voids between panels and lagging and between piles, lagging and excavation faces are filled with No. 57 stone. Compact stone to the satisfaction of the Engineer. When separation geotextiles are required, overlap adjacent geotextiles at least 18" and hold separation geotextiles in place with wire staples or anchor pins as needed.

#### F. Pile Coatings

For soldier pile walls with panels, clean exposed galvanized or painted surfaces of piles with a 2,500 psi pressure washer after wall construction is complete. Repair galvanized surfaces that are exposed and damaged in accordance with Article 1076-7 of the *Standard Specifications*. Repair painted surfaces that are exposed and damaged by applying 4.0 to 7.0 mils wet film thickness of a topcoat to damaged areas with brushes or rollers. Use the same paint for damaged areas that was used for the topcoat when painting piles initially. Feather or taper topcoats in damaged areas to be level with surrounding areas.

### 5.0 MEASUREMENT AND PAYMENT

*Soldier Pile Retaining Walls* will be measured and paid in square feet. Soldier pile walls will be measured as the square feet of exposed wall face area with the height equal to the difference between top and bottom of wall elevations. Define "top of wall" as top of coping or top of panels or concrete facing for soldier pile walls without coping. Define "bottom of wall" as shown in the plans and no measurement will be made for portions of soldier pile walls embedded below bottom of wall elevations.

The contract unit price for *Soldier Pile Retaining Walls* will be full compensation for providing designs, submittals, labor, tools, equipment and soldier pile wall materials, installing piles, excavating, backfilling, hauling and removing excavated materials and supplying temporary support of excavations, wall drainage systems, leveling pads, panels,

concrete facing, No. 57 stone, geotextiles and any incidentals necessary to construct soldier pile walls. The contract unit price for *Soldier Pile Retaining Walls* will also be full compensation for coping, pile coatings and brick veneers, if required. No additional payment will be made and no extension of completion date or time will be allowed for repairing overexcavations or unstable excavations or thicker concrete facing.

The contract unit price for *Soldier Pile Retaining Walls* does not include the cost for ditches, fences, handrails, barrier or guardrail associated with soldier pile walls as these items will be paid for elsewhere in the contract.

Where it is necessary to provide backfill material behind soldier pile walls from sources other than excavated areas or borrow sources used in connection with other work in the contract, payment for furnishing and hauling such backfill material will be paid as extra work in accordance with Article 104-7 of the *Standard Specifications*. Placing and compacting such backfill material is not considered extra work but is incidental to the work being performed.

Payment will be made under:

**Pay Item**

Soldier Pile Retaining Walls

**Pay Unit**

Square Foot

**PILE DRIVING CRITERIA**

**(9-18-12)**

Revise the 2012 *Standard Specifications* as follows:

**Page 4-72, Subarticle 450-3(D)(3) Required Driving Resistance, lines 26-30,** delete first paragraph and replace with the following:

The Engineer will determine if the proposed pile driving methods and equipment are acceptable and provide the blows/ft and equivalent set for the required driving resistance noted in the plans, i.e., "pile driving criteria" except for structures with pile driving analyzer (PDA) testing. For structures with PDA testing, provide pile driving criteria for any bents and end bents with piles in accordance with Subarticle 450-3(F)(4).

**Page 4-73, Subarticle 450-3(F) Pile Driving Analyzer, lines 45-48,** delete third paragraph and replace with the following:

The Engineer will complete the review of the proposed pile driving methods and equipment within 7 days of receiving PDA reports and pile driving criteria. Do not place concrete for caps or footings on piles until PDA reports and pile driving criteria have been accepted.

**Page 4-75, Subarticle 450-3(F) Pile Driving Analyzer,** add the following:

**(4) Pile Driving Criteria**

Analyze pile driving with the GRL Wave Equation Analysis Program (GRLWEAP) manufactured by Pile Dynamics, Inc. Use the same PDA Consultant that provides PDA

reports to perform GRLWEAP analyses and develop pile driving criteria. Provide driving criteria sealed by an engineer approved as a Project Engineer (key person) for the same PDA Consultant.

Analyze pile driving so driving stresses, energy transfer, ram stroke and blows/ft from PDA testing and resistances from CAPWAP analyses correlate to GRLWEAP models. Provide pile driving criteria for each combination of required driving resistance and pile length installed for all pile types and sizes. Submit 2 copies of pile driving criteria with PDA reports. Include the following for driving criteria:

- (a) Project information in accordance with Subarticle 450-3(F)(3)(a)
- (b) Table showing blows/ft and equivalent set vs. either stroke for multiple strokes in increments of 6" or bounce chamber pressure for multiple pressures in increments of 1 psi
- (c) Maximum stroke or blows/ft or pile cushion requirements to prevent overstressing piles as needed
- (d) GRLWEAP software version information
- (e) PDF copy of all pile driving criteria and executable GRLWEAP input and output files

**Page 4-76, Article 450-4 MEASUREMENT AND PAYMENT**, add the following:

The contract unit price for *PDA Testing* will also be full compensation for performing GRLWEAP analysis and developing and providing pile driving criteria.

**PROJECT SPECIAL PROVISION**

(10-18-95)

Z-1

**PERMITS**

The Contractor's attention is directed to the following permits, which have been issued to the Department of Transportation by the authority granting the permit.

| <b><u>PERMIT</u></b>                                     | <b><u>AUTHORITY GRANTING THE PERMIT</u></b>                           |
|----------------------------------------------------------|-----------------------------------------------------------------------|
| Dredge and Fill and/or<br>Work in Navigable Waters (404) | U. S. Army Corps of Engineers                                         |
| Water Quality (401)                                      | Division of Environmental Management, DENR<br>State of North Carolina |

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by \* are the responsibility of the department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-13 of the *2012 Standard Specifications* and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the Engineer to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

**Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.**

**U.S. ARMY CORPS OF ENGINEERS  
WILMINGTON DISTRICT**

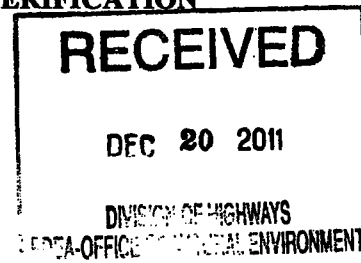
Action ID: 2011-02234County: MooreUSGS Quad: Southern Pines

**GENERAL PERMIT (REGIONAL AND NATIONWIDE) VERIFICATION**

Property Owner : Dr. Gregory Thorpe, PhD, Manager

Address: NCDOT PDEA  
1598 Mail Service Center  
Raleigh, North Carolina 27699

Telephone No.:



Size and location of property (water body, road name/number, town, etc.): The project area is located along an unnamed tributary of McDeeds Creek, approximately ½ mile north of the intersection of SR 1309 (Morganton Road) and US 1 (Sandhills Boulevard) in Southern Pines, Moore County, North Carolina.

Description of projects area and activity: U-3324. This verification authorizes the replacement of a 36" culvert with a 48" culvert and the discharge of fill material into 30 linear feet of stream channel for the construction of a rip-rap energy dissipater at the outlet of the culvert. This verification also authorizes temporary impacts to 10 linear feet of stream channel.

Applicable Law: ☒ Section 404 (Clean Water Act, 33 USC 1344)  
☐ Section 10 (Rivers and Harbors Act, 33 USC 403)

Authorization: Regional General Permit Number: \_\_\_\_\_  
 Nationwide Permit Number: 3

Your work is authorized by the above referenced permit provided it is accomplished in strict accordance with the attached conditions and your submitted application and attached information dated December 9, 2011. Any violation of the attached conditions or deviation from your submitted plans may subject the permittee to a stop work order, a restoration order and/or appropriate legal action.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to March 18, 2012. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit.

Activities subject to Section 404 (as indicated above) may also require an individual Section 401 Water Quality Certification. You should contact the NC Division of Water Quality (telephone (919) 733-1786) to determine Section 401 requirements.

For activities occurring within the twenty coastal counties subject to regulation under the Coastal Area Management Act (CAMA), prior to beginning work you must contact the N.C. Division of Coastal Management.

This Department of the Army verification does not relieve the permittee of the responsibility to obtain any other required Federal, State or local approvals/permits.

If there are any questions regarding this verification, any of the conditions of the Permit, or the Corps of Engineers regulatory program, please contact Mr. Ronnie Smith at (910) 251-4829.

SMITH, RONNIE D  
 ALE1281725242

Corps Regulatory Official Ronnie SmithDate: December 20, 2011Expiration Date of Verification: 18 March 2012

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the attached customer Satisfaction Survey or visit <http://per2.nwp.usace.army.mil/survey.html> to complete the survey online.

**Copy Furnished:**

**Mr. Greg Price  
NCDOT -PDEA  
1598 Mail Service Center  
Raleigh, North Carolina 27699**

**Mr. Art King  
NCDOT  
Post Office Box 1067  
Aberdeen, NC 28315**

**Mr. Timothy Johnson  
NCDOT  
Post Office Box 1067  
Aberdeen, NC 28315**

**Mr. Mason Herndon  
Division of Water Quality  
225 Green Street, Suite 714  
Fayetteville, North Carolina 28301**

**Ms. Rachelle Beauregard  
NCDOT -PDEA  
1598 Mail Service Center  
Raleigh, North Carolina 27699**

### Determination of Jurisdiction:

- A. ☒ Based on preliminary information, there appear to be waters of the US including wetlands within the above described project area. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331).
- B. ☐ There are Navigable Waters of the United States within the above described project area subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- C. ☐ There are waters of the US and/or wetlands within the above described project area subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- D. ☐ The jurisdictional areas within the above described project area have been identified under a previous action. Please reference jurisdictional determination issued \_\_\_\_\_ Action ID \_\_\_\_\_.

### Basis For Determination

The water body exhibits an ordinary high water mark as indicated by the absence of vegetation in the stream channel and the presence of bed and banks.

Remarks. \_\_\_\_\_

### Attention USDA Program Participants

This delineation/determination has been conducted to identify the limits of Corps' Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

### F. Appeals Information (This information applies only to approved jurisdictional determinations as indicated in B and C above).

This correspondence constitutes an approved jurisdictional determination for the above described site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

US Army Corps of Engineers  
South Atlantic Division  
Attn: Jason Steele, Review Officer  
60 Forsyth Street SW, Room 10M15  
Atlanta, Georgia 30303-8801  
Phone: (404) 562-5137

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by February 18, 2011.

**\*\*It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.\*\***

Corps Regulatory Official: Ronnie Smith

SMITH, RONNIE.DALE.1281725242

Date: December 20, 2011

# NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: **NCDOT**File Number: **2011-02234**Date: **December 20, 2011**

Attached is:

See Section below

|                                     |                                                                    |   |
|-------------------------------------|--------------------------------------------------------------------|---|
| <input type="checkbox"/>            | INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission) | A |
| <input type="checkbox"/>            | PROFFERED PERMIT (Standard Permit or Letter of permission)         | B |
| <input type="checkbox"/>            | PERMIT DENIAL                                                      | C |
| <input type="checkbox"/>            | APPROVED JURISDICTIONAL DETERMINATION                              | D |
| <input checked="" type="checkbox"/> | PRELIMINARY JURISDICTIONAL DETERMINATION                           | E |

**SECTION I -** The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://www.usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

**A: INITIAL PROFFERED PERMIT:** You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

**B: PROFFERED PERMIT:** You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**C: PERMIT DENIAL:** You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**D: APPROVED JURISDICTIONAL DETERMINATION:** You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.



**E: PRELIMINARY JURISDICTIONAL DETERMINATION:** You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

## **SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT**

**REASONS FOR APPEAL OR OBJECTIONS:** (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

**ADDITIONAL INFORMATION:** The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

### **POINT OF CONTACT FOR QUESTIONS OR INFORMATION:**

If you have questions regarding this decision and/or the appeal process you may contact:

**District Engineer, Wilmington Regulatory Division,**  
Attn: Ronnie Smith  
69 Darlington Avenue  
Wilmington, North Carolina 28403

If you only have questions regarding the appeal process you may also contact:

**Mr. Jason Steele, Administrative Appeal Review Officer**  
CESAD-PDO  
U.S. Army Corps of Engineers, South Atlantic Division  
60 Forsyth Street, Room 10M15  
Atlanta, Georgia 30303-8801  
Phone: (404) 562-5137

**RIGHT OF ENTRY:** Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

|                                  |       |                   |
|----------------------------------|-------|-------------------|
| Signature of appellant or agent. | Date: | Telephone number: |
|----------------------------------|-------|-------------------|

**For appeals on Initial Proffered Permits send this form to:**

**District Engineer, Wilmington Regulatory Division, Attn: Ronnie Smith, 69 Darlington Avenue, Wilmington, North Carolina 28403**

**For Permit denials, Proffered Permits and approved Jurisdictional Determinations send this form to:**

**Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Jason Steele, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801**  
Phone: (404) 562-5137

Action ID. 2011-02234County: RandolphUSGS Quad: Southern Pines**GENERAL PERMIT SPECIAL CONDITIONS**

1. The stream channel shall be restored within the temporary impact area and all temporary measures shall be removed immediately upon project completion.
2. The top of the rip-rap shall be placed at the same elevation or lower than the bottom of the natural stream channel. If a berm will be placed within the stream channel to support the rip-rap, the top of the berm shall be placed at the same elevation or lower than the bottom of the natural stream channel. If a berm will be placed, the berm must be placed within the permitted permanent surface water impact area as shown on the submitted plans.

Action ID Number: 2011-02234

County: Moore

Permittee: NCDOT

Date Verification Issued: December 20, 2011

Project Manager: Ronnie Smith

\*Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

US ARMY CORPS OF ENGINEERS  
WILMINGTON DISTRICT  
WILMINGTON REGULATORY FIELD OFFICE  
69 DARLINGTON AVENUE  
WILMINGTON, NORTH CAROLINA 28403

Please note that your permitted activity is subject to a compliance inspection by a U. S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and condition of the said permit, and required mitigation was completed in accordance with the permit conditions.

\_\_\_\_\_  
Signature of Permittee

\_\_\_\_\_  
Date

**NATIONWIDE PERMIT 3  
DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS  
FINAL NOTICE OF ISSUANCE AND MODIFICATION OF NATIONWIDE PERMITS  
FEDERAL REGISTER  
AUTHORIZED MARCH 19, 2007**

**Maintenance.** (a) The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure, or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. This NWP authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the district engineer, provided the permittee can demonstrate funding, contract, or other similar delays.

(b) This NWP also authorizes the removal of accumulated sediments and debris in the vicinity of and within existing structures (e.g., bridges, culverted road crossings, water intake structures, etc.) and the placement of new or additional riprap to protect the structure. The removal of sediment is limited to the minimum necessary to restore the waterway in the immediate vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend further than 200 feet in any direction from the structure. This 200 foot limit does not apply to maintenance dredging to remove accumulated sediments blocking or restricting outfall and intake structures or to maintenance dredging to remove accumulated sediments from canals associated with outfall and intake structures. All dredged or excavated materials must be deposited and retained in an upland area unless otherwise specifically approved by the district engineer under separate authorization. The placement of riprap must be the minimum necessary to protect the structure or to ensure the safety of the structure. Any bank stabilization measures not directly associated with the structure will require a separate authorization from the district engineer.

(c) This NWP also authorizes temporary structures, fills, and work necessary to conduct the maintenance activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

(d) This NWP does not authorize maintenance dredging for the primary purpose of navigation or beach restoration. This NWP does not authorize new stream channelization or stream relocation projects.

- \* **Notification:** For activities authorized by paragraph (b) of this NWP, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). Where maintenance dredging is proposed, the pre-construction notification must include information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals. (Sections 10 and 404)

**Note:** This NWP authorizes the repair, rehabilitation, or replacement of any previously authorized structure or fill that does not qualify for the Clean Water Act Section 404(f) exemption for maintenance.

### **NATIONWIDE PERMIT CONDITIONS**

The following General Conditions must be followed in order for any authorization by a NWP to be valid:

1. **Navigation.** (a) No activity may cause more than a minimal adverse effect on navigation.  
 (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.  
 (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
2. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
3. **Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.
4. **Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
5. **Shellfish Beds.** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48.
6. **Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).
7. **Water Supply Intakes.** No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.
8. **Adverse Effects From Impoundments.** If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.
9. **Management of Water Flows.** To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).
10. **Fills Within 100-Year Floodplains.** The activity must comply with applicable FEMA-approved state or local floodplain management requirements.
11. **Equipment.** Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.

15. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

16. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

17. Endangered Species. (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

\* (c) Non-federal permittees shall notify the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have “no effect” on listed species or critical habitat, or until Section 7 consultation has been completed.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

(e) Authorization of an activity by a NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the U.S. FWS or the

NMFS, both lethal and non-lethal “takes” of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide Web pages at <http://www.fws.gov/> and <http://www.noaa.gov/fisheries.html> respectively.

18. Historic Properties. (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

\*

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, explaining the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

19. Designated Critical Resource Waters. Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, state natural heritage sites, and outstanding



national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the district engineer after notice and opportunity for public comment. The district engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 27, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

20. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10 acre and require pre-construction notification, unless the district engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. For wetland losses of 1/10 acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream restoration, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2 acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2 acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

21. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

22. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

23. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

24. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

25. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

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(Transferee)

---

(Date)

- \* 26. Compliance Certification. Each permittee who received an NWP verification from the Corps must submit a signed certification regarding the completed work and any required mitigation. The certification form must be forwarded by the Corps with the NWP verification letter and will include:

- (a) A statement that the authorized work was done in accordance with the NWP authorization, including any general or specific conditions;
- (b) A statement that any required mitigation was completed in accordance with the permit conditions; and
- (c) The signature of the permittee certifying the completion of the work and mitigation.

\*

27. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, as a general rule, will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) Forty-five calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 17 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 18 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) is completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee cannot begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided result in a quicker decision.);

(4) The PCN must include a delineation of special aquatic sites and other waters of the United States on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters of the United States, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, where appropriate;

(5) If the proposed activity will result in the loss of greater than 1/10 acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement

will be satisfied. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWP and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(2) For all NWP 48 activities requiring pre-construction notification and for other NWP activities requiring pre-construction notification to the district engineer that result in the loss of greater than 1/2-acre of waters of the United States, the district engineer will immediately provide (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy of the PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps multiple copies of pre-construction notifications to expedite agency coordination.

(5) For NWP 48 activities that require reporting, the district engineer will provide a copy of each report within 10 calendar days of receipt to the appropriate regional office of the NMFS.

(e) District Engineer's Decision: In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If the proposed activity requires a PCN and will result in a loss of greater than 1/10 acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any

proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any conditions the district engineer deems necessary. The district engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan.

28. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

#### **FURTHER INFORMATION**

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project.

#### **DEFINITIONS**

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration, establishment (creation), enhancement, or preservation of aquatic resources for the purpose of compensating for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Discharge: The term "discharge" means any discharge of dredged or fill material.

**Enhancement:** The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

**Ephemeral stream:** An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

**Establishment (creation):** The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

**Historic Property:** Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

**Independent utility:** A test to determine what constitutes a single and complete project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

**Intermittent stream:** An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

**Loss of waters of the United States:** Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities eligible for exemptions under Section 404(f) of the Clean Water Act are not considered when calculating the loss of waters of the United States.

**Non-tidal wetland:** A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

**Open water:** For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

**Ordinary High Water Mark:** An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas (see 33 CFR 328.3(e)).

**Perennial stream:** A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

**Practicable:** Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

**Pre-construction notification:** A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

**Preservation:** The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

**Re-establishment:** The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area.

**Rehabilitation:** The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

**Restoration:** The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

**Riffle and pool complex:** Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

**Riparian areas:** Riparian areas are lands adjacent to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects waterbodies with their adjacent uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 20.)

**Shellfish seeding:** The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

**Single and complete project:** The term “single and complete project” is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete project must have independent utility (see definition). For linear projects, a “single and complete project” is all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single waterbody several times at separate and distant locations, each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

*Stormwater management:* Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

*Stormwater management facilities:* Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

*Stream bed:* The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

*Stream channelization:* The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

*Structure:* An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

*Tidal wetland:* A tidal wetland is a wetland (i.e., water of the United States) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line, which is defined at 33 CFR 328.3(d).

*Vegetated shallows:* Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

*Waterbody:* For purposes of the NWP, a waterbody is a jurisdictional water of the United States that, during a year with normal patterns of precipitation, has water flowing or standing above ground to the extent that an ordinary high water mark (OHWM) or other indicators of jurisdiction can be determined, as well as any wetland area (see 33 CFR 328.3(b)). If a jurisdictional wetland is adjacent--meaning bordering, contiguous, or neighboring--to a jurisdictional waterbody displaying an OHWM or other indicators of jurisdiction, that waterbody and its adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of "waterbodies" include streams, rivers, lakes, ponds, and wetlands.



## **REGIONAL CONDITIONS FOR NATIONWIDE PERMITS IN THE WILMINGTON DISTRICT**

### **1.0. Excluded Waters**

The Corps has identified waters that will be excluded from the use of all NWP's during certain timeframes. These waters are:

#### **1.1. Anadromous Fish Spawning Areas**

Waters of the United States identified by either the North Carolina Division of Marine Fisheries (NCDMF) or the North Carolina Wildlife Resources Commission (NCWRC) as anadromous fish spawning areas are excluded during the period between February 15 and June 30, without prior written approval from NCDMF or NCWRC and the Corps.

#### **1.2. Trout Waters Moratorium**

Waters of the United States in the twenty-five designated trout counties of North Carolina are excluded during the period between October 15 and April 15 without prior written approval from the NCWRC. (see Section I. b. 7. for a list of the twenty-five trout counties).

#### **1.3. Sturgeon Spawning Areas**

Waters of the United States designated as sturgeon spawning areas are excluded during the period between February 1 and June 30, without prior written approval from the National Marine Fisheries Service (NMFS).

### **\* 2.0. Waters Requiring Additional Notification**

The Corps has identified waters that will be subject to additional notification requirements for activities authorized by all NWP's. These waters are:

#### **\* 2.1. Western NC Counties that Drain to Designated Critical Habitat**

Waters of the U.S. that requires a Pre-Construction Notification pursuant to General Condition 27 (PCN) and located in the sixteen counties listed below, applicants must provide a copy of the PCN to the US Fish and Wildlife Service, 160 Zillicoa Street, Asheville, North Carolina 28805. This PCN must be sent concurrently to the US Fish and Wildlife Service and the Corps Asheville Regulatory Field Office. Please see General Condition 17 for specific notification requirements related to Federally Endangered Species and the following website for information on the location of designated critical habitat.

Counties with tributaries that drain to designated critical habitat that require notification to the Asheville US Fish and Wildlife Service: Avery, Cherokee, Forsyth, Graham, Haywood, Henderson, Jackson, Macon Mecklenburg, Mitchell, Stokes, Surry, Swain, Transylvania, Union and Yancey.

Website and office addresses for Endangered Species Act Information:

The Wilmington District has developed the following website for applicants which provide guidelines on how to review linked websites and maps in order to fulfill NWP general condition 17 requirements.

<http://www.saw.usace.army.mil/wetlands/ESA>

Applicants who do not have internet access may contact the appropriate US Fish and Wildlife Service offices or the US Army Corps of Engineers office listed below.

US Fish and Wildlife Service  
Asheville Field Office  
160 Zillicoa Street  
Asheville, NC 28801  
Telephone: (828) 258-3939

Asheville US Fish and Wildlife Service Office counties: All counties west of and including Anson, Stanly, Davidson, Forsyth and Stokes Counties

US Fish and Wildlife Service  
 Raleigh Field Office  
 Post Office Box 33726  
 Raleigh, NC 27636-3726  
 Telephone: (919) 856-4520

Raleigh US Fish and Wildlife Service Office counties: all counties east of and including Richmond, Montgomery, Randolph, Guilford, and Rockingham Counties.

**\* 2.2. Special Designation Waters**

Prior to the use of any NWP in any of the following North Carolina identified waters and contiguous wetlands, applicants must comply with Nationwide Permit General Condition 27 (PCN). The North Carolina waters and contiguous wetlands that require additional notification requirements are:

“Outstanding Resource Waters” (ORW) and “High Quality Waters” (HQW) (as designated by the North Carolina Environmental Management Commission), or  
 “Inland Primary Nursery Areas” (IPNA) (as designated by the North Carolina Wildlife Resources Commission), or “Contiguous Wetlands” (as defined by the North Carolina Environmental Management Commission), or “Primary Nursery Areas” (PNA) (as designated by the North Carolina Marine Fisheries Commission).

**2.3. Coastal Area Management Act (CAMA) Areas of Environmental Concern**

Non-Federal applicants for any NWP in a designated “Area of Environmental Concern” (AEC) in the twenty (20) counties of Eastern North Carolina covered by the North Carolina Coastal Area Management Act (CAMA), must also obtain the required CAMA permit. Construction activities for non-Federal projects may not commence until a copy of the approved CAMA permit is furnished to the appropriate Wilmington District Regulatory Field Office (Wilmington Field Office – P.O. Box 1890, Wilmington, NC 28402 or Washington Field Office – P.O. Box 1000, Washington, NC 27889).

**\* 2. 4. Barrier Islands**

Prior to the use of any NWP on a barrier island of North Carolina, applicants must comply with Nationwide Permit General Condition 27 (PCN).

**\* 2.5. Mountain or Piedmont Bogs**

Prior to the use of any NWP in a “Mountain or Piedmont Bog” of North Carolina, applicants shall comply with Nationwide Permit General Condition 27 (PCN).

Note: The following wetland community types identified in the N.C. Natural Heritage Program document, “Classification of Natural communities of North Carolina (Michael P. Schafale and Alan S. Weakley, 1990), are subject to this regional condition.

| Mountain Bogs                                  | Piedmont Bogs                  |
|------------------------------------------------|--------------------------------|
| Swamp Forest-Bog Complex                       | Upland depression Swamp Forest |
| Swamp Forest-Bog Complex<br>(Spruce Subtype)   |                                |
| Southern Appalachian Bog<br>(Northern Subtype) |                                |
| Southern Appalachian Bog<br>(Southern Subtype) |                                |
| Southern Appalachian Fen                       |                                |

**\* 2.6. Animal Waste Facilities**

Prior to use of any NWP for construction of animal waste facilities in waters of the US, including wetlands, applicants shall comply with Nationwide Permit General Condition 27 (PCN).

**\* 2.7. Trout Waters**

Prior to any discharge of dredge or fill material into streams or waterbodies within the twenty-five (25) designated trout counties of North Carolina, the applicant shall comply with

Nationwide Permit General Condition 27 (PCN). The applicant shall also provide a copy of the notification to the appropriate NCWRC office to facilitate the determination of any potential impacts to designated Trout Waters. Notification to the Corps of Engineers will include a statement with the name of the NCWRC biologist contacted, the date of the notification, the location of work, a delineation of wetlands, a discussion of alternatives to working in the mountain trout waters, why alternatives were not selected, and a plan to provide compensatory mitigation for all unavoidable adverse impacts to mountain trout waters.

**NCWRC and NC Trout Counties**

|                                     |           |          |         |
|-------------------------------------|-----------|----------|---------|
| Mr. Ron Linville                    |           |          |         |
| Western Piedmont Region Coordinator | Alleghany | Caldwell | Watauga |
| 3855 Idlewild Road                  | Ashe      | Mitchell | Wilkes  |
| Kernersville, NC 27284-9180         | Avery     | Stokes   |         |
| Telephone: (336) 769-9453           | Burke     | Surry    |         |

|                                   |          |           |              |
|-----------------------------------|----------|-----------|--------------|
| Mr. Dave McHenry                  |          |           |              |
| Mountain Region Coordinator       | Buncombe | Henderson | Polk         |
| 20830 Great Smoky Mtn. Expressway | Cherokee | Jackson   | Rutherford   |
| Waynesville, NC 28786             | Clay     | Macon     | Swain        |
| Telephone: (828) 452-2546         | Graham   | Madison   | Transylvania |
| Fax: (828) 452-7772               | Haywood  | McDowell  | Yancey       |

**3.0. List of Corps Regional Conditions for All Nationwide Permits**

The following conditions apply to all Nationwide Permits in the Wilmington District:

**3.1. Limitation of Loss of Perennial Stream Bed**

NWPs may not be used for activities that may result in the loss or degradation of greater than 300 total linear feet of perennial streams. The NWPs may not be used for activities that may result in the loss or degradation of greater than 300 total linear feet of ephemeral and intermittent streams that exhibit important aquatic function(s)\* Loss of stream includes the linear feet of stream bed that is filled, excavated, or flooded by the proposed activity. The District Commander can waive the 300 linear foot limit for ephemeral and intermittent streams on a case-by-case basis if he determines that the proposed activity will result in minimal individual and cumulative adverse impacts to the aquatic environment. Waivers for the loss of ephemeral and intermittent streams must be in writing. This waiver only applies to the 300 linear feet threshold for NWPs. Mitigation may still be required for impacts to ephemeral and intermittent streams, on a case-by-case basis, depending on the impacts to the aquatic environment of the

proposed project. [\*Note: The Corps uses the Stream Quality Assessment Worksheet, located with Permit Information on the Regulatory Program Web Site, to aid in the determination of aquatic function within the intermittent stream channel.]

### **3.2. Mitigation for Loss of Stream Bed Exceeding 150 Feet.**

For any NWP that results in a loss of more than 150 linear feet of perennial and/or ephemeral/intermittent stream, the applicant shall provide a mitigation proposal to compensate for the loss of aquatic function associated with the proposed activity. For stream losses less than 150 linear feet, that require a PCN, the District Commander may determine, on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effect on the aquatic environment.

### **3.3. Pre-construction Notification for Loss of Streambed Exceeding 150 Feet.**

Prior to use of any NWP for any activity which impacts more than 150 total linear feet of perennial stream or ephemeral/ intermittent stream, the applicant must comply with Nationwide Permit General Condition 27 (PCN). This applies to NWPs that do not have specific notification requirements. If a NWP has specific notification requirements, the requirements of the NWP should be followed.

### **3.4. Restriction on Use of Live Concrete**

For all NWPs which allow the use of concrete as a building material, measures will be taken to prevent live or fresh concrete, including bags of uncured concrete, from coming into contact with waters of the state until the concrete has hardened.

### **3.5. Requirements for Using Riprap for Bank Stabilization**

For all NWPs that allow for the use of riprap material for bank stabilization, the following measures shall be applied:

**3.5.1.** Filter cloth must be placed underneath the riprap as an additional requirement of its use in North Carolina waters.

**3.5.2.** The placement of riprap shall be limited to the areas depicted on submitted work plan drawings.

**3.5.3.** The riprap material shall be clean and free from loose dirt or any pollutant except in trace quantities that would not have an adverse environmental effect.

**3.5.4.** It shall be of a size sufficient to prevent its movement from the authorized alignment by natural forces under normal conditions.

**3.5.5.** The riprap material shall consist of clean rock or masonry material such as, but not limited to, granite, marl, or broken concrete.

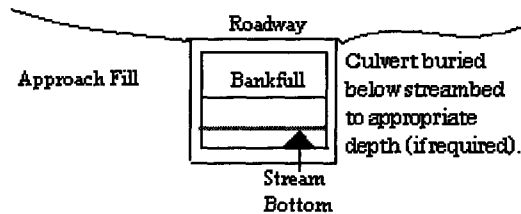
21

**3.5.6.** A waiver from the specifications in this Regional Condition may be requested in writing. The waiver will only be issued if it can be demonstrated that the impacts of complying with this Regional condition would result in greater adverse impacts to the aquatic environment.

### **3.6. Safe Passage Requirements for Culvert Placement**

For all NWPs that involve the construction/installation of culverts, measures will be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a pipe or culvert should not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed opening should be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gage data, if available. In the absence of such data, bankfull flow can be used as a comparable level.

In the twenty (20) counties of North Carolina designated as coastal counties by the Coastal Area Management Act (CAMA): All pipe and culvert bottoms shall be buried at least one foot below normal bed elevation when they are placed within the Public Trust Area of Environmental Concern (AEC) and/or the Estuarine Waters AEC as designated by CAMA, and/or all streams appearing as blue lines on United States Geological Survey (USGS) quad sheets.



In all other counties: Culverts greater than 48 inches in diameter will be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter or less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain the existing channel slope. The bottom of the culvert must be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions.

Destabilizing the channel and head cutting upstream should be considered in the placement of the culvert.

A waiver from the depth specifications in this condition may be requested in writing. The waiver will be issued if it can be demonstrated that the proposal would result in the least impacts to the aquatic environment.

All counties: Culverts placed in wetlands do not have to be buried.

### **3.7. Notification to NCDENR Shellfish Sanitation Section**

Applicants shall notify the NCDENR Shellfish Sanitation Section prior to dredging in or removing sediment from an area closed to shell fishing where the effluent may be released to an area open for shell fishing or swimming in order to avoid contamination from the disposal area and cause a temporary shellfish closure to be made. Such notification shall also be provided to the appropriate Corps of Engineers Regulatory Field Office. Any disposal of sand to the ocean beach should occur between November 1 and April 30 when recreational usage is low. Only clean sand should be used and no dredged sand from closed shell fishing areas may be used. If beach disposal were to occur at times other than stated above or if sand from a closed shell fishing area is to be used, a swimming advisory shall be posted, and a press release shall be issued.

### **3.8. Preservation of Submerged Aquatic Vegetation**

Adverse impacts to Submerged Aquatic Vegetation (SAV) are not authorized by any NWP within any of the twenty coastal counties defined by North Carolina's Coastal Area Management Act of 1974 (CAMA).

**NC DIVISION OF WATER QUALITY - GENERAL CERTIFICATION CONDITIONS**

For the most recent General Certification conditions, call the NC Division of Water Quality, Wetlands/401 Certification Unit at (919) 733-1786 or access the following website:

<http://h2o.enr.state.nc.us/ncwetlands/certs.html>

**NC DIVISION OF COASTAL MANAGEMENT - STATE CONSISTENCY**

In a letter dated May 7, 2007, the North Carolina Division of Coastal Management found this NWP consistent with the North Carolina Coastal Zone Management Program. Updates on CAMA Consistency for NC can be found on the NC DCM web site at:

<http://dcm2.enr.state.nc.us/Permits/consist.htm>

**EASTERN BAND OF THE CHEROKEE INDIANS TRIBAL WATER QUALITY CERTIFICATIONS**

In a letter dated May 8, 2007, US EPA, on behalf of the Eastern Band of Cherokee Indians, provided Tribal General Conditions for Nationwide Permits on Cherokee Indian Reservation. These Tribal General Conditions are located on the Corps website at:

<http://www.saw.usace.army.mil/WETLANDS/NWP2007/EBCI-certs.html>

**Citations:**

2007 Nationwide Permits Public Notice for Final Issue Date: March 15, 2007

Correction Notice for Nationwide Permits, Federal Register / Vol. 72, No. 88 / Tuesday, May 8, 2007 / Notices p.26082

2007 SAW Regional Conditions – Authorized June 1, 2007

This and other information can be found on the Corps web site at:

<http://www.saw.usace.army.mil/WETLANDS/NWP2007/nationwide-permits.html>

## Water Quality Certification N°. 3687

**GENERAL CERTIFICATION FOR PROJECTS ELIGIBLE FOR U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT NUMBERS: 3 (MAINTENANCE), 4 (FISH AND WILDLIFE HARVESTING, ENHANCEMENT, AND ATTRACTION DEVICES AND ACTIVITIES), 5 (SCIENTIFIC MEASUREMENT DEVICES—25 CUBIC YARDS FOR WEIRS AND FLUMES), 6 (SURVEY ACTIVITIES—25 CUBIC YARDS FOR TEMPORARY PADS), 7 (OUTFALL STRUCTURES AND ASSOCIATED INTAKE STRUCTURES), 19 (MINOR DREDGING), 20 (OIL SPILL CLEANUP), 22 (REMOVAL OF VESSELS), 25 (STRUCTURAL DISCHARGE), 30(MOIST SOIL MANAGEMENT FOR WILDLIFE), 32 (COMPLETED ENFORCEMENT ACTIONS), 36 (BOAT RAMPS (IN NONWETLAND SITES)), AND REGIONAL PERMIT 197800056 (PIERS, DOCKS AND BOATHOUSES), AND REGIONAL PERMIT 197800125 (BOAT RAMPS) AND RIPARIAN AREA PROTECTION RULES (BUFFER RULES)**

Water Quality Certification Number 3687 is issued in conformity with the requirements of Section 401, Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (DWQ) Regulations in 15 NCAC 2H, Section .0500 and 15 NCAC 2B .0200 for the discharge of fill material to waters and wetland areas which are waters of the United States as described in 33 CFR 330 Appendix A (B) (3, 4, 5, 6, 7, 19, 20, 22, 25, 30, 32, and 36) of the Corps of Engineers regulations and Regional Permits 197800056 and 19780125 and for the Riparian Area Protection Rules (Buffer Rules) in 15A NCAC 2B .0200.

The State of North Carolina certifies that the specified category of activity will not violate applicable portions of Sections 301, 302, 303, 306 and 307 of the Public Laws 92-500 and 95-217 if conducted in accordance with the conditions hereinafter set forth.

**Activities meeting any one (1) of the following thresholds or circumstances require *written approval* for a 401 Water Quality Certification from the Division of Water Quality (the "Division"):**

- a. Impacts equal or greater than 40 linear feet of additional permanent stream impact at an existing stream crossing location, or
- b. Temporary or permanent impacts equal to or exceeding: one-third (1/3) acre of wetlands East of Interstate-95, or one-tenth (1/10) of acre of wetlands West of Interstate-95; or
- c. Any impact associated with a Notice of Violation or an enforcement action initiated by the Division and/or the Division of Land Resources; or
- d. Projects with any impacts to streams, wetlands, and/or waters that have received a Notice of Violation from the Division and/or Division of Land Resources; or
- e. Any impacts to streams and/or buffers in the Neuse, Tar-Pamlico, Randleman and Catawba River Basins (or any other basins with Riparian Area Protection Rules [Buffer Rules] in effect at the time of application) *unless* the activities are listed as "EXEMPT" from these Rules.

\*

In accordance with North Carolina General Statute Section 143-215.3D(e), written approval for a 401 Water Quality General Certification must include the appropriate fee. If a project also requires a CAMA Permit, then one payment to both agencies shall be submitted and will be the higher of the two fees.

**Activities included in this General Certification and below the thresholds listed above *do not* require written approval from the Division of Water Quality as long as they comply with the Conditions of Certification listed below. If any of these Conditions cannot be met, written approval from the Division is required.**

## Water Quality Certification N°. 3687

### Conditions of Certification:

#### 1. No Impacts Beyond Those Authorized for this General Certification

No waste, spoil, solids, or fill of any kind shall occur in wetlands, waters, or riparian areas beyond the thresholds established for use of this General Certification, or beyond the footprint of the impacts authorized in the written approval, including incidental impacts. All construction activities, including the design, installation, operation, and maintenance of sediment and erosion control Best Management Practices, shall be performed so that no violations of state water quality standards, statutes, or rules occur.

#### 2. Standard Erosion and Sediment Control Practices

Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices:

- a. Design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
- b. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
- c. Reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.
- d. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times, except for publicly funded linear transportation projects when materials can be accessed offsite in a timely manner.
- e. If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNAs), Trout (Tr), SA, WS-I, WS-II, High Quality (HQW), or Outstanding Resource (ORW) waters, then the sediment and erosion control requirements contained within *Design Standards in Sensitive Watersheds* (15A NCAC 04B .0124) supercede all other sediment and erosion control requirements.

#### 3. No Sediment and Erosion Control Measures in Wetlands or Waters

Sediment and erosion control measures should not be placed in wetlands or waters outside of the permitted impact areas without prior approval from the Division. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, then the design and placement of temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or stream beds or banks, adjacent to or upstream and down stream of the above structures. All sediment and erosion control devices shall be removed and the natural grade restored within two (2) months of the date that the Division of Land Resources or locally delegated program has released the project.

#### 4. Construction Stormwater Permit NCG010000

Upon the approval of an Erosion and Sedimentation Control Plan issued by the Division of Land Resources (DLR) or a DLR delegated local erosion and sedimentation control program, an NPDES General stormwater permit (NCG010000) administered by the Division is automatically issued to the project. This General Permit allows stormwater to be discharged during land disturbing construction activities as stipulated by conditions in the permit. If the



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activity is covered by this permit [applicable to construction projects that disturb one (1) or more acres], full compliance with permit conditions including the sedimentation control plan, self-monitoring, record keeping and reporting requirements are required. A copy of this permit and monitoring report forms may be found at [http://h2o.enr.state.nc.us/su/Forms\\_Documents.htm](http://h2o.enr.state.nc.us/su/Forms_Documents.htm).

NCDOT shall be required to be in full compliance with the conditions related to construction activities within the most recent version of their individual NPDES (NCS000250) stormwater permit.

### 5. Work in the Dry

All work in or adjacent to stream waters shall be conducted in a dry work area. Approved best management practices from the most current version of the NC Sediment and Erosion Control Manual, or the NC DOT Construction and Maintenance Activities Manual, such as sandbags, rock berms, cofferdams, and other diversion structures shall be used to minimize excavation in flowing water. Exceptions to this condition require submittal to, and approval by, the Division.

### 6. Construction Moratoriums and Coordination

If activities must occur during periods of high biological activity (i.e. sea turtle or bird nesting), then biological monitoring may be required at the request of other state or federal agencies and coordinated with these activities. This condition can be waived through written concurrence on a case by case basis upon reasonable justification.

All moratoriums on construction activities established by the NC Wildlife Resources Commission (WRC), US Fish and Wildlife Service (USFWS), NC Division of Marine Fisheries (DMF), or National Marine Fisheries Service (NMFS) to protect trout, anadromous fish, larval/post-larval fishes and crustaceans, or other aquatic species of concern shall be obeyed. This condition can be waived through written concurrence on a case by case basis upon reasonable justification.

Work within the twenty-five (25) designated trout counties or identified state or federal endangered or threatened species habitat shall be coordinated with the appropriate WRC, USFWS, NMFS personnel.

### 7. Riparian Area Protection Rules (Buffer Rules)

Activities located in the protected 50-foot wide riparian areas (whether jurisdictional wetlands or not) within the Neuse, Tar-Pamlico, Randleman, Catawba (or any other basin with buffer rules), shall be limited to "uses" identified within and constructed in accordance with 15A NCAC 2B .0233, .0259, .0250, and .0243, and shall be located, designed, constructed, and maintained to have minimal disturbance to protect water quality to the maximum extent practicable through the use of best management practices. All riparian area protection rule requirements, including diffuse flow requirements, must be met.

### 8. Water Supply Watershed Buffers

The 100-foot wide (high-density development) or the 30-foot wide vegetative buffer (all other development) must be maintained adjacent to all perennial waters except for allowances as provided in the Water Supply Watershed Protection Rules [15A NCAC 2B .0212 through .0215].

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### 9. Placement of Culverts and Other Structures in Waters and Wetlands

The application must include construction plans with cross-sectional details in order to indicate that the current stability of the stream will be maintained or enhanced (i.e., not result in head cuts).

Culverts required for this project shall be designed and installed in such a manner that the original stream profiles are not altered and allow for aquatic life movement during low flows. Existing stream dimensions (including the cross section dimensions, pattern, and longitudinal profile) must be maintained above and below locations of each culvert. Placement of culverts and other structures in waters, streams, and wetlands must be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life, unless otherwise justified and approved by the Division.

Installation of culverts in wetlands must ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions. Additionally, when roadways, causeways or other fill projects are constructed across FEMA-designated floodways or wetlands, openings such as culverts or bridges must be provided to maintain the natural hydrology of the system as well as prevent constriction of the floodway that may result in destabilization of streams or wetlands.

Any rip rap required for normal pipe burial and stabilization shall be buried such that the original stream elevation is restored and maintained.

The establishment of native, woody vegetation and other soft stream bank stabilization techniques must be used where practicable instead of rip-rap or other bank hardening methods.

10. If concrete is used during the construction, then a dry work area should be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete should not be discharged to surface waters due to the potential for elevated pH and possible aquatic life/fish kills.
11. Applications for riprap groins proposed in accordance with 15A NCAC 07H .1401 (NC Division of Coastal Management General Permit for construction of Wooden and Riprap Groins in Estuarine and Public Trust Waters) must meet all the specific conditions for design and construction specified in 15A NCAC 07H .1405.

### 12. Temporary Fills and/or Access Roads

All temporary fill and culverts shall be removed and the impacted area returned to the original grade, including each stream's original cross sectional dimensions, plan form pattern, and longitudinal bed and bed profile after construction is complete or within two (2) months of the establishment of the crossing, whichever is sooner, and the various sites shall be stabilized with natural woody vegetation (except for the maintenance areas of permanent utility crossings) and restored to prevent erosion. If the crossings are not completely removed and restored as described above within the specified time above, then written approval from the Division must be obtained to modify this condition.

## Water Quality Certification N°. 3687

13. For activities requiring written approval, additional site-specific conditions may be added to the approval letter in order to ensure compliance with all applicable water quality and effluent standards.

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### 14. Certificate of Completion

When written authorization is required for use of this certification, upon completion of all permitted impacts included within the approval and any subsequent modifications, the applicant shall be required to return the certificate of completion attached to the approval. One copy of the certificate shall be sent to the DWQ Central Office in Raleigh at 1650 Mail Service Center, Raleigh, NC, 27699-1650.

\*

15. If an environmental document is required under NEPA or SEPA, then this General Certification is not valid until a Finding of No Significant Impact (FONSI) or Record of Decision (ROD) is issued by the State Clearinghouse.
16. This General Certification shall expire three (3) years from the date of issuance of the written approval or on the same day as the expiration date of these corresponding Nationwide and Regional General Permits. In accordance with General Statute 136-44.7B, certifications issued to the NCDOT shall expire only upon expiration of the federal 404 Permit. The conditions in effect on the date of issuance of Certification for a specific project shall remain in effect for the life of the project, regardless of the expiration date of this Certification. If the construction process for approved activities will overlap the expiration and renewal date of the corresponding 404 Permit and the Corps allows for continued use of the 404 Permit, then the General Certification shall also remain in effect without requiring re-application and re-approval to use this Certification for the specific impacts already approved.
17. The applicant/permittee and their authorized agents shall conduct all activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act), and any other appropriate requirements of State and Federal Law. If the Division determines that such standards or laws are not being met, including failure to sustain a designated or achieved use, or that State or Federal law is being violated, or that further conditions are necessary to assure compliance, then the Division may reevaluate and modify this General Water Quality Certification.

Non-compliance with or violation of the conditions herein set forth by a specific fill project shall result in revocation of this General Certification for the project and may result in criminal and/or civil penalties.

The Director of the North Carolina Division of Water Quality may require submission of a formal application for Individual Certification for any project in this category of activity if it is determined that the project is likely to have a significant adverse effect upon water quality, including state or federally listed endangered or threatened aquatic species, or degrade the waters so that existing uses of the wetland or downstream waters are precluded.

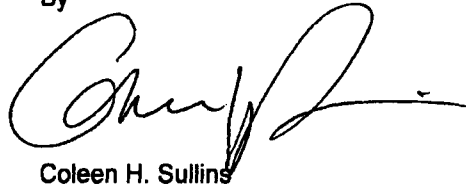
Public hearings may be held for specific applications or group of applications prior to a Certification decision if deemed in the public's best interest by the Director of the North Carolina Division of Water Quality.

## Water Quality Certification N°. 3687

Effective date: November 1, 2007

DIVISION OF WATER QUALITY

By

A handwritten signature in black ink, appearing to read 'Coleen H. Sullins', with a long horizontal flourish extending to the right.

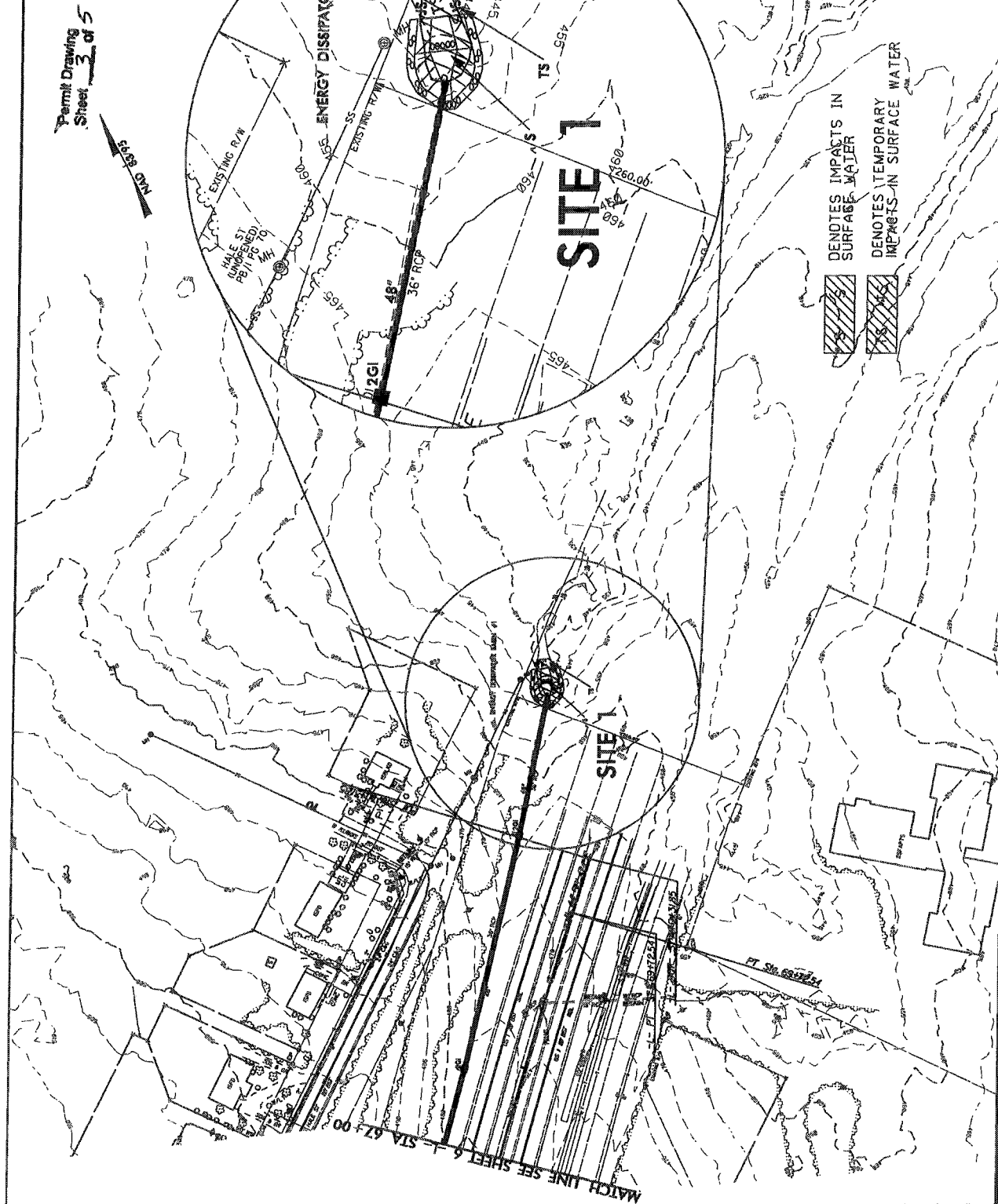
Coleen H. Sullins

Director

***History Note: Water Quality Certification Number 3687 replaces Water Quality Certification Number 3376 issued on March 18, 2002, Water Quality Certification Number 3494 issued December 31, 2004, and Water Quality Certification Number 3624 issued March 2007. This General Certification is rescinded when the Corps of Engineers re-authorizes any of these Nationwide or Regional Permits or when deemed appropriate by the Director of the Division of Water Quality.***







PROPERTY OWNERS

| <u>Site</u> | <u>Last Name</u>        | <u>First Name</u> | <u>Address</u> | <u>City/Town</u> | <u>State</u> | <u>Zip Code</u> |
|-------------|-------------------------|-------------------|----------------|------------------|--------------|-----------------|
| 1           | STATE OF NORTH CAROLINA |                   | PO BOX 629     | RALEIGH          | NC           | 27611           |

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

MOORE COUNTY  
WBS - 34923.1.1 (U-3324)

SHEET *4 of 5* 11/21/2011



+ 48" RCP PIPE / ENERGY DISSIPATOR

ATN Revised 3/31/05

**SHEET 7 of 5**      **11/21/2011**

**STANDARD SPECIAL PROVISION**  
**AVAILABILITY OF FUNDS – TERMINATION OF CONTRACTS**

(S-20-08)

Z-2

*General Statute 143C-6-11. (h) Highway Appropriation* is hereby incorporated verbatim in this contract as follows:

(h) Amounts Encumbered. – Transportation project appropriations may be encumbered in the amount of allotments made to the Department of Transportation by the Director for the estimated payments for transportation project contract work to be performed in the appropriation fiscal year. The allotments shall be multiyear allotments and shall be based on estimated revenues and shall be subject to the maximum contract authority contained in *General Statute 143C-6-11(c)*. Payment for transportation project work performed pursuant to contract in any fiscal year other than the current fiscal year is subject to appropriations by the General Assembly. Transportation project contracts shall contain a schedule of estimated completion progress, and any acceleration of this progress shall be subject to the approval of the Department of Transportation provided funds are available. The State reserves the right to terminate or suspend any transportation project contract, and any transportation project contract shall be so terminated or suspended if funds will not be available for payment of the work to be performed during that fiscal year pursuant to the contract. In the event of termination of any contract, the contractor shall be given a written notice of termination at least 60 days before completion of scheduled work for which funds are available. In the event of termination, the contractor shall be paid for the work already performed in accordance with the contract specifications.

Payment will be made on any contract terminated pursuant to the special provision in accordance with Subarticle 108-13(E) of the *2012 Standard Specifications*.

**STANDARD SPECIAL PROVISION**  
**NCDOT GENERAL SEED SPECIFICATION FOR SEED QUALITY**

(S-17-11)

Z-3

Seed shall be sampled and tested by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory. When said samples are collected, the vendor shall supply an independent laboratory report for each lot to be tested. Results from seed so sampled shall be final. Seed not meeting the specifications shall be rejected by the Department of Transportation and shall not be delivered to North Carolina Department of Transportation warehouses. If seed has been delivered it shall be available for pickup and replacement at the supplier's expense.

Any re-labeling required by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory, that would cause the label to reflect as otherwise specified herein shall be rejected by the North Carolina Department of Transportation.

Seed shall be free from seeds of the noxious weeds Johnsongrass, Balloonvine, Jimsonweed, Witchweed, Itchgrass, Serrated Tussock, Showy Croton, Smooth Croton, Sicklegod, Sandbur, Wild Onion, and Wild Garlic. Seed shall not be labeled with the above weed species on the seed analysis label. Tolerances as applied by the Association of Official Seed Analysts will NOT be allowed for the above noxious weeds except for Wild Onion and Wild Garlic.

Tolerances established by the Association of Official Seed Analysts will generally be recognized. However, for the purpose of figuring pure live seed, the found pure seed and found germination percentages as reported by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory will be used. Allowances, as established by the NCDOT, will be recognized for minimum pure live seed as listed on the following pages.

The specifications for restricted noxious weed seed refers to the number per pound as follows:

| <b><u>Restricted Noxious Weed</u></b> | <b><u>Limitations per Lb. Of Seed</u></b> | <b><u>Restricted Noxious Weed</u></b> | <b><u>Limitations per Lb. of Seed</u></b> |
|---------------------------------------|-------------------------------------------|---------------------------------------|-------------------------------------------|
| Blessed Thistle                       | 4 seeds                                   | Cornflower (Ragged Robin)             | 27 seeds                                  |
| Cocklebur                             | 4 seeds                                   | Texas Panicum                         | 27 seeds                                  |
| Spurred Anoda                         | 4 seeds                                   | Bracted Plantain                      | 54 seeds                                  |
| Velvetleaf                            | 4 seeds                                   | Buckhorn Plantain                     | 54 seeds                                  |
| Morning-glory                         | 8 seeds                                   | Broadleaf Dock                        | 54 seeds                                  |
| Corn Cockle                           | 10 seeds                                  | Curly Dock                            | 54 seeds                                  |
| Wild Radish                           | 12 seeds                                  | Dodder                                | 54 seeds                                  |
| Purple Nutsedge                       | 27 seeds                                  | Giant Foxtail                         | 54 seeds                                  |
| Yellow Nutsedge                       | 27 seeds                                  | Horsenettle                           | 54 seeds                                  |
| Canada Thistle                        | 27 seeds                                  | Quackgrass                            | 54 seeds                                  |
| Field Bindweed                        | 27 seeds                                  | Wild Mustard                          | 54 seeds                                  |
| Hedge Bindweed                        | 27 seeds                                  |                                       |                                           |

Seed of Pensacola Bahiagrass shall not contain more than 7% inert matter, Kentucky Bluegrass, Centipede and Fine or Hard Fescue shall not contain more than 5% inert matter whereas a maximum of 2% inert matter will be allowed on all other kinds of seed. In addition, all seed shall not contain more than 2% other crop seed nor more than 1% total weed seed. The germination rate as tested by the North Carolina Department of Agriculture shall not fall below 70%, which includes both dormant and hard seed. Seed shall be labeled with not more than 7%, 5% or 2% inert matter (according to above specifications), 2% other crop seed and 1% total weed seed.

Exceptions may be made for minimum pure live seed allowances when cases of seed variety shortages are verified. Pure live seed percentages will be applied in a verified shortage situation. Those purchase orders of deficient seed lots will be credited with the percentage that the seed is deficient.

**FURTHER SPECIFICATIONS FOR EACH SEED GROUP ARE GIVEN BELOW:**

Minimum 85% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 83% pure live seed will not be approved.

Sericea Lespedeza  
Oats (seeds)

Minimum 80% pure live seed; maximum 1% total weed seed; maximum 2% total other crop; maximum 144 restricted noxious weed seed per pound. Seed less than 78% pure live seed will not be approved.

Tall Fescue (all approved varieties)  
Kobe Lespedeza  
Korean Lespedeza  
Weeping Lovegrass  
Carpetgrass

Bermudagrass  
Browntop Millet  
German Millet – Strain R  
Clover – Red/White/Crimson

Minimum 78% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 76% pure live seed will not be approved.

Common or Sweet Sundangrass

Minimum 76% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 74% pure live seed will not be approved.

Rye (grain; all varieties)  
Kentucky Bluegrass (all approved varieties)  
Hard Fescue (all approved varieties)  
Shrub (bicolor) Lespedeza

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 noxious weed seed per pound. Seed less than 70% pure live seed will not be approved.

Centipedegrass

Crownvetch

Pensacola Bahiagrass

Creeping Red Fescue

Japanese Millet

Reed Canary Grass

Zoysia

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 5% inert matter; maximum 144 restricted noxious weed seed per pound.

Barnyard Grass

Big Bluestem

Little Bluestem

Bristly Locust

Birdsfoot Trefoil

Indiangrass

Orchardgrass

Switchgrass

Yellow Blossom Sweet Clover

**STANDARD SPECIAL PROVISION****ERRATA**

(1-17-12) (Rev. 9-18-12)

Z-4

Revise the *2012 Standard Specifications* as follows:

**Division 2**

**Page 2-7, line 31, Article 215-2 Construction Methods**, replace “Article 107-26” with “Article 107-25”.

**Page 2-17, Article 226-3, Measurement and Payment, line 2**, delete “pipe culverts,”.

**Page 2-20, Subarticle 230-4(B), Contractor Furnished Sources, change references as follows:** **Line 1**, replace “(4) Buffer Zone” with “(c) Buffer Zone”; **Line 12**, replace “(5) Evaluation for Potential Wetlands and Endangered Species” with “(d) Evaluation for Potential Wetlands and Endangered Species”; and **Line 33**, replace “(6) Approval” with “(4) Approval”.

**Division 4**

**Page 4-77, line 27, Subarticle 452-3(C) Concrete Coping**, replace “sheet pile” with “reinforcement”.

**Division 6**

**Page 6-7, line 31, Article 609-3 Field Verification of Mixture and Job Mix Formula Adjustments**, replace “30” with “45”.

**Page 6-10, line 42, Subarticle 609-6(C)(2)**, replace “Subarticle 609-6(E)” with “Subarticle 609-6(D)”.

**Page 6-11, Table 609-1 Control Limits**, replace “Max. Spec. Limit” for the Target Source of  $P_{0.075}/P_{be}$  Ratio with “1.0”.

**Page 6-40, Article 650-2 Materials**, replace “Subarticle 1012-1(F)” with “Subarticle 1012-1(E)”

**Division 10**

**Page 10-74, Table 1056-1 Geotextile Requirements**, replace “50%” for the UV Stability (Retained Strength) of Type 5 geotextiles with “70%”.

**Division 12**

**Page 12-7, Table 1205-3**, add “FOR THERMOPLASTIC” to the end of the title.

**Page 12-8, Subarticle 1205-5(B), line 13**, replace “Table 1205-2” with “Table 1205-4”.

**Page 12-8, Table 1205-4 and 1205-5**, replace “THERMOPLASTIC” in the title of these tables with “POLYUREA”.

**Page 12-9, Subarticle 1205-6(B), line 21**, replace “Table 1205-4” with “Table 1205-6”.

**Page 12-11, Subarticle 1205-8(C), line 25**, replace “Table 1205-5” with “Table 1205-7”.

**Division 15**

**Page 15-6, Subarticle 1510-3(B), after line 21, replace the allowable leakage formula with the following:  $W = LD\sqrt{P} \div 148,000$**

**Page 15-6, Subarticle 1510-3(B), line 32, delete “may be performed concurrently or” and replace with “shall be performed”.**

**Page 15-17, Subarticle 1540-3(E), line 27, delete “Type 1”.**

**Division 17**

**Page 17-26, line 42, Subarticle 1731-3(D) Termination and Splicing within Interconnect Center, delete this subarticle.**

Revise the *2012 Roadway Standard Drawings* as follows:

**1633.01 Sheet 1 of 1, English Standard Drawing for Matting Installation, replace “1633.01” with “1631.01”.**

**STANDARD SPECIAL PROVISION****PLANT AND PEST QUARANTINES****(Imported Fire Ant, Gypsy Moth, Witchweed, And Other Noxious Weeds)**

(3-18-03)

Z-04a

**Within Quarantined Area**

This project may be within a county regulated for plant and/or pests. If the project or any part of the Contractor's operations is located within a quarantined area, thoroughly clean all equipment prior to moving out of the quarantined area. Comply with federal/state regulations by obtaining a certificate or limited permit for any regulated article moving from the quarantined area.

**Originating in a Quarantined County**

Obtain a certificate or limited permit issued by the N.C. Department of Agriculture/United States Department of Agriculture. Have the certificate or limited permit accompany the article when it arrives at the project site.

**Contact**

Contact the N.C. Department of Agriculture/United States Department of Agriculture at 1-800-206-9333, 919-733-6932, or <http://www.ncagr.com/plantind/> to determine those specific project sites located in the quarantined area or for any regulated article used on this project originating in a quarantined county.

**Regulated Articles Include**

1. Soil, sand, gravel, compost, peat, humus, muck, and decomposed manure, separately or with other articles. This includes movement of articles listed above that may be associated with cut/waste, ditch pulling, and shoulder cutting.
2. Plants with roots including grass sod.
3. Plant crowns and roots.
4. Bulbs, corms, rhizomes, and tubers of ornamental plants.
5. Hay, straw, fodder, and plant litter of any kind.
6. Clearing and grubbing debris.
7. Used agricultural cultivating and harvesting equipment.
8. Used earth-moving equipment.
9. Any other products, articles, or means of conveyance, of any character, if determined by an inspector to present a hazard of spreading imported fire ant, gypsy moth, witchweed or other noxious weeds.



**STANDARD SPECIAL PROVISION****AWARD OF CONTRACT**

(6-28-77)

Z-6

“The North Carolina Department of Transportation, in accordance with the provisions of *Title VI of the Civil Rights Act of 1964* (78 Stat. 252) and the Regulations of the Department of Transportation (*49 C.F.R., Part 21*), issued pursuant to such act, hereby notifies all bidders that it will affirmatively insure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the ground of race, color, or national origin”.

**STANDARD SPECIAL PROVISION****MINORITY AND FEMALE EMPLOYMENT REQUIREMENTS**

Z-7

**NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (*EXECUTIVE NUMBER 11246*)**

1. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, see as shown on the attached sheet entitled "Employment Goals for Minority and Female participation".

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The Contractor's compliance with the Executive Order and the regulations in *41 CFR Part 60-4* shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in *41 CFR 60-4.3(a)*, and its effort to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project or the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the executive Order and the regulations in *41 CFR Part 60-4*. Compliance with the goals will be measured against the total work hours performed.

2. As used in this Notice and in the contract resulting from this solicitation, the "covered area" is the county or counties shown on the cover sheet of the proposal form and contract.

**EMPLOYMENT GOALS FOR MINORITY  
AND FEMALE PARTICIPATION**

Economic Areas

**Area 023 29.7%**

Bertie County  
Camden County  
Chowan County  
Gates County  
Hertford County  
Pasquotank County  
Perquimans County

**Area 024 31.7%**

Beaufort County  
Carteret County  
Craven County  
Dare County  
Edgecombe County  
Green County  
Halifax County  
Hyde County  
Jones County  
Lenoir County  
Martin County  
Nash County  
Northampton County  
Pamlico County  
Pitt County  
Tyrrell County  
Washington County  
Wayne County  
Wilson County

**Area 025 23.5%**

Columbus County  
Duplin County  
Onslow County  
Pender County

**Area 026 33.5%**

Bladen County  
Hoke County  
Richmond County  
Robeson County  
Sampson County  
Scotland County

**Area 027 24.7%**

Chatham County  
Franklin County  
Granville County  
Harnett County  
Johnston County  
Lee County  
Person County  
Vance County  
Warren County

**Area 028 15.5%**

Alleghany County  
Ashe County  
Caswell County  
Davie County  
Montgomery County  
Moore County  
Rockingham County  
Surry County  
Watauga County  
Wilkes County

**Area 029 15.7%**

Alexander County  
Anson County  
Burke County  
Cabarrus County  
Caldwell County  
Catawba County  
Cleveland County  
Iredell County  
Lincoln County  
Polk County  
Rowan County  
Rutherford County  
Stanly County

**Area 0480 8.5%**

Buncombe County  
Madison County

**Area 030 6.3%**

Avery County  
Cherokee County  
Clay County  
Graham County  
Haywood County  
Henderson County  
Jackson County  
McDowell County  
Macon County  
Mitchell County  
Swain County  
Transylvania County  
Yancey County

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SMSA AreasArea 5720 26.6%

Currituck County

Area 9200 20.7%

Brunswick County

New Hanover County

Area 2560 24.2%

Cumberland County

Area 6640 22.8%

Durham County

Orange County

Wake County

Area 1300 16.2%

Alamance County

Area 3120 16.4%

Davidson County

Forsyth County

Guilford County

Randolph County

Stokes County

Yadkin County

Area 1520 18.3%

Gaston County

Mecklenburg County

Union County

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Goals for FemaleParticipation in Each Trade

(Statewide) 6.9%

**STANDARD SPECIAL PROVISION****REQUIRED CONTRACT PROVISIONS FEDERAL - AID CONSTRUCTION CONTRACTS**

FHWA - 1273 Electronic Version - May 1, 2012

Z-8

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

**ATTACHMENTS**

- A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

**I. GENERAL**

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).  
The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.  
Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.  
Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).
2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.
3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.
4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

**II. NONDISCRIMINATION**

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are

incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

- a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.
- b. The contractor will accept as its operating policy the following statement:  
 "It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."
2. **EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.
3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
  - a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
  - b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
  - c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.
  - d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
  - e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.
  - a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.
  - b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.
  - c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.
5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:
  - a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
  - b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
  - c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
  - d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.
6. **Training and Promotion:**
  - a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.
  - b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).
  - c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
  - d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:
  - a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.
  - b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
  - c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.
  - d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.
8. **Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.
9. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.
  - a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.
  - b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.
10. **Assurance Required by 49 CFR 26.13(b):**
  - a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.
  - b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.
11. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.
  - a. The records kept by the contractor shall document the following:
    - (1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;
    - (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and
    - (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;
  - b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

### III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

### IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

#### 1. Minimum wages

- a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the

Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

- b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:
  - (i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
  - (ii) The classification is utilized in the area by the construction industry; and
  - (iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.
- c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.
2. **Withholding.** The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.
3. **Payrolls and basic records**
  - a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
  - b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the



payrolls shall only need to include an individually identifying number for each employee ( e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at [http://www.dol.gov/esa/whd/forms/ wh347instr.htm](http://www.dol.gov/esa/whd/forms/wh347instr.htm) or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency.

- (2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
  - (i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
  - (ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
  - (iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.
- (4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### 4. Apprentices and trainees

- a. Apprentices (programs of the USDOL). Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- b. Trainees (programs of the USDOL). Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

- In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- c. **Equal employment opportunity.** The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.
  - d. **Apprentices and Trainees (programs of the U.S. DOT).** Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.
  5. **Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.
  6. **Subcontracts.** The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.
  7. **Contract termination: debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
  8. **Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.
  9. **Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.
  10. **Certification of eligibility.**
    - a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
    - b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
    - c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

#### V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. **Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
2. **Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.
3. **Withholding for unpaid wages and liquidated damages.** The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.
4. **Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

#### VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).
  - a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees

from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
  - (2) the prime contractor remains responsible for the quality of the work of the leased employees;
  - (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
  - (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.
- b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.
2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
  3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.
  4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.
  5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

#### **VII. SAFETY: ACCIDENT PREVENTION**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

#### **VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

#### **IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

**X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

**1. Instructions for Certification – First Tier Participants:**

- a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.
- d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).
- f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
- g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.
- h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.
- i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

\* \* \* \* \*

**2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:**

- a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:
  - (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;
  - (2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
  - (3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and
  - (4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

**2. Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
- d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).
- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.
- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.
- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

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**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion—Lower Tier Participants:**

- 1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.
- 2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

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**XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

- 1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
  - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
  - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- 2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
- 3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**STANDARD SPECIAL PROVISION****ON-THE-JOB TRAINING**

(10-16-07) (Rev. 7-21-09)

Z-10

**Description**

The North Carolina Department of Transportation will administer a custom version of the Federal On-the-Job Training (OJT) Program, commonly referred to as the Alternate OJT Program. All contractors (existing and newcomers) will be automatically placed in the Alternate Program. Standard OJT requirements typically associated with individual projects will no longer be applied at the project level. Instead, these requirements will be applicable on an annual basis for each contractor administered by the OJT Program Manager.

On the Job Training shall meet the requirements of 23 CFR 230.107 (b), 23 USC – Section 140, this provision and the On-the-Job Training Program Manual.

The Alternate OJT Program will allow a contractor to train employees on Federal, State and privately funded projects located in North Carolina. However, priority shall be given to training employees on NCDOT Federal-Aid funded projects.

**Minorities and Women**

Developing, training and upgrading of minorities and women toward journeyman level status is a primary objective of this special training provision. Accordingly, the Contractor shall make every effort to enroll minority and women as trainees to the extent that such persons are available within a reasonable area of recruitment. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

**Assigning Training Goals**

The Department, through the OJT Program Manager, will assign training goals for a calendar year based on the contractors' past three years' activity and the contractors' anticipated upcoming year's activity with the Department. At the beginning of each year, all contractors eligible will be contacted by the Department to determine the number of trainees that will be assigned for the upcoming calendar year. At that time the Contractor shall enter into an agreement with the Department to provide a self-imposed on-the-job training program for the calendar year. This agreement will include a specific number of annual training goals agreed to by both parties. The number of training assignments may range from 1 to 15 per contractor per calendar year. The Contractor shall sign an agreement to fulfill their annual goal for the year. A sample agreement is available at [www.ncdot.org/business/ocs/ojt/](http://www.ncdot.org/business/ocs/ojt/).

**Training Classifications**

The Contractor shall provide on-the-job training aimed at developing full journeyman level workers in the construction craft/operator positions. Preference shall be given to providing training in the following skilled work classifications:

|                     |                                  |
|---------------------|----------------------------------|
| Equipment Operators | Office Engineers                 |
| Truck Drivers       | Estimators                       |
| Carpenters          | Iron / Reinforcing Steel Workers |
| Concrete Finishers  | Mechanics                        |
| Pipe Layers         | Welders                          |

The Department has established common training classifications and their respective training requirements that may be used by the contractors. However, the classifications established are not all-inclusive. Where the training is oriented toward construction applications, training will be allowed in lower-level management positions such as office engineers and estimators. Contractors shall submit new classifications for specific job functions that their employees are performing. The Department will review and recommend for acceptance to FHWA the new classifications proposed by contractors, if applicable. New classifications shall meet the following requirements:

Proposed training classifications are reasonable and realistic based on the job skill classification needs, and

The number of training hours specified in the training classification is consistent with common practices and provides enough time for the trainee to obtain journeyman level status.

The Contractor may allow trainees to be trained by a subcontractor provided that the Contractor retains primary responsibility for meeting the training and this provision is made applicable to the subcontract. However, only the Contractor will receive credit towards the annual goal for the trainee.

Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training course leading to journeyman level status or in which they have been employed as a journeyman.

**Records and Reports**

The Contractor shall maintain enrollment, monthly and completion reports documenting company compliance under these contract documents. These documents and any other information as requested shall be submitted to the OJT Program Manager.

Upon completion and graduation of the program, the Contractor shall provide each trainee with a certification Certificate showing the type and length of training satisfactorily completed.

**Trainee Interviews**

All trainees enrolled in the program will receive an initial and Trainee/Post graduate interview conducted by the OJT program staff.

**Trainee Wages**

Contractors shall compensate trainees on a graduating pay scale based upon a percentage of the prevailing minimum journeyman wages (Davis-Bacon Act). Minimum pay shall be as follows:

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| 60 percent | of the journeyman wage for the first half of the training period    |
| 75 percent | of the journeyman wage for the third quarter of the training period |
| 90 percent | of the journeyman wage for the last quarter of the training period  |

In no instance shall a trainee be paid less than the local minimum wage. The Contractor shall adhere to the minimum hourly wage rate that will satisfy both the NC Department of Labor (NCDOL) and the Department.

**Achieving or Failing to Meet Training Goals**

The Contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and who receives training for at least 50 percent of the specific program requirement. Trainees will be allowed to be transferred between projects if required by the Contractor's scheduled workload to meet training goals.

If a contractor fails to attain their training assignments for the calendar year, they may be taken off the NCDOT's Bidders List.

**Measurement and Payment**

No compensation will be made for providing required training in accordance with these contract documents.



**STANDARD SPECIAL PROVISION**  
**MINIMUM WAGES**  
**GENERAL DECISION NC120096 01/06/2012 NC96**

Z-96

Date:

General Decision Number: NC120096 01/06/12 NC96

Superseded General Decision Numbers: NC20100133

State: North Carolina

Construction Type: HIGHWAY

**COUNTIES:**

|           |            |          |
|-----------|------------|----------|
| Bladen    | Lee        | Robeson  |
| Cleveland | Lenoir     | Rowan    |
| Columbus  | Lincoln    | Sampson  |
| Davidson  | Montgomery | Scotland |
| Duplin    | Moore      | Stanly   |
| Harnett   | Richmond   | Wilson   |
| Iredell   |            |          |

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects, railroad construction, bascule, suspension and spandrel arch bridges designed for commercial navigation, bridges involving marine construction, and other major bridges).

Modification Number  
0

Publication Date  
01/06/2012

SUNC2011-077 09/16/2011

|                                                                                      | Rates | Fringes |
|--------------------------------------------------------------------------------------|-------|---------|
| CARPENTER (Form Work Only)                                                           | 13.30 |         |
| CEMENT MASON/CONCRETE FINISHER                                                       | 14.18 |         |
| INSTALLER (Guardrail) (includes Guiderail/Post Driver Work)                          | 11.76 |         |
| IRONWORKER (Reinforcing)                                                             | 13.90 |         |
| LABORER                                                                              |       |         |
| Asphalt, Asphalt Distributor, Raker, and Spreader                                    | 12.81 |         |
| Common or General                                                                    |       |         |
| Davidson County                                                                      | 10.64 |         |
| Harnett County                                                                       | 10.41 |         |
| Iredell County                                                                       | 10.38 |         |
| Lenoir County                                                                        | 9.98  |         |
| Remaining Counties                                                                   | 10.27 |         |
| Richmond County                                                                      | 10.46 |         |
| Robeson County                                                                       | 10.07 |         |
| Rowan County                                                                         | 10.25 |         |
| Stanly County                                                                        | 9.03  |         |
| Concrete Saw                                                                         | 11.56 |         |
| Landscape                                                                            | 9.90  |         |
| Luteman                                                                              | 12.68 |         |
| Mason Tender (Cement/Concrete)                                                       | 10.53 |         |
| Pipelayer                                                                            |       |         |
| Remaining Counties                                                                   | 11.79 |         |
| Stanly County                                                                        | 12.25 |         |
| Traffic Control (Flagger)                                                            | 10.31 |         |
| POWER EQUIPMENT OPERATORS                                                            |       |         |
| Backhoe/Excavator/Trackhoe                                                           | 14.64 |         |
| Broom/Sweeper                                                                        | 12.29 |         |
| Bulldozer                                                                            | 15.32 |         |
| Crane                                                                                | 19.10 |         |
| Grader/Blade                                                                         | 19.29 |         |
| Loader                                                                               | 13.93 |         |
| Mechanic                                                                             | 15.92 |         |
| Milling Machine                                                                      |       |         |
| Columbus, Davidson, Duplin, Lenoir, Lincoln, Moore,<br>Richmond, and Stanly Counties | 14.09 |         |
| Remaining Counties                                                                   | 13.80 |         |
| Oiler                                                                                | 14.19 |         |
| Paver                                                                                | 14.10 |         |
| Roller                                                                               | 12.83 |         |
| Scraper                                                                              | 12.29 |         |
| Screed                                                                               | 14.75 |         |
| Tractor                                                                              | 13.92 |         |
| TRUCK DRIVER                                                                         |       |         |
| Dump Truck                                                                           |       |         |
| Davidson County                                                                      | 12.61 |         |
| Remaining Counties                                                                   | 11.80 |         |
| Lowboy Truck                                                                         | 15.99 |         |
| Single Axle Truck                                                                    | 12.07 |         |
| Water Truck                                                                          | 13.82 |         |

Welders – Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

#### Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters, PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rate.

#### Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U. S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, D.C. 20210

- 2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, D.C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

- 3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, D.C. 20210

- 4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

**Vendor 4 of 9: ENGLISH CONSTRUCTION CO., INC. (3714)**  
**Call Order 009 (Proposal: C202886)**

**Bid Information**

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**County:** MOORE  
**Address:** PO Box P7000  
Lynchburg , VA , 24505  
**Signature Check:** John\_M.\_Jordan\_Jr.\_3714  
**Time Bid Received:** September 18, 2012 01:48 PM  
**Amendment Count:** 0

**Bid Checksum:** FEAF287E  
**Bid Total:** \$9,992,653.35  
**Items Total:** \$9,992,653.35  
**Time Total:** \$0.00

**Bidding Errors:**  
None.

DBE GOAL SET 10.0  
DBE GOAL MET 10.0

Vendor 4 of 9: ENGLISH CONSTRUCTION CO., INC. (3714)  
Call Order 009 (Proposal: C202886)

**Bid Bond Information**

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|                             |                                                                              |
|-----------------------------|------------------------------------------------------------------------------|
| <b>Projects:</b>            | <b>Bond Maximum:</b>                                                         |
| <b>Counties:</b>            | <b>State of Incorporation:</b>                                               |
| <b>Bond ID:</b> SNC12820865 | <b>Agency Execution Date:</b> 9/17/2012 10                                   |
| <b>Paid by Check:</b> No    | <b>Surety Name:</b> surety2000                                               |
| <b>Bond Percent:</b> 5%     | <b>Bond Agency Name:</b> Travelers Casualty and Surety<br>Company of America |

Vendor 3714's Bid Information for Call 009, Letting L120918, 09/18/12

English Construction Company, Inc. (3714)  
Call Order 009 (Proposal ID C202886)

#### LIST OF DBE PARTICIPANTS

| VENDOR<br>NUMBER | DBE NAME<br>ADDRESS                                                       | WORK<br>CODE TYPE OF WORK | CERT<br>TYPE AMOUNT      |
|------------------|---------------------------------------------------------------------------|---------------------------|--------------------------|
| 4898 WB          | BULLINGTON CONSTRUCTION INC<br>417 FOXGLOVE LANE , INDIAN TRAIL, NC 28079 |                           | Sub 159,789.60 committed |
| 7099 MB          | LOCKLEAR CONTRACTING INC<br>469 LONNIE FARM ROAD , PEMBROKE, NC 28372     |                           | Sub 669,393.34 committed |
| 7099 MB          | LOCKLEAR CONTRACTING INC<br>469 LONNIE FARM ROAD , PEMBROKE, NC 28372     |                           | Sub 205,081.80 committed |
| TOTAL:           |                                                                           |                           | \$1,034,264.74<br>10.35% |

Vendor 3714's Bid Information for Call 009, Letting L120918, 09/18/12

English Construction Company, Inc. (3714)  
Call Order 009 (Proposal ID C202886)

#### Miscellaneous Data Info - Contractor Responses:

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#### NON-COLLUSION AND DEBARMENT CERTIFICATION

Explanation of the prospective bidder that is unable to certify to any of the statements in this certification:

Explanation:

NOT ANSWERED  
NOT ANSWERED  
NOT ANSWERED  
NOT ANSWERED

#### AWARD LIMITS ON MULTIPLE PROJECTS

By answering YES to this statement, the bidder acknowledges that they are using the award limits on multiple projects. No

It is the desire of the Bidder to be awarded contracts, the value of which will not exceed a total of NOT ANSWERED for those projects indicated herein, for which bids will be opened on (MM/DD/YY)

The Award Limits shall apply to the following projects:

| Contract Number | County |
|-----------------|--------|
| NOT ANSWERED    |        |
| NOT ANSWERED    |        |
| NOT ANSWERED    |        |
| NOT ANSWERED    |        |
| NOT ANSWERED    |        |
| NOT ANSWERED    |        |

#### Bid Bond Data Info - Contractor Responses:

=====

BondID: SNC12820865  
Surety Registry Agency: surety2000  
Verified?: Yes  
Surety Agency: Travelers Casualty and Surety Company of America  
Bond Execution Date: 9/17/2012 10  
Bond Amount: \$499,632.67 (Five Percent of Bid)



Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line<br>No.                | Item<br>Description                                                       | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Cts |
|----------------------------|---------------------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| Section 0001 ROADWAY ITEMS |                                                                           |                                  |                             |                             |
| Alt Group                  |                                                                           |                                  |                             |                             |
| 0001                       | 0000100000-N MOBILIZATION                                                 | LUMP                             | LUMP                        | 490,000.00                  |
| 0002                       | 0000400000-N CONSTRUCTION SURVEYING                                       | LUMP                             | LUMP                        | 69,194.30                   |
| 0003                       | 0029000000-N REINFORCED BRIDGE APPROACH FILL, STATION ***** (21+37.80-Y-) | LUMP                             | LUMP                        | 20,288.75                   |
| 0004                       | 0050000000-E SUPPLEMENTARY CLEARING & GRUB-BING                           | 1.000<br>ACR                     | 6,802.35000                 | 6,802.35                    |
| 0005                       | 0057000000-E UNDERCUT EXCAVATION                                          | 2,500.000<br>CY                  | 9.75000                     | 24,375.00                   |
| 0006                       | 0063000000-N GRADING                                                      | LUMP                             | LUMP                        | 631,282.00                  |
| 0007                       | 0106000000-E BORROW EXCAVATION                                            | 39,500.000<br>CY                 | 11.65000                    | 460,175.00                  |
| 0008                       | 0195000000-E SELECT GRANULAR MATERIAL                                     | 2,000.000<br>CY                  | 40.95000                    | 81,900.00                   |
| 0009                       | 0196000000-E GEOTEXTILE FOR SOIL STABILIZATION                            | 3,100.000<br>SY                  | 2.00000                     | 6,200.00                    |
| 0010                       | 0199000000-E TEMPORARY SHORING                                            | 1,889.000<br>SF                  | 48.00000                    | 90,672.00                   |

State of NC  
Dept of Transportation

Date: 08-21-12  
Revised:

Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line No. | Item Description                                                | Approx. Quantity and Units | Unit Price Dollars Cts | Bid Amount Dollars Ct |
|----------|-----------------------------------------------------------------|----------------------------|------------------------|-----------------------|
| 0011     | 0262000000-N GENERIC GRADING ITEM ENERGY DISSIPATOR BASIN       | 2.000 EA                   | 4,781.85000            | 9,563.70              |
| 0012     | 0318000000-E FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES | 1,080.000 TON              | 30.05000               | 32,454.00             |
| 0013     | 0320000000-E FOUNDATION CONDITIONING GEOTEXTILE                 | 3,530.000 SY               | 4.20000                | 14,826.00             |
| 0014     | 0335200000-E 15" DRAINAGE PIPE                                  | 60.000 LF                  | 25.85000               | 1,551.00              |
| 0015     | 0343000000-E 15" SIDE DRAIN PIPE                                | 56.000 LF                  | 25.85000               | 1,447.60              |
| 0016     | 0366000000-E 15" RC PIPE CULVERTS, CLASS III                    | 1,296.000 LF               | 25.85000               | 33,501.60             |
| 0017     | 0372000000-E 18" RC PIPE CULVERTS, CLASS III                    | 660.000 LF                 | 29.55000               | 19,503.00             |
| 0018     | 0378000000-E 24" RC PIPE CULVERTS, CLASS III                    | 200.000 LF                 | 35.35000               | 7,070.00              |
| 0019     | 0384000000-E 30" RC PIPE CULVERTS, CLASS III                    | 912.000 LF                 | 46.45000               | 42,362.40             |
| 0020     | 0390000000-E 36" RC PIPE CULVERTS, CLASS III                    | 1,012.000 LF               | 60.65000               | 61,377.80             |
| 0021     | 0402000000-E 48" RC PIPE CULVERTS, CLASS III                    | 2,004.000 LF               | 89.65000               | 179,658.60            |
| 0022     | 0448200000-E 15" RC PIPE CULVERTS, CLASS IV                     | 732.000 LF                 | 27.40000               | 20,056.80             |

State of NC  
Dept of Transportation

Date: 08-21-12  
Revised:

Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line<br>No. | Item<br>Description                                                 | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Cts |
|-------------|---------------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| 0023        | 0448300000-E 18" RC PIPE<br>CULVERTS, CLASS IV<br>LF                | 452.000                          | 32.70000                    | 14,780.40                   |
| 0024        | 0448400000-E 24" RC PIPE<br>CULVERTS, CLASS IV<br>LF                | 64.000                           | 41.15000                    | 2,633.60                    |
| 0025        | 0448500000-E 30" RC PIPE<br>CULVERTS, CLASS IV<br>LF                | 304.000                          | 53.80000                    | 16,355.20                   |
| 0026        | 0448600000-E 36" RC PIPE<br>CULVERTS, CLASS IV<br>LF                | 752.000                          | 65.40000                    | 49,180.80                   |
| 0027        | 0448700000-E 42" RC PIPE<br>CULVERTS, CLASS IV<br>LF                | 32.000                           | 82.80000                    | 2,649.60                    |
| 0028        | 0582000000-E 15" CS PIPE<br>CULVERTS, 0.064" THICK<br>LF            | 156.000                          | 31.10000                    | 4,851.60                    |
| 0029        | 0588000000-E 18" CS PIPE<br>CULVERTS, 0.064" THICK<br>LF            | 76.000                           | 38.00000                    | 2,888.00                    |
| 0030        | 0636000000-E *** CS PIPE<br>ELBOWS, ***** THICK<br>(15", 0.064") EA | 8.000                            | 342.90000                   | 2,743.20                    |
| 0031        | 0636000000-E *** CS PIPE<br>ELBOWS, ***** THICK<br>(18", 0.064") EA | 2.000                            | 432.60000                   | 865.20                      |
| 0032        | 0995000000-E PIPE<br>REMOVAL<br>LF                                  | 2,135.000                        | 10.55000                    | 22,524.25                   |
| 0033        | 1099500000-E SHALLOW<br>UNDERCUT<br>CY                              | 1,000.000                        | 9.75000                     | 9,750.00                    |
| 0034        | 1099700000-E CLASS IV<br>SUBGRADE STABILIZA- TION<br>TON            | 2,000.000                        | 25.75000                    | 51,500.00                   |

State of NC  
Dept of Transportation

Date: 08-21-12  
Revised:

Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line No. | Item Description                                           | Approx. Quantity and Units | Unit Price Dollars Cts | Bid Amount Dollars Cts |
|----------|------------------------------------------------------------|----------------------------|------------------------|------------------------|
| 0035     | 1110000000-E STABILIZER AGGREGATE                          | 250.000 TON                | 25.25000               | 6,312.50               |
| 0036     | 1220000000-E INCIDENTAL STONE BASE                         | 100.000 TON                | 38.30000               | 3,830.00               |
| 0037     | 1330000000-E INCIDENTAL MILLING                            | 247.000 SY                 | 8.45000                | 2,087.15               |
| 0038     | 1489000000-E ASPHALT CONC BASE COURSE, TYPE B25.0B         | 4,480.000 TON              | 45.25000               | 202,720.00             |
| 0039     | 1491000000-E ASPHALT CONC BASE COURSE, TYPE B25.0C         | 3,900.000 TON              | 44.08000               | 171,912.00             |
| 0040     | 1498000000-E ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B | 3,250.000 TON              | 44.20000               | 143,650.00             |
| 0041     | 1503000000-E ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C | 2,630.000 TON              | 44.60000               | 117,298.00             |
| 0042     | 1519000000-E ASPHALT CONC SURFACE COURSE, TYPE S9.5B       | 4,410.000 TON              | 41.95000               | 184,999.50             |
| 0043     | 1523000000-E ASPHALT CONC SURFACE COURSE, TYPE S9.5C       | 5,430.000 TON              | 46.10000               | 250,323.00             |
| 0044     | 1575000000-E ASPHALT BINDER FOR PLANT MIX                  | 1,240.000 TON              | 675.31000              | 837,384.40             |
| 0045     | 1693000000-E ASPHALT PLANT MIX, PAVEMENT REPAIR            | 70.000 TON                 | 164.35000              | 11,504.50              |
| 0046     | 1840000000-E MILLED RUMBLE STRIPS (ASPHALT CONCRETE)       | 10,620.000 LF              | 0.65000                | 6,903.00               |

State of NC  
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Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line<br>No. | Item<br>Description                                                 | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Ct |
|-------------|---------------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------|
| 0047        | 2000000000-N RIGHT OF<br>WAY MARKERS                                | 55.000<br>EA                     | 184.65000                   | 10,155.75                  |
| 0048        | 2209000000-E ENDWALLS                                               | 0.672<br>CY                      | 946.80000                   | 636.25                     |
| 0049        | 2253000000-E PIPE<br>COLLARS                                        | 1.250<br>CY                      | 949.65000                   | 1,187.06                   |
| 0050        | 2264000000-E PIPE PLUGS                                             | 3.720<br>CY                      | 949.65000                   | 3,532.70                   |
| 0051        | 2286000000-N MASONRY<br>DRAINAGE STRUCTURES                         | 80.000<br>EA                     | 1,055.15000                 | 84,412.00                  |
| 0052        | 2308000000-E MASONRY<br>DRAINAGE STRUCTURES                         | 54.000<br>LF                     | 237.40000                   | 12,819.60                  |
| 0053        | 2364200000-N FRAME WITH<br>TWO GRATES, STD 840.20                   | 19.000<br>EA                     | 474.80000                   | 9,021.20                   |
| 0054        | 2365000000-N FRAME WITH<br>TWO GRATES, STD 840.22                   | 4.000<br>EA                      | 474.80000                   | 1,899.20                   |
| 0055        | 2366000000-N FRAME WITH<br>TWO GRATES, STD 840.24                   | 3.000<br>EA                      | 474.80000                   | 1,424.40                   |
| 0056        | 2367000000-N FRAME WITH<br>TWO GRATES, STD 840.29                   | 11.000<br>EA                     | 474.80000                   | 5,222.80                   |
| 0057        | 2374000000-N FRAME WITH<br>GRATE & HOOD, STD<br>840.03, TYPE ** (E) | 6.000<br>EA                      | 501.21000                   | 3,007.26                   |
| 0058        | 2374000000-N FRAME WITH<br>GRATE & HOOD, STD<br>840.03, TYPE ** (F) | 18.000<br>EA                     | 501.20000                   | 9,021.60                   |

State of NC  
Dept of Transportation

Date: 08-21-12  
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Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line<br>No. | Item<br>Description                                                  | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Cts |
|-------------|----------------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| 0059        | 2374000000-N FRAME WITH<br>GRATE & HOOD, STD<br>840.03, TYPE ** (G)  | 7.000<br>EA                      | 501.20000                   | 3,508.40                    |
| 0060        | 2396000000-N FRAME WITH<br>COVER, STD 840.54                         | 12.000<br>EA                     | 369.30000                   | 4,431.60                    |
| 0061        | 2538000000-E **'-**"<br>CONCRETE CURB & GUTTER<br>(8" X 12")         | 50.000<br>LF                     | 19.90000                    | 995.00                      |
| 0062        | 2549000000-E 2'-6"<br>CONCRETE CURB & GUTTER                         | 3,060.000<br>LF                  | 17.20000                    | 52,632.00                   |
| 0063        | 2556000000-E SHOULDER<br>BERM GUTTER                                 | 700.000<br>LF                    | 16.50000                    | 11,550.00                   |
| 0064        | 2577000000-E CONCRETE<br>EXPRESSWAY GUTTER                           | 1,936.000<br>LF                  | 18.45000                    | 35,719.20                   |
| 0065        | 2591000000-E 4" CONCRETE<br>SIDEWALK                                 | 1,090.000<br>SY                  | 29.40000                    | 32,046.00                   |
| 0066        | 2647000000-E 5"<br>MONOLITHIC CONCRETE<br>ISLANDS (SURFACE MOUNTED)  | 1,600.000<br>SY                  | 31.90000                    | 51,040.00                   |
| 0067        | 2724000000-E PRECAST<br>REINFORCED CONCRETE<br>BARRIER, SINGLE FACED | 200.000<br>LF                    | 75.00000                    | 15,000.00                   |
| 0068        | 2860000000-N CONVERT<br>EXISTING CATCH BASIN TO<br>JUNCTION BOX      | 1.000<br>EA                      | 1,002.41000                 | 1,002.41                    |
| 0069        | 2905000000-N CONVERT<br>EXISTING DROP INLET<br>TO JUNCTION BOX       | 5.000<br>EA                      | 1,028.75000                 | 5,143.75                    |
| 0070        | 3030000000-E STEEL BM<br>GUARDRAIL                                   | 8,137.500<br>LF                  | 14.85000                    | 120,841.88                  |

State of NC  
Dept of Transportation

Date: 08-21-12  
Revised:

Contract ID: C202886      Project(s): STPNHF-1(10)  
Letting Date: 09-18-12    Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line<br>No. | Item<br>Description                                                    | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Cts |
|-------------|------------------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| 0071        | 3045000000-E STEEL BM<br>GUARDRAIL, SHOP<br>CURVED                     | 242.390<br>LF                    | 15.80000                    | 3,829.76                    |
| 0072        | 3105000000-N STEEL BM<br>GUARDRAIL TERMINAL<br>SECTIONS                | 1.000<br>EA                      | 42.20000                    | 42.20                       |
| 0073        | 3150000000-N ADDITIONAL<br>GUARDRAIL POSTS                             | 25.000<br>EA                     | 36.90000                    | 922.50                      |
| 0074        | 3195000000-N GUARDRAIL<br>ANCHOR UNITS, TYPE AT-1                      | 4.000<br>EA                      | 448.45000                   | 1,793.80                    |
| 0075        | 3210000000-N GUARDRAIL<br>ANCHOR UNITS, TYPE CAT-1                     | 5.000<br>EA                      | 448.45000                   | 2,242.25                    |
| 0076        | 3215000000-N GUARDRAIL<br>ANCHOR UNITS, TYPE III                       | 4.000<br>EA                      | 1,424.45000                 | 5,697.80                    |
| 0077        | 3270000000-N GUARDRAIL<br>ANCHOR UNITS, TYPE 350                       | 11.000<br>EA                     | 1,925.68000                 | 21,182.48                   |
| 0078        | 3317000000-N GUARDRAIL<br>ANCHOR UNITS, TYPE B-77                      | 8.000<br>EA                      | 1,477.20000                 | 11,817.60                   |
| 0079        | 3360000000-E REMOVE<br>EXISTING GUARDRAIL                              | 37.000<br>LF                     | 2.10000                     | 77.70                       |
| 0080        | 3524000000-E VINYL<br>COATED CHAIN LINK<br>FENCE, **" FABRIC (48")     | 7,539.000<br>LF                  | 5.25000                     | 39,579.75                   |
| 0081        | 3539000000-E METAL LINE<br>POSTS FOR **" CHAINLINK<br>FENCE (48")      | 636.000<br>EA                    | 29.55000                    | 18,793.80                   |
| 0082        | 3545000000-E METAL<br>TERMINAL POSTS FOR **"<br>CHAIN LINK FENCE (48") | 66.000<br>EA                     | 44.30000                    | 2,923.80                    |

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| Line<br>No. | Item<br>Description                                                | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Ct |
|-------------|--------------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------|
| 0083        | 3628000000-E RIP RAP,<br>CLASS I                                   | 7.000<br>TON                     | 94.65000                    | 662.55                     |
| 0084        | 3649000000-E RIP RAP,<br>CLASS B                                   | 143.000<br>TON                   | 45.90000                    | 6,563.70                   |
| 0085        | 3656000000-E GEOTEXTILE<br>FOR DRAINAGE                            | 2,495.000<br>SY                  | 2.00000                     | 4,990.00                   |
| 0086        | 3659000000-N PREFORMED<br>SCOUR HOLES WITH LEVEL<br>SPREADER APRON | 3.000<br>EA                      | 2,271.70000                 | 6,815.10                   |
| 0087        | 4048000000-E REINFORCED<br>CONCRETE SIGN<br>FOUN-DATIONS           | 1.000<br>CY                      | 10.55000                    | 10.55                      |
| 0088        | 4054000000-E PLAIN<br>CONCRETE SIGN FOUNDA-<br>TIONS               | 1.000<br>CY                      | 10.55000                    | 10.55                      |
| 0089        | 4060000000-E SUPPORTS,<br>BREAKAWAY STEEL BEAM                     | 1,219.000<br>LB                  | 4.20000                     | 5,119.80                   |
| 0090        | 4072000000-E SUPPORTS,<br>3-LB STEEL U-CHANNEL                     | 933.000<br>LF                    | 5.15000                     | 4,804.95                   |
| 0091        | 4096000000-N SIGN<br>ERECTION, TYPE D                              | 7.000<br>EA                      | 94.95000                    | 664.65                     |
| 0092        | 4102000000-N SIGN<br>ERECTION, TYPE E                              | 47.000<br>EA                     | 55.40000                    | 2,603.80                   |
| 0093        | 4108000000-N SIGN<br>ERECTION, TYPE F                              | 5.000<br>EA                      | 94.95000                    | 474.75                     |
| 0094        | 4109000000-N SIGN<br>ERECTION, TYPE ***<br>(OVER-HEAD) (A)         | 2.000<br>EA                      | 738.60000                   | 1,477.20                   |



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| Line<br>No. | Item<br>Description                                                        | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Ct |
|-------------|----------------------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------|
| 0095        | 4110000000-N SIGN<br>ERECTION, TYPE ***<br>(GROUND MOUNTED) (A)            | EA 4.000                         | 685.85000                   | 2,743.40                   |
| 0096        | 4116100000-N SIGN<br>ERECTION, RELOCATE, TYPE<br>**** (GROUND MOUNTED) (D) | EA 5.000                         | 105.50000                   | 527.50                     |
| 0097        | 4155000000-N DISPOSAL OF<br>SIGN SYSTEM, U- CHANNEL                        | EA 85.000                        | 1.05000                     | 89.25                      |
| 0098        | 4192000000-N DISPOSAL OF<br>SUPPORT, U-CHANNEL                             | EA 5.000                         | 1.05000                     | 5.25                       |
| 0099        | 4234000000-N DISPOSAL OF<br>SIGN, A OR B<br>(OVERHEAD)                     | EA 2.000                         | 1.05000                     | 2.10                       |
| 0100        | 4251000000-N DISPOSAL OF<br>LIGHTING SYSTEM                                | EA 1.000                         | 527.60000                   | 527.60                     |
| 0101        | 4263000000-N DISPOSAL OF<br>WALKWAY                                        | EA 1.000                         | 527.60000                   | 527.60                     |
| 0102        | 4400000000-E WORK ZONE<br>SIGNS (STATIONARY)                               | SF 699.000                       | 10.50000                    | 7,339.50                   |
| 0103        | 4405000000-E WORK ZONE<br>SIGNS (PORTABLE)                                 | SF 424.000                       | 10.85000                    | 4,600.40                   |
| 0104        | 4410000000-E WORK ZONE<br>SIGNS (BARRICADE<br>MOUNTED)                     | SF 309.000                       | 13.90000                    | 4,295.10                   |
| 0105        | 4415000000-N FLASHING<br>ARROW BOARD                                       | EA 3.000                         | 4,747.40000                 | 14,242.20                  |
| 0106        | 4420000000-N PORTABLE<br>CHANGEABLE MESSAGE SIGN                           | EA 4.000                         | 10,304.00000                | 41,216.00                  |

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|-------------|-----------------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| 0107        | 4430000000-N DRUMS<br>EA                                              | 528.000                          | 62.30000                    | 32,894.40                   |
| 0108        | 4445000000-E BARRICADES<br>(TYPE III)<br>LF                           | 714.000                          | 58.75000                    | 41,947.50                   |
| 0109        | 4455000000-N FLAGGER<br>DAY                                           | 185.000                          | 212.00000                   | 39,220.00                   |
| 0110        | 4465000000-N TEMPORARY<br>CRASH CUSHIONS<br>EA                        | 7.000                            | 5,803.35000                 | 40,623.45                   |
| 0111        | 4470000000-N RESET<br>TEMPORARY CRASH CUSHION<br>EA                   | 4.000                            | 2,637.92000                 | 10,551.68                   |
| 0112        | 4480000000-N TMA<br>EA                                                | 2.000                            | 5,228.65000                 | 10,457.30                   |
| 0113        | 4485000000-E PORTABLE<br>CONCRETE BARRIER<br>LF                       | 3,952.000                        | 24.20000                    | 95,638.40                   |
| 0114        | 4490000000-E PORTABLE<br>CONCRETE BARRIER<br>(ANCHORED)<br>LF         | 334.000                          | 35.60000                    | 11,890.40                   |
| 0115        | 4500000000-E RESET<br>PORTABLE CONCRETE BAR-<br>RIER<br>LF            | 1,641.000                        | 4.15000                     | 6,810.15                    |
| 0116        | 4505000000-E RESET<br>PORTABLE CONCRETE BAR-<br>RIER (ANCHORED)<br>LF | 334.000                          | 15.80000                    | 5,277.20                    |
| 0117        | 4510000000-N LAW<br>ENFORCEMENT<br>HR                                 | 440.000                          | 88.00000                    | 38,720.00                   |
| 0118        | 4650000000-N TEMPORARY<br>RAISED PAVEMENT<br>MARKERS<br>EA            | 686.000                          | 5.30000                     | 3,635.80                    |

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| Line<br>No. | Item<br>Description                                                                  | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Ct |
|-------------|--------------------------------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------|
| 0119        | 4685000000-E THERMOPLAST<br>IC PAVEMENT MARKING LINES<br>(4", 90 MILS)               | 11,313.000<br>LF                 | 0.80000                     | 9,050.40                   |
| 0120        | 4686000000-E THERMOPLAST<br>IC PAVEMENT MARKING LINES<br>(4", 120 MILS)              | 15,192.000<br>LF                 | 0.90000                     | 13,672.80                  |
| 0121        | 4695000000-E THERMOPLAST<br>IC PAVEMENT MARKING LINES<br>(8", 90 MILS)               | 880.000<br>LF                    | 2.10000                     | 1,848.00                   |
| 0122        | 4697000000-E THERMOPLAST<br>IC PAVEMENT MARKING LINES<br>(8", 120 MILS)              | 1,168.000<br>LF                  | 2.10000                     | 2,452.80                   |
| 0123        | 4700000000-E THERMOPLAST<br>IC PAVEMENT MARKING LINES<br>(12", 90 MILS)              | 3,063.000<br>LF                  | 2.10000                     | 6,432.30                   |
| 0124        | 4710000000-E THERMOPLAST<br>IC PAVEMENT MARKING LINES<br>(24", 120 MILS)             | 485.000<br>LF                    | 10.55000                    | 5,116.75                   |
| 0125        | 4721000000-E THERMOPLAST<br>IC PAVEMENT<br>MARKING CHARACTER (120<br>MILS)           | 24.000<br>EA                     | 79.15000                    | 1,899.60                   |
| 0126        | 4725000000-E THERMOPLAST<br>IC PAVEMENT MARKING SYMBOL<br>(90 MILS)                  | 67.000<br>EA                     | 105.50000                   | 7,068.50                   |
| 0127        | 4770000000-E COLD<br>APPLIED PLASTIC PAVEMENT<br>MARKING LINES, TYPE **<br>(4") (II) | 797.000<br>LF                    | 2.10000                     | 1,673.70                   |
| 0128        | 4770000000-E COLD<br>APPLIED PLASTIC PAVEMENT<br>MARKING LINES, TYPE **<br>(4") (IV) | 945.000<br>LF                    | 2.10000                     | 1,984.50                   |
| 0129        | 4775000000-E COLD<br>APPLIED PLASTIC PAVEMENT<br>MARKING LINES, TYPE **<br>(6") (II) | 86.000<br>LF                     | 3.15000                     | 270.90                     |

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| Line<br>No. | Item<br>Description                                                                         | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Cts |
|-------------|---------------------------------------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| 0130        | 4805000000-N COLD<br>APPLIED PLASTIC PAVEMENT<br>MARKING SYMBOL, TYPE **<br>(II)            | 2.000<br>EA                      | 158.30000                   | 316.60                      |
| 0131        | 4805000000-N COLD<br>APPLIED PLASTIC PAVEMENT<br>MARKING SYMBOL, TYPE **<br>(IV-REMOVEABLE) | 2.000<br>EA                      | 158.30000                   | 316.60                      |
| 0132        | 4810000000-E PAINT<br>PAVEMENT MARKING LINES<br>(4")                                        | 74,422.000<br>LF                 | 0.25000                     | 18,605.50                   |
| 0133        | 4820000000-E PAINT<br>PAVEMENT MARKING LINES<br>(8")                                        | 5,138.000<br>LF                  | 0.55000                     | 2,825.90                    |
| 0134        | 4835000000-E PAINT<br>PAVEMENT MARKING LINES<br>(24")                                       | 1,287.000<br>LF                  | 3.15000                     | 4,054.05                    |
| 0135        | 4840000000-N PAINT<br>PAVEMENT MARKING<br>CHARAC-TER                                        | 36.000<br>EA                     | 36.95000                    | 1,330.20                    |
| 0136        | 4845000000-N PAINT<br>PAVEMENT MARKING SYMBOL                                               | 126.000<br>EA                    | 36.95000                    | 4,655.70                    |
| 0137        | 4850000000-E REMOVAL OF<br>PAVEMENT MARKING LINES<br>(4")                                   | 31,700.000<br>LF                 | 0.40000                     | 12,680.00                   |
| 0138        | 4860000000-E REMOVAL OF<br>PAVEMENT MARKING LINES<br>(8")                                   | 1,429.000<br>LF                  | 0.80000                     | 1,143.20                    |
| 0139        | 4870000000-E REMOVAL OF<br>PAVEMENT MARKING LINES<br>(24")                                  | 273.000<br>LF                    | 3.20000                     | 873.60                      |
| 0140        | 4875000000-N REMOVAL OF<br>PAVEMENT MARKING<br>SYMBOLS & CHARACTERS                         | 47.000<br>EA                     | 36.95000                    | 1,736.65                    |

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| Line No. | Item Description                                                 | Approx. Quantity and Units | Unit Price Dollars Cts | Bid Amount Dollars Ct |
|----------|------------------------------------------------------------------|----------------------------|------------------------|-----------------------|
| 0141     | 4900000000-N PERMANENT RAISED PAVEMENT MARKERS                   | 16.000 EA                  | 5.25000                | 84.00                 |
| 0142     | 4905000000-N SNOWPLOWABLE PAVEMENT MARKERS                       | 191.000 EA                 | 30.60000               | 5,844.60              |
| 0143     | 4955000000-N OBJECT MARKERS (END OF ROAD)                        | 6.000 EA                   | 36.90000               | 221.40                |
| 0144     | 5005000000-E 80' HIGH MOUNT STANDARD                             | 3.000 EA                   | 16,882.55000           | 50,647.65             |
| 0145     | 5010000000-E 100' HIGH MOUNT STANDARD                            | 1.000 EA                   | 20,549.25000           | 20,549.25             |
| 0146     | 5020000000-N PORTABLE DRIVE UNIT                                 | 1.000 EA                   | 4,220.60000            | 4,220.60              |
| 0147     | 5025000000-E HIGH MOUNT FOUNDATIONS                              | 21.000 CY                  | 316.55000              | 6,647.55              |
| 0148     | 5030000000-N HIGH MOUNT LUMINAIRES ***** (400W HPS)              | 24.000 EA                  | 791.35000              | 18,992.40             |
| 0149     | 5030000000-N HIGH MOUNT LUMINAIRES ***** (750W HPS)              | 6.000 EA                   | 844.10000              | 5,064.60              |
| 0150     | 5050000000-N LIGHT STANDARD, TYPE MTLT ***** (MTLT 45' (SA) 15') | 6.000 EA                   | 4,220.65000            | 25,323.90             |
| 0151     | 5050000000-N LIGHT STANDARD, TYPE MTLT ***** (MTLT 45' (TA) 15') | 6.000 EA                   | 4,747.20000            | 28,483.20             |

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| Line<br>No. | Item<br>Description                                                     | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Cts |
|-------------|-------------------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| 0152        | 5070000000-N STANDARD<br>FOUNDATION ***** (R1)                          | 10.000<br>EA                     | 791.35000                   | 7,913.50                    |
| 0153        | 5070000000-N STANDARD<br>FOUNDATION ***** (R2)                          | 2.000<br>EA                      | 844.10000                   | 1,688.20                    |
| 0154        | 5080000000-N LIGHT<br>STANDARD LUMINAIRES,<br>TYPE ***** (RDW,<br>250W) | 18.000<br>EA                     | 474.80000                   | 8,546.40                    |
| 0155        | 5120000000-N ELECTRIC<br>SERVICE POLE<br>***** (30', CLASS<br>4)        | 1.000<br>EA                      | 1,055.15000                 | 1,055.15                    |
| 0156        | 5125000000-E ELECTRIC<br>SERVICE LATERAL<br>***** (3, #1/0<br>USE)      | 100.000<br>LF                    | 7.35000                     | 735.00                      |
| 0157        | 5145000000-N LIGHT<br>CONTROL EQUIPMENT, TYPE<br>RW ***** (SSPM)        | 1.000<br>EA                      | 10,024.00000                | 10,024.00                   |
| 0158        | 5155000000-E ELECTRICAL<br>DUCT, TYPE BD, SIZE *****<br>(2")            | 120.000<br>LF                    | 5.25000                     | 630.00                      |
| 0159        | 5155000000-E ELECTRICAL<br>DUCT, TYPE BD, SIZE *****<br>(3")            | 210.000<br>LF                    | 7.40000                     | 1,554.00                    |
| 0160        | 5160000000-E ELECTRICAL<br>DUCT, TYPE JA, SIZE *****<br>(3")            | 190.000<br>LF                    | 14.75000                    | 2,802.50                    |
| 0161        | 5160000000-E ELECTRICAL<br>DUCT, TYPE JA, SIZE *****<br>(4")            | 100.000<br>LF                    | 15.80000                    | 1,580.00                    |
| 0162        | 5160000000-E ELECTRICAL<br>DUCT, TYPE JA, SIZE *****<br>(6")            | 170.000<br>LF                    | 16.85000                    | 2,864.50                    |

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|-------------|-----------------------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| 0163        | 5170000000-E ** #8 W/G<br>FEEDER CIRCUIT (2)<br>LF                          | 220.000                          | 2.10000                     | 462.00                      |
| 0164        | 5175000000-E ** #6 W/G<br>FEEDER CIRCUIT (2)<br>LF                          | 600.000                          | 3.15000                     | 1,890.00                    |
| 0165        | 5180000000-E ** #4 W/G<br>FEEDER CIRCUIT (2)<br>LF                          | 380.000                          | 4.20000                     | 1,596.00                    |
| 0166        | 5185000000-E ** #2 W/G<br>FEEDER CIRCUIT (2)<br>LF                          | 380.000                          | 5.25000                     | 1,995.00                    |
| 0167        | 5205000000-E ** #8 W/G<br>FEEDER CIRCUIT IN<br>*****" CONDUIT (2, 1 1/2) LF | 2,710.000                        | 6.30000                     | 17,073.00                   |
| 0168        | 5210000000-E ** #6 W/G<br>FEEDER CIRCUIT IN<br>*****" CONDUIT (2, 1 1/2) LF | 1,520.000                        | 7.40000                     | 11,248.00                   |
| 0169        | 5215000000-E ** #4 W/G<br>FEEDER CIRCUIT IN<br>*****" CONDUIT (2, 1 1/2) LF | 2,310.000                        | 8.45000                     | 19,519.50                   |
| 0170        | 5220000000-E ** #2 W/G<br>FEEDER CIRCUIT IN<br>*****" CONDUIT (2, 1 1/2) LF | 2,750.000                        | 10.55000                    | 29,012.50                   |
| 0171        | 5240000000-N ELECTRICAL<br>JUNCTION BOXES<br>***** (PC18) EA                | 15.000                           | 527.55000                   | 7,913.25                    |
| 0172        | 5240000000-N ELECTRICAL<br>JUNCTION BOXES<br>***** (PC30) EA                | 2.000                            | 633.10000                   | 1,266.20                    |
| 0173        | 5240000000-N ELECTRICAL<br>JUNCTION BOXES<br>***** (PC36) EA                | 4.000                            | 791.35000                   | 3,165.40                    |
| 0174        | 5255000000-N PORTABLE<br>LIGHTING<br>LUMP                                   | LUMP                             | LUMP                        | 42,385.65                   |

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|-------------|-------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| 0175        | 5325000000-E *** WATER<br>LINE (18")<br>LF      | 134.000                          | 253.25000                   | 33,935.50                   |
| 0176        | 5325600000-E 6" WATER<br>LINE<br>LF             | 1,575.000                        | 46.45000                    | 73,158.75                   |
| 0177        | 5325800000-E 8" WATER<br>LINE<br>LF             | 50.000                           | 153.00000                   | 7,650.00                    |
| 0178        | 5326200000-E 12" WATER<br>LINE<br>LF            | 582.000                          | 82.30000                    | 47,898.60                   |
| 0179        | 5540000000-E 6" VALVE<br>EA                     | 6.000                            | 1,002.41000                 | 6,014.46                    |
| 0180        | 5546000000-E 8" VALVE<br>EA                     | 1.000                            | 1,318.96000                 | 1,318.96                    |
| 0181        | 5558000000-E 12" VALVE<br>EA                    | 2.000                            | 2,395.20000                 | 4,790.40                    |
| 0182        | 5571600000-E 6" TAPPING<br>VALVE<br>EA          | 1.000                            | 2,363.55000                 | 2,363.55                    |
| 0183        | 5648000000-N RELOCATE<br>WATER METER<br>EA      | 4.000                            | 976.00000                   | 3,904.00                    |
| 0184        | 5649000000-N RECONNECT<br>WATER METER<br>EA     | 5.000                            | 738.60000                   | 3,693.00                    |
| 0185        | 5672000000-N RELOCATE<br>FIRE HYDRANT<br>EA     | 3.000                            | 2,532.35000                 | 7,597.05                    |
| 0186        | 5691300000-E 8" SANITARY<br>GRAVITY SEWER<br>LF | 70.000                           | 92.85000                    | 6,499.50                    |



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|-------------|-----------------------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------|
| 0187        | 5798000000-E ABANDON **"<br>UTILITY PIPE (18")<br>LF                        | 128.000                          | 15.80000                    | 2,022.40                   |
| 0188        | 5804000000-E ABANDON 12"<br>UTILITY PIPE<br>LF                              | 300.000                          | 10.55000                    | 3,165.00                   |
| 0189        | 5882000000-N GENERIC<br>UTILITY ITEM BREAKDOWN<br>AND REBUILD MANHOLE<br>EA | 2.000                            | 1,055.15000                 | 2,110.30                   |
| 0190        | 6000000000-E TEMPORARY<br>SILT FENCE<br>LF                                  | 2,000.000                        | 1.80000                     | 3,600.00                   |
| 0191        | 6006000000-E STONE FOR<br>EROSION CONTROL, CLASS<br>A<br>TON                | 3,110.000                        | 45.90000                    | 142,749.00                 |
| 0192        | 6009000000-E STONE FOR<br>EROSION CONTROL, CLASS<br>B<br>TON                | 1,285.000                        | 45.95000                    | 59,045.75                  |
| 0193        | 6012000000-E SEDIMENT<br>CONTROL STONE<br>TON                               | 2,065.000                        | 38.71000                    | 79,936.15                  |
| 0194        | 6015000000-E TEMPORARY<br>MULCHING<br>ACR                                   | 166.000                          | 506.45000                   | 84,070.70                  |
| 0195        | 6018000000-E SEED FOR<br>TEMPORARY SEEDING<br>LB                            | 4,550.000                        | 2.10000                     | 9,555.00                   |
| 0196        | 6021000000-E FERTILIZER<br>FOR TEMPORARY SEED-ING<br>TON                    | 18.250                           | 685.86000                   | 12,516.95                  |
| 0197        | 6024000000-E TEMPORARY<br>SLOPE DRAINS<br>LF                                | 600.000                          | 11.30000                    | 6,780.00                   |
| 0198        | 6029000000-E SAFETY<br>FENCE<br>LF                                          | 100.000                          | 2.10000                     | 210.00                     |

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| Line No. | Item Description                              | Approx. Quantity and Units | Unit Price Dollars Cts | Bid Amount Dollars Cts |
|----------|-----------------------------------------------|----------------------------|------------------------|------------------------|
| 0199     | 6030000000-E SILT EXCAVATION                  | 2,780.000 CY               | 9.35000                | 25,993.00              |
| 0200     | 6036000000-E MATTING FOR EROSION CONTROL      | 30,000.000 SY              | 1.25000                | 37,500.00              |
| 0201     | 6037000000-E COIR FIBER MAT                   | 15.000 SY                  | 10.55000               | 158.25                 |
| 0202     | 6038000000-E PERMANENT SOIL REINFORCEMENT MAT | 100.000 SY                 | 5.25000                | 525.00                 |
| 0203     | 6042000000-E 1/4" HARDWARE CLOTH              | 2,660.000 LF               | 3.20000                | 8,512.00               |
| 0204     | 6071010000-E WATTLE                           | 1,245.000 LF               | 6.85000                | 8,528.25               |
| 0205     | 6071020000-E POLYACRYLAMIDE (PAM)             | 665.000 LB                 | 6.90000                | 4,588.50               |
| 0206     | 6071030000-E COIR FIBER BAFFLE                | 150.000 LF                 | 5.80000                | 870.00                 |
| 0207     | 6071050000-E **" SKIMMER (1-1/2")             | 1.000 EA                   | 753.30000              | 753.30                 |
| 0208     | 6084000000-E SEEDING & MULCHING               | 123.000 ACR                | 1,456.10000            | 179,100.30             |
| 0209     | 6087000000-E MOWING                           | 80.000 ACR                 | 42.20000               | 3,376.00               |
| 0210     | 6090000000-E SEED FOR REPAIR SEEDING          | 1,700.000 LB               | 3.10000                | 5,270.00               |

State of NC  
Dept of Transportation

Date: 08-21-12  
Revised:

Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line<br>No. | Item<br>Description                                                   | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Cts |
|-------------|-----------------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| 0211        | 6093000000-E FERTILIZER<br>FOR REPAIR SEEDING                         | 4.500<br>TON                     | 833.60000                   | 3,751.20                    |
| 0212        | 6096000000-E SEED FOR<br>SUPPLEMENTAL SEEDING                         | 3,075.000<br>LB                  | 2.65000                     | 8,148.75                    |
| 0213        | 6102000000-E SODDING                                                  | 8,000.000<br>SY                  | 6.10000                     | 48,800.00                   |
| 0214        | 6105000000-E WATER                                                    | 205.000<br>M/G                   | 94.95000                    | 19,464.75                   |
| 0215        | 6108000000-E FERTILIZER<br>TOPDRESSING                                | 92.250<br>TON                    | 675.31000                   | 62,297.35                   |
| 0216        | 6114500000-N SPECIALIZED<br>HAND MOWING                               | 50.000<br>MHR                    | 32.70000                    | 1,635.00                    |
| 0217        | 6117000000-N RESPONSE<br>FOR EROSION CONTROL                          | 75.000<br>EA                     | 105.50000                   | 7,912.50                    |
| 0218        | 6147000000-E GENERIC<br>EROSION CONTROL ITEM TREE<br>PROTECTION FENCE | 2,800.000<br>LF                  | 2.15000                     | 6,020.00                    |
| 0219        | 7060000000-E SIGNAL<br>CABLE                                          | 6,485.000<br>LF                  | 1.05000                     | 6,809.25                    |
| 0220        | 7120000000-E VEHICLE<br>SIGNAL HEAD (12", 3<br>SECTION)               | 49.000<br>EA                     | 580.35000                   | 28,437.15                   |
| 0221        | 7132000000-E VEHICLE<br>SIGNAL HEAD (12", 4<br>SECTION)               | 8.000<br>EA                      | 738.60000                   | 5,908.80                    |
| 0222        | 7144000000-E VEHICLE<br>SIGNAL HEAD (12", 5<br>SECTION)               | 4.000<br>EA                      | 1,055.15000                 | 4,220.60                    |

State of NC  
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Date: 08-21-12  
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Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line No. | Item Description                                      | Approx. Quantity and Units | Unit Price Dollars Cts | Bid Amount Dollars Cts |
|----------|-------------------------------------------------------|----------------------------|------------------------|------------------------|
| 0223     | 7252000000-E MESSENGER CABLE (1/4")                   | 80.000 LF                  | 0.55000                | 44.00                  |
| 0224     | 7264000000-E MESSENGER CABLE (3/8")                   | 1,235.000 LF               | 2.10000                | 2,593.50               |
| 0225     | 7288000000-E PAVED TRENCHING (*****)(1, 2")           | 150.000 LF                 | 10.55000               | 1,582.50               |
| 0226     | 7300000000-E UNPAVED TRENCHING (*****)(1, 2")         | 1,300.000 LF               | 5.25000                | 6,825.00               |
| 0227     | 7300100000-E UNPAVED TRENCHING FOR TEMP-ORARY LEAD-IN | 365.000 LF                 | 4.25000                | 1,551.25               |
| 0228     | 7301000000-E DIRECTIONAL DRILL (*****)(1, 2")         | 175.000 LF                 | 12.65000               | 2,213.75               |
| 0229     | 7301000000-E DIRECTIONAL DRILL (*****)(2, 2")         | 610.000 LF                 | 14.75000               | 8,997.50               |
| 0230     | 7324000000-N JUNCTION BOX (STANDARD SIZE)             | 29.000 EA                  | 527.60000              | 15,300.40              |
| 0231     | 7360000000-N WOOD POLE                                | 13.000 EA                  | 1,266.20000            | 16,460.60              |
| 0232     | 7372000000-N GUY ASSEMBLY                             | 20.000 EA                  | 263.80000              | 5,276.00               |
| 0233     | 7408000000-E 1" RISER WITH WEATHERHEAD                | 2.000 EA                   | 527.60000              | 1,055.20               |
| 0234     | 7420000000-E 2" RISER WITH WEATHERHEAD                | 12.000 EA                  | 685.86000              | 8,230.32               |

State of NC  
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Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line<br>No. | Item<br>Description                                                   | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Cts |
|-------------|-----------------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| 0235        | 7444000000-E INDUCTIVE<br>LOOP SAWCUT                                 | 3,860.000<br>LF                  | 8.45000                     | 32,617.00                   |
| 0236        | 7456000000-E LEAD-IN<br>CABLE (*****<br>(14-2)                        | 7,710.000<br>LF                  | 1.05000                     | 8,095.50                    |
| 0237        | 7574550000-N FURNISH<br>WIRELESS LIGHTNING<br>ARRESTOR                | 4.000<br>EA                      | 580.35000                   | 2,321.40                    |
| 0238        | 7575142000-N 900MHZ<br>RADIO                                          | 4.000<br>EA                      | 6,119.95000                 | 24,479.80                   |
| 0239        | 7588000000-N METAL POLE<br>WITH SINGLE MAST ARM                       | 6.000<br>EA                      | 14,772.25000                | 88,633.50                   |
| 0240        | 7590000000-N METAL POLE<br>WITH DUAL MAST ARM                         | 2.000<br>EA                      | 18,992.90000                | 37,985.80                   |
| 0241        | 7613000000-N SOIL TEST                                                | 8.000<br>EA                      | 1,582.75000                 | 12,662.00                   |
| 0242        | 7614100000-E DRILLED<br>PIER FOUNDATION                               | 64.000<br>CY                     | 316.55000                   | 20,259.20                   |
| 0243        | 7631000000-N MAST ARM<br>WITH METAL POLE DE- SIGN                     | 8.000<br>EA                      | 1,055.15000                 | 8,441.20                    |
| 0244        | 7636000000-N SIGN FOR<br>SIGNALS                                      | 4.000<br>EA                      | 369.30000                   | 1,477.20                    |
| 0245        | 7684000000-N SIGNAL<br>CABINET FOUNDATION                             | 3.000<br>EA                      | 1,055.15000                 | 3,165.45                    |
| 0246        | 7756000000-N CONTROLLER<br>WITH CABINET (TYPE 2070L,<br>BASE MOUNTED) | 3.000<br>EA                      | 13,717.10000                | 41,151.30                   |

Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line<br>No.        | Item<br>Description                                                                       | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Cts |
|--------------------|-------------------------------------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------------|
| 0247               | 7768000000-N CONTROLLER<br>WITH CABINET (TYPE 2070L,<br>POLE MOUNTED)                     | 1.000<br>EA                      | 12,661.90000                | 12,661.90                   |
| 0248               | 7780000000-N DETECTOR<br>CARD (TYPE 2070L)                                                | 23.000<br>EA                     | 158.25000                   | 3,639.75                    |
| 0249               | 7901000000-N CABINET<br>BASE EXTENDER                                                     | 3.000<br>EA                      | 685.86000                   | 2,057.58                    |
| 0250               | 7948000000-N TRAFFIC<br>SIGNAL REMOVAL                                                    | 2.000<br>EA                      | 1,582.75000                 | 3,165.50                    |
| 0251               | 7980000000-N GENERIC<br>SIGNAL ITEM POWDER COAT<br>FOR DOUBLE MAST ARM WITH<br>METAL POLE | 1.000<br>EA                      | 2,110.35000                 | 2,110.35                    |
| 0252               | 7980000000-N GENERIC<br>SIGNAL ITEM POWDER COAT<br>FOR SINGLE MAST ARM WITH<br>METAL POLE | 4.000<br>EA                      | 1,266.20000                 | 5,064.80                    |
| Section 0001 Total |                                                                                           |                                  |                             | 7,363,332.45                |

Section 0003 WALL ITEMS

Alt Group

|      |                                                                                          |                 |           |            |
|------|------------------------------------------------------------------------------------------|-----------------|-----------|------------|
| 0253 | 8802014000-E SOLDIER<br>PILE RETAINING WALLS                                             | 6,250.000<br>SF | 84.00000  | 525,000.00 |
| 0254 | 8839000000-E GENERIC<br>RETAINING WALL ITEM<br>CONCRETE BARRIER RAIL<br>WITH MOMENT SLAB | 268.000<br>LF   | 300.00000 | 80,400.00  |
| 0255 | 8847000000-E GENERIC<br>RETAINING WALL ITEM MSE<br>RETAINING WALL NO. 3                  | 700.000<br>SF   | 70.00000  | 49,000.00  |

State of NC  
Dept of Transportation

Date: 08-21-12  
Revised:

Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line<br>No. | Item<br>Description                                                     | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Ct |
|-------------|-------------------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------|
| 0256        | 8847000000-E GENERIC<br>RETAINING WALL ITEM MSE<br>RETAINING WALL NO. 4 | 200.000<br>SF                    | 70.00000                    | 14,000.00                  |
|             | Section 0003 Total                                                      |                                  |                             | 668,400.00                 |

Section 0004 STRUCTURE ITEMS

Alt Group

|      |                                                                                            |                  |             |            |
|------|--------------------------------------------------------------------------------------------|------------------|-------------|------------|
| 0257 | 8035000000-N REMOVAL OF<br>EXISTING STRUCTURE AT<br>STATION *****<br>(21+37.80-Y6-)        | LUMP             | LUMP        | 52,500.00  |
| 0258 | 8091000000-N FOUNDATION<br>EXCAVATION FOR BENT** AT<br>STATION ***** (1,<br>(21+37.80-Y6-) | LUMP             | LUMP        | 25,000.00  |
| 0259 | 8112730000-N PDA TESTING                                                                   | 1.000<br>EA      | 2,500.00000 | 2,500.00   |
| 0260 | 8121000000-N UNCLASSIFIED<br>STRUCTURE EXCAVATION<br>AT STATION *****<br>(21+37.80-Y6-)    | LUMP             | LUMP        | 2,500.00   |
| 0261 | 8147000000-E REINFORCED<br>CONCRETE DECK SLAB                                              | 15,298.000<br>SF | 34.50000    | 527,781.00 |
| 0262 | 8161000000-E GROOVING<br>BRIDGE FLOORS                                                     | 14,074.000<br>SF | 0.60000     | 8,444.40   |
| 0263 | 8182000000-E CLASS A<br>CONCRETE (BRIDGE)                                                  | 229.000<br>CY    | 800.00000   | 183,200.00 |
| 0264 | 8210000000-N BRIDGE<br>APPROACH SLABS,<br>STATION*****<br>(21+37.80-Y6-)                   | LUMP             | LUMP        | 55,000.00  |

Contract ID: C202886 Project(s): STPNHF-1(10)  
Letting Date: 09-18-12 Call Order: 009  
Bidder: 3714 - English Construction Company, Inc.

| Line<br>No. | Item<br>Description                                                    | Approx.<br>Quantity<br>and Units | Unit Price<br>Dollars   Cts | Bid Amount<br>Dollars   Ct |
|-------------|------------------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------|
| 0265        | 8217000000-E REINFORCING<br>STEEL (BRIDGE)                             | 32,993.000<br>LB                 | 1.00000                     | 32,993.00                  |
| 0266        | 8238000000-E SPIRAL<br>COLUMN REINFORCING<br>STEEL (BRIDGE)            | 1,902.000<br>LB                  | 1.25000                     | 2,377.50                   |
| 0267        | 8280000000-E APPROX<br>..... LBS<br>STRUCTURALSTEEL                    | LUMP                             | LUMP                        | 680,000.00                 |
| 0268        | 8364000000-E HP12X53<br>STEEL PILES                                    | 2,650.000<br>LF                  | 42.00000                    | 111,300.00                 |
| 0269        | 8393000000-N PILE<br>REDRIVES                                          | 56.000<br>EA                     | 150.00000                   | 8,400.00                   |
| 0270        | 8531000000-E 4" SLOPE<br>PROTECTION                                    | 930.000<br>SY                    | 110.00000                   | 102,300.00                 |
| 0271        | 8650000000-N POT<br>BEARINGS                                           | LUMP                             | LUMP                        | 30,000.00                  |
| 0272        | 8657000000-N ELASTOMERIC<br>BEARINGS                                   | LUMP                             | LUMP                        | 11,000.00                  |
| 0273        | 8867000000-E GENERIC<br>STRUCTURE ITEM CLASSIC<br>CONCRETE BRIDGE RAIL | 335.000<br>LF                    | 375.00000                   | 125,625.00                 |
|             | Section 0004 Total                                                     |                                  |                             | 1,960,920.90               |
|             | Bid Total                                                              |                                  |                             | 9,992,653.35               |



## NON-COLLUSION AND DEBARMENT CERTIFICATION

The bidder certifies that neither he, nor any official, agent or employee of the bidder has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with this bid, and that the bidder intends to do the work with its own bonafide employees or subcontractors and is not bidding for the benefit of another contractor. In addition, submitting this electronic bid constitutes the bidder's certification of Status under penalty of perjury under the laws of the United States and in accordance with the Debarment Certification on file with the Department.

By submitting this bid, the bidder certifies to the best of his knowledge and belief that he and his principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records; making false statements; or receiving stolen property;
- c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph b. of this certification; and
- d. Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

Where the prospective bidder is unable to certify to any of the statements in this certification, the bidder shall submit an explanation in the blanks provided herein. The explanation will not necessarily result in denial of participation in a contract.

Explanation:  
NOT ANSWERED  
NOT ANSWERED  
NOT ANSWERED  
NOT ANSWERED

If the prequalified bidder's status changes, he shall immediately submit a new fully executed non-collusion affidavit and debarment certification with an explanation of the change to the Contract Office prior to submitting the bid.

Failure to furnish a certification or an explanation will be grounds for rejection of a bid

AWARD LIMITS ON MULTIPLE PROJECTS

By answering YES to this statement, the bidder acknowledges that they are using the award limits on multiple projects. No

A bidder who desires to bid on more than one project on which bids are to be opened on the same date, and who also desires to avoid receiving an award of more projects than he is equipped to handle, may bid on any number of projects but may limit the total amount of work awarded to him on selected projects by completing the AWARD LIMITS ON MULTIPLE PROJECTS.

The Award Limits on Multiple Projects must be filled in on each project bid for which the Bidder desires protection.

It is the desire of the Bidder to be awarded contracts, the value of which will not exceed a total of NOT ANSWERED for those projects indicated herein, for which bids will be opened on (MM/DD/YY)

The Award Limits shall apply to the following projects:

| Contract Number | County |
|-----------------|--------|
| NOT ANSWERED    |        |
| NOT ANSWERED    |        |
| NOT ANSWERED    |        |
| NOT ANSWERED    |        |
| NOT ANSWERED    |        |
| NOT ANSWERED    |        |

It is agreed that if I am (we are) the low Bidder(s) on indicated projects, the total value of which is more than the above stipulated award limits, the Board of Transportation will award me (us) projects from among those indicated that have a total value not to exceed the award limit and will result in the lowest total bids to the Department of Transportation.

NORTH CAROLINA STATE DEPARTMENT OF TRANSPORTATION  
DBE COMMITMENT ITEMS

DATE:08-21-12  
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PROPOSAL: C202886  
LETTING: L120918 CALL: 009  
VENDOR: 3714 English Construction Company, Inc.

| LINE NO.                                            | ITEM NO.     | ITEM DESC.       | UNIT TYPE | SUBCONTRACTOR QUANTITY | SUBCONTRACTOR UNIT PRICE | EXTENDED AMOUNT |           |
|-----------------------------------------------------|--------------|------------------|-----------|------------------------|--------------------------|-----------------|-----------|
| DBE SUBCONTRACTOR: 4898 BULLINGTON CONSTRUCTION INC |              |                  |           |                        |                          |                 |           |
| Will Use Quote: Yes                                 |              |                  |           |                        |                          |                 |           |
| 0070                                                | 3030000000-E | STL BM GUARD LF  |           | 8137.500               | 14.10000                 | 114738.75       |           |
| 0071                                                | 3045000000-E | SBGR SHOP CU LF  |           | 242.390                | 15.00000                 | 3635.85         |           |
| 0072                                                | 3105000000-N | SBGR TERM SE EA  |           | 1.000                  | 40.00000                 | 40.00           |           |
| 0073                                                | 3150000000-N | ADDIT GUARDR EA  |           | 25.000                 | 35.00000                 | 875.00          |           |
| 0074                                                | 3195000000-N | GR ANCHOR TY EA  |           | 4.000                  | 425.00000                | 1700.00         |           |
| 0075                                                | 3210000000-N | GR ANCHOR TY EA  |           | 5.000                  | 425.00000                | 2125.00         |           |
| 0076                                                | 3215000000-N | GR ANCHOR TY EA  |           | 4.000                  | 1350.00000               | 5400.00         |           |
| 0077                                                | 3270000000-N | GR ANCHOR TY EA  |           | 11.000                 | 1825.00000               | 20075.00        |           |
| 0078                                                | 3317000000-N | GR ANCHOR TY EA  |           | 8.000                  | 1400.00000               | 11200.00        |           |
| DBE COMMITMENT TOTAL FOR SUBCONTRACTOR:             |              |                  |           |                        |                          | 159,789.60      | committed |
| DBE COMMITMENT TOTAL FOR VENDOR (SubContractor )    |              |                  |           |                        |                          | 159,789         |           |
| DBE SUBCONTRACTOR: 7099 LOCKLEAR CONTRACTING INC    |              |                  |           |                        |                          |                 |           |
| Will Use Quote: Yes                                 |              |                  |           |                        |                          |                 |           |
| 0001                                                | 0000100000-N | MOBILIZATION LS  |           | 0.100                  | 318525.40000             | 31852.54        |           |
| 0012                                                | 0318000000-E | FND CONDIT M TON |           | 1080.000               | 28.50000                 | 30780.00        |           |
| 0013                                                | 0320000000-E | FND CONDIT G SY  |           | 3530.000               | 2.10000                  | 7413.00         |           |
| 0014                                                | 0335200000-E | 15" DRAINAGE LF  |           | 60.000                 | 24.50000                 | 1470.00         |           |
| 0015                                                | 0343000000-E | 15" SIDE DRA LF  |           | 56.000                 | 24.50000                 | 1372.00         |           |
| 0016                                                | 0366000000-E | 15" RC PIPE LF   |           | 1296.000               | 24.50000                 | 31752.00        |           |
| 0017                                                | 0372000000-E | 18" RC PIPE LF   |           | 660.000                | 28.00000                 | 18480.00        |           |
| 0018                                                | 0378000000-E | 24" RC PIPE LF   |           | 200.000                | 33.50000                 | 6700.00         |           |
| 0019                                                | 0384000000-E | 30" RC PIPE LF   |           | 912.000                | 44.00000                 | 40128.00        |           |
| 0020                                                | 0390000000-E | 36" RC PIPE LF   |           | 1012.000               | 57.50000                 | 58190.00        |           |
| 0021                                                | 0402000000-E | 48" RC PIPE LF   |           | 2004.000               | 85.00000                 | 170340.00       |           |
| 0022                                                | 0448200000-E | 15" RCP CULV LF  |           | 732.000                | 26.00000                 | 19032.00        |           |
| 0023                                                | 0448300000-E | 18" RCP CULV LF  |           | 452.000                | 31.00000                 | 14012.00        |           |
| 0024                                                | 0448400000-E | 24" RCP CULV LF  |           | 64.000                 | 39.00000                 | 2496.00         |           |
| 0025                                                | 0448500000-E | 30" RCP CULV LF  |           | 304.000                | 51.00000                 | 15504.00        |           |
| 0026                                                | 0448600000-E | 36" RCP CULV LF  |           | 752.000                | 62.00000                 | 46624.00        |           |
| 0027                                                | 0448700000-E | 42" RCP CULV LF  |           | 32.000                 | 78.50000                 | 2512.00         |           |
| 0028                                                | 0582000000-E | 15" CS PIPE LF   |           | 156.000                | 29.50000                 | 4602.00         |           |
| 0029                                                | 0588000000-E | 18" CS PIPE LF   |           | 76.000                 | 36.00000                 | 2736.00         |           |
| 0030                                                | 0636000000-E | **" CS ELBOW EA  |           | 8.000                  | 325.00000                | 2600.00         |           |
| 0031                                                | 0636000000-E | **" CS ELBOW EA  |           | 2.000                  | 410.00000                | 820.00          |           |
| 0032                                                | 0995000000-E | PIPE REMOVAL LF  |           | 2135.000               | 10.00000                 | 21350.00        |           |
| 0048                                                | 2209000000-E | ENDWALLS CY      |           | 0.672                  | 900.00000                | 604.80          |           |
| 0049                                                | 2253000000-E | PIPE COLLARS CY  |           | 1.250                  | 900.00000                | 1125.00         |           |
| 0050                                                | 2264000000-E | PIPE PLUGS CY    |           | 3.720                  | 900.00000                | 3348.00         |           |
| 0051                                                | 2286000000-N | MASNRY DRAIN EA  |           | 80.000                 | 1000.00000               | 80000.00        |           |
| 0052                                                | 2308000000-E | MASNRY DRAIN LF  |           | 54.000                 | 225.00000                | 12150.00        |           |
| 0053                                                | 2364200000-N | FRAME W/2GRT EA  |           | 19.000                 | 450.00000                | 8550.00         |           |

NORTH CAROLINA STATE DEPARTMENT OF TRANSPORTATION  
DBE COMMITMENT ITEMS

DATE: 08-21-12  
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| LINE NO.                                         | ITEM NO.     | ITEM DESC.   | UNIT TYPE | SUBCONTRACTOR QUANTITY | SUBCONTRACTOR UNIT PRICE | EXTENDED AMOUNT |           |
|--------------------------------------------------|--------------|--------------|-----------|------------------------|--------------------------|-----------------|-----------|
| 0054                                             | 2365000000-N | FRAME W/2GRT | EA        | 4.000                  | 450.00000                | 1800.00         |           |
| 0055                                             | 2366000000-N | FRAME W/2GRT | EA        | 3.000                  | 450.00000                | 1350.00         |           |
| 0056                                             | 2367000000-N | FRAME W/2GRT | EA        | 11.000                 | 450.00000                | 4950.00         |           |
| 0057                                             | 2374000000-N | FRAME-GRT-HD | EA        | 6.000                  | 475.00000                | 2850.00         |           |
| 0058                                             | 2374000000-N | FRAME-GRT-HD | EA        | 18.000                 | 475.00000                | 8550.00         |           |
| 0059                                             | 2374000000-N | FRAME-GRT-HD | EA        | 7.000                  | 475.00000                | 3325.00         |           |
| 0060                                             | 2396000000-N | FRAME W/COVE | EA        | 12.000                 | 350.00000                | 4200.00         |           |
| 0068                                             | 2860000000-N | CONVERT CB T | EA        | 1.000                  | 950.00000                | 950.00          |           |
| 0069                                             | 2905000000-N | CONVERT DI T | EA        | 5.000                  | 975.00000                | 4875.00         |           |
| DBE COMMITMENT TOTAL FOR SUBCONTRACTOR:          |              |              |           |                        |                          | 669,393.34      | committed |
| DBE COMMITMENT TOTAL FOR VENDOR (SubContractor ) |              |              |           |                        |                          | 669,393         |           |

DBE SUBCONTRACTOR: 7099 LOCKLEAR CONTRACTING INC  
Will Use Quote: Yes

|                                                  |              |              |        |          |             |            |           |
|--------------------------------------------------|--------------|--------------|--------|----------|-------------|------------|-----------|
| 0001                                             | 0000100000-N | MOBILIZATION | LS     | 0.100    | 97658.00000 | 9765.80    |           |
| 0175                                             | 5325000000-E | **" WATER    | LI LF  | 134.000  | 240.00000   | 32160.00   |           |
| 0176                                             | 5325600000-E | 6" WATER     | LIN LF | 1575.000 | 44.00000    | 69300.00   |           |
| 0177                                             | 5325800000-E | 8" WATER     | LIN LF | 50.000   | 145.00000   | 7250.00    |           |
| 0178                                             | 5326200000-E | 12" WATER    | LI LF  | 582.000  | 78.00000    | 45396.00   |           |
| 0179                                             | 5540000000-E | 6" VALVE     | EA     | 6.000    | 950.00000   | 5700.00    |           |
| 0180                                             | 5546000000-E | 8" VALVE     | EA     | 1.000    | 1250.00000  | 1250.00    |           |
| 0181                                             | 5558000000-E | 12" VALVE    | EA     | 2.000    | 2270.00000  | 4540.00    |           |
| 0182                                             | 5571600000-E | 6" TAPPING   | V EA   | 1.000    | 2240.00000  | 2240.00    |           |
| 0183                                             | 5648000000-N | RELOCATE     | WAT EA | 4.000    | 925.00000   | 3700.00    |           |
| 0184                                             | 5649000000-N | RECONNECT    | WA EA  | 5.000    | 700.00000   | 3500.00    |           |
| 0185                                             | 5672000000-N | RELOCATE     | FIR EA | 3.000    | 2400.00000  | 7200.00    |           |
| 0186                                             | 5691300000-E | 8" SANITARY  | LF     | 70.000   | 88.00000    | 6160.00    |           |
| 0187                                             | 5798000000-E | ABANDON **"  | LF     | 128.000  | 15.00000    | 1920.00    |           |
| 0188                                             | 5804000000-E | ABANDON 12"  | LF     | 300.000  | 10.00000    | 3000.00    |           |
| 0189                                             | 5882000000-N | GENERIC UTIL | EA     | 2.000    | 1000.00000  | 2000.00    |           |
| DBE COMMITMENT TOTAL FOR SUBCONTRACTOR:          |              |              |        |          |             | 205,081.80 | committed |
| DBE COMMITMENT TOTAL FOR VENDOR (SubContractor ) |              |              |        |          |             | 205,081    |           |

TOTAL DBE COMMITMENT FOR VENDOR:                      Entered:      10.35% or      1034264.74  
                                                                         Required:      10.00% or      999265.34  
                                                                                                                 <GOAL MET>

## Contract Item Sheets For C202886

| Line #               | ItemNumber   | Sec # | Description                                                          | Quantity Unit  | Unit Bid Price | Amount Bid |
|----------------------|--------------|-------|----------------------------------------------------------------------|----------------|----------------|------------|
| <b>ROADWAY ITEMS</b> |              |       |                                                                      |                |                |            |
| 0001                 | 0000100000-N | 800   | MOBILIZATION                                                         | Lump Sum<br>LS | 490,000.00     | 490,000.00 |
| 0002                 | 0000400000-N | 801   | CONSTRUCTION SURVEYING                                               | Lump Sum<br>LS | 69,194.30      | 69,194.30  |
| 0003                 | 0029000000-N | SP    | REINFORCED BRIDGE APPROACH<br>FILL, STATION *****<br>(21 + 37.80-Y-) | Lump Sum<br>LS | 20,288.75      | 20,288.75  |
| 0004                 | 0050000000-E | 226   | SUPPLEMENTARY CLEARING & GRUB-<br>BING                               | 1<br>ACR       | 6,802.35       | 6,802.35   |
| 0005                 | 0057000000-E | 226   | UNDERCUT EXCAVATION                                                  | 2,500<br>CY    | 9.75           | 24,375.00  |
| 0006                 | 0063000000-N | SP    | GRADING                                                              | Lump Sum<br>LS | 631,282.00     | 631,282.00 |
| 0007                 | 0106000000-E | 230   | BORROW EXCAVATION                                                    | 39,500<br>CY   | 11.65          | 460,175.00 |
| 0008                 | 0195000000-E | 265   | SELECT GRANULAR MATERIAL                                             | 2,000<br>CY    | 40.95          | 81,900.00  |
| 0009                 | 0196000000-E | 270   | GEOTEXTILE FOR SOIL STABILIZA-<br>TION                               | 3,100<br>SY    | 2.00           | 6,200.00   |
| 0010                 | 0199000000-E | SP    | TEMPORARY SHORING                                                    | 1,889<br>SF    | 48.00          | 90,672.00  |
| 0011                 | 0262000000-N | SP    | GENERIC GRADING ITEM<br>ENERGY DISSIPATOR BASIN                      | 2<br>EA        | 4,781.85       | 9,563.70   |
| 0012                 | 0318000000-E | 300   | FOUNDATION CONDITIONING MATE-<br>RIAL, MINOR STRUCTURES              | 1,080<br>TON   | 30.05          | 32,454.00  |
| 0013                 | 0320000000-E | 300   | FOUNDATION CONDITIONING GEO-<br>TEXTILE                              | 3,530<br>SY    | 4.20           | 14,826.00  |
| 0014                 | 0335200000-E | 305   | 15" DRAINAGE PIPE                                                    | 60<br>LF       | 25.85          | 1,551.00   |
| 0015                 | 0343000000-E | 310   | 15" SIDE DRAIN PIPE                                                  | 56<br>LF       | 25.85          | 1,447.60   |
| 0016                 | 0366000000-E | 310   | 15" RC PIPE CULVERTS, CLASS<br>III                                   | 1,296<br>LF    | 25.85          | 33,501.60  |
| 0017                 | 0372000000-E | 310   | 18" RC PIPE CULVERTS, CLASS<br>III                                   | 660<br>LF      | 29.55          | 19,503.00  |
| 0018                 | 0378000000-E | 310   | 24" RC PIPE CULVERTS, CLASS<br>III                                   | 200<br>LF      | 35.35          | 7,070.00   |

## Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                   | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|-----------------------------------------------|---------------|----------------|------------|
| 0019   | 0384000000-E | 310   | 30" RC PIPE CULVERTS, CLASS III               | 912 LF        | 46.45          | 42,362.40  |
| 0020   | 0390000000-E | 310   | 36" RC PIPE CULVERTS, CLASS III               | 1,012 LF      | 60.65          | 61,377.80  |
| 0021   | 0402000000-E | 310   | 48" RC PIPE CULVERTS, CLASS III               | 2,004 LF      | 89.65          | 179,658.60 |
| 0022   | 0448200000-E | 310   | 15" RC PIPE CULVERTS, CLASS IV                | 732 LF        | 27.40          | 20,056.80  |
| 0023   | 0448300000-E | 310   | 18" RC PIPE CULVERTS, CLASS IV                | 452 LF        | 32.70          | 14,780.40  |
| 0024   | 0448400000-E | 310   | 24" RC PIPE CULVERTS, CLASS IV                | 64 LF         | 41.15          | 2,633.60   |
| 0025   | 0448500000-E | 310   | 30" RC PIPE CULVERTS, CLASS IV                | 304 LF        | 53.80          | 16,355.20  |
| 0026   | 0448600000-E | 310   | 36" RC PIPE CULVERTS, CLASS IV                | 752 LF        | 65.40          | 49,180.80  |
| 0027   | 0448700000-E | 310   | 42" RC PIPE CULVERTS, CLASS IV                | 32 LF         | 82.80          | 2,649.60   |
| 0028   | 0582000000-E | 310   | 15" CS PIPE CULVERTS, 0.064" THICK            | 156 LF        | 31.10          | 4,851.60   |
| 0029   | 0588000000-E | 310   | 18" CS PIPE CULVERTS, 0.064" THICK            | 76 LF         | 38.00          | 2,888.00   |
| 0030   | 0636000000-E | 310   | *** CS PIPE ELBOWS, ***** THICK (15", 0.064") | 8 EA          | 342.90         | 2,743.20   |
| 0031   | 0636000000-E | 310   | *** CS PIPE ELBOWS, ***** THICK (18", 0.064") | 2 EA          | 432.60         | 865.20     |
| 0032   | 0995000000-E | 340   | PIPE REMOVAL                                  | 2,135 LF      | 10.55          | 22,524.25  |
| 0033   | 1099500000-E | 505   | SHALLOW UNDERCUT                              | 1,000 CY      | 9.75           | 9,750.00   |
| 0034   | 1099700000-E | 505   | CLASS IV SUBGRADE STABILIZATION               | 2,000 TON     | 25.75          | 51,500.00  |
| 0035   | 1110000000-E | 510   | STABILIZER AGGREGATE                          | 250 TON       | 25.25          | 6,312.50   |
| 0036   | 1220000000-E | 545   | INCIDENTAL STONE BASE                         | 100 TON       | 38.30          | 3,830.00   |

## Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                   | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|-----------------------------------------------|---------------|----------------|------------|
| 0037   | 1330000000-E | 607   | INCIDENTAL MILLING                            | 247 SY        | 8.45           | 2,087.15   |
| 0038   | 1489000000-E | 610   | ASPHALT CONC BASE COURSE, TYPE B25.0B         | 4,480 TON     | 45.25          | 202,720.00 |
| 0039   | 1491000000-E | 610   | ASPHALT CONC BASE COURSE, TYPE B25.0C         | 3,900 TON     | 44.08          | 171,912.00 |
| 0040   | 1498000000-E | 610   | ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B | 3,250 TON     | 44.20          | 143,650.00 |
| 0041   | 1503000000-E | 610   | ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C | 2,630 TON     | 44.60          | 117,298.00 |
| 0042   | 1519000000-E | 610   | ASPHALT CONC SURFACE COURSE, TYPE S9.5B       | 4,410 TON     | 41.95          | 184,999.50 |
| 0043   | 1523000000-E | 610   | ASPHALT CONC SURFACE COURSE, TYPE S9.5C       | 5,430 TON     | 46.10          | 250,323.00 |
| 0044   | 1575000000-E | 620   | ASPHALT BINDER FOR PLANT MIX                  | 1,240 TON     | 675.31         | 837,384.40 |
| 0045   | 1693000000-E | 654   | ASPHALT PLANT MIX, PAVEMENT REPAIR            | 70 TON        | 164.35         | 11,504.50  |
| 0046   | 1840000000-E | 665   | MILLED RUMBLE STRIPS (ASPHALT CONCRETE)       | 10,620 LF     | 0.65           | 6,903.00   |
| 0047   | 2000000000-N | 806   | RIGHT OF WAY MARKERS                          | 55 EA         | 184.65         | 10,155.75  |
| 0048   | 2209000000-E | 838   | ENDWALLS                                      | 0.672 CY      | 946.80         | 636.25     |
| 0049   | 2253000000-E | 840   | PIPE COLLARS                                  | 1.25 CY       | 949.65         | 1,187.06   |
| 0050   | 2264000000-E | 840   | PIPE PLUGS                                    | 3.72 CY       | 949.65         | 3,532.70   |
| 0051   | 2286000000-N | 840   | MASONRY DRAINAGE STRUCTURES                   | 80 EA         | 1,055.15       | 84,412.00  |
| 0052   | 2308000000-E | 840   | MASONRY DRAINAGE STRUCTURES                   | 54 LF         | 237.40         | 12,819.60  |
| 0053   | 2364200000-N | 840   | FRAME WITH TWO GRATES, STD 840.20             | 19 EA         | 474.80         | 9,021.20   |
| 0054   | 2365000000-N | 840   | FRAME WITH TWO GRATES, STD 840.22             | 4 EA          | 474.80         | 1,899.20   |

Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                            | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|--------------------------------------------------------|---------------|----------------|------------|
| 0055   | 2366000000-N | 840   | FRAME WITH TWO GRATES, STD<br>840.24                   | 3<br>EA       | 474.80         | 1,424.40   |
| 0056   | 2367000000-N | 840   | FRAME WITH TWO GRATES, STD<br>840.29                   | 11<br>EA      | 474.80         | 5,222.80   |
| 0057   | 2374000000-N | 840   | FRAME WITH GRATE & HOOD, STD<br>840.03, TYPE **<br>(E) | 6<br>EA       | 501.21         | 3,007.26   |
| 0058   | 2374000000-N | 840   | FRAME WITH GRATE & HOOD, STD<br>840.03, TYPE **<br>(F) | 18<br>EA      | 501.20         | 9,021.60   |
| 0059   | 2374000000-N | 840   | FRAME WITH GRATE & HOOD, STD<br>840.03, TYPE **<br>(G) | 7<br>EA       | 501.20         | 3,508.40   |
| 0060   | 2396000000-N | 840   | FRAME WITH COVER, STD 840.54                           | 12<br>EA      | 369.30         | 4,431.60   |
| 0061   | 2538000000-E | 846   | ***_*** CONCRETE CURB & GUTTER<br>(8" X 12")           | 50<br>LF      | 19.90          | 995.00     |
| 0062   | 2549000000-E | 846   | 2'-6" CONCRETE CURB & GUTTER                           | 3,060<br>LF   | 17.20          | 52,632.00  |
| 0063   | 2556000000-E | 846   | SHOULDER BERM GUTTER                                   | 700<br>LF     | 16.50          | 11,550.00  |
| 0064   | 2577000000-E | 846   | CONCRETE EXPRESSWAY GUTTER                             | 1,936<br>LF   | 18.45          | 35,719.20  |
| 0065   | 2591000000-E | 848   | 4" CONCRETE SIDEWALK                                   | 1,090<br>SY   | 29.40          | 32,046.00  |
| 0066   | 2647000000-E | 852   | 5" MONOLITHIC CONCRETE ISLANDS<br>(SURFACE MOUNTED)    | 1,600<br>SY   | 31.90          | 51,040.00  |
| 0067   | 2724000000-E | 857   | PRECAST REINFORCED CONCRETE<br>BARRIER, SINGLE FACED   | 200<br>LF     | 75.00          | 15,000.00  |
| 0068   | 2860000000-N | 859   | CONVERT EXISTING CATCH BASIN<br>TO JUNCTION BOX        | 1<br>EA       | 1,002.41       | 1,002.41   |
| 0069   | 2905000000-N | 859   | CONVERT EXISTING DROP INLET TO<br>JUNCTION BOX         | 5<br>EA       | 1,028.75       | 5,143.75   |
| 0070   | 3030000000-E | 862   | STEEL BM GUARDRAIL                                     | 8,137.5<br>LF | 14.85          | 120,841.88 |



## Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                         | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|-----------------------------------------------------|---------------|----------------|------------|
| 0071   | 3045000000-E | 862   | STEEL BM GUARDRAIL, SHOP CURVED                     | 242.39 LF     | 15.80          | 3,829.76   |
| 0072   | 3105000000-N | 862   | STEEL BM GUARDRAIL TERMINAL SECTIONS                | 1 EA          | 42.20          | 42.20      |
| 0073   | 3150000000-N | 862   | ADDITIONAL GUARDRAIL POSTS                          | 25 EA         | 36.90          | 922.50     |
| 0074   | 3195000000-N | 862   | GUARDRAIL ANCHOR UNITS, TYPE AT-1                   | 4 EA          | 448.45         | 1,793.80   |
| 0075   | 3210000000-N | 862   | GUARDRAIL ANCHOR UNITS, TYPE CAT-1                  | 5 EA          | 448.45         | 2,242.25   |
| 0076   | 3215000000-N | 862   | GUARDRAIL ANCHOR UNITS, TYPE III                    | 4 EA          | 1,424.45       | 5,697.80   |
| 0077   | 3270000000-N | SP    | GUARDRAIL ANCHOR UNITS, TYPE 350                    | 11 EA         | 1,925.68       | 21,182.48  |
| 0078   | 3317000000-N | 862   | GUARDRAIL ANCHOR UNITS, TYPE B-77                   | 8 EA          | 1,477.20       | 11,817.60  |
| 0079   | 3360000000-E | 863   | REMOVE EXISTING GUARDRAIL                           | 37 LF         | 2.10           | 77.70      |
| 0080   | 3524000000-E | SP    | VINYL COATED CHAIN LINK FENCE, *** FABRIC (48")     | 7,539 LF      | 5.25           | 39,579.75  |
| 0081   | 3539000000-E | 866   | METAL LINE POSTS FOR *** CHAIN LINK FENCE (48")     | 636 EA        | 29.55          | 18,793.80  |
| 0082   | 3545000000-E | 866   | METAL TERMINAL POSTS FOR *** CHAIN LINK FENCE (48") | 66 EA         | 44.30          | 2,923.80   |
| 0083   | 3628000000-E | 876   | RIP RAP, CLASS I                                    | 7 TON         | 94.65          | 662.55     |
| 0084   | 3649000000-E | 876   | RIP RAP, CLASS B                                    | 143 TON       | 45.90          | 6,563.70   |
| 0085   | 3656000000-E | 876   | GEOTEXTILE FOR DRAINAGE                             | 2,495 SY      | 2.00           | 4,990.00   |
| 0086   | 3659000000-N | SP    | PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON     | 3 EA          | 2,271.70       | 6,815.10   |

Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                                   | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|---------------------------------------------------------------|---------------|----------------|------------|
| 0087   | 4048000000-E | 902   | REINFORCED CONCRETE SIGN FOUNDATIONS                          | 1<br>CY       | 10.55          | 10.55      |
| 0088   | 4054000000-E | 902   | PLAIN CONCRETE SIGN FOUNDATIONS                               | 1<br>CY       | 10.55          | 10.55      |
| 0089   | 4060000000-E | 903   | SUPPORTS, BREAKAWAY STEEL BEAM                                | 1,219<br>LB   | 4.20           | 5,119.80   |
| 0090   | 4072000000-E | 903   | SUPPORTS, 3-LB STEEL U-CHANNEL                                | 933<br>LF     | 5.15           | 4,804.95   |
| 0091   | 4096000000-N | 904   | SIGN ERECTION, TYPE D                                         | 7<br>EA       | 94.95          | 664.65     |
| 0092   | 4102000000-N | 904   | SIGN ERECTION, TYPE E                                         | 47<br>EA      | 55.40          | 2,603.80   |
| 0093   | 4108000000-N | 904   | SIGN ERECTION, TYPE F                                         | 5<br>EA       | 94.95          | 474.75     |
| 0094   | 4109000000-N | 904   | SIGN ERECTION, TYPE *** (OVERHEAD)<br>(A)                     | 2<br>EA       | 738.60         | 1,477.20   |
| 0095   | 4110000000-N | 904   | SIGN ERECTION, TYPE ***<br>(GROUND MOUNTED)<br>(A)            | 4<br>EA       | 685.85         | 2,743.40   |
| 0096   | 4116100000-N | 904   | SIGN ERECTION, RELOCATE, TYPE<br>**** (GROUND MOUNTED)<br>(D) | 5<br>EA       | 105.50         | 527.50     |
| 0097   | 4155000000-N | 907   | DISPOSAL OF SIGN SYSTEM, U-CHANNEL                            | 85<br>EA      | 1.05           | 89.25      |
| 0098   | 4192000000-N | 907   | DISPOSAL OF SUPPORT, U-CHANNEL                                | 5<br>EA       | 1.05           | 5.25       |
| 0099   | 4234000000-N | 907   | DISPOSAL OF SIGN, A OR B<br>(OVERHEAD)                        | 2<br>EA       | 1.05           | 2.10       |
| 0100   | 4251000000-N | 907   | DISPOSAL OF LIGHTING SYSTEM                                   | 1<br>EA       | 527.60         | 527.60     |
| 0101   | 4263000000-N | 907   | DISPOSAL OF WALKWAY                                           | 1<br>EA       | 527.60         | 527.60     |
| 0102   | 4400000000-E | 1110  | WORK ZONE SIGNS (STATIONARY)                                  | 699<br>SF     | 10.50          | 7,339.50   |
| 0103   | 4405000000-E | 1110  | WORK ZONE SIGNS (PORTABLE)                                    | 424<br>SF     | 10.85          | 4,600.40   |

## Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                         | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|-----------------------------------------------------|---------------|----------------|------------|
| 0104   | 4410000000-E | 1110  | WORK ZONE SIGNS (BARRICADE MOUNTED)                 | 309 SF        | 13.90          | 4,295.10   |
| 0105   | 4415000000-N | 1115  | FLASHING ARROW BOARD                                | 3 EA          | 4,747.40       | 14,242.20  |
| 0106   | 4420000000-N | 1120  | PORTABLE CHANGEABLE MESSAGE SIGN                    | 4 EA          | 10,304.00      | 41,216.00  |
| 0107   | 4430000000-N | 1130  | DRUMS                                               | 528 EA        | 62.30          | 32,894.40  |
| 0108   | 4445000000-E | 1145  | BARRICADES (TYPE III)                               | 714 LF        | 58.75          | 41,947.50  |
| 0109   | 4455000000-N | 1150  | FLAGGER                                             | 185 DAY       | 212.00         | 39,220.00  |
| 0110   | 4465000000-N | 1160  | TEMPORARY CRASH CUSHIONS                            | 7 EA          | 5,803.35       | 40,623.45  |
| 0111   | 4470000000-N | 1160  | RESET TEMPORARY CRASH CUSHION                       | 4 EA          | 2,637.92       | 10,551.68  |
| 0112   | 4480000000-N | 1165  | TMA                                                 | 2 EA          | 5,228.65       | 10,457.30  |
| 0113   | 4485000000-E | 1170  | PORTABLE CONCRETE BARRIER                           | 3,952 LF      | 24.20          | 95,638.40  |
| 0114   | 4490000000-E | 1170  | PORTABLE CONCRETE BARRIER (ANCHORED)                | 334 LF        | 35.60          | 11,890.40  |
| 0115   | 4500000000-E | 1170  | RESET PORTABLE CONCRETE BARRIER                     | 1,641 LF      | 4.15           | 6,810.15   |
| 0116   | 4505000000-E | 1170  | RESET PORTABLE CONCRETE BARRIER (ANCHORED)          | 334 LF        | 15.80          | 5,277.20   |
| 0117   | 4510000000-N | SP    | LAW ENFORCEMENT                                     | 440 HR        | 88.00          | 38,720.00  |
| 0118   | 4650000000-N | 1251  | TEMPORARY RAISED PAVEMENT MARKERS                   | 686 EA        | 5.30           | 3,635.80   |
| 0119   | 4685000000-E | 1205  | THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)  | 11,313 LF     | 0.80           | 9,050.40   |
| 0120   | 4686000000-E | 1205  | THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS) | 15,192 LF     | 0.90           | 13,672.80  |
| 0121   | 4695000000-E | 1205  | THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)  | 880 LF        | 2.10           | 1,848.00   |

## Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                                           | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|-----------------------------------------------------------------------|---------------|----------------|------------|
| 0122   | 4697000000-E | 1205  | THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)                   | 1,168 LF      | 2.10           | 2,452.80   |
| 0123   | 4700000000-E | 1205  | THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)                   | 3,063 LF      | 2.10           | 6,432.30   |
| 0124   | 4710000000-E | 1205  | THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)                  | 485 LF        | 10.55          | 5,116.75   |
| 0125   | 4721000000-E | 1205  | THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)                   | 24 EA         | 79.15          | 1,899.60   |
| 0126   | 4725000000-E | 1205  | THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)                       | 67 EA         | 105.50         | 7,068.50   |
| 0127   | 4770000000-E | 1205  | COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (II)        | 797 LF        | 2.10           | 1,673.70   |
| 0128   | 4770000000-E | 1205  | COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)        | 945 LF        | 2.10           | 1,984.50   |
| 0129   | 4775000000-E | 1205  | COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (6") (II)        | 86 LF         | 3.15           | 270.90     |
| 0130   | 4805000000-N | 1205  | COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (II)            | 2 EA          | 158.30         | 316.60     |
| 0131   | 4805000000-N | 1205  | COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (IV-REMOVEABLE) | 2 EA          | 158.30         | 316.60     |
| 0132   | 4810000000-E | 1205  | PAINT PAVEMENT MARKING LINES (4")                                     | 74,422 LF     | 0.25           | 18,605.50  |
| 0133   | 4820000000-E | 1205  | PAINT PAVEMENT MARKING LINES (8")                                     | 5,138 LF      | 0.55           | 2,825.90   |
| 0134   | 4835000000-E | 1205  | PAINT PAVEMENT MARKING LINES (24")                                    | 1,287 LF      | 3.15           | 4,054.05   |
| 0135   | 4840000000-N | 1205  | PAINT PAVEMENT MARKING CHARACTER                                      | 36 EA         | 36.95          | 1,330.20   |
| 0136   | 4845000000-N | 1205  | PAINT PAVEMENT MARKING SYMBOL                                         | 126 EA        | 36.95          | 4,655.70   |

## Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                         | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|-----------------------------------------------------|---------------|----------------|------------|
| 0137   | 4850000000-E | 1205  | REMOVAL OF PAVEMENT MARKING LINES (4")              | 31,700 LF     | 0.40           | 12,680.00  |
| 0138   | 4860000000-E | 1205  | REMOVAL OF PAVEMENT MARKING LINES (8")              | 1,429 LF      | 0.80           | 1,143.20   |
| 0139   | 4870000000-E | 1205  | REMOVAL OF PAVEMENT MARKING LINES (24")             | 273 LF        | 3.20           | 873.60     |
| 0140   | 4875000000-N | 1205  | REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS    | 47 EA         | 36.95          | 1,736.65   |
| 0141   | 4900000000-N | 1251  | PERMANENT RAISED PAVEMENT MARKERS                   | 16 EA         | 5.25           | 84.00      |
| 0142   | 4905000000-N | 1253  | SNOWPLOWABLE PAVEMENT MARKERS                       | 191 EA        | 30.60          | 5,844.60   |
| 0143   | 4955000000-N | 1264  | OBJECT MARKERS (END OF ROAD)                        | 6 EA          | 36.90          | 221.40     |
| 0144   | 5005000000-E | 1401  | 80' HIGH MOUNT STANDARD                             | 3 EA          | 16,882.55      | 50,647.65  |
| 0145   | 5010000000-E | 1401  | 100' HIGH MOUNT STANDARD                            | 1 EA          | 20,549.25      | 20,549.25  |
| 0146   | 5020000000-N | 1401  | PORTABLE DRIVE UNIT                                 | 1 EA          | 4,220.60       | 4,220.60   |
| 0147   | 5025000000-E | SP    | HIGH MOUNT FOUNDATIONS                              | 21 CY         | 316.55         | 6,647.55   |
| 0148   | 5030000000-N | 1403  | HIGH MOUNT LUMINAIRES ***** (400W HPS)              | 24 EA         | 791.35         | 18,992.40  |
| 0149   | 5030000000-N | 1403  | HIGH MOUNT LUMINAIRES ***** (750W HPS)              | 6 EA          | 844.10         | 5,064.60   |
| 0150   | 5050000000-N | 1404  | LIGHT STANDARD, TYPE MTLT ***** (MTLT 45' (SA) 15') | 6 EA          | 4,220.65       | 25,323.90  |
| 0151   | 5050000000-N | 1404  | LIGHT STANDARD, TYPE MTLT ***** (MTLT 45' (TA) 15') | 6 EA          | 4,747.20       | 28,483.20  |
| 0152   | 5070000000-N | 1405  | STANDARD FOUNDATION ***** (R1)                      | 10 EA         | 791.35         | 7,913.50   |
| 0153   | 5070000000-N | 1405  | STANDARD FOUNDATION ***** (R2)                      | 2 EA          | 844.10         | 1,688.20   |

## Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                             | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|---------------------------------------------------------|---------------|----------------|------------|
| 0154   | 5080000000-N | 1406  | LIGHT STANDARD LUMINAIRES,<br>TYPE *****<br>(RDW, 250W) | 18<br>EA      | 474.80         | 8,546.40   |
| 0155   | 5120000000-N | 1407  | ELECTRIC SERVICE POLE ****<br>*****<br>(30', CLASS 4)   | 1<br>EA       | 1,055.15       | 1,055.15   |
| 0156   | 5125000000-E | 1407  | ELECTRIC SERVICE LATERAL<br>*****<br>(3, #1/0 USE)      | 100<br>LF     | 7.35           | 735.00     |
| 0157   | 5145000000-N | 1408  | LIGHT CONTROL EQUIPMENT, TYPE<br>RW *****<br>(SSPM)     | 1<br>EA       | 10,024.00      | 10,024.00  |
| 0158   | 5155000000-E | 1409  | ELECTRICAL DUCT, TYPE BD, SIZE<br>*****<br>(2")         | 120<br>LF     | 5.25           | 630.00     |
| 0159   | 5155000000-E | 1409  | ELECTRICAL DUCT, TYPE BD, SIZE<br>*****<br>(3")         | 210<br>LF     | 7.40           | 1,554.00   |
| 0160   | 5160000000-E | 1409  | ELECTRICAL DUCT, TYPE JA, SIZE<br>*****<br>(3")         | 190<br>LF     | 14.75          | 2,802.50   |
| 0161   | 5160000000-E | 1409  | ELECTRICAL DUCT, TYPE JA, SIZE<br>*****<br>(4")         | 100<br>LF     | 15.80          | 1,580.00   |
| 0162   | 5160000000-E | 1409  | ELECTRICAL DUCT, TYPE JA, SIZE<br>*****<br>(6")         | 170<br>LF     | 16.85          | 2,864.50   |
| 0163   | 5170000000-E | 1410  | ** #8 W/G FEEDER CIRCUIT<br>(2)                         | 220<br>LF     | 2.10           | 462.00     |
| 0164   | 5175000000-E | 1410  | ** #6 W/G FEEDER CIRCUIT<br>(2)                         | 600<br>LF     | 3.15           | 1,890.00   |
| 0165   | 5180000000-E | 1410  | ** #4 W/G FEEDER CIRCUIT<br>(2)                         | 380<br>LF     | 4.20           | 1,596.00   |
| 0166   | 5185000000-E | 1410  | ** #2 W/G FEEDER CIRCUIT<br>(2)                         | 380<br>LF     | 5.25           | 1,995.00   |

Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                                | Quantity Unit  | Unit Bid Price | Amount Bid |
|--------|--------------|-------|------------------------------------------------------------|----------------|----------------|------------|
| 0167   | 5205000000-E | 1410  | ** #8 W/G FEEDER CIRCUIT IN<br>***** CONDUIT<br>(2, 1 1/2) | 2,710<br>LF    | 6.30           | 17,073.00  |
| 0168   | 5210000000-E | 1410  | ** #6 W/G FEEDER CIRCUIT IN<br>***** CONDUIT<br>(2, 1 1/2) | 1,520<br>LF    | 7.40           | 11,248.00  |
| 0169   | 5215000000-E | 1410  | ** #4 W/G FEEDER CIRCUIT IN<br>***** CONDUIT<br>(2, 1 1/2) | 2,310<br>LF    | 8.45           | 19,519.50  |
| 0170   | 5220000000-E | 1410  | ** #2 W/G FEEDER CIRCUIT IN<br>***** CONDUIT<br>(2, 1 1/2) | 2,750<br>LF    | 10.55          | 29,012.50  |
| 0171   | 5240000000-N | 1411  | ELECTRICAL JUNCTION BOXES<br>*****<br>(PC18)               | 15<br>EA       | 527.55         | 7,913.25   |
| 0172   | 5240000000-N | 1411  | ELECTRICAL JUNCTION BOXES<br>*****<br>(PC30)               | 2<br>EA        | 633.10         | 1,266.20   |
| 0173   | 5240000000-N | 1411  | ELECTRICAL JUNCTION BOXES<br>*****<br>(PC36)               | 4<br>EA        | 791.35         | 3,165.40   |
| 0174   | 5255000000-N | 1413  | PORTABLE LIGHTING                                          | Lump Sum<br>LS | 42,385.65      | 42,385.65  |
| 0175   | 5325000000-E | 1510  | *** WATER LINE<br>(18")                                    | 134<br>LF      | 253.25         | 33,935.50  |
| 0176   | 5325600000-E | 1510  | 6" WATER LINE                                              | 1,575<br>LF    | 46.45          | 73,158.75  |
| 0177   | 5325800000-E | 1510  | 8" WATER LINE                                              | 50<br>LF       | 153.00         | 7,650.00   |
| 0178   | 5326200000-E | 1510  | 12" WATER LINE                                             | 582<br>LF      | 82.30          | 47,898.60  |
| 0179   | 5540000000-E | 1515  | 6" VALVE                                                   | 6<br>EA        | 1,002.41       | 6,014.46   |
| 0180   | 5546000000-E | 1515  | 8" VALVE                                                   | 1<br>EA        | 1,318.96       | 1,318.96   |
| 0181   | 5558000000-E | 1515  | 12" VALVE                                                  | 2<br>EA        | 2,395.20       | 4,790.40   |
| 0182   | 5571600000-E | 1515  | 6" TAPPING VALVE                                           | 1<br>EA        | 2,363.55       | 2,363.55   |

Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                           | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|-------------------------------------------------------|---------------|----------------|------------|
| 0183   | 5648000000-N | 1515  | RELOCATE WATER METER                                  | 4<br>EA       | 976.00         | 3,904.00   |
| 0184   | 5649000000-N | 1515  | RECONNECT WATER METER                                 | 5<br>EA       | 738.60         | 3,693.00   |
| 0185   | 5672000000-N | 1515  | RELOCATE FIRE HYDRANT                                 | 3<br>EA       | 2,532.35       | 7,597.05   |
| 0186   | 5691300000-E | 1520  | 8" SANITARY GRAVITY SEWER                             | 70<br>LF      | 92.85          | 6,499.50   |
| 0187   | 5798000000-E | 1530  | ABANDON *** UTILITY PIPE (18")                        | 128<br>LF     | 15.80          | 2,022.40   |
| 0188   | 5804000000-E | 1530  | ABANDON 12" UTILITY PIPE                              | 300<br>LF     | 10.55          | 3,165.00   |
| 0189   | 5882000000-N | SP    | GENERIC UTILITY ITEM<br>BREAKDOWN AND REBUILD MANHOLE | 2<br>EA       | 1,055.15       | 2,110.30   |
| 0190   | 6000000000-E | 1605  | TEMPORARY SILT FENCE                                  | 2,000<br>LF   | 1.80           | 3,600.00   |
| 0191   | 6006000000-E | 1610  | STONE FOR EROSION CONTROL,<br>CLASS A                 | 3,110<br>TON  | 45.90          | 142,749.00 |
| 0192   | 6009000000-E | 1610  | STONE FOR EROSION CONTROL,<br>CLASS B                 | 1,285<br>TON  | 45.95          | 59,045.75  |
| 0193   | 6012000000-E | 1610  | SEDIMENT CONTROL STONE                                | 2,065<br>TON  | 38.71          | 79,936.15  |
| 0194   | 6015000000-E | 1615  | TEMPORARY MULCHING                                    | 166<br>ACR    | 506.45         | 84,070.70  |
| 0195   | 6018000000-E | 1620  | SEED FOR TEMPORARY SEEDING                            | 4,550<br>LB   | 2.10           | 9,555.00   |
| 0196   | 6021000000-E | 1620  | FERTILIZER FOR TEMPORARY SEED-<br>ING                 | 18.25<br>TON  | 685.86         | 12,516.95  |
| 0197   | 6024000000-E | 1622  | TEMPORARY SLOPE DRAINS                                | 600<br>LF     | 11.30          | 6,780.00   |
| 0198   | 6029000000-E | SP    | SAFETY FENCE                                          | 100<br>LF     | 2.10           | 210.00     |
| 0199   | 6030000000-E | 1630  | SILT EXCAVATION                                       | 2,780<br>CY   | 9.35           | 25,993.00  |
| 0200   | 6036000000-E | 1631  | MATTING FOR EROSION CONTROL                           | 30,000<br>SY  | 1.25           | 37,500.00  |
| 0201   | 6037000000-E | SP    | COIR FIBER MAT                                        | 15<br>SY      | 10.55          | 158.25     |



Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                        | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|----------------------------------------------------|---------------|----------------|------------|
| 0202   | 6038000000-E | SP    | PERMANENT SOIL REINFORCEMENT MAT                   | 100 SY        | 5.25           | 525.00     |
| 0203   | 6042000000-E | 1632  | 1/4" HARDWARE CLOTH                                | 2,660 LF      | 3.20           | 8,512.00   |
| 0204   | 6071010000-E | SP    | WATTLE                                             | 1,245 LF      | 6.85           | 8,528.25   |
| 0205   | 6071020000-E | SP    | POLYACRYLAMIDE (PAM)                               | 665 LB        | 6.90           | 4,588.50   |
| 0206   | 6071030000-E | 1640  | COIR FIBER BAFFLE                                  | 150 LF        | 5.80           | 870.00     |
| 0207   | 6071050000-E | SP    | *** SKIMMER (1-1/2")                               | 1 EA          | 753.30         | 753.30     |
| 0208   | 6084000000-E | 1660  | SEEDING & MULCHING                                 | 123 ACR       | 1,456.10       | 179,100.30 |
| 0209   | 6087000000-E | 1660  | MOWING                                             | 80 ACR        | 42.20          | 3,376.00   |
| 0210   | 6090000000-E | 1661  | SEED FOR REPAIR SEEDING                            | 1,700 LB      | 3.10           | 5,270.00   |
| 0211   | 6093000000-E | 1661  | FERTILIZER FOR REPAIR SEEDING                      | 4.5 TON       | 833.60         | 3,751.20   |
| 0212   | 6096000000-E | 1662  | SEED FOR SUPPLEMENTAL SEEDING                      | 3,075 LB      | 2.65           | 8,148.75   |
| 0213   | 6102000000-E | 1664  | SODDING                                            | 8,000 SY      | 6.10           | 48,800.00  |
| 0214   | 6105000000-E | 1664  | WATER                                              | 205 M/G       | 94.95          | 19,464.75  |
| 0215   | 6108000000-E | 1665  | FERTILIZER TOPDRESSING                             | 92.25 TON     | 675.31         | 62,297.35  |
| 0216   | 6114500000-N | 1667  | SPECIALIZED HAND MOWING                            | 50 MHR        | 32.70          | 1,635.00   |
| 0217   | 6117000000-N | SP    | RESPONSE FOR EROSION CONTROL                       | 75 EA         | 105.50         | 7,912.50   |
| 0218   | 6147000000-E | SP    | GENERIC EROSION CONTROL ITEM TREE PROTECTION FENCE | 2,800 LF      | 2.15           | 6,020.00   |
| 0219   | 7060000000-E | 1705  | SIGNAL CABLE                                       | 6,485 LF      | 1.05           | 6,809.25   |
| 0220   | 7120000000-E | 1705  | VEHICLE SIGNAL HEAD (12", 3 SECTION)               | 49 EA         | 580.35         | 28,437.15  |

## Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                  | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|----------------------------------------------|---------------|----------------|------------|
| 0221   | 7132000000-E | 1705  | VEHICLE SIGNAL HEAD (12", 4 SECTION)         | 8 EA          | 738.60         | 5,908.80   |
| 0222   | 7144000000-E | 1705  | VEHICLE SIGNAL HEAD (12", 5 SECTION)         | 4 EA          | 1,055.15       | 4,220.60   |
| 0223   | 7252000000-E | 1710  | MESSENGER CABLE (1/4")                       | 80 LF         | 0.55           | 44.00      |
| 0224   | 7264000000-E | 1710  | MESSENGER CABLE (3/8")                       | 1,235 LF      | 2.10           | 2,593.50   |
| 0225   | 7288000000-E | 1715  | PAVED TRENCHING (*****)<br>(1, 2")           | 150 LF        | 10.55          | 1,582.50   |
| 0226   | 7300000000-E | 1715  | UNPAVED TRENCHING (*****)<br>(1, 2")         | 1,300 LF      | 5.25           | 6,825.00   |
| 0227   | 7300100000-E | 1715  | UNPAVED TRENCHING FOR TEMP-<br>ORARY LEAD-IN | 365 LF        | 4.25           | 1,551.25   |
| 0228   | 7301000000-E | 1715  | DIRECTIONAL DRILL (*****)<br>(1, 2")         | 175 LF        | 12.65          | 2,213.75   |
| 0229   | 7301000000-E | 1715  | DIRECTIONAL DRILL (*****)<br>(2, 2")         | 610 LF        | 14.75          | 8,997.50   |
| 0230   | 7324000000-N | 1716  | JUNCTION BOX (STANDARD SIZE)                 | 29 EA         | 527.60         | 15,300.40  |
| 0231   | 7360000000-N | 1720  | WOOD POLE                                    | 13 EA         | 1,266.20       | 16,460.60  |
| 0232   | 7372000000-N | 1721  | GUY ASSEMBLY                                 | 20 EA         | 263.80         | 5,276.00   |
| 0233   | 7408000000-E | 1722  | 1" RISER WITH WEATHERHEAD                    | 2 EA          | 527.60         | 1,055.20   |
| 0234   | 7420000000-E | 1722  | 2" RISER WITH WEATHERHEAD                    | 12 EA         | 685.86         | 8,230.32   |
| 0235   | 7444000000-E | 1725  | INDUCTIVE LOOP SAWCUT                        | 3,860 LF      | 8.45           | 32,617.00  |
| 0236   | 7456000000-E | 1726  | LEAD-IN CABLE (*****)<br>(14-2)              | 7,710 LF      | 1.05           | 8,095.50   |
| 0237   | 7574550000-N | SP    | FURNISH WIRELESS LIGHTNING<br>ARRESTOR       | 4 EA          | 580.35         | 2,321.40   |
| 0238   | 7575142000-N | 1736  | 900MHZ RADIO                                 | 4 EA          | 6,119.95       | 24,479.80  |

## Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                                               | Quantity Unit | Unit Bid Price | Amount Bid |
|--------|--------------|-------|---------------------------------------------------------------------------|---------------|----------------|------------|
| 0239   | 7588000000-N | SP    | METAL POLE WITH SINGLE MAST ARM                                           | 6 EA          | 14,772.25      | 88,633.50  |
| 0240   | 7590000000-N | SP    | METAL POLE WITH DUAL MAST ARM                                             | 2 EA          | 18,992.90      | 37,985.80  |
| 0241   | 7613000000-N | SP    | SOIL TEST                                                                 | 8 EA          | 1,582.75       | 12,662.00  |
| 0242   | 7614100000-E | SP    | DRILLED PIER FOUNDATION                                                   | 64 CY         | 316.55         | 20,259.20  |
| 0243   | 7631000000-N | SP    | MAST ARM WITH METAL POLE DE-SIGN                                          | 8 EA          | 1,055.15       | 8,441.20   |
| 0244   | 7636000000-N | 1745  | SIGN FOR SIGNALS                                                          | 4 EA          | 369.30         | 1,477.20   |
| 0245   | 7684000000-N | 1750  | SIGNAL CABINET FOUNDATION                                                 | 3 EA          | 1,055.15       | 3,165.45   |
| 0246   | 7756000000-N | 1751  | CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)                        | 3 EA          | 13,717.10      | 41,151.30  |
| 0247   | 7768000000-N | 1751  | CONTROLLER WITH CABINET (TYPE 2070L, POLE MOUNTED)                        | 1 EA          | 12,661.90      | 12,661.90  |
| 0248   | 7780000000-N | 1751  | DETECTOR CARD (TYPE 2070L)                                                | 23 EA         | 158.25         | 3,639.75   |
| 0249   | 7901000000-N | 1753  | CABINET BASE EXTENDER                                                     | 3 EA          | 685.86         | 2,057.58   |
| 0250   | 7948000000-N | 1757  | TRAFFIC SIGNAL REMOVAL                                                    | 2 EA          | 1,582.75       | 3,165.50   |
| 0251   | 7980000000-N | SP    | GENERIC SIGNAL ITEM<br>POWDER COAT FOR DOUBLE MAST<br>ARM WITH METAL POLE | 1 EA          | 2,110.35       | 2,110.35   |
| 0252   | 7980000000-N | SP    | GENERIC SIGNAL ITEM<br>POWDER COAT FOR SINGLE MAST<br>ARM WITH METAL POLE | 4 EA          | 1,266.20       | 5,064.80   |

## Contract Item Sheets For C202886

| Line<br># | ItemNumber   | Sec<br># | Description                                                               | Quantity<br>Unit | Unit Bid<br>Price | Amount<br>Bid |
|-----------|--------------|----------|---------------------------------------------------------------------------|------------------|-------------------|---------------|
| 0253      | 8802014000-E | SP       | SOLDIER PILE RETAINING WALLS                                              | 6,250<br>SF      | 84.00             | 525,000.00    |
| 0254      | 8839000000-E | SP       | GENERIC RETAINING WALL ITEM<br>CONCRETE BARRIER RAIL WITH MOM<br>ENT SLAB | 268<br>LF        | 300.00            | 80,400.00     |
| 0255      | 8847000000-E | SP       | GENERIC RETAINING WALL ITEM<br>MSE RETAINING WALL NO. 3                   | 700<br>SF        | 70.00             | 49,000.00     |
| 0256      | 8847000000-E | SP       | GENERIC RETAINING WALL ITEM<br>MSE RETAINING WALL NO. 4                   | 200<br>SF        | 70.00             | 14,000.00     |

Contract Item Sheets For C202886

| Line # | ItemNumber   | Sec # | Description                                                                  | Quantity Unit  | Unit Bid Price | Amount Bid |
|--------|--------------|-------|------------------------------------------------------------------------------|----------------|----------------|------------|
| 0257   | 8035000000-N | 402   | REMOVAL OF EXISTING STRUCTURE<br>AT STATION *****<br>(21 + 37.80-Y6-)        | Lump Sum<br>LS | 52,500.00      | 52,500.00  |
| 0258   | 8091000000-N | 410   | FOUNDATION EXCAVATION FOR BENT<br>** AT STATION *****<br>(1, 21 + 37.80-Y6-) | Lump Sum<br>LS | 25,000.00      | 25,000.00  |
| 0259   | 8112730000-N | 450   | PDA TESTING                                                                  | 1<br>EA        | 2,500.00       | 2,500.00   |
| 0260   | 8121000000-N | 412   | UNCLASSIFIED STRUCTURE EXCAVA-<br>TION AT STATION *****<br>(21 + 37.80-Y6-)  | Lump Sum<br>LS | 2,500.00       | 2,500.00   |
| 0261   | 8147000000-E | 420   | REINFORCED CONCRETE DECK SLAB                                                | 15,298<br>SF   | 34.50          | 527,781.00 |
| 0262   | 8161000000-E | 420   | GROOVING BRIDGE FLOORS                                                       | 14,074<br>SF   | 0.60           | 8,444.40   |
| 0263   | 8182000000-E | 420   | CLASS A CONCRETE (BRIDGE)                                                    | 229<br>CY      | 800.00         | 183,200.00 |
| 0264   | 8210000000-N | 422   | BRIDGE APPROACH SLABS, STATION<br>*****<br>(21 + 37.80-Y6-)                  | Lump Sum<br>LS | 55,000.00      | 55,000.00  |
| 0265   | 8217000000-E | 425   | REINFORCING STEEL (BRIDGE)                                                   | 32,993<br>LB   | 1.00           | 32,993.00  |
| 0266   | 8238000000-E | 425   | SPIRAL COLUMN REINFORCING<br>STEEL (BRIDGE)                                  | 1,902<br>LB    | 1.25           | 2,377.50   |
| 0267   | 8280000000-E | 440   | APPROX ..... LBS STRUCTURAL<br>STEEL                                         | 412,000<br>LS  | 680,000.00     | 680,000.00 |
| 0268   | 8364000000-E | 450   | HP12X53 STEEL PILES                                                          | 2,650<br>LF    | 42.00          | 111,300.00 |
| 0269   | 8393000000-N | 450   | PILE REDRIVES                                                                | 56<br>EA       | 150.00         | 8,400.00   |
| 0270   | 8531000000-E | 462   | 4" SLOPE PROTECTION                                                          | 930<br>SY      | 110.00         | 102,300.00 |
| 0271   | 8650000000-N | SP    | POT BEARINGS                                                                 | Lump Sum<br>LS | 30,000.00      | 30,000.00  |
| 0272   | 8657000000-N | 430   | ELASTOMERIC BEARINGS                                                         | Lump Sum<br>LS | 11,000.00      | 11,000.00  |

Contract Item Sheets For C202886

| Line<br># | ItemNumber   | Sec<br># | Description                                            | Quantity<br>Unit | Unit Bid<br>Price | Amount<br>Bid |
|-----------|--------------|----------|--------------------------------------------------------|------------------|-------------------|---------------|
| 0273      | 8867000000-E | SP       | GENERIC STRUCTURE ITEM<br>CLASSIC CONCRETE BRIDGE RAIL | 335<br>LF        | 375.00            | 125,625.00    |

TOTAL AMOUNT OF BID FOR ENTIRE PROJECT

\$9,992,653.35

1529/Sep28/Q886304.532/D1252060646000/E273



Contract No. C202886

Rev. 5-19-11

County Moore

**EXECUTION OF CONTRACT  
NON-COLLUSION AFFIDAVIT, DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION**

**CORPORATION**

The Contractor being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with this Contract, that the Contractor has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the Contractor intends to do the work with its own bonafide employees or subcontractors and did not bid for the benefit of another contractor.

By submitting this Execution of Contract, Non-Collusion Affidavit and Debarment Certification, the Contractor is certifying his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

*N.C.G.S. § 133-32* and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

**SIGNATURE OF CONTRACTOR**

English Construction Company, Inc.

Full name of Corporation

P.O.Box P-7000

Lynchburg, Virginia 24505

Address as Prequalified

Attest

Carolyn S. Shelton

Secretary/Assistant Secretary  
Select appropriate title

By

John M. Jordan, Jr.  
President/Vice President/Assistant Vice President  
Select appropriate title

Carolyn S. Shelton, Secretary

Print or type Signer's name

John M. Jordan, Jr.,  
Senior Vice President

Print or type Signer's name

**CORPORATE SEAL**

**AFFIDAVIT MUST BE NOTARIZED**

Subscribed and sworn to before me this the

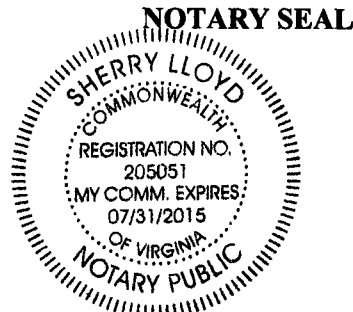
2nd day of October 2012

Sherry Lloyd  
Signature of Notary Public

of Campbell County

State of Virginia

My Commission Expires: July 31, 2015



## DEBARMENT CERTIFICATION

### Conditions for certification:

1. The prequalified bidder shall provide immediate written notice to the Department if at any time the bidder learns that his certification was erroneous when he submitted his debarment certification or explanation filed with the Department, or has become erroneous because of changed circumstances.
2. The terms *covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded*, as used in this provision, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. A copy of the Federal Rules requiring this certification and detailing the definitions and coverages may be obtained from the Contract Officer of the Department.
3. The prequalified bidder agrees by submitting this form, that he will not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in NCDOT contracts, unless authorized by the Department.
4. For Federal Aid projects, the prequalified bidder further agrees that by submitting this form he will include the Federal-Aid Provision titled *Required Contract Provisions Federal-Aid Construction Contract (Form FHWA PR 1273)* provided by the Department, without subsequent modification, in all lower tier covered transactions.
5. The prequalified bidder may rely upon a certification of a participant in a lower tier covered transaction that he is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless he knows that the certification is erroneous. The bidder may decide the method and frequency by which he will determine the eligibility of his subcontractors.
6. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this provision. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
7. Except as authorized in paragraph 6 herein, the Department may terminate any contract if the bidder knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available by the Federal Government.



### DEBARMENT CERTIFICATION

The prequalified bidder certifies to the best of his knowledge and belief, that he and his principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records; making false statements; or receiving stolen property;
- c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph b. of this certification; and
- d. Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- e. Will submit a revised Debarment Certification immediately if his status changes and will show in his bid proposal an explanation for the change in status.

If the prequalified bidder cannot certify that he is not debarred, he shall provide an explanation with this submittal. An explanation will not necessarily result in denial of participation in a contract.

Failure to submit a non-collusion affidavit and debarment certification will result in the prequalified bidder's bid being considered non-responsive.

☐

Check here if an explanation is attached to this certification.

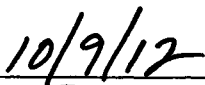
**Contract No.**     **C202886**

**County (ies):**     **Moore**

ACCEPTED BY THE  
DEPARTMENT OF TRANSPORTATION

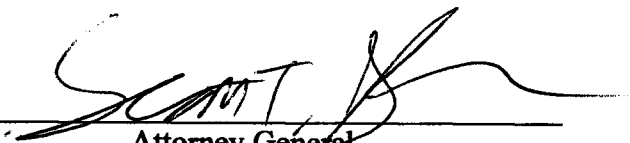


\_\_\_\_\_  
Contract Officer



\_\_\_\_\_  
Date

Execution of Contract and Bonds  
Approved as to Form:



\_\_\_\_\_  
Attorney General

Contract No.  
County

C202886  
Moore

Rev 5-17-11

Bond No. 105838290

**CONTRACT PAYMENT BOND**

|                                |                                                                                      |
|--------------------------------|--------------------------------------------------------------------------------------|
| Date of Payment Bond Execution | <u>October 2, 2012</u>                                                               |
| Name of Principal Contractor   | <u>English Construction Company, Inc.</u>                                            |
| Name of Surety:                | <u>Travelers Casualty and Surety</u><br><u>Company of America</u>                    |
| Name of Contracting Body:      | <u>North Carolina Department of Transportation</u><br><u>Raleigh, North Carolina</u> |
| Amount of Bond:                | <u>\$9,992,653.35</u>                                                                |
| Contract ID No.:               | <u>C202886</u>                                                                       |
| County Name:                   | <u>Moore</u>                                                                         |

KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL CONTRACTOR (hereafter, PRINCIPAL) and SURETY above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the Contracting Body, numbered as shown above and hereto attached:

NOW THEREFORE, if the principal shall promptly make payment to all persons supplying labor and material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Contract No. C202886  
County Moore

Rev 5-17-11

**CONTRACT PAYMENT BOND**

*Affix Seal of Surety Company*

Travelers Casualty and Surety Company of America  
Print or type Surety Company Name

By Whitney D. Melton, Attorney-In-Fact  
Print, stamp or type name of Attorney-in-Fact

Whitney D. Melton  
Signature of Attorney-in-Fact

Frances M. Saunders  
Signature of Witness

Frances M. Saunders  
Print or type Signer's name

202 River Oaks Drive  
Altavista, Virginia 24517  
Address of Attorney-in-Fact

Contract No.  
County

C202886  
Moore

Rev 5-17-11

**CONTRACT PAYMENT BOND**

**CORPORATION**

SIGNATURE OF CONTRACTOR (Principal)

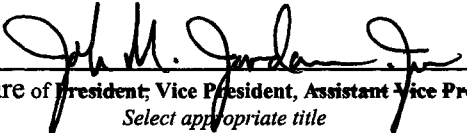
English Construction Company, Inc.

Full name of Corporation

P.O.Box P-7000  
Lynchburg, Virginia 24505

Address as prequalified

By

  
Signature of ~~President~~ Vice President, Assistant Vice President  
Select appropriate title

John M. Jordan, Jr.,  
Senior Vice President

Print or type Signer's name

*Affix Corporate Seal*

Attest



Signature of Secretary, Assistant Secretary --  
Select appropriate title

Carolyn S. Shelton, Secretary

Print or type Signer's name



## POWER OF ATTORNEY

Farmington Casualty Company  
 Fidelity and Guaranty Insurance Company  
 Fidelity and Guaranty Insurance Underwriters, Inc.  
 St. Paul Fire and Marine Insurance Company  
 St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company  
 Travelers Casualty and Surety Company  
 Travelers Casualty and Surety Company of America  
 United States Fidelity and Guaranty Company

Attorney-In Fact No. 213509

Certificate No. 004666629

**KNOW ALL MEN BY THESE PRESENTS:** That St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company and St. Paul Mercury Insurance Company are corporations duly organized under the laws of the State of Minnesota, that Farmington Casualty Company, Travelers Casualty and Surety Company, and Travelers Casualty and Surety Company of America are corporations duly organized under the laws of the State of Connecticut, that United States Fidelity and Guaranty Company is a corporation duly organized under the laws of the State of Maryland, that Fidelity and Guaranty Insurance Company is a corporation duly organized under the laws of the State of Iowa, and that Fidelity and Guaranty Insurance Underwriters, Inc., is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint

Whitney D. Melton, and Frances M. Saunders

of the City of Altavista, State of Virginia, their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 22nd day of December, 2011.

Farmington Casualty Company  
 Fidelity and Guaranty Insurance Company  
 Fidelity and Guaranty Insurance Underwriters, Inc.  
 St. Paul Fire and Marine Insurance Company  
 St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company  
 Travelers Casualty and Surety Company  
 Travelers Casualty and Surety Company of America  
 United States Fidelity and Guaranty Company



State of Connecticut  
 City of Hartford ss.

By: George W. Thompson

George W. Thompson, Senior Vice President

On this the 22nd day of December, 2011, before me personally appeared George W. Thompson, who acknowledged himself to be the Senior Vice President of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.  
 My Commission expires the 30th day of June, 2016.



Marie C. Tetreault  
 Marie C. Tetreault, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, which resolutions are now in full force and effect, reading as follows:

**RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

**FURTHER RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

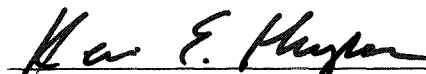
**FURTHER RESOLVED**, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

**FURTHER RESOLVED**, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, Kevin E. Hughes, the undersigned, Assistant Secretary, of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 2nd day of October, 20 12

WARNING: THIS POWER OF ATTORNEY IS INVALID WITHOUT THE RED BORDER

  
Kevin E. Hughes, Assistant Secretary



To verify the authenticity of this Power of Attorney, call 1-800-421-3880 or contact us at [www.travelersbond.com](http://www.travelersbond.com). Please refer to the Attorney-In-Fact number, the above-named individuals and the details of the bond to which the power is attached.

Contract No. C202886  
County Moore

Rev 5-17-11

Bond No. 105838290

### CONTRACT PERFORMANCE BOND

Date of Performance Bond Execution: October 2, 2012

Name of Principal Contractor: English Construction Company, Inc.  
Travelers Casualty and Surety

Name of Surety: Company of America

Name of Contracting Body: North Carolina Department of Transportation  
Raleigh, North Carolina

Amount of Bond: \$9,992,653.35

Contract ID No.: C202886

County Name: Moore

KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL CONTRACTOR (hereafter, PRINCIPAL) and SURETY above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the Contracting Body, numbered as shown above and hereto attached:

NOW THEREFORE, if the principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the Contracting Body, with or without notice to the Surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.



Contract No.  
County

C202886

Moore

Rev 5-17-11

**CONTRACT PERFORMANCE BOND**

*Affix Seal of Surety Company*

Travelers Casualty and Surety Company of America

Print or type Surety Company Name

By Whitney D. Melton, Attorney-In-Fact

Print, stamp or type name of Attorney-in-Fact

Whitney D. Melton  
Signature of Attorney-in-Fact

Frances M. Saunders  
Signature of Witness

Frances M. Saunders

Print or type Signer's name

202 River Oaks Drive  
Altavista, Virginia 24517

Address of Attorney-in-Fact

Contract No.  
County

C202886

Moore

Rev 5-17-11

**CONTRACT PERFORMANCE BOND**

**CORPORATION**

SIGNATURE OF CONTRACTOR (Principal)

English Construction Company, Inc.

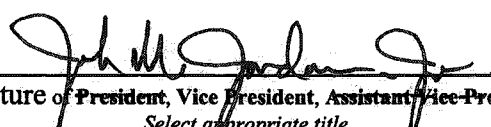
Full name of Corporation

P.O.Box P-7000

Lynchburg, Virginia 24505

Address as prequalified

By

  
Signature of ~~President, Vice President, Assistant Vice President -~~  
Select appropriate title

John M. Jordan, Jr.,  
Senior Vice President

Print or type Signer's name

*Affix Corporate Seal*

Attest



Signature of Secretary, Assistant Secretary -  
Select appropriate title

Carolyn S. Shelton, Secretary

Print or type Signer's name



## POWER OF ATTORNEY

Farmington Casualty Company  
 Fidelity and Guaranty Insurance Company  
 Fidelity and Guaranty Insurance Underwriters, Inc.  
 St. Paul Fire and Marine Insurance Company  
 St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company  
 Travelers Casualty and Surety Company  
 Travelers Casualty and Surety Company of America  
 United States Fidelity and Guaranty Company

Attorney-In Fact No. 213509

Certificate No. 004666630

**KNOW ALL MEN BY THESE PRESENTS:** That St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company and St. Paul Mercury Insurance Company are corporations duly organized under the laws of the State of Minnesota, that Farmington Casualty Company, Travelers Casualty and Surety Company, and Travelers Casualty and Surety Company of America are corporations duly organized under the laws of the State of Connecticut, that United States Fidelity and Guaranty Company is a corporation duly organized under the laws of the State of Maryland, that Fidelity and Guaranty Insurance Company is a corporation duly organized under the laws of the State of Iowa, and that Fidelity and Guaranty Insurance Underwriters, Inc., is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint

Whitney D. Melton, and Frances M. Saunders

of the City of Altavista, State of Virginia, their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 22nd day of December, 2011.

Farmington Casualty Company  
 Fidelity and Guaranty Insurance Company  
 Fidelity and Guaranty Insurance Underwriters, Inc.  
 St. Paul Fire and Marine Insurance Company  
 St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company  
 Travelers Casualty and Surety Company  
 Travelers Casualty and Surety Company of America  
 United States Fidelity and Guaranty Company



State of Connecticut  
 City of Hartford ss.

By: \_\_\_\_\_

George W. Thompson, Senior Vice President

On this the 22nd day of December, 2011, before me personally appeared George W. Thompson, who acknowledged himself to be the Senior Vice President of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.  
 My Commission expires the 30th day of June, 2016.



Marie C. Tetreault  
 Marie C. Tetreault, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, which resolutions are now in full force and effect, reading as follows:

**RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

**FURTHER RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

**FURTHER RESOLVED**, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

**FURTHER RESOLVED**, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, Kevin E. Hughes, the undersigned, Assistant Secretary, of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 2nd day of October, 2012.

  
Kevin E. Hughes, Assistant Secretary



To verify the authenticity of this Power of Attorney, call 1-800-421-3880 or contact us at [www.travelersbond.com](http://www.travelersbond.com). Please refer to the Attorney-In-Fact number, the above-named individuals and the details of the bond to which the power is attached.

