



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

JAMES H. TROGDON, III  
SECRETARY

July 12, 2018

**Addendum No. 2**

Contract No.: DA00333

WBS Element: 50196.3.1

TIP Number: R-5738

*Grading, Drainage, Paving and Structure Improvements on SR1208 "Kitty Hawk Road," in Dare County*

To Whom It May Concern:

Reference is made to the proposal and plans previously furnished for this project.

The following revision has been made to the proposal:

Page 5, "Note to Contractor" has been revised to include the coating requirements to be applied over all permanent steel sheet piling. Please void existing Page 5 and replace with the revised Page 5.

Pages 49A - 49N, "Field Painting Over Hot Dip Galvanized Surfaces" has been replaced with "Painting Over Hot Dip Galvanized Surfaces". Please void existing Pages 49A - 49N and replace with the revised Pages 49A -49N.

"Execution of Contract" has been revised to include the correct Project Number and County. Please void existing "Execution of Contract" and replace with the revised "Execution of Contract".

Plan Sheet W-2, has been revised to include the coating requirements to be applied over all permanent steel sheet piling. Please void existing Plan Sheet W-2and replace with the revised Plan Sheet W-2.

*Mailing Address:*  
NC DEPARTMENT OF TRANSPORTATION  
DIVISION ONE  
113 AIRPORT DRIVE, SUITE 100  
EDENTON, NC 27932

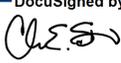
*Telephone:* (252) 482-1850  
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*Customer Service:* 1-877-368-4968

*Location:*  
113 AIRPORT DRIVE, SUITE 100  
EDENTON, NC 27932

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

The amended EBS File (DA00333.002) has been uploaded to Bid Express. We apologize for any inconvenience.

Sincerely,

DocuSigned by:  
  
CDAEAC77A6394FB...

C. E. Slachta  
Division Proposals Engineer

cc: J. D. Jennings, PE  
C. W. Bridgers, Jr, PE  
G. A. Byrum, PE  
R. W. Midgett, PE.

## PROJECT SPECIAL PROVISIONS

### **NOTE TO CONTRACTOR:**

One primary objective of this project is the adjustment of the roadway profile grade to reduce flooding in low lying areas to the extent possible. The proposed profile grade has been developed with this intent and must be followed. Grade control must be established and followed on both the roadway and structures portions of the project.

Pavement along the transverse centerline of all caps shall be saw cut to a depth of  $\frac{3}{4}$ " $\pm$ , cleaned, and filled with an approved asphalt sealant in accordance with Section 1028 of the Standard Specifications. Payment for this work shall be incidental to other pay items in contract and no separate payment will be made for this work.

Apply an approved epoxy protective coating to the tops of all caps and to the exterior faces of all exterior core slab units. Use a Type 4A flexible and moisture insensitive epoxy coating in accordance with Section 1081 of the Standard Specifications. Provide a Type 3 material certification in accordance with Article 106-3 showing that the proposed epoxy meets Type 4A requirements. Payment for this work shall be incidental to other pay items in contract and no separate payment will be made for this work.

**In addition to galvanization, all permanent steel sheet piling shall receive application of a liquid coating system in accordance with the special provision "Painting Over Hot Dip Galvanized Surfaces."**

### **BOND REQUIREMENTS:**

(06-01-16)

102-8, 102-10

SPD 01-420A

A Bid Bond is required in accordance with Article 102-10 of the *2018 Standard Specifications for Roads and Structures*.

Contract Payment and Performance Bonds are required in accordance with Article 103-7 of the *2018 Standard Specifications for Roads and Structures*.

### **CONTRACT TIME AND LIQUIDATED DAMAGES:**

The date of availability for this contract is **September 17, 2018**, 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 **the date of acceptance of all erosion control measures in the contract. Liquidated Damages will begin if erosion control items are not accepted within 90 consecutive calendar days following acceptance of roadway and structure items.**

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 **Seven Hundred Fifty Dollars (\$ 750.00)** per calendar day.

**PAINTING OVER HOT DIP GALVANIZED SURFACES**

(7-7-2017)

**DESCRIPTION**

Apply a liquid coating system over new, partially weathered or weathered hot-dip galvanized steel surfaces in accordance with the Plans, Special Provisions and the applicable requirements of Section 442, Section 1072, Section 1076 and Section 1080 of the *2018 Standard Specifications*. A liquid coating system incorporates all members to be hot dipped galvanized prior to shop applied coating layers. The galvanization provides cathodic protection on the interior, exterior and hidden surfaces of the structural steel to be coated. Design and fabrication of members to be galvanized shall be in accordance with ASTM A-385 titled "Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip).

**TWELVE-MONTH OBSERVATION PERIOD**

The Contractor maintains responsibility for the coating system for a 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 shall guarantee the coating system under the payment and performance bond (refer to Article 109-10 of the *2018 Standard Specifications*). To successfully complete the observation period, the coating system shall meet the following requirements after 12 months service:

- No visible rust, contamination or application defect is observed in any coated area.
- Painted surfaces have a uniform color and gloss.
- Acrylic top coats shall have an adhesion that meets ASTM D3359, 3A rating. On other top coats; the Department may elect to use one or a combination of the adhesion test methods that are listed under performance characteristics/data on the manufacturer's product data sheet.

Final acceptance is made only after the paint system meets the above requirements.

**CERTIFICATION**

Fabrication facilities must currently possess an AISC Certified Bridge Fabricator: Intermediate (IBR) or higher certification. Coating facilities must currently possess the AISC Sophisticated Paint Endorsement (SPE) or the SSPC QP-3 certification to apply the duplex coating system. Work is only sublet by approval of the Engineer. Coating facilities must be an enclosed Shop: as per modified by AISC/SSPC; an enclosed shop is a permanent facility or building (four continuous walls or partitions to grade or floor with a roof) and be a Department approved Structural Steel Coating Shop Facility as listed on the below web-link:

<https://apps.ncdot.gov/vendor/ApprovedProducts/Producer.aspx>

**QUALITY CONTROL**

All quality control (QC) personnel are subject to review and acceptance of the Engineer. The minimum certifications required shall be SSPC BCI Level I, Level II or NACE CIP Level I or higher.

Unless more stringent requirements are specified by the manufacturer or stated in the shop coating facility's Quality Manual, calibration verification of instruments used for inspection is performed by the equipment manufacturer annually. The shop coating facility maintains calibration records and certificates in the office for all instruments that require formal calibration. Calibration records shall be available for instruments being used by QC personnel on site.

At a minimum, QC personnel shall use calibrated instruments as identified in their QC Manual and the equipment manufacturer's recommendations as provided to the department in the Prequalification section of these provisions. They shall conduct the required quality control tests in accordance with these requirements and report the minimum information required by the appropriate ASTM test methods and these provisions.

#### **NOTIFICATION OF WORK**

Prior to starting work, in state shop coating facilities shall provide a minimum of three (3) working days' notice and out of state shop coating facilities shall provide a minimum of eight (8) working days' notice by submitting a notice of beginning work form (Annex 1). When submitting the form (Annex 1) the facility shall include; work schedule, days per week, hours per day and number of shifts. Typical working hours are considered Monday through Friday (8am- 5pm).

If the coater and/or fabricator are at the same location no additional notification is required.

If the shop coating facility does not perform scheduled work for a period exceeding three (3) consecutive days, additional notification of work as identified above shall be submitted. Any work performed without proper notification as identified above will be performed at the shop coatings facility's risk.

#### **PRE-JOB MEETING**

The Department may require a pre-job meeting for specific applications as determined by the Engineer.

#### **SAFETY**

Painting over galvanizing may involve the use of hazardous materials, operations, and equipment. This Project Special Provision does not address all of the potential safety concerns associated with their use. It is the responsibility of the shop coating facility to establish appropriate safety and health requirements, and determine any regulatory requirements or limitations prior to use. All equipment, procedures and methods shall fully comply with the requirements of Article 107 of the 2018 NCDOT Standard Specifications.

Personnel involved in the inspection and/or oversight of any coating application should work directly with shop coating facilities safety personnel to ensure proper safety protocol is being followed.

## **GALVANIZING OF MATERIALS**

The fabrication facility shall consult with the galvanizer to ensure the fabricated product meets the requirements of ASTM A385 and provide the galvanizer and Department with mill test reports for the steel thickness(s) and chemistry prior to galvanizing. The fabrication facility shall specify on their purchase order No water quenching or treating with chromate conversion coatings after galvanizing. If the purchase order does not specify the above underlined statement it is the responsibility of the fabricator to test for chromate conversion coatings in accordance with ASTM D6386, Appendix X1 prior to beginning any surface preparation activities.

Galvanize material accordance with Article 1076. Prior to blast cleaning operations, shop facilities shall remove all oil, grease and anti-spatter material in accordance with SSPC SP-1. Article 1076-3 requires all welded areas to be blast cleaned to an SSPC SP-6 prior to sending to the galvanizing facility. The galvanizing facility must be a Department approved Structural Steel Shop Galvanizing facility as listed on the NCDOT Approved Supplier listing:

<https://apps.ncdot.gov/vendor/approvedproducts/Producer.aspx>

## **LIQUID COATING SYSTEM**

Only paint suppliers that have a NCDOT qualified inorganic zinc primer may furnish paints for this project and the Engineer is to approve the submitted liquid coating system. All paints applied to a structure shall be from the same supplier.

The Contractor is to submit a liquid coating system to the Engineer for approval. The coating system must be of good quality, capable of providing adequate adhesion and service life when applied over the galvanized surfaces (New, Partially Weathered or Weathered galvanized surfaces) The liquid coating system shall meet the generic type(s) specified in SSPC Guide 19, Table 1 under immersion service, incorporates a stripe coat of at least 4-7 wet film thickness (WFT) and an aesthetic finish coat of 3-5 mils dry film thickness (DFT).

Top coat color shall be Federal Standard 595C color #26622 (gray) unless otherwise specified by the Engineer. Additional Federal Standard colors can be found at <http://www.federalstandardcolor.com/>

## **STORAGE AND HANDLING**

For all liquid paint components, the coating shop facility shall take all necessary precautions to prevent any contamination and/or damage during handling, storage and transportation which include storing in the open air at any time during the coating process (surface preparation through curing of the top coat).

Do not expose coating materials to rain, excessive condensation, long periods of direct sunlight, or temperatures above 110F or below 40F. In addition, the shop coating facility shall place a device which records the high, low and current temperatures inside the storage location which houses the coating materials. Follow the manufacturer's storage requirements if more restrictive than the above requirements.

Coating material shall arrive at the shop coating facility in sealed containers clearly marked with the type, batch and/or lot numbers properly labeled on the container. There shall be no modification of the coating except upon and in accordance with the express written stipulation by an authorized representative of the coating manufacturer and with specific approval of the Engineer. At the department's option, the inspector may randomly collect a sample of the coating used on the project if the material has been exposed to extremely high/low temperatures and/or exhibits excessive skinning in the container.

### **COATING MATERIALS**

All material coatings applied shall be from the same manufacturer. Before any coatings are applied, the shop coating facility shall provide the Engineer a copy of the product data sheet, SDS (formerly MSDS) sheet, manufacturer's certification and NCDOT HICAMS test report for each type, color and/or batch of coating used on the project.

All coating materials shall be supplied to the work site in their original unopened containers bearing the paint manufacturer's label and instructions.

### **PREPARATION OF SURFACES**

The method, extent of surface preparation and paint materials shall be approved by the paint manufacturer.

Depending on the length of exposure of hot-dip galvanized surfaces they may have layers of zinc oxides, zinc hydroxides and zinc carbonates that must be removed before paint will adhere to the zinc coating.

Surfaces shall be free of visible signs of wet storage stain which appear as a fine white powder. The coating facility shall submit a procedure to the Department for review and approval for the removal of light and medium wet storage stain prior to removing wet storage stains. Heavy and extreme wet storage stains on hot dipped galvanized products are unacceptable to the Department. The American Galvanizing Association (AGA) has a publication for reference titled "A Guide to Minimizing and Treating Wet Storage Stain on Hot-Dip Galvanized Steel"

When hot dipped galvanized or mechanically galvanized nuts for high strength fasteners are to be installed and final tightened before surface preparation, the coating facility shall ensure the colored lubricant is removed prior to surface preparation. The quality control shall submit a procedure to the Department for review and approval for the removal of the colored lubricant. The quality control shall inspect and document the removal of any coloring dye remaining. A white cloth wipe test shall be conducted in the presence of the Department's representative that no color transfer is used to confirm that all lubricant and non-absorbed dye has been removed, leaving only the residual "stain" on the surface.

Prior to surface preparation the QC shall assign piece marks to sheet pile, pipe pile and H-Pile in accordance with Article 1072-21.

### Newly Galvanized Surfaces

Newly galvanized surfaces are zinc-coated steel that have been exposed to the atmosphere for less than 48 hours. These surfaces shall be prepared in accordance with ASTM D6386, Section 5. The quality control shall verify, inspect and document all phases of surface preparation that includes but not limited to the following hold points:

#### Surface Smoothing

Removal of all surface abnormalities listed in ASTM D6386, Section 5.2. After smoothing, all surfaces shall be inspected for conformance to the required zinc thickness in accordance with these Specifications, ASTM A123 or ASTM A153 utilizing a magnetic thickness instrument in accordance with ASTM D7091. Any area falling below the required zinc thickness, before or after removal of any high spots the quality control inspector shall submit a repair procedure to the Department for review and approval.

#### Surface Cleaning

Removal of oil and grease before they are coated and using a method specified in ASTM D6386, Section 5.3. Documentation shall include the type of surface cleaning method used, type of solvent, type of hand tool or power tool method used and is to be verified in the presence of the Department's representative in accordance with the ASTM F-22.

#### Surface Preparation

Removal of zinc oxide and zinc hydroxides must be removed before paint will adhere to the zinc coatings. Surface preparation is to be performed using one of five methods as specified in ASTM D6386, Section 5.4. Documentation shall include the SSPC AB-1 abrasive qualification test results, type of zinc phosphate treatment, wash primer or acrylic passivation/pretreatment used

Perform the following tests in the presence of the Department representative:

- Each blasting operator shall verify cleanliness of air before blasting operations in accordance with ASTM D-4285 and verify the blasting pressure and nozzle to work-piece distance.
- Quality control testing of AB-1 abrasives.
- No blasting work shall be carried out when the temperature of the steel surfaces is less than 5°F above dew point of the surrounding air, or the relative humidity of the air is greater than 85%. Use ASTM E-337 when performing ambient conditions assessments at four hour intervals or as conditions change.
- Abrasive blasting performed in accordance with SSPC SP-16. All surfaces shall be blown down with clean, dry compressed air.
- The purpose of sweep blasting is to deform, not remove the galvanized metal. Any area falling below the required zinc thickness, before or after sweep blasting, shall be repaired using a Department approved procedure. All surfaces shall be inspected utilizing a magnetic thickness instrument in accordance with ASTM D7091.

### Partially Galvanized Surfaces

Partially galvanized surfaces have been exposed to the atmosphere for greater than 48 hours and up to one year after galvanizing and the surfaces shall be prepared in accordance with ASTM D6386, Section 6. The quality control shall verify, inspect and document all phases of surface preparation that includes but not limited to the following hold points:

#### Chromate Conversion Verification

The presence of chromate conversion coatings can severely impair the adhesion of some paint coating systems. If the coating facility can provide written documentation of a purchase order as stated above in "Galvanization of Materials" then no further action is required. If the coating facility cannot provide the above documentation they shall submit a procedure for testing for chromate presence as outlined in ASTM D6386, appendix X1.

#### Wet Storage Stain

Before preparing the surface of partially weathered galvanized steel, the surface must be checked for the presence of wet storage stain. Use a Department approved method for the removal of wet storage stain.

#### Surface Smoothing

Removal of all surface abnormalities listed in ASTM D6386, Section 5.2.

After smoothing, all surfaces shall be inspected for conformance to the required zinc thickness in accordance with these Specifications, ASTM A123 or ASTM A153 utilizing a magnetic thickness instrument in accordance with ASTM D7091.

Any area falling below the required zinc thickness, before or after removal of any high spots the quality control inspector shall submit a repair procedure to the Department for review and approval.

#### Surface Preparation

Removal of zinc oxide and zinc hydroxides must be removed before paint will adhere to the zinc coatings. Surface preparation is to be performed using one of five methods as specified in ASTM D6386, Section 5.4. Documentation shall include the SSPC AB-1 abrasive qualification test results, type of zinc phosphate treatment, wash primer or acrylic passivation/pretreatment used.

Perform the following tests in the presence of the Department representative:

- Each blasting operator shall verify cleanliness of air before blasting operations in accordance with ASTM D-4285 and verify the blasting pressure and nozzle to work-piece distance.
- Quality control testing of AB-1 abrasives

- No blasting work shall be carried out when the temperature of the steel surfaces is less than 5°F above dew point of the surrounding air, or the relative humidity of the air is greater than 85%. Use ASTM E-337 when performing ambient conditions assessments at four hour intervals or as conditions change.
- Abrasive blasting performed in accordance with SSPC SP-16. All surfaces shall be blown down with clean, dry compressed air.
- The purpose of sweep blasting is to deform, not remove the galvanized metal. Any area falling below the required zinc thickness, before or after sweep blasting, shall be repaired using a Department approved procedure. All surfaces shall be inspected utilizing a magnetic thickness instrument in accordance with ASTM D7091.

#### Pretreatment

The formation of zinc oxide on the surface will begin very quickly so the paint coating should be applied within 30 minutes after surface preparation. The Department encourages the coating facility to submit a pretreatment as described in ASTM D6386, Section 5.4.3 thru 5.4.5. If a pretreatment is approved and applied, it may not be necessary to paint immediately.

#### Weathered Galvanized Surfaces

Weathered galvanized surfaces have been exposed to the atmosphere for than one year after galvanizing the surfaces and shall be prepared in accordance with ASTM D6386, Section 7. The quality control shall verify, inspect and document all phases of surface preparation that includes but not limited to the following hold points:

#### Surface Cleaning

Removal of organic compounds such oil, grease, soot on the surface of the part, surface cleaning in accordance with ASTM D6386; Section 5.3 shall be performed before any other cleaning is performed.

Documentation shall include the type of surface cleaning method used, type of solvent, type of hand tool or power tool method used and is to be verified in the presence of the Department's representative in accordance with the ASTM F-22.

#### Surface Preparation

The natural corrosion of the zinc metal produces a roughened surface film. The surface preparation that is needed is a power wash with warm water to remove loose particles from the surface. The power wash shall use a pressure of  $\leq 1450$  psi so as not to damage the protective film.

#### Pretreatment

The coating facility shall provide a pretreatment as recommended by the coating manufacturer and approved by the Department. Pretreatment types are shown in ASTM D6386, Section 5.4.

**COATING APPLICATION**

In some atmospheric conditions, such as high humidity or high temperature or both, the formation of zinc oxide on the freshly prepared surfaces will begin very quickly. Zinc oxide formation is not visible to the unaided eye; therefore, in any atmosphere, painting shall be started within an hour after surface preparation.

All paint is to be applied as required by Article 442-9. The completed coating shall be free from visible defects such as runs, sags, pinholes, voids, bubbles, grit, dust inclusion and be of good visual appearance. The top coat shall completely cover the color of the underlying layers. The stripe coat shall be applied by brush or roller only and applied in accordance with Article 442-9(A).

Cure of acrylic/waterborne stripe coats shall be accessed by using the thumb test in accordance with ASTM D1640 prior to the application of any successive layers of paint. Cure of other generic paint types not listed shall use the more restrictive dry to recoat or dry to topcoat times as stated on the paint manufacturers written instructions. Contact surfaces and field welding locations shall meet the requirements of Article 442-10(C)(1)(b)(e).

Any area where newly applied paint fails to meet the specifications shall be repaired or replaced by the Contractor. The Engineer approves all repair processes regardless of size before the repair is made. Repaired areas shall meet these specifications.

**COATING APPLICATION TIME**

In some atmospheric conditions, such as high humidity or high temperature or both, the formation of zinc oxide on the freshly prepared surfaces will begin very quickly.

Newly Galvanized Surfaces

Zinc oxide formation is not visible to the unaided eye; therefore, in any atmosphere, painting shall be started within an hour after surface preparation.

Partially Galvanized Surfaces

If no protective treatment such as those described in ASTM D6386, Section 5.4.3 thru 5.4.5 is applied, in some atmospheric conditions, such as high humidity, or high temperature, or both, the formation of zinc oxide on the surface will begin very quickly so the paint coating shall be applied within 30 min.

Weathered Galvanized Surfaces

The paint shall be applied no later than eight (8) hours after surface preparation.

**INSPECTION**

QC is required to record and maintain inspections that are specified by the contract and in accordance with the current Standard Specifications, ensuring that they are signed by the QC inspector who performed the inspection. These records shall be available at the shop for review and submitted to the Quality Assurance representative at the end of each work week or as directed.

Final Visual Inspection Acceptance Criteria

Visual examination using line of sight vision of surface preparation or coating inspection shall be done at an angle not less than 30 degrees and at a distance of no more than twenty four inches (24"). Ambient lighting as measured at the inspection surface shall not be less than 50 foot candles.

Any surface contamination of the end product as a result of improper storage and/or protection as defined by the Engineer shall be removed by shop coating facility prior to final acceptance by the Department.

At a minimum the quality control forms shall be on their company letterhead/logo that uses a Daily inspection report form equivalent to the information required on M&T-610. Submit all Dry Film Thickness (DFT) readings on a form equivalent to M&T-611 to include any pre-treatment applications. Digital versions of these forms can be found on the NCDOT Materials and Tests webpage: <https://connect.ncdot.gov/resources/Materials/Pages/ChemicalLaboratory.aspx>

### Dry Film Thickness

Dry film thickness measurements are mandatory for the QC and quality assurance inspectors on the application of the **pretreatment, intermediate and top coat as applicable**. Measurements shall be taken with a Type 2 gage as defined in SSPC PA-2, recorded to the frequency specified in this program and on a form similar to the M&T Form 611.

The type 2 gage needs to be adjusted to account for the profile of the substrate in order to read the thickness directly. The QC shall use and provide the quality assurance inspector with a gage adjustment method as prescribed in SSPC PA-2, Appendix 8.

QC and quality assurance shall measure and record the dry film thickness (DFT) for the coating application and for those products identified in Figures 1, 2, 3, 4, 5 & 6 as applicable for that specific product. These requirements are applicable to each individual component and shall be obtained as identified in the appropriate Figures 1 through 6 below.

Random locations are defined as equally spaced inspection intervals along the entire length of the member.

All spot readings are defined as the average of 3 to 5 individual gage readings obtained within a 1 ½" diameter circle at each random location and must meet the minimum requirement specified. Discard any single unusually high or low gage readings that are not repeated consistently. The average of the acceptable gage readings is the spot measurement.

For products not identified in Figures 1, 2, 3, 4, 5 & 6 the DFT inspection shall include each surface area, change in contour, face, leg, flange, edge and side for that member.

### H & Sheet Pile Members

- 8 random locations for surface area identified above for members  $\leq 45$  feet.
- For members greater than 45 feet in length, one additional location shall be required for each additional 10 feet in length.

### Pipe Pile Members

- 8 random locations for surface area identified above for members  $\leq$  45 feet in length and up to 24" in diameter.
- For members greater than 45 feet in length, one additional location shall be required for each additional 10 feet in length.
- 10 random locations for surface area identified above for members  $\leq$  45 feet in length for diameters greater than 24" and up to 48" in diameter.
- For members greater than 45 feet in length and over 24" in diameter to 48" in diameter, one additional location shall be required for each additional 10 feet in length.
- For members greater than 48" in diameter, consult the Engineer for DFT testing interval.

### Bearing Assemblies

- For each bearing assembly, 5 random location areas per bearing face, in addition to measure 3 spot areas on each plate edges when greater than one inch in thickness.

### Diaphragm/Cross-Frames/X and/or K Frame Assembly

- For each assembly that is  $\leq$  5 feet in length; 5 random locations that encompass the entire assembly shall be examined. For assemblies greater than 5 feet in length one additional location shall be required for each additional 12" in length.

When a spot reading is non-conforming, the extent of the non-conforming area will be determined by taking additional spot readings not to exceed a one foot interval in all directions until acceptable spot averages are obtained. Material that does not meet the minimum DFT shall be demarcated using a non-staining material and documented. The operator shall repair these deficient areas in accordance with their pre-approved procedure.

### Adhesion Strength

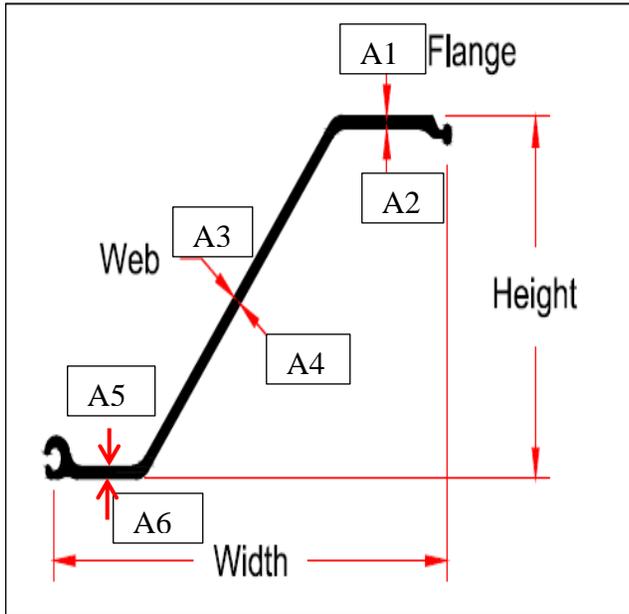
The adhesion strength of the top coat shall be measured in accordance with ASTM D-4541. After completion of the adhesion testing, affected surfaces shall be repaired. Provide repair procedures that are pre-approved by the Department and address adhesion and cohesion failures in the intermediate/topcoat layer. One test equals 3 dollies in which the shop coating facility shall properly taper and touch up all repair areas in accordance with SSPC PA-1, Section 11.

If there is a failure associated with any one test an additional test is required. If additional failures occur, the shop coating facility shall document the location and type of failure and provide the Department with a corrective action plan for review and approval.

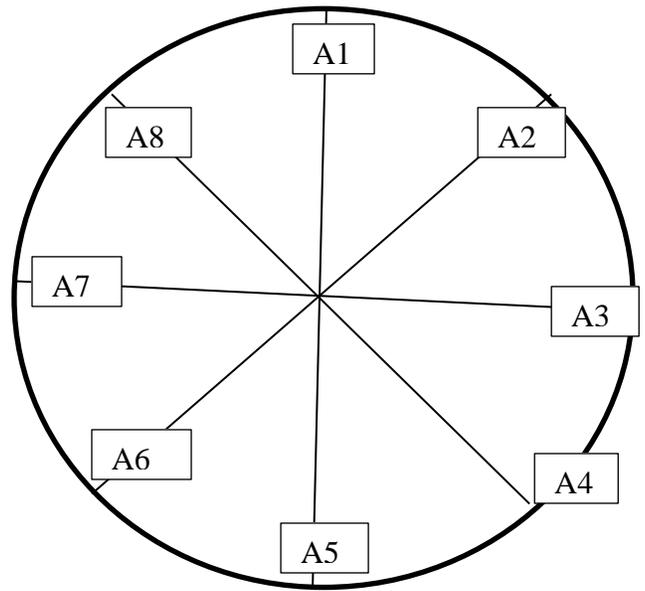
Adhesion tests shall be performed at least once on the prepared surface, with a minimum of one test per shift and per lot. A lot shall be defined as follows:

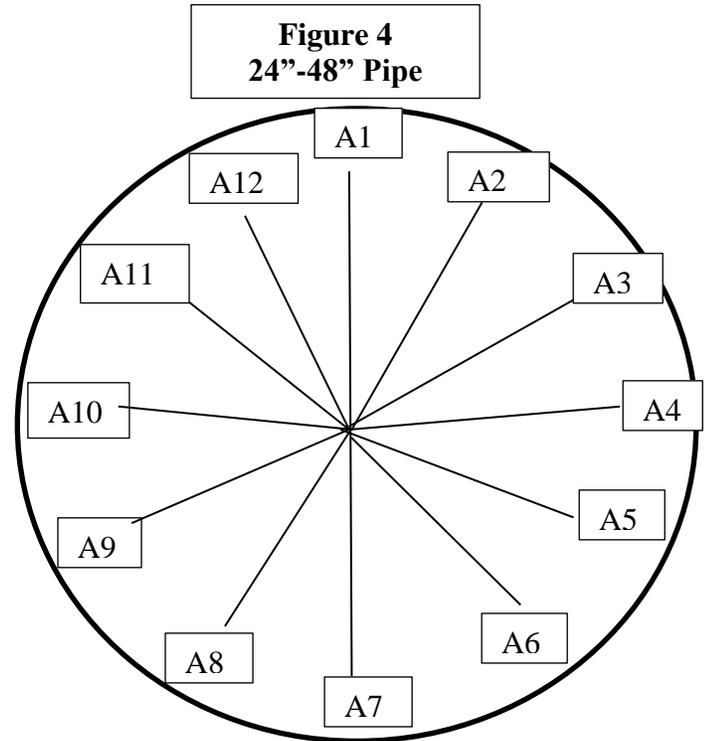
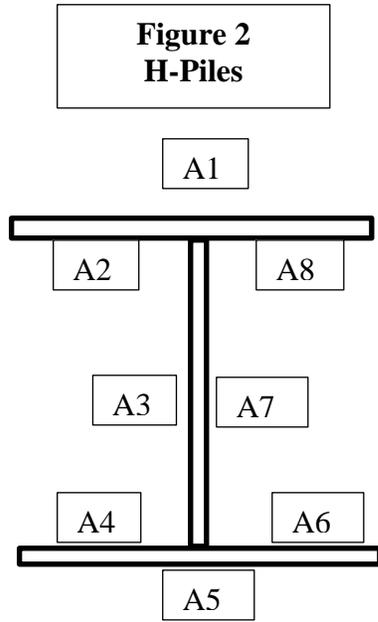
- A lot is one or more articles of the same type and size comprising a single order or a single delivery load, whichever is the smaller, or any number of articles identified as a lot by the shop coating facility, when these have been coated within a single production shift and in the same production area.

**Figure 1**  
**Sheet Piles**

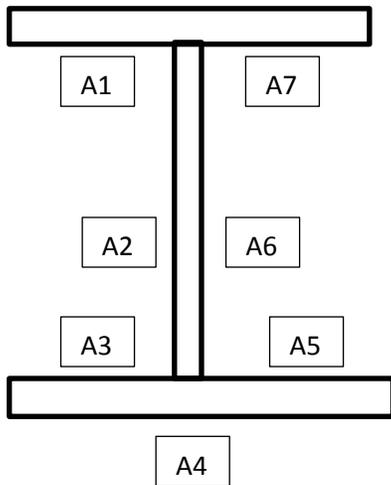


**Figure 3**  
**12"-24" Pipe**

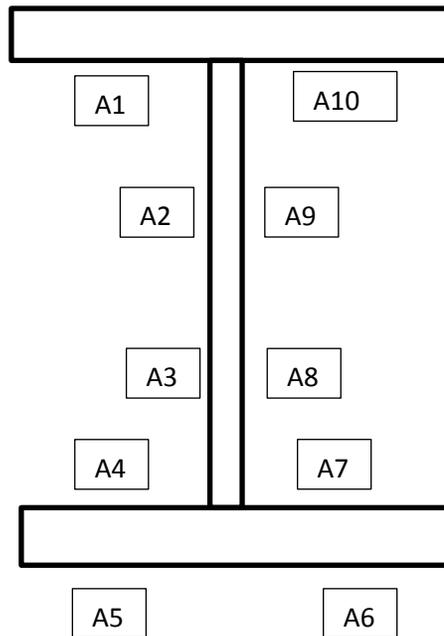




**Figure 5  
Roll beam or plate girder  $\leq 36''$  in depth**



**Figure 6  
Roll beam or plate girder  $> 36''$  in depth and bottom flanges  $\geq 15''$  in width.**



**REPAIR AREAS**

Routine repairs are defined as a single localized area measuring one square foot or less. The Engineer shall be consulted for non-localized and/or multiple areas of repair.

All repairs that are performed on this project must meet the requirements of this paragraph. The shop coating facility shall provide a coating repair procedure to the Engineer prior to starting any surface preparation. The repair procedure shall demonstrate that the proposed work method and equipment used for the repair will meet the quality requirements listed in this program.

Repair procedures are subject to the approval of the Engineer. If the coating has been damaged and bare substrate metal is observed, the coating shall be repaired, including all damaged layers.

If the shop coating facility did not exhibit reasonable conformance to protect the work during application, storage and/or construction, the Engineer may require a finish coat at no additional cost to the Department. The final acceptances of all repairs, to include aesthetics, will be approved at the Engineer's discretion. The repair procedure shall meet all provisions of this document

## ANNEX 1.

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
MATERIALS AND TESTS UNIT, STRUCTURAL MATERIALS GROUP**



**Notification of Beginning Work Form**

Date of Notification	
Name & Phone Number of Producer/Coater Contact Person	
Planned Date to Start Work (see note at bottom of page)	
Name of Producer/Coating Contractor	
Location of Producer/Coating Contractor	
Project Number	
Contract Number	
County	
Bridge Number	
Shop Job Number	

**Details of Work to Begin**

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**Completed form should be submitted to the Metals Engineer, Welding Engineer & Coating Engineer (electronically or by mail) at:**

<p align="center"><b>Randy Porter</b> Metals Engineer NCDOT Materials and Tests Unit 1563 Mail Service Center Raleigh, NC 27699 <a href="mailto:srporter@ncdot.gov">srporter@ncdot.gov</a></p>	<p align="center"><b>Eddie Shelar</b> Welding Engineer NCDOT Materials and Tests Unit 1350 Jammie Court Winston Salem, NC 27106 <a href="mailto:gshelar@ncdot.gov">gshelar@ncdot.gov</a></p>	<p align="center"><b>Aaron Dacey</b> Coating Engineer NCDOT Materials and Tests Unit 1563 Mail Service Center Raleigh, NC 27699 <a href="mailto:ahdacey@ncdot.gov">ahdacey@ncdot.gov</a></p>
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**NOTE: According to Article 1072-7(A), Materials & Test Unit requires 72 hours (3 days) notice for in-state producers and 192 hours (8 days) notice for producers out-of-state**

**Execution of Contract**

**Contract No: DA00333**

**Counties: Dare**

ACCEPTED BY THE DEPARTMENT

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**Contract Officer**

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Date

PROJECT REFERENCE NO. <b>R-5738</b>		SHEET NO. <b>W-2</b>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER			
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			

### NOTES

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

THE RETAINING WALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 452 OF THE STANDARD SPECIFICATIONS.

THE RETAINING WALL SHALL BE MEASURED AND PAID AS THE ACTUAL NUMBER OF SQUARE FEET OF EXPOSED FACE AREA INCORPORATED INTO THE COMPLETED RETAINING WALL. THE RETAINING WALL HEIGHT IS MEASURED AS THE DIFFERENCE BETWEEN THE TOP AND BOTTOM OF THE RETAINING WALL. THE TOP OF THE RETAINING WALL IS DEFINED AS THE TOP OF THE CONCRETE CAP. THE BOTTOM OF THE RETAINING WALL IS DEFINED AS THE EXISTING GROUND LINE.

CLASS AA CONCRETE SHALL BE USED IN THE CAST-IN-PLACE CAP AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CONCRETE CAP AND SPACED A MAXIMUM OF 10 FEET.

INSTALL THE SHEETING TO THE REQUIRED EMBEDMENT AS SHOWN ON THE PLANS.

STEEL SHEET PILING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A690 AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. IN ADDITION TO GALVANIZATION, STEEL SHEET PILING SHALL RECEIVE APPLICATION OF A LIQUID COATING SYSTEM IN ACCORDANCE WITH THE SPECIAL PROVISION "PAINTING OVER HOT DIP GALVANIZED SURFACES."

STEEL SHEET PILING SHALL BE HOT ROLLED.

THE SCOUR CRITICAL ELEVATION FOR THE RETAINING WALL AT END BENT NO. 1 IS ELEVATION -4 FT. THE SCOUR CRITICAL ELEVATION FOR THE RETAINING WALL AT END BENT NO. 2 IS ELEVATION -3.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED BY MAINTENANCE FORCES TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

USE SELECT MATERIAL CLASS III, ACCORDING TO SECTION 1016 OF THE NCDOT STANDARD SPECIFICATIONS, AS BACKFILL BEHIND THE RETAINING WALL. NO SEPERATE PAYMENT WILL BE MADE FOR THIS ITEM. ALL MATERIALS, EQUIPMENT OR LABOR FOR PLACING AND COMPACTING THIS MATERIAL SHALL BE INCLUDED IN THE CONTRACT BID PRICE FOR SQUARE FOOT OF 18" STEEL SHEET PILE RETAINING WALLS.

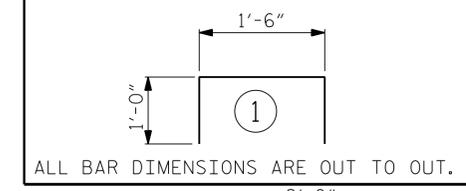
THE FINISH GRADE OF THE BACK FILL SHALL BE GRADED TO PROVIDE ADEQUATE DRAINAGE AS DIRECTED BY THE ENGINEER.

REVISIONS  
 REVISION 1 (RDO): 7/1/2018 - REMOVED NOTE STATING: "FOR STEEL SHEET PILE RETAINING WALL SEE SPECIAL PROVISIONS." AND  
 REVISION 2 (RDO): 7/12/2018 - ADDED NOTE REGARDING SPECIAL PROVISION "PAINTING OVER HOT DIP GALVANIZED SURFACES." AND  
 - ADDED NOTE "WITH SHOP APPLIED LIQUID COATING SYSTEM"

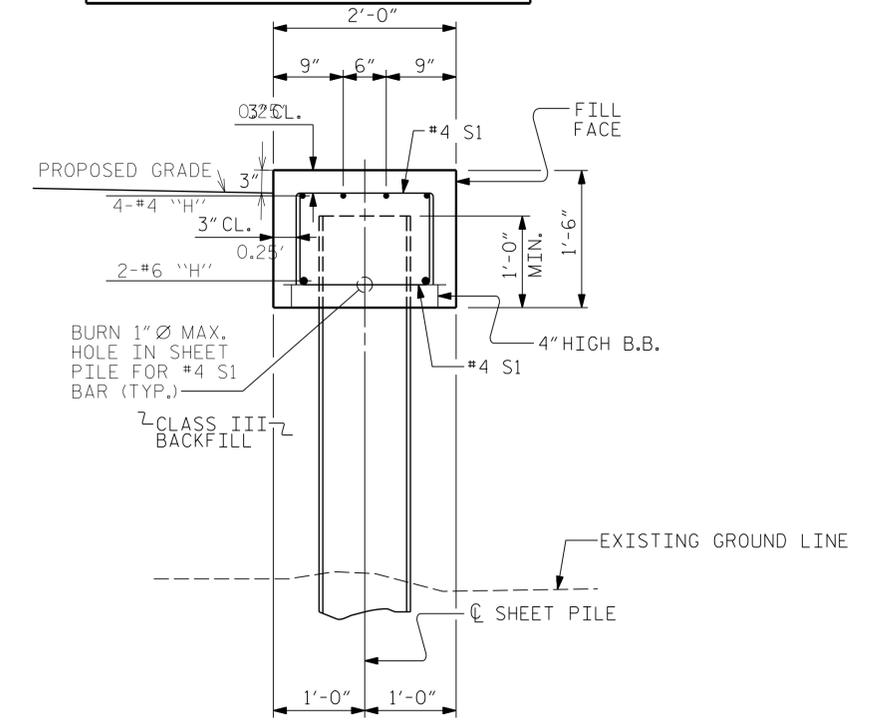
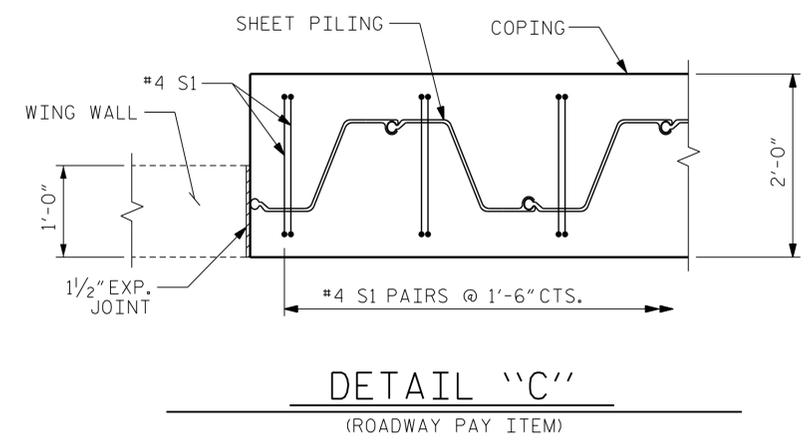
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ROADWAY PAY ITEM											
BILL OF MATERIAL- COPING						BILL OF MATERIAL- COPING					
END BENT 1						END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	12	#4	STR	29'-8"	238	* B1	20	#4	STR	27'-8"	370
* B2	4	#6	STR	44'-0"	264	* B2	6	#6	STR	45'-8"	412
* S1	114	#4	1	3'-6"	267	* S1	198	#4	1	3'-6"	463
* EPOXY COATED REINFORCING STEEL					769 LBS.	* EPOXY COATED REINFORCING STEEL					1245 LBS.
CLASS AA CONCRETE COPING					9.5 C.Y.	CLASS AA CONCRETE COPING					14.6 C.Y.
TOTAL CLASS AA CONCRETE					9.5 C.Y.	TOTAL CLASS AA CONCRETE					14.6 C.Y.

**BILL OF MATERIAL - 18" STEEL GALVANIZED SHEET PILE (PZ-27) WITH SHOP APPLIED LIQUID COATING SYSTEM RETAINING WALLS .....930 SQ. FT.**



BAR	SPLICE LENGTH
* B1	2'-0"
* B2	3'-0"



**SECTION THRU SHEET PILING AND COPING**  
(ROADWAY PAY ITEM)