

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

PROPOSAL

DATE AND TIME OF BID OPENING: **OCTOBER 19, 2021 AT 2:00 PM**

CONTRACT ID C204027
WBS 52024.3.4

FEDERAL-AID NO. NHPIM-0277(19)
COUNTY MECKLENBURG
T.I.P. NO. I-5746C
MILES 1.330
ROUTE NO. I 277
LOCATION I-277 (BROOKSHIRE FRWY) FROM BRIDGE DECK OVER 10TH STREET TO
BRIDGE DECK OVER JOHNSON STREET AND BRIDGE DECKS OVER I-77.

TYPE OF WORK GRADING, DRAINAGE, PAVING, AND BRIDGE REHABILITATION.

NOTICE:

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

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A ROADWAY & STRUCTURE PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

**PROPOSAL FOR THE CONSTRUCTION OF
CONTRACT No. C204027 IN MECKLENBURG 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. C204027 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 2018 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. C204027 in Mecklenburg 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 2018* 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

DocuSigned by:

Ronald E. Davenport, Jr.

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9/20/2021

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

(7-1-95) (Rev. 12-18-07)

108

SP1 G10 A

The date of availability for this contract is **November 29, 2021**.

The completion date for this contract is **October 1, 2024**.

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 Thousand Dollars (\$ 2,000.00)** per calendar day.

INTERMEDIATE CONTRACT TIME NUMBER 1 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 **the following roads**, during the following time restrictions:

DAY AND TIME RESTRICTIONS**I-277, I-77 (including Any Ramp), I-77 Hot Lanes, and US 29/Graham Street****SINGLE LANE CLOSURES****Monday thru Friday, 6:00 A.M. to 9:00 P.M.****Saturday and Sunday, 9:00 A.M. to 6:00 P.M.****DOUBLE LANE CLOSURES****Monday thru Friday, 6:00 A.M. to 11:00 P.M.****Saturday and Sunday, 9:00 A.M. to 9:00 P.M.****Johnson Street, NC Music Factory Boulevard, Church Street, Tryon Street,
College Street, Brevard Street, 11th Street, and 12th Street****Monday thru Sunday, 7:00 A.M. to 9:00 A.M. and 4:00 P.M. to 6:00 P.M**

In addition, the Contractor shall not close or narrow a lane of traffic on **Any Road**, 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 **9:00 P.M.** January 2nd. If New Year's Day is on a Friday, Saturday, Sunday or Monday, then until **9:00 P.M.** the following Tuesday.
3. For **Easter**, between the hours of **6:00 A.M.** Thursday and **9:00 P.M.** Monday.
4. For **Memorial Day**, between the hours of **6:00 A.M.** Friday and **9:00 P.M.** Tuesday.
5. For **Independence Day**, between the hours of **6:00 A.M.** the day before Independence Day and **9:00 P.M.** the day after Independence Day.

If **Independence Day** is on a Friday, Saturday, Sunday or Monday, then between the hours of **6:00 A.M.** the Thursday before Independence Day and **9:00 P.M.** the Tuesday after Independence Day.
6. For **Labor Day**, between the hours of **6:00 A.M.** Friday and **9:00 P.M.** Tuesday.
7. For **Thanksgiving**, between the hours of **6:00 A.M.** Tuesday and **9:00 P.M.** Monday.
8. For **Christmas**, between the hours of **6:00 A.M.** the Friday before the week of Christmas Day and **9:00 P.M.** the following Tuesday after the week of Christmas Day.
9. For **Carolina Panthers home games**, occurring at **Bank of America Stadium** between **three (3) hours** before the start and **two (2) hours** after the end of **each game**.
10. For **Charlotte Hornets home games**, occurring at **Spectrum Center** between **two (2) hours** before the start and **two (2) hours** after the end of **each game**.
11. For **Charlotte Knights home games**, occurring at **Truist Field** between **one (1) hour** before the start and **one (1) hour** after the end of **each game**.
12. For **any City of Charlotte Special Event** as listed in **General Note B-12** on **Sheet TMP-5**.

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 **Two Thousand Five Hundred Dollars (\$ 2,500.00)** per fifteen (15) minute time period.

INTERMEDIATE CONTRACT TIME NUMBER 2 AND LIQUIDATED DAMAGES:

(5-21-13)

108

SP1 G14 I

The Contractor shall complete the work required of installing each new inductive loop after the removal of each existing loop by the milling, patching or resurfacing operations and shall place and maintain traffic on same.

The date of availability for this intermediate contract time for each inductive loop installation will be the date when the Contractor elects to disturb the existing inductive loop.

The completion date for this intermediate contract time for each inductive loop installation will be the date which is seven (7) consecutive calendar days after the date of availability.

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

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 *2018 Standard Specifications*):

Line #	Description
96	Polyester Polymer Concrete Materials
	Or
97	Epoxy Polymer Concrete Materials

SPECIALTY ITEMS:

(7-1-95)(Rev. 7-20-21)

108-6

SP1 G37

Items listed below will be the specialty items for this contract (see Article 108-6 of the 2018 Standard Specifications).

Line #	Description
15-19	Guardrail
20-22	Fencing
31-33, 40-43	Long-Life Pavement Markings
44	Permanent Pavement Markers
46-49	Erosion Control
50	Signals/ITS System
57-68, 87	Bridge Painting
51, 78, 81, and 96 or 97	Polymer Concrete Overlay

FUEL PRICE ADJUSTMENT:

(11-15-05) (Rev. 7-20-21)

109-8

SP1 G43

Revise the 2018 Standard Specifications as follows:

Page 1-87, Article 109-8, Fuel Price Adjustments, add the following:

The base index price for DIESEL #2 FUEL is \$ **2.1926** 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 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
Sub-Ballast	Gal/Ton	0.55
Asphalt Concrete Base Course, Type _____	Gal/Ton	0.90 or 2.90
Asphalt Concrete Intermediate Course, Type _____	Gal/Ton	0.90 or 2.90
Asphalt Concrete Surface Course, Type _____	Gal/Ton	0.90 or 2.90
Open-Graded Asphalt Friction Course	Gal/Ton	0.90 or 2.90
Permeable Asphalt Drainage Course, Type _____	Gal/Ton	0.90 or 2.90
Sand Asphalt Surface Course, Type _____	Gal/Ton	0.90 or 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

For the asphalt items noted in the chart as eligible for fuel adjustments, the bidder may include the *Fuel Usage Factor Adjustment Form* with their bid submission if they elect to use the fuel usage factor. The *Fuel Usage Factor Adjustment Form* is found at the following link:

<https://connect.ncdot.gov/letting/LetCentral/Fuel%20Usage%20Factor%20Adjustment%20Form.pdf>

Select either 2.90 Gal/Ton fuel factor or 0.90 Gal/Ton fuel factor for each asphalt line item on the *Fuel Usage Factor Adjustment Form*. The selected fuel factor for each asphalt item will remain in effect for the duration of the contract.

Failure to complete the *Fuel Usage Factor Adjustment Form* will result in using 2.90 gallons per ton as the Fuel Usage Factor for Diesel for the asphalt items noted above. The contractor will not be permitted to change the Fuel Usage Factor after the bids are submitted.

SCHEDULE OF ESTIMATED COMPLETION PROGRESS:

(7-15-08) (Rev. 5-13-19)

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:

<u>Fiscal Year</u>	<u>Progress (% of Dollar Value)</u>
2022	(7/01/21 - 6/30/22) 32% of Total Amount Bid
2023	(7/01/22 - 6/30/23) 43% of Total Amount Bid
2024	(7/01/23 - 6/30/24) 22% of Total Amount Bid
2025	(7/01/24 - 6/30/25) 3% of Total Amount Bid

The Contractor shall also furnish his own progress schedule in accordance with Article 108-2 of the *2018 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. 8-17-21)

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.

Replacement / Substitution – A full or partial reduction in the amount of work subcontracted to a committed (or an approved substitute) DBE firm.

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.
<https://connect.ncdot.gov/business/Turnpike/Documents/Form%20DBE-IS%20Subcontractor%20Payment%20Information.pdf>

RF-1 DBE Replacement Request Form - Form for replacing a committed DBE.
<http://connect.ncdot.gov/projects/construction/Construction%20Forms/DBE%20MBE%20WBE%20Replacement%20Request%20Form.pdf>

SAF Subcontract Approval Form - Form required for approval to sublet the contract.
<http://connect.ncdot.gov/projects/construction/Construction%20Forms/Subcontract%20Approval%20Form%20Rev.%202012.zip>

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.
<http://connect.ncdot.gov/projects/construction/Construction%20Forms/Joint%20Check%20Notification%20Form.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 estimated amount (based on quantities and unit prices) listed at the time of bid.
<http://connect.ncdot.gov/letting/LetCentral/Letter%20of%20Intent%20to%20Perform%20as%20a%20Subcontractor.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://connect.ncdot.gov/municipalities/Bid%20Proposals%20for%20LGA%20Content/08%20DBE%20Subcontractors%20\(Federal\).docx](http://connect.ncdot.gov/municipalities/Bid%20Proposals%20for%20LGA%20Content/08%20DBE%20Subcontractors%20(Federal).docx)

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://connect.ncdot.gov/business/SmallBusiness/Documents/DBE%20Subcontractor%20Quote%20Comparison%20Example.xls>

DBE Goal

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

Disadvantaged Business Enterprises **2.0** %

- (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://www.ebs.nc.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 the electronic submittal file.

- (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 the electronic submittal file, 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

- (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. **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.
 - (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 corresponding goal.
- (2) *If the DBE goal is zero,* entries on the *Listing of DBE Subcontractors* are not required for the zero goal, however any DBE participation that is achieved during the project shall be reported in accordance with requirements contained elsewhere in the special provision.

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 10:00 a.m. 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 10:00 a.m. 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 10:00 a.m. 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 10:00 a.m. 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 10:00 a.m. on 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 10:00 a.m. on the next official state business day. If the contractor cannot send the information electronically, then one complete set and 5 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, written notices, use of verifiable electronic means 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.
 - (1) Where appropriate, break 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.
 - (2) Negotiate with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be sublet includes potential for DBE participation (2nd and 3rd tier subcontractors).
- (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, 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 Opportunity and Work Force Development Unit at BOWD@ncdot.gov 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 Prequalification 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 Prequalification 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 subcontractor (or an approved substitute DBE subcontractor) to meet all or part of a contract goal requirement, the contractor shall not terminate the DBE subcontractor 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.

The Contractor must give notice in writing both by certified mail and email to the DBE subcontractor, with a copy to the Engineer of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor must give the DBE subcontractor five (5) business days to respond to the Contractor's Notice of Intent to Request Termination and/or Substitution. If the DBE subcontractor objects to the intended termination/substitution, the DBE, within five (5) business days must advise the Contractor and the Department of the reasons why the action should

not be approved. The five-day notice period shall begin on the next business day after written notice is provided to the DBE subcontractor.

A committed DBE subcontractor may only be terminated after receiving the Department's written approval based upon a finding of good cause for the proposed termination and/or substitution. For purposes of this section, good cause shall include the following circumstances:

- (a) The listed DBE subcontractor fails or refuses to execute a written contract;
- (b) The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;
- (c) The listed DBE subcontractor fails or refuses to meet the prime contractor's reasonable, nondiscriminatory bond requirements;
- (d) The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
- (e) The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant to 2 CFR Parts 180, 215 and 1,200 or applicable state law;
- (f) The listed DBE subcontractor is not a responsible contractor;
- (g) The listed DBE voluntarily withdraws from the project and provides written notice of withdrawal;
- (h) The listed DBE is ineligible to receive DBE credit for the type of work required;
- (i) A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the contract;
- (j) Other documented good cause that compels the termination of the DBE subcontractor. Provided, that good cause does not exist if the prime contractor seeks to terminate a DBE it relied upon to obtain the contract so that the prime contractor can self-perform the work for which the DBE contractor was engaged or so that the prime contractor can substitute another DBE or non-DBE contractor after contract award.

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).
 - (3) Exception: If the DBE's ineligibility is caused solely by its having exceeded the size standard during the performance of the contract, 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 and overall goal.

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.

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.

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

Failure to Meet Contract Requirements

Failure to meet contract requirements in accordance with Subarticle 102-15(J) of the *2018 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).

RESTRICTIONS ON ITS EQUIPMENT AND SERVICES:

(11-17-20)

SP01 G090

All telecommunications, video or other ITS equipment or services installed or utilized on this project must be in conformance with UNIFORM ADMINISTRATIVE REQUIREMENTS, COST PRINCIPLES, AND AUDIT REQUIREMENTS FOR FEDERAL AWARDS **2 CFR, § 200.216** **Prohibition on certain telecommunications and video surveillance services or equipment.**

USE OF UNMANNED AIRCRAFT SYSTEM (UAS):

(8-20-19)

SP1 G092

The Contractor shall adhere to all Federal, State and Local regulations and guidelines for the use of Unmanned Aircraft Systems (UAS). This includes but is not limited to US 14 CFR Part 107 *Small UAS Rule*, NC GS 15A-300.2 *Regulation of launch and recovery sites*, NC GS 63-95 *Training required for the operation of unmanned aircraft systems*, NC GS 63-96 *Permit required for commercial operation of unmanned aircraft system*, and NCDOT UAS Policy. The required operator certifications include possessing a current Federal Aviation Administration (FAA) Remote Pilot Certificate, a NC UAS Operator Permit as well as operating a UAS registered with the FAA.

Prior to beginning operations, the Contractor shall complete the NCDOT UAS – Flight Operation Approval Form and submit it to the Engineer for approval. All UAS operations shall be approved by the Engineer prior to beginning the operations.

All contractors or subcontractors operating UAS shall have UAS specific general liability insurance to cover all operations under this contract.

The use of UAS is at the Contractor's discretion. No measurement or payment will be made for the use of UAS. In the event that the Department directs the Contractor to utilize UAS, payment will be in accordance with Article 104-7 Extra Work.

EQUIPMENT IDLING GUIDELINES:

(1-19-21)

107

SP1 G096

Exercise reduced fuel consumption and reduced equipment emissions during the construction of all work associated with this contract. Employees engaged in the construction of this project

should turn off vehicles when stopped for more than thirty (30) minutes and off-highway equipment should idle no longer than fifteen (15) consecutive minutes.

These guidelines for turning off vehicles and equipment when idling do not apply to:

1. Idling when queuing.
2. Idling to verify the vehicle is in safe operating condition.
3. Idling for testing, servicing, repairing or diagnostic purposes.
4. Idling necessary to accomplish work for which the vehicle was designed (such as operating a crane, mixing concrete, etc.).
5. Idling required to bring the machine system to operating temperature.
6. Emergency vehicles, utility company, construction, and maintenance vehicles where the engines must run to perform needed work.
7. Idling to ensure safe operation of the vehicle.
8. Idling when the propulsion engine is providing auxiliary power for other than heating or air conditioning. (such as hydraulic systems for pavers)
9. When specific traffic, safety, or emergency situations arise.
10. If the ambient temperature is less than 32 degrees Fahrenheit. Limited idling to provide for the safety of vehicle occupants (e.g. to run the heater).
11. If the ambient temperature is greater than 90 degrees Fahrenheit. Limited idling to provide for the safety of vehicle occupants of off-highway equipment (e.g. to run the air conditioning) no more than 30 minutes.
12. Diesel powered vehicles may idle for up to 30 minutes to minimize restart problems.

Any vehicle, truck, or equipment in which the primary source of fuel is natural gas or electricity is exempt from the idling limitations set forth in this special provision.

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.

CARGO PREFERENCE ACT:

(2-16-16)

Privately owned United States-flag commercial vessels transporting cargoes are subject to the Cargo Preference Act (CPA) of 1954 requirements and regulations found in 46 CFR 381.7. Contractors are directed to clause (b) of 46 CFR 381.7 as follows:

(b) Contractor and Subcontractor Clauses. "Use of United States-flag vessels: The contractor agrees-

" (1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract."

MAINTENANCE OF THE PROJECT:

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

104-10

SP1 G125

Revise the *2018 Standard Specifications* as follows:

Page 1-39, Article 104-10 Maintenance of the Project, line 25, add the following after the first sentence of the first paragraph:

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

Page 1-39, 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 1-39, 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.

COOPERATION BETWEEN CONTRACTORS:

(7-1-95)

105-7

SP1 G133

The Contractor's attention is directed to Article 105-7 of the *2018 Standard Specifications*.

I-5746A / I-5746B (C203867 Mecklenburg) is located adjacent to this project and is currently under construction. C203867 is not anticipated to be complete prior to the letting of this project.

I-5769 (C204511 Mecklenburg) is located in proximity to this project and is currently under construction. C204511 is not anticipated to be complete prior to the letting of this project.

I-6052 / 15BPR.35 (C204237 Mecklenburg) is located adjacent to this project and is anticipated for a March 21, 2023 letting.

P-5705BA / P-5705BB (C204058 Mecklenburg) is located in proximity to this project and is currently under construction. C204058 is not anticipated to be complete prior to the letting of this project.

The Contractor on this project shall cooperate with the Contractor working within or adjacent to the limits of this project to the extent that the work can be carried out to the best advantage of all concerned.

ELECTRONIC BIDDING:

(2-19-19)

101, 102, 103

SP1 G140

Revise the *2018 Standard Specifications* as follows:

Page 1-4, Article 101-3, DEFINITIONS, BID (OR PROPOSAL) *Electronic Bid*, line 1, replace “Bid Express®” with “the approved electronic bidding provider”.

Page 1-15, Subarticle 102-8(B), Electronic Bids, lines 39-40, replace “to Bid Express®” with “via the approved electronic bidding provider”.

Page 1-15, Subarticle 102-8(B)(1), Electronic Bids, line 41, delete “from Bid Express®”

Page 1-17, Subarticle 102-9(C)(2), Electronic Bids, line 21, replace “Bid Express® miscellaneous folder within the .ebs” with “electronic submittal”.

Page 1-29, Subarticle 103-4(C)(2), Electronic Bids, line 32, replace “.ebs miscellaneous data file of Expedite” with “electronic submittal file”

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.

EROSION AND SEDIMENT CONTROL/STORMWATER CERTIFICATION:

(1-16-07) (Rev 12-15-20)

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 and within 24 hours after a rainfall event equal to or greater than 1.0 inch that occurs within a 24 hour period. Additional monitoring may be required at the discretion of Division of Water Resources personnel if the receiving stream is 303(d) listed for turbidity and the project has had documented problems managing turbidity.
 - (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 Certified Designer on the erosion and sediment control/stormwater component of all reclamation plans and if applicable, the certification number of the Level III 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.

PROJECT SPECIAL PROVISIONS**ROADWAY****BURNING RESTRICTIONS:**

(7-1-95)

200, 210, 215

SP2 R05

Open burning is not permitted on any portion of the right-of-way limits established for this project. Do not burn the clearing, grubbing or demolition debris designated for disposal and generated from the project at locations within the project limits, off the project limits or at any waste or borrow sites in this county. Dispose of the clearing, grubbing and demolition debris by means other than burning, according to state or local rules and regulations.

PRICE ADJUSTMENT - ASPHALT BINDER FOR PLANT MIX:

(11-21-00)

620

SP6 R25

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

The base price index for asphalt binder for plant mix is **\$ 507.27** per ton.

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

FINAL SURFACE TESTING NOT REQUIRED:

(5-18-04) (Rev. 2-16-16)

610

SP6 R45

Final surface testing is not required on this project in accordance with Section 610-13, *Final Surface Testing and Acceptance*.

MILLING ASPHALT PAVEMENT:

(1-15-19)

607

SP6 R59

Revise the *2018 Standard Specifications* as follows:

Page 6-5, Article 607-2, EQUIPMENT, lines 14-16, delete the seventh sentence of this Article and replace with the following:

Use either a non-contacting laser or sonar type ski system with a minimum of three referencing stations mounted on the milling machine at a length of at least 24 feet.

FINE MILLING:

(8-9-13) (REV. 2-8-19) Div.10

607

SPI 6-17

Description

This work includes fine milling of existing asphalt concrete pavement a depth of 5/8" as indicated in the Plans and as directed by the Engineer. The fine milled surface shall provide a texture suitable for use as a temporary riding surface on the existing mainline travel lanes until a lift of Ultra-Thin Bonded Wearing course been completed.

Construction Method**(A) Equipment**

Use power-driven, self-propelled fine-milling equipment possessing the size and shape to allow traffic safe passage through areas adjacent to the work. Also, ensure the fine-milling equipment will be:

- (1) Equipped with a cutting mandrel with carbide or equivalent tipped cutting teeth designed for fine-milling (5/16 inch spacing) bituminous pavement full lane width to close tolerances.
- (2) Equipped with grade and slope controls operating from a string line or ski and based on mechanical or sonic operation.
- (3) Capable of removing pavement to an accuracy of 3/8 in.
- (4) Furnished with a lighting system for night work, as necessary.
- (5) Provided with conveyors capable of side, rear, or front loading to transfer the milled material from the roadway to a truck.

(B) Fine Milling Operation

Follow the Plans to fine-mill the designated areas and depths, as required. Ensure the following requirements are met:

- (1) Ensure fine-milling methods produce a uniform finished surface and maintain a constant cross slope between extremities in each lane.
- (2) Provide positive drainage to prevent water accumulation on the fine-milled pavement, as shown on the Plans or directed by the Engineer.
- (3) Bevel back the longitudinal vertical edges greater than 2 inch produced by the removal process and left exposed to traffic. Bevel the vertical edges back at least 3 inch for each 2 inch of material removed. Use an attached mold board or other approved method.
- (4) Taper the transverse edges 10 feet to avoid creating a traffic hazard and to produce a smooth surface when removing material at ramp areas and ends of milled sections.
- (5) Protect with a temporary asphaltic concrete tie-in (paper joint) vertical edges at other areas such as bridge approach slabs, drainage structures, and utility appurtenances greater than 1/2 inch areas left open to transversing vehicles. Place the temporary tie-in at taper rate of at least 6 to 1 horizontal to vertical distance.

- (6) Remove dust, residue, and loose milled material from the fine-milled surface. Do not allow traffic on the milled surface and do not place asphaltic concrete on the milled surface until removal is complete.

(C) Quality Acceptance

Provide a fine-milled test section of a minimum of 400 feet in length for approval by the Engineer to ensure the fine milling operation provides a surface texture suitable as a temporary riding surface using a fine milling drum with adequate bit spacing and wrap configuration and proper forward cutting speed.

Ensure the fine-milling operation produces a uniform pavement texture true to line, grade, and cross section.

Fine-mill additional depth to eliminate excessive scabbing of the in place material as directed by the Engineer.

Fine-milled pavement surfaces are subject to visual and straightedge inspections. Ensure a 10 ft. straightedge is kept at the fine-milling operation to measure surface irregularities of the milled pavement surface.

Ensure the cross slope is uniform and no depressions or slope misalignments greater than 1/4 inch per 12 foot exist when the slope is tested with a straightedge placed perpendicular to the center line.

Measurement and Payment

Fine Milling will be measured and paid as the actual number of square yards of pavement surface milled in accordance with this Specification. In measuring this quantity, the length will be the actual length milled, measured along the pavement surface. The width will be the width required by the plans or directed, measured along the pavement surface. Such price and payment will be full compensation for furnishing equipment, fine-milling, hauling, stockpiling milled material, and satisfactorily performing the work.

Payment will be made under:

Pay Item

Fine Milling 5/8" Depth

Pay Unit

Square Yard

RESURFACING EXISTING BRIDGES:

(7-1-95) (Rev. 8-21-12)

SP6 R61AR

The Contractor's attention is directed to the fact that he will be required to resurface the bridges on this project if directed by the Engineer.

Place the surface so as to follow a grade line set by the Engineer with the minimum thickness as shown on the sketch herein or as directed by the Engineer. State Forces will make all necessary repairs to the bridge floors prior to the time that the Contractor places the proposed surfacing. Give

the Engineer at least 15 days' notice prior to the expected time to begin operations so that State Forces will have sufficient time to complete their work.

At all bridges that are not to be resurfaced, taper out the proposed resurfacing layer adjacent to the bridges to insure a proper tie-in with the bridge surface.

ULTRA-THIN BONDED WEARING COURSE:

(1-15-19)

661

SP6 R64

Revise the *2018 Standard Specifications* as follows:

Page 6-49, Article 661-4, CONSTRUCTION METHODS, lines 25-28, delete the third sentence of this Sub-article and replace with the following:

Unless otherwise specified, use a mobile grade reference system capable of averaging the existing grade or pavement profile over at least a 30 feet distance; or by non-contacting laser or sonar type ski with at least three referencing stations mounted on the paver at a minimum length of 24 feet.

Page 6-50, Article 661-4, CONSTRUCTION METHODS, line 9, delete the word “four” and replace with “three”.

ASPHALT CONCRETE PLANT MIX PAVEMENTS:

(2-20-18) (Rev.1-15-19)

610, 1012

SP6 R65

Revise the *2018 Standard Specifications* as follows:

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

Mix Property	Limits of Precision
25.0 mm sieve (Base Mix)	± 10.0%
19.0 mm sieve (Base Mix)	± 10.0%
12.5 mm sieve (Intermediate & Type P-57)	± 6.0%
9.5 mm sieve (Surface Mix)	± 5.0%
4.75 mm sieve (Surface Mix)	± 5.0%
2.36 mm sieve (All Mixes, except S4.75A)	± 5.0%
1.18 mm sieve (S4.75A)	± 5.0%
0.075 mm sieve (All Mixes)	± 2.0%
Asphalt Binder Content	± 0.5%
Maximum Specific Gravity (G_{mm})	± 0.020
Bulk Specific Gravity (G_{mb})	± 0.030
TSR	± 15.0%
QA retest of prepared QC Gyratory Compacted Volumetric Specimens	± 0.015
Retest of QC Core Sample	± 1.2% (% Compaction)
Comparison QA Core Sample	± 2.0% (% Compaction)

QA Verification Core Sample	± 2.0% (% Compaction)
Density Gauge Comparison of QC Test	± 2.0% (% Compaction)
QA Density Gauge Verification Test	± 2.0% (% Compaction)

Page 6-17, Table 610-1, MIXING TEMPERATURE AT THE ASPHALT PLANT, replace with the following:

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

Page 6-17, Subarticle 610-3(C), Job Mix Formula (JMF), lines 38-39, delete the fourth paragraph.

Page 6-18, Subarticle 610-3(C), Job Mix Formula (JMF), line 12, replace “SF9.5A” with “S9.5B”.

Page 6-18, Table 610-3, MIX DESIGN CRITERIA, replace with the following:

Mix Type	Design ESALs millions ^A	Binder PG Grade	Compaction Levels		Max. Rut Depth (mm)	Volumetric Properties ^B			
			G _{mm} @			VMA % Min.	VTM %	VFA Min.-Max.	%G _{mm} @ N _{ini}
			N _{ini}	N _{des}					
S4.75A	< 1	64 - 22	6	50	11.5	16.0	4.0 - 6.0	65 - 80	≤ 91.5
S9.5B	0 - 3	64 - 22	6	50	9.5	16.0	3.0 - 5.0	70 - 80	≤ 91.5
S9.5C	3 - 30	64 - 22	7	65	6.5	15.5	3.0 - 5.0	65 - 78	≤ 90.5
S9.5D	> 30	76 - 22	8	100	4.5	15.5	3.0 - 5.0	65 - 78	≤ 90.0
I19.0C	ALL	64 - 22	7	65	-	13.5	3.0 - 5.0	65 - 78	≤ 90.5
B25.0C	ALL	64 - 22	7	65	-	12.5	3.0 - 5.0	65 - 78	≤ 90.5
Design Parameter					Design Criteria				
All Mix Types	Dust to Binder Ratio (P _{0.075} / P _{bc})				0.6 - 1.4 ^C				
	Tensile Strength Ratio (TSR) ^D				85% Min. ^E				

A. Based on 20 year design traffic.

B. Volumetric Properties based on specimens compacted to N_{des} as modified by the Department.

C. Dust to Binder Ratio (P_{0.075} / P_{bc}) for Type S4.75A is 1.0 - 2.0.

D. NCDOT-T-283 (No Freeze-Thaw cycle required).

E. TSR for Type S4.75A & B25.0C mixes is 80% minimum.

Page 6-19, Table 610-5, BINDER GRADE REQUIREMENTS (BASED ON RBR%), replace with the following:

Mix Type	%RBR ≤ 20%	21% ≤ %RBR ≤ 30%	%RBR ≥ 30%
S4.75A, S9.5B, S9.5C, I19.0C, B25.0C	PG 64-22	PG 64-22 ^A	PG-58-28
S9.5D, OGFC	PG 76-22 ^B	n/a	n/a

- A. If the mix contains any amount of RAS, the virgin binder shall be PG 58-28.
- B. Maximum Recycled Binder Replacement (%RBR) is 18% for mixes using PG 76-22 binder.

Page 6-20, Table 610-6, PLACEMENT TEMPERATURES FOR ASPHALT, replace with the following:

TABLE 610-6 PLACEMENT TEMPERATURES FOR ASPHALT	
Asphalt Concrete Mix Type	Minimum Surface and Air Temperature
B25.0C	35°F
I19.0C	35°F
S4.75A, S9.5B, S9.5C	40°F ^A
S9.5D	50°F

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

Page 6-21, Article 610-8, SPREADING AND FINISHING, lines 34-35, delete the second sentence and replace with the following:

Use an MTV for all surface mix regardless of binder grade on Interstate, US Routes, and NC Routes (primary routes) that have 4 or more lanes and median divided.

Page 6-21, Article 610-8, SPREADING AND FINISHING, lines 36-38, delete the fourth sentence and replace with the following:

Use MTV for all ramps, loops, Y-line that have 4 or more lanes and are median divided, full width acceleration lanes, full width deceleration lanes, and full width turn lanes that are greater than 1000 feet in length.

Page 6-23, Table 610-7, DENSITY REQUIREMENTS, replace with the following:

TABLE 610-7 DENSITY REQUIREMENTS	
Mix Type	Minimum % G_{mm} (Maximum Specific Gravity)
S4.75A	85.0 ^A
S9.5B	90.0
S9.5C, S9.5D, I19.0C, B25.0C	92.0

- A. Compaction to the above specified density will be required when the S4.75A mix is applied at a rate of 100 lbs/sy or higher.

Page 6-24, Article 610-13, FINAL SURFACE TESTING, lines 35-36, delete the second sentence and replace with the following:

Final surface testing is not required on ramps, loops and turn lanes.

Page 6-26, Subarticle 610-13(A)(1), Acceptance for New Construction, lines 29-30, delete the second sentence and replace with the following:

Areas excluded from testing by the profiler may be tested using a 10-foot straightedge in accordance with Article 610-12.

Page 6-27, Subarticle 610-13(B), Option 2- North Carolina Hearne Straightedge, lines 41-46, delete the eighth and ninth sentence of this paragraph and replace with the following:

Take profiles over the entire length of the final surface travel lane pavement exclusive of structures, approach slabs, paved shoulders, tapers, or other irregular shaped areas of pavement, unless otherwise approved by the Engineer. Test in accordance with this provision all mainline travel lanes, full width acceleration or deceleration lanes and collector lanes.

Page 6-28, Subarticle 610-13(B), Option 2- North Carolina Hearne Straightedge, lines 1-2, delete these two lines.

Page 6-32, Article 610-16 MEASUREMENT AND PAYMENT, replace with the following:

Pay Item	Pay Unit
Asphalt Concrete Base Course, Type B25.0C	Ton
Asphalt Concrete Intermediate Course, Type I19.0C	Ton
Asphalt Concrete Surface Course, Type S4.75A	Ton
Asphalt Concrete Surface Course, Type S9.5B	Ton
Asphalt Concrete Surface Course, Type S9.5C	Ton
Asphalt Concrete Surface Course, Type S9.5D	Ton

Page 10-30, Table 1012-1, AGGREGATE CONSENSUS PROPERTIES, replace with the following:

**TABLE 1012-1
AGGREGATE CONSENSUS PROPERTIES^A**

Mix Type	Coarse Aggregate Angularity^B	Fine Aggregate Angularity % Minimum	Sand Equivalent % Minimum	Flat and Elongated 5 : 1 Ratio % Maximum
<i>Test Method</i>	<i>ASTM D5821</i>	<i>AASHTO T 304</i>	<i>AASHTO T 176</i>	<i>ASTM D4791</i>
S4.75A; S9.5B	75 / -	40	40	-
S9.5C; I19.0C; B25.0C	95 / 90	45	45	10
S9.5D	100 / 100	45	50	10
OGFC	100 / 100	45	45	10
UBWC	100 / 85	45	45	10

A. Requirements apply to the design aggregate blend.

B. 95 / 90 denotes that 95% of the coarse aggregate has one fractured face and 90% has 2 or more fractured faces.

JOINT CONSTRUCTION, REPAIR AND SEALING:

(4-15-08) (Rev 3-20-18)

SPI 7-12A

Description

Saw existing backer rods joints, saw existing sawed joints, remove existing deteriorated backer rods and clean and seal joints with Low Modulus Silicone in accordance with the detail in the plans and the manufacturer's recommendations. Also, repair and reseal existing joints with Low Modulus Silicone, form joints in slab replacements and seal with Low Modulus Silicone in accordance with Standard Drawing No. 700.01.

Materials

Low Modulus Silicone Sealant shall meet the requirements of Section 1028-3(A) of the *Standard Specifications* for Low Modulus Silicone Sealant; and shall be on the Department's approved product listing that is being evaluated by National Transportation Product Evaluation Program (NTPEP).

Construction

Have on-site, a manufacturer's representative during the initial start-up. This requirement will be suspended once the Engineer determines that the installation process is working smoothly.

Saw and seal pavement joints, and form control joints in one lane at a time.

Saw and seal joints at locations shown on the plans or as directed by the Engineer.

Saw and seal the centerline longitudinal joint according to Standard Drawing No. 700.01.

Form control joints in the proposed replacement slabs according to the spacing and dimensions as shown on the plans. Form the control joints by sawing with an approved concrete saw. Saw as soon as the concrete has hardened sufficiently without spalling or raveling, but before the lane is reopened to traffic, and not more than 6 hours after the concrete is placed.

Equip air compressors for cleaning joints with suitable traps capable of removing all surplus water and oil in the compressed air. The Engineer will check the compressed air daily for contamination. Do not use contaminated air.

Cleaning and sealing shall be as follows:

(A) Cleaning Freshly Cut Sawed Joints

Immediately after sawing the joint, completely remove the resulting slurry from the joint and the immediate area by flushing with a jet of water under pressure, and other tools as necessary. After flushing, blow out the joint with compressed air. After the surfaces are thoroughly clean and dry and just before the joint sealer is placed, blow out the joint with compressed air having a pressure of at least 90 psi and remove all traces of dust. If freshly cut sawed joints become contaminated before they are sealed, clean as many times as necessary with cleaning methods approved by the Engineer.

(B) Installing Backup Material

When required, install closed cell, expanded polyethylene foam rod type backup material in a manner that will produce the shape factor specified. If the sealant bonds to the backup material, a bond-breaking type may be required.

(C) Taping Expansion Joints

When the joints have been cleaned and are thoroughly dry, place bond-breaking adhesive tape on top of the joint material or backup material to prevent any bonding action between the bottom of the joint sealer and the top of underlying material. The tape shall completely cover the top of the underlying material, but at no place shall the tape be allowed to adhere to the sides of the joint.

(D) Sealing Joints Requirements

- (1) Place joint sealer in accordance with the manufacturer's recommendations and these Specifications. Do not place silicone joint sealer when the air temperature near the joint is less than 50°F or is 50°F and falling or between October 15 and May 1, unless otherwise directed by the Engineer.
- (2) Filling the Joint: Do not seal a joint until the seal is thoroughly clean and dry, and properly taped, if taping is required. Place the sealer in reasonably close conformity with dimensions shown on the plans. The joints will be rejected for any unreasonable deviation until satisfactory corrective measures are taken.

Apply the joint sealer by an approved mechanical device or by manually pouring or troweling, depending upon the consistency used. When applied mechanically or by pouring, a nozzle or pouring spout shall be shaped to fit inside the joint to introduce the sealer from inside the joint. Pouring consistency shall be used in horizontal joints, and troweling consistency shall be used in vertical joints, unless the pouring consistency is such that it can be satisfactorily placed in vertical joints.

Recess the joint sealer below the adjacent surface as shown in Standard Drawing No. 700.01.

If the joint material fails in either adhesion or cohesion, the joint shall be repaired to the Engineer's satisfaction at the Contractor's expense.

- (3) Special Requirements for Installation of Low Modulus Silicone Sealant: The sealant shall be applied or tooled in a manner which causes it to wet the joint faces and provide the required recess.
- (4) Cleaning Pavement: Promptly remove surplus joint sealer on the pavement after a joint has been sealed so that the joint sealer is not exposed to direct contact with traffic.

(E) Opening to Traffic

Do not permit traffic over sealed joints without the approval of the Engineer.

Measurement and Payment

Joint Construction, Repair and Sealing will be measured and paid for at the contract unit price of the actual number of linear feet of joints, which are satisfactorily constructed, repaired and sealed. The length will be measured along the joints that have been constructed or repaired and sealed. Such price and payment will be full compensation for this work, including but not limited to removal and disposal of existing joint sealant and backer rod, preparation of joints, and furnishing all labor, tools, materials, and supplies, tools equipment and incidentals needed to complete the work.

Payment will be made under:

Pay Item

Joint Construction, Repair and Sealing

Pay Unit

Linear Foot

SUPPLEMENTAL SURVEYING:

(4-20-21)

801

SP8 R03

Revise the *2018 Standard Specifications* as follows:

Page 8-7, Article 801-3 MEASUREMENT AND PAYMENT, lines 10-11, replace with the following:

Supplemental Surveying Office Calculations will be paid at the stated price of \$85.00 per hour. *Supplemental Field Surveying* will be paid at the stated price of \$145.00 per hour. The

GUARDRAIL END UNITS, TYPE - TL-3:

(4-20-04) (Rev. 7-1-17)

862

SP8 R65

Description

Furnish and install guardrail end units in accordance with the details in the plans, the applicable requirements of Section 862 of the *2018 Standard Specifications*, and at locations shown in the plans.

Materials

Furnish guardrail end units listed on the NCDOT [Approved Products List](https://apps.dot.state.nc.us/vendor/approvedproducts/) at <https://apps.dot.state.nc.us/vendor/approvedproducts/> or approved equal.

Prior to installation the Contractor shall submit to the Engineer:

- (A) FHWA acceptance letter for each guardrail end unit certifying it meets the requirements of the AASHTO Manual for Assessing Safety Hardware, Test Level 3, in accordance with Article 106-2 of the *2018 Standard Specifications*.

- (B) Certified working drawings and assembling instructions from the manufacturer for each guardrail end unit in accordance with Article 105-2 of the *2018 Standard Specifications*.

No modifications shall be made to the guardrail end 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 *2018 Standard Specifications* and is incidental to the cost of the guardrail end unit.

Measurement and Payment

Measurement and payment will be made in accordance with Article 862-6 of the *2018 Standard Specifications*.

Payment will be made under:

Pay Item

Guardrail End Units, Type TL-3

Pay Unit

Each

GUARDRAIL ANCHOR UNITS AND TEMPORARY GUARDRAIL ANCHOR UNITS:

(1-16-2018)

862

SP8 R70

Guardrail anchor units will be in accordance with the details in the plans and the applicable requirements of Section 862 of the *2018 Standard Specifications*.

Revise the *2018 Standard Specifications* as follows:

Page 8-42, Article 862-6 MEASUREMENT AND PAYMENT, add the following:

Guardrail Anchor Units, Type ___ and Temporary Guardrail Anchor Units Type ___ will be measured and paid as units of each completed and accepted. No separate measurement will be made of any rail, terminal sections, posts, offset blocks, concrete, hardware or any other components of the completed unit that are within the pay limits shown in the plans for the unit as all such components will be considered to be part of the unit.

Payment will be made under:

Pay Item

Guardrail Anchor Units, Type _____
Temporary Guardrail Anchor Units, Type ____

Pay Unit

Each
Each

ADJUSTMENT OF MANHOLES, METER BOXES, AND VALVE BOXES:

(7-1-95) (Rev. 8-21-12)

858

SP8 R97R

The Contractor's attention is directed to Article 858-3 of the *2018 Standard Specifications*. Cast iron or steel fittings will not be permitted for the adjustment of manholes, meter boxes, and valve boxes on this project.

PORTLAND CEMENT CONCRETE PRODUCTION AND DELIVERY:

(9-15-20)

1000, 1014, 1024

SP10 R01

Revise the *2018 Standard Specifications* as follows:

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

TABLE 1000-1 REQUIREMENTS FOR CONCRETE											
Class of Concrete	Min. Compressive Strength at 28 days	Maximum Water-Cement Ratio				Consistency Maximum Slump		Cement Content			
		Air-Entrained Concrete		Non-Air-Entrained Concrete		Vibrated	Non-Vibrated	Vibrated		Non-Vibrated	
		Rounded Aggregate	Angular Aggregate	Rounded Aggregate	Angular Aggregate			Min.	Max.	Min.	Max.
		<i>Units</i>	<i>psi</i>					<i>inch</i>	<i>inch</i>	<i>lb/cy</i>	<i>lb/cy</i>
AA	4500	0.381	0.426	---	---	3.5 ^A	---	639	715	---	---
AA Slip Form	4500	0.381	0.426	---	---	1.5	---	639	715	---	---
Drilled Pier	4500	---	---	0.450	0.450	---	5 - 7 dry 7 - 9 wet	---	---	640	800
A	3000	0.488	0.532	0.550	0.594	3.5 ^A	4.0	564	---	602	---
B	2500	0.488	0.567	0.559	0.630	1.5 machine placed 2.5 ^A hand placed	4.0	508	---	545	---
Sand Light-weight	4500	---	0.420	---	---	4.0 ^A	---	715	---	---	---
Latex Modified	3000 (at 7 days)	0.400	0.400	---	---	6.0	---	658	---	---	---
Flowable Fill excavatable	150 max. (at 56 days)	as needed	as needed	as needed	as needed	---	Flowable	---	---	40	100
Flowable Fill non-excavatable	125	as needed	as needed	as needed	as needed	---	Flowable	---	---	100	as needed

Pavement	4500 Design, field 650 flexural, design only	0.559	0.559	---	---	1.5 slip form 3.0 hand placed	---	526	---	---	---
Precast	See Table 1077-1	as needed	as needed	---	---	6.0	as needed	as needed	as needed	as needed	as needed
Prestressed	per contract	See Table 1078-1	See Table 1078-1	---	---	8.0	---	564	as needed	---	---

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

THERMOPLASTIC PAVEMENT MARKING MATERIAL – COLOR TESTING:

3-19-19

1087

SP10 R05

Revise the *2018 Standard Specifications* as follows:

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

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

POLYUREA PAVEMENT MARKING MATERIAL – TYPE 2 TYPICAL CERTIFIED MILL TEST REPORT:

3-19-19

1087

SP10 R06

Amend the *2018 Standard Specifications* as follows:

Page 10-184, Subarticle 1087-8 Material Certification, in accordance with Subarticle 106-3 provide a Type 2 Typical Certified Mill Test Report and a Type 3 Manufacturer’s Certification for Polyurea pavement marking material.

When tested, the material shall meet the physical and chemical characteristics provided by the manufacturer. NCDOT reserves the right to compare these test results to baseline test results gathered by the NCDOT Materials and Test Unit.

NON-CAST IRON SNOWPLOWABLE PAVEMENT MARKERS:

10-19-21

1086, 1250, 1253

SP10 R08

Revise the *2018 Standard Specifications* as follows:

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

(A) General

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

(B) Housings

(1) Dimensions

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

(2) Materials

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

(3) Surface

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

(4) Identification

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

(C) Reflectors

(1) General

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

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

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

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

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

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

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

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

(A) General

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

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

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

(B) Reflector Replacement

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

Missing housings shall be replaced. Broken housings shall be removed and replaced. In both cases the slot for the housings shall be properly prepared prior to installing the new housing. Removal of broken housings and preparation of slots will be considered incidental to the work of replacing housings.

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

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

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

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

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

Payment will be made under:

Pay Item	Pay Unit
Non-Cast Iron Snowplowable Pavement Marker	Each
Replace Snowplowable Pavement Marker Reflector	Each

MATERIALS FOR PORTLAND CEMENT CONCRETE:

(9-15-20)

1000, 1024

SP10 R24

Revise the *2018 Standard Specifications* as follows:

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

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

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

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

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

WORK ZONE INSTALLER:

(7-20-21)

1101, 1150

SP11 R04

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

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

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

installation and removal of temporary traffic control.

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

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

EXTRUDED THERMOPLASTIC PAVEMENT MARKING THICKNESS:

3-19-19

1205

SP12 R05

Revise the *2018 Standard Specifications* as follows:

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

Use application equipment that provides multiple width settings ranging from 4 inches to 12 inches and multiple thickness settings to achieve a minimum pavement marking thickness of 0.090 inch above the surface of the pavement.

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

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

COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE II (9"):

(5-1-16)

Div 10

Description

The Contractor shall install Cold Applied Plastic Pavement Marking Lines, Type II (9") in accordance with the applicable requirements of Section 1205 of the *2018 Standard Specifications*, and as directed by the Engineer. This line shall be a 10' skip with a contrast White/Black line. The white line shall be a 6" wide with a 1.5" black border on each side. Any alteration to this design must be approved by the Engineer prior to installation.

Materials

Refer to Article 1205-6 of the *2018 Standard Specifications*.

Measurement and Payment

Contrast Cold Applied Plastic Pavement Marking Lines, Type II (9") will be measured and paid for as the actual number of linear feet of pavement marking lines satisfactorily placed and accepted by the Engineer. Such price and payment will include all materials, tools, labor, equipment and incidentals necessary to satisfactorily complete the work.

Payment will be made under:

Pay Item	Pay Unit
Contrast Cold Applied Plastic Pavement Marking Lines, Type II (9")	Linear Foot

EROSION AND STORMWATER CONTROL FOR SHOULDER CONSTRUCTION AND RECONSTRUCTION:

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

105-16, 225-2, Division 16

SP16 R03R

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

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

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

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

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

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

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

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

STANDARD SPECIAL PROVISION
AVAILABILITY OF FUNDS – TERMINATION OF CONTRACTS

(5-20-08)

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(D) of the *2018 Standard Specifications*.

STANDARD SPECIAL PROVISION
NCDOT GENERAL SEED SPECIFICATION FOR SEED QUALITY

(5-17-11)

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 Crotalaria, Smooth Crotalaria, Sicklepod, 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:

<u>Restricted Noxious Weed</u>	<u>Limitations per Lb. Of Seed</u>	<u>Restricted Noxious Weed</u>	<u>Limitations per Lb. of Seed</u>
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)	Bermudagrass
Kobe Lespedeza	Browntop Millet
Korean Lespedeza	German Millet – Strain R
Weeping Lovegrass	Clover – Red/White/Crimson
Carpetgrass	

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	Japanese Millet
Crownvetch	Reed Canary Grass
Pensacola Bahiagrass	Zoysia
Creeping Red Fescue	

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**

(10-16-18) (Rev.2-16-21)

Z-4

Revise the *2018 Standard Specifications* as follows:

Division 6

Page 6-7, Article 609-1 DESCRIPTION, line 29, replace article number “609-10” with “609-9”.

Division 7

Page 7-27, Article 725-1 MEASUREMENT AND PAYMENT, line 4, replace article number “725-1” with “724-4”.

Page 7-28, Article 725-1 MEASUREMENT AND PAYMENT, line 10, replace article number “725-1” with “725-3”.

Division 10

Page 10-78, Article 1056-4 GEOTEXTILES, TABLE 1056-1, Permittivity, Type 2, replace “Table 6^D” with “Table 7^D” and **Permittivity, Type 3^B,** replace “Table 7^D” with “Table 8^D”.

Page 10-121, Article 1076-7, REPAIR OF GALVANIZING, line 8, replace article number “1080-9” with “1080-7”.

Page 10-162, Article 1080-50 PAINT FOR VERTICAL MARKERS, line 1, replace article number “1080-50” with “1080-10”.

Page 10-162, Article 1080-61 EPOXY RESIN FOR REINFORCING STEEL, line 5, replace article number “1080-61” with “1080-11”.

Page 10-162, Article 1080-72 ABRASIVE MATERIALS FOR BLAST CLEANING STEEL, line 22, replace article number “1080-72” with “1080-12”.

Page 10-163, Article 1080-83 FIELD PERFORMANCE AND SERVICES, line 25, replace article number “1080-83” with “1080-13”.

Division 17

Page 17-15, Article 1715-4 MEASUREMENT AND PAYMENT, lines 42-44, replace the second sentence with the following:

An example is an installation of a single 1.25 inch HDPE conduit would be paid as:

Directional Drill (1)(1.25”) Linear Foot

STANDARD SPECIAL PROVISION**PLANT AND PEST QUARANTINES****(Imported Fire Ant, Gypsy Moth, Witchweed, Emerald Ash Borer, Guava Root Knot Nematode, And Other Noxious Weeds)**

(3-18-03) (Rev. 5-21-19)

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, 919-707-3730, or <https://www.ncagr.gov/plantindustry/Plant/quaran/table2.htm> 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, emerald ash borer, guava root knot nematode, or other noxious weeds.

STANDARD SPECIAL PROVISION**TITLE VI AND NONDISCRIMINATION:**

(6-28-77)(Rev 6/19/2018)

Z-6

Revise the *2018 Standard Specifications* as follows:

Replace Article 103-4(B) with the following:

The North Carolina Department of Transportation is committed to carrying out the U.S. Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts.

The provisions of this section related to United States Department of Transportation (US DOT) Order 1050.2A, Title 49 Code of Federal Regulations (CFR) part 21, 23 United States Code (U.S.C.) 140 and 23 CFR part 200 (or 49 CFR 303, 49 U.S.C. 5332 or 49 U.S.C. 47123) are applicable to all North Carolina Department of Transportation (NCDOT) contracts and to all related subcontracts, material supply, engineering, architectural and other service contracts, regardless of dollar amount. Any Federal provision that is specifically required not specifically set forth is hereby incorporated by reference.

(1) **Title VI Assurances (USDOT Order 1050.2A, Appendix A)**

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

(a) Compliance with Regulations

The contractor (hereinafter includes consultants) shall comply with the Acts and the Regulations relative to Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

(b) Nondiscrimination

The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

(c) Solicitations for Subcontractors, Including Procurements of Materials and Equipment

In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Nondiscrimination on the grounds of race, color, or national origin.

(d) Information and Reports

The contractor shall provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the FHWA to be pertinent to ascertain compliance with such Acts,

Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor shall so certify to the Recipient or the FHWA, as appropriate, and shall set forth what efforts it has made to obtain the information.

(e) Sanctions for Noncompliance:

In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it and/or the FHWA may determine to be appropriate, including, but not limited to:

- (i) Withholding payments to the contractor under the contract until the contractor complies; and/or
- (ii) Cancelling, terminating, or suspending a contract, in whole or in part.

(f) Incorporation of Provisions

The contractor shall include the provisions of paragraphs (a) through (f) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor shall take action with respect to any subcontract or procurement as the Recipient or the FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

(2) **Title VI Nondiscrimination Program (23 CFR 200.5(p))**

The North Carolina Department of Transportation (NCDOT) has assured the USDOT that, as a condition to receiving federal financial assistance, NCDOT will comply with Title VI of the Civil Rights Act of 1964 and all requirements imposed by Title 49 CFR part 21 and related nondiscrimination authorities to ensure that no person shall, on the ground of race, color, national origin, limited English proficiency, sex, age, or disability (including religion/creed or income-level, where applicable), be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any programs, activities, or services conducted or funded by NCDOT. Contractors and other organizations under contract or agreement with NCDOT must also comply with Title VI and related authorities, therefore:

(a) During the performance of this contract or agreement, contractors (e.g., subcontractors, consultants, vendors, prime contractors) are responsible for complying with NCDOT's Title VI Program. Contractors are not required to prepare or submit Title VI Programs. To comply with this section, the prime contractor shall:

1. Post NCDOT's Notice of Nondiscrimination and the Contractor's own Equal Employment Opportunity (EEO) Policy in conspicuous locations accessible to all employees, applicants and subcontractors on the jobsite.
2. Physically incorporate the required Title VI clauses into all subcontracts on federally-assisted and state-funded NCDOT projects, and ensure inclusion by subcontractors into all lower-tier subcontracts.
3. Required Solicitation Language. The Contractor shall include the following notification in all solicitations for bids and requests for work or material, regardless of funding source:

“The North Carolina Department of Transportation, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§

2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award. In accordance with other related nondiscrimination authorities, bidders and contractors will also not be discriminated against on the grounds of sex, age, disability, low-income level, creed/religion, or limited English proficiency in consideration for an award.”

4. Physically incorporate the FHWA-1273, in its entirety, into all subcontracts and subsequent lower tier subcontracts on Federal-aid highway construction contracts only.
 5. Provide language assistance services (i.e., written translation and oral interpretation), free of charge, to LEP employees and applicants. Contact NCDOT OCR for further assistance, if needed.
 6. For assistance with these Title VI requirements, contact the NCDOT Title VI Nondiscrimination Program at 1-800-522-0453.
- (b) Subrecipients (e.g. cities, counties, LGAs, planning organizations) may be required to prepare and submit a Title VI Plan to NCDOT, including Title VI Assurances and/or agreements. Subrecipients must also ensure compliance by their contractors and subrecipients with Title VI. (23 CFR 200.9(b)(7))
- (c) If reviewed or investigated by NCDOT, the contractor or subrecipient agrees to take affirmative action to correct any deficiencies found within a reasonable time period, not to exceed 90 calendar days, unless additional time is granted by NCDOT. (23 CFR 200.9(b)(15))
- (d) The Contractor is responsible for notifying subcontractors of NCDOT’s External Discrimination Complaints Process.
1. Applicability
Title VI and related laws protect participants and beneficiaries (e.g., members of the public and contractors) from discrimination by NCDOT employees, subrecipients and contractors, regardless of funding source.
 2. Eligibility
Any person—or class of persons—who believes he/she has been subjected to discrimination based on race, color, national origin, Limited English Proficiency (LEP), sex, age, or disability (and religion in the context of employment, aviation, or transit) may file a written complaint. The law also prohibits intimidation or retaliation of any sort.
 3. Time Limits and Filing Options
Complaints may be filed by the affected individual(s) or a representative and must be filed no later than 180 calendar days after the following:
 - (i) The date of the alleged act of discrimination; or
 - (ii) The date when the person(s) became aware of the alleged discrimination; or
 - (iii) Where there has been a continuing course of conduct, the date on which that conduct was discontinued or the latest instance of the conduct.Title VI and related discrimination complaints may be submitted to the following entities:

- North Carolina Department of Transportation, Office of Civil Rights, Title VI Program, 1511 Mail Service Center, Raleigh, NC 27699-1511; toll free 1-800-522-0453
 - Federal Highway Administration, North Carolina Division Office, 310 New Bern Avenue, Suite 410, Raleigh, NC 27601, 919-747-7010
 - US Department of Transportation, Departmental Office of Civil Rights, External Civil Rights Programs Division, 1200 New Jersey Avenue, SE, Washington, DC 20590; 202-366-4070
4. Format for Complaints
Complaints must be in writing and signed by the complainant(s) or a representative, and include the complainant's name, address, and telephone number. Complaints received by fax or e-mail will be acknowledged and processed. Allegations received by telephone will be reduced to writing and provided to the complainant for confirmation or revision before processing. Complaints will be accepted in other languages, including Braille.
5. Discrimination Complaint Form
Contact NCDOT Civil Rights to receive a full copy of the Discrimination Complaint Form and procedures.
6. Complaint Basis
Allegations must be based on issues involving race, color, national origin (LEP), sex, age, disability, or religion (in the context of employment, aviation or transit). "Basis" refers to the complainant's membership in a protected group category.

**TABLE 103-1
COMPLAINT BASIS**

Protected Categories	Definition	Examples	Applicable Nondiscrimination Authorities
Race and Ethnicity	An individual belonging to one of the accepted racial groups; or the perception, based usually on physical characteristics that a person is a member of a racial group	Black/African American, Hispanic/Latino, Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, White	Title VI of the Civil Rights Act of 1964; 49 CFR Part 21; 23 CFR 200; 49 U.S.C. 5332(b); 49 U.S.C. 47123. <i>(Executive Order 13166)</i>
Color	Color of skin, including shade of skin within a racial group	Black, White, brown, yellow, etc.	
National Origin (<i>Limited English Proficiency</i>)	Place of birth. Citizenship is not a factor. (<i>Discrimination based on language or a person's accent is also covered</i>)	Mexican, Cuban, Japanese, Vietnamese, Chinese	
Sex	Gender. The sex of an individual. <i>Note: Sex under this program does not include sexual orientation.</i>	Women and Men	1973 Federal-Aid Highway Act; 49 U.S.C. 5332(b); 49 U.S.C. 47123.
Age	Persons of any age	21-year-old person	Age Discrimination Act of 1975 49 U.S.C. 5332(b); 49 U.S.C. 47123.
Disability	Physical or mental impairment, permanent or temporary, or perceived.	Blind, alcoholic, para-amputee, epileptic, diabetic, arthritic	Section 504 of the Rehabilitation Act of 1973; Americans with Disabilities Act of 1990

<p>Religion (in the context of employment) <i>(Religion/ Creed in all aspects of any aviation or transit-related construction)</i></p>	<p>An individual belonging to a religious group; or the perception, based on distinguishable characteristics that a person is a member of a religious group. In practice, actions taken as a result of the moral and ethical beliefs as to what is right and wrong, which are sincerely held with the strength of traditional religious views. Note: Does not have to be associated with a recognized religious group or church; if an individual sincerely holds to the belief, it is a protected religious practice.</p>	<p>Muslim, Christian, Sikh, Hindu, etc.</p>	<p>Title VII of the Civil Rights Act of 1964; 23 CFR 230; FHWA-1273 Required Contract Provisions. <i>(49 U.S.C. 5332(b); 49 U.S.C. 47123)</i></p>
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(3) Pertinent Nondiscrimination Authorities

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest agrees to comply with the following non-discrimination statutes and authorities, including, but not limited to:

- (a) Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
- (b) The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- (c) Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex);
- (d) Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability) and 49 CFR Part 27;
- (e) The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);
- (f) Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- (g) The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- (h) Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- (i) The Federal Aviation Administration's Nondiscrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- (j) Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures Nondiscrimination against minority populations by discouraging programs, policies, and activities with

disproportionately high and adverse human health or environmental effects on minority and low-income populations;

- (k) Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of Limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
 - (l) Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).
 - (m) Title VII of the Civil Rights Act of 1964 (42 U.S.C. § 2000e et seq., Pub. L. 88-352), (prohibits employment discrimination on the basis of race, color, religion, sex, or national origin).
- (4) **Additional Title VI Assurances**

***The following Title VI Assurances (Appendices B, C and D) shall apply, as applicable*

- (a) Clauses for Deeds Transferring United States Property (1050.2A, Appendix B)
The following clauses will be included in deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein from the United States pursuant to the provisions of Assurance 4.

NOW, THEREFORE, the U.S. Department of Transportation as authorized by law and upon the condition that the North Carolina Department of Transportation (NCDOT) will accept title to the lands and maintain the project constructed thereon in accordance with the North Carolina General Assembly, the Regulations for the Administration of the Federal-Aid Highway Program, and the policies and procedures prescribed by the Federal Highway Administration of the U.S. Department of Transportation in accordance and in compliance with all requirements imposed by Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. § 2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the NCDOT all the right, title and interest of the U.S. Department of Transportation in and to said lands described in Exhibit A attached hereto and made a part hereof.

(HABENDUM CLAUSE)

TO HAVE AND TO HOLD said lands and interests therein unto the North Carolina Department of Transportation (NCDOT) and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and will be binding on the NCDOT, its successors and assigns.

The NCDOT, in consideration of the conveyance of said lands and interests in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person will on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed [,] [and]* (2) that the NCDOT will use the lands and interests in lands and interests in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations and Acts may be amended [,] and (3) that in the event of breach of any of the above-mentioned nondiscrimination conditions, the Department will have a right to enter or re-enter said lands and facilities on said land, and that above described land and facilities will thereon revert to and vest in and become the absolute property of the U.S. Department of Transportation and its assigns as such interest existed prior to this instruction].*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to make clear the purpose of Title VI.)

(b) Clauses for Transfer of Real Property Acquired or Improved Under the Activity, Facility, or Program (1050.2A, Appendix C)

The following clauses will be included in deeds, licenses, leases, permits, or similar instruments entered into by the North Carolina Department of Transportation (NCDOT) pursuant to the provisions of Assurance 7(a):

1. The (grantee, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add "as a covenant running with the land"] that:
 - (i.) In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a U.S. Department of Transportation activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (grantee, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Acts and Regulations (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.
2. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will have the right to terminate the (lease, license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued. *
3. With respect to a deed, in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the NCDOT and its assigns. *

- (*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)
- (c) Clauses for Construction/Use/Access to Real Property Acquired Under the Activity, Facility or Program (1050.2A, Appendix D)

The following clauses will be included in deeds, licenses, permits, or similar instruments/ agreements entered into by the North Carolina Department of Transportation (NCDOT) pursuant to the provisions of Assurance 7(b):

1. The (grantee, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, "as a covenant running with the land") that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (grantee, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the Acts and Regulations, as amended, set forth in this Assurance.
2. With respect to (licenses, leases, permits, etc.), in the event of breach of any of the above Non-discrimination covenants, the NCDOT will have the right to terminate the (license, permit, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued. *
3. With respect to deeds, in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will there upon revert to and vest in and become the absolute property of the NCDOT and its assigns. *

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

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 for 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

SMSA Areas

Area 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

Goals for Female

Participation 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.
- The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.
 - The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.
10. **Assurance Required by 49 CFR 26.13(b):**
- The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.
 - 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.
- The records kept by the contractor shall document the following:
 - The number and work hours of minority and non-minority group members and women employed in each work classification on the project;
 - The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and
 - The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;
 - 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

- 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> 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 contacting 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 to 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.

* * * * *

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.

* * * * *

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. 4-21-15)

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.\

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 NC20210088 01/01/2021 NC88

Z-088

Date: January 1, 2021

General Decision Number: NC20210088 01/01/2021 NC88

Superseded General Decision Numbers: NC20200088

State: North Carolina

Construction Type: HIGHWAY

COUNTIES:

Alamance	Forsyth	Randolph
Anson	Gaston	Rockingham
Cabarrus	Guilford	Stokes
Chatham	Mecklenburg	Union
Davie	Orange	Yadkin
Durham	Person	

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.95 for calendar year 2021 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.95 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract for calendar year 2021. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR.5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2) – (60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number

0

Publication Date

01/01/2021

SUNC2014-003 11/14/2014

	Rates	Fringes
BLASTER	18.64	
CARPENTER	13.68	.05
CEMENT MASON/CONCRETE FINISHER	13.93	
ELECTRICIAN		
Electrician	18.79	2.72

	Rates	Fringes
Telecommunications Technician	15.19	1.25
IRONWORKER	13.30	
LABORER		
Asphalt Raker and Spreader	12.78	
Asphalt Screed/Jackman	14.50	
Carpenter Tender	12.51	.27
Cement Mason/Concrete Finisher Tender	11.04	
Common or General	10.40	.01
Guardrail/Fence Installer	13.22	
Pipelayer	12.43	
Traffic Signal/Lighting Installer	15.65	.24
PAINTER		
Bridge	23.77	
POWER EQUIPMENT OPERATORS		
Asphalt Broom Tractor	10.00	
Bulldozer Fine	16.13	
Bulldozer Rough	14.36	
Concrete Grinder/Groover	17.92	
Crane Boom Trucks	18.19	
Crane Other	19.83	
Crane Rough/All-Terrain	19.10	
Drill Operator Rock	14.28	
Drill Operator Structure	20.89	
Excavator Fine	16.95	
Excavator Rough	13.63	
Grader/Blade Fine	19.84	
Grader/Blade Rough	15.47	
Loader 2 Cubic Yards or Less	13.31	
Loader Greater Than 2 Cubic Yards	16.19	
Material Transfer Vehicle (Shuttle Buggy)	15.44	
Mechanic	17.51	
Milling Machine	15.22	
Off-Road Hauler/Water Tanker	11.83	
Oiler/Greaser	14.16	
Pavement Marking Equipment	12.05	
Paver Asphalt	15.97	
Paver Concrete	18.20	
Roller Asphalt Breakdown	12.79	
Roller Asphalt Finish	13.76	
Roller Other	12.08	
Scraper Finish	12.65	
Scraper Rough	11.50	
Slip Form Machine	19.60	
Tack Truck/Distributor Operator	14.82	
TRUCK DRIVER		
GVWR of 26,000 Lbs or Less	11.45	
GVWR of 26,001 Lbs or Greater	13.57	.03

Welders – Receive rate prescribed for craft performing operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any

solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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 a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 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. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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

STRUCTURAL FOAM VOID FILL/STABLIZATION:

(9-16-21)

Description

Provide polyurethanes (PU) for chemical grouting. Use polyurethanes for slab jacking, void filling, leak sealing, permeation grouting, subgrade stabilization and other applications in accordance with the contract. Use PU foams, gels and resins that are on the NCDOT APL.

Handling and Storing

Handle, store and dispose of polyurethanes per the manufacturer’s instructions. Use equipment recommended by the PU Manufacturer or equipment capable of proportioning and mixing components in accordance with the PU Manufacturer’s requirements. Utilize pumps and injection equipment that can maintain recommended pressures and temperatures.

Polyurethane Requirements

Use PU types in accordance with the contract. Use polyurethanes that meet the properties and characteristics listed below. Provide Type 3 material certifications in accordance with Article 106-3 of the *Standard Specifications* for polyurethanes. Do not use expired or improperly stored PU components or materials. If an expiration date is not provided by the PU Manufacturer, assume an expiration date 6 months after production.

(A) Type 1 Polyurethane

Type 1 polyurethane is a two component, high density, hydrophobic and hydro-insensitive PU foam mixed with a ratio of 1:1 by volume. When injected, the components react with each other to expand and harden forming a rigid closed cell foam. Provide PU foams that meet the following:

TYPE 1 POLYURETHANE REQUIREMENTS		
Property	Requirement	Test Method
Apparent Density (Free Rise)	3 – 4.5 pcf	ASTM D1622
Compressive Strength ¹ (Free Rise)	38 psi	ASTM D1621
Retention of Density (Hydro-Insensitivity)	80%	NYSDOT GTP-9 ²
Wet Compressive Strength ¹ (Hydro-Insensitivity)	38 psi	NYSDOT GTP-9 ²

1. Compressive strength of at least 90% of maximum strength within 30 minutes of injection.
2. New York State Department of Transportation Geotechnical Test Procedure: Hydro-Insensitivity of High Density Polyurethane Grout – Panel Test.

(B) Type 2 Polyurethane

Type 2 polyurethane is a single component, low or medium viscosity, hydrophobic PU resin mixed with an optional or required catalyst/accelerator per the PU Manufacturer’s instructions to initiate or speed up reactions. When injected, the PU resin reacts with moisture in the soil or voids to expand and solidify forming a rigid or flexible, watertight closed cell foam. Provide PU rigid or flexible foams that meet the following:

TYPE 2 POLYURETHANE REQUIREMENTS

Property	Requirement	Test Method
Viscosity ¹ (Rigid Foam)	200 centipoise	ASTM D4016 or D4878
Viscosity ¹ (Flexible Foam)	750 centipoise	
Compressive Strength ² (Without Soil)	150 psi	ASTM D1621
Compressive Strength ² (With Sand)	150 psi	ASTM D695 or D4219
Tensile Strength ³	150 psi	ASTM D3574

1. Maximum viscosity of uncured resin.
2. Compressive strength of cured rigid foam; does not apply to flexible foam.
3. Tensile strength of cured flexible foam; does not apply to rigid foam.

(C) Type 3 Polyurethane

Type 3 polyurethane is a single component, medium viscosity, hydrophilic PU resin mixed with optional or required water per the PU Manufacturer's instructions to initiate reactions. An optional catalyst/accelerator as recommended by the PU Manufacturer may be approved for Type 3 PU based on the application. When injected, the PU resin reacts with water to expand and produce a flexible watertight closed cell foam/impermeable gel. Provide PU foams or gels that meet the following:

TYPE 3 POLYURETHANE REQUIREMENTS

Property	Requirement	Test Method
Viscosity ¹	750 centipoise	ASTM D4016 or D4878
Tensile Strength ²	150 psi	ASTM D3574

1. Maximum viscosity of uncured resin.
2. Tensile strength of cured foam; does not apply to gel.

Temperature Requirements

Follow the PU Manufacturer's instructions for storage and injection temperatures. Do not inject components when the air temperature measured at the location of the chemical grouting operation in the shade away from artificial heat is below 40°F.

(D) Safety

A copy of the Data sheet and Material Safety Data Sheet (MSDS) of all chemicals used must be on site at all times. Workers must wear protective rubber gloves, full protection (front and side) safety glasses, chemical goggles or face shield and any other necessary precautions as outlined in product MSDS when handling or pumping grout.

(E) Cleaning

Clean the substrate to produce a finish appearance acceptable to the Engineer. Shave any excess foam from the area. Clean the tools and equipment with MEK or Xylene immediately after use. Cured polyurethane foam can only be removed mechanically. Clean skin with soap and water, NEVER solvent.

Leave the work area in a neat, clean and safe condition without evidence of spillovers onto adjacent areas.

(F) Measurement and Payment

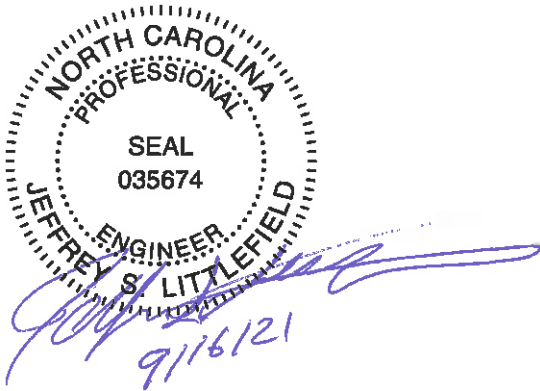
Structural Foam Void Fill/Stabilization will be measured and paid by the actual number

of gallons of mixture incorporated into the completed and accepted work. Such price and payment will be full compensation for all material, labor, tools, equipment, and incidentals necessary to satisfactorily complete the work described in this provision.

Payment will be made under:

Pay Item
Structural Foam Void Fill/Stabilization

Pay Unit
Gallons



DocuSigned by:
Jeff Littlefield
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9/17/2021



DocuSigned by:
Matthew V. Springer
 BC60F6E8B584403...
 8/27/2020

POLYUREA PAVEMENT MARKING MEDIA AND THICKNESS:

(08-27-20)

Amend the *NCDOT 2018 Standard Specifications* as follows:

Page 12-8, Subarticle 1205-5(B), lines 14-16, replace with the following:

Produce polyurea pavement marking lines that have a minimum dry thickness of 20 mils above the pavement surface when placed on concrete and asphalt pavements. Produce polyurea pavement marking lines that have a minimum dry thickness of 30 mils above the pavement surface on textured surfaces such as OGFC and on surfaces where the polyurea will be placed over a previously removed pavement marking.

Page 12-9, replace **Table 1205-4 Minimum Reflectometer Requirement for Polyurea** with the following:

Item	Color	Reflectivity
Standard Glass Beads	White	375 mcd/lux/m ²
	Yellow	250 mcd/lux/m ²

The installer may choose to use an AASHTO Type 4/Type 1 or AASHTO Type 3/Type 1 double drop system, but no price adjustment will be made, and these systems will be incidental to the polyurea pavement marking.

Pay Item

Pay Unit

Polyurea Pavement Marking Lines, _____", _____mils
 (Standard Glass Beads)

Linear Foot

TC-1


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Mecklenburg County

WORK ZONE TRAFFIC CONTROL Project Special Provisions Table of Contents

Special Provision	Page
Work Zone Traffic Control for Interstate/Freeway Resurfacing Projects	TC-2
Work Zone Presence Lighting	TC-13
Sequential Flashing Warning Lights	TC-17

DS



DocuSigned by:
Lee Ainsworth
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8/5/2021

TC-2

I-5746 C

Mecklenburg County

WORK ZONE TRAFFIC CONTROL FOR INTERSTATE/FREEWAY RESURFACING PROJECTS

GENERAL REQUIREMENTS

This Provision is intended for Interstate/Freeway Resurfacing projects that are performed at night. In the event, the Day and time Restrictions allow for daytime work activities the Work zone Presence Lighting and Sequential Flashing Lights are to be omitted. However, the Digital Speed Limit Signs will be required as described below.

Maintain traffic in accordance with Divisions 10, 11 and 12 of the *2018 Standard Specifications* and the following provisions:

Install Work Zone Advance Warning Signs according to the **Traffic Management Plan in the Contract Documents, prior to beginning any other work.**

When personnel and/or equipment are working on the shoulder adjacent to a divided facility and within 10 feet of an open travel lane, close the nearest open travel lane using Standard Drawing No. 1101.02 of the *2018 Roadway Standard Drawings*.

When personnel and/or equipment are working within a lane of travel of a divided facility, close the lane using Standard Drawing No. 1101.02 of the *2018 Roadway Standard Drawings* or as directed by the Engineer. Conduct the work so that all personnel and/or equipment remain within the closed travel lane. Perform work only when weather and visibility conditions allow safe operations as directed by the Engineer.

1. Time Restrictions for Lane Closure and Road Closure Activities

All lane closure and road closure activities shall be performed in compliance with the Day and Time restrictions listed and defined in this Contract.

Any activities performed outside of these requirements will be subject to the Liquidated Damages unless approved by the Engineer prior to beginning the activity.

The Contractor may place/pre-stage all required signs and traffic control devices necessary for lane closures prior to the closure time as approved by the Engineer. However, flashing arrow boards and changeable message signs shall not indicate lane closure information until 30 minutes or less prior to the installation of the lane closure. Typical pre-staging times are 1 hour for a single lane closure and 2 hours for double and triple lane closures. The travel lane(s) are to be closed at the prescribed times defined in this Contract.

TC-3

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Mecklenburg County

For removal, the lane(s) must be reopened in compliance with the times defined in this Contract. It is acceptable to remove the signs and traffic control devices from the shoulder/staging area after the lane(s) are reopened to traffic.

2. Work Zone Speed Limits and Digital Speed Limit Signs (DSLS)

All speed limits are to be ordinated by the State Traffic Engineer in order to have a lawfully enforceable speed limit; therefore, no speed limit messages/signs shall be installed prior to receiving a signed ordinance. NCDOT has sole authority of the speed limits displayed within the work zone.

The Regional Traffic Engineering Office and the Division Construction Engineer in coordination with the Work Zone Traffic Control Section will provide all Work Zone Speed Limit recommendations based on activities and conditions.

When lane closures are in effect and if ordinated by the State Traffic Engineer, implement a Work Zone “Variable” Speed Limit Reduction as stated in the ordinance and in accordance with the attached Provision and drawing.

Use Digital Speed Limit Signs (DSLS) to display the work zone speed limit as shown in the attached drawing. The Speed Limit shall be continuously displayed on the digital speed limit signs. (See Attached Provision.)

The Contractor will be responsible for coordinating with the Engineer when the Work Zone Speed Limits are to be changed and will have to seek approval by the Engineer before the Speed Limit is changed.

When the variable speed limit reductions are in effect, cover any existing speed limit signs located within the active work area that conflict with the variable speed limit reduction.

The speed limit shall be returned to the existing speed limit when the lane closure is removed and traffic is returned to the existing pattern.

3. Work Zone Presence Lighting and Sequential Flashing Warning Lights

Provide the following for nighttime work activities in accordance with attached drawing and special provisions:

- A. Furnish and install Work Zone Presence Lighting to supplement the Contractor’s portable construction and equipment lighting for the purpose of alerting motorist to the existence of an active work zone and to encourage compliance with the reduced work zone speed limit. (See attached Provision.)

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Mecklenburg County

B. Furnish and install Sequential Flashing Warning Lights on drums used for merging tapers to assist motorist in determining which direction to merge and to decrease late lane merging. (See attached Provision.)

4. Law Enforcement

The Contractor shall provide 2 Law Enforcement Officers for the mainline during lane closure operations and 2 additional Law Enforcement Officers for ramp/loop closures when both operations occur simultaneously.

Use Law Enforcement Officers to assist in the shadowing of workers during the installation and during the removal of lane closures.

TEMPORARY TRAFFIC CONTROL (TTC)

Refer to Standard Drawing No. 1101.02, 1101.11, 1110.01, 1110.02, 1115.01, 1130.01, 1135.01, 1165.01, and 1180.01 of the *2018 Roadway Standard Drawings* when closing a lane of travel in a stationary work zone for items such as milling, paving, diamond grinding concrete pavements, minor bridge and approach slab rehabilitation.

Drums are recommended for all lane closure operations occurring at night. However, if skinny drums are used at night, they shall be placed every 20' in the tangent sections of lane closure operations. Skinny drums shall not be used for upstream tapers, **on Interstate Highways, however Skinny drums, and Cones are permitted on City, and Side Street lane closures.**

When covering work zone signs, use an opaque material that prevents reading of the sign at night by a driver using high beam headlights. Use material, which does not damage the sign sheeting.

Refer to **Traffic Management Plan in the Contract Documents for milling, paving, and concrete pavement repair of ramps** unless otherwise approved to be closed by the Engineer. If approved, see attached drawing for typical placement of devices and signing for the detour route. All items shall be compensated for based on the unit bid price for the respective item.

Refer to Standard Drawing No. 1101.02, sheet 12 or 13 of the *2018 Roadway Standard Drawings* for utilizing a Moving Operation for such items as pavement marking and marker placement. A minimum speed of 3 mph shall be maintained at all times with no stops that narrow or close a lane of travel. If the moving operation is progressing slower than 3 mph at any time, install a lane closure. All traffic control devices for this operation is considered incidental to the pay items for Pavement Marking and Markers.

TRAFFIC OPERATIONS

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1. Project Requirements:

Failure to comply with the following requirements will result in a suspension of all other operations:

- A. Before working on ANY MAP, the Contractor shall submit a written construction sequence for traffic control and construction lighting for ALL MAPS to the Engineer at the first pre-construction meeting and the sequence must be approved before closing a lane of traffic. The Contractor and Engineer will coordinate with the State Work Zone Engineer at 919-814-4937 for additional traffic control guidance, as necessary.
- B. The maximum "Active Work Area" is a distance of 5 miles. It is defined as the maximum allowable distance for Resurfacing Operations taking place in a single work period. Therefore, the maximum length of lane closure is 5 miles. However, approval by the Engineer is required before closing more than 2 miles of Interstate to ensure the Contractor has the equipment and labor force to actively pursue the work.
- C. Notify the Engineer 48 hours before resurfacing the areas of existing pavement that require patching. Patch these areas before resurfacing occurs. Allow full depth asphalt patching to cool to the point of supporting traffic without displacement or rutting before reopening closed lane. Coordinate the resurfacing operations of the patched areas with the Engineer.
- D. Notify the Engineer 48 hours before milling or resurfacing will interfere with the existing Signal Loops. Loops may need to be placed in milled surface before resurfacing occurs. Coordinate all signal loop operations with the Engineer.
- E. Obtain written approval of the Engineer before working in more than one location or setting up additional lane closures.
- F. The Contractor on this and any adjacent projects, or subcontractors working within this project shall coordinate lane closure location, type, and direction with the Engineer to best maintain lane continuity through the limits of this and adjacent projects.
- G. Operate equipment and conduct operations in the same direction as the flow of traffic. Maintain vehicular access in accordance with Article 1101-05 of the *2018 Standard Specifications*.
- H. Provide appropriate construction lighting in accordance with Section 1413 of the *2018 Standard Specifications*, and these **Project Special Provisions**.
- I. Contractor shall diamond grind, mill and pave lanes in an order such that water shall not accumulate.

2. Paving Lift Requirements and Time Limitations:

TC-6

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Mecklenburg County

Failure to comply with the following requirements will result in a suspension of all other operations until all lanes of traffic are brought to the same station and elevation:

Paving Overlays and Lifts up to 3"

- A. For surface course paving lifts of 2.0" or less, the Contractor shall conduct his paving operations such that the following conditions are met.

Once paving begins in any lane, the Contractor will be permitted to pave as far as the work operations allow (up to 5 miles) for the initial paving period. In the next days' paving operation, not to exceed 72 hours, bring the adjacent lane to the same station and elevation. At the end of the work day, any uneven lane conditions shall be signed with an "UNEVEN PAVEMENT/NEXT XX MILES" on the portable changeable message signs and portable "UNEVEN PAVEMENT" signs (dual mounted) 1,000' in advance of the uneven pavement and every ½ miles thereafter along the uneven portion of roadway. Once mitigated, all portable "UNEVEN PAVEMENT" signs shall be removed.

For Open Graded Surface Mixes, "UNEVEN PAVEMENT" signs are not required.

- B. For 3" surface course mixes, place in two paving lifts of 1 ½" each unless directed otherwise by the Engineer. Conditions for uneven travel lanes same as described above.

Paving Lifts Greater than 3"

For all other paving lifts greater than 3", bring all newly resurfaced lanes to the same station and elevation by the end of each work day unless the Contractor utilizes the notched wedge paving methods as described below:

- A. Any paving lift greater than 3" shall be mitigated by having an approved wedge apparatus on the paver that shapes the edge 1" vertically and the remaining at a maximum slope steepness of 2:1. The maximum paving lift allowed to use this method is 3".
- B. At the end of the work day, the Contractor shall place portable "UNEVEN PAVEMENT" signs in advance of the uneven pavement and spaced every ½ mile along the section of uneven pavement. Once mitigated, all portable "UNEVEN PAVEMENT" signs shall be removed.
- C. In the next day's paving operation and not to exceed 72 hours, the Contractor shall bring up the adjacent lane to the same station and elevation before any further paving takes place on the project.

Milling Operations (Does Not Apply to Fine Milling)

TC-7

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Mecklenburg County

Conduct milling operations so that any milled pavement is paved back by the end of each work day.

A milled/grooved surface shall not be re-opened to traffic except in cases where inclement weather or mechanical failure prevents the paving back of the lane by the end of the work day.

If milled areas are not paved back within the same work period due to inclement weather or mechanical failure, the Contractor is to furnish and install portable signs to warn drivers of the conditions. The signs include "Grooved Pavement" (W8-15) w/ Motorcycle Plaque mounted below, and "Uneven Lanes" (W8-11). These are to be dual indicated where lateral clearance can be obtained within the median areas. Install the "Grooved Pavement" (W8-15) w/ Motorcycle Plaque 1500' in advance of the milled area. Install the "Uneven Lanes" (W8-11) 500' in advance of the milled area. Alternate these signs every ½ mile. Once mitigated, all portable signs are to be removed.

Slope the pavement at the beginning and ending of the daily milling operation as directed by the Engineer. Sweep and remove all milled material from the roadway as soon as the daily milling operation is completed. Remove any existing pavement adjacent to the milled area that has been damaged and replace with patch material as directed by the Engineer.

Fine Milling / Microsurfacing Operations (Depths less than 1")

For fine milling operations less than 1", paving is not required in the same work period. The paving of the fine milled area is to be conducted within the next work period and not to exceed 72 hours. No advance warning signs are needed for the conditions. However, pavement markings are required by the end of each work day.

3. Temporary Pavement Markings:

Review and record the existing pavement markings and markers before obliteration. Re-establish the new pavement markings and markers using the record of existing markings in conjunction with the *2018 Roadway Standard Drawings* unless otherwise directed by the Engineer. Submit the record of the existing pavement markings seven calendar days before the obliteration of any pavement markings.

Obliterated pavement markings shall be replaced by the end of each workday's operation. Interim paint may be used to comply with time limitations if final pavement markings cannot be placed except for milled surfaces or diamond ground surfaces. Final markings shall be placed within 30 days in accordance with Section 1205-4 and Section 1205-5. For milled surfaces, temporary pavement markings shall be used in accordance with Section 1205-8(C). There will be no direct payment for interim paint. Temporary paint will be paid for at the contract unit price.

TC-8

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Mecklenburg County

For concrete surfaces that have been diamond ground as a surface treatment, 4” temporary paint shall be used in accordance with Section 1205-8(C). Upon completion of all diamond grinding operations, 4” line removal shall be used to remove 100% of the 4” temporary paint on the final concrete surface by grinding method only. Use an acceptable method to grind ridges smooth only where pavement markings will be installed prior to placing final pavement marking material. This method shall also be used in the area of the black contrast for surface preparation. Payment for line removal will be made in accordance with Section 1205-10.

For project winterization, install temporary paint markings in accordance with Section 1205-8(C) of the 2018 Standard Specifications. Use 4” lane, edge, and center lines and 8” gore lines. Compensation for this work shall be made in accordance with Section 1205-10 except that no payment will be made if paving is completed more than 30 days before the written notification by the Department that winterization is required.

4. Work Zone Signing:

A. Description

Install advance/general warning work zone signs according to the **Traffic Management Plan in the Contract Documents** prior to beginning work.

For paving overlays of 3” or greater that create a drop-off adjacent to the median shoulder, install “LOW/SOFT SHOULDER” (SP 13107) signs on the median shoulder. Place initially at the construction limits, and then space 1 mile thereafter. No signing required for the outside shoulder.

Install and maintain signing in accordance with the Divisions 11 and 12 of the *2018 Standard Specifications*, **and these Special Provisions**.

B. Installation

All stationary Advance/General warning work zone signs require notification to existing Utility owners per Article 105-8 of the 2018 Standard Specifications and Special Provision SP1 G115 within 3 to 12 full working days prior to installation.

Install all Advance/General warning work zone signs before beginning work on a particular map. If signs are installed more than seven (7) calendar days prior to the beginning of work on a particular map, cover the signs until the work begins. Install each work zone Advance/General warning sign separately and not on the same post or stand with any other sign except where an advisory speed plate or directional arrow is used.

TC-9

I-5746 C

Mecklenburg County

All sign locations to be verified by the Engineer prior to installation. Once the signs have been installed and accepted, any sign relocations requested by the Department will be compensated in accordance with Article 104-7. Any additional signs other than the ones required in this provision or attached drawings will be compensated in accordance with Article 104-7.

If there is a period of construction inactivity longer than 14 calendar days, remove or cover advance/general warning work zone signs. Uncover advance/general warning work zone signs no more than 7 calendar days before work resumes.

All other operations may be suspended upon failure to comply with the above requirements. Such suspended operations would not be resumed until the above requirements are fulfilled.

C. Sign Removal

Once Maps on the Project are substantially completed, it is acceptable to remove the Stationary Work Zone Signs on those Maps in lieu of waiting until all of the Maps are completed on the Project. A Map is substantially complete when the resurfacing operations are completed and the shoulders are brought up to the same elevation as the proposed pavement and when temporary pavement markings (paint) are installed along the centerline and edge lines as well as the ramps and loops. The final pavement markings (Thermoplastic or Polyurea) and/or markers do not have to be installed for the Map to be considered substantially complete. Final Pavement Markings/Markers are installed with portable signing and changeable message signs according to Roadway Standard Drawing 1101.02, sheet 13. Any remaining punch list items requiring traffic control are to be completed with portable work zone signing with compensation covered in the Contract Unit price for price for the required Traffic Control items.

Stationary Work Zone Sign removal is a condition of final project acceptance.

D. Lane Closure Work Zone Signs

Install any required lane closure signing needed during the life of the project in accordance with the Standard Drawing No. 1101.02, 1101.11 and 1110.02 of the *2018 Roadway Standard Drawings*.

TC-10

I-5746 C

Mecklenburg County

MEASUREMENT AND PAYMENT

Stationary Work Zone Signs will be measured and paid as the actual number of square feet satisfactorily installed at each location and accepted by the Engineer.

Refer to the respective Sections of Division 11 and 12 of the 2018 Standard Specifications or the attached Special Provisions for the satisfactory installation and removal of lane closures and temporary pavement markings and markers.

Measurement for Lane Closures is the actual number of stationary lane closures satisfactorily installed for paving and all other required operations as shown in Roadway Standard Drawing 1101.02, sheets 4, 5, 6, 8, 9 & 10, **and these Special Provisions**. All labor, traffic control devices, and signing for lane closures as shown in these Roadway Standard Drawings are paid under this item.

Measurement for Ramp/Loop Closures is the actual number of total ramp/loop closures and detours satisfactorily installed for ramp/loop paving and all other required operations as shown on the **Traffic Management Plan** detail drawing. All labor **shall be paid under the unit price for Lane and Ramp/Loop Closures**.

Ramp/Loop Closures will be measured and paid at the Contractor's unit price for Ramp/Loop Closures on a per each basis. In the event two separate ramps are closed at the same time, they will be measured individually and paid on a per each basis.

Measurement and payment for paint pavement marking lines, paint pavement marking symbols, removal of pavement marking lines will be according to Section 1250-10.

Measurement and payment for law enforcement will be made and paid as the actual number of hours each Law Enforcement Officer provides during the life of the project as approved by the Engineer.

Digital Speed Limit Signs, Sequential Flashing Warning Lights, and Work Zone Presence Lighting are paid separately.

Payment will be made under:

TC-11

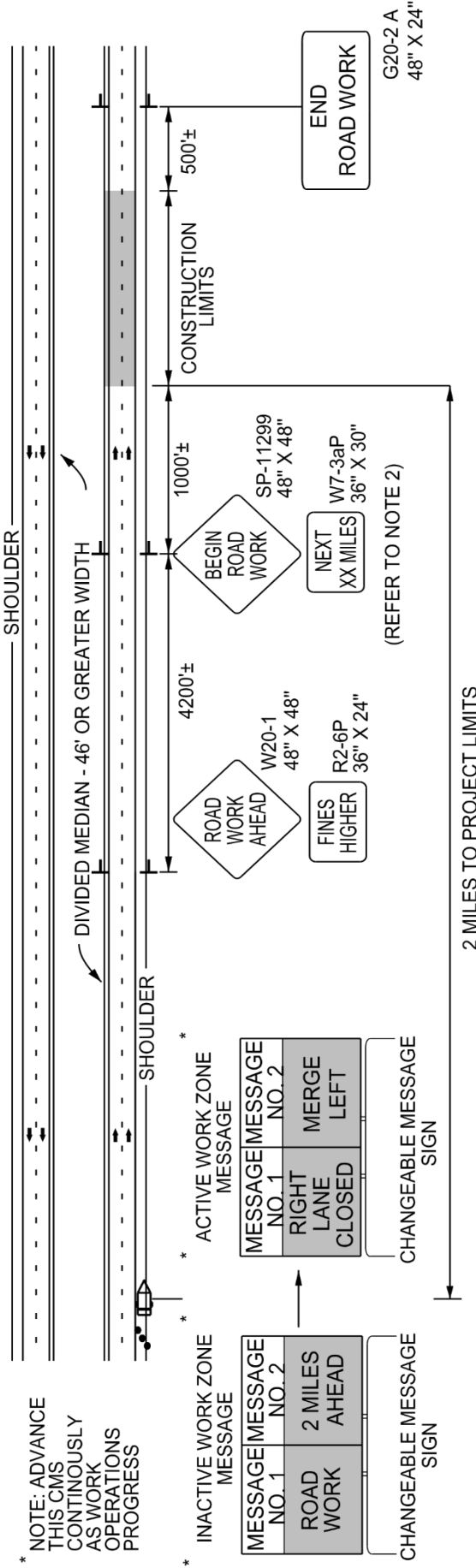
I-5746 C

Mecklenburg County

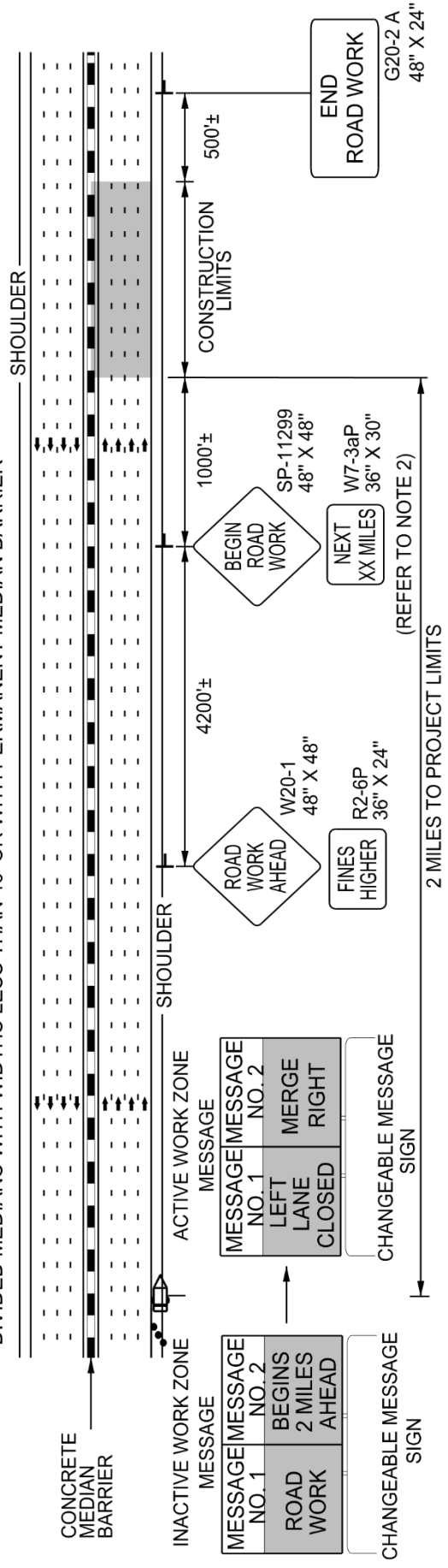
Pay Item	Pay Unit
Work Zone Signs (Stationary)	SF
Interstate Lane Closure	EA
Street Lane Closure	EA
Ramp/Loop Closure	EA
Flagger	Day
Paint Pavement Marking Lines (6" – 12")	LF
Paint Pavement Marking Symbols	EA
Removal of Pavement Marking Lines	LF
Law Enforcement	HR

STATIONARY ADVANCE WARNING SIGNS FOR INTERSTATE / FREEWAY RESURFACING PROJECTS

DIVIDED MEDIANS WITH WIDTHS 46' OR GREATER



DIVIDED MEDIANS WITH WIDTHS LESS THAN 46' OR WITH PERMANENT MEDIAN BARRIER



LEGEND

▲ DIRECTION OF TRAFFIC FLOW

● TRAFFIC DRUM

◁ CHANGEABLE MESSAGE SIGN (CMS)

▬ STATIONARY SIGN

NOTES

- THIS DRAWING IS TO BE USED IN CONJUNCTION WITH THE WORK ZONE VARIABLE SPEED LIMIT USING DIGITAL SPEED LIMIT SIGNS FOR INTERSTATE/FREEWAY RESURFACING PROJECTS DETAIL.
- FOR SIGN W7-3aP, ROUND TO THE NEAREST MILE.
- FOR ENTRANCE AND EXIT RAMP, REFER TO RSD 1101.01, SHEET 1, DETAIL B & C.
- FOR ADDITIONAL NOTES, REFER TO RSD 1101.01, SHEET 1.

TC-13

I-5746 C

Mecklenburg County

WORK ZONE PRESENCE LIGHTING:

(05/31/18)

DESCRIPTION

Furnish and install Work Zone Presence Lighting to supplement the Contractor's construction/task (Portable Construction Lighting) and equipment lighting during nightly work activities on high speed (greater than 55 MPH) facilities and/or facilities that have significant traffic volumes and impacts. The purpose of Work Zone Presence Lighting is to alert the motorist to the existence of an active work zone, improve worker visibility, and to assist in compliance of the work zone speed limit by providing lighting throughout the length of the lane closure.

MATERIALS

Anti-glare lighting systems are required. Work Zone Presence Lighting is in addition to the Contractors' Portable Construction Lighting. Work Zone Presence Lighting shall be installed in accordance with the attached detail and Manufacturer's recommendations.

All Work Zone Presence Lighting shall be supplied with a power source to provide the light output as described in the chart below.

Each light unit shall be capable of providing a minimum of 14,000 lumens illuminating a minimum area of approximately 3,000 square feet. The light shall be capable of being elevated to a height of 14 feet above the pavement.

Each light unit support base or mounting stand shall have the capability of being leveled.

Provide Work Zone Presence Lighting listed on the NCDOT APL.

CONSTRUCTION METHODS

The purpose of Work Zone Presence Lighting is to illuminate areas of the lane closure where construction/task lights are not located. Typical use is during lane closures for resurfacing and milling operations in locations where the pavement is being prepped for paving or milling, as well as where these operations have passed through that involve remaining work items such as rolling, coring/inspecting, shoulder and striping activities.

Immediately replace any lighting unit that is not operational.

Installation Locations

1. Standard Lane Closure Lengths of 2 miles or less

TC-14

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Mecklenburg County

Position #1: Initially, place the work zone presence lighting starting 1 mile downstream of the merge taper and continue until the end of the lane closure. See attached detail-Position #1.

Position #2: Once paving operations progress to the point where the construction/task lighting has to be relocated to finish paving for the night, the Work Zone Presence Lighting shall be relocated to the beginning of the lane closure. See Attached Drawing-Position #2.

2. Lane Closures exceeding 2 miles (Must be approved by the Engineer)

Single Work Operations: If the lane closure is longer than 2 miles within a single work operation, begin installing the work zone presence lighting at the halfway point of the lane closure length and continue placing the lights until the end of the lane closure. Same procedure for relocation shall be followed as described above.

3. Multiple Work Operations exceeding 2 miles (Must be approved by the Engineer)

If the lane closure is longer than 2 miles and 2 separate operations are working concurrently, treat as 2 separate locations. The Work Zone Presence Lights are installed at the halfway point in each operation. The lights in the 1st operation will end where the 2nd operation begins. The lights in the 2nd operation will terminate with the end of the lane closure. Same procedure for relocation shall be followed as described above.

Lighting Unit Installation Requirements

The lighting units shall be installed inside the lane closure as shown on the attached detail and spaced according to the chart below:

SPACING CHART

Light Output (Lumens)	Illuminated Fixture Area-Minimum (Square Feet)	Maximum Spacing (Feet)	Light Units (Per Mile)
14,000 to 35,000	4'	750'	7
35,001 to 59,999	5'	1,000'	5
60,000 and above	6' or greater	1,320	4

Whenever possible, each light unit shall be placed on the 10' paved shoulder according to the above spacing based on the amount of light output for each unit.

Each light unit shall be installed and moved as necessary to allow for efficient paving operations to take place as well as to not interfere with the Contractor's ability to light the work area. At no time shall Work Zone Presence Lighting be located in the same area as the Contractor's construction/task lighting or conflict with his work operations.

TC-15

I-5746 C

Mecklenburg County

If the Contractor provides sufficient construction/task lighting to meet the luminance requirements of Section 1413-3 for the full length of the lane closure or if sufficient existing overhead lighting is present, Work Zone Presence Lighting may be eliminated as directed by the Engineer.

MEASUREMENT AND PAYMENT

Work Zone Presence Lighting will be measured and paid as the maximum number of lighting units satisfactorily placed, accepted by the Engineer, and in use at any one time during the life of the project.

Relocation, replacement, repair, removal, and maintenance of Work Zone Presence Lighting units will be incidental to the work of this section. No measurement or separate payment will be made for power generators, batteries, or other power supply devices.

Pay Item

Work Zone Presence Lighting

Pay Unit

Each

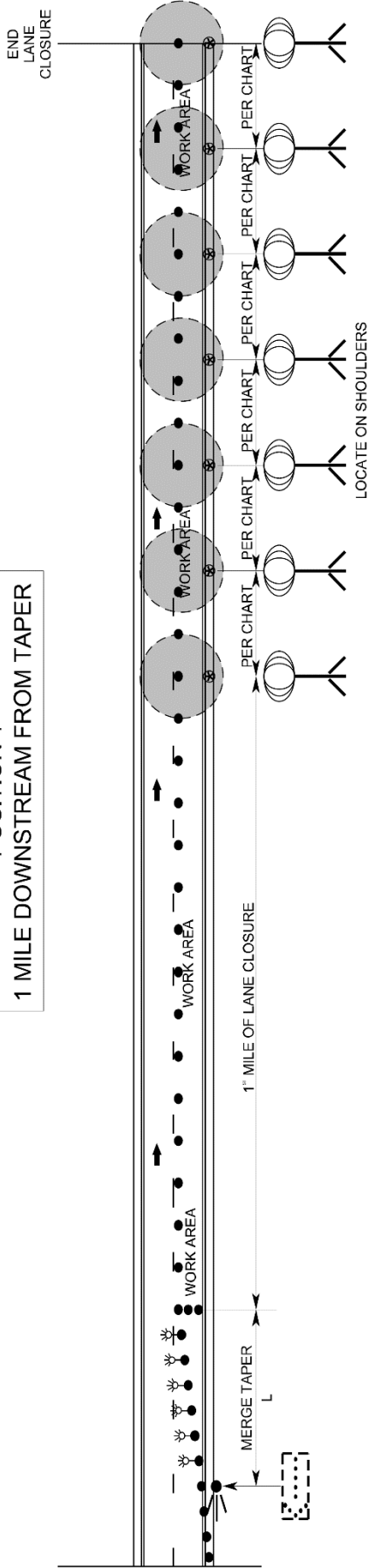
TC-16

I-5746 C

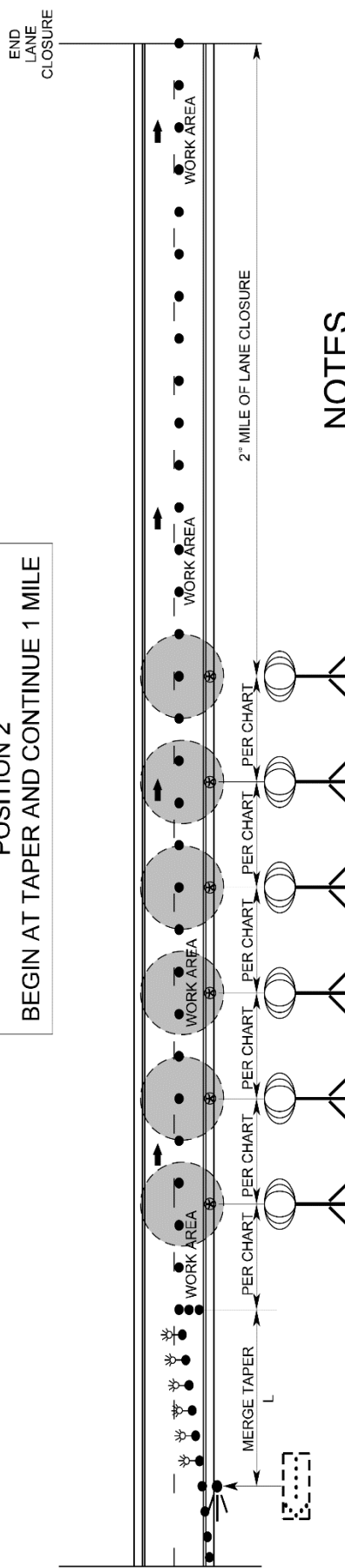
Mecklenburg County

SEQUENTIAL FLASHING WARNING LIGHTS AND WORK ZONE PRESENCE LIGHTING

POSITION 1 1 MILE DOWNSTREAM FROM TAPER



POSITION 2 BEGIN AT TAPER AND CONTINUE 1 MILE



NOTES

- 1) WORK ZONE PRESENCE LIGHTING MAY BE OMITTED FOR THE ENTIRE LANE CLOSURE IF THE CONTRACTOR PROVIDES SUFFICIENT CONSTRUCTION/TASK LIGHTING TO MEET THE LUMINANCE REQUIREMENTS OF SECTION 1413-3 FOR THE FULL LENGTH OF THE LANE CLOSURE. IF EXISTING OVERHEAD ROADWAY LIGHTING IS FUNCTIONAL AND EXTENDS FOR THE FULL LENGTH OF THE LANE CLOSURE, OR AS DIRECTED BY THE ENGINEER.
- 2) PLACE ON PAVED OUTSIDE SHOULDER IF POSSIBLE.
- 3) IF THE LANE CLOSURE IS LONGER THAN 2 MILES USE ADDITIONAL PRESENCE LIGHTING AT THE RECOMMENDED SPACING. BEGIN INSTALLING WORK ZONE PRESENCE LIGHTING AT THE HALFWAY POINT OF THE LANE CLOSURE LENGTH FOR POSITION 1. POSITION 2 WILL BE THE FIRST HALF OF THE LANE CLOSURE LENGTH.

SPACING CHART

LIGHT OUTPUT (LUMENS)	MINIMUM LIGHTED FIXTURE AREA (SQUARE FEET)	MAXIMUM SPACING (FEET)	MAXIMUM LIGHT UNITS (PER MILE)
14,000 TO 35,000	4	750	7
35,001 TO 60,000	5	1,000	5
ABOVE 60,000	6 AND GREATER	1,320	4

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I-5746 C

Mecklenburg County

SEQUENTIAL FLASHING WARNING LIGHTS:

(10/08/2016)

Description

Furnish and install Sequential Flashing Warning Lights on drums used for merging tapers during nightly work activities on interstates and freeways with speed limits greater than 55 MPH and or facilities that have significant traffic volumes.

The purpose of these lights is to assist the motorist in determining which direction to merge when approaching a lane closure. It's also designed to reduce the number of late merges resulting in devices being struck and having to be reset to maintain positive guidance at the merge point. The successive flashing of the lights shall occur from the upstream end of the merging taper to the downstream end of the merging taper in order to identify the desired vehicle path.

Materials

The Sequential Flashing Warning Lights shall meet all of the requirements for warning lights within the current edition of the Manual of Uniform Traffic Control Devices (MUTCD).

Each light unit shall be capable of operating fully and continuously for a minimum of 200 hours when equipped with a standard battery set.

Each light in the sequence shall be flashed at a rate of not less than 55 times per minute and not more than 75 times per minute. The flash rate and flash duration shall be consistent throughout the sequence.

Supply a Type 3 Certification (Independent Test Lab results) documenting all actual test results for the specified parameters contained in the Institute of Transportation Engineer's (ITE's) *Purchase Specification for Flashing and Steady Burn Warning Lights*. The laboratory shall also identify all manufacturer codes and part numbers for the incandescent lamp or LED clusters, lenses, battery, and circuitry, and the total width of the light with the battery in place. The complete assembly shall be certified as crashworthy when firmly affixed to the channelizing device.

All Sequential Flashing Warning Lights shall be on the NCDOT Work Zone Traffic Control Approved Products List.

Construction Methods

Sequential Flashing Warning Lights are to be used for night time lane closures.

These lights shall flash sequentially beginning with the first light and continuing until the final light.

The Sequential Flashing Warning Lights shall automatically flash in sequence when placed on the drums that form the merging taper.

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Mecklenburg County

The number of lights used in the drum taper shall equal the number of drums used in the taper.

Drums are the only channelizing device allowed to mount sequential flashing warning lights.

The Sequential Flashing Warning Lights shall be weather independent and visual obstructions shall not interfere with the operation of the lights.

The Sequential Flashing Warning Lights shall automatically sequence when placed in line in an open area with a distance between lights of 10 to 100 feet. A 10 foot stagger in the line of lights shall have no adverse effect on the operation of the lights.

If one light fails, the flashing sequence shall continue. If more than 1 light fails, all of the lights are to be automatically turned to the "off" mode. Non-sequential flashing is prohibited.

When lane closures are not in effect, the Sequential Flashing Warning Lights shall be deactivated.

Measurement and Payment

Sequential Flashing Warning Lights will be measured and paid as the maximum number of sequential flashing warning lights satisfactorily installed and properly functioning at any one time during the life of the project.

This includes all materials and labor to install, maintain and remove all the Sequential Flashing Warning Lights.

Pay Item

Sequential Flashing Warning Lights

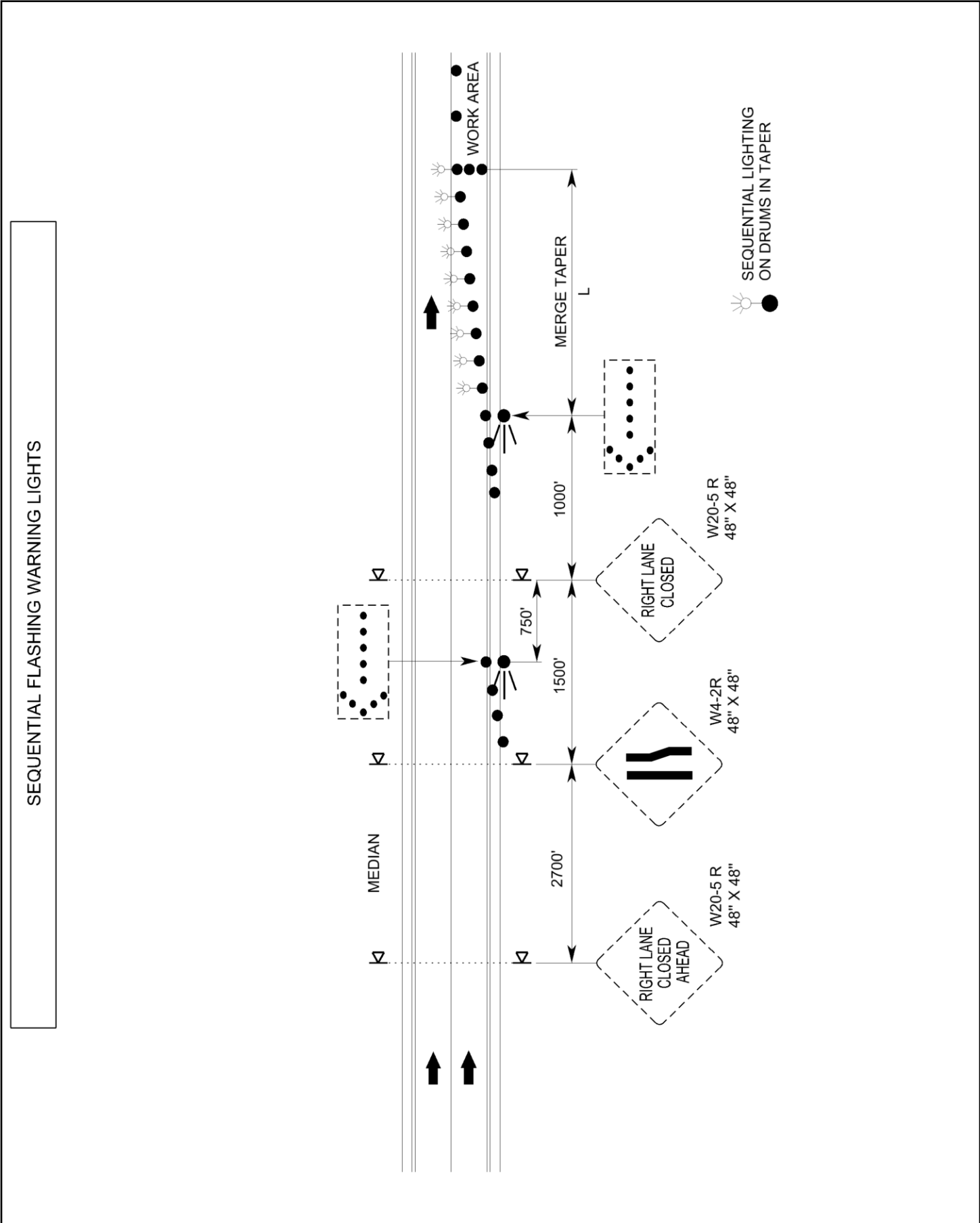
Pay Unit

Each

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I-5746 C

Mecklenburg County



**Project Special Provisions
Erosion Control**

STABILIZATION REQUIREMENTS:

(3-11-2016)

Stabilization for this project shall comply with the time frame guidelines as specified by the NCG-010000 general construction permit effective April 1, 2019 issued by the North Carolina Department of Environmental Quality Division of Water Resources. 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:

(West)

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.

Shoulder and Median Areas

August 1 - June 1

20#	Kentucky Bluegrass
75#	Hard Fescue
25#	Rye Grain
500#	Fertilizer
4000#	Limestone

May 1 - September 1

20#	Kentucky Bluegrass
75#	Hard Fescue
10#	German or Browntop Millet
500#	Fertilizer
4000#	Limestone

Areas Beyond the Mowing Pattern, Waste and Borrow Areas:

August 1 - June 1

100#	Tall Fescue
15#	Kentucky Bluegrass
30#	Hard Fescue
25#	Rye Grain
500#	Fertilizer
4000#	Limestone

May 1 - September 1

100#	Tall Fescue
15#	Kentucky Bluegrass
30#	Hard Fescue
10#	German or Browntop Millet
500#	Fertilizer
4000#	Limestone

Approved Tall Fescue Cultivars

06 Dust	Escalade	Justice	Serengeti
2 nd Millennium	Essential	Kalahari	Shelby
3 rd Millennium	Evergreen 2	Kitty Hawk 2000	Sheridan
Apache III	Falcon IV	Legitimate	Signia
Avenger	Falcon NG	Lexington	Silver Hawk
Barlexas	Falcon V	LSD	Sliverstar
Barlexas II	Faith	Magellan	Shenandoah Elite
Bar Fa	Fat Cat	Matador	Sidewinder
Barrera	Festnova	Millennium SRP	Skyline
Barrington	Fidelity	Monet	Solara
Barrobusto	Finelawn Elite	Mustang 4	Southern Choice II
Barvado	Finelawn Xpress	Ninja 2	Speedway
Biltmore	Finesse II	Ol' Glory	Spyder LS
Bingo	Firebird	Olympic Gold	Sunset Gold
Bizem	Firecracker LS	Padre	Taccoa
Blackwatch	Firenza	Patagonia	Tanzania
Blade Runner II	Five Point	Pedigree	Trio
Bonsai	Focus	Picasso	Tahoe II
Braveheart	Forte	Piedmont	Talladega
Bravo	Garrison	Plantation	Tarheel
Bullseye	Gazelle II	Proseeds 5301	Terrano
Cannavaro	Gold Medallion	Prospect	Titan ltd
Catalyst	Grande 3	Pure Gold	Titanium LS
Cayenne	Greenbrooks	Quest	Tracer
Cessane Rz	Greenkeeper	Raptor II	Traverse SRP
Chipper	Gremlin	Rebel Exeda	Tulsa Time
Cochise IV	Greystone	Rebel Sentry	Turbo
Constitution	Guardian 21	Rebel IV	Turbo RZ
Corgi	Guardian 41	Regiment II	Tuxedo RZ
Corona	Hemi	Regenerate	Ultimate
Coyote	Honky Tonk	Rendition	Venture
Darlington	Hot Rod	Rhambler 2 SRP	Umbrella
Davinci	Hunter	Rembrandt	Van Gogh
Desire	Inferno	Reunion	Watchdog
Dominion	Innovator	Riverside	Wolfpack II
Dynamic	Integrity	RNP	Xtremegreen
Dynasty	Jaguar 3	Rocket	
Endeavor	Jamboree	Scorpion	

Approved Kentucky Bluegrass Cultivars:

4-Season	Blue Velvet	Gladstone	Quantum Leap
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Alexa II	Blueberry	Granite	Rambo
America	Boomerang	Hampton	Rhapsody
Apollo	Brilliant	Harmonie	Rhythm
Arcadia	Cabernet	Impact	Rita
Aries	Champagne	Jefferson	Royce
Armada	Champlain	Juliet	Rubicon
Arrow	Chicago II	Jump Start	Rugby II
Arrowhead	Corsair	Keeneland	Shiraz
Aura	Courtyard	Langara	Showcase
Avid	Delight	Liberator	Skye
Award	Diva	Madison	Solar Eclipse
Awesome	Dynamo	Mercury	Sonoma
Bandera	Eagleton	Midnight	Sorbonne
Barduke	Emblem	Midnight II	Starburst
Barnique	Empire	Moon Shadow	Sudden Impact
Baroness	Envicta	Moonlight SLT	Total Eclipse
Barrister	Everest	Mystere	Touche
Barvette HGT	Everglade	Nu Destiny	Tsunami
Bedazzled	Excursion	NuChicago	Unique
Belissimo	Freedom II	NuGlade	Valor
Bewitched	Freedom III	Odyssey	Voyager II
Beyond	Front Page	Perfection	Washington
Blacksburg II	Futurity	Pinot	Zinfandel
Blackstone	Gaelic	Princeton 105	
Blue Note	Ginney II	Prosperity	

Approved Hard Fescue Cultivars:

Aurora II	Eureka II	Oxford	Scaldis II
Aurora Gold	Firefly	Reliant II	Spartan II
Berkshire	Granite	Reliant IV	Stonehenge
Bighorn GT	Heron	Rescue 911	
Chariot	Nordic	Rhino	

On cut and fill slopes 2:1 or steeper add 20# Sericea Lespedeza 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.

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. 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 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*, and the rate of application 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 six inches.

CONSTRUCTION MATERIALS MANAGEMENT

(3-19-19) (rev. 04-24-19)

Description

The requirements set forth shall be adhered to in order to meet the applicable materials handling requirements of the NCG010000 permit. Structural controls installed to manage construction materials stored or used on site shall be shown on the E&SC Plan. Requirements for handling materials on construction sites shall be as follows:

Polyacrylamides (PAMS) and Flocculants

Polyacrylamides (PAMS) and flocculants shall be stored in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures designed to protect adjacent surface waters. PAMS or other flocculants used shall be selected from the NC DWR List of Approved PAMS/Flocculants. The concentration of PAMS and other flocculants used shall not exceed those specified in the NC DWR List of Approved PAMS/Flocculants and in accordance with the manufacturer's instructions. The NC DWR List of Approved PAMS/Flocculants is available at:

https://files.nc.gov/ncdeq/Water%20Quality/Environmental%20Sciences/ATU/ApprovedPAMS_4_1_2017.pdf

Equipment Fluids

Fuels, lubricants, coolants, and hydraulic fluids, and other petroleum products shall be handled and disposed of in a manner so as not to enter surface or ground waters and in accordance with applicable state and federal regulations. Equipment used on the site must be operated and maintained properly to prevent discharge of fluids. Equipment, vehicle, and other wash waters shall not be discharged into E&SC basins or other E&SC devices. Alternative controls should be provided such that there is no discharge of soaps, solvents, or detergents.

Waste Materials

Construction materials and land clearing waste shall be disposed of in accordance with North Carolina General Statutes, Chapter 130A, Article 9 - Solid Waste Management, and rules governing the disposal of solid waste (15A NCAC 13B). Areas dedicated for managing construction material and land clearing waste shall be at least 50 feet away from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. Paint and other liquid construction material waste shall not be dumped into storm drains. Paint and other liquid construction waste washouts should be located at least 50 away from storm drain inlets unless there is no alternative. Other options are to install lined washouts or use portable, removable bags or bins. Hazardous or toxic waste shall be managed in accordance with the federal Resource Conservation and Recovery Act (RCRA) and NC Hazardous Waste Rules at 15A NCAC, Subchapter 13A. Litter and sanitary waste shall be managed in a manner to prevent it from entering jurisdictional waters and shall be disposed of offsite.

Herbicide, Pesticide, and Rodenticides

Herbicide, pesticide, and rodenticides shall be stored and applied in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act, North Carolina Pesticide Law of 1971 and labeling restrictions.

Concrete Materials

Concrete materials onsite, including excess concrete, must be controlled and managed to avoid contact with surface waters, wetlands or buffers. No concrete or cement slurry shall be discharged from the site. (Note that discharges from onsite concrete plants require coverage under a separate NPDES permit – NCG140000.) Concrete wash water shall be managed in accordance with the *Concrete Washout Structure* provision. Concrete slurry shall be managed and disposed of in accordance with *NCDOT DGS and HOS DCAR Distribution of Class A Residuals Statewide* (Permit No. WQ0035749). Any hardened concrete residue will be disposed of, or recycled on site, in accordance with state solid waste regulations.

Earthen Material Stock Piles

Earthen material stock piles shall be located at least 50 feet away from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available.

Measurement and Payment

Conditions set within the *Construction Materials Management* provision are incidental to the project for which no direct compensation will be made.

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. Posts shall be installed a minimum of 2 ft. into the ground. 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)(5) 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:

Pay Item	Pay Unit
Safety Fence	Linear Foot

WATTLE:

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, 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 ³ +/- 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.

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.

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

Wattle 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 *Wattle*.

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.

Payment will be made under:

Pay Item

Wattle

Pay Unit

Linear Foot

CONCRETE WASHOUT STRUCTURE:

(12-10-20)

Description

Concrete washout structures are enclosures above or below grade to contain concrete waste water and associated concrete mix from washing out ready-mix trucks, drums, pumps, or other equipment. Concrete washouts must collect and retain all the concrete washout water and solids, so that this material does not migrate to surface waters or into the ground water. These enclosures are not intended for concrete waste not associated with wash out operations.

The concrete washout structure may include constructed devices above or below ground and or commercially available devices designed specifically to capture concrete wash water.

Materials

Item	Section
Temporary Silt Fence	1605

Safety Fence shall meet the specifications as provided elsewhere in this contract.

Geomembrane basin liner shall meet the following minimum physical properties for low permeability; it shall consist of a polypropylene or polyethylene 10 mil thick geomembrane. If the minimum setback dimensions can be achieved the liner is not required. (5 feet above groundwater, 50 feet from top of bank of perennial stream, other surface water body, or wetland.)

Construction Methods

Build an enclosed earthen berm or excavate to form an enclosure in accordance with the details and as directed.

Install temporary silt fence around the perimeter of the enclosure in accordance with the details and as directed if structure is not located in an area where existing erosion and sedimentation control devices are capable to containing any loss of sediment.

Post a sign with the words "Concrete Washout" in close proximity of the concrete washout area, so it is clearly visible to site personnel. Install safety fence as directed for visibility to construction traffic.

The construction details for the above grade and below grade concrete washout structures can be found on the following web page link:

<https://connect.ncdot.gov/resources/roadside/SoilWaterDocuments/ConcreteWashoutStructuredetail.pdf>

Alternate details for accommodating concrete washout may be submitted for review and approval.

The alternate details shall include the method used to retain and dispose of the concrete waste water within the project limits and in accordance with the minimum setback requirements. (5 feet above groundwater, 50 feet from top of bank of perennial stream, other surface water body, or wetland.)

Maintenance and Removal

Maintain the concrete washout structure(s) to provide adequate holding capacity plus a minimum freeboard of 12 inches. Remove and dispose of hardened concrete and return the structure to a functional condition after reaching 75% capacity.

Inspect concrete washout structures for damage and maintain for effectiveness.

Remove the concrete washout structures and sign upon project completion. Grade the earth material to match the existing contours and permanently seed and mulch area.

Measurement and Payment

Concrete Washout Structure will be paid for per each enclosure installed in accordance with the details. If alternate details or commercially available devices are approved, then those devices will also be paid for per each approved and installed device.

Temporary Silt Fence will be measured and paid for in accordance with Article 1605-5 of the *Standard Specifications*.

Safety Fence shall be measured and paid for as provided elsewhere in this contract.

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

Payment will be made under:

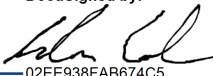
Pay Item	Pay Unit
Concrete Washout Structure	Each

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Structures
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Epoxy Resin Injection	(SPECIAL)	BP-80
Shotcrete Repairs	(SPECIAL)	BP-84
Concrete Repairs	(02-11-19)	BP-89
Mural Paint Repair	(SPECIAL)	BP-91
Volumetric Mixer	(12-18-12)	BP-98
Concrete for Deck Repair	(SPECIAL)	BP-100

Epoxy Coating and Debris Removal	(SPECIAL)	BP-101
Falsework and Formwork	(04-05-12)	BP-102
Submittal of Working Drawings	(01-29-21)	BP-108
Crane Safety	(06-20-19)	BP-114
Grout for Structures	(12-1-17)	BP-115
Latex Modified Concrete – Early Strength	(SPECIAL)	BP-116
LMC Overlay Surface Preparation	2-11-19	BP-120



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STRUCTURE PROJECT SPECIAL PROVISIONS**SCOPE OF WORK**

This work shall consist of furnishing all labor, equipment, and materials to overlay the existing bridge deck with polymer concrete overlay, repair concrete substructure, repair prestressed girders, clean and paint existing bearings, and repair, clean, and paint structural steel as directed in the plans. Work includes: portable lighting; existing bridge deck surface preparation by scarification and shotblasting the existing bridge deck; application of primer; overlaying the prepared bridge deck with polymer concrete; existing bridge deck surface preparation by hydro-demolition; overlaying prepared bridge deck with latex modified concrete – early strength overlay; installation of foam joint seals; grooving bridge deck; pavement markings; substructure repair using concrete, shotcrete, and epoxy resin injection; structural steel repair; repair and replacement of the existing bearing and masonry plates; cleaning and painting existing bearing and masonry plates with HRCSA; removal, containment, and disposal of the existing structural steel paint system; preparation of the surface to be painted and application of the new structural steel paint system; preparation of concrete surfaces and repair of mural paint; disposal of demolition and waste material; seeding and mulching all grassed areas disturbed; and all incidental items necessary to complete the project as specified and shown on the plans. No separate payment will be made for required lighting in paint containment, as the cost of such is incidental to the work being performed.

Work will be performed on the existing bridges at the following locations in Mecklenburg County:

- 1.) Bridge #44 – I-277 NBL over I-77 and collectors
- 2.) Bridge #48 – I-277 SBL over I-77 and collectors
- 3.) Bridge #320 – I-277/NC 16 over North Brevard Street
- 4.) Bridge #322 – I-277/NC 16 over Charlotte Area Transit
- 5.) Bridge #326 – I-277/NC 16 over North College Street
- 6.) Bridge #327 – I-277/NC 16 over North Tryon Street
- 7.) Bridge #328 – I-277/NC 16 over North Church Street
- 8.) Bridge #330 – I-277/NC 16 over US 29/US 49 (North Graham Street)
- 9.) Bridge #332 – I-277 over SCL RR, Johnson Street and N.C. Music Factory Boulevard
- 10.) Bridge #138 – East 12th Street over Tryon Street

The contractor shall provide all necessary access; underdeck platforms, scaffolding, ladders, etc.; provide all traffic control; provide all staging areas, material storage, waste disposal; provide environmental controls to limit loss of materials from sawing equipment, and chipping equipment; and all else necessary to complete the work.

The contractor shall be responsible for fulfilling all requirements of the NCDOT Standard Specifications for Roads and Structures dated January 2018, except as otherwise specified herein.

SILANE DECK TREATMENT**(SPECIAL)****DESCRIPTION**

This work consists of preparation of concrete bridge deck surfaces and the furnishing and application of alkylalkoxysilane (silane) penetrant sealers, with 100% solids, to seal bridge deck surfaces and cracks. Prepare the surface of the concrete deck and apply the silane bridge deck sealer in accordance with this special provision and as indicated on the plans, or as approved by the Engineer.

Work includes: bridge deck surface preparation, placement of silane deck sealer, and any incidentals necessary to complete the project, as specified or as indicated on the plans.

SUBMITTALS

Submit for approval the following requested items and any other relevant documents:

- (A) A safety data sheet (SDS) for each shipment of the silane materials.
- (B) Silane material information and manufacturer's written preparation and application instructions.
- (C) Certification from an independent testing laboratory that the materials meet the requirements of these provisions. Do not incorporate these materials into the project until the Engineer has accepted and approved the certification for the material.
- (D) The dates of manufacture of the silane materials, their lot numbers and date of shelf-life expiration for each lot number.
- (E) A table indicating the likely cure time, in minutes, to allow vehicular traffic on the silane-treated deck surface. Provide time for the allowable ambient temperature range, in increments of 10° F (6° C).
- (F) A work plan for each structure that includes estimated times for surface preparation and silane application.

MATERIAL DELIVERY AND STORAGE

Store at the site sufficient quantities of silane materials to perform the entire application.

Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Ensure that each container is clearly marked by the manufacturer with the following information:

- (A) Manufacturer's name and address.
- (B) Product name.
- (C) Date of manufacture.
- (D) Expiration date.
- (E) Lot identification number.
- (F) Container serial number.

Provide the Engineer a certification from the manufacturer, confirming that the silane materials meet the requirements of this special provision. Do not incorporate these materials into the project until the Engineer has accepted and approved the certification for the material. Submit such

certification for each lot of material delivered to the project. In each certification, identify the serial or lot numbers of the containers certified.

The Engineer may require samples from each lot or container of materials delivered to the project or from containers at the point of use. When samples are required, furnish samples in accordance with the Engineer's instructions.

Store silane materials in unopened containers in a clean, dry area between 40° F and 90° F. Store containers in a manner that prevents leakage or spillage.

MANUFACTURER'S REPRESENTATIVE

Provide a manufacturer's representative on site for the duration of the surface preparation and silane application work, to provide expert assistance on surface preparation, storage, mixing, application, clean-up, and disposal of materials.

MATERIALS

Provide silane from a single manufacturer, and provide silane that conforms to requirements indicated in Table 1, below.

**Table 1
SILANE PROPERTIES**

Property	Test Method	Requirement
Silane Content		100%
VOC content	EPA method 24	Less than 350 g/l
Surface Appearance after Application		Unchanged
Flash Point	ASTM D3278	140° F, minimum
Resistance to Chloride Ion Penetration	AASHTO T259 and T260	Less than: 0.52 pounds/yd ³ (criteria of 1.5) at 1/2 inch level; 0.00 pounds/yd ³ (criteria of 0.75) at 1 inch level
Water absorption test	ASTM C 642	0.50% maximum/48 hours; 1.5% maximum/50 days
Scaling resistance	ASTM C 672	(non-air-entrained concrete) 0 rating "No Scaling" (100 cycles)
NCHRP 244		
Water weight gain	Series II - cube test	85% reduction, minimum
Absorbed chloride		87% reduction, minimum
Absorbed chloride	Series IV - Southern climate	95% reduction, minimum

SURFACE PREPARATION

Prepare the surface of the concrete deck for application of the silane by shotblasting in order to remove all existing grease, slurry, oils, paint, dirt, striping, curing compound, rust, membrane, weak surface mortar, or any other contaminants that could interfere with the proper adhesion, penetration, and the curing of the silane material.

Prepare a final surface that adheres to the following requirements:

- (A) For areas to receive deck seal treatment, clean by shotblasting. Where approved by the Engineer, abrasive sandblasting may be used in areas that cannot be accessed by the shotblaster. Select the size of shot or sand, and travel speed of the equipment to provide a uniformly clean surface with a uniform profile. Remove striping to the maximum extent determined to be practical by the Engineer using up to three passes with shotblasting, sandblasting, or other approved equipment. Do not expose cleaned surfaces to vehicular traffic unless approved by the Engineer. If the deck becomes contaminated before placing the silane deck sealer, shotblast or abrasive sandblast the contaminated areas to the satisfaction of the Engineer, at no additional cost.
- (B) Prior to silane application, protect cracks on the concrete bridge deck from materials that can interfere with the penetration and the curing of the silane material. Just prior to placement of the silane, remove, by magnets and oil-free compressed air and vacuuming, any loose particles, such that no excess particles remain. The concrete deck shall be completely dry. Power washing will not be allowed.
- (C) The silane manufacturer may suggest cleaning and preparation methods other than those detailed by this special provision. The Engineer must approve such alternative methods prior to implementation.

SILANE APPLICATION**(A) Test Area**

- (1) Test a small area of the surface (minimum 5 ft. by 5 ft.) before general application to ensure desired performance results, aesthetics, and application rates and to verify application technique. Allow 5–7 days for the product to react fully before evaluating.
- (2) Application rates may vary depending on field conditions and the substrate to be treated.
- (3) Conduct at least one absorption test in the test area, using a Rilem Tube Test. Acceptable results are no loss of water in the Rilem tube over a period of 20 minutes. Adjust application to achieve required repellent performance.
- (4) The manufacturer's representative shall assist the Contractor in determining the application rates. Use test applications on actual surfaces to determine accurate application rates. Extremely porous surfaces may require two (2) coats of silane.
- (5) Do not begin production application of silane until Engineer has approved the test area, including approval of aesthetics, color, texture, and appearance.

(B) Application

Immediately before placing silane, all exposed surfaces shall be completely dry and blown clean with oil-free compressed air to remove any loose dust and debris. Apply silane as soon as practical after the exposed surfaces have been properly prepared and conditions are satisfactory:

- (1) Stir material thoroughly before and during application.
- (2) Apply silane with low-pressure spray or by flooding, followed by brooming or squeegeeing for even distribution, in accordance with manufacturer's instructions.
- (3) Maintain operating pressures in sprayers used for application of the silane sealer material sufficiently low so that atomization or misting of the material does not occur.
- (4) Begin the application of the silane at the lowest elevation and proceed upward, toward higher elevations, unless otherwise approved by the Engineer.
- (5) Apply even distribution of silane. Take care when applying the silane, so that running or ponding does not occur.
- (6) Apply silane in a single application to the concrete deck surface with enough material to saturate the surface. Remove excess material with a broom or squeegee and dispose of excess material appropriately. If a second coat is required, it should be applied "wet on wet" before first coat dries.
- (7) Application of sealant by spray methods will not be permitted when wind speeds are 20 mph or more, or if in the opinion of the Engineer, unsatisfactory results will be obtained. Other application methods or rescheduling will be required.
- (8) Avoid application with hand pump sprayers. For small areas of silane application, the use of hand pump sprayers must be approved by the Engineer.
- (9) Contractor shall protect from overspray all pedestrians, vehicles, plants and vegetation, and other areas not receiving silane application.
- (10) Allow product to penetrate the bridge deck and dry, as required by the manufacturer, prior to opening to traffic.

LIMITATIONS OF OPERATIONS

- (1) Prior to application of any silane sealer, cure concrete or concrete repairs for a minimum of 28 days or as required by the silane manufacturer.
- (2) Do not use silane material after the shelf life date.
- (3) Do not return unused material in opened containers to storage for later use. Either apply such material to appropriate areas on concrete deck surfaces or remove and appropriately dispose of it at offsite locations provided by the Contractor.
- (4) If expansion joints are not being replaced or have been replaced prior to shotblasting, they shall be protected from damage from the shotblasting operation. Deck drains and areas of curb or railing above the proposed surface shall be protected from the shotblasting operation.
- (5) Pick up and store all blast media and contaminants in a vacuum unit. Do not create dust during the blasting operation that will obstruct the view of motorists in adjacent roadways. Store, handle, and dispose of blast media and contaminants in accordance with all applicable local, state, and federal requirements.
- (6) Cover deck joint seal and elastomeric material, plug deck drain scuppers, seal cracks on underside of deck, and use other necessary protective measures to prevent leakage of silane below the concrete deck, to protect waterways, bridge components, pedestrians, vehicles, roadway, vegetation, and any other items or areas below or near the bridge.

- (7) Application of sealant by spray methods will not be permitted during windy conditions, if in the opinion of the Engineer, unsatisfactory results will be obtained. Other application methods or rescheduling will be required.
- (8) Avoid application with hand pump sprayers. For small areas of silane application, the use of hand pump sprayers might be allowed, but must be approved by the Engineer.
- (9) Protect traffic from rebound, dust, overspray, and construction activities. Provide appropriate shielding, as required and/or directed by the Engineer.
- (10) The Contractor shall provide suitable coverings (e.g. heavy-duty drop cloths) as needed to protect all exposed areas not to receive silane treatment, such as asphalt pavement, curbs, sidewalks, parapets, etc.
- (11) Clean and/or repair all damage or defacement resulting from Contractor's operations to the Engineer's satisfaction at no additional cost to the Department.
- (12) The equipment used for silane application must be clean of foreign materials and approved by the Engineer before use.
- (13) The surface to receive the treatment shall be dry for at least 48 hours before treatment and shall be free from sand, surface dust and dirt, oil, grease, chemical films, and other contaminants prior to application of the silane.
- (14) The surface, air, and material temperatures shall be between 40°F and 90°F during application.
- (15) Do not apply silane materials during cold, hot, or wet weather conditions or when adverse weather conditions are forecast within 12 hours of the completion of the silane application. Correct any coating damaged by rain or moisture by an additional application or as required by the silane manufacturer.
- (16) Protect prepared surfaces from precipitation and heavy dew during and after the application of the silane.
- (17) Conduct the work in a continuous operation, with the silane application as soon as practical following surface preparation.
- (18) Apply silane during the lowest temperature period of the day, typically between 1:00 a.m. and 9:00 a.m., when the cracks are open to the greatest extent.
- (19) Clean up, dispose of any surplus material, and restore any disturbed areas unless otherwise directed.
- (20) 100% Silane is a combustible liquid; take appropriate precautions during handling, storage, and operations. **KEEP AWAY FROM OPEN FLAME.**
- (21) Work crews should wear appropriate personal protection equipment and follow manufacturer's recommendations when applying silane. Refer to the SDS and all applicable local, state, and federal laws, and rules and regulations of authorities having jurisdiction over the project, for specific guidance for personal and environmental protection and safety requirements.

MEASUREMENT AND PAYMENT

Shotblasting Bridge Deck will be measured and paid for at the contract unit price per square yard and will be full compensation for the shotblasting and necessary sandblasting and handwork to

prepare the entire concrete bridge deck, and removal and disposal of all waste material generated.

Silane Deck Treatment will be measured and paid for at the contract unit price per square yard and will be full compensation for bridge deck surface and crack preparation; for furnishing and applying the silane deck treatment; for protection of waterways, bridge, and other nearby surfaces, vehicles, and pedestrians; and for all labor, tools, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Shotblasting Bridge Deck	Square Yard
Silane Deck Treatment	Square Yard

PAINTING EXISTING STRUCTURE

(2-11-19)

DESCRIPTION

This work shall consist of furnishing all labor, equipment, and materials necessary to clean and paint the structural steel of the existing bridge. Work includes: removal, containment and disposal of the existing paint system; preparation of the surface to be painted and applying the new paint system; a containment enclosure; and any incidentals necessary to complete the project as specified and shown on the plans.

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 *Standard Specifications*). To complete successfully the observation period, the coating system shall meet the following requirements after 12 months service:

- (A) No visible rust, contamination or application defect is observed in any coated area.
- (B) Painted surfaces have a uniform color and gloss.
- (C) Painted surfaces have an adhesion that meets an ASTM D3359, 3A rating.

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

SUBMITTALS

Submit all of the following to the Engineer for review and approval before scheduling the pre-construction meeting. Allow at least two (2) weeks for the review process.

- (A) The existing paint systems include toxic substances such as red lead oxide, which are considered hazardous if improperly removed. The contractor shall be currently Society for Protective Coatings (SSPC) Quality Program (QP) 2, Category A certified, and have successfully completed lead paint removal and field painting on similar structures within 18 months prior to this bid. Lead abatement work completed within the 18 month period shall have been completed in accordance with contract specifications, free of citation from safety or environmental agencies. Lead abatement work shall include, but not be limited to:

abrasive blasting; waste handling, storage and disposal; worker safety during lead abatement activities (fall protection, personal protective equipment (PPE), etc.); and containment. This requirement is in addition to the contractor pre-qualification requirements covered by Article 102-2 of the *Standard Specifications*.

The apparent low bidder shall submit a list of projects for which QP 2 work was performed within the last 18 months including owner contact information and submit to the Engineer a "Lead Abatement Affidavit". See link for form:

<https://www.ncdot.gov/initiatives-policies/Transportation/bridges/Documents/leadabatementaffidavit.pdf>.

- (B) Work schedule which shall be kept up to date, with a copy of the revised schedule being provided to the Engineer in a timely manner.
- (C) Containment system plans and design calculations in accordance with SSPC Guide 6, Class 2A and other project requirements, signed and sealed by a Professional Engineer licensed by the State of North Carolina.
- (D) Bridge wash water sampling and disposal plan.
- (E) Subcontractor identification.
- (F) Lighting plan for night work in accordance with Section 1413 of the *Standard Specifications*.
- (G) Traffic control plan with NCDOT certified supervisors, flaggers and traffic control devices.
- (H) Health and safety plan addressing at least the required topics as specified by the SSPC QP 1 and QP 2 program and including hazard communication, respiratory health, emergency procedures, and local hospital and treatment facilities with directions and phone numbers, disciplinary criteria for workers who violate the plan and accident investigation. The plan shall address the following: hazardous materials, personal protective equipment, general health and safety, occupational health and environmental controls, fire protection and prevention, signs signals, and barricades, materials handling, storage, use, and disposal, hand and power tools, welding and cutting, electrical, scaffolds, fall protection, cranes, derricks, hoists, elevators, and conveyors, ladders, toxic and hazardous substances, airless injection and high pressure water jet (HPWJ).
- (I) Provide the Engineer a letter of certification that all employees performing work on the project have blood lead levels that are below the Occupational Safety and Health Administration (OSHA) action level.
- (J) Provide the Engineer with Competent Person qualifications and summary of work experience.
- (K) Environmental Compliance Plan.
- (L) Quality Control Plan (Project Specific) with quality control qualifications and summary of work experience.
- (M) Bridge and Public Protection Plan (Overspray, Utilities, etc. - Project/Task Specific).
- (N) Abrasive Blast Media:
 - (1) Product Data Sheet.
 - (2) Blast Media Test Reports in accordance with Article 1080-12 of the *Standard Specification*.

(O) Coating Material:

- (1) NCDOT HICAMS Test Reports (testing performed by NCDOT Materials and Tests Unit).
- (2) Product Data Sheets.
- (3) Material Safety Data Sheets.
- (4) Product Specific Repair Procedures.
- (5) Acceptance letters from paint manufacturer's for work practices that conflict with special provisions and/or paint manufactures product data sheets.

PRE-CONSTRUCTION MEETING

Submittals shall be reviewed and approved by the Engineer prior to scheduling the pre-construction meeting. Allow no less than two (2) weeks for a review process. When requesting a pre-construction meeting, contact the Engineer at least seven (7) working days in advance of the desired pre-construction date. The contractor's project supervisor, Competent Person, quality control personnel and certified traffic control supervisor shall be in attendance at the pre-construction meeting in order for the Contractor and NCDOT team to establish responsibilities for various personnel during project duration and to establish realistic timeframes for problem escalation.

CONTAINMENT SYSTEM

Prior to performing any construction or painting operations on the structure, the Contractor shall furnish the Engineer with plans and design calculations for a sufficiently designed containment system, which will provide access for any repairs on structural steel members, cleaning and surface preparations for structural steel members, and coating operations for structural steel members of the bridge. The containment system shall not be installed, and no work shall begin, until the Engineer has reviewed and approved, in writing, the submitted containment system plans and design calculations. Containment system plans and design calculations shall be prepared, sealed, and signed by a Professional Engineer licensed by the State of North Carolina. Allow a minimum of two (2) weeks for review of the containment plans and calculations.

The containment system shall meet or exceed the requirements of Class 2A containment in accordance with SSPC Guide 6. The Contractor shall determine the required capacity of the containment system, which, at a minimum, shall include loads due to wind, repair materials and repair operations, equipment, and tools; however, the capacity shall not be less than that required by Federal or State regulations. Design steel members to meet the requirements of the *American Institute of Steel Construction Manual*. Design timber members in accordance with the *National Design Specification for Stress-Grade Lumber and Its Fastenings* of the National Forest Products Association. The containment system shall be constructed of materials capable of withstanding damage from any of the work required on this project and shall provide a two (2) hour resistance to fire.

In the containment system plans, describe how debris is contained and collected. Describe the type of tarpaulin, bracing materials, and the maximum designed wind load. Design wind loads shall be in accordance with the Falsework and Formwork special provision. Describe the dust collection system and how a negative pressure of 0.03 inches of water column is maintained inside the enclosure, while blasting operations are being conducted. Describe how the airflow inside the

containment structure is designed to meet all applicable OSHA Standards. Describe how water run-off from rain will be routed by or through the enclosure. Describe how wash water will be contained and paint chips separated. Describe what physical containment will be provided during painting application to protect the public and areas not to be painted.

Drilling holes in the superstructure for the purpose of attaching the containment system is prohibited.

The Contractor will be responsible for certifying the containment system has been constructed in accordance with the approved plans.

The containment system shall be cleaned after each workday.

Upon completion of work, remove all anchorages in the substructure and repair the substructure at no additional cost to the Department.

Protect non-metallic parts of bearings from blasting and painting (i.e.: Pot Bearings, Elastomeric Pads, and Disc Bearings).

WASH WATER SAMPLING AND DISPOSAL PLAN

All wash water shall be collected and sampled prior to disposal. Representative sampling and testing methodology shall conform to North Carolina Administrative Code 15A NCAC 02B.0103, "Analytical Procedures". Wash water shall be tested for pollutants listed in 15A NCAC 02B.0211(3), 15A NCAC 02T.0505(b)(1) and 15A NCAC 2T.0905(h). Depending on the test results, wash water disposal methods shall be described in the disposal plan. Wash water shall be disposed of in accordance with all current Federal and State regulations. See link for NCDOT Guidelines for Managing Bridge Wash Water:

<https://www.ncdot.gov/initiatives-policies/Transportation/bridges/Documents/WashWater.pdf>

WASTE HANDLING OF PAINT AND ABRASIVES

Comply with all Federal, State, and local regulations. Failure to comply with the regulations could result in fines and loss of qualified status with NCDOT.

Comply with the Resource Conservation and Recovery Act (RCRA - 40 CFR 261 - 265) and the Occupational Safety and Health Act (OSHA - 29 CFR 1910 - 1926) regulations for employee training, and for the handling, storage, labeling, recordkeeping, reporting, inspections and disposal of all hazardous waste generated during paint removal.

A summary of Generator Requirements is available at the above NCDOT web link, which cites the specific regulations for each Generator category. Quantities of waste by weight and dates of waste generation shall be recorded. Waste stored at the project site shall be properly labeled. All waste, hazardous or non-hazardous, requires numbered shipping manifests.

The North Carolina Department of Environmental Quality (NCDEQ) have adopted RCRA as the North Carolina Hazardous Waste Management Rules and are responsible for enforcement. The *Hazardous Waste Generator Compliance Manual* is published by the Compliance Branch of the Division of Waste Management of NCDEQ, and can be found at: <https://files.nc.gov/ncdeq/Waste%20Management/DWM/HW/Compliance/Generator%20Compliance%20Manual.pdf>

Immediately after award of the contract, arrange for waste containers, sampling, testing, transportation, and disposal of all waste. No work shall begin until the Contractor furnishes the Engineer with a written waste disposal plan. Any alternative method for handling waste shall be pre-approved by the Engineer. Use an approved waste management company from the following link:

<https://www.ebs.nc.gov/VendorDirectory/results.html?sap-params=cD0xJTIwJmN1cnJlbnRfc2VhcmNoX3BhZ2U9d2Mmc2VsZWN0aW9uX2Zpcm1fbmFtZT0mc2VsZWN0aW9uX2NlcnQ9JnNlbGVjdGlvb19maXJtdHlwZT0meXNjX2Zpcm10eXB1PSZzZWx1Y3Rpb25fd29ya2xvY2F0aW9uPSZ5c2Nfd29ya2xvY2F0aW9uPSZzZWx1Y3Rpb25fYWRkcnN0YXRIPSZ5c2NfYWRkcnN0YXRIPSZzZWx1Y3Rpb25fYWRkcmNvdW50eT0meXNjX2FkZHIjb3VudHk9JnNlbGVjdGlvb193a2NvZGU9MDAzMDQwJnlzY193a2NvZGU9MDAzMDQwJTIwQ090VEFNSU5BVEVEJTIwTUFURVJJQUxTJTIwUkVNT1ZBTCZzZWx1Y3Rpb25fZGZlZyZ0meXNjX2Rpc2M9JnNlbGVjdGlvb19uYWIjcz0meXNjX25haWNzPSZzZWx1Y3Rpb25fY3R5cGU9MA%3d%3d>

All removed paint and spent abrasive media shall be tested for lead following the SW-846 Toxicity Characteristic Leaching Procedure (TCLP) Method 1311 Extraction, as required in 40 CFR 261, Appendix 11, to determine whether it shall be disposed of as hazardous waste. Furnish the Engineer certified test reports showing TCLP results of the paint chips stored on site, with disposal in accordance with “Flowchart on Lead Waste Identification and Disposal” at:

<https://ncdenr.s3.amazonaws.com/s3fs-public/document-library/Lead%20Disposal.pdf>

All sampling shall be done in presence of the Engineer’s representative.

The Competent Person shall obtain composite samples from each barrel of the wash water and waste generated by collecting two or more portions taken at regularly spaced intervals during accumulation. Composite the portions into one sample for testing purposes. Acquire samples after 10% or before 90% of the barrel has accumulated. The intent is to provide samples that are representative of widely separated portions, but not the beginning and end of wash water or waste accumulation.

Perform sampling by passing a receptacle completely through the discharge stream or by completely diverting the discharge into a sample container. If discharge of the wash water or waste is too rapid to divert the complete discharge stream, discharge into a container or transportation unit sufficiently large to accommodate the flow and then accomplish the sampling in the same manner as described above.

Comply with the NCDEQ *Hazardous Waste Compliance Generator Manual*. Record quantities of waste by weight and dates of waste generation. Until test results are received, store all waste, and label as “NCDOT Bridge Paint Removal Waste - Pending Analysis” and include the date generated and contact information for the Engineer. Store waste containers in an enclosed, sealed, and secured storage container protected from traffic from all directions. Obtain approval for the

protection plan for these containers from the Engineer. If adequate protection cannot be obtained by use of existing guardrail, provide the necessary supplies and equipment to maintain adequate protection. Once test results are received and characterized, label waste as either “Hazardous Waste - Pending Disposal” or “Paint Waste - Pending Disposal”.

Once the waste has been collected, and the quantities determined, prepare the appropriate shipping documents and manifests and present them to the Engineer. The Engineer will verify the type and quantity of waste and obtain a Provisional Environmental Protection Agency (EPA) ID number from:

Melodi Deaver
Division of Waste Management/Hazardous Waste Section
North Carolina Department of Environmental Quality
1646 Mail Service Center
Raleigh, NC 27699
Phone: (919) 707-8204, Email: melodi.deaver@ncdenr.gov

At the time of shipping, the Engineer will sign, date, and add the ID number in the appropriate section on the manifest. The maximum on-site storage time for collected waste shall be 90 calendar days. All waste whether hazardous or non-hazardous will require numbered shipping manifests. The cost for waste disposal (including lab and Provisional EPA ID number) is included in the bid price for this contract. Note NC Hazardous Waste Management Rules (15A NCAC 13A) for more information. Provisional EPA ID numbers may be obtained at:

<https://deq.nc.gov/about/divisions/waste-management/hw/provisional-notification>

Testing labs shall be certified in accordance with North Carolina State Laboratory Public Health Environmental Sciences. List of certified laboratories may be obtained at:

<https://slphreporting.ncpublichealth.com/Certification/CertifiedLaboratory.asp>

All test results shall be documented on the lab analysis as follows:

(A) For leachable lead:

(1) Soils/Solid/Liquid- EPA 1311/200.7/6010

Area sampling will be performed for the first two (2) days at each bridge location. The area sample will be located within five (5) feet of the containment and where the highest probability of leakage will occur (access door, etc.). Results from the area sampling will be given to the Engineer within 72 hours of sampling (excluding weekends). If the results of the samples exceed $20 \mu\text{g}/\text{m}^3$ corrective measures shall be taken and monitoring shall be continued until two (2) consecutive sample results are less than $20 \mu\text{g}/\text{m}^3$.

Time Weighted Average (TWA) may suspend the work if there are visible emissions outside the containment enclosure or pump monitoring results exceeding the level of $30 \mu\text{g}/\text{m}^3$.

Where schools, housing and/or buildings are within 500 feet of the containment, the Contractor shall perform initial Total Suspended Monitoring (TSP) Lead monitoring for the first ten (10) days of the project during abrasive blasting, vacuuming and containment removal. Additional monitoring will be required during abrasive blasting two (2) days per month thereafter. Results of the TSP monitoring at any location shall not exceed $1.5 \mu\text{g}/\text{m}^3$.

EQUIPMENT MOBILIZATION

The equipment used in any travel lanes and paved shoulder shall be mobile equipment on wheels that has the ability to move on/off the roadway in less than 30 minutes. All work conducted in travel lanes shall be from truck or trailer supported platforms and all equipment shall be self-propelled or attached to a tow vehicle at all times.

QUALITY CONTROL INSPECTOR

Provide a quality control (QC) inspector in accordance with the SSPC QP guidelines to ensure that all processes, preparation, blasting and coating application are in accordance with the requirements of the contract. The inspector shall have written authority to perform QC duties to include continuous improvement of all QC internal procedures. The presence of the engineer or inspector at the work site shall in no way lessen the contractor's responsibility for conformity with the contract.

QUALITY ASSURANCE INSPECTOR

The quality assurance inspector which may be a Department employee or a designated representative of the Department shall observe, document, assess, and report that the Contractor is complying with all of the requirements of the contract. Inspectors employed by the Department are authorized to inspect all work performed and materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. The inspector is not authorized to alter or waive the requirements of the contract. Each stage in preparing the structure to be coated which includes but not limited to washing, blasting, coating testing and inspection shall be inspected and approved by the Engineer or an authorized representative.

SUBLETTING OF CONTRACT

Only contractors certified to meet SSPC QP 2, Category A, and have successfully completed lead paint removal and field painting on all similar structures within 18 months prior to this bid are qualified for this work. Work is only sublet by approval of the Engineer.

PREPARATION OF SURFACES

Before any other surface preparation is conducted, all surfaces shall be power washed to remove dust, salts, dirt, and other contaminants. All wash water shall be contained, collected, and tested in accordance with the requirements of NCDOT Guidelines for Managing Bridge Wash Water. Obtain approval of the Engineer and allow all cleaned surfaces to dry to the touch and without standing water before beginning surface preparation or painting activities.

Surface preparation is done with materials meeting Article 1080-12 of the *2 Standard Specifications*. No silica sand or other silica materials are permitted for use. The profile shall be between 1.0 and 3.0 mils when measured on a smooth steel surface. Conduct and document at least two (2) tests per beam/girder and two (2) tests per span of diaphragms/cross bracing.

Spread tarpaulins over all pavements and surfaces underneath equipment used for abrasive blasting as well as equipment and containers used to collect abrasive media. This requirement will be enforced during activity and inactivity of equipment.

Before the Contractor departs from the work site at the end of the workday, collect all debris generated during surface preparation and all dust collector hoses, tarps or other appurtenances containing blasting residue in approved containers.

Clean a 3" x 3" area at each structure to demonstrate the specified finish, and the inspector will preserve this area by covering it with tape, plastic or some other suitable means so that it can be retained as the Dry Film Thickness (DFT) gauge adjustment standard. An acceptable alternative is for the Contractor to provide a steel plate with similar properties and geometry as the substrate to be measured.

The contractor and or quality assurance representative shall notify the Engineer of any area of corroded steel that has lost more than 50% of its original thickness.

All parts of the bridges not to be painted and the travelling public shall be protected from overspray. Submit a plan to protect all parts of bridge that are not required to be painted and a plan to protect the traveling public and surrounding environment while applying all coats of paint to a structure.

Ensure that chloride levels on the surfaces are $7 \mu\text{g}/\text{cm}^2$ or lower using an acceptable sample method in accordance with SSPC Guide 15. The frequency of testing shall be two (2) tests per span after all surface preparation has been completed and immediately prior to painting. Select test areas representing the greatest amount of corrosion in the span as determined by the Engineers' representative. Additional testing may be required if significant amounts of chloride are detected.

All weld splatter, slag or other surface defects resulting in a raised surface above the final paint layer shall be removed prior to application of primer coat.

PAINTING OF STEEL

Paint System 1, as specified in these special provisions and Article 442-8 of the *Standard Specifications*, is to be used for this work. System 1 is an inorganic zinc primer, two coats acrylic paint, and one stripe coat of acrylic paint over blast-cleaned surfaces in accordance with SSPC-SP-10 (Near White Blast). Perform all mixing operations over an impervious surface with provisions to prevent runoff to grade of any spilled material. The contractor is responsible for reporting quantities of thinner purchased as well the amounts used. No container with thinner shall be left uncovered, when not in use.

Apply 2" stripe coat, by brush or roller only, to all exposed edges of steel including fasteners before applying the finish coat. Locate the edge or corner in the approximate center of the paint stripe.

Any area where newly applied paint fails to meet the specifications shall be repaired or replaced by the Contractor, at no additional cost to the Department. The Engineer approves all repair processes before the repair is made. Repaired areas shall meet the *Standard Specifications*. The Contractor applies an additional finish coat of paint to areas where the tape adhesion test is conducted.

MATERIALS

Only paint suppliers that have a NCDOT qualified inorganic zinc primer may furnish paints for this project. All paints applied to a structure shall be from the same supplier. Before any paints are

applied the Contractor shall provide the Engineer a manufacturer's certification that each batch of paint meets the requirements of the applicable Section 1080 of the *Standard Specifications*.

The inspector randomly collects a one pint sample of each paint product used on the project. Additional samples may be collected as needed to verify compliance to the specifications.

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

INSPECTION

Surface Preparation for System 1 shall be in accordance with SSPC SP-10. Any area(s) not meeting the requirements of SSPC SP-10 shall be remediated prior to application of coating. Surface inspection is considered ready for inspection when all blast abrasive, residue and dust is removed from surfaces to be coated.

(A) Quality Assurance Inspection

The Contractor furnishes all necessary OSHA approved apparatus such as ladders, scaffolds and platforms as required for the inspector to have reasonable and safe access to all parts of the work. The contractor illuminates the surfaces to be inspected to a minimum of 50-foot candles of light. All access points shall be illuminated to a minimum of 20-foot candles of light.

NCDOT reserves the right for ongoing Quality Assurance (QA) inspection to include but not limited to surface contamination testing, adhesion pull testing, and DFT readings as necessary to assure quality.

Inform the Engineer and the Division Safety Engineer of all scheduled and unannounced inspections from SSPC, OSHA, EPA and/or others that come on site. Furnish the Engineer a copy of all inspection reports except for reports performed by a third party and or consultant on behalf of the Contractor.

(B) Inspection Instruments

At a minimum, furnish the following calibrated instruments and conduct the following quality control tests:

- (1) Sling Psychrometer - ASTM E337 - bulb type
- (2) Surface Temperature Thermometer
- (3) Wind Speed Indicator
- (4) Tape Profile Tester - ASTM D4417 Method C
- (5) Surface Condition Standards - SSPC VIS-1 and VIS-3
- (6) Wet Film Thickness Gage - ASTM D4414
- (7) Dry Film Thickness Gage - SSPC-PA2 Modified
- (8) Solvent Rub Test Kit - ASTM D4752

- (9) Adhesion Test Kit - ASTM D3359 Method A (Tape Test)
- (10) Adhesion Pull test - ASTM D4541
- (11) Surface Contamination Analysis Kit or (Chloride Level Test Kit) SSPC Technology Guide 15

(C) Quality Control

Maintain a daily quality control record in accordance with Subarticle 442-12(D) of the *Standard Specifications* and make such records available at the job site for review by the inspector and submit to the Engineer as directed. In addition to the information required on Form M&T-610, submit all Dry Film Thickness (DFT) readings on a form equivalent to Form M&T-611. These forms can be found at:

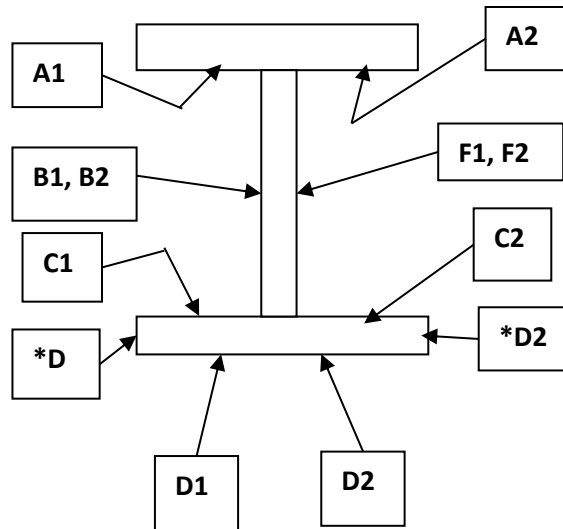
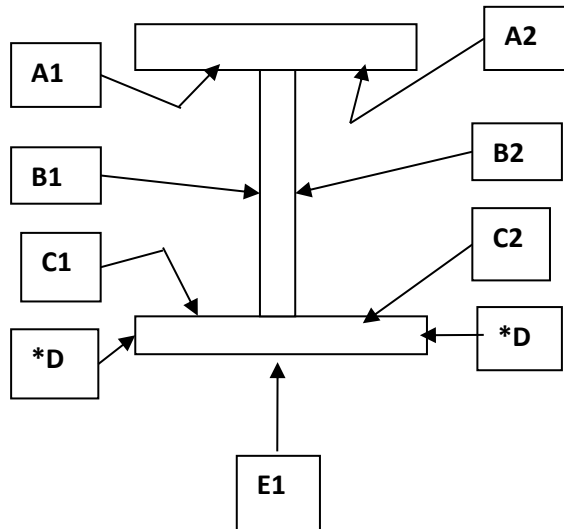
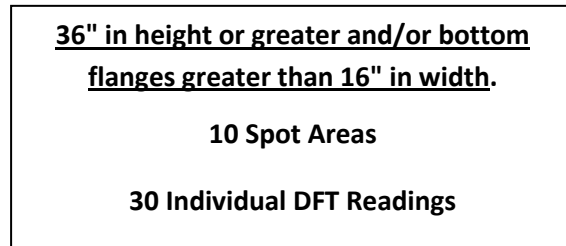
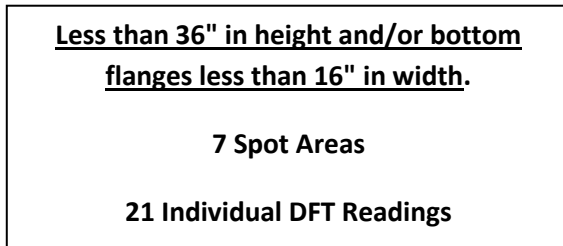
<https://connect.ncdot.gov/resources/Materials/Pages/Materials-Manual-by-Material.aspx?Order=MM-03-02>

- (1) Measure DFT at each spot on the attached diagram and at the required number of locations as specified below:
 - (a) For span members less than 45 feet; three (3) random locations along each girder in each span.
 - (b) For span members greater than 45 feet; add one additional location for each additional ten (10) feet in span length.

DFT measurements for the prime coat shall not be taken for record until the zinc primer has cured in accordance with ASTM D4752 (MEK Rub Test) with no less than a four (4) resistance rating.

Stiffeners and other attachments to beams and or plate girders shall be measured at no less than five (5) random spots per span. Also, dry film thickness is measured at no less than six (6) random spots per span on diaphragms/cross frames.

Each spot is an average of three (3) to five (5) individual gage readings as defined in SSPC PA-2. No spot average shall be less than 80% of minimum DFT for each layer applied; this does not apply to stripe coat application. Spot readings that are non-conforming shall be re-assessed by performing additional spot measurements not to exceed one-foot intervals on both sides of the low areas until acceptable spot averages are obtained. These non-conforming areas shall be corrected by the Contractor prior to applying successive coats.



***D areas are only included when flange thickness is one inch (1") or greater.**

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- (2) Two (2) random adhesion tests (1 test = 3 dollies) per span are conducted on interior surfaces in accordance with ASTM D4541 (Adhesion Pull Test) after the prime coat has been properly cured in accordance with ASTM D4752 (MEK Rub Test) with no less than a four (4) resistance rating, and will be touched up by the Contractor. The required minimum average adhesion is 400 psi.
- (3) Cure of the intermediate and stripe coats shall be accessed by using the thumb test in accordance with ASTM D1640 (Curing Formation Test) prior to the application of any successive layers of paint.
- (4) One random Cut Tape adhesion test per span is conducted in accordance with ASTM D3359 (X-Cut Tape Test) on interior surface after the finish coat is cured. Repair areas shall be properly tapered and touched up by the Contractor.

SAFETY AND ENVIRONMENTAL COMPLIANCE PLANS

Personnel access boundaries are delineated for each work site using signs, tape, cones, or other approved means. Submit copies of safety and environmental compliance plans that comply with SSPC QP 2 Certification requirements.

HEALTH AND SAFETY RESPONSIBILITIES

This project may involve toxic metals such as arsenic, lead, cadmium and hexavalent chromium. It is the contractor's responsibility to test for toxic metals and if found, comply with the OSHA regulations, which may include medical testing.

Ensure a "Competent Person" as defined in OSHA 29 CFR 1926.62; one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them; is on site during all surface preparation activities and monitors the effectiveness of containment, dust collection systems and waste sampling. Before any work begins, provide a written summary of the Competent Person's safety training.

Comply with Subarticle 442-14(B) of the *Standard Specifications*.

Comply with Subarticle 442-14(D) of the *Standard Specifications*. Ensure employee blood sampling test results are less than 50 micrograms per deciliter. Remove employees with a blood sampling test of 50 or more micrograms per deciliter from work activities involving any lead exposure.

An employee who has been removed with a blood level of 50 micrograms per deciliter or more shall have two (2) consecutive blood sampling tests spaced one week apart indicating that the employee's blood lead level is at or below 40 micrograms per deciliter before returning to work activities involving any lead exposure.

All OSHA recordable accidents that occur during the project duration are to be reported to the Engineer within twenty-four (24) hours of occurrence. In addition, for accidents that involve civilians or property damage that occurs within the work zone the Division Safety Engineer shall be notified immediately.

Prior to blasting operations, the Contractor shall have an operational OSHA approved hand wash station at each bridge location and a decontamination trailer at each bridge or between bridges unless the work is on the roadway, or the Contractor shall show reason why it is not feasible to do so and provide an alternative site as approved by the Engineer. The Contractor shall assure that all employees whose airborne exposure to lead is above the Permissible Exposure Limit (PEL) shall shower at the end of their work shift.

STORAGE OF PAINT AND EQUIPMENT

Provide a location for materials, equipment, and waste storage. Spread tarpaulins over all pavements and surfaces underneath equipment used for abrasive recycling and other waste handling equipment or containers. All land and or lease agreements that involve private property shall disclose to the property owner that heavy metals may be present on the Contractor's equipment. Prior to storing the Contractor's equipment on private property, provide a notarized written consent signed by the land owner received by the Engineer at least forty-eight (48) hours before using property. All storage of paint, solvents, and other materials applied to structures shall be stored in accordance with Subarticle 442-9(C) of the *Standard Specifications* or the manufacturers' requirements. The more restrictive requirements will apply.

UTILITIES

Protect all utility lines or mains that may be supported on, under, or adjacent to bridge work sites from damage and paint overspray.

MEASUREMENT AND PAYMENT

The cost of inspection, surface preparation, and repainting the existing structure is included in the lump sum price bid for *Cleaning and Repainting of Bridge #___*. This price is full compensation for furnishing all inspection equipment, all paint, cleaning abrasives, cleaning solvents and all other materials; preparing and cleaning surfaces to be painted; applying paint in the field; protecting work area, traffic and property; and furnishing blast cleaning equipment, paint spraying equipment, brushes, rollers, any other hand or power tools and any other equipment.

Pollution Control will be paid at the contract lump sum price which will be full compensation for all collection, handling, storage, air monitoring, and disposal of debris and wash water, all personal protective equipment, and all personal hygiene requirements, and all equipment, material and labor necessary for the daily collection of the blast debris into specified containers; and any measures necessary to ensure conformance to all safety and environmental regulations as directed by the Engineer.

Painting Containment for Bridge #___ will be paid at the lump sum contract price and will be full compensation for the design, materials, installation, maintenance, and removal of the containment system.

Payment will be made under:

Pay Item	Pay Unit
Cleaning and Repainting of Bridge #___	Lump Sum
Pollution Control	Lump Sum
Painting Containment for Bridge #___	Lump Sum

SCOPE OF WORK

Bridge #320: This bridge was built in 1967 and carries I-277/NC 16 over North Brevard Street. The superstructure consists of 3 simple spans that vary from 15 to 17 lines of steel beams. The beams consists of W27x84 & W33x135 sections and are at varying spacing with steel diaphragms. The bridge has an overall length of 121'-6" with a concrete deck and a deck width that varies from 116'-8" to 138'-9". The minimum vertical clearance is 15'-1". The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is **19,500** sq. ft.

Bridge #330: This bridge was built in 1971 and carries I-277/NC16 over US 29/NC 49 (North Graham Street). The superstructure consists of 3 simple spans that vary from 22 to 25 lines of steel beams. The beams consist of W30x99, W33x118, W36x135, W36x245, W36x280 & W36x300 sections and are at varying spacing with steel diaphragms. The bridge has an overall length of 103'-0" with a concrete deck and a variable deck width. The minimum vertical clearance is 14'-7"

1/4". The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is **46,000** sq. ft.

SPOT PAINTING OF STEEL STRUCTURE REPAIR AREAS**(SPECIAL)****DESCRIPTION**

This work shall consist of furnishing all labor, equipment, and materials necessary to clean and paint the steel repair areas of the existing structure. Work includes: removal, containment and disposal of the existing paint system; preparation of the surface to be painted and applying the new paint system; a containment enclosure; and any incidentals necessary to complete the project as specified and shown on the plans.

CERTIFICATION

Only contractors who are currently SSPC QP 1 certified, and have successfully completed field painting on similar structures within 18 months prior to this bid, may perform this work.

Successfully completed projects shall have all lead abatement work completed in accordance with the contract and be free of citation from safety or environmental agencies. Lead abatement work shall include, but not be limited to: abrasive blasting; waste handling, storage and disposal; worker safety during lead abatement activities (fall protection, PPE, etc.); and containment. This requirement is in addition to the Contractor pre-qualification requirements covered by Article 102-2 of the *2018 Standard Specifications*.

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*). For successful completion of the observation period, the coating system shall meet the following requirements after 12 months service:

- (A) No visible rust, contamination or application defect is observed in any coated area.
- (B) Painted surfaces have a uniform color and gloss.
- (C) Painted surfaces have an adhesion that meets an ASTM D3359, 3A rating.

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

SUBMITTALS

Submit all of the following to the Engineer for review and approval before scheduling the pre-construction meeting. Allow at least 2 weeks for the review process.

- (A) Work schedule which shall be kept up to date, with a copy of the revised schedule being provided to the Engineer in a timely manner,

- (B) Containment Drawings in accordance with SSPC Guide 6, Class 3A sealed by a Professional Engineer licensed by the State of North Carolina,
- (C) Bridge wash water sampling and disposal plan,
- (D) Subcontractor identification,
- (E) Lighting plan for night work in accordance with Section 1413 of the *2018 Standard Specifications*,
- (F) Traffic control plan with NCDOT certified supervisors, flaggers and traffic control devices,
- (G) Health and Safety Plan addressing at least the required topics as specified by the SSPC QP 1 program which includes, but is not limited to: hazardous materials, personal protective equipment, hand and power tools, ladders, toxic and hazardous substances, emergency procedures, and local hospital and treatment facilities with directions and phone numbers, disciplinary criteria for workers who violate the plan and accident investigation,
- (H) Provide the Engineer with Competent Person qualifications and summary of work experience.
- (I) Environmental Compliance Plan
- (J) Quality Control Plan (Project Specific) with quality control qualifications and summary of work experience.
- (K) Bridge and Public Protection Plan (Overspray, Utilities, etc. - Project/Task Specific)
- (L) Abrasive Blast Media
 - (1) Product Data Sheet
 - (2) Blast Media Test Reports in accordance with Article 1080-12 of the *2018 Standard Specification*.
- (M) Coating Material
 - (1) NCDOT HICAMS Test Reports (testing performed by NCDOT Materials and Tests Unit),
 - (2) Product Data Sheets,
 - (3) Material Safety Data Sheets,
 - (4) Product Specific Repair Procedures, and
 - (5) Acceptance letters from paint manufacturers for work practices that conflict with Project Special Provisions and/or paint manufactures' product data sheets.

PRE-CONSTRUCTION MEETING

Submittals shall be reviewed and approved by the Engineer prior to scheduling the pre-construction meeting. Allow no less than 2 weeks for a review process. When requesting a pre-construction meeting, contact the Engineer at least 7 working days in advance of the desired pre-construction date. The contractor's project supervisor, Competent person, quality control personnel and certified traffic control supervisor shall be in attendance at the pre-construction meeting in order for the Contractor and NCDOT team to establish responsibilities for various personnel during project duration and to establish realistic timeframes for problem escalation.

CONTAINMENT PLAN

The containment plan shall meet Class 3A containment in accordance with SSPC Guide 6. Enclosure drawings and loads supported by the structure shall be prepared, signed, and sealed

by a Professional Engineer licensed by the State of North Carolina. Describe what physical containment will be provided during painting application to protect the public and areas not to be painted. Protect non-metallic parts of bearings from blasting and painting (i.e.: Pot Bearings, Elastomeric Pads, and Disc Bearings).

WASH WATER SAMPLING AND DISPOSAL PLAN

No work may begin until the Contractor furnishes the Engineer with a containment plan for surface preparation and coating operations and the Engineer reviews and approves in writing said plan. All wash water shall be collected and sampled prior to disposal. Representative sampling and testing methodology shall conform to 15A NCAC 02B.0103, "Analytical Procedures." Wash water shall be tested for pollutants listed in 15A NCAC 02B.0211(3), 15A NCAC 02T.0505(b)(1) and 15A NCAC 2T.0905(h). Depending on the test results, wash water disposal methods shall be described in the disposal plan. Wash water shall be disposed of in accordance with all current Federal and State regulations. See link for NCDOT Guidelines for Managing Bridge Wash Water: <http://www.ncdot.gov/projects/nbridges/#stats>.

WASTE HANDLING OF PAINT AND ABRASIVES

Comply with all Federal, State, and local regulations. Failure to comply with the regulations could result in fines and loss of qualified status with NCDOT.

Comply with the Resource Conservation and Recovery Act (RCRA - 40 CFR 261 - 265) and the Occupational Safety and Health Act (OSHA - 29 CFR 1910 - 1926) regulations for employee training, and for the handling, storage, labeling, recordkeeping, reporting, inspections and disposal of all hazardous waste generated during paint removal. All waste, hazardous or non-hazardous, requires numbered shipping manifests.

Comply with the NCDENR Hazardous Waste Compliance Manual for Generators of Hazardous Waste. Record quantities of waste by weight and dates of waste generation. Until test results are received, store all waste, and label as "NCDOT Bridge Paint Removal Waste - Pending Analysis" and include the date generated and contact information for the Division HazMat Manager or Project Engineer. Store waste containers in an enclosed, sealed, and secured storage container protected from traffic from all directions. Obtain approval for the protection plan for these containers from the Engineer. If adequate protection cannot be obtained by use of existing guardrail, provide the necessary supplies and equipment to maintain adequate protection. Once test results are received and characterized, label waste as either "Hazardous Waste - Pending Disposal" or "Paint Waste - Pending Disposal."

The North Carolina Department of Environment and Natural Resources (NCDENR) adopted RCRA as the North Carolina Hazardous Waste Management Rules and is responsible for enforcement. The "Hazardous Waste Compliance Manual for Generators of Hazardous Waste" is published by the Compliance Branch of the Division of Waste Management of NCDENR and can be found at <http://portal.ncdenr.org/web/wm/hw/rules>.

If waste is considered hazardous, the following applies:

Use a company from the below list of approved waste management companies. Immediately after award of the contract, arrange for waste containers, sampling, testing, transportation, and disposal of all waste. No work shall begin until the Contractor furnishes the Engineer with a written waste disposal plan. Any alternative method for handling waste shall be pre-approved by the Engineer.

Southern Logistics, Inc. – 312 Orville Wright Dr., Greensboro, NC 27409
(Ph. 336-662-0292)

A&D Environmental – PO Box 484, High Point, NC 27261
(Ph. 336-434-7750)

Poseidon Environmental Services, Inc. – 837 Boardman-Canfield Rd #209, Youngstown, OH
(Ph. 330-726-1560)

Clean Harbors Reidsville, LLC – 208 Watlington Industrial Drive, Reidsville, NC 27320
(Ph. 336-342-6106)

Test all removed paint and spent abrasive media for lead following the SW-846 TCLP Method 1311 Extraction, as required in 40 CFR 261, Appendix 11, to determine whether it shall be disposed of as hazardous waste. Furnish the Engineer certified test reports showing TCLP results and Iron analysis of the paint chips stored on site, with disposal being in accordance with “Flowchart on Lead Waste Identification and Disposal” at:

http://portal.ncdenr.org/c/document_library/get_file?p_l_id=38491&folderId=328599&name=DLFE-9855.pdf.

All sampling shall be done in presence of the Engineer’s representative.

The Competent Person shall obtain composite samples from each barrel of the wash water and waste generated by collecting two or more portions taken at regularly spaced intervals during accumulation. Composite the portions into one sample for testing purposes. Acquire samples after 10% or before 90% of the barrel has accumulated. The intent is to provide samples that are representative of widely separated portions, but not the beginning and end of wash water or waste accumulation.

Perform sampling by passing a receptacle completely through the discharge stream or by completely diverting the discharge into a sample container. If discharge of the wash water or waste is too rapid to divert the complete discharge stream, discharge into a container or transportation unit sufficiently large to accommodate the flow and then accomplish the sampling in the same manner as described above.

Once the waste has been collected, and the quantities determined, prepare the appropriate shipping documents and manifests and present them to the Engineer. The Engineer will verify the type and quantity of waste and obtain a Provisional EPA ID number from the:

NC Hazardous Waste Section
North Carolina Department of Environment & Natural Resources
1646 Mail Service Center
Raleigh, NC 27699
Phone (919) 508-8400, Fax (919) 715-4061

At the time of shipping, the Engineer will sign, date, and add the ID number in the appropriate section on the manifest. The maximum on-site storage time for collected waste shall be 90 days. All waste whether hazardous or non-hazardous will require numbered shipping manifests. The cost for waste disposal (including lab and Provisional EPA ID number) is included in the bid price for this contract. Note NC Hazardous Waste Management Rules (15A NCAC 13A) for more information. Provisional EPA ID numbers may be obtained at this link:

<http://portal.ncdenr.org/web/wm/provisional-hw-notification-page>.

Testing labs shall be certified in accordance with North Carolina State Laboratory Public Health Environmental Sciences. List of certified laboratories may be obtained at this link:

<http://slphreporting.ncpublichealth.com/EnvironmentalSciences/Certification/CertifiedLaboratory.asp>.

All test results shall be documented on the lab analysis as follows:

1. For leachable lead:
 - a. Soils/Solid/Liquid- EPA 1311/200.7/6010

Area sampling will be performed for the first 2 days at each bridge location. The area sample will be located within five feet of the containment and where the highest probability of leakage will occur (access door, etc.). Results from the area sampling will be given to the Engineer within 72 hours of sampling (excluding weekends). If the results of the samples exceed $20 \mu\text{g}/\text{m}^3$ corrective measures shall be taken and monitoring shall be continued until two consecutive sample results are less than $20 \mu\text{g}/\text{m}^3$.

TWA may suspend the work if there are visible emissions outside the containment enclosure or pump monitoring results exceeding the level of $30 \mu\text{g}/\text{m}^3$.

Where schools, housing and/or buildings are within 500 feet of the containment, the Contractor shall perform initial TSP-Lead monitoring for the first 10 days of the project during abrasive blasting, vacuuming and containment removal. Additional monitoring will be required during abrasive blasting 2 days per month thereafter. Results of the TSP monitoring at any location shall not exceed $1.5 \mu\text{g}/\text{m}^3$.

EQUIPMENT MOBILIZATION

The equipment used in any travel lanes and paved shoulder shall be mobile equipment on wheels that has the ability to move on/off the roadway in less than 30 minutes. All work conducted in travel lanes shall be from truck or trailer supported platforms and all equipment shall be self-propelled or attached to a tow vehicle at all times.

QUALITY CONTROL INSPECTOR

Provide a quality control inspector in accordance with the SSPC QP guidelines to ensure that all processes, preparation, blasting and coating application are in accordance with the

requirements of the contract. The inspector shall have written authority to perform QC duties to include continuous improvement of all QC internal procedures. The presence of the engineer or inspector at the work site shall in no way lessen the contractor's responsibility for conformity with the contract.

QUALITY ASSURANCE INSPECTOR

The quality assurance inspector, which may be a Department employee or a designated representative of the Department, shall observe, document, assess, and report that the Contractor is complying with all of the requirements of the contract. Inspectors employed by the Department are authorized to inspect all work performed and materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. The inspector is not authorized to alter or waive the requirements of the contract. Each stage in preparing the structure to be coated which includes but not limited to washing, blasting, coating testing and inspection shall be inspected and approved by the Engineer or his authorized representative.

SUBLETTING OF CONTRACT

Only contractors certified to meet SSPC QP 1 and have successfully completed field painting on similar structures within 18 months prior to this bid are qualified for this work. Work is only sublet by approval of the Engineer.

SEQUENCE OF WORK

Prior to performing steel repairs, remove existing coating and clean the existing steel to remove corrosion, salts, dirt, and other contaminants at the repair location, to 6" to 12" beyond the dimensions of the required repair.

Perform the steel repair as indicated and required in the plans and other special provisions.

After repairs are complete and accepted, prepare and paint the repair area and surrounding areas in accordance with this special provision.

PREPARATION OF SURFACES

Before any other surface preparation is conducted, all surfaces to be painted shall be power washed to remove dust, salts, dirt, and other contaminants. All wash water shall be contained, collected, and tested in accordance with the requirements of NCDOT Managing Bridge Wash Water specification. Obtain approval of the Engineer and allow all cleaned surfaces to dry to the touch and without standing water before beginning surface preparation or painting activities.

Surface preparation is done with materials meeting Article 1080-12 of the *2018 Standard Specifications*. No silica sand or other silica materials are permitted for use. The profile shall be between 1.0 and 3.0 mils when measured on a smooth steel surface. Conduct and document at least 2 tests per beam/girder and 2 tests per span of diaphragms/cross bracing.

Spread tarpaulins over all pavements and surfaces underneath equipment used for abrasive blasting as well as equipment and containers used to collect abrasive media. This requirement will be enforced during activity and inactivity of equipment.

Before the Contractor departs from the work site at the end of the work day, collect all debris generated during surface preparation and all dust collector hoses, tarps or other appurtenances containing blasting residue in approved containers.

Clean a 3" x 3" area at each structure to demonstrate the specified finish, and the inspector will preserve this area by covering it with tape, plastic or some other suitable means so that it can be retained as the Dry Film Thickness (DFT) gauge adjustment standard. An acceptable alternative is for the Contractor to provide a steel plate with similar properties and geometry as the substrate to be measured.

The contractor and/ or quality assurance representative shall notify the Engineer of any area of corroded steel that has lost more than 50% of its original thickness.

All parts of the bridges not to be painted and the travelling public shall be protected from overspray. Submit a plan to protect all parts of bridge that are not required to be painted and a plan to protect the traveling public and surrounding environment while applying all coats of paint to a structure.

Ensure that chloride levels on the surfaces are $7 \mu\text{g}/\text{cm}^2$ or lower using an acceptable sample method in accordance with SSPC Guide 15. The frequency of testing shall be 2 tests per span after all surface preparation has been completed and immediately prior to painting. Select test areas representing the greatest amount of corrosion in the span as determined by the Engineers' representative. Additional testing may be required if significant amounts of chloride are detected.

PAINTING OF STEEL

Paint System 1, as specified in the *Structural Steel Shop Coatings Program* is to be used for this work.

The *Structural Steel Shop Coatings Program* can be found at the following link.

<https://connect.ncdot.gov/resources/Materials/MaterialsResources/Structural%20Steel%20Shop%20Coatings%20Program.pdf>

System 1 is an inorganic zinc primer, two coats acrylic paint, and one stripe coat of acrylic paint over blast-cleaned surfaces in accordance with SSPC-SP-10 (Near White Blast). Perform all mixing operations over an impervious surface with provisions to prevent runoff to grade of any spilled material. The contractor is responsible for reporting quantities of thinner purchased as well the amounts used. No container with thinner shall be left uncovered, when not in use.

Apply 2" stripe coat, by brush or roller only, to all exposed edges of steel including fasteners before applying the finish coat. Locate the edge or corner in the approximate center of the paint stripe.

Painting shall cover the repair area and the area where existing paint has been removed, and paint shall be blended for a dimension of 6" to 12" onto the existing paint system.

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 before the repair is made. Repaired areas shall meet the specifications. The Contractor applies an additional finish coat of paint to areas where the tape adhesion test is conducted.

MATERIALS

Only paint suppliers that have a NCDOT qualified inorganic zinc primer may furnish paints for this project. All paints applied to a structure shall be from the same supplier. Before any paints are applied, the Contractor shall provide the Engineer a manufacturer's certification that each batch of paint meets the requirements of the applicable Section 1080 of the *2018 Standard Specifications*.

Color of the paint shall match that of the existing paint on the structure steel.

The inspector randomly collects a one-pint sample of each paint product used on the project. Additional samples may be collected as needed to verify compliance to the specifications.

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

INSPECTION

Surface Preparation for System 1 shall be in accordance with SSPC SP-10. Any area(s) not meeting SSPC SP-10 shall be remediated prior to application of coating. Surface inspection is considered ready for inspection when all blast abrasive, residue and dust is removed from surfaces to be coated.

(A) Quality Assurance Inspection

The Contractor furnishes all necessary OSHA approved apparatus such as ladders, scaffolds and platforms as required for the inspector to have reasonable and safe access to all parts of the work. The contractor illuminates the surfaces to be inspected to a minimum of 50-foot candles of light. All access points shall be illuminated to a minimum of 20-foot candles of light.

NCDOT reserves the right for ongoing QA (Quality Assurance) inspection to include, but not limited to surface contamination testing, adhesion pull testing, and DFT readings as necessary to assure quality.

Inform the Engineer and the Division Safety Engineer of all scheduled and unannounced inspections from SSPC, OSHA, EPA, and/or others that come on site. Furnish the Engineer a copy of all inspection reports except for reports performed by a third party and or consultant on behalf of the Contractor.

(B) Inspection Instruments

At a minimum, furnish the following calibrated instruments and conduct the following quality control tests:

- (1) Sling Psychrometer - ASTM E337 - bulb type
- (2) Surface Temperature Thermometer
- (3) Wind Speed Indicator
- (4) Tape Profile Tester - ASTM D4417 Method C
- (5) Surface Condition Standards - SSPC VIS-1 and VIS-3
- (6) Wet Film Thickness Gage - ASTM D4414
- (7) Dry Film Thickness Gage - SSPC-PA2 Modified
- (8) Pencil Hardness Test - ASTM D3363
- (9) Adhesion Test Kit - ASTM D3359 Method A (Tape Test)
- (10) Adhesion Pull test - ASTM D4541
- (11) Surface Contamination Analysis Kit or (Chloride Level Test Kit)
SSPC Technology Guide 15

(C) Quality Control

Maintain a daily quality control record in accordance with Article 442-12 (D) of the *2018 Standard Specifications*, make such records available at the job site for review by the inspector, and submit to the Engineer as directed. In addition to the information required on M&T-610, submit all Dry Film Thickness (DFT) readings on a form equivalent to M&T-611.

Measure DFT at each spot on the attached diagram and at the required number of locations as specified below:

- (1) For span members with a height 36" or less check two (2) random locations along each member in each span.
- (2) For span members with a height 36" or greater check three (3) random locations along each member in each span.

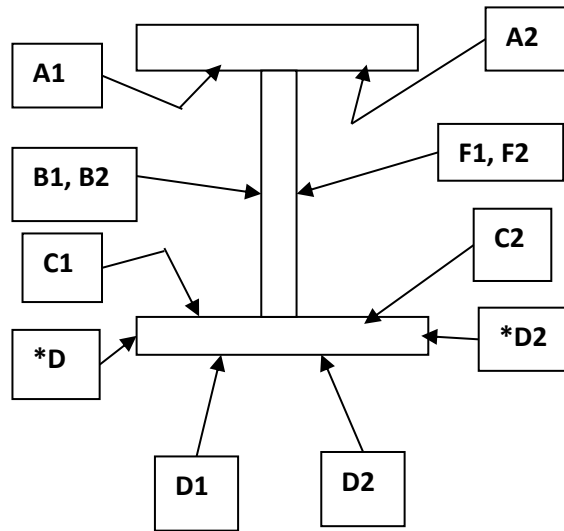
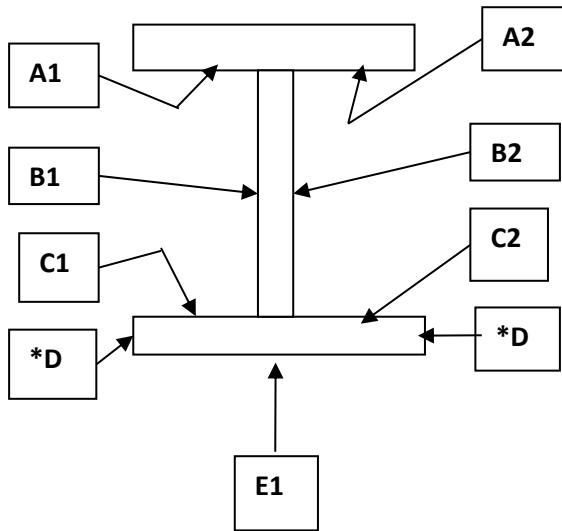
Stiffeners and other attachments to beams and or plate girders shall be measured at no less than two random spots per span. Also, dry film thickness is measured at no less than two random spots per span on diaphragms/"K" frames.

Each spot is an average of three to five individual gauge readings as defined in SSPC PA-2. No spot average shall be less than 80% of minimum DFT for each layer applied; this does not apply to stripe coat application. Spot readings that are nonconforming shall be re-accessed by performing additional spot measurements not to exceed one-foot intervals on both sides of the low areas until acceptable spot

averages are obtained. These non-conforming areas shall be corrected by the Contractor prior to applying successive coats.

Less than 36" in height and/or bottom flanges less than 16" in width.
7 Spot Areas
21 Individual DFT Readings

36" in height or greater and/or bottom flanges greater than 16" in width.
10 Spot Areas
30 Individual DFT Readings



***D areas are only included when flange thickness is one inch (1") or greater.**

***D areas are only included when flange thickness is one inch (1") or greater.**

Two random adhesion tests (1 test=3 dollies) per span are conducted on interior surfaces in accordance with ASTM D4541 (Adhesion Pull Test) after the prime coat has been properly cured in accordance with ASTM D3363 (Pencil Hardness) with no less than 2H, and will be touched up by the Contractor. The required minimum average adhesion is 400 psi.

Cure of the intermediate and stripe coats shall be assessed by using the thumb test in accordance with ASTM D1640 (Curing Formation Test) prior to the application of any successive layers of paint.

One random Cut Tape adhesion test per span is conducted in accordance with ASTM D3359 (X-Cut Tape Test) on interior surface after the finish coat is cured. Repair areas shall be properly tapered and touched up by the Contractor.

SAFETY AND ENVIRONMENTAL COMPLIANCE PLANS

Personnel access boundaries are delineated for each work site using signs, tape, cones, or other approved means. Submit copies of safety and environmental compliance plans that comply with SSPC QP 1 Certification requirements.

HEALTH AND SAFETY RESPONSIBILITIES

This project may involve toxic metals such as arsenic, lead, cadmium and hexavalent chromium. It is the contractor's responsibility to test for toxic metals and if found, comply with the OSHA regulations, which may include medical testing.

Ensure a "Competent Person" as defined in OSHA 29 CFR 1926.62 - one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them - is on site during all surface preparation activities and monitors the effectiveness of containment, dust collection systems, and waste sampling. Before any work begins, provide a written summary of the Competent Person's safety training.

Comply with Subarticle 442-14(B) of the *2018 Standard Specifications*.

Comply with Subarticle 442-14(D) of the *2018 Standard Specifications*. Ensure employee blood sampling test results are less than 50 micrograms per deciliter. Remove employees with a blood sampling test of 50 or more micrograms per deciliter from work activities involving any lead exposure.

An employee who has been removed with a blood level of 50 micrograms per deciliter or more shall have two consecutive blood sampling tests spaced one week apart indicating that the employee's blood lead level is at or below 40 micrograms per deciliter before returning to work activities involving any lead exposure.

All OSHA recordable accidents that occur during the project duration are to be reported to the Engineer within twenty-four (24) hours of occurrence. In addition, for accidents that involve civilians or property damage that occurs within the work zone the Division Safety Engineer shall be notified immediately.

Prior to blasting operations, the Contractor shall have an operational OSHA approved hand wash station at each bridge location and a decontamination trailer at each bridge or between bridges unless the work is on the roadway, or the Contractor shall show reason why it is not feasible to do so and provide an alternative site as approved by the Engineer. The Contractor shall assure that all employees whose airborne exposure to lead is above the PEL shall shower at the end of their work shift.

STORAGE OF PAINT AND EQUIPMENT

Provide a location for materials, equipment, and waste storage. Spread tarpaulins over all pavements and surfaces underneath equipment used for abrasive recycling and other waste handling equipment or containers. All land and or lease agreements that involve private

property shall disclose to the property owner that heavy metals may be present on the Contractor's equipment. Prior to storing the Contractor's equipment on private property, provide a notarized written consent signed by the land owner received by the Engineer at least forty-eight (48) hours before using property. All storage of paint, solvents, and other materials applied to structures shall be stored in accordance with Section 442 of the *2018 Standard Specifications* or the manufacturers' requirements. The more restrictive requirements will apply.

UTILITIES

Protect all utility lines or mains that may be supported on, under, or adjacent to bridge work sites from damage and paint overspray.

MEASUREMENT AND PAYMENT

The cost of inspection, surface preparation, and repainting the existing structure is included in the lump sum price bid for *Spot Painting of Steel Structure Repair Areas*. This price is full compensation for furnishing all inspection equipment, all paint, cleaning abrasives, cleaning solvents and all other materials; preparing and cleaning surfaces to be painted; applying paint in the field; protecting work area, traffic and property; and furnishing blast cleaning equipment, paint spraying equipment, brushes, rollers, any other hand or power tools and any other equipment; and a containment enclosure.

Pollution Control will be paid at the contract lump sum price which will be full compensation for all collection, handling, storage, air monitoring, and disposal of debris and wash water, all personal protective equipment, and all personal hygiene requirements, and all equipment, material and labor necessary for the daily collection of the blast debris into specified containers; and any measures necessary to ensure conformance to all safety and environmental regulations as directed by the Engineer.

Payment will be made under:

Pay Item	Pay Unit
Spot Painting of Steel Structure Repair Areas	Lump Sum
Pollution Control	Lump Sum

SCOPE OF WORK

Bridge #326: This bridge was built in 1967 and carries I-277/NC 16 over North College Street. The superstructure consists of 3 simple spans that vary from 17 to 18 lines of steel beams. These beams consist of W30x99, W33x118, W36x135 & W36x160 sections and are at varying spacing with steel diaphragms. The bridge has an overall length of 138'-0" with a concrete deck and a deck width that varies from 146'-5 1/4" to 127'-8 1/2". The minimum vertical clearance is 17'-8 1/2". The existing paint system is inorganic zinc primer with acrylic top coat, and the estimated area to be cleaned and painted is **65** sq. ft.

Bridge #327: This bridge was built in 1973 and carries I-277/NC 16 over North Tryon Street. The superstructure consists of 3 simple spans that vary from 15 to 19 steel beams. These beams consist of W33x118, W36x135, W36x230, W36x260, W36x280 & W36x300 sections and are at varying spacing with steel diaphragms. The bridge has an overall length of 186'-0" with a concrete deck of varying width. The minimum vertical clearance is 15'-6 7/8". The existing paint system is unknown, and the estimated area to be cleaned and painted is **90** sq. ft.

Bridge #328: This bridge was built in 1973 and carries I-277/NC 16 over North Church Street. The superstructure consists of 3 simple spans with 14 lines of steel beams. These beams consist of W33x118, W36x135 & W36x160 sections and are spaced at 7'-9" spacing with steel diaphragms. The bridge has an overall length of 153'-0" with a concrete deck and a 108'-10" total deck width. The minimum vertical clearance is 15'-3". The existing paint system is unknown, and the estimated area to be cleaned and painted is **40** sq. ft.

Bridge #332: This bridge was built in 1971 and carries I-277/NC 16 over Johnson Street, N.C. Music Factory Boulevard, CSX Railroad and Norfolk Southern Railroad. Spans A through N and Span T are simple spans and vary from 18 to 23 girders consisting of W36 sections at varying spacing with steel diaphragms. Spans P through S is a continuous unit and consists of 59" plate girders spaced at 7'-9" with steel diaphragms. The bridge has an overall length of 1189'-0" with a concrete deck of varying width. The minimum vertical clearance is 14'-10". The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is **850** sq. ft.

BRIDGE JOINT DEMOLITION

(SPECIAL)

DESCRIPTION

This special provision addresses the removal of existing joint material and adjacent concrete headers to facilitate the installation of new elastomeric concrete headers and bridge joint seals at the locations noted in the contract plans.

EQUIPMENT

Use the following surface preparation equipment:

- (A) Sawing equipment capable of sawing concrete to a specified depth.
- (B) Power driven hand tools for removal of concrete are required that meet the following requirements:
- (C) Pneumatic hammers weighing a nominal 15 lbs. (7 kg) or less
- (D) Pneumatic hammer chisel-type bits that do not exceed the diameter of the shaft in width.
- (E) Hand tools such as hammers and chisels for removal of final particles of concrete.

REMOVAL AND PREPARATION

Prior to any construction, take the necessary precautions to ensure debris from joint construction is not allowed to fall below the bridge deck.

Remove existing joint material by methods approved by the Engineer. Provide a 1" deep saw cut around the perimeter of areas noted for bridge deck removal.

Remove by chipping with hand tools concrete headers adjacent to the joint to the limits shown on the contract plans. Use a small chipping hammer (15 lb. class) to prepare the edges of the repair area to limit micro fractures. In addition, all loose and unsound concrete shall be removed. Dispose of the removed concrete.

In overhangs, removing concrete areas greater than 0.60 ft²/ft length of bridge will require overhang support. Submit the overhang support method to the Engineer for approval.

If the condition of the concrete is such that deep spalls or sheer faces result, notify the Engineer for the proper course of action. Excavation of concrete at the existing joint shall result in the bottom of the excavation being reasonably flat and level, to provide sufficient substrate for placement and support of elastomeric concrete.

Care shall be taken not to cut, stretch, or damage any exposed reinforcing steel.

Clean, repair, or replace rusted or loose reinforcing steel. Thoroughly clean the newly exposed surface to be free of all grease, oil, curing compounds, acids, dirt, or loose debris.

MEASUREMENT AND PAYMENT

Bridge Joint Demolition will be measured and paid for at the contract unit price bid per square foot and will be full compensation for removal, containment, and disposal of existing joint material and concrete, and shall include the cost of labor, tools, equipment, and incidentals necessary to complete the work.

Pay Item	Pay Unit
Bridge Joint Demolition	Square Feet

ELASTOMERIC CONCRETE FOR PRESERVATION

(2-11-19)

DESCRIPTION

Elastomeric concrete is a mixture of a two-part polymer consisting of polyurethane and/or epoxy and kiln-dried aggregate. Provide an elastomeric concrete and binder system that is preapproved. Use the concrete in the blocked-out areas on both sides of the bridge deck joints as indicated on the plans.

MATERIALS

Provide materials that comply with the following minimum requirements at 14 days (or at the end of the specified curing time).

ELASTOMERIC CONCRETE PROPERTIES	TEST METHOD	MINIMUM REQUIREMENT
Compressive Strength, psi	ASTM D695	2000
5% Deflection Resilience	ASTM D695	95
Splitting Tensile Strength, psi	ASTM D3967	625
Bond Strength to Concrete, psi	ASTM C882 (C882M)	450
Durometer Hardness	ASTM D2240	50

BINDER PROPERTIES (without aggregate)	TEST METHOD	MINIMUM REQUIREMENT
Tensile Strength, psi	ASTM D638	1000
Ultimate Elongation	ASTM D638	150%
Tear Resistance, lb/in	ASTM D624	200

In addition to the requirements above, the elastomeric concrete must be resistant to water, chemical, UV and ozone exposure and withstand temperature extremes. Elastomeric concrete systems requiring preheated aggregates are not allowed.

PREQUALIFICATION

Manufacturers of elastomeric concrete materials shall submit samples (including aggregate, primer and binder materials) and a Type 3 certification in accordance with Article 106-3 of the *Standard Specifications* for prequalification to:

North Carolina Department of Transportation
Materials and Tests Unit
1801 Blue Ridge Road
Raleigh, NC 27607

Prequalification will be determined for the system. Individual components will not be evaluated, nor will individual components of previously evaluated systems be deemed prequalified for use.

The submitted binder (a minimum volume of 1 gallon) and corresponding aggregate samples will be evaluated for compliance with the Materials requirements specified above. Systems satisfying all of the Materials requirements will be prequalified for a one (1) year period. Before the end of this period new product samples shall be resubmitted for prequalification evaluation.

If, at any time, any formulation or component modifications are made to a prequalified system that system will no longer be approved for use.

INSTALLATION

The elastomeric concrete shall not be placed until the reinforced concrete deck slab or overlay has cured for seven (7) full days and reached a minimum strength of 3,000 psi.

Provide a manufacturer's representative at the bridge site during the installation of the elastomeric concrete to ensure that all steps being performed comply with all manufacturer installation requirements including, but not limited to: weather conditions (ambient temperature, relative humidity, precipitation, wind, etc.), concrete deck surface preparation, binder and aggregate mixing, primer application, elastomeric concrete placement, curing conditions and minimum curing time before joint exposure to traffic. Do not place elastomeric concrete if the ambient air or surface temperature is below 45°F.

Prepare the concrete surface within 48 hours prior to placing the elastomeric concrete. Before placing the elastomeric concrete, all concrete surfaces shall be thoroughly cleaned and dry. Sandblast the concrete surface in the block-out and clear the surface of all loose debris. Do not place the elastomeric concrete until the surface preparation is completed and approved.

Prepare and apply a primer, as per manufacturer's recommendations, to all concrete faces to be in contact with elastomeric concrete, and to areas specified by the manufacturer.

Prepare, batch, and place the elastomeric concrete in accordance with the manufacturer's instructions. Place the elastomeric concrete in the areas specified on the plans while the primer is still tacky and within two (2) hours after applying the primer. Trowel the elastomeric concrete to a smooth finish.

The joint opening in the elastomeric concrete shall match the formed opening in the concrete deck prior to sawing the joint.

FIELD SAMPLING

Provide additional production material to allow freshly mixed elastomeric concrete to be sampled for acceptance. A minimum of six (6) 2-inch cube molds and three (3) 3-inch diameter x 6-inch cylinders will be taken by the Department for each day's production. Compression, splitting tensile, and durometer hardness testing will be performed by the Department to determine acceptance. Materials failing to meet the requirements listed above are subject to removal and replacement at no cost to the Department.

BASIS OF PAYMENT

Elastomeric Concrete for Preservation will be measured and paid for at the contract unit price bid per cubic foot and will be full compensation for material, labor, tools, and equipment necessary for satisfactorily installing the elastomeric concrete in place.

Pay Item	Pay Unit
Elastomeric Concrete for Preservation	Cubic Feet

FOAM JOINT SEALS FOR PRESERVATION**(SPECIAL)****SEALS**

Use preformed seals compatible with concrete and resistant to abrasion, oxidation, oils, gasoline, salt, and other materials that are spilled on or applied to the surface. Use a resilient, UV stable, preformed, impermeable, flexible, expansion joint seal. The joint seal shall consist of low-density, closed cell, cross-linked polyethylene non-extrudable foam. The joint seal shall contain no EVA (Ethylene Vinyl Acetate). Cell generation shall be achieved by being physically blown using nitrogen. No chemical blowing agents shall be used in the cell generation process.

Use seals manufactured with grooves $\frac{1}{8}$ " \pm wide by $\frac{1}{8}$ " \pm deep and spaced between $\frac{1}{4}$ " and $\frac{1}{2}$ " apart along the bond surface running the length of the joint. Use seals with a depth that meets the manufacturer's recommendation, but is not less than 70% of the uncompressed width. Provide a seal designed so that, when compressed, the center portion of the top does not extend upward above the original height of the seal by more than $\frac{1}{4}$ ". Provide a seal that has a working range of 30% tension and 60% compression and meets the requirements given below.

TEST	TEST METHOD	REQUIREMENT
Tensile Strength	ASTM D3575, Suffix T	110 – 130 psi
Compression Set	ASTM D1056 Suffix B, 2 hr recovery	10% - 16%
Water Absorption	ASTM D3575	< 0.03 lb/ft ²
Elongation at Break	ASTM D3575	180% - 210%
Tear Resistance	ASTM D624 (D3575, Suffix G)	14 – 20 pli
Density	ASTM D3575, Suffix W, Method A	1.8 – 2.2 lb/ft ³
Toxicity	ISO-10993.5	Pass (not cytotoxic)

Have the top of the joint seal clearly shop marked. Inspect the joint seals upon receipt to ensure that the marks are clearly visible before installation.

BONDING ADHESIVE

Use a two-component, 100% solid, modified epoxy adhesive supplied by the joint seal manufacturer that meets the requirements given below.

TEST	TEST METHOD	REQUIREMENT
Tensile strength	ASTM D638	3,000 psi (min.)
Compressive strength	ASTM D695	7,000 psi (min.)
Hardness	Shore D Scale	75-85 psi
Water Absorption	ASTM D570	0.25% by weight max.
Elongation to Break	ASTM D638	5% (max.)
Bond Strength	ASTM C882	2,000 psi (min.)

Use an adhesive that is workable to 40°F. When installing in ambient air or surface temperatures below 40°F or for application on moist, difficult to dry concrete surfaces, use an adhesive specified by the manufacturer of the joint seal.

SAWING THE JOINT

The concrete at the face of the joint (elastomeric concrete, polyester polymer concrete, Portland cement concrete, etc.) shall have sufficient time to cure such that no damage can occur to the concrete prior to sawing to the final width and depth as specified in the plans.

When sawing the joint to receive the foam seal, always use a rigid guide to control the saw in the desired direction. To control the saw and to produce a straight line as indicated on the plans, anchor and positively connect a template or a track to the bridge deck. Do not saw the joint by visual means such as a chalk line. Fill the holes used for holding the template or track to the deck with an approved flowable, non-shrink, non-metallic grout.

Saw cut to the desired width and depth in one (1) or two (2) passes of the saw by placing and spacing two (2) metal blades on the saw shaft to the desired width for the joint opening.

The desired depth is the depth of the seal plus ¼" above the top of the seal plus approximately 1" below the bottom of the seal. An irregular bottom of sawed joint is permitted as indicated on the plans. Grind exposed corners on saw cut edges to a ¼" chamfer.

Saw cut a straight joint, centered over the formed opening and to the desired width specified in the plans. Prevent any chipping or damage to the sawed edges of the joint.

Remove any staining or deposited material resulting from sawing with a wet blade to the satisfaction of the Engineer.

PREPARATION OF SAWED JOINT FOR SEAL INSTALLATION

The elastomeric concrete or polyester polymer concrete at the joint shall cure a minimum of 24 hours prior to seal installation. Portland cement concrete at the joint shall cure following the special provisions.

After sawing the joint, the Engineer will thoroughly inspect the sawed joint opening for spalls, popouts, cracks, etc. All necessary repairs will be made by the Contractor prior to blast cleaning and installing the seal, at no cost to the Department.

Clean the joints by sandblasting with clean dry sand immediately before placing the bonding agent. Sandblast the joint opening to provide a firm, clean joint surface free of curing compound, loose material and any foreign matter. Sandblast the joint opening without causing pitting or uneven surfaces. The aggregate in the joint concrete may be exposed after sandblasting.

After blasting, either brush the surface with clean brushes made of hair, bristle, or fiber, blow the surface with compressed air, or vacuum the surface until all traces of blast products and abrasives are removed from the surface, pockets, and corners.

If nozzle blasting is used to clean the joint opening, use compressed air that does not contain detrimental amounts of water or oil.

Examine the blast-cleaned surface and remove any traces of oil, grease, or smudge deposited in the cleaning operations.

Bond the seal to the blast-cleaned surface on the same day the surface is blast cleaned.

SEAL INSTALLATION

Install the joint seal according to the manufacturer's procedures and recommendations and as recommended below. Do not install the joint seal if the ambient air or surface temperature is below 45°F. Have a manufacturer's certified trained factory representative present during the installation of the first seal of the project.

Before installing the joint seal, check the uninstalled seal length to ensure the seal is the same length as the deck opening. When the joint seal requires splicing, use the heat welding method by placing the joint material ends against a Teflon heating iron of 425-475°F for 7 - 10 seconds, then pressing the ends together tightly. Do not test the welding until the material has completely cooled.

Begin installation by protecting the top edges of the concrete deck adjacent to the vertical walls of the joint as a means to minimize clean up. Stir each epoxy bonding agent component independently, using separate stirring rods for each component to prevent premature curing of the bonding agent. Pour the two (2) components, at the specified mixing ratio, into a clean mixing bucket. Mix the components with a low speed drill (400 rpm max.) until a uniform gray color is achieved without visible marbling. Apply bonding agent to both sides of the joint concrete, as well as both sides of the joint seal, making certain to fill completely the grooves with epoxy. With gloved hands, compress the joint seal and with the help of a blunt probe, push the seal into the joint opening until the seal is recessed approximately ¼" below the surface. When pushing down on the joint seal, apply pressure only in a downward direction. Do not push the joint seal into the joint opening at an angle that would stretch the material. Seals that are stretched during installation shall be removed and rejected. Once work on placing a seal begins, do not stop until it is completed. Clean the excess epoxy from the top of the joint seal immediately with a trowel. Do not use solvents or any cleaners to remove the excess epoxy from the top of the seal. Remove the protective cover at the joint edges and check for any excess epoxy on the surface. Remove excess epoxy with a trowel, the use of solvents or any cleaners will not be allowed.

The installed system shall be watertight and will be monitored until final inspection and approval.

(A) Watertight Integrity Test

- (1) Upon completion of each foam seal expansion joint, perform a water test on the top surface to detect any leakage. Cover the roadway section of the joint from curb to curb, or barrier rail to barrier rail, with water, either ponded or flowing, not less than 1 inch above the roadway surface at all points. Block sidewalk sections and secure an unnozzled water hose delivering approximately 1 gallon of water per minute to the inside face of the bridge railing, trained in a downward position about six (6) inches above the sidewalk, such that there is continuous flow of water across the sidewalk and down the curb face of the joint.
- (2) Maintain the ponding or flowing of water on the roadway and continuous flow across sidewalks and curbs for a period of five (5) hours. At the conclusion of the test, the underside of the joint is closely examined for leakage. The foam seal expansion joint is considered watertight if no obvious wetness is visible on the Engineer's finger after

touching a number of underdeck areas. Damp concrete that does not impart wetness to the finger is not considered a sign of leakage.

- (3) If the joint system leaks, locate the place(s) of leakage and take any repair measures necessary to stop the leakage at no additional cost to the Department. Use repair measures recommended by the manufacturer and approved by the Engineer prior to beginning corrective work.
- (4) If measures to eliminate leakage are taken, perform a subsequent water integrity test subject to the same conditions as the original test. Subsequent tests carry the same responsibility as the original test and are performed at no additional cost to the Department.

Do not place pavement markings on top of foam joint seals.

BASIS OF PAYMENT

Foam Joint Seals for Preservation will be measured and paid for at the contract unit price bid per linear foot and will be full compensation for furnishing all material, labor, tools, and equipment necessary for installing these seals in place and accepted.

Pay Item

Foam Joint Seals for Preservation

Pay Unit

Linear Feet

POLYMER CONCRETE BRIDGE DECK OVERLAY

(SPECIAL)

DESCRIPTION

This work consists of furnishing and placing a Polymer Concrete (PC) overlay system with a resin primer on concrete surfaces. The surface of the concrete shall be prepared and the PC overlay system shall be applied in accordance with this special provision in conformity with the lines, grades, thickness, and typical cross-sections shown on the plans or as approved by the Engineer. Unless specifically mentioned below, all requirements specified for the bridge deck are also required for the approach slabs.

The Contractor shall select one of the PC overlay systems below:

- (A) Polyester Polymer Concrete (PPC) with a High Molecular Weight Methacrylate (HMWM) resin primer.
- (B) Epoxy Polymer Concrete (EPC) with an epoxy resin primer.

Work includes: placement of resin primer; placement of PC surface patching and/or overlay; and any incidentals necessary to complete the project as specified or as shown on the plans.

The System Provider is the manufacturer that will provide the PC system for the PC overlay. The System shall include the necessary and appropriate PC components, as well as the necessary and appropriate resin primer components. Contractor shall not change System Provider during project, without approval from the Engineer.

QUALIFICATIONS AND SUBMITTALS

The Contractor shall submit the following requested items and any other relevant documents at least two (2) weeks prior to the PC Overlay Pre-placement Conference. These submittals are for approval and shall be directed to the Engineer.

- (A) Overlay System: The Contractor shall submit two (2) copies of the System Provider's material information, written installation instructions, safety data sheets, and independent test results for approval.
- (B) System Provider Qualifications: The Contractor shall install an overlay system with all components provided through a single System Provider with documented experience successfully supplying at least five (5) PC overlay projects of similar size and scope installed within the past five (5) years. The Contractor shall submit documentation of the System Provider's project experience including the following:
- (1) Project Location.
 - (2) Owner Agency.
 - (3) Project construction date.
 - (4) Overlay quantities.
 - (5) Reference name and contact information for owner representative.
- (C) Contractor Qualifications: The Contractor shall submit documentation of successful projects placing structural concrete bridge decks, modified concrete bridge deck overlays, or PC overlay systems to finished grade using similar equipment as specified herein within the past five (5) years. A minimum of two (2) employees on site must have the equivalent work experience qualifications of the Contractor. The documentation of Contractors qualifications shall include the following:
- (1) Project Location.
 - (2) Owner Agency.
 - (3) Project construction date.
 - (4) Overlay quantities.
 - (5) Reference name and contact information for owner representative.
- (D) System Provider Technical Representative Qualifications: The System Provider Technical Representative shall be an employee of the PC overlay system manufacturer, have a minimum of five (5) successful PC overlay projects within the last five (5) years, and be completely competent in all aspects of the work, including surface preparation, mixing, placement, curing, and testing of the PC overlay system. The Technical Representative shall have experience on a minimum of five (5) successful projects of similar size and scope. The Contractor shall submit documentation of the System Provider Technical Representative's experience including the following:
- (1) Years of Experience with PC overlay systems
 - (2) Project location
 - (3) Project construction date
 - (4) Overlay quantities
 - (5) Reference name and contact information for owner representative

The Technical Representative shall be available on site, for a minimum of three (3) days per project, to give the installer advice and guidance on the installation of PC overlay systems. This includes, but is not limited to: deck concrete surface preparation, PC overlay materials, PC overlay application, PC overlay curing or any time there are questions or issues that may

arise. The Technical Representative shall be on site for the first PC overlay placement and shall remain on site until the Engineer is satisfied with the PC overlay preparation, placement, and finishing operations.

(E) Overlay Placement Plan: The Contractor shall submit an Overlay Placement Plan that includes the following:

- (1) Schedule of overlay work and testing for each bridge.
- (2) Anticipated concrete deck repair locations and repair method.
- (3) Staging plan describing overlay placement sequence including:
 - (a) Construction joint locations. Longitudinal construction joints between passes shall be located along the centerline of travel lanes or edge of travel lanes.
 - (b) Sequence of placement.
 - (c) Placement widths.
 - (d) Anticipated placement lengths.
 - (e) Placement direction.
 - (f) Joint locations.
 - (g) Location of proposed trial overlay(s).
- (4) Description of equipment used for:
 - (a) Surface preparation including grinding and shotblasting.
 - (b) Applying resin primer.
 - (c) Measuring, mixing, placing, and finishing the PC overlay.
 - (d) Applying surface finish sand/fine aggregate.
- (5) Method of protecting and finishing inlets and bridge drains.
- (6) Method for isolating expansion joints.
- (7) Method for measuring and maintaining overlay thickness and profile.
- (8) Cure time for PC overlay.
- (9) Storage and handling of resin primer and PC overlay components.
- (10) Procedure for disposal of excess resin primer, PC overlay materials, and containers.
- (11) Procedure for cleanup of mixing and placement equipment.

(F) Equipment: The Contractor shall submit documentation of current certification that mixing equipment has been calibrated (Caltrans California test CT 109 or similar accepted). The Contractor shall submit a documented history of the use of the placement equipment to successfully place PC overlays on bridge projects for review and approval by the Engineer.

MATERIALS

The Polymer Concrete shall consist of a resin binder and aggregate as specified below. It shall also include a compatible primer which when mixed with other specified ingredients and applied as specified herein, is capable of producing a Polymer Concrete meeting the requirements of this specification.

- (1) Verification. The Contractor shall submit a Certified Test Report from independent labs for all of the materials associated with the PC overlay in accordance with this special provision.
- (2) Packaging and Shipment. All components shall be shipped in strong, substantial containers, bearing the manufacturer's label specifying batch/lot number, brand name, and quantity. If bulk resin is to be used, the contractor shall notify the Engineer in writing ten (10) working days prior to the delivery of the bulk resin to the job site. Bulk resin is any resin that is stored in containers in excess of 55 gallons.

- (3) Sampling. NCDOT reserves the right to retain and test samples of components of the PC overlay system. This includes requiring submittal of samples prior to the first installation or on-site sampling during construction.

Only use materials that are specified for the selected PC overlay system. Mixing materials from different PC overlay systems shall not be permitted.

- (A) Polyester Polymer Concrete (PPC) materials shall consist of a polyester resin binder, a High Molecular Weight Methacrylate (HMWM) primer, and aggregate.

- (1) Polyester Resin Binder: Polyester resin binder shall have the following properties:
- Be an unsaturated isophthalic polyester-styrene co-polymer. The resin content shall be 12% +/-1% of the weight of the dry aggregate.
 - Contain at least 1 percent by weight gamma-methacryloxypropyltrimethoxysilane, an organosilane ester silane coupler.
 - Be used with a promoter that is compatible with suitable methyl ethyl ketone peroxide and cumene hydroperoxide initiators.
 - Meet the required values for the material properties shown in Table 1, below.

Accelerators or inhibitors may be required to achieve proper setting time of PPC. They shall be used as recommended by the overlay System Provider.

Table 1
POLYESTER RESIN BINDER PROPERTIES (PPC ONLY)
(Each lot sent to job shall be tested)

Property	Test Method	Requirement
Viscosity*	ASTM D 2196	75 – 200 cps (RVT No.1 Spindle, 20 RPM at 77 °F)
Specific Gravity*	ASTM D 1475	1.05 to 1.10 at 77 °F
Elongation	ASTM D 638	35 percent, minimum Type I specimen, thickness 0.25 ± 0.03” at Rate = 0.45 inch/minute.
	ASTM D 618	Sample Conditioning: 18/25/50+5/70
Tensile Strength	ASTM D 638	2,500 psi, minimum Type I specimen, thickness 0.25 ± 0.03” at Rate = 0.45 inch/minute.
	ASTM D 618	Sample Conditioning: 18/25/50+5/70
* Test shall be performed before adding initiator.		

- (2) High Molecular Weight Methacrylate (HMWM) Primer: Primer for the substrate concrete surface shall be a wax-free, low odor, high molecular weight methacrylate primer, and consist of a resin, initiator, and promoter. The primer shall conform to requirements indicated in Table 2, below, and all components shall be supplied by the System Provider.

Initiator for the methacrylate resin shall consist of a metal drier and peroxide. If supplied separately from the resin, the metal drier shall not be mixed with the peroxide directly; a VIOLENT EXOTHERMIC REACTION will occur. The containers and measuring devices shall not be stored in a manner that allows leakage or spilling to contact the containers or materials of the other.

Table 2
HMWM PRIMER PROPERTIES (PPC ONLY)
(Tested yearly)

Property	Test Method	Requirement
Viscosity**	ASTM D 2196	25 cps maximum (Brookfield RVT with UL adapter, 50 RPM at 77 °F)
Volatile Content**	ASTM D 2369	30 percent, maximum
Specific Gravity**	ASTM D 1475	0.90 minimum at 77 °F
Flash Point	ASTM D 3278	180 °F minimum
Vapor Pressure**	ASTM D 323	1.0 mm Hg, maximum at 77 °F
PCC Saturated Surface-Dry Bond Strength (Adhesive)	California Test 551, part 5	700 psi, minimum at 24 hours and 70 ± 1°F (with PPC at 12% resin content by weight of the dry aggregate), primed surface
**Test shall be performed before initiator is added		

(B) Epoxy Polymer Concrete (EPC) materials shall consist of an epoxy resin binder/primer and aggregate.

- (1) Epoxy Resin Binder/Primer: Epoxy resin binder/primer shall have the following properties:
- Be a low viscosity epoxy resin. The resin content shall be 12% +/-1% of the weight of the dry aggregate.
 - Be 100% solids epoxy.
 - Be a two-part, low modulus epoxy resin.
 - Be moisture insensitive.
 - Meet the required values for the material properties shown in Table 3, below.

Accelerators or inhibitors may not be used to achieve proper setting time of EPC.

Table 3
EPOXY RESIN BINDER/PRIMER PROPERTIES (EPC ONLY)
(Each lot sent to job shall be tested)

Property	Test Method	Requirement
Viscosity	ASTM D 2196	75 – 150 cps (RVT No.1 Spindle, 20 RPM at 77 °F)
Specific Gravity	ASTM D 1475	1.05 to 1.08 at 77 °F
Elongation	ASTM D 638	35 percent, minimum Type I specimen, thickness 0.25 ± 0.03” at Rate = 0.45 inch/minute.
	ASTM D 618	Sample Conditioning: 18/25/50+5/70
Tensile Strength	ASTM D 638	2,800 psi, minimum Type I specimen, thickness 0.25 ± 0.03” at Rate = 0.45 inch/minute.
	ASTM D 618	Sample Conditioning: 18/25/50+5/70

(C) Aggregates: PC overlay aggregate shall be used for PPC and EPC and have the following properties:

- No more than 45 percent crushed particles retained on the No. 8 sieve when tested in accordance with American Association of State Highway and Transportation Officials (AASHTO) Test Method T335.

- (2) Fine aggregate consists of natural sand only.
- (3) Weighted-average aggregate absorption of no more than 1.0 percent when tested under AASHTO Test Methods T84 and T85.
- (4) At the time of mixing with resin, have moisture content of not more than one-half (1/2) of the weighted-average aggregate absorption when tested under AASHTO Test Method T255.
- (5) Moh's hardness of seven (7) or greater.
- (6) Comply with the requirements for the aggregate gradation indicated in Table 4, below:

Table 4
AGGREGATE GRADATION
(Tested yearly)

Sieve Size	Percent Passing
3/8"	100
No. 4	60-85
No. 8	55-65
No. 16	29-50
No. 30	16-36
No. 50	5-20
No. 100	0-7
No. 200	0-3

(D) Sand/Fine Aggregate: Sand or fine aggregate for an abrasive finish shall be used for PPC and EPC and have the following properties:

- (1) Commercial-quality blast sand/fine aggregate.
- (2) Not less than 95 percent pass the No. 8 sieve and not less than 95 percent retained on the No. 20 sieve when tested under AASHTO Test Method T27.
- (3) Shall be dry at the time of application.

(E) Composite system: The composite PC overlay system shall have the following properties indicated in Table 5, below:

Table 5
COMPOSITE PROPERTIES
(Tested every 2 years)

Property	Test Method	Requirement
PCC Saturated Surface Dry Bond Strength	CT 551	500 psi minimum at 24 hrs. and 70° F (without primer, at 12% resin content by weight of the dry aggregate, on Saturated Surface Dry Specimen)
Abrasion Resistance	CT 550	< 2g weight loss (at 12% resin content by weight of the dry aggregate)
Modulus of Elasticity	ASTM C 469	1,000,000 psi to 2,000,000 psi (at 12% resin content by weight of the dry aggregate)

CONSTRUCTION REQUIREMENTS

- (A) PC Overlay Pre-placement Conference: A Pre-placement Conference shall be held before any overlay operations begin. Attendees shall include representatives from all parties involved in the work. If necessary, teleconferencing of attendees may be approved by the Engineer.
- (B) PC Overlay Placement Notice: Contractor shall provide a minimum 48 hours notice to the Engineer, prior to placement of PC overlay on any structure.
- (C) Trial Application: Prior to constructing the overlay, one or more trial applications shall be placed on a previously constructed concrete base to demonstrate proper initial set time and the effectiveness of the mixing, placing, and finishing equipment proposed. The set time can be determined as the time elapsed from resin catalyzation until the in-place PC trial application cannot be deformed by pressing with a finger, indicating the resin binder is no longer in a liquid state. Each trial application shall be the planned paving width, at least ten (10) feet long, and have the same thickness as the specified overlay. Conditions during the construction of the trial application(s) and equipment used shall be similar to those to be used for construction of the overlay. The location of the trial application(s) shall be approved by the Engineer. Trial applications shall be properly disposed of off-site by the Contractor, if removal is necessary.

The number of trial applications required shall be as many as necessary for the Contractor to demonstrate the ability to construct an acceptable trial overlay section and competency to perform the work. However, the installer or proposed equipment/techniques may be rejected if not shown to be acceptable after three (3) trials.

Overlay direct tension bond testing shall be performed in accordance with Section (F)(1) of this special provision. Acceptable test results shall be achieved on a trial application before the installation may proceed.

- (D) Equipment: All equipment for cleaning the existing concrete surface and mixing and applying the overlay system shall be in accordance with the System Provider's recommendations, as approved by the Engineer prior to commencement of any work.
- (1) Surface Preparation Equipment: Provide appropriate scarifying, shotblasting, sandblasting and other equipment to adequately prepare the bridge deck substrate, as required in the Overlay Surface Preparation for Polymer Concrete special provision.
 - (2) Mixing Equipment: A continuous automated mixer shall be used for all PC overlay applications. The continuous mixer shall:
 - (a) Employ an auger screw/chute device capable of sufficiently mixing catalyzed resin with dry aggregate.
 - (b) Employ a plural component pumping system capable of handling binder resin and catalyst while maintaining proper ratios to achieve set/cure times within the specified limits. Catalyzed resin shall flow through a static mix tube for sufficient duration to completely mix the liquid system.
 - (c) Be equipped with an automatic metering device that measures and records aggregate and resin volumes. Record volumes at least every five (5) minutes, including time and date. Submit recorded volumes at the end of the work shift to the Engineer.
 - (d) Have a visible readout gage that displays volumes of aggregate and resin being recorded.
 - (e) Produce a satisfactory mix consistently during the entire placement.

A portable mechanical mixer of appropriate size for proposed batches, as recommended by the System Provider and approved by the Engineer, may be used for all PC patching applications and for smaller area overlay applications if approved by the Engineer.

(3) Finishing Equipment: Finishing may be accomplished with a Self-Propelled Slip-Form Paving Machine or Vibratory Screed.

(a) Self-Propelled Slip-Form Paving Machine: A self-propelled slip-form paving machine, which is modified or specifically built to effectively place the PC overlay in a manner that meets the objectives and requirements of the project, may be used for PC overlay applications. The paving machine shall:

(i) Employ a vibrating pan to consolidate and finish the PC overlay.

(ii) Be fitted with hydraulically controlled grade automation to establish the finished profile. The automation shall be fitted with substrate grade averaging devices on both sides of the new placement; the device shall average 15 feet in front and behind the automation sensors; or the sensor shall be constructed to work with string-line control. It is acceptable to match grade when placing lanes adjacent to previously placed PC.

(iii) Be calibrated for the projects requirements, and calibrated periodically following the manufacturers recommendations.

(iv) Have sufficient engine power and weight to provide adequate vibration of the finishing pan while maintaining consistent forward placement speed.

(v) Be capable of both forward and reverse motion under its own power.

(b) Vibratory Screed: A vibratory screed may be used for finishing the PC overlay, but must be approved by the Engineer at least two (2) weeks prior to PC overlay placement.

(D) Concrete Deck Repairs and Surface Preparation: All areas that require removal of existing patches or unsound concrete shall be removed and prepared in accordance with the requirements of the Overlay Surface Preparation for Polymer Concrete special provision. Placement of concrete for deck repair material shall be Polymer Concrete in accordance with this special provision. Prepare all concrete deck and repaired deck surfaces in accordance with the requirements of the Overlay Surface Preparation for Polymer Concrete special provision.

(E) Application of Overlay: Methods indicated in this special provision are typical of general installations and may be modified per the System Provider's recommendations as approved by the Engineer. The application of the overlay shall not begin until the concrete deck is completely surface dry in accordance with ASTM D4263, with a wait time revised from 16 hours to two (2) hours, or as directed by the System Provider's Technical Representative. Prior to overlay application, the concrete surface temperature shall be within the specified temperature ranges below. Night work may be required when temperatures cannot be met during the day.

(a) For PPC overlays, the concrete surface temperature shall be between 40° and 100° F.

(b) For EPC overlays, the concrete surface temperature shall be between 60° and 90° F.

During overlay application, precaution shall be taken to assure that traffic is protected from rebound, dust, and construction activities. Appropriate shielding shall be provided as required and directed by the Engineer.

During overlay application, the Contractor shall provide suitable coverings (e.g. heavy duty drop cloths) as needed to protect all exposed areas not to receive overlay, such as curbs,

sidewalks, parapets, etc. All damage or defacement resulting from this application shall be cleaned and/or repaired to the Engineer's satisfaction at no additional cost to the Department.

- (1) Primer Application: Immediately before placing primer, all exposed surfaces shall be completely dry and blown clean with oil-free compressed air. Exposed surfaces shall be protected from precipitation and heavy dew during and after the application of the primer.

After the exposed surfaces have been prepared and are dry, primer shall be applied in accordance with the System Provider's recommendations. Primer shall be placed within five (5) minutes of mixing at approximately 90-100 ft²/ gal or the rate acceptable to the Engineer.

Primer shall be applied by flooding and uniformly spread to completely cover surfaces to receive overlay. Care shall be taken to avoid heavy application that results in excess ponding. Excess material shall be removed or distributed to meet the required application rate. Primer shall be reapplied to any areas that appear dry prior to overlay placement.

Primer shall not be allowed to leak onto areas that have not received surface preparation.

- (2) PC Overlay Application: The PC overlay shall be applied during the interval between 15 minutes and two (2) hours after the primer has been applied. The PC overlay shall be placed prior to gelling. For PPC overlays, the overlay shall be placed within 15 minutes following addition of initiator, unless otherwise recommended by the System Provider's Technical Representative.

The resin binder shall be initiated for PPC overlays and blended completely. Aggregate shall be added and mixed sufficiently.

The set time can be determined in the field when the in-place PC application cannot be deformed by pressing with a finger, indicating that the resin binder is no longer in a liquid state.

- (a) When using PPC, the initial set time shall be at least 30 minutes and at most 90 minutes. If the PPC initial set is not within 30 to 90 minutes, the material shall be removed and replaced.
- (b) When using EPC, the initial set time shall be at least 30 minutes and at most 180 minutes. If the EPC initial set is not within 30 to 180 minutes, the material shall be removed and replaced.

The overlay shall be consolidated and finished to the required grade and cross-section using PC placement equipment as defined herein.

If a vibratory screed is used, prior to placing the PC overlay, place and fasten screed rails in position to ensure finishing the new surface to the required profile. Do not treat screed rails with parting compound to facilitate their removal. Prior to placing the overlay, attach a filler block to the bottom of the screed and pass it over the overlay area to check the thickness. The filler block thickness shall be equal to the design overlay thickness as shown in the plans. Remove all concrete that the block does not clear.

Place the PC overlay in one operation. Provide a minimum overlay thickness as shown in the plans.

Although the paver or screed may yield a finished or nearly finished surface, additional finishing may be necessary. The PC overlay shall be finished, as necessary, through traditional concrete finishing methods, producing a slight resin bleed indicating complete consolidation of aggregates.

Finishing of Polymer Concrete used as patching of an existing deck surface or overlay shall be completed and finished using traditional concrete hand finishing methods and hand concrete finishing tools. Such patches shall be placed flush with the top of the existing deck surface.

Resin content shall be as specified in the Materials section of this special provision and to yield a Polymer Concrete consistency that requires surface applied consolidation and finishing to consolidate aggregates and yield a slight sheen of bleed resin on top surface, yet does not yield excess bleed resin.

A surface friction sand/fine aggregate finish of at least 2.2 lbs/ yd² shall be broadcast onto the glossy surface immediately after sufficient finishing and before resin gelling occurs. To ensure adequate pavement friction, the completed PC overlay surface shall be free of any smooth or "glassy" areas such as those resulting from insufficient quantities of surface aggregate. Any such surface defects shall be repaired by the Contractor in the manner recommended by the System Provider and approved by the Engineer at no additional cost to the Department.

All final edges of PC overlay not adjacent to barrier rail, parapet, or bridge deck joints shall be finished neat, straight, and square, unless otherwise noted on project plans or approved by the Engineer.

Unless otherwise indicated on the plans, groove the deck surface in accordance with Subarticle 420-14(B) of the *Standard Specifications*. Vehicular traffic may travel across a deck surface that has not been grooved; however, the entire deck area shall be grooved after the PC overlay achieves design strength and no later than seven (7) calendar days after completion of the overlay unless otherwise approved by the Engineer.

Before completion of the project, all deck joints shall be sawcut, prepared, and sealed according to the details in the plans.

After the PC material has set, if final sawcutting for joint seals will not be done within 12 hours, at minimum, a single sawcut shall be made at the approximate midpoint of each joint. The sawcut shall be made within 12 hours or prior to opening of PC placement to traffic, if traffic will be allowed within 12 hours. Two (2) saw cuts may be made, but final saw cutting for the joints shall be done in accordance with the special provisions for the installation of the joint seals.

Any surface that is scarified shall be covered with the PC overlay before traffic is returned to the bridge deck, unless otherwise approved by the Engineer.

Upon approval by the Engineer, if traffic is to be returned to the site, but the overlay is not completed within the allowable lane closure time and is more than ¾ inch higher in elevation than the adjacent pavement, the PC overlay edges shall be tapered. The leading edge of the overlay shall be tapered at a 4:1 (horizontal: vertical) slope. Tapered edges longitudinal to the direction of traffic and tapered edges on the trailing edge of the overlay and shall be at a 45 degree slope. Tapers of 45 degrees may remain, and PC overlay may be placed adjacent. Tapers with a 4:1 (horizontal: vertical) slope shall be sawcut square to the overlay surface, prior to placing adjacent PC overlay.

The Contractor shall collect a ticket for each pass or portion of a pass that is provided by each mixer, and ensure that the following information is shown on each ticket:

(a) Project Number.

- (b) Bridge Number.
- (c) Date and Time.
- (d) Location of Placement (Lane and Station Limits or location and length of placement along the length of the bridge).
- (e) Aggregate Weight.
- (f) Resin Binder Weight.

The tickets shall be available on site for Inspection personnel to use in tabulating quantities.

Curing: The Contractor shall allow the overlay to cure sufficiently before subjecting it to loads or traffic of any nature that may damage the overlay. Cure time depends upon the ambient and deck temperatures as well as initiator/accelerator levels.

The overlay shall be considered cured to a traffic ready state when a minimum reading of 25 on a properly calibrated Swiss hammer is achieved. Other rebound hammers may be use as approved by the Engineer.

(F) Acceptance Testing: Acceptance of the deck repairs, surface preparation, and PC overlay will be determined by the Engineer based on direct tension bond testing, and smoothness quality testing performed by the Engineer, assisted by the Contractor.

- (1) Overlay Direct Tension Bond Testing: Direct tension bond (pull-off) tests shall be performed after 24 hours by the Contractor in accordance with ASTM C1583. At a minimum, three (3) direct tension bond tests shall be performed on each bridge overlay. For bridges with deck areas greater than 25,000 square feet, additional tests shall be performed at a frequency of one test per 25,000 square feet of additional deck area, rounded up. Additional testing may be required as directed by the Engineer.

The test result shall be the average of the tests for each structure. Test cores shall be drilled a minimum of 1/2" below the bond line.

The average minimum bond strength of the PC overlay system on normal weight concrete shall be 250 psi, with no individual test measured below 225 psi. An acceptable test will demonstrate that the overlay bond strength is sufficient, or by producing a concrete subsurface failure area greater than 50% of the test surface area. The Contractor shall repair all direct tension test locations with PC overlay in accordance with this special provision.

Direct tension bond testing shall be performed by an independent testing firm and shall be arranged by the Contractor. The Contractor may perform the direct tension bond testing with the approval of the Engineer. Testing shall be performed using a calibrated tensile loading device, in the presence of the Engineer. The tensile loading device shall be calibrated annually. The cost of direct tension bond testing shall be included in the bid price for *Placing and Finishing PC Overlay* item.

- (2) Smoothness Quality Testing: As soon as practical after the PC overlay has hardened sufficiently, the Contractor shall test the finished surface with an approved rolling straightedge that is designed, constructed, and adjusted, so that it will accurately indicate or mark all deck areas which deviate from a plane surface by more than 1/8" in 10'. The Contractor shall remove all high areas in the hardened surface in excess of 1/8" in 10' with an approved grinding or cutting machine. Any fins or other protrusions remaining after grinding operations shall be removed to the satisfaction of the Engineer. Additionally, the final PC deck surface shall not deviate from the line and elevation indicated on the plans by more than 0.3" over any 50' length. If approved by the Engineer, correct low areas in an acceptable manner.

(G) Corrective Work

- (1) Repair of Surface Defects: The repair materials and finishing methods for surface defects in the overlay shall be in accordance with those used for the application of the overlay. All surface defects shall be repaired to the satisfaction of the Engineer before acceptance of the work is made.
- (2) Correction for Smoothness: Areas showing high spots of more than $\frac{1}{8}$ " in 10' shall be marked and ground until the high spot does not exceed $\frac{1}{8}$ " in 10'. Ground surface may be sawcut grooved to restore the texture if ordered by the Engineer. Areas showing low spots of more than $\frac{1}{8}$ " in 10' shall be marked and a proposed repair procedure shall be submitted to the Engineer. The use of the proposed repair procedure shall be as recommended by the System Provider and approved by the Engineer.
- (3) Replacement of Defective Overlay: A defective overlay, or portion thereof, resulting in failing overlay pull bond test results shall be removed and replaced at the Contractor's expense. The Contractor shall submit a written corrective work proposal to the Engineer, which shall include the methods and procedures that will be used. The Contractor shall not commence corrective work until the methods and procedures have been approved in writing by the Engineer. The Engineer's approval shall not relieve the Contractor of the responsibility of producing work in conformity with the Contract.
- (4) Repair of Cracking: After a one-week cure period, if cracks are in the overlay, the Contractor shall fill the cracks with properly catalyzed and mixed primer material at no cost to the Department. Care shall be taken to fill the cracks only and ensure minimal primer material is left on the finished surface of the overlay.

MEASUREMENT AND PAYMENT

Concrete Deck Repair for PC Overlay will be measured and paid for at the contract unit price bid per square yard and will be full compensation for placement of concrete deck repair material and shall include the cost of labor, tools, equipment and incidentals necessary to complete the work.

Placing and Finishing PC Overlay will be measured and paid for as the contract unit price bid per square yard of overlay placement and final surface finishing. Payment will be full compensation for all labor, equipment, and all incidentals necessary to complete the PC overlay placement. Construction and removal (if required) of trial application(s), including concrete base surfaces, will not be measured and paid for separately, but shall be incidental to complete the work. Tining of bridge deck, if used, will be incidental to this pay item.

Grooving Bridge Floors will be measured and paid in accordance with Article 420-21 of the *Standard Specifications*.

Only one of the following pay items shall be used for materials, dependent on the PC overlay system used.

- (A) *Polyester Polymer Concrete Materials* will be measured as the actual volume of PPC material complete-in-place. The volume shall include material used for overlay, patching of existing unsound concrete deck surface or overlays, and bridge deck concrete repairs as directed by the Engineer. Tickets provided to the project inspector, showing quantities of PPC produced, shall be sufficient to calculate volume of material placed. Materials placed for trial application(s) shall be included in this Pay Item if placed and remaining on the bridge deck as part of the permanent overlay. *Polyester Polymer Concrete Materials* will be paid for at the contract unit price per cubic yard and will be full compensation to furnish the PPC material, including HMWM primer, freight to the project site, receiving, storage, and disposal of any unused PPC

overlay material. Payment by cubic foot will be based on a 135 lbs/ ft³ unit weight and quantities recorded by calibrated mixer unit readouts.

- (B) *Epoxy Polymer Concrete Materials* will be measured as the actual volume of EPC material complete-in-place. The volume shall include material used for overlay, patching of existing unsound concrete deck surface or overlays, and bridge deck concrete repairs as directed by the Engineer. Tickets provided to the project inspector, showing quantities of EPC produced, shall be sufficient to calculate volume of material placed. Materials placed for trial application(s) shall be included in this Pay Item if placed and remaining on the bridge deck as part of the permanent overlay. *Epoxy Polymer Concrete Materials* will be paid for at the contract unit price per cubic yard and will be full compensation to furnish the EPC material, including epoxy primer, freight to the project site, receiving, storage, and disposal of any unused EPC overlay material. Payment by cubic foot will be based on a 135 lbs/ ft³ unit weight and quantities recorded by calibrated mixer unit readouts.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Concrete Deck Repair for PC Overlay	Square Yard
Placing & Finishing PC Overlay	Square Yard
Grooving Bridge Floors	Square Feet
Polyester Polymer Concrete Materials	Cubic Yard
Epoxy Polymer Concrete Materials	Cubic Yard

OVERLAY SURFACE PREPARATION FOR

POLYMER CONCRETE

(SPECIAL)

DESCRIPTION

This special provision addresses the surface preparation activities required prior to the placement of polymer concrete (PC). Unless specifically mentioned below, all requirements specified for the bridge deck are also required for the approach slabs.

Work includes: removal of unsound and sound bridge deck concrete and existing patches in deck repair areas; preparation of repair areas prior to placement of PC bridge deck repair material; bridge deck surface preparation prior to placement of PC overlay; and any incidentals necessary to prepare the bridge deck for placement of PC repair material or PC overlay, as specified or as shown on the plans.

DEFINITIONS

Scarification shall consist of the removal of any asphalt wearing surface and concrete surface to the uniform depth and limits shown on the plans.

Shotblasting shall consist of steel beads (or other materials as approved by the Engineer) “shot” out of a machine onto the bridge concrete deck concrete floor to remove soft or deteriorated concrete, and to clean the concrete deck surface for the application of the PC overlay. Contractor shall vary the speed of the shotblaster or make multiple passes, as necessary, to achieve the required surface preparation for the PC overlay. Areas inaccessible with shotblasting equipment may require surface preparation with sandblasting equipment and hand equipment.

EQUIPMENT

All equipment for cleaning the existing concrete surface and mixing and applying the overlay system shall be in accordance with the System Provider's recommendations, as approved by the Engineer prior to commencement of any work:

- (A) Scarifying equipment that is a power-operated, mechanical grinder capable of removing a minimum depth of 1/4" for each pass.
- (B) Shotblasting and sandblasting equipment to adequately prepare the bridge deck substrate, as required in this special provision. Provide equipment to supply oil-free and moisture-free compressed air for final surface preparation.
- (C) Equipment capable of sawing concrete to the specified plan depth.
- (D) Power driven hand tools for removal of unsound concrete are required that meet the following requirements:
 - (1) Pneumatic hammers weighing a nominal 15 lbs. or less.
 - (2) Pneumatic hammer chisel-type bits that do not exceed the diameter of the shaft in width.
- (E) Hand tools, such as hammers and chisels, for removal of final particles of unsound concrete.
- (F) Self-propelled vacuum capable of picking up dust and other loose material from prepared deck surface.
- (G) Equipment to supply oil-free and moisture-free compressed air for final surface preparation.

The equipment must operate at a noise level less than 90 decibels at a distance of 50 feet.

MANAGEMENT AND DISPOSAL OF CONCRETE DEBRIS

All concrete debris shall become the property of the Contractor. The contractor shall be responsible for disposing of all debris generated by scarification, shotblasting, sandblasting, and any other surface preparation operations, in compliance with applicable regulations concerning such disposal.

All costs associated with management and disposal of all debris shall be included in the payment of other items.

OSP PLAN SUBMITTAL

Prior to beginning surface preparation activities, the Contractor shall submit for review and approval the Overlay Surface Preparation (OSP) Plan. The OSP Plan shall detail the type of equipment that is intended to be used and the means by which the Contractor will achieve the following requirements:

- (A) Estimate depth of reinforcing steel.
- (B) Scarification of deck to depth required.
- (C) Measure depth of scarification to show completed within limits.
- (D) Measure depth of shotblasting to show completed within limits.

The OSP Plan shall also include a schedule showing lane closures with estimated amount of bridge deck to be scarified, anticipated areas of Class II/III to be repaired and PC to be placed within that lane closure time. The Contractor should assume that any surface that is scarified shall be covered with the proper PC overlay before traffic is returned to the bridge deck, unless otherwise approved by the Engineer. The Contractor may propose traffic to be allowed on scarified bridge deck surfaces provided that the surface and joints are found to be structurally

sound after scarification and a smooth transition is provided at the leading and trailing ends and throughout the bridge surface. The duration between bridge deck scarification and PC placement shall be specified by the Engineer. The number of bridges, if any, that can be scarified in advance of PC placement shall be specified by the Engineer. Any additional approach work required to provide a smooth transition to the scarified surface before opening to traffic is incidental to the other items of work. The OSP plan shall clearly show the Contractor's intended plan and order of scarifying and placing PC on all bridges with associated timeframes. The OSP plan and associated scarification timeframes must be approved by the Engineer prior to starting any surface preparation operations.

SURFACE PREPARATION

Prior to any construction, take the necessary precautions to ensure debris from bridge deck preparation and repairs is not allowed to fall below the bridge deck.

Remove all existing asphalt overlays and all loose, disintegrated, unsound or contaminated concrete to the limits shown on the plans with the following requirements.

During surface preparation, precaution shall be taken to assure that traffic is protected from rebound, dust, and construction activities. Appropriate shielding shall be provided as required and directed by the Engineer. During surface preparation, the Contractor shall provide suitable coverings, as needed to protect all exposed areas not to receive overlay, such as curbs, sidewalks, parapets, etc. All damage or defacement resulting from surface preparation shall be repaired to the Engineer's satisfaction at no additional cost to the Department.

(A) Sealing of Bridge Deck: Seal all expansion joints subject to run-off water from the scarification, shotblasting, and PC placement process with material approved by the Engineer, prior to beginning any demolition. The expansion joints shall remain sealed until it has been determined that water and materials from the scarification, shotblasting, and PC placement operations cannot be discharged through them any longer. Take all steps necessary to eliminate the flow of water or materials through the expansion joints, and any other locations water or materials could leak from the deck.

All deck drains in the immediate work area and other sections of the bridge affected by the work being performed shall be sealed prior to beginning scarification. Drains shall remain sealed until it has been determined that water and materials from the scarification, shotblasting, and PC placement operations cannot be discharged through them any longer.

(B) Scarifying Bridge Deck: Remove any asphalt wearing surface from the bridge deck and scarify the concrete deck to remove the entire concrete surface of the deck to the uniform depth and limits shown on the plans.

It will be the Contractor's responsibility to determine amount of cover for the reinforcing steel. Use a pachometer or other approved device, as approved by Engineer, prior to scarification. Readings shall be read and recorded in the presence of the Engineer. Readings shall be recorded for each span at 1/5 points longitudinally and 1/3 points transversely. The cost for this work will be considered incidental to the cost of surface preparation of the bridge deck.

Estimated average cover to top mat:

Bridge Number 320: 1 7/8" +/-3/8"

Bridge Number 322: 2 1/8" +/-3/8"

Bridge Number 326: 2 3/16" +/-3/8"

Bridge Number 327: 1 1/2" +/-3/8"

Bridge Number 328: 1 1/2" +/-3/8"

Bridge Number 330: 1 1/2" +/-3/8"

Bridge Number 332: 1 1/2" +/-3/8"

The above top mat cover dimensions are an estimate based on the best available information. Calibrate scarifying equipment in order to avoid damaging the reinforcing steel in the bridge floor or the approach slab. Care shall be taken not to cut, stretch, or damage any exposed reinforcing steel. If reinforcing bars or bridge drainage devices are pulled up or snagged during scarification operations, cease work and consult with the Engineer to determine any necessary adjustments to the roto-milling operation.

Remove and dispose of all concrete and asphalt, and thoroughly clean the scarified surface. In areas where reinforcing steel is located in the depth to be scarified, use another method with the Engineer's approval.

The Engineer will re-inspect after each removal and require additional removals until compliance with plans and specifications are met.

Regardless of the method of removal, the removal operation shall be stopped if it is determined that sound concrete is being removed to a depth greater than required by the plans.

- (C) Class II Surface Preparation (Partial Depth): At locations specified on the plans or identified by the Engineer for Class II Surface Preparation, verify the depth of removal achieved by the scarification. Remove by additional scarification or chipping with hand tools all existing patches and unsound concrete. No additional payment will be made for Class II Surface Preparation depths achieved by the initial scarification.

All patches shall be removed under Class II Surface Preparation. If any patch cannot be removed by means of scarification, the Contractor shall use hand tools to remove the patch. Areas indicated on the plans that require Class II Surface Preparation, including the locations of existing patches, are from the best information available. The Contractor shall verify prior to surface preparation the location of all existing patches.

Spalled or unsound areas of the deck not removed by scarification shall be removed to sound concrete at locations noted in the contract plans or as directed by the Engineer. Remove existing spalled or unsound areas of the bridge concrete deck by methods approved by the Engineer.

Provide a 1" deep saw cut around the perimeter of areas noted for bridge deck or patch removal. Remove, using the type of tools listed above, all concrete or patch material within the sawcut to a minimum depth of 1" and as necessary to remove unsound concrete. All loose and unsound concrete or patch material shall be removed.

Thoroughly clean the newly exposed surface to be free of all grease, oil, curing compounds, acids, dirt, or loose debris in accordance with this special provision.

Dispose of the removed concrete, clean, repair or replace rusted or loose reinforcing steel, and thoroughly clean the newly exposed surface. Care shall be taken not to cut, stretch, or damage any exposed reinforcing steel.

In overhangs, removing concrete areas of less than 0.60 ft²/ft length of bridge without overhang support is permitted unless the Engineer directs otherwise. Overhang support is required for areas removed greater than 0.60 ft²/ft length of bridge. Submit details of overhang support to the Engineer for approval prior to beginning the work.

(D) Class III Surface Preparation (Full Depth): At locations specified on the plans or identified by the Engineer for Class III Surface Preparation, remove the concrete by chipping with hand tools the full depth of slab. Dispose of the removed concrete, clean, repair or replace damaged reinforcing steel and thoroughly clean the newly exposed surface. Care shall be taken not to cut, stretch, or damage any exposed reinforcing steel.

For areas of less than 3 ft², suspending forms from existing reinforcing steel using wire ties is permitted. For larger areas, support forms by blocking from the beam flanges, or other approved method.

Overhang support is required for full depth removal adjacent to bridge rails. Submit details of overhang support to the Engineer for approval prior to beginning the work.

(E) Preparation of Reinforcing Steel: Remove concrete without cutting or damaging existing steel unless otherwise noted in the plans. Clean, repair, or replace rusted or loose reinforcing steel. Damaged reinforcing steel, such as bars with nicks deeper than 20% of the bar diameter, shall be repaired or replaced. Reinforcing steel which has a cross section reduced to 75% or less shall be replaced with new reinforcing steel of similar cross section area. Replacement bars shall be Grade 60 and meet the material requirements of Section 1070 of the *Standard Specifications*.

Replacement bars shall be spliced to existing bars using either minimum 30 bar diameter lap splices to existing steel with 100% cross sectional area or approved mechanical connectors.

For reinforcing steel left unsupported by the concrete removal process, support and protect the exposed reinforcing steel against displacement and damage from loads, such as those caused by removal equipment and delivery buggies. All reinforcing steel damaged or dislodged by these operations shall be replaced with bars of the same size at the contractor's expense.

Reinforcing steel exposed and satisfactorily cleaned and prepared will not require additional cleaning, if encased in concrete within seven (7) days. Rebar exposed for more than seven (7) days shall be satisfactorily cleaned and prepared, prior to placement of the new concrete. The satisfactory cleanliness and preparation of the reinforcing steel shall be determined by the Engineer.

When large areas of the deck on composite bridges are removed resulting in the debonding of the primary reinforcing bars, the removal shall be performed in stages to comply with the construction sequence shown on the plans or as directed by the Engineer.

(F) Concrete Deck Repair: Repair and fill the Class II Surface Preparation areas of the existing bridge concrete deck prior to the final surface preparation and application of the PC overlay, at locations shown in the plans, or as determined by the Engineer, if necessary. Materials other than PC may be used for concrete deck repairs, but shall be approved by the PC System Provider's Technical Representative and shall be applied and prepared as required by the PC System Provider. For concrete deck repairs with PC:

- (1) Removal and surface preparation of the repair area shall be in accordance with and shall be paid for under pay items in this special provision.
- (2) Materials, equipment, placement, and finishing of PC used for concrete deck repairs shall meet the requirements of and shall be paid for under pay items in the Polymer Concrete Bridge Deck Overlay special provision.

PC repair material may be placed up to one (1) hour prior to overlay placement.

All repairs shall be placed and finished to match substrate deck grade prior to PC placement, in order to provide a uniform overlay thickness.

Concrete deck repairs with PC may be utilized as a stand-alone item where required on structures not to receive a PC overlay.

(G) Surface Cleaning: The surface of concrete substrate and repaired areas shall be prepared for application of the overlay by shotblasting in order to remove all existing grease, slurry, oils, paint, dirt, striping, curing compound, rust, membrane, weak surface mortar, or any other contaminants that could interfere with the proper adhesion of the overlay system. The final prepared surface shall adhere to the following requirements:

- (1) If expansion joints are not being replaced or have been replaced prior to shotblasting they shall be protected from damage from the shotblasting operation. Deck drains and areas of curb or railing above the proposed surface shall be protected from the shotblasting operation.
- (2) The areas to receive overlay shall be cleaned by shotblasting, or abrasive sandblasting in the event that the shotblaster cannot access areas to be prepared. Do not begin shotblasting until all grinding or milling operations are completed. Cleaning shall not commence until all work involving the repair of the concrete deck surface has been completed and the deck is dry. All contaminants shall be picked up and stored in the vacuum unit and no dust shall be created during the blasting operation that will obstruct the view of motorists in adjacent roadways. The travel speed and/or number of passes of the shotblasting unit shall be adjusted, so as to result in all weak or loose surface mortar being removed, aggregates within the concrete being exposed, and open pores in the concrete exposed, as well as a visible change in the concrete color. Cleaned surfaces shall not be exposed to vehicular traffic unless approved by the Engineer. If the deck becomes contaminated before placing the overlay, the Contractor shall shotblast or abrasive sandblast the contaminated areas to the satisfaction of the Engineer at no additional cost to the Department.
- (3) Prior to the overlay placement, any loose particles shall be removed by magnets, oil free compressed air, and vacuuming, such that no trapped particles remain. Power washing will not be allowed.
- (4) The areas to be overlaid shall be blown off with oil and moisture free compressed air just prior to placement of the primer and shall be completely dry.
- (5) Cleaning methods other than those detailed by specification may be suggested by the PC System Provider and approved by the Engineer.
- (6) All steel surfaces that will be in contact with the PC overlay shall be cleaned in accordance with Structural Steel Paint Council (SSPC) Surface Preparation (SP) No. 10, Near-White Blast Cleaning, except that wet blasting methods shall not be allowed.

(H) Safety: Provide a containment system for handling expected and unexpected blow through of the deck. The containment system shall retain runoff water and debris and protect the area under the bridge deck. The Contractor shall be responsible for any injury or damage caused by these operations. The containment system shall remain in place until the concrete has been cast and attained minimum strength.

Provide adequate lighting when performing deck preparation activities at night. Submit a lighting plan to the Engineer for approval prior to beginning work.

MEASUREMENT AND PAYMENT

Scarifying Bridge Deck will be measured and paid for at the contract unit price per square yard and will be full compensation for the milling of existing asphalt wearing surface from the bridge deck and approaches, milling of the entire concrete bridge deck, repairing or replacing any damaged reinforcing steel, and the cleaning and disposal of all waste material generated.

Shotblasting Bridge Deck will be measured and paid for at the contract unit price per square yard and will be full compensation for the shotblasting and necessary sandblasting and handwork to prepare the entire concrete bridge deck and approaches, and removal and disposal of all waste material generated.

Class II Surface Preparation will be measured and paid for at the contract unit price per square yard and will be full compensation for Class II (partial depth) deck preparation where required by the plans. The cost will also include removal and disposal of unsound and contaminated concrete, removal of all existing patches, cleaning, repairing, or replacing of reinforcing steel, and all materials, labor, tools, equipment and incidentals necessary to complete the work.

Class III Surface Preparation will be measured and paid for at the contract unit price per square yard and will be full compensation for Class III (full depth) deck preparation and repair where required by the plans. The cost will also include removal and disposal of unsound and contaminated concrete, cleaning, repairing or replacing of reinforcing steel, under deck containment, placing and finishing concrete for full depth repair, and all materials, labor, tools, equipment and incidentals necessary to complete the work.

Reinforcing Steel that is required for the repairs will be in accordance with Section 425 of the *Standard Specifications*.

Payment will be made under:

Pay Item

Scarifying Bridge Deck
Shotblasting Bridge Deck
Class II Surface Preparation
Class III Surface Preparation

Pay Unit

Square Yard
Square Yard
Square Yard
Square Yard

BEAM REPAIR-CUT OUT**(SPECIAL)****DESCRIPTION**

Cut and remove beam and stiffener areas identified as deteriorated, damaged or with excessive section loss at locations determined by the Engineer after blasting and priming for new paint system. The Engineer will determine the extent of the section to be removed. The repaired beam or stiffener section shall be inspected by NCDOT during fit-up and approved before welding the new stiffener or section may begin. After approval of the fit-up beam or stiffener section, weld fit-up section into place. Welding shall be performed by certified welders as specified in the *Standard Specifications*.

CONTAINMENT SYSTEM

An approved containment system must be installed prior to beginning work. See the Containment System section of the *Painting Existing Structure* Special Provisions regarding loading, design, and submittal requirements for the containment system.

FIELD ALTERATIONS

Since this repair involves working with an existing structure where the dimensions may vary throughout the structure, the contractor should expect and shall be prepared to make alterations in the field. This includes, but not limited to, having qualified personnel on hand to perform necessary alterations and having extra material on hand (or the ability to procure extra material in a timely manner). All such alterations shall be brought to the attention of the Engineer and agreed upon prior to alteration.

BASIS OF PAYMENT

Payment will be made at the contract price bid per pounds structural steel used for *Beam Repair Cut-Out*. Such payment will be full compensation for all materials, equipment, tools, labor, welding, miscellaneous steel, and incidentals necessary to complete the work.

Pay Item	Pay Unit
Beam Repair Cut-Out	Lb.

BEAM REPAIR-PLATING**(SPECIAL)****DESCRIPTION**

Plate beam webs, flanges, or stiffeners identified as deteriorated, damaged, or with excessive section loss at locations determined by the Engineer, after blasting and priming for new paint system. The Engineer will determine the extent of the section to be plated. The repair plate shall be inspected by NCDOT during fit-up and approved before welding the new plate may begin. After approval of the new plate, weld the plate into place. Welding shall be performed by certified welders as specified in the *Standard Specifications*.

CONTAINMENT SYSTEM

An approved containment system must be installed prior to beginning work. See the Containment System section of the *Painting Existing Structure* or *Painting Existing Weathering Steel Structure* Special Provisions regarding loading, design, and submittal requirements for the containment system.

FIELD ALTERATIONS

Since this repair involves working with an existing structure where the dimensions may vary throughout the structure, the contractor should expect and shall be prepared to make alterations in the field. This includes, but is not limited to, having qualified personnel on hand to perform necessary alterations and having extra material on hand (or the ability to procure extra material in

a timely manner). All such alterations shall be brought to the attention of the Engineer and agreed upon prior to alteration.

BASIS OF PAYMENT

Payment will be made at the contract price bid per pounds structural steel used for *Beam Repair Plating*. Such payment will be full compensation for all materials, equipment, tools, labor, welding, miscellaneous steel, and incidentals necessary to complete the work.

Pay Item	Pay Unit
Beam Repair Plating	Lb.

BRIDGE JACKING

(SPECIAL)

DESCRIPTION

Bridge jacking at end bents and interior bents is to facilitate beam or bent cap repairs and to replace and/ or reset bearings, as necessary. This work shall consist of furnishing all engineering, labor, equipment, and materials necessary for construction and subsequent removal of jacking support system, including jacks, jack supports, shims and all necessary blocking. Included under this item shall be all work to raise and support the existing structure as specified on the plans and as noted herein.

UTILITY COORDINATION

Utility owners with active utilities on the bridge shall be notified by the contractor of the jacking operation 30 days before the operation begins.

SCOPE OF WORK

Work for bridge jacking includes calculating existing and applied bridge loads, designing proper strength jacking scheme, evaluating stresses imposed on the bridge members, setting blocking and jacks, jacking bridge girders, mechanically locking jacks, and lowering bridge spans onto bearing assemblies.

Submit calculations, working drawings, and jacking procedure to the Engineer for review and approval prior to the start of work. Calculations and jacking procedure shall account for all loads expected while bridge is jacked or temporarily supported. Working drawings and all calculations (for determination of all applied loads, for design of the jacking scheme, to evaluate stresses imposed on the bridge members, and any other necessary calculations) for the required jacking scheme shall be sealed by an engineer licensed in the State of North Carolina.

Thoroughly clean areas under the proposed jacks to provide a flat, clean jacking surface. When jacking surfaces are not level or have slightly deteriorated concrete areas, use non-shrink grout to repair them to a flat level surface. The minimum thickness of the grout shall be as recommended by the manufacturer.

If the Engineer determines that any jacking surface contains highly deteriorated concrete, delay all work at that location and initiate provisions for pneumatically applied mortar or cast in place concrete repairs to restore the surface to full capacity for the jacking operations.

Do not remove any steel that has been welded to the existing bridge; it shall remain in place. The Contractor may opt to leave the jacking beam in place unless otherwise specified.

Make test cubes or cylinders of the nonshrink grout or concrete used for bearing pedestal repairs. The beams shall not be lowered in place until the test specimens achieve 3,500 psi minimum compressive strength.

The jack system shall be equipped with a direct reading gauge to directly read the jack force in pounds or kips. However, a gauge accompanied by a chart with which the dial reading can be converted into pounds may be used if approved by the Engineer.

Prior to bridge jacking, complete all diaphragm modifications necessary at the location where jacking is to occur. If a span connected to an end bent is to be jacked, ensure the curtain wall is either clear of the girders, or fully free to move with the jacked span prior to jacking. Lock jacks and install blocking while the bridge is in the raised condition. While in the raised condition, follow bridge plans for any work that may be required. Complete repair work, as needed. After all repairs requiring bridge jacking are completed, lower the bridge onto the bearing assemblies.

Unless otherwise allowed by the Engineer, all bridge jacking operations shall be complete before new deck overlay or deck joints and seals are placed on the existing structure.

Bridge jacking will be designated as one of two jacking arrangements, as follows:

Type I

Type I Bridge Jacking shall be applicable for jacking at individual beam or bearing locations. On a particular bridge bent or end bent, there might be more than one Type I Bridge Jacking. When jacking individual beam or bearing locations, all adjacent bearings of beams not being jacked may be loosened to decrease the resistance of the deck slab during jacking. The maximum differential between adjacent beams that are being jacked is 1/8". Should the jacking of an individual beam require the jacking of adjacent beams to reduce stresses or damage in the bridge, the jacking of the individual beam and adjacent beams shall be considered one Type I Bridge Jacking. All bearings loosened shall be tightened back after repair operations are completed and the jacks and blocking have been removed.

Type II

Type II Bridge Jacking shall be applicable for jacking an entire span end (i.e., all beams at one time) on a bent or end bent.

BASIS OF PAYMENT

Type I Bridge Jacking Bridge No. ___ payment will be made at the price bid for each set-up to complete bridge jacking as shown in the contract plans. The price per each jacking set-up required will be full compensation for designing proper strength jacking scheme (calculations, working drawings, and jacking procedure), all materials, equipment, tools, labor, and incidentals necessary to complete the work of this scope, including any jacking frames, jacking plates, and concrete repair required due to jacking operations.

Type II Bridge Jacking Bridge No. ___ payment will be made at the price bid for each set-up to complete bridge jacking as shown in the contract plans. The price per each jacking set-up required

will be full compensation for designing proper strength jacking scheme (calculations, working drawings, and jacking procedure), all materials, equipment, tools, labor, and incidentals necessary to complete the work of this scope, including any jacking frames, jacking plates, and concrete repair required due to jacking operations.

Pay Item	Pay Unit
Type I Bridge Jacking Bridge No. ____	Each
Type II Bridge Jacking Bridge No. ____	Each

STEEL BEARING KEEPER ANGLE ASSEMBLY

(SPECIAL)

DESCRIPTION

Fabricate and install steel bearing keeper angle assemblies at locations shown on the plans and as determined by the Engineer. Install steel bearing keeper angle assemblies after any new paint system has been applied, concrete bent cap repairs have been completed, and the top of the bent cap has been pressure washed and cleaned (if necessary), but before epoxy coating the top of the bent cap. Measures shall be taken to prevent damage to the paint system during installation of the steel bearing keeper angle assemblies. Any damage to the paint system shall be repaired by the Contractor at no additional cost to the Department.

BASIS OF PAYMENT

Steel Bearing Keeper Angle Assembly will be measured and paid in units of each. The price per each steel bearing keeper angle assembly will be full compensation for all materials, equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Steel Bearing Keeper Angle Assembly	Each

CLEANING AND PAINTING EXISTING BEARINGS WITH HRCSA

(SPECIAL)

DESCRIPTION

These items of work shall consist of cleaning, preparation, and field application of the specified paint system to existing steel bridge bearings and for all labor, materials, tools and equipment necessary, to complete the work to the limits shown on the plans, described in these special provisions, or as directed by the Engineer.

The bridge bearings shall be cleaned using hand tools, power tools, and high pressure water equipment. Using dry compressed air, connections and crevices will be dried completely. Rust penetrant will be applied to all open connections, crevices, pack rust and rust scale areas. A paint system with a co-polymerized high ratio of 'active' calcium sulfonate (HRCSA) shall be used as a stripe coat at all connections/crevices and as a topcoat over the bearings.

The bearings shall be considered to be plates (including masonry plates, sole plates, embedded plates, and other associated plates), bolts, nuts, washers, rockers, and any other components or hardware that comprise the bearing assembly.

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 *Standard Specifications*). To complete successfully the observation period, the coating system shall meet the following requirements after 12 months service:

- (A) No visible rust, contamination or application defect is observed in any coated area.
- (B) Painted surfaces have a uniform color and gloss.
- (C) Painted surfaces have an adhesion that meets an ASTM D3359, 3A rating.

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

SUBMITTALS

Submit all of the following to the Engineer for review and approval before scheduling the pre-construction meeting. Allow at least two (2) weeks for the review process.

- (B) The existing paint systems include toxic substances such as red lead oxide, which are considered hazardous if improperly removed. The contractor shall be currently Society for Protective Coatings (SSPC) Quality Program (QP) 2, Category A certified, and have successfully completed lead paint removal and field painting on similar structures within 18 months prior to this bid. Lead abatement work completed within the 18 month period shall have been completed in accordance with contract specifications, free of citation from safety or environmental agencies. Lead abatement work shall include, but not be limited to: abrasive blasting; waste handling, storage and disposal; worker safety during lead abatement activities (fall protection, personal protective equipment (PPE), etc.); and containment. This requirement is in addition to the contractor pre-qualification requirements covered by Article 102-2 of the *Standard Specifications*.

The apparent low bidder shall submit a list of projects for which QP 2 work was performed within the last 18 months including owner contact information and submit to the Engineer a "Lead Abatement Affidavit". This form may be downloaded from: <https://www.ncdot.gov/initiatives-policies/Transportation/bridges/Documents/leadabatementaffidavit.pdf>

- (M) Work schedule which shall be kept up to date, with a copy of the revised schedule being provided to the Engineer in a timely manner.
- (N) Containment system plans and design calculations in accordance with SSPC Guide 6, Class 2A and other project requirements, signed and sealed by a Professional Engineer licensed by the State of North Carolina.
- (O) Bridge wash water sampling and disposal plan.
- (P) Subcontractor identification.

- (Q) Lighting plan for night work in accordance with Section 1413 of the *Standard Specifications*.
- (R) Traffic control plan with NCDOT certified supervisors, flaggers and traffic control devices.
- (S) Health and safety plan addressing at least the required topics as specified by the SSPC QP 1 and QP 2 program and including hazard communication, respiratory health, emergency procedures, and local hospital and treatment facilities with directions and phone numbers, disciplinary criteria for workers who violate the plan and accident investigation. The plan shall address the following: hazardous materials, personal protective equipment, general health and safety, occupational health and environmental controls, fire protection and prevention, signs signals, and barricades, materials handling, storage, use, and disposal, hand and power tools, welding and cutting, electrical, scaffolds, fall protection, cranes, derricks, hoists, elevators, and conveyors, ladders, toxic and hazardous substances, airless injection and high pressure water jet (HPWJ).
- (T) Provide the Engineer a letter of certification that all employees performing work on the project have blood lead levels that are below the Occupational Safety and Health Administration (OSHA) action level.
- (U) Provide the Engineer with Competent Person qualifications and summary of work experience.
- (V) Environmental Compliance Plan.
- (W) Quality Control Plan (Project Specific) with quality control qualifications and summary of work experience.
- (P) Bridge and Public Protection Plan (Overspray, Utilities, etc. - Project/Task Specific).
- (Q) Abrasive Blast Media:
 - (3) Product Data Sheet.
 - (4) Blast Media Test Reports in accordance with Article 1080-12 of the *Standard Specification*.
- (R) Coating Material:
 - (6) NCDOT HICAMS Test Reports (testing performed by NCDOT Materials and Tests Unit).
 - (7) Product Data Sheets.
 - (8) Material Safety Data Sheets.
 - (9) Product Specific Repair Procedures.
 - (10) Acceptance letters from paint manufacturer's for work practices that conflict with special provisions and/or paint manufactures product data sheets.

PRE-CONSTRUCTION MEETING

Submittals shall be reviewed and approved by the Engineer prior to scheduling the pre-construction meeting. Allow no less than two (2) weeks for a review process. When requesting a pre-construction meeting, contact the Engineer at least seven (7) working days in advance of the desired pre-construction date. The contractor's project supervisor, Competent Person, quality control personnel and certified traffic control supervisor shall be in attendance at the pre-construction meeting in order for the Contractor and NCDOT team to establish responsibilities for various personnel during project duration and to establish realistic timeframes for problem escalation.

CONTAINMENT SYSTEM

If a containment plan for Painting of Existing Structure is submitted for a bridge that will have its bearings cleaned and painted with HRCSA, the containment plan for that structural steel painting operation will suffice for cleaning and painting existing bearings with HRCSA. If the structural steel of a bridge is not to be cleaned and painted, and no containment plan has been submitted for

that bridge, and that bridge will have its bearings cleaned and painted with HRCSA, a containment plan for cleaning and painting existing bearings with HRCSA shall be submitted for review and approval.

Prior to performing any construction or painting operations on the structure, the Contractor shall furnish the Engineer with plans and design calculations for a sufficiently designed containment system, which will provide access for any repairs on structural steel members, cleaning and surface preparations for structural steel members, and coating operations for structural steel members of the bridge. The containment system shall not be installed, and no work shall begin, until the Engineer has reviewed and approved, in writing, the submitted containment system plans and design calculations. Containment system plans and design calculations shall be prepared, sealed, and signed by a Professional Engineer licensed by the State of North Carolina. Allow a minimum of two (2) weeks for review of the containment plans and calculations.

The containment system shall meet or exceed the requirements of Class 3W containment in accordance with SSPC Guide 6. The Contractor shall determine the required capacity of the containment system, which, at a minimum, shall include loads due to wind, repair materials and repair operations, equipment, and tools; however, the capacity shall not be less than that required by Federal or State regulations. Design steel members to meet the requirements of the *American Institute of Steel Construction Manual*. Design timber members in accordance with the *National Design Specification for Stress-Grade Lumber and Its Fastenings* of the National Forest Products Association. The containment system shall be constructed of materials capable of withstanding damage from any of the work required on this project and shall provide a two (2) hour resistance to fire.

In the containment system plans, describe how debris is contained and collected. Describe the type of tarpaulin, bracing materials, and the maximum designed wind load. Design wind loads shall be in accordance with the Falsework and Formwork special provision. Describe the dust collection system and how a negative pressure of 0.03 inches of water column is maintained inside the enclosure, while blasting operations are being conducted. Describe how the airflow inside the containment structure is designed to meet all applicable OSHA Standards. Describe how water run-off from rain will be routed by or through the enclosure. Describe how wash water will be contained and paint chips separated. Describe what physical containment will be provided during painting application to protect the public and areas not to be painted.

Drilling holes in the superstructure for the purpose of attaching the containment system is prohibited.

The Contractor will be responsible for certifying the containment system has been constructed in accordance with the approved plans.

The containment system shall be cleaned after each workday.

Upon completion of work, remove all anchorages in the substructure and repair the substructure at no additional cost to the Department.

Protect non-metallic parts of bearings from blasting and painting (i.e.: Pot Bearings, Elastomeric Pads, and Disc Bearings).

WASH WATER SAMPLING AND DISPOSAL PLAN

All wash water shall be collected and sampled prior to disposal. Representative sampling and testing methodology shall conform to North Carolina Administrative Code 15A NCAC 02B.0103, "Analytical Procedures". Wash water shall be tested for pollutants listed in 15A NCAC 02B.0211(3), 15A NCAC 02T.0505(b)(1) and 15A NCAC 2T.0905(h). Depending on the test results, wash water disposal methods shall be described in the disposal plan. Wash water shall be disposed of in accordance with all current Federal and State regulations. See link for NCDOT Guidelines for Managing Bridge Wash Water:

<https://www.ncdot.gov/initiatives-policies/Transportation/bridges/Documents/WashWater.pdf>

WASTE HANDLING OF PAINT AND ABRASIVES

Comply with all Federal, State, and local regulations. Failure to comply with the regulations could result in fines and loss of qualified status with NCDOT.

Comply with the Resource Conservation and Recovery Act (RCRA - 40 CFR 261 - 265) and the Occupational Safety and Health Act (OSHA - 29 CFR 1910 - 1926) regulations for employee training, and for the handling, storage, labeling, recordkeeping, reporting, inspections and disposal of all hazardous waste generated during paint removal.

A summary of Generator Requirements is available at the above NCDOT web link, which cites the specific regulations for each Generator category. Quantities of waste by weight and dates of waste generation shall be recorded. Waste stored at the project site shall be properly labeled. All waste, hazardous or non-hazardous, requires numbered shipping manifests.

The North Carolina Department of Environmental Quality (NCDEQ) have adopted RCRA as the North Carolina Hazardous Waste Management Rules and are responsible for enforcement. The *Hazardous Waste Generator Compliance Manual* is published by the Compliance Branch of the Division of Waste Management of NCDEQ, and can be found at: <https://files.nc.gov/ncdeq/Waste%20Management/DWM/HW/Compliance/Generator%20Compliance%20Manual.pdf>

Immediately after award of the contract, arrange for waste containers, sampling, testing, transportation, and disposal of all waste. No work shall begin until the Contractor furnishes the Engineer with a written waste disposal plan. Any alternative method for handling waste shall be pre-approved by the Engineer. Use an approved waste management company from the following link:

<https://www.ebs.nc.gov/VendorDirectory/results.html?sap-params=cD0xJTIwJmN1cnJlbnRfc2VhcmNoX3BhZ2U9d2Mmc2VsZWN0aW9uX2Zpcm1fbmFtZT0mc2VsZWN0aW9uX2NlcnQ9JnNlbGVjdGlvb19maXJtdHlwZT0meXNjX2Zpcm10eXB1PSZzZWx1Y3Rpb25fd29ya2xvY2F0aW9uPSZ5c2Nfd29ya2xvY2F0aW9uPSZzZWx1Y3Rpb25fYWRkcnN0YXRIPSZ5c2NfYWRkcnN0YXRIPSZzZWx1Y3Rpb25fYWRkcmNvdW50eT0meXNjX2FkZHIjb3VudHk9JnNlbGVjdGlvb193a2NvZGU9MDAzMDQwJnlzY193a2NvZGU9MDAzMDQwJTIwQ090VEFNSU5BVEVEJTIwTUFURVJQUxTJTIwUkVNT1ZBTCZzZWx1Y3Rpb25fZGZlZyZ0meXNjX2Rpc2M9JnNlbGVjdGlvb19uYWljcz0meXNjX25haWNzPSZzZWx1Y3Rpb25fY3R5cGU9MA%3d%3d>

All removed paint and spent abrasive media shall be tested for lead following the SW-846 Toxicity Characteristic Leaching Procedure (TCLP) Method 1311 Extraction, as required in 40 CFR 261,

Appendix 11, to determine whether it shall be disposed of as hazardous waste. Furnish the Engineer certified test reports showing TCLP results of the paint chips stored on site, with disposal in accordance with “Flowchart on Lead Waste Identification and Disposal” at:

<https://ncdenr.s3.amazonaws.com/s3fs-public/document-library/Lead%20Disposal.pdf>

All sampling shall be done in presence of the Engineer’s representative.

The Competent Person shall obtain composite samples from each barrel of the wash water and waste generated by collecting two or more portions taken at regularly spaced intervals during accumulation. Composite the portions into one sample for testing purposes. Acquire samples after 10% or before 90% of the barrel has accumulated. The intent is to provide samples that are representative of widely separated portions, but not the beginning and end of wash water or waste accumulation.

Perform sampling by passing a receptacle completely through the discharge stream or by completely diverting the discharge into a sample container. If discharge of the wash water or waste is too rapid to divert the complete discharge stream, discharge into a container or transportation unit sufficiently large to accommodate the flow and then accomplish the sampling in the same manner as described above.

Comply with the NCDEQ *Hazardous Waste Compliance Generator Manual*. Record quantities of waste by weight and dates of waste generation. Until test results are received, store all waste, and label as “NCDOT Bridge Paint Removal Waste - Pending Analysis” and include the date generated and contact information for the Engineer. Store waste containers in an enclosed, sealed, and secured storage container protected from traffic from all directions. Obtain approval for the protection plan for these containers from the Engineer. If adequate protection cannot be obtained by use of existing guardrail, provide the necessary supplies and equipment to maintain adequate protection. Once test results are received and characterized, label waste as either “Hazardous Waste - Pending Disposal” or “Paint Waste - Pending Disposal”.

Once the waste has been collected, and the quantities determined, prepare the appropriate shipping documents and manifests and present them to the Engineer. The Engineer will verify the type and quantity of waste and obtain a Provisional Environmental Protection Agency (EPA) ID number from:

Melodi Deaver
Division of Waste Management/Hazardous Waste Section
North Carolina Department of Environmental Quality
1646 Mail Service Center
Raleigh, NC 27699
Phone: (919) 707-8204, Email: melodi.deaver@ncdenr.gov

At the time of shipping, the Engineer will sign, date, and add the ID number in the appropriate section on the manifest. The maximum on-site storage time for collected waste shall be 90 calendar days. All waste whether hazardous or non-hazardous will require numbered shipping manifests. The cost for waste disposal (including lab and Provisional EPA ID number) is included in the bid price for this contract. Note NC Hazardous Waste Management Rules (15A NCAC 13A) for more information. Provisional EPA ID numbers may be obtained at:

<https://deq.nc.gov/about/divisions/waste-management/hw/provisional-notification>

Testing labs shall be certified in accordance with North Carolina State Laboratory Public Health Environmental Sciences. List of certified laboratories may be obtained at:

<https://slphreporting.ncpublichealth.com/Certification/CertifiedLaboratory.asp>

All test results shall be documented on the lab analysis as follows:

(B) For leachable lead:

(1) Soils/Solid/Liquid- EPA 1311/200.7/6010

Area sampling will be performed for the first two (2) days at each bridge location. The area sample will be located within five (5) feet of the containment and where the highest probability of leakage will occur (access door, etc.). Results from the area sampling will be given to the Engineer within 72 hours of sampling (excluding weekends). If the results of the samples exceed $20 \mu\text{g}/\text{m}^3$ corrective measures shall be taken and monitoring shall be continued until two (2) consecutive sample results are less than $20 \mu\text{g}/\text{m}^3$.

Time Weighted Average (TWA) may suspend the work if there are visible emissions outside the containment enclosure or pump monitoring results exceeding the level of $30 \mu\text{g}/\text{m}^3$.

Where schools, housing and/or buildings are within 500 feet of the containment, the Contractor shall perform initial Total Suspended Monitoring (TSP) Lead monitoring for the first ten (10) days of the project during abrasive blasting, vacuuming and containment removal. Additional monitoring will be required during abrasive blasting two (2) days per month thereafter. Results of the TSP monitoring at any location shall not exceed $1.5 \mu\text{g}/\text{m}^3$.

EQUIPMENT MOBILIZATION

The equipment used in any travel lanes and paved shoulder shall be mobile equipment on wheels that has the ability to move on/off the roadway in less than 30 minutes. All work conducted in travel lanes shall be from truck or trailer supported platforms and all equipment shall be self-propelled or attached to a tow vehicle at all times.

QUALITY CONTROL INSPECTOR

Provide a quality control (QC) inspector in accordance with the SSPC QP guidelines to ensure that all processes, preparation, blasting and coating application are in accordance with the requirements of the contract. The inspector shall have written authority to perform QC duties to include continuous improvement of all QC internal procedures. The presence of the engineer or inspector at the work site shall in no way lessen the contractor's responsibility for conformity with the contract.

QUALITY ASSURANCE INSPECTOR

The quality assurance inspector which may be a Department employee or a designated representative of the Department shall observe, document, assess, and report that the Contractor is complying with all of the requirements of the contract. Inspectors employed by the Department are authorized to inspect all work performed and materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. The inspector is not authorized to alter or waive the requirements of the contract. Each

stage in preparing the structure to be coated which includes but not limited to washing, blasting, coating testing and inspection shall be inspected and approved by the Engineer or an authorized representative.

SUBLETTING OF CONTRACT

Only contractors certified to meet SSPC QP 2, Category A, and have successfully completed lead paint removal and field painting on all similar structures within 18 months prior to this bid are qualified for this work. Work is only sublet by approval of the Engineer.

PREPARATION OF SURFACES

(A) Removal of Soil, Concrete, Debris, and Other Material

Soil, concrete, debris, and other foreign material that might be on or attached to the bearings, plates, or any other bearing components shall be removed. Removal of such material may require the use of brooms, brushes, hand tools, hammers, chisels, pneumatic hammers, or other tools or power tools. Pneumatic hammers used for removal of such material shall weigh a nominal 15 lbs. or less. Exercise care to avoid nicking or gouging the bearing components during removal of soil, concrete, debris, and other foreign material. Should damage occur, repairs shall be made to the bearings at no cost to the Department.

(B) Cleaning and Removal of Pack Rust

Removal of pack rust shall be done by hand tool cleaning to meet requirements of SSPC Surface Preparation (SP)-SP 2, or by power tool cleaning to meet requirements of SSPC-SP 3, or a combination of these methods. Any black oxide scale shall be removed, unless otherwise directed by the Engineer. Pay particular attention to crevice areas when removing pack rust and rust scale. Exercise care to avoid nicking or gouging the bearing components during removal. Remove all rust scale and loose pack rust, followed by high pressure water cleaning.

(C) High Pressure Water Cleaning (HPWC)

The bearings shall be cleaned with water at a minimum pressure of 5,000 psi, at five (5) gallons per minute, with a rotating tip, at a maximum four (4) inch standoff distance from the steel surface, held as perpendicular to the steel surface as possible.

All water to be used in the surface preparation shall be potable water.

Ambient wash water temperature is allowed; hot water is not necessary.

The wash water shall include a soluble salt removing chemical at a minimum ratio of 100:1 and in compliance with manufacturer recommendations.

Care should be taken to ensure that the potable wash water does not have a level of chloride exceeding 15 parts per million (ppm) when tested. If higher, the level of soluble salt removing chemical should be proportionally increased as per manufactures recommendation.

It should be expected that the surfaces of the steel (and connections) are contaminated with soluble salts (e.g. Chlorides, Sulfates, or Nitrates). Using an acceptable sample method in

accordance with SSPC Guide 15, ensure that soluble salt levels on the surfaces do not exceed allowable soluble salt limits listed below:

- (1) Chloride - NVC3 3 $\mu\text{g}/\text{cm}^2$
- (2) Sulfate - NVS10 10 $\mu\text{g}/\text{cm}^2$
- (3) Nitrate - NVN10 10 $\mu\text{g}/\text{cm}^2$

The frequency of testing shall be two (2) tests per span after all surface preparation has been completed and immediately prior to painting. Select test areas representing the greatest amount of corrosion in the span as determined by the Engineers' representative. Additional testing may be required if significant amounts of chloride are detected.

The surface cleaning shall meet the requirements of SSPC Waterjet (WJ)-WJ4, to remove loose paint and loose rust. SSPC SP2 or SP3 (hand or power tool cleaning) may be used in inaccessible areas or when water cleaning is not possible.

In some cases, after HPWC, there may be areas of tightly adhered black oxide that were not removed. All black oxide scale shall be removed, unless otherwise directed by the Engineer.

If there is a question of whether all loose paint has been removed, adhesion testing of the remaining "tightly adhered" paint shall be done in accordance with ASTM D 4541-02 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers, with a minimum value of 300 psi.

Care should be taken to ensure all crevice corroded and pack rusted joints connections and corrosion frozen bearings are flushed with water containing a soluble salt removing chemical, at a minimum pressure of 5,000 psi, at five (5) gallons per minute, to ensure removal of all loose materials and to flush out any contaminant.

(D) Compressed Air Drying

All joints, connections, and bearings shall be blown dry with clean, dry, oil free, high pressure (100 psi) compressed air, regardless if the areas appear to be dry. Use the white blotter test in accordance with ASTM D4285 to verify the cleanliness of the compressed air used for blowout of "Limited Access" areas and drying. Conduct the test at least once per shift for each compressor system. Sufficient freedom from oil and moisture is confirmed if soiling and/or discoloration are not visible on the paper. If air contamination is evidenced, change filters, clean traps, add moisture separators or filters, or make adjustments as necessary to achieve clean, dry air.

All surfaces shall be inspected at this point. Surface preparation found to be deficient will be repeated at the Contractor's expense as directed by the Engineer. Once areas are agreed to be satisfactory, the Contractor may proceed with penetrating sealer application.

PAINTING OF STEEL

(A) Penetrating Sealer

Penetrating sealer may be applied by brush, roller, or airless spray method as recommended by the manufacturer. The mixing amount and method of mixing for the sealer components must

be in accordance with the manufacturer's instruction. Wet coat sufficiently to completely cover and penetrate the steel surface, but do not apply heavy coat. Use coat thickness as recommended by the manufacturer. Apply liberally to crevices and joints and/or spaces where a gap has been created between plates and around bolts, nuts and washers. Allow material to soak into spaces. Brush out any excess material, so as to not retard curing of the topcoat or result in an unaesthetically pleasing surface.

The penetrating sealer shall be applied within 24-hours after completion of the cleaning operations and before flash-rusting occurs. No bare steel surface prepared for penetrating sealer application shall be left uncoated long enough to allow the formation of rust. Cleaned areas upon which rust has formed shall be re-cleaned in accordance with the cleaning requirement at no additional cost. The presence of rust shall be determined by the Engineer.

The receiving steel surface shall be clean and absolutely dry. The permissible steel surface temperature and the ambient temperature shall be as recommended by the sealer manufacturer. However, in no case, shall the penetrating sealer be applied when the steel surface or the ambient temperatures is below 36°F or above 104°F, or the relative humidity exceeds 99% or a 3.6°F (2°C) temperature-Dew Point temperature spread.

Drying time is temperature, humidity, and film thickness dependent. Use manufacturer's recommended drying schedule to estimate the drying time of the penetrating sealer for application of the other coatings. If the manufacturer's recommendations allow, the use of forced air pressure to dry the surface will be permitted.

(B) HRCSA – Striping and Topcoat

No application of any stripe/primer shall be allowed until cleaning and preparation of the substrate has been approved by the Engineer. See drawings to determine exact location of structure components to be painted.

The permissible steel surface temperature and the ambient temperature shall be as recommended by the coating manufacturer. However, in no case, shall the coating be applied when the steel surface or the ambient temperatures is below 36°F or above 104°F, or the relative humidity exceeds 99% or a 3.6°F (2°C) temperature-Dew Point temperature spread.

The Contractor shall provide paint brushes, rollers, and spray equipment to conduct the work as specified in this special provision.

The Contractor shall also provide specialized equipment as required for the painting of limited access areas and for other difficult-to-clean areas. Specialized equipment may include, but is not limited to:

- (1) Pole guns for spray painting.
- (2) Mitts, daubers, or other methods to supplement brush application.

Stripe painting will be required on the following surfaces that have been cleaned: edges of plates, angles, lattice, connections (rivets and bolt heads) or other shapes, corners, crevices, back-to-back angles, and built-up edges. The surfaces of existing steel members to which new steel may be connected (faying surfaces) shall also be cleaned and painted as herein described. The stripe coat shall have a band width of at least four (4) in. (101.6 mm) to each side of the adjoining edges and is to completely coat the interior of all crevices. All

stripe painting should be applied by spray, but immediately afterwards it may be “brushed in” using a brush. No other method of paint application will be allowed for stripe painting.

Paint for intermediate coat or topcoat may be applied using spray, brush, or roll methods.

Spray painting will be permitted only within a containment that will contain all of the sprayed material, as approved by the Engineer. Complete protection from paint spatter, spillage, overspray, wind-blown paint, or similar releases of paint shall be provided. Covers, tarps, mesh, and similar materials shall be placed around the work area to protect public and private property, pedestrian, vehicular, marine, or other traffic, all portions of the bridge, highway appurtenances, waterways, and similar surrounding areas and property, upon, beneath, or adjacent to the structure.

Apply HRCSA as directed by the manufacturer. Wait time between the stripe coats, intermediate coats, and the topcoat shall be as per the manufacturer’s recommendations. The following paint schedule shall be used unless special exceptions are submitted and approved according to manufacturer recommendations prior to the start of this work.

Application Location	Description	Film Thickness
SPOT	Liberally apply a stripe coat to crevice corroded and pack rusted bearings and connections, provide extra material to bolts, nuts and any gaps around rivets.	15-18 mils (wet) 10-12 mils (dry)
SPOT	Over exposed metal areas and areas of tightly adhered contaminant free rust or flash rust, apply a spot prime with 5 to 7 mils DFT of Topcoat, including areas mentioned in previous SPOT application.	7-10 mils (wet) 5-7 mils (dry)

Prior to placing the subsequent coats, the Contractor will ensure that the prior coat is clean of all foreign matter, such as grease, dirt, bird waste, etc., before application of the subsequent coat.

Sealer, stripe, spot, and finish coats shall be applied in sufficient quantity so as to produce the minimum specified Dry Film Thicknesses (DFT). Care should be taken to not over apply the primer/topcoat, especially on flat surfaces. Maximum 25 mils DFT.

Active calcium sulfonate coatings cure slowly, so wet film measurements may be used as criteria for **preliminary** acceptance of the coating. Wet film thickness (WFT) measurements shall be determined as the job progresses and corrections shall be made during paint application.

Dry film thicknesses shall be determined using SSPC Paint Application (PA) PA2 – using a digital film thickness gage and a shim – after the coating has cured sufficiently to allow accurate measurements. Depending upon ambient air conditions, it may take more than one week before DFT measurements can be taken.

Areas failing to meet the specified WFT range shall be over-coated with the same paint to produce at least the total WFT required.

Paint applied containing unauthorized thinners, paint applied to contaminated surfaces, and paint applied contrary to this special provision shall result in the re-cleaning and re-painting of the surface. The work of re-cleaning, re-painting, or over-coating, if required, shall be performed within ten (10) working days following notification by the Engineer and shall be done by the Contractor to the satisfaction of the Engineer, at no additional cost to the Department.

MATERIALS

(A) Penetrant and Paint System

The paint system to be used shall be a High Ratio Co-Polymerized Calcium Sulfonate (HRCSA) coating system. Characteristics of submitted products shall meet or exceed those of the requirements listed within this special provision.

The structure is to be coated with a High Ratio, Co-Polymerized Calcium Sulfonate (HRCSA) corrosion mitigation system. Any Contractor-proposed coating system shall meet the following requirements:

- (1) The proposed coating system shall be an HRCSA coating as defined by this special provision and shall be submitted for approval.
 - (a) Primer/Topcoat (Minimum 9.5% active sulfonate) must maintain a 9-11 to 1 ratio Total Base Number to Active Sulfonate, i.e., total base number of 85 to 104 to 9.5% Active Sulfonate, as determined by Percent Active Sulfonate Content by Cationic Titration (Hyamine) testing, Procedure No. 817/4.9/T1409A.
 - (b) Formulations with greater than 27% Alkyd or co-polymer are not valid HRCSA.
 - (c) Zero Volatile Organic Compounds (VOC), 100% Solids Penetrant/Sealer approved by HRCSA manufacturer (Minimum 15% active sulfonate, a total base number of 135 to 165, must maintain a 9-11 to 1 ratio Active Sulfonate to Total Base Number as determined by Total Base Number Determination testing, Procedure No. 817/4.9/T1401.
- (2) The proposed coating system shall be certified in writing by the coating manufacturer that the HRCSA Primer/Topcoat and the HRCSA Penetrant Sealer meets the HRCSA special provision and has been verified by the testing titration protocols indicated above. The Engineer may choose to perform verification testing using the same protocols on materials delivered to the job site.
- (3) The proposed coating formulation shall have independent laboratory tests showing that the HRCSA coating, as supplied, has been tested to ASTM D5894 with a 24 hour freeze-thaw cycle and has passed a minimum 5,000 hours with no rust creepage at the scribe. The manufacturer shall certify that the currently manufactured formulation used is the same as the formulation that was tested, and can supply supporting documentation.

Lighting shall be equipped with explosion-proof fixtures.

The accumulation of empty paint cans, combustibles, and other debris will not be permitted.

Material Safety Data Sheets (MSDS) sheets for all materials shall be maintained on file and

provided to the Engineer prior to receipt of the material from the manufacturers.

If required, paint shall be mixed with mechanical mixers in accordance with the paint manufacturer's recommendations.

The primer, stripe, and other coats may be thinned only if recommended by the manufacturer, done in compliance with the manufacturer's instructions, approved by the Engineer, and mixed in the presence of the Engineer. If recommended by the manufacturer and approved by the Engineer, a measuring cup, having graduation in ounces, shall be used in the addition of thinner to any paint. No "eye balling" during addition of thinner to paint will be allowed. Paint mixed with thinner by "eye balling" will be subject to rejection by the Engineer as ruined material.

(B) Penetrant and Paint Storage

Do not expose penetrant and paint materials to rain, excessive condensation, long periods of direct sunlight, or temperatures above 100°F or below 40°F. In addition, the Contractor shall place a device which records the high, low, and current temperatures inside the storage location. Follow the manufacturer's storage requirements if more restrictive than the above requirements. Any material found to be damaged or beyond its expiration date shown on the container shall be immediately removed from the project site and will be considered as ruined material.

All storage of paint, solvents, and other materials applied to structures shall be stored in accordance with Subarticle 442-9(C) of the *Standard Specifications* or the manufacturers' requirements. The more restrictive requirements will apply.

(C) Testing of Paint Samples

Engineer reserves the right to conduct tests of the materials at any time, and any number of times during the period of field painting.

The Engineer will sample the paint(s) being used. A representative size sample of each component of paint(s) at the construction site will be transferred to metal containers, identified, sealed, and certified in the presence of the Contractor.

Tests on paint samples may be performed by the Department in order to confirm the manufacturer's test results submitted with each batch of material.

If the laboratory test results show that the material being used does not comply with the requirements specified in this special provision, the Contractor will be directed to stop painting work and remove non-complying paint; pay for testing; re-paint surfaces coated with rejected paint; or remove rejected paint from previously painted surfaces if, upon re-painting with specified paint, the two (2) coatings are not compatible.

INSPECTION

Surface Preparation for System 1 shall be in accordance with SSPC SP-10. Any area(s) not meeting the requirements of SSPC SP-10 shall be remediated prior to application of coating. Surface inspection is considered ready for inspection when all blast abrasive, residue and dust is removed from surfaces to be coated.

(D) Quality Assurance Inspection

The Contractor furnishes all necessary OSHA approved apparatus such as ladders, scaffolds and platforms as required for the inspector to have reasonable and safe access to all parts of the work. The contractor illuminates the surfaces to be inspected to a minimum of 50-foot candles of light. All access points shall be illuminated to a minimum of 20-foot candles of light.

NCDOT reserves the right for ongoing Quality Assurance (QA) inspection to include but not limited to surface contamination testing, adhesion pull testing, and DFT readings as necessary to assure quality.

Inform the Engineer and the Division Safety Engineer of all scheduled and unannounced inspections from SSPC, OSHA, EPA and/or others that come on site. Furnish the Engineer a copy of all inspection reports except for reports performed by a third party and or consultant on behalf of the Contractor.

(E) Inspection Instruments

At a minimum, furnish the following calibrated instruments and conduct the following quality control tests:

- (12) Sling Psychrometer - ASTM E337 - bulb type
- (13) Surface Temperature Thermometer
- (14) Wind Speed Indicator
- (15) Tape Profile Tester - ASTM D4417 Method C
- (16) Surface Condition Standards - SSPC VIS-1 and VIS-3
- (17) Wet Film Thickness Gage - ASTM D4414
- (18) Dry Film Thickness Gage - SSPC-PA2 Modified
- (19) Solvent Rub Test Kit - ASTM D4752
- (20) Adhesion Test Kit - ASTM D3359 Method A (Tape Test)
- (21) Adhesion Pull test - ASTM D4541
- (22) Surface Contamination Analysis Kit or (Chloride Level Test Kit) SSPC Technology Guide 15

(F) Quality Control

Maintain a daily quality control record in accordance with Subarticle 442-12(D) of the *Standard Specifications* and make such records available at the job site for review by the inspector and submit to the Engineer as directed. In addition to the information required on Form M&T-610, submit all Dry Film Thickness (DFT) readings on a form equivalent to Form M&T-611. These forms can be found at:

<https://connect.ncdot.gov/resources/Materials/Pages/Materials-Manual-by-Material.aspx?Order=MM-03-02>

Film thickness shall be measured at no less than six (6) random spots per bearing (each of four (4) bearing plate edges and two (2) readings on top of the sole plate). Also, film thickness shall be measured at no less than six (6) random spots per span on diaphragms/cross frames.

Each spot is an average of three (3) to five (5) individual gage readings as defined in SSPC PA-2. No spot average shall be less than 80% of minimum film thickness for each layer

applied; this does not apply to stripe coat application. These non-conforming areas shall be corrected by the Contractor prior to applying successive coats.

Areas failing to meet the specified film thickness range shall be over-coated with the same paint to produce at least the total film thickness required.

REPAIR OF DAMAGED COATINGS

All damaged coatings, new or existing, shall be repaired prior to project completion and acceptance in accordance with the above specifications for re-coating and over-coating and as directed by the Engineer, at no additional cost to the Department.

COATING MANUFACTURER'S REPRESENTATIVE

Unless waived by the Engineer, the Contractor shall make arrangements for a representative of the coating manufacturer to be present on-site as work begins, at a minimum, and as necessary as work progresses, to work together with the Contractor and representatives of the Department and to provide comments and guidance, so that the cleaning, application, and inspection procedures are done properly.

SAFETY AND ENVIRONMENTAL COMPLIANCE PLANS

Personnel access boundaries are delineated for each work site using signs, tape, cones, or other approved means. Submit copies of safety and environmental compliance plans that comply with SSPC QP 2 Certification requirements.

HEALTH AND SAFETY RESPONSIBILITIES

This project may involve toxic metals such as arsenic, lead, cadmium and hexavalent chromium. It is the contractor's responsibility to test for toxic metals and if found, comply with the OSHA regulations, which may include medical testing.

Ensure a "Competent Person" as defined in OSHA 29 CFR 1926.62; one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them; is on site during all surface preparation activities and monitors the effectiveness of containment, dust collection systems and waste sampling. Before any work begins, provide a written summary of the Competent Person's safety training.

Comply with Subarticle 442-14(B) of the *Standard Specifications*.

Comply with Subarticle 442-14(D) of the *Standard Specifications*. Ensure employee blood sampling test results are less than 50 micrograms per deciliter. Remove employees with a blood sampling test of 50 or more micrograms per deciliter from work activities involving any lead exposure.

An employee who has been removed with a blood level of 50 micrograms per deciliter or more shall have two (2) consecutive blood sampling tests spaced one week apart indicating that the employee's blood lead level is at or below 40 micrograms per deciliter before returning to work activities involving any lead exposure.

All OSHA recordable accidents that occur during the project duration are to be reported to the Engineer within twenty-four (24) hours of occurrence. In addition, for accidents that involve civilians or property damage that occurs within the work zone the Division Safety Engineer shall be notified immediately.

Prior to blasting operations, the Contractor shall have an operational OSHA approved hand wash station at each bridge location and a decontamination trailer at each bridge or between bridges unless the work is on the roadway, or the Contractor shall show reason why it is not feasible to do so and provide an alternative site as approved by the Engineer. The Contractor shall assure that all employees whose airborne exposure to lead is above the Permissible Exposure Limit (PEL) shall shower at the end of their work shift.

STORAGE OF PAINT AND EQUIPMENT

Provide a location for materials, equipment, and waste storage. Spread tarpaulins over all pavements and surfaces underneath equipment used for abrasive recycling and other waste handling equipment or containers. All land and or lease agreements that involve private property shall disclose to the property owner that heavy metals may be present on the Contractor's equipment. Prior to storing the Contractor's equipment on private property, provide a notarized written consent signed by the land owner received by the Engineer at least forty-eight (48) hours before using property. All storage of paint, solvents, and other materials applied to structures shall be stored in accordance with Subarticle 442-9(C) of the *Standard Specifications* or the manufacturers' requirements. The more restrictive requirements will apply.

UTILITIES

Protect all utility lines or mains that may be supported on, under, or adjacent to bridge work sites from damage and paint overspray.

MEASUREMENT AND PAYMENT

Painting Containment for Bridge No. ___ will be paid for at the contract unit price which will be full compensation for the design, materials, installation, maintenance, and removal of the containment system.

Pollution Control will be paid at the contract lump sum price which will be full compensation for all collection, handling, storage, air monitoring, and disposal of debris and wash water, all personal protective equipment, and all personal hygiene requirements, and all equipment, material and labor necessary for the daily collection of the blast debris into specified containers; and any measures necessary to ensure conformance to all safety and environmental regulations as directed by the Engineer.

Cleaning and Painting Existing Bearings will be measured and paid for each bearing location. The price for each bearing will be full compensation for all labor, materials and equipment necessary to complete the work. All work shall be done in a manner satisfactory to the Engineer.

Payment will be made under:

Pay Item

Pay Unit

Painting Containment for Bridge No. ____
 Pollution Control
 Cleaning and Painting Existing Bearings with High Ratio
 Calcium Sulfonate

Lump Sum
 Lump Sum
 Each

BEARING REPLACEMENT**(SPECIAL)****DESCRIPTION**

This work shall consist of furnishing, fabrication and installation of new steel bearing to replace existing bearing at locations shown on the plans and as determined by the Engineer.

SCOPE OF WORK

Use AASHTO M270 Grade 50 for all steel masonry plates and sole plates. The existing bearing shall be replaced with bearing as detailed in the plans. The girders shall be jacked according to the Bridge Jacking Special Provision before beginning any work for bearing replacement. Thoroughly clean the exposed surfaces of the existing structure in accordance with Article 442-7(B) of the Standard Specifications after jacking. The Engineer shall inspect and approve the bearing replacement after cleaning.

MEASUREMENT AND PAYMENT

Bearing Replacement will be measured and paid in units of each. The price per each will be full compensation for all materials, equipment, tools, labor, and incidentals necessary to complete the work. Concrete repairs will be paid for as part of the contract unit price bid for "Concrete Repair". Bridge jacking will be paid for as part of the contract unit price bid for "Bridge Jacking".

BEARING PLATE REPOSITIONING**(SPECIAL)****DESCRIPTION**

This work shall consist of repositioning steel bearing plates at locations shown on the plans and as determined by the Engineer. This work shall consist of jacking the beam, repositioning the bearing, and removing the jacking support system.

MEASUREMENT AND PAYMENT

Bearing Plate Repositioning will be measured and paid in units of each. The price per each will be full compensation for all materials, equipment, tools, labor, and incidentals necessary to complete the work. Bridge jacking will be paid for as part of the contract unit price bid for "Bridge Jacking".

ANCHOR BOLT NUT REPLACEMENT**(SPECIAL)****DESCRIPTION**

This work shall consist of replacing missing anchor bolt nut and washers at locations shown on the plans and as determined by the Engineer. Anchor bolt nuts shall meet the requirements of AASHTO M291-DH or AASHTO M292-2H. Washers shall meet the requirements of AASHTO M293. Nuts and washers shall be galvanized in accordance with the standard specifications. Nuts for anchor bolts are to be tightened finger tight and then backed off ½ turn. The thread of the nut and bolt shall then be burred with a sharp pointed tool.

MEASUREMENT AND PAYMENT

There will be no separate payment for Anchor Bolt Nut Replacement as it will be considered incidental to the various pay items.

EPOXY RESIN INJECTION**(SPECIAL)****GENERAL**

For repairing cracks, an applicator certified by the manufacturer of epoxy injection system to be used is required to perform the epoxy resin injection. The Contractor shall submit documentation that indicates the firm, supervisor and the workmen have completed an instruction program in the methods of restoring concrete structures utilizing the epoxy injection process and have five (5) years of relative experience with a record of satisfactory performance on similar projects.

The Contractor furnishes all materials, tools, equipment, appliances, labor and supervision required when repairing cracks with the injection of an epoxy resin adhesive.

SCOPE OF WORK

Using Epoxy Resin Injection, repair all cracks 25 mils (625 μm) wide or greater in the interior bent columns and caps, in the ends of the girders, in the cantilevered portion of the ends of the girders, and in the cantilevered portion of the superstructure deck.

SUBMITTALS

Prior to Construction, the Contractor shall submit the following to the Engineer for review and approval:

- (A) Information covering the materials and their properties, storage and handling requirements, and Material Safety Data Sheets.
- (B) Preparation and epoxy injection installation procedures, including written instructions from the manufacturer of the proportioning dispenser as to the procedures recommended to monitor and assure its proportioning accuracy of the unit.
- (C) Proposed injection repair procedures in the event that during testing it is found that the injection installation procedure did not completely fill cracks with epoxy.
- (D) The resumes of the Contractor's staff and/or the epoxy resin manufacturer's Technical Representative that will be on site performing the epoxy injection. The resumes shall detail the

epoxy injection installation experience and any manufacturer installation certifications the installer has.

(E) The names and telephone numbers of contact persons for recent projects where they have performed epoxy injection.

(F) Material certifications and sampling shall be as required as per the NCDOT *Standard Specifications* Section 106.

COOPERATION

Cooperate and coordinate with the Technical Representative of the epoxy resin manufacturer for satisfactory performance of the work.

Have the Technical Representative present when the epoxy resin injection process begins and until the Engineer is assured that their service is no longer needed.

The expense of having this representative on the job is the Contractor's responsibility and no direct payment will be made for this expense.

MATERIAL PROPERTIES

Provide a two-component structural epoxy adhesive for injection into cracks or other voids. Provide modified epoxy resin (Component "A") that conforms to the following requirements:

	Test Method	Specification Requirements
Viscosity @ 40 ± 3°F, cps	Brookfield RVT Spindle No. 4 @ 20 rpm	6,000 – 8,000
Viscosity @ 77 ± 3°F, cps	Brookfield RVT Spindle No. 2 @ 20 rpm	400 - 700
Epoxide Equivalent Weight	ASTM D1652	152 - 168
Ash Content, %	ASTM D482	1 max.

Provide the amine curing agent (Component "B") used with the epoxy resin that meets the following requirements:

	Test Method	Specification Requirements
Viscosity @ 40 ± 3°F, cps	Brookfield RVT Spindle No. 2 @ 20 rpm	700 - 1400
Viscosity @ 77 ± 3°F, cps	Brookfield RVT Spindle No. 2 @ 20 rpm	105 - 240
Amine Value, mg KOH/g	ASTM D664*	490 - 560
Ash Content, %	ASTM D482	1 max.
* Method modified to use perchloric acid in acetic acid.		

Certify that the Uncured Adhesive, when mixed in the mix ratio that the material supplier specifies, has the following properties:

Pot Life (60 gram mass)

@ 77 ± 3°F - 15 minutes minimum

@ 100 ± 3°F - 5 minutes minimum

Certify that the Adhesive, when cured for seven (7) days at 77 ± 3°F unless otherwise specified, has the following properties:

	Test Method	Specification Requirements
Ultimate Tensile Strength	ASTM D638	7,000 psi (min.)
Tensile Elongation at Break	ASTM D638	4% max.
Flexural Strength	ASTM D790	10,000 psi (min.)
Flexural Modulus	ASTM D790	3.5 x 10 ⁵ psi
Compressive Yield Strength	ASTM D695	11,000 psi (min.)
Compressive Modulus	ASTM D695	2.0 - 3.5 x 10 ⁵ psi
Heat Deflection Temperature Cured 28 days @ 77 ± 3°F	ASTM D648*	125°F min. 135°F min.
Slant Shear Strength, 5,000 psi (34.5 MPa) compressive strength concrete Cured 3 days @ 40°F wet concrete Cured 7 days @ 40°F wet concrete Cured 1 day @ 77°F dry concrete	AASHTO T237	 3,500 psi (min.) 4,000 psi (min.) 5,000 psi (min.)
* Cure test specimens so the peak exothermic temperature does not exceed 77°F.		

Use an epoxy bonding agent, as specified for epoxy mortar, as the surface seal (used to confine the epoxy resin during injection).

EQUIPMENT FOR INJECTION

Use portable positive displacement type pumps with interlock to provide positive ratio control of exact proportions of the two (2) components at the nozzle to meter and mix the two (2) injection adhesive components and inject the mixed adhesive into the crack. Use electric or air powered pumps that provide in-line metering and mixing.

Use injection equipment with automatic pressure control capable of discharging the mixed adhesive at any pre-set pressure up to 200 ± 5 psi and equipped with a manual pressure control override.

Use equipment capable of maintaining the volume ratio for the injection adhesive as prescribed by the manufacturer. A tolerance of $\pm 5\%$ by volume at any discharge pressure up to 200 psi is permitted.

Provide injection equipment with sensors on both the Component A and B reservoirs that automatically stop the machine when only one component is being pumped to the mixing head.

PREPARATION

Follow these steps prior to injecting the epoxy resin:

- (A) Remove all dirt, dust, grease, oil, efflorescence and other foreign matter detrimental to the bond of the epoxy injection surface seal system from the surfaces adjacent to the cracks or other areas of application. Acids and corrosives are not permitted.
- (B) Provide entry ports along the crack at intervals as determined by the Contractor to ensure full penetration of the crack.
- (C) Apply surface seal material to the face of the crack between the entry ports. For through cracks, apply surface seal to both faces.
- (D) Allow enough time for the surface seal material to gain adequate strength before proceeding with the injection.
- (E) Perform an air pressure check of the surface seal to ensure the system is airtight prior to proceeding with the injection.

EPOXY INJECTION

Before epoxy adhesive injection occurs, the Contractor shall test discharge one pint of epoxy to calibrate the equipment and to demonstrate that the workmen and equipment are working properly.

Follow approved preparation and installation procedures submitted by the Contractor. It is the Contractor's responsibility to achieve full penetration of cracks being injected.

Perform epoxy adhesive injection continuously until cracks are completely filled. Pressure shall be maintained until complete refusal of material is achieved. Any stoppage of injection for more than 15 minutes shall result in the injection equipment being cleaned, at no additional cost to the Department, before resuming injection.

If port to port travel of epoxy adhesive is not indicated, or the surface seal and/or ports become dislodged, immediately stop the work and notify the Engineer.

TESTING

The Contractor shall drill 3" diameter cored holes of the cured epoxy to a depth of 6" to verify the cracks have been completely filled with epoxy. When drilling cores, care shall be taken to avoid existing steel reinforcement, where possible. Injection will not proceed beyond the initial 50 feet until three (3) cores have been submitted to, and approved by, the Engineer. If the epoxy does not penetrate a minimum of 6" or the full depth of the crack, whichever is less, the repair will be

rejected, and the contractor shall follow their proposed repair procedure that has been approved by the Engineer. The presence of the technical representative will be required when repairs begin.

The Engineer will take possession of the cores from the repaired concrete for compressive testing. If the failure plane is located at the repaired crack, a minimum compressive strength of 3,000 psi is required of these cores. The cost of coring is incidental to the epoxy injection pay item. If the core fails, the contractor will be required to take corrective action before proceeding and another 50' test section will be required.

After the contractor demonstrates acceptable repairs, cores will be taken at a rate of one per 100 linear feet of repair until completion of the work or unacceptable cores are encountered.

FINISHING

When cracks are completely filled, allow the epoxy adhesive to cure for sufficient time to allow the removal of the surface seal without any draining or runback of epoxy material from the cracks.

All cored holes will be filled with Type 3 grout in accordance with Section 1003 of the *Standard Specifications*.

Remove the surface seal material and injection adhesive runs or spills from concrete surfaces.

Finish the face of the crack and all core holes flush to the adjacent concrete, removing any indentations or protrusions caused by the placement of entry ports or grout placement.

BASIS OF PAYMENT

Epoxy Resin Injection will be paid at the contract unit price per linear foot. For full depth cracks, payment will be made for one side only. Such payment will be full compensation for all materials, tools, equipment, labor, coring and for all incidentals necessary to complete the work.

Pay Item	Pay Unit
Epoxy Resin Injection	Linear Foot

SHOTCRETE REPAIRS

(SPECIAL)

GENERAL

The work covered by this special provision consists of removing deteriorated concrete from the structure in accordance with the limits, depth and details shown on the plans, described herein and as established by the Engineer. This work also includes removing and disposing all loose debris, cleaning and repairing reinforcing steel and applying structural shotcrete.

The location and extent of repairs shown on the plans are general in nature. The Engineer shall determine the extent of removal in the field based on an evaluation of the condition of the exposed surfaces.

Any portion of the structure that is damaged from construction operations shall be repaired to the Engineer's satisfaction, at no extra cost to the Department.

MATERIAL REQUIREMENTS

Use prepackaged dry mix shotcrete conforming to the requirements of ASTM C1480, the applicable sections of the *Standard Specifications* and the following:

Test Description	Test Method	Age (Days)	Specified Requirements
Silica Fume (%)	ASTM C1240	-	10 (Max.)
Air Content - As Shot (%)	ASTM C231 or ASTM C457	-	5 ± 2
Minimum Compressive Strength (psi)	ASTM C109	7 28	3,000 5,000
Minimum Bond Pull-off Strength (psi)	ASTM C1583 or ASTM C882	28	250
Rapid Chloride Permeability Tests (range in coulombs)	ASTM C1202	-	100 - 1000

Admixtures are not allowed unless approved by the Engineer. Store shotcrete in an environment where temperatures remain above 40°F and less than 95°F

All equipment must operate in accordance with the manufacturer's specifications and material must be placed within the recommended time.

QUALITY CONTROL**(A) Qualification of Shotcrete Contractor**

The shotcrete Contractor shall provide proof of experience by submitting a description of jobs similar in size and character that have been completed within the last five (5) years. The name, address and telephone number of references for the submitted projects shall also be furnished. Failure to provide appropriate documentation will result in the rejection of the proposed shotcrete contractor.

(B) Qualification of Nozzleman

The shotcrete Contractor's nozzleman shall be certified by the American Concrete Institute (ACI). Submit proof of certification to the Engineer prior to beginning repair work. The nozzleman shall maintain certification at all times while work is being performed for the Department. Failure to provide and maintain certification will result in the rejection of the proposed nozzleman.

TEMPORARY WORK PLATFORM

Prior to beginning any repair work, provide details for a sufficiently sized temporary work platform at each repair location. Design steel members to meet the requirements of the American Institute of Steel Construction Manual. Design timber members in accordance with the *National Design Specification for Stress-Grade Lumber and Its Fastenings* of the National Forest Products Association. Submit the platform design and plans for review and

approval. The design and plans shall be sealed and signed by a North Carolina registered Professional Engineer. Do not install the platform until the design and plans are approved. Drilling holes in the superstructure for the purpose of attaching the platform is prohibited. Upon completion of work, remove all anchorages in the substructure and repair the substructure at no additional cost to the Department.

SURFACE PREPARATION

Prior to starting the repair operation, delineate all surfaces and areas assumed to be deteriorated by visually examining and sounding the concrete surface with a hammer or other approved method. The Engineer is the sole judge in determining the limits of deterioration.

Prior to removal, introduce a shallow saw cut approximately 1/2" in depth around the repair area at right angles to the concrete surface. Remove all deteriorated concrete 1 inch below the reinforcing steel with a 17 lb (maximum) pneumatic hammer with points that do not exceed the width of the shank or with hand picks or chisels as directed by the Engineer. Do not cut or remove the existing reinforcing steel. Unless specifically directed by the Engineer, do not remove concrete deeper than 1 inch below the reinforcing steel.

Abrasive blast all exposed concrete surfaces and existing reinforcing steel in repair areas to remove all debris, loose concrete, loose mortar, rust, scale, etc. After sandblasting examine the reinforcing steel to ensure at least 90% of the original diameter remains. If there is more than 10% reduction in the rebar diameter, splice in and securely tie supplemental reinforcing bars as directed by the Engineer.

Provide stainless welded wire fabric at each repair area larger than one square foot if the depth of the repair exceeds 2 inches from the existing, intact exterior face of the concrete member. Provide a minimum 4" x 4" - 12 gage stainless welded wire fabric unless otherwise shown on the plans. Rigidly secure the welded wire fabric to existing steel or to 3/16" diameter stainless hook fasteners adequately spaced to prevent sagging. Encase the welded wire fabric in shotcrete a minimum depth of 1 1/2 inches.

With the exception of overhead applications, the contractor has the option to use synthetic fiber reinforcement as an alternate to welded wire fabric if attaching welded wire fabric is impractical or if approved by the Engineer. Welded wire fabric and synthetic fiber reinforcement shall not be used in the same repair area.

Thoroughly clean the repair area of all dirt, grease, oil or foreign matter, and remove all loose or weakened material before applying shotcrete. Saturate the repair area with clean water the day before applying shotcrete. Bring the wetted surface to a saturated surface dry (SSD) condition prior to applying shotcrete and maintain this condition until the application begins. Use a blowpipe to facilitate removal of free surface water. Only oil-free compressed air is to be used in the blowpipe.

The time between removal of deteriorated concrete and applying shotcrete shall not exceed five (5) calendar days. If the time allowance exceeds (5) calendar days, prepare the surface at the direction of the Engineer before applying shotcrete.

APPLICATION AND SURFACE FINISH

Apply shotcrete only when the surface temperature of the repair area is greater than 40°F and less than 95°F. Do not apply shotcrete to frosted surfaces. Maintain shotcrete at a minimum temperature of 40°F for three (3) calendar days after placement.

Apply shotcrete in layers. The properties of the applied shotcrete determine the proper thickness of each layer or lift.

The nozzleman should hold the nozzle three (3) to four (4) feet from the surface being covered in a position that ensures the shotcrete strikes at right angles to the surface being covered without excessive impact. The nozzleman shall maintain the water amount at a practicable minimum, so the mix properly adheres to the repair area. Water content should not become high enough to cause the mix to sag or fall from vertical or inclined surfaces, or to separate in horizontal layers.

Use shooting wires or guide strips that do not entrap rebound sand. Use guide wires to provide a positive means of checking the total thickness of the shotcrete applied. Remove the guide wires prior to the final finish coat.

To avoid leaving sand pockets in the shotcrete, blow or rake off sand that rebounds and does not fall clear of the work, or which collects in pockets in the work. Do not reuse rebound material in the work.

If a work stoppage longer than two (2) hours takes place on any shotcrete layer prior to the time it has been built up to required thickness, saturate the area with clean water and use a blowpipe as outlined previously, prior to continuing with the remaining shotcrete course. Do not apply shotcrete to a dry surface.

Finish all repaired areas, including chamfered edges, as close as practicable to their original dimensions and configuration, unless otherwise required to provide a minimum 2" of cover for reinforcing steel exposed during repair. If necessary to extend shotcrete repair material beyond the original member dimensions and geometry, coordinate with the Engineer to determine methods, geometry, and dimensions of the final finished surface to provide a minimum 2" of cover on reinforcing steel. Slightly build up and trim shotcrete to the final surface by cutting with the leading edge of a sharp trowel. Use a rubber float to correct any imperfections. Limit work on the finished surface to correcting imperfections caused by trowel cutting.

Immediately after bringing shotcrete surfaces to final thickness, thoroughly check for sags, bridging, and other deficiencies. Repair any imperfections at the direction of the Engineer.

Cure the completed shotcrete surface in accordance with Article 420-15(B) Water Method, of the *Standard Specifications* for seven (7) calendar days. If the water method is impracticable or if approved by the Engineer, a membrane curing compound may be used in accordance with Subarticle 420-15(C) at double the manufacturer's recommended coverage rate.

MATERIAL TESTING & ACCEPTANCE

Each day shotcreting takes place, the nozzleman shall shoot one 18" x 18" x 3.5" test panel in the same position as the repair work that is being done to demonstrate the shotcrete is being applied properly. Store, handle and cure the test panel in the same manner as the repaired substructure and do not disturb for the first 24 hours after shotcreting.

Approximately 72 hours after completing the final shotcrete placement, thoroughly test the surface with a hammer. At this time, the repair area should have sufficient strength for all sound sections to ring sharply. Remove and replace any unsound portions prior to the final inspection of the work. No additional compensation will be provided for removal and replacement of unsound shotcrete.

In accordance with Subarticle 1002-3(H) of the Standard Specifications, core three (3) 3" diameter samples from each test panel. Compressive strength values on test panels shall equal or exceed the required 28-day strength requirements. Should failures occur on the test panel cores, acceptance of the material will be determined by tests on cores from the installed work on the structure. A minimum of (3) three cores shall be taken from the area in question of the structure. The average compressive strength of the cores taken from the structure shall equal or exceed the specified strength of the shotcrete applied, and no single core shall have strength less than 85% of the specified value. Any cores taken from the structure shall penetrate into the existing concrete at least two (2) inches. Cores shall also be inspected for delamination, sand pockets, segregation, and voids.

The adequacy of the bond between the existing concrete and the shotcrete shall be determined by direct tension bond testing, in accordance with ASTM C1583 or ASTM C882, as directed by the Engineer. A minimum bond strength of 250 psi will be accepted as satisfactory. Bond failure less than 250 psi attributable to the failure of existing concrete will not be cause for rejection. The cost of up to three passing direct tension bond tests shall be the responsibility of the Contractor; additional passing pull-off tests will be the responsibility of the Department.

Any repair work failing to meet the requirements of this provision will be rejected and the Contractor shall implement a remediation plan to correct the deficiency at no additional cost to the Department. No extra payment will be provided for drilling extra cores. Patch all core holes in the repaired structure to the satisfaction of the Engineer.

MEASUREMENT AND PAYMENT

Shotcrete Repairs will be measured and paid for at the contract unit price bid per cubic foot and will be full compensation for removal, containment and disposal off-site of unsound concrete including the cost of materials, labor, tools, equipment and incidentals necessary to complete the repair work. Depth will be measured from the original outside concrete face. If modifications to the dimensions and geometry are approved by the Engineer to achieve proper clearance over reinforcing steel, depth measurements will be made from the modified final outside face. The Contractor and Engineer will measure quantities after removal of unsound concrete and before application of repair material. Payment will also include the cost of sandblasting, surface cleaning and preparation, cleaning of reinforcing steel,

placement of new steel, cost of temporary work platform, testing for soundness and bond strength, curing of shotcrete and taking core samples from the test panels and the structure.

Payment will be made under:

Pay Item**Pay Unit**

Shotcrete Repairs

Cubic Feet

CONCRETE REPAIRS**(2-11-19)****DESCRIPTION**

Work includes removal of concrete in spalled, delaminated and/or cracked areas of the existing bent caps, bent columns, underside of bridge decks, deck slabs, girders, and bridge rails in reasonably close conformity with the lines, depth, and details shown on the plans, described herein and as established by the Engineer. This work also includes straightening, cleaning, and replacement of reinforcing steel, doweling new reinforcing steel, removing all loose materials, removing and disposing of debris, formwork, applying repair material, and protecting adjacent areas of the bridge and environment from material leakage. The repair material shall be one of the materials described in this Special Provision, unless otherwise noted in the plans or special provisions.

The location and extent of repairs shown on the plans described herein are general in nature. The Engineer shall determine the extent of removal in the field based on an evaluation of the condition of the exposed surfaces. The Contractor shall coordinate removal operations with the Engineer. No more than 30% of a round or square column or 30% of the bearing area under a beam shall be removed without a temporary support system and approval from the Engineer.

Repair, to the Engineer's satisfaction, any portion of the structure that is damaged from construction operations. No extra payment is provided for these repairs.

SURFACE PREPARATION

(A) Adhere to the following surface preparation requirements or the repair material manufacturer's requirements, whichever is more stringent.

(B) Prior to starting the repair operation, delineate all surfaces and areas assumed to be deteriorated by visually examining and sounding the concrete surface with a hammer or other approved method. The Engineer is the sole judge in determining the limits of deterioration.

(C) Prior to concrete removal, introduce a shallow saw cut, 1/2" in depth, around the repair area at right angles to the concrete surface. Sawcut should be located a minimum 2" beyond the perimeter of the deteriorated concrete area to be repaired. Remove all concrete within the sawcut to a minimum depth of 1/2". If concrete removal exposes reinforcing steel, remove all deteriorated concrete 1" below the reinforcing steel with a 17 lb (maximum) pneumatic hammer, with points that do not exceed the width of the shank, or with hand picks or chisels, as directed by the Engineer. Do not cut or remove the existing reinforcing steel. Unless specifically directed by the Engineer, do not remove concrete deeper than 1" below the reinforcing steel.

(D) Abrasive blast all exposed concrete surfaces and existing reinforcing steel in repair areas to remove all debris, loose concrete, loose mortar, rust, scale, etc. After blasting, examine the reinforcing steel to ensure at least 90% of the original diameter remains. If there is more than 10% reduction in the rebar diameter, splice in and securely tie supplemental reinforcing bars as directed by the Engineer. This might require additional removal of concrete, in order to achieve an appropriate splice length of the reinforcing steel.

(E) Thoroughly clean the repair area of all dirt, grease, oil, or foreign matter, and remove all loose or weakened material by abrasive blasting before applying concrete repair material. Acid etch with 15% hydrochloric acid, only if approved by the Engineer. Follow acid etching by scrubbing and flushing with copious amounts of clean water. Check the cleaning using moist pH paper. Water cleaning is complete when the paper reads ten (10) or higher.

(F) Follow all abrasive blasting with vacuum cleaning.

(G) The time between removal of deteriorated concrete and applying concrete repair material shall not exceed 72 hours. If the time allowance exceeds 72 hours, prepare the surface at the direction of the Engineer before applying concrete repair material.

APPLICATION AND SURFACE FINISH

Apply repair material to damp surfaces only when allowed by repair material recommendations and approved by the Engineer. Prepare damp surfaces in accordance with the *Standard Specifications* and/ or repair material manufacturer's recommendations. Use a blowpipe to facilitate removal of free surface water. Only oil-free compressed air is to be used in the blowpipe.

When surface preparation is completed, mix and apply repair material in accordance with the *Standard Specifications* and/ or repair material manufacturer's recommendations.

Use aggregate that is washed, kiln-dried, and bagged. Maximum size of aggregate shall not exceed 2/3 of the minimum depth of the repair area, or 3/4 of the depth of excavation behind the reinforcing steel, whichever is smaller.

Unless otherwise required by the repair material manufacturer, apply bonding agent to all repair areas immediately prior to placing repair material.

Repair areas shall be formed unless otherwise approved by the Engineer. Form and finish all repaired areas, including chamfered edges, as close as practicable to their original "As Built" dimensions and configuration. After applying the repair material, remove excessive material and provide a smooth, flush surface, unless directed otherwise.

Cure finished Class A concrete repair material by maintaining 95% relative humidity at the repair and surrounding areas by fogging, moist curing, or other approved means for seven (7) days. Cure polymer modified concrete repair material in accordance with manufacturer's recommendations.

REPAIR MATERIAL OPTIONS

(A) Polymer Modified Concrete Repair Material

Repair material shall be polymer modified cement mortar for vertical or overhead applications and shall be suitable for applications in marine environments. Material shall be approved for use by NCDOT. Submit repair material to the Engineer for review and approval prior to beginning the work. Color of repair material shall be concrete gray.

(B) Class A Concrete Repair Material

Repair material shall be Class A Portland Cement Concrete as described in Article 1000-4 of the *Standard Specifications*.

TEMPORARY WORK PLATFORM

Prior to beginning any repair work, provide details for a sufficiently sized temporary work platform at each repair location. Design steel members to meet the requirements of the *American Institute of Steel Construction Manual*. Design timber members in accordance with the *National Design Specification for Stress-Grade Lumber and Its Fastenings* of the National Forest Products Association. Submit the platform design and plans for review and approval. The design and plans shall be sealed and signed by a North Carolina registered Professional Engineer. Do not install the platform until the design and plans are approved. Drilling holes in the superstructure for the purpose of attaching the platform is prohibited. Upon completion of work, remove all anchorages in the substructure and repair the substructure at no additional cost to the Department.

MEASUREMENT AND PAYMENT

Concrete Repairs will be measured and paid for at the contract unit price bid per cubic foot and will be full compensation for removal, containment and disposal off-site of unsound concrete including the cost of materials, reinforcing steel, labor, tools, equipment and incidentals necessary to complete the repair work. Depth will be measured from the original outside concrete face. The Contractor and Engineer will measure quantities after removal of unsound concrete and before application of repair material. Payment will also include the cost of abrasive blasting, surface cleaning and preparation, blast cleaning of reinforcing steel, placement of new reinforcing steel, cost of temporary work platform, testing of the soundness of the exposed concrete surface, furnishing and installation of repair mortar material, curing and sampling of concrete, and protection/cleaning of adjacent areas from splatter or leakage.

Reinforcing Steel that is required for the repairs will be in accordance with Section 425 of the *Standard Specifications*.

Payment will be made under:

Pay Item	Pay Unit
Concrete Repairs	Cubic Feet

MURAL PAINT REPAIR

(SPECIAL)

DESCRIPTION

Portions of the existing mural on the girders and bent columns, struts, and caps of bridge 590322 will be destroyed by the concrete repairs, shotcrete repairs, or epoxy resin injection repairs.

Following acceptable completion of such repairs, the work of this special provision shall consist of furnishing all labor, equipment, and materials necessary to clean, prepare, prime, and paint these repaired concrete areas, as well as mural areas that might be damaged by the Contractor's activities. Work includes: removal, containment, and disposal of the existing paint system or concrete to properly prepare the concrete substrate; preparation of the surface to be primed and painted; applying the new primer and paint system; a containment enclosure; and any incidentals necessary to complete the mural paint repair.

SUBMITTALS

Submit all of the following to the Engineer and Charlotte Area Transit System (CATS) for review and approval before scheduling the pre-construction meeting. Allow at least two (2) weeks for the review process.

- (X) Work schedule which shall be kept up to date, with a copy of the revised schedule being provided to the Engineer in a timely manner.
- (Y) Containment system plans and design calculations to provide appropriate containment for surface preparation and primer and paint and other project requirements, signed and sealed by a Professional Engineer licensed by the State of North Carolina.
- (Z) Sampling and disposal plan of concrete, paint, or other materials as appropriate and necessary.
- (AA) Subcontractor identification.
- (BB) Lighting plan for night work in accordance with Section 1413 of the *Standard Specifications*.
- (CC) Health and safety plan addressing at least the required topics as specified by OSHA and other applicable federal, state, and local authorities and including hazard communication, respiratory health, emergency procedures, and local hospital and treatment facilities with directions and phone numbers, disciplinary criteria for workers who violate the plan and accident investigation. At a minimum, the plan shall address the following: hazardous materials, personal protective equipment, general health and safety, occupational health and environmental controls, fire protection and prevention, signs, signals, and barricades, materials handling, storage, use, and disposal, hand and power tools, welding and cutting, electrical, scaffolds, fall protection, cranes, derricks, hoists, elevators, and conveyors, ladders, toxic and hazardous substances, airless injection, and high pressure water jet (HPWJ).
- (DD) Environmental Compliance Plan.
- (EE) Quality Control Plan (Project Specific) with quality control qualifications and summary of work experience.
- (S) Bridge and Public Protection Plan (Overspray, Utilities, etc. - Project/Task Specific).
- (T) Coating Material:
 - (11) Product Data Sheets.
 - (12) Material Safety Data Sheets.

- (13) Paint Sample.
- (14) Product Specific Repair Procedures.
- (15) Acceptance letters from paint manufacturers for work practices that conflict with special provisions and/or paint manufactures' product data sheets.

PRE-CONSTRUCTION MEETING

Submittals shall be reviewed and approved by the Engineer prior to scheduling the pre-construction meeting. Allow no less than two (2) weeks for a review process. When requesting a pre-construction meeting, contact the Engineer at least seven (7) working days in advance of the desired pre-construction date. The contractor's project supervisor, Competent Person, quality control personnel and certified traffic control supervisor shall be in attendance at the pre-construction meeting in order for the Contractor and NCDOT team to establish responsibilities for various personnel during project duration and to establish realistic timeframes for problem escalation.

CONTAINMENT SYSTEM

Prior to performing any construction or painting operations on the structure, the Contractor shall furnish the Engineer with plans and design calculations for a sufficiently designed containment system, which will provide access for any repairs, cleaning and surface preparations, and coating operations for concrete bridge members. The containment system shall not be installed, and no work shall begin, until the Engineer has reviewed and approved, in writing, the submitted containment system plans and design calculations. Containment system plans and design calculations shall be prepared, sealed, and signed by a Professional Engineer licensed by the State of North Carolina. Allow a minimum of two (2) weeks for review of the containment plans and calculations.

The Contractor shall determine the containment requirements appropriate for the concrete substrate surface preparation, paint and primer application, and other activities and work planned to be performed within the containment. The containment system shall meet or exceed such requirements. The Contractor shall determine the required capacity of the containment system, which, at a minimum, shall include loads due to wind, repair materials and repair operations, equipment, and tools; however, the capacity shall not be less than that required by Federal or State regulations. Design steel members to meet the requirements of the American Institute of Steel Construction Manual. Design timber members in accordance with the National Design Specification for Stress-Grade Lumber and Its Fastenings of the National Forest Products Association. The containment system shall be constructed of materials capable of withstanding damage from any of the work required on this project and shall provide a two (2) hour resistance to fire.

In the containment system plans, describe how debris is contained and collected. Describe the type of tarpaulin, bracing materials, and the maximum designed wind load. Design wind loads shall be in accordance with the Falsework and Formwork special provision. Describe the dust collection system and, if applicable, how a negative pressure of 0.03 inches of water column is maintained inside the enclosure, while work operations are being conducted. Describe how the airflow inside the containment structure is designed to meet all applicable OSHA Standards. Describe how water run-off from rain will be routed by or through the enclosure. Describe how wash water will be

contained and paint chips separated. Describe what physical containment will be provided during painting application to protect the public and areas not to be painted.

Drilling holes in the superstructure for the purpose of attaching the containment system is prohibited.

The Contractor will be responsible for certifying the containment system has been constructed in accordance with the approved plans.

The containment system shall be cleaned after each workday.

Upon completion of work, remove all anchorages in the substructure and repair the substructure at no additional cost to the Department.

Protect non-metallic parts of bearings from blasting and painting (i.e.: Pot Bearings, Elastomeric Pads, and Disc Bearings).

SAMPLING, TESTING, DISPOSAL

Based on the requirements and processes of the paint manufacturer for surface preparation, mixing, application, and any other operations associated with repair of the mural paint, Contractor shall develop monitoring, sampling, testing, disposal, and other processes to address worker and public health, environmental protection, and other requirements of Federal, State, and local authorities

EQUIPMENT MOBILIZATION

The equipment used in any travel lanes and paved shoulder shall be mobile equipment on wheels that has the ability to move on/off the roadway in less than 30 minutes. All work conducted in travel lanes shall be from truck or trailer supported platforms and all equipment shall be self-propelled or attached to a tow vehicle at all times.

QUALITY CONTROL INSPECTOR

Provide a quality control (QC) inspector in accordance with the SSPC QP guidelines to ensure that all processes, preparation, and coating application are in accordance with the requirements of the contract. The inspector shall have written authority to perform QC duties to include continuous improvement of all QC internal procedures. The presence of the engineer or inspector at the work site shall in no way lessen the contractor's responsibility for conformity with the contract.

QUALITY ASSURANCE INSPECTOR

The quality assurance inspector, which may be a Department employee or a designated representative of the Department shall observe, document, assess, and report that the Contractor is complying with all of the requirements of the contract. Inspectors employed by the Department are authorized to inspect all work performed and materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. The inspector is not authorized to alter or waive the requirements of the contract. Each stage in preparing the structure to be coated which includes but not limited to washing, blasting, coating testing and inspection shall be inspected and approved by the Engineer or an authorized representative.

EXTENTS OF MURAL PAINT REPAIR

Cleaning, preparation, and primer and paint application shall cover entire repaired concrete area or damaged area and extend approximately three inches (3") beyond a repaired concrete area or damaged area.

One coat of primer and one coat of paint topcoat shall be satisfactorily applied within the extents of each mural repair area.

CLEANING, PREPARATION, AND APPLICATION OF PRIMER AND PAINT

Cleaning, preparation, and primer and paint storage and application shall follow the requirements of the product manufacturer.

PRIMER AND PAINT MATERIALS

Primer and paint shall be compatible for application on the existing mural paint system, and unless otherwise allowed by the Engineer, primer and paint shall be from the same manufacturer.

Contractor shall contact CATS for required colors of primer and paint.

As a minimum, primer and paint shall meet the following requirements:

A. Primer Product:

Primer shall be an acrylic coating specifically engineered for exterior, above-grade, concrete surfaces. Primer shall be highly alkali and efflorescence resistant and may be applied to surfaces with a pH of 6 to 13. Primer shall be allowed to be placed by spray, roller, or brush.

Primer shall meet the following:

VOC: OTC Compliant

Weight Solids: 55 ± 5%

Volume Solids: 40 ± 4%

Vehicle Type: Acrylic

Wind Driven Rain Test: Pass (ASTM D6904-03)

Water Vapor Permeance (US): 25.79 perms (ASTM D1653 grains/(hr ft² in Hg))

Mildew Resistance: Pass (ASTM D3273/D3274)

Flexibility: Pass (ASTM D522, method B, 180° bend, 1/8-inch mandrel)

Alkali Resistance: Pass (ASTM D1308)

Efflorescence: None (ASTM D7072-04)

Primer shall comply with the following:

OTC

OTC Phase II

S.C.A.Q.M.D.

CARB

CARB SCM 2007

CARB SCM 2020
Canada
LEED v4 & v4.1 Emissions
LEED v4 & v4.1 V.O.C.
EPD-NSF Certified
MIR-Product Lens Certified
MPI

B. Paint Product:

Paint shall be a high build, 100% acrylic latex coating formulated to seal and protect existing concrete. The alkaline-resistant coating shall be allowed to be applied to concrete that maintains pH levels of 13 or less. Paint shall be compatible for application with the proposed primer. Paint shall be allowed to be placed by spray, roller, or brush.

Paint shall meet the following:

VOC: OTC Compliant

Weight Solids: 60 ± 5%

Volume Solids: 50 ± 5%

Moisture Resistance: no loss of adhesion, discoloration, blistering, cracking, or flaking
(Federal Test Method Std. No. 141, Method 2051, procedure B)

Moisture Vapor Permeability: 9 perms (TT-C-555B, sec. 4.4.8)

Resistance to Wind Driven Rain: Pass – no penetration of water (TT-C-555B, sec. 3.3.3)
Pass – no visible leaks; no rear face dampness (ASTM D6904)

Salt Spray (Fog): Pass (ASTM B1117-85, 2000 hours exposure)

Flexibility: Pass (ASTM D1737, 1 inch mandrel bend)

Impact Resistance: Pass (ASTM D2794)

Abrasion Resistance: Pass 3000 liters of falling sand with no wear-through to substrate
(Federal Test Method 141A-6191 ASTM D968)

Mildew Resistance: Pass (TT-P-29 Fed. Std. 141, Method 6152 and Method 6271.1, 7 and 21 day test)

Fungus Resistance: Pass - rating of 10 with no biological growth after 4 weeks (TT-P-29k- ASTM D3274)

Freeze-Thaw Resistance: Pass – no blisters, cracks, loss of adhesion, or other visual effects (AASHTO R-31, Section 8, Test No. 6)

Accelerated Weathering: Pass 5000 hours with no cracking, flaking, blistering, or any other visual effects (ASTM G155)

Cyclic Weathering: Pass – no blisters, cracks, loss of adhesion, or other visual defects (AASHTO R-31/ ASTM D5894, 5040 hours)

INSPECTION

Surface preparation shall follow the requirements of the primer and paint manufacturer. Any area(s) not meeting the requirements shall be remediated prior to application of coating. Surface inspection is considered ready for inspection when all cleaning solvent or media, residue, and dust is removed from surfaces to be coated.

(G) Quality Assurance Inspection

The Contractor furnishes all necessary OSHA approved apparatus such as ladders, scaffolds and platforms as required for the inspector to have reasonable and safe access to all parts of the work. The contractor illuminates the surfaces to be inspected to a minimum of 50-foot candles of light. All access points shall be illuminated to a minimum of 20-foot candles of light.

NCDOT reserves the right for ongoing Quality Assurance (QA) inspection to include but not limited to surface contamination testing, adhesion pull testing, and DFT readings as necessary to assure quality.

Inform the Engineer and the Division Safety Engineer of all scheduled and unannounced inspections from SSPC, OSHA, EPA and/or others that come on site. Furnish the Engineer a copy of all inspection reports except for reports performed by a third party and or consultant on behalf of the Contractor.

(H) Inspection Instruments

At a minimum, furnish the following calibrated instruments and conduct the following quality control tests:

- (23) Sling Psychrometer - ASTM E337 - bulb type
- (24) Surface Temperature Thermometer
- (25) Wind Speed Indicator
- (26) Tape Profile Tester - ASTM D4417 Method C
- (27) Surface Condition Standards - SSPC VIS-1 and VIS-3
- (28) Wet Film Thickness Gage - ASTM D4414
- (29) Dry Film Thickness Gage - SSPC-PA2 Modified
- (30) Solvent Rub Test Kit - ASTM D4752
- (31) Adhesion Test Kit - ASTM D3359 Method A (Tape Test)
- (32) Adhesion Pull test - ASTM D4541
- (33) Surface Contamination Analysis Kit or (Chloride Level Test Kit) SSPC Technology Guide 15

(I) Quality Control

Maintain a daily quality control record in accordance with Subarticle 442-12(D) of the *Standard Specifications* and make such records available at the job site for review by the inspector and submit to the Engineer as directed. In addition to the information required on Form M&T-610, submit all Dry Film Thickness (DFT) readings on a form equivalent to Form M&T-611. These forms can be found at:

<https://connect.ncdot.gov/resources/Materials/Pages/Materials-Manual-by-Material.aspx?Order=MM-03-02>

DFT testing shall be conducted at mural repair areas as follows:

Mural Repair Area Size (Sq. Ft.)	Minimum Number of Test Locations
0 < 1.5	3
1.5+ < 5.0	6
<u>5.0+ < 25.0</u>	<u>12</u>

MEASUREMENT AND PAYMENT

Mural Paint Repair will be paid at the contract lump sum price which will be full compensation for furnishing all inspection equipment, all paint, cleaning abrasives, cleaning solvents and all other materials; preparing and cleaning surfaces to be painted; applying paint and primer in the field; protecting work area, traffic and property; and furnishing cleaning equipment, paint spraying equipment, brushes, rollers, any other hand or power tools and any other equipment. All work shall be done in a manner satisfactory to the Engineer.

Pollution Control will be paid at the contract lump sum price which will be full compensation for all collection, handling, storage, air monitoring, and disposal of debris and wash water; all personal protective equipment; all personal hygiene requirements; all equipment, material and labor necessary for the daily collection of the debris into specified containers; and any measures necessary to ensure conformance to all safety and environmental regulations, and as directed by the Engineer.

Painting Containment for Bridge #___ will be paid at the lump sum contract price and will be full compensation for the design, materials, installation, maintenance, and removal of the containment system.

VOLUMETRIC MIXER

(12-18-12)

DESCRIPTION

This provision addresses the requirements for batching deck repair concrete at the point of delivery using a Mobile High Performance Volume Mixer (MHPVM). Work shall be in accordance with the general requirements of Section 1000-12 of the *Standard Specifications* and as amended by these provisions.

MATERIALS

Produce high early strength concrete with MHPVM equipment. Furnish project site storage facilities that will provide protection of materials in accordance with the *Standard Specifications* and all material suppliers' recommendations.

EQUIPMENT

MHPVM devices shall have prominently displayed stamped metal plate(s) from the Volumetric Mixers Manufacturers Bureau stating that the equipment conforms to the requirements of ASTM C685.

Hydraulic cement concrete shall be mixed at the point of delivery by a combination of materials and mixer unit conforming to the following:

- 1.) The unit shall be equipped with calibrated proportioning devices for each ingredient added to the concrete mix. The unit shall be equipped with a working recording meter that is visible at all times and furnishes a ticket printout with the calibrated measurement of the mix being produced. If at any time the mixer fails to discharge a uniform mix, production of concrete shall be suspended until such time that problems are corrected.
- 2.) Each unit shall have prominently displayed stamped metal plate(s) attached by the manufacturer on which the following are plainly marked: the gross volume of the transportation unit in terms of mixed concrete, the discharge speed and the mass calibrated constant of the machine in terms of volume.
- 3.) MHPVMs shall be calibrated by a Department approved testing agency in accordance with the manufacturer's recommendations at an interval of every 6 months or a maximum production of 2500 cubic yards, whichever comes first prior to use on the project. The yield shall be maintained within a tolerance of +/- 1% and verified using a minimum 2 cubic feet container every 500 cubic yards or a minimum of once per week.
- 4.) The three cubic feet initially discharged from the truck shall be discarded and not used for concrete placement. Acceptance of the concrete shall comply with the Standard Specifications except that the sample secured for acceptance testing will be taken after four cubic feet is discharged from the delivery vehicle. During discharge, the consistency as determined by ASTM C143 on representative samples taken from the mixer discharge at random intervals shall not vary by more than 1 inch. Acceptance tests shall be performed on each load. If test data demonstrates that acceptable consistency of concrete properties is being achieved, the Engineer may reduce testing requirements.
- 5.) MHPVM equipment shall be operated by a person who is a certified operator by the equipment manufacturer. Any equipment adjustments made during the on-site production of concrete shall be done under the direct on-site supervision of the producer's NCDOT Certified Concrete Batch Technician.

UNIFORMITY AND ACCEPTANCE

The contractor is responsible for providing a Certified Concrete Plant Technician during batching operations, and a Certified Concrete Field Technician during placing operations.

MEASUREMENT AND PAYMENT

Volumetric Mixer will be paid for as lump sum and will be full compensation for furnishing the certified MHPVM devices and calibration of the equipment.

Pay Item	Pay Unit
Volumetric Mixer	Lump Sum

CONCRETE FOR DECK REPAIR**(SPECIAL)****GENERAL**

This special provision addresses concrete deck repairs prior to placing silane deck treatment. Work shall begin within 60 days of notification. After surface preparation, the Engineer sounds the deck using a chain drag or other acceptable means and marks areas to be repaired.

MATERIALS

Concrete deck repair material shall be epoxy-based material listed as a Type 2 epoxy resin system on the NCDOT Approved Product List (APL) and approved by the silane deck treatment manufacturer for use with the proposed silane deck treatment system. Concrete deck repair material shall attain a minimum compressive strength of 4,500 psi within 3 hours. Proportioning, aggregates, mixing, and curing of the epoxy-based repair material shall follow all manufacturer's requirements.

Materials containing cement mortar may be acceptable; however, a 28 day curing period will be required before placing the silane deck treatment. The curing period may be adjusted if approved by the silane manufacturer and the Engineer. If repair materials containing cement mortar are proposed, they shall attain a minimum compressive strength of 4,500 psi within 3 hours and shall be submitted for review and approval by the Engineer. Proportioning, aggregates, mixing, and curing of the repair material shall follow all manufacturer's requirements.

CLASS II SURFACE PREPARATION (PARTIAL DEPTH)

Saw cut a perimeter surrounding the repair to a depth not less than 1 inch and remove all loose, unsound and contaminated material by chipping with hand tools to an average depth of approximately one-half the deck thickness, but no less $\frac{3}{4}$ " below the top mat of steel. Clean, repair, or replace rusted or loose reinforcing steel. Care shall be taken not to cut, stretch, or damage any exposed reinforcing steel. Thoroughly clean the newly exposed surface. Use a bonding agent in accordance with the manufacturer's recommendations.

PLACEMENT AND FINISHING

Place concrete for deck repair at locations indicated on the plans that have been properly prepared as required in the subsection "Class II Surface Preparation (Partial Depth)" unless otherwise required by the repair material manufacturer or allowed by the Engineer, place, consolidate, finish, and cure concrete deck repair material in accordance with Section 420 of the *Standard*

Specifications. For small deck areas (less than 16 sq. ft.) finish surface by tining to a depth of ¼” in a pattern similar to the existing grooving pattern.

MEASUREMENT & PAYMENT

Concrete for Deck Repair will be measured and paid for at the contract unit price per square feet for the appropriate areas repaired. The price shall include materials, labor, equipment, tools and any incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Concrete for Deck Repair	Cubic Feet

EPOXY COATING AND DEBRIS REMOVAL

(SPECIAL)

GENERAL

This work applies to all bents and end bents of all bridges throughout the project as noted in the plans. Pressure wash, clean and epoxy coat top of the all bent and end bent caps under open joints and at the expansion joints of steel girder spans after painting of all girders is concluded.

Debris removal from the top of bent caps shall be incidental to epoxy coating the top of bent caps.

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 the proposed epoxy meets Type 4A requirements.

SURFACES

Apply the epoxy protective coating to the top surface area, including chamfer area of bent caps under open joints and expansion joints of the steel girder spans, excluding areas under elastomeric bearings.

Thoroughly clean all dust, dirt, grease, oil, laitance and other objectionable material from the concrete surfaces to be coated. Air blast all surfaces immediately before applying the protective coating.

Use only cleaning agents preapproved by the Engineer.

APPLICATION

Apply epoxy protective coating only when the air temperature is at least 40°F and rising, but less than 95°F and the surface temperature of the area to be coated is at least 40°F. Remove any excess or free-standing water from the surfaces before applying the coating. Apply one coat of epoxy protective coating at a rate such that it covers between 100 and 200 sf/gal.

Under certain combinations of circumstances, the cured epoxy protective coating may develop an oily condition on the surface due to amine blush. This condition is not detrimental to the applied system.

Apply the coating so the entire designated surface of the concrete is covered and all pores are filled. To provide a uniform appearance, use the exact same material on all visible surfaces.

BASIS OF PAYMENT

Epoxy Coating will be measured and paid for by the contract unit price per square foot and shall be full compensation for furnishing all material, labor, tools and equipment necessary for cleaning and coating the tops of bent caps. Debris removal from the top of bent caps shall be incidental to epoxy coating the top of bent caps.

Pay Item	Pay Unit
Epoxy Coating	Square Feet

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 $\frac{3}{4}$ ".

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 feet above ground	Pressure, lb/ft ² 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 (mph)	COUNTY	25 YR (mph)	COUNTY	25 YR (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

(1-29-21)

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 Engineer. Either the Structures Management 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 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 Engineer, Structures Management 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.

ADDRESSES AND CONTACTS

For submittals to the Structures Management Unit, use the following addresses:

Via US mail:

Mr. B. C. Hanks, P. E.
State Structures Engineer
North Carolina Department
of Transportation
Structures Management Unit
1581 Mail Service Center
Raleigh, NC 27699-1581

Attention: Mr. J. L. Bolden, P. E.

Via other delivery service:

Mr. B. C. Hanks, P. E.
State Structures Engineer
North Carolina Department
of Transportation
Structures Management Unit
1000 Birch Ridge Drive
Raleigh, NC 27610

Attention: Mr. J. L. Bolden, P. E.

Submittals may also be made via email.

Send submittals to:

jlbolden@ncdot.gov (James Bolden)

Send an additional e-copy of the submittal to the following address:

eomile@ncdot.gov (Emmanuel Omile)

mrorie@ncdot.gov (Madonna Rorie)

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. David Hering, L. G., 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. David Hering, L. G., 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

Via Email: EastGeotechnicalSubmittal@ncdot.gov

For projects in Divisions 8-14, use the following Western Regional Office address:

Via US mail or other delivery service:

Mr. Eric Williams, 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 Email: WestGeotechnicalSubmittal@ncdot.gov

The status of the review of structure-related submittals sent to the Structures Management Unit can be viewed from the Unit's website, via the "Drawing Submittal Status" link.

The status of the review of geotechnical-related submittals sent to the Geotechnical Engineering Unit can be viewed from the Unit's website, via the "Geotechnical Construction Submittals" link.

Direct any questions concerning submittal review status, review comments or drawing markups to the following contacts:

Primary Structures Contact: James Bolden
(919) 707 – 6408
(919) 250 – 4082 facsimile
jlbolden@ncdot.gov

Secondary Structures Contacts: Emmanuel Omile
(919) 707 – 6451
Madonna Rorie
(919) 707 – 6508

Eastern Regional Geotechnical Contact (Divisions 1-7): David Hering
(919) 662 – 4710
dthering@ncdot.gov

Western Regional Geotechnical Contact (Divisions 8-14): Eric Williams
(704) 455 – 8902
ewilliams3@ncdot.gov

SUBMITTAL COPIES

Furnish one complete copy of each submittal, including all attachments, to the Engineer. At the same time, submit the number of hard copies shown below of the same complete submittal directly to the Structures Management Unit and/or the Geotechnical Engineering Unit.

The first table below covers “Structure Submittals”. The Engineer will receive review comments and drawing markups for these submittals from the Structures Management Unit. The second table in this section covers “Geotechnical Submittals”. The 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 Structures Management 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

Submittal	Copies Required by Structures Management Unit	Copies Required by Geotechnical Engineering Unit	Contract Reference Requiring Submittal ¹
Arch Culvert Falsework	5	0	Plan Note, SN Sheet & “Falsework and Formwork”
Box Culvert Falsework ⁷	5	0	Plan Note, SN Sheet & “Falsework and Formwork”
Cofferdams	6	2	Article 410-4
Foam Joint Seals ⁶	9	0	“Foam Joint Seals”
Expansion Joint Seals (hold down plate type with base angle)	9	0	“Expansion Joint Seals”
Expansion Joint Seals (modular)	2, then 9	0	“Modular Expansion Joint Seals”
Expansion Joint Seals (strip seals)	9	0	“Strip Seals”
Falsework & Forms ² (substructure)	8	0	Article 420-3 & “Falsework and Formwork”
Falsework & Forms (superstructure)	8	0	Article 420-3 & “Falsework and Formwork”
Girder Erection over Railroad	5	0	Railroad Provisions

Maintenance and Protection of Traffic Beneath Proposed Structure	8	0	“Maintenance and Protection of Traffic Beneath Proposed Structure at Station ____”
Metal Bridge Railing	8	0	Plan Note
Metal Stay-in-Place Forms	8	0	Article 420-3
Metalwork for Elastomeric Bearings ^{4,5}	7	0	Article 1072-8
Miscellaneous Metalwork ^{4,5}	7	0	Article 1072-8
Disc Bearings ⁴	8	0	“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
Precast Concrete Box Culverts	2, then 1 reproducible	0	“Optional Precast Reinforced Concrete Box Culvert at Station ____”
Prestressed Concrete Cored Slab (detensioning sequences) ³	6	0	Article 1078-11
Prestressed Concrete Deck Panels	6 and 1 reproducible	0	Article 420-3
Prestressed Concrete Girder (strand elongation and detensioning sequences)	6	0	Articles 1078-8 and 1078-11
1. Removal of Existing Structure over Railroad	5	0	Railroad Provisions
Revised Bridge Deck Plans (adaptation to prestressed deck panels)	2, then 1 reproducible	0	Article 420-3
Revised Bridge Deck Plans (adaptation to modular expansion joint seals)	2, then 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 ⁵	7	0	Article 1072-8 & “Sound Barrier Wall”
Structural Steel ⁴	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 ⁴	8	0	Article 1072-8

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. Articles refer to the *Standard Specifications*.
- Submittals for these items are necessary only when required by a note on plans.
- Submittals for these items may not be required. A list of pre-approved sequences is available from the producer or the Materials & Tests Unit.
- The fabricator may submit these items directly to the Structures Management Unit.
- The two sets of preliminary submittals required by Article 1072-8 of the *Standard Specifications* are not required for these items.
- Submittals for Fabrication Drawings are not required. Submittals for Catalogue Cuts of Proposed Material are required. See Section 5.A of the referenced provision.
- Submittals are necessary only when the top slab thickness is 18” or greater.

GEOTECHNICAL SUBMITTALS

Submittal	Copies Required by Geotechnical Engineering Unit	Copies Required by Structures Management Unit	Contract Reference Requiring Submittal ¹
Drilled Pier Construction Plans ²	1	0	Subarticle 411-3(A)
Crosshole Sonic Logging (CSL) Reports ²	1	0	Subarticle 411-5(A)(2)
Pile Driving Equipment Data Forms ^{2,3}	1	0	Subarticle 450-3(D)(2)
Pile Driving Analyzer (PDA) Reports ²	1	0	Subarticle 450-3(F)(3)

Retaining Walls ⁴	1 drawings, 1 calculations	2 drawings	Applicable Provisions
Temporary Shoring ⁴	1 drawings, 1 calculations	2 drawings	“Temporary Shoring” & “Temporary Soil Nail Walls”

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. Subarticles refer to the *Standard Specifications*.
2. Submit one hard copy of submittal to the Engineer. Submit a second copy of submittal electronically (PDF via email), US mail or other delivery service to the appropriate Geotechnical Engineering Unit regional office. Electronic submission is preferred.
3. The Pile Driving Equipment Data Form is available from:
https://connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
See second page of form for submittal instructions.
4. Electronic copy of submittal is required. See referenced provision.

CRANE SAFETY**(6-20-19)**

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 (OSHA) regulations.

Submit all items listed below to the Engineer prior to beginning crane operations. 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:** Crane operators shall be certified by the National Commission for the Certification of Crane Operators (NCCCO) or the National Center for Construction Education and Research (NCCER). Other approved nationally accredited programs will be considered upon request. In addition, crane operators shall have a current CDL medical card. Submit a list of crane operator(s) and include current certification for each type of crane operated (small hydraulic, large hydraulic, small lattice, large lattice) and medical evaluations for each operator.

GROUT FOR STRUCTURES

(12-1-17)

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, decks, end bent caps, or bent caps. Mix and place grout in accordance with the manufacturer's recommendations, the applicable sections of the Standard Specifications and this provision.

MATERIAL REQUIREMENTS

Unless otherwise noted on the plans, use a Type 3 Grout in accordance with Section 1003 of the Standard Specifications.

Initial setting time shall not be less than 10 minutes when tested in accordance with ASTM C266.

Construction loading and traffic loading shall not be allowed until the 3 day compressive strength is achieved.

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.

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.

LATEX MODIFIED CONCRETE – EARLY STRENGTH**(SPECIAL)****DESCRIPTION**

This special provision addresses the requirements for furnishing and placing an overlay of latex modified concrete - early strength (LMC-ES) over existing concrete or repair concrete on bridge decks. Perform this work in accordance with this special provision and the applicable parts of the *Standard Specifications*.

QUALITY CONTROL

The Contractor is responsible for setting up a pre-construction meeting with the Resident Engineer and the Area Construction Engineer.

Submit a Quality Control Plan to the Engineer for approval, which, at a minimum, describes the methods of: storing materials, calibrating mixers, controlling moisture content in the aggregate, maintaining proper mix temperature, retarder usage, curing and curing time, controlling evaporation rate, cleaning and removing excess water.

Prior to beginning work, provide proof of experience of the person in direct responsible charge by submitting a description of jobs similar in size and character that have been completed within the last five (5) years. The name, address, and telephone number of references for the submitted projects shall also be furnished. Failure to provide appropriate documentation will result in the rejection of the proposed LMC-ES overlay Contractor.

Before beginning any work, obtain approval for all equipment to be used for deck preparation, mixing, placing, finishing, and curing the LMC-ES.

MATERIALS

For materials, equipment, and proportioning and mixing of modified compositions, see Article 1000-7 of the *Standard Specifications*.

Provide aggregates for use in the LMC-ES that are free from ice, frost, frozen particles, or other contaminants when introduced into the mixer.

The 2018 *Standard Specifications* shall be revised as follows:

Table 1000-4 – Revise the following:

Cement Content, 658 lb/cy (min.) change to 658 lb/cy (*max.*)

7 day Compressive Strength, 3,000 psi (min.) change to 3 day Compressive Strength, 3,000 psi (min.)

1000-7(A), Line 1, Page 10-9 – Replace with the following:

Use Portland cement that meets Article 1024-1 of the *Standard Specifications*. Type III cement, and other cement types are allowed, with approval by the Engineer.

1000-7(A), Line 15, Page 10-9 – Replace with the following:

Measure the slump immediately after discharge from the mixer.

1000-7(A) – Add the following paragraph to the end of the section:

Submit the LMC-ES mix design, including laboratory compressive strength data for a minimum of six (6) 4-inch by 8-inch cylinders at 3 days for early strength concrete to the Engineer for review. Include test results for the slump and air content of the laboratory mix. Perform tests in accordance with AASHTO T 22, T 119, and T 152.

For projects with multiple bridges using the same mix design, or bridge decks with time constraints that require more than one night for placement, a relationship between the compressive strength and rebound hammer readings may be developed and used to estimate the 2,500-psi strength for opening to traffic in lieu of compressive strength testing.

For the correct procedure, reference Document: Rebound Hammer Calibration Procedure for use on Rapid Set Cement Latex Bridge Deck Overlays involving Multiple Bridges and/or Multiple Placement Days. Contact your local M&T representative for a copy of this document or see the following link:

<https://connect.ncdot.gov/resources/Materials/MaterialsResources/Rebound%20Hammer%20Calibration%20Memo.pdf>

Three-day concrete compressive strength sampling and testing is required in addition to the use of this method.

PREPARATION OF SURFACE

Completely clean all surfaces within 48 hours prior to placing the overlay unless otherwise approved by the Engineer.

Thoroughly soak the clean surface and maintain a wet surface for at least two (2) hours immediately prior to placing the LMC-ES. After soaking the surface for at least two (2) hours, cover it with a layer of white opaque polyethylene film that is at least 4 mils thick. Immediately prior to placing the LMC-ES, remove standing water from the surface using an approved vacuum system.

PLACING AND FINISHING

Prior to placing LMC-ES, install a bulkhead of easily compressible material at expansion joints to the required grade and profile. Placing material across expansion joints and sawing it later is not permitted.

Construction joints other than those shown on the plans will not be permitted unless approved by the Engineer. At construction joints, remove 4” of previously placed LMC-ES prior to placing the adjacent latex concrete. Also, for longitudinal construction joints, 4” of previously poured LMC-ES shall be scarified, hydro-demolitioned and recast with the next stage.

Place and fasten screed rails in position to ensure finishing the new surface to the required profile. Do not treat screed rails with parting compound to facilitate their removal. Prior to placing the overlay attach a filler block to the bottom of the screed and pass it over the area to be repaired to

check the thickness. The filler block thickness shall be equal to the design overlay thickness as shown in the plans. Remove all concrete that the block does not clear. Individual aggregates left after hydro-demolition may be allowed to project above the base of the filler block. Remove aggregate that does not provide a 1" clear cover to the top of the overlay.

Brush a latex cement mixture onto all vertical surfaces and do not let the brushed material dry before it is covered with the additional material required for the final grade. Remove all loose aggregate from the latex cement brushed surface prior to latex concrete placement (NOTE: For surfaces not prepared with hydro-demolition, brush the lean latex mixture over horizontal and vertical surfaces).

Do not place the LMC-ES until the burlap is saturated and approved by the Engineer. Drain excess water from the wet burlap before placement.

Place the LMC-ES in one operation. Provide a minimum overlay thickness as shown in the plans.

When a tight, uniform surface is achieved and before the concrete becomes non-plastic, further finish the surface of the floor by burlap dragging or another acceptable method that produces an acceptable uniform surface texture.

Once LMC-ES placement begins a single layer of wet burlap shall be placed five (5) feet behind the screed's burlap drag. In the event of a delay of ten (10) minutes or more, temporarily cover all exposed latex concrete with wet burlap and white opaque polyethylene.

Promptly cover the surface with a second layer of clean, wet burlap as soon as the surface will support it without deformation. Wet cure the surface for 24 hours. Dry cure the surface for a minimum 24 hours. In the event Intermediate Contract Time (ICT) does not allow for such curing time, the Engineer may reduce the dry cure time. Wet curing material shall be continually saturated during the wet cure period. The Engineer may require an increase in the minimum cure time when the overlay thickness is greater than 1.5 inches or the ambient temperature remains below 60°F.

Screed rails or construction dams shall be separated from the newly placed concrete by passing a pointing trowel along the face of the formwork and the newly placed concrete. Carefully make this trowel cut for the entire depth and length of rails or dams after the LMC-ES has sufficiently stiffened and cannot flow back.

As soon as practical, after the concrete has hardened sufficiently, test the finished surface with an approved rolling straightedge that is designed, constructed, and adjusted so that it will accurately indicate or mark all deck areas which deviate from a plane surface by more than 1/8" in 10'. Remove all high areas in the hardened surface in excess of 1/8" in 10' with an approved grinding or cutting machine. Additionally, the final LMC-ES deck surface shall not deviate from the line and elevation indicated on the plans by more than 0.3" over any 50' length. Where variations are such that the corrections extend below the limits of the top layer of grout, seal the corrected surface with an approved sealing agent as required by the Engineer. If approved by the Engineer, correct low areas in an acceptable manner.

Unless otherwise indicated on the plans, groove the bridge floor in accordance with Article 420-14(B) of the *Standard Specifications*. Vehicular traffic may travel across a deck surface that has not been grooved; however, the entire deck area shall be grooved after the LMC-ES achieves

design strength and no later than seven (7) days after completion of the overlay unless otherwise approved by the Engineer.

LIMITATIONS OF OPERATIONS

The mixer is not permitted on the bridge deck unless otherwise approved.

No traffic is permitted on the finished LMC-ES surface until the total specified curing time is completed and until the concrete reaches the minimum specified compressive strength.

Do not place LMC-ES if the temperature of the concrete surface on which the overlay is to be placed is below 50°F or above 85°F. Measure the surface temperature by placing a thermometer under the insulation against the surface.

Prior to placing LMC-ES, the Engineer and the Contractor shall independently determine the air temperature and wind speed. Do not place LMC-ES if the ambient air temperature is below 50°F or above 85°F, or if the wind velocity is greater than 10 mph.

Do not place LMC-ES when the temperature of the LMC-ES is below 45°F or above 85°F.

Prior to placing LMC-ES, the Engineer and the Contractor shall independently determine the evaporation rate and record in the Inspector Daily Diary. Do not place LMC-ES if the rate of evaporation of surface moisture from the LMC-ES determined by the Engineer or Contractor exceeds 0.05 pounds per square foot per hour during placement. The evaporation rate is calculated using the following formula:

$$E = (T_c^{2.5} - r * T_a^{2.5}) * (1 + 0.4V) * (10^{-6})$$

where,

E = Evaporation Rate,

T_c = Concrete Temp (°F),

r = Relative Humidity (%/100)

T_a = Air Temp (°F),

V = Wind Velocity (mph)

If the calculated evaporation rate exceeds 0.05 pounds per square foot per hour, the Contractor may propose engineered controls of the parameters (temperature, relative humidity, wind velocity) to reduce the evaporation rate. The evaporation rate shall be recalculated, with the appropriate parameters, after the proposed control measures are in place. The recalculated evaporation rate shall be 0.05 pounds per square foot per hour or less, prior to placement.

Do not place LMC-ES if the National Weather Service predicts the air temperature at the site to be below 35°F during the next 24 hours. If the predicted air temperature is above 35°F but below 50°F, then use insulation to protect the LMC-ES for a period of at least 48 hours. Use insulation that meets the requirements of Subarticle 420-7(C) of the *Standard Specifications* and, if required, place it on the LMC-ES as soon as initial set permits. When using insulation to protect LMC-ES during the wet curing period, do not remove the insulation until the ambient air temperature is at least 50°F and rising.

Stop all placement operations during periods of precipitation. Take adequate precautions to protect freshly placed LMC-ES from sudden or unexpected precipitation. Keep an adequate quantity of protective coverings at the worksite to protect the freshly placed pavement from precipitation.

If working at night, provide approved lighting.

For acceptance of the LMC-ES, 3-day concrete compressive strength testing on sampled concrete cylinders shall attain a minimum 3,000 psi compressive strength.

Do not allow traffic on the LMC-ES surface until the LMC-ES has attained a minimum compressive strength of 2,500 psi. Compressive strength for opening the bridge to traffic may be determined by compressive strength testing of sampled concrete cylinders or by establishing a relationship between the compressive strength and rebound hammer readings, in lieu of compressive strength testing. Should the Engineer question the validity of rebound hammer readings, the Contractor shall be prepared to perform compressive strength testing on sampled concrete cylinders, at no additional cost to the Department.

MEASUREMENT AND PAYMENT

Latex Modified Concrete Overlay– Early Strength will be measured and paid for in cubic yards of LMC-ES satisfactorily placed on the completed deck.

Placing and Finishing Latex Modified Concrete Overlay – Early Strength will be paid for at the contract unit price bid per square yard which includes compensation for furnishing all labor, tools, equipment and incidentals necessary to complete the work in accordance with the contract documents.

Grooving Bridge Floors will be measured and paid in accordance with Section 420-21 of the *Standard Specifications*.

Payment will be made under:

Pay Item	Pay Unit
Latex Modified Concrete Overlay – Early Strength	Cubic Yard
Placing and Finishing Latex Modified Concrete Overlay – Early Strength	Square Yard

LMC OVERLAY SURFACE PREPARATION

(2-11-19)

DESCRIPTION

This special provision addresses the surface preparation activities required prior to the placement of latex modified concrete. Unless specifically mentioned below, all requirements specified for the bridge deck are also required for the approach slabs.

DEFINITIONS

Scarification shall consist of the removal of any asphalt wearing surface and concrete surface to a uniform depth within ½” of the plan overlay thickness or to the limits shown on the plans.

Hydro-demolition shall consist of the removal of the deck surface by means of high pressure water blasting which will remove concrete, oil, dirt, concrete laitance and rust from the exposed reinforcing bars by direct impact, pressurization of micro and macro cracks and cavitation produced by jet instability.

EQUIPMENT

Use the following surface preparation equipment:

- (A) Scarifying equipment that is a power-operated, mechanical grinder capable of removing a minimum depth of ¼” for each pass.
- (B) Hydro-demolition machine, self-propelled with a minimum orifice pressure of 17,000 psi.
- (C) All water used for hydro-demolition shall be potable.
- (D) Equipment capable of sawing concrete to the specified plan depth.
- (E) Hand-held high velocity (7,500 psi minimum) water-jet equipment capable of removing rust scale from reinforcing steel, removing small chips of concrete partially loosened by the scarifying or chipping operation, and for removing rehydrated dust left from scarification.
- (F) Power driven hand tools for removal of unsound concrete are required that meet the following requirements:
 - (1) Pneumatic hammers weighing a nominal 35 lb or less.
 - (2) Pneumatic hammer chisel-type bits that do not exceed the diameter of the shaft in width.
- (G) Hand tools such as hammers and chisels for removal of final particles of unsound concrete.
- (H) Self-propelled vacuum capable of picking up water, dust, and other loose material from prepared deck surface.
- (I) Vibratory screed for overlays, except as noted herein.

The hydro-demolition machine shall be self-propelled and capable of producing a water-jet through an orifice at a pressure of at least 17,000 psi. The machine shall move the jet transversely across the area and forward and backward so that the entire deck is covered with the water-jet and operated at a pressure sufficient to remove the unsound concrete.

The machine shall have sufficient means to control and vary the following functions:

- (A) Water pressure.
- (B) Angle and distance of the orifice in relation to the surface to be blasted.
- (C) Limits of transverse and longitudinal movement of the orifice.
- (D) Speed of the orifice in the transverse and longitudinal direction.

High pressure pump(s) shall be equipped with over-pressurization relief valves and rupture disc systems. All high pressure components shall be rated at full working pressure of the hydro-demolition system. The complete hydro-demolition system must be capable of depressurization from a single point.

The equipment must operate at a noise level less than 90 decibels at a distance of 50 feet.

MANAGEMENT AND DISPOSAL OF CONCRETE GRINDING RESIDUALS

The contractor must collect and properly dispose of water, Hydro-demolition Operation Slurry (HOS), Diamond Grinding Slurry (DGS), and solids from bridge deck preparation, otherwise referred to as Concrete Grinding Residuals (CGR). Prior to beginning work, submit for approval by the Engineer an HOS/DGS Management Plan. Prepare the plan in accordance with the NCDOT Guidelines on the Management and Disposal of CGR available at:

[https://connect.ncdot.gov/resources/Environmental/Environmental Permits and Guidelines/Forms/AllItems.aspx](https://connect.ncdot.gov/resources/Environmental/Environmental%20Permits%20and%20Guidelines/Forms/AllItems.aspx)

The contractor shall comply with applicable regulation concerning such water disposal.

Prior to final payment, the contractor must submit a paper copy of all completed records pertaining to disposal of CGR. All costs associated with Management and Disposal of CGR shall be included in the payment of other items.

OSP PLAN SUBMITTAL

Prior to beginning surface preparation activities, the Contractor shall submit for review and approval the Overlay Surface Preparation (OSP) Plan. The OSP Plan shall detail the type of equipment that is intended to be used and the means by which the Contractor will achieve the following requirements:

- (A) Estimate depth of reinforcing steel.
- (B) Scarification of deck to required depth.
- (C) Field verification that required scarification depth was achieved within limits.
- (D) Hydro-demolition of deck with appropriate profile and to required depth.
- (E) Field verification that the required hydro-demolition depth was achieved within limits.

SURFACE PREPARATION

Remove all existing asphalt overlays and all loose, disintegrated, unsound or contaminated concrete to the limits shown on the plans with the following requirements:

- (A) Sealing of Bridge Deck: Seal all expansion joints subject to run-off water from the hydro-demolition process with material approved by the Engineer, prior to beginning any demolition. The expansion joints shall remain sealed until water from the hydro-demolition process no longer passes over them. Take all steps necessary to eliminate the flow of water through the expansion joints, and any other locations water could leak from the deck.

All deck drains in the immediate work area and other sections of the bridge affected by the work being performed shall be sealed prior to beginning scarification. Drains shall remain sealed until it has been determined that materials from the hydro-demolition and concrete overlay operations cannot be discharged through them any longer.

- (B) Scarifying Bridge Deck: Removal of any asphalt wearing surface from the bridge deck and scarification of the entire surface of the concrete deck to remove concrete to a uniform depth

within $\frac{1}{2}$ " of the plan overlay thickness, but not less than $\frac{1}{2}$ " inch above the top mat of reinforcing steel.

It will be the Contractor's responsibility to determine amount of cover for the reinforcing steel. Use a pachometer or other approved device, as directed by Engineer, prior to beginning hydro-demolition. Readings shall be taken in the presence of the Engineer. Readings should be taken for each span at 1/5 points longitudinally and 1/3 points transversely. This cost for this work will be considered incidental to the cost of hydro-demolition of the bridge deck.

Estimated average cover to top mat:

Bridge # 138: 1" +/-3/8"

The above top mat cover dimensions are an estimate based on the best available information. Calibrate scarifying equipment in order to avoid damaging the reinforcing steel in the bridge floor or the approach slab. If reinforcing bars or bridge drainage devices are pulled up or snagged during operations, then cease work and consult with the Engineer to determine any necessary adjustments to the scarifying operation.

Remove and dispose of all concrete and asphalt, and thoroughly clean the scarified surface. In areas where reinforcing steel is located in the depth to be scarified, use another method with the Engineer's approval.

- (C) Calibration of Hydro-Demolition Equipment: Two (2) trial areas shall be designated by the Engineer to demonstrate that the equipment, personnel, and methods of operation are capable of producing results to the satisfaction of the Engineer. The first trial area shall consist of approximately 50 square feet of sound concrete as determined by the Engineer. The equipment shall be calibrated to remove sound concrete from the scarified surface to the depth required to achieve the plan overlay thickness. After completion of this test area, the equipment shall be moved to the second area consisting of deteriorated or defective concrete, to determine whether unsound concrete will be completely removed with the previous calibration and to establish a baseline for requiring the contractor to place under-deck containment in areas subject to full depth removal, before beginning the hydro-demolition process in a span. Should it be determined that not all defective concrete has been removed, the hydro-demolition system shall be recalibrated to remove an additional $\frac{1}{4}$ " of sound concrete, then re-test on deteriorated concrete.

If additional defective concrete is found, the depth of cut will increase in $\frac{1}{4}$ " increments until only sound concrete is found remaining.

When satisfactory results are obtained, the machine parameters shall be used for production removal. The contractor shall make adjustments to the operating parameters, as required, to perform concrete removal as indicated on the plans and to adjust to the variance in the compressive strength of the concrete.

Hand held water blasting equipment, pneumatic hammers, and hand tools may be substituted for the hydro-demolition unit in inaccessible or inconvenient areas.

(D) Hydro-demolition (Overlay Depth): Remove by hydro-demolition or chipping with hand tools all loose, unsound and contaminated deck concrete and, if necessary, sound concrete in order to allow for the placement of an overlay with the minimum depth shown on the plans. In areas where reinforcing steel is exposed and debonded for a length greater than two (2) feet, remove deck to an average depth of ½” below the exposed and debonded reinforcing steel. Reinforcing steel that is exposed and loose shall be tied to the crossing bar(s) as needed to secure the steel. Reinforcing steel shall be considered loose if when struck, movement or vibration can be observed. Concrete below crossing bar shall be removed as necessary to tie reinforcing steel to crossing bar with a wire tie. Dispose of the unsound concrete, clean, repair or replace damaged reinforcing steel and thoroughly clean the newly exposed surface.

Care shall be taken not to cut, stretch, or damage any exposed reinforcing steel.

The Engineer will re-inspect after each removal and require additional removals until compliance with plans and specifications are met.

Any areas of the prepared surface contaminated by oil or other materials detrimental to good bond as a result of the contractor’s operations shall be cleaned at the contractor’s expense.

Regardless of the method of removal, the removal operation shall be stopped if it is determined that sound concrete is being removed to a depth greater than required by the plans including any ¼” increments added per the above calibration process.

Appropriate recalibration, or change in equipment and methods shall be performed prior to resuming the removal operation.

(E) Class II Surface Preparation (Partial Depth): At locations specified on the plans for Class II Surface Preparation, verify the depth of removal achieved by the hydro-demolition. The average depth of removal shall be approximately one-half the deck thickness but not less than ¾” below the top mat of steel. When hydro-demolition did not achieve the Class II Surface Preparation depth requirements, remove by hydro-demolition or chipping with hand tools all existing patches and contaminated concrete to the required depth. No additional payment will be made for Class II Surface Preparation depths achieved by the initial hydro-demolition.

All patches shall be removed under Class II Surface Preparation. If any patch cannot be removed by means of hydro-demolition, the Contractor shall use hand tools to remove the patch. Areas indicated on the plans that require Class II Surface Preparation, including the locations of existing patches, are from the best information available. The Contractor shall verify prior to surface preparation the location of all existing patches.

Dispose of the removed concrete, clean, repair or replace rusted or loose reinforcing steel and thoroughly clean the newly exposed surface. Care shall be taken not to cut, stretch, or damage any exposed reinforcing steel.

In overhangs, removing concrete areas of less than 0.60 ft²/ft. length of bridge without overhang support is permitted unless the Engineer directs otherwise. Overhang support is required for areas removed greater than 0.60 ft²/ft. length of bridge. Submit details of overhang support to the Engineer for approval prior to beginning the work.

- (F) Class III Surface Preparation (Full Depth): Remove by hydro-demolition or chipping with hand tools the full depth of slab. Dispose of the removed concrete, clean, repair or replace damaged reinforcing steel and thoroughly clean the newly exposed surface. Care shall be taken not to cut, stretch, or damage any exposed reinforcing steel.

For areas of less than 3 ft² suspending forms from existing reinforcing steel using wire ties is permitted. For larger areas, support forms by blocking from the beam flanges, or other approved method.

Overhang support is required for full depth removal adjacent to bridge rails. Submit details of overhang support to the Engineer for approval prior to beginning the work.

- (G) Under Deck Containment: Under deck containment shall be installed where Class III surface preparation occurs. The containment shall be installed prior to hydro-demolition in the areas where full depth removal is required or blow through may occur during the hydro-demolition process.

Submit for approval detailed plans for the under deck containment system. Detail how waste, debris, and wastewater are contained.

- (H) Concrete for Full Depth Repair: Fill the Class III surface preparation areas with Class AA, high early strength structural concrete or latex modified concrete in accordance with one of the methods described below:

- (1) Refill full depth areas with Class AA concrete to the bottom of the proposed concrete overlay in accordance with Section 420 of the *Standard Specifications*. Any of the methods for curing Class AA concrete as stated in the *Standard Specifications* are permitted except the membrane curing compound method.

Provide a raked finish to the surface of the Class AA concrete which provides a minimum relief of $\frac{1}{16}$ " and a maximum relief of $\frac{1}{4}$ ".

Verify the Class AA concrete has attained a minimum compressive strength of 2,500 psi using an approved, non-destructive test method. Brush a lean mix of the latex modified concrete to the surface and immediately place the overlay course.

- (2) Refill full depth areas with high early strength concrete as described in the Concrete for Deck Repair and Volumetric Mixer special provisions.

- (3) Refilling full depth areas with latex modified concrete during the Class III repair is permitted if any of the following conditions are met:

(a) The reinforcing steel cover is 1½ inches or less for the top mat of steel.

(b) The area being repaired is less than 1 yd².

(c) The Engineer directs the fill.

- (I) Preparation of Reinforcing Steel: Remove concrete without cutting or damaging existing steel unless otherwise noted in the plans. Damaged reinforcing steel, such as bars with nicks

deeper than 20% of the bar diameter, shall be repaired or replaced. Reinforcing steel which has a cross section reduced to 75% or less shall be replaced with new reinforcing steel of similar cross section area. Replacement bars shall be Grade 60 and meet the material requirements of Section 1070 of the *Standard Specifications*. Replacement bars shall be spliced to existing bars using either minimum 30 bar diameter lap splices to existing steel with 100% cross sectional area or approved mechanical connectors.

Support and protect the exposed reinforcing steel left unsupported by the hydro-demolition process against displacement and damage from loads such as those caused by removal equipment and delivery buggies. All reinforcing steel damaged or dislodged by these operations shall be replaced with bars of the same size at the contractor's expense.

Reinforcing steel exposed and cleaned by hydro-demolition will not require additional cleaning if encased in concrete within seven (7) days. Rebar exposed for more than seven (7) days shall be cleaned by high velocity water jets, with a minimum pressure 4,000 psi, prior to placement of the new concrete.

When large areas of the deck on composite bridges are removed resulting in the debonding of the primary reinforcing bars, the removal shall be performed in stages to comply with the construction sequence shown on the plans or as directed by the Engineer.

- (J) Safety: Provide a containment system for handling expected and unexpected blow through of the deck. The containment system shall retain runoff water and debris and protect the area under the bridge deck. The Contractor shall be responsible for any injury or damage caused by these operations. The containment system shall remain in place until the concrete has been cast and reach minimum strength.

Provide adequate lighting when performing hydro-demolition activities at night. Submit a lighting plan to the Engineer for approval prior to beginning work.

- (K) Surface Cleaning: Removal of concrete debris shall be accomplished either by hand or mechanical means capable of removing wet debris and water in the same pass and after the hydro-demolition process to prevent debris from setting or adhering to the surface of the sound concrete. All concrete debris shall become the property of the Contractor and shall be legally disposed of at the contractor's expense. The contractor shall be responsible for disposing of all debris generated by the scarification operations. Any debris which is allowed to set or adhere to the surface of the sound concrete shall be carefully removed at no additional cost. Exercise care to avoid any damage to the remaining sound concrete or exposed reinforcement. Prior to the placement of the overlay, the entire surface shall be cleaned with high pressure water to remove any bond-breaking residue, loose material from the concrete surface, and/or rust from the reinforcing steel. This residue shall be collected and disposed of by the contractor.

Any areas modified by chipping or hammering shall be cleaned with high pressure water at 7,500 psi minimum to remove any bond-breaking residue, loose concrete, and any deleterious material. This material shall be collected and disposed of by the contractor.

Any areas of the prepared surface contaminated by oil or other materials detrimental to good bond as a result of the contractor's operations shall be cleaned at the contractor's expense.

MEASUREMENT AND PAYMENT

Scarifying Bridge Deck will be measured and paid for at the contract unit price per square yard and will be full compensation for the milling of existing asphalt wearing surface from the bridge deck or approaches, milling of the entire concrete bridge deck, repairing or replacing any damaged reinforcing steel, and the cleaning and disposal of all waste material generated.

Hydro-Demolition of Bridge Deck will be measured and paid for at the contract unit price per square yard and will be full compensation for hydro-demolition, removal and disposal of unsound and contaminated concrete, cleaning, repairing or replacing of reinforcing steel, and furnishing all materials, labor, tools, equipment and incidentals necessary to complete the work.

Class II Surface Preparation will be measured and paid for at the contract unit price per square yard and will be full compensation for Class II (partial depth) deck preparation where required by the plans and not attained by the initial hydro-demolition of the deck. The cost will also include removal and disposal of unsound and contaminated concrete, removal of all existing patches, cleaning, repairing or replacing of reinforcing steel, and all materials, labor, tools, equipment and incidentals necessary to complete the work.

Class III Surface Preparation will be measured and paid for at the contract unit price per square yard and will be full compensation for Class III (full depth) deck preparation and repair where required by the plans. The cost will also include removal and disposal of unsound and contaminated concrete, cleaning, repairing or replacing of reinforcing steel, under deck containment, placing and finishing concrete for full depth repair, and for furnishing all materials, labor, tools, equipment and incidentals necessary to complete the work.

Reinforcing Steel that is required for the repairs will be in accordance with Section 425 of the *Standard Specifications*.

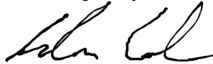
Payment will be made under:

Pay Item	Pay Unit
Scarifying Bridge Deck	Square Yard
Hydro-Demolition of Bridge Deck	Square Yard
Class II Surface Preparation	Square Yard
Class III Surface Preparation	Square Yard

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Railroad
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8/31/2021

RAILROAD GENERAL SPECIAL PROVISIONS – CHARLOTTE (SPECIAL)
AREA TRANSIT SYSTEM

When performing work on, over, or adjacent to Charlotte Area Transit System (“CATS”) right-of-way or operations, selected contractor (“Contractor”) must abide by the current CATS Special Provisions and the following additional requirements. In the event of any conflicting statements between these Special Provisions and the Agreement between CATS and NCDOT, these Special Provisions will govern.

I. AUTHORITY OF CATS REPRESENTATIVE

The CATS Representative shall have final authority in all matters affecting the safe maintenance of CATS operations and CATS property, and his or her approval shall be obtained by the Contractor for methods of construction to avoid interference with CATS operations and CATS property and all other matters contemplated by the Agreement and these Special Provisions.

II. INTERFERENCE WITH CATS OPERATIONS

- A. Contractor shall arrange and conduct its work so that there will be no interference with CATS operations, including trail, signal, telephone and telegraphic services, or damage to CATS property, or to poles, wires, and other facilities of tenants on CATS Property or right of way (ROW). Contractor shall store materials to prevent trespassers from causing damage to trains, or CATS Property. Whenever Work is likely to affect the operations or safety of trains, the method of doing such Work shall first be submitted to the CATS Representative for approval, but such approval shall not relieve Contractor from liability in connection with such Work.
- B. If conditions arising from or in connection with the Project require that immediate and unusual provisions be made to protect train operation or CATS property, Contractor shall make such provision. If the CATS Representative determines that such provision is insufficient, CATS may, at the expense of the Contractor, require or provide such provision as may be deemed necessary, or cause the Work to cease immediately.
- C. To the extent it deems it necessary for the safety and protection of the general public, its property, or its operations, CATS may supply flaggers at any time during the progress of the Proposed Work. As provided in a separate Agreement between CATS and NCDOT, any costs incurred by CATS pursuant to this Section may be submitted to NCDOT for reimbursement.

III. NOTICE OF STARTING WORK

The Contractor shall not commence any work on CATS Property or rights-of-way until it has complied with the following conditions:

- A. Notify CATS in writing of the date that it intends to commence Work on the Project. Such notice must be received by CATS at least ten business days in advance of the date the Contractor proposes to begin Work on CATS property. The notice must refer to this Agreement by date. If flagging service is required, such notice shall be submitted at least thirty (30) business days in advance of the date scheduled to commence the Work.
- B. Obtain authorization from the CATS Representative to begin Work on CATS property. Such authorization to include an outline of specific conditions with which it must comply.
- C. Obtain from CATS the names, addresses, and telephone numbers of CATS personnel who must receive notice under provisions in the Agreement. Where more than one individual is designated, the area of responsibility of each shall be specified.

IV. WORK CORRESPONDENCE AND SUBMITTALS

All construction related correspondence will be directed to CATS Representative, with the following contact and address:

Jill Brim, P.E.
Engineering & Implementation Manager
Charlotte Area Transit System
600 East 4th Street
Charlotte, NC 28202
704-651-3809
jill.brim@charlottenc.gov

Upon receipt of notification, the CATS Representative will direct the Contractor to the local CATS construction contact for the project. In the event the CATS Representative is replaced, new contact information will be provided within five (5) days of replacement.

All required work plan submittals shall be forwarded to and approved in writing by the CATS prior to proceeding with the work of each applicable phase. Up to thirty (30) days will be required to review all submittals. Up to an additional thirty (30) days will be required to review any subsequent submissions returned not approved.

V. PRECONSTRUCTION MEETING

Prior to any construction activities on or about CATS, the Contractor shall have a pre- construction meeting with CATS designated representative to discuss potential on-track safety issues during project construction activities. All individuals must complete Roadway Worker Protection Program (RWPP) Safety Training prior to entering the CATS ROW.

VI. TRACK ALLOCATION MEETING

Contractor shall have a responsible representative attend weekly CATS Track Allocation Meetings. Typically, Track Allocation Meetings are held Wednesdays at 3:30 p.m. via WebEx. Contractor shall confirm meeting day, time, and location/ virtual website with CATS and acquire access permission for the meeting from CATS.

VII. REQUIRED SUBMITTALS

The Contractor shall submit, including but not limited to, the following construction procedures and documents. The Contractor shall obtain written acceptance of each from CATS, before proceeding with maintenance work or entering CATS ROW.

- A. Means and Methods – The Contractor shall develop a detailed submission indicating the progression of work with specific times when tasks will be performed during the project. This submission may require a walkthrough at which time CATS representative will be present. Work will not be permitted to commence until the Contractor has provided CATS with a satisfactory plan that project will be undertaken without scheduling, performance, or safety related issues. Provide a listing of the anticipated equipment to be used, the location of all equipment to be used, and ensure a contingency plan of action is in place should a primary piece of equipment malfunction. All work in the vicinity of CATS property that has the potential of affecting CATS train operations must be submitted and approved by CATS prior to work being performed. This submission will also include a detailed narrative discussing the coordination of project safety issues between NCDOT, Contractor, and CATS. The narrative shall address project level coordination and day-to-day, specific work operations including crane and equipment operations and debris containment.
- B. Containment System – Concrete, paint, dust, and other debris, and tools, equipment, or other items may not be deposited on the CATS ROW or pedestrian walkways at any time during work operations. Containment to prevent such deposition shall apply to all work on bridge, including but not limited to Deck, Superstructure, and Substructure work. Any bridge work that possesses the risk of depositing items over the ROW or the overhead catenary system (OCS) must include containment sufficiently designed to contain and support itself, as well as workers, equipment, tools, removed materials, materials to be installed, and any other items within the containment, and sufficiently designed to remain in place with expected wind, vibration, and other applied loads. Design wind loads shall be in accordance with the Falsework and Formwork special provision.

The Contractor shall submit for review and written approval a containment system for work over or adjacent to CATS ROW or pedestrian walkways. Unless otherwise approved by CATS, no temporary containment system shall encroach horizontally within fifteen feet (15'-0") measured perpendicularly from the centerline of the nearest track. Any containment system must also maintain a minimum vertical clearance of twenty feet (20'-0") measured from top of high rail to the lowest point of structure in the clearance area which extends fifteen feet (15'-0") to both sides from centerline of track. If the existing vertical clearance is less than twenty feet (20'-0"), no reduction in vertical clearance is permissible.

Any containment system must also maintain a minimum clearance of ten feet (10'-0") all the way around (vertically and horizontally) the existing parts of the overhead catenary system, as measured from the top of the OCS poles.

If work will be occurring on pedestrian walkways adjacent to CATS lines, containment limits shall be adjusted to allow for passage of pedestrian traffic. Any containment system must also provide a minimum horizontal clearance of ten feet (10'-0") and maintain a minimum vertical clearance of ten feet (10'-0") for any pedestrian pathway. Adequate pedestrian lighting must be maintained when pedestrian passage is allowed. Limits for pedestrian passage are subject to determination and approval by CATS and Charlotte Department of Transportation (CDOT).

A construction submittal must be provided to CATS and NCDOT and include a written installation and removal procedure and a plan showing the details of the containment system. This submission is to include any work platforms, with design loads and supporting calculations signed and sealed by a Professional Engineer in the State of North Carolina. The design of the system shall also be in accordance with OSHA and fully comply with all federal, state, and local environment laws, regulations, statutes, and ordinances at all times.

No ordering, fabrication, installation of containment system may begin until submittal is approved by NCDOT and CATS.

- C. Anchoring and Securing Equipment – Lifts, scaffolding, tools, and other equipment that could potentially fall into a zone within fifteen feet (15'-0") measured perpendicularly from the centerline of the nearest track shall be positively secured to anchorage sufficient to retain the lifts, scaffolding, tools, and other equipment. A construction submittal must be provided to CATS and NCDOT and include a plan to install and secure such lifts, scaffolding, tools, and other equipment. The anchorage and security plan shall indicate equipment, structures, and anchorage to be used. Plan design drawings and calculations shall demonstrate that anchorage and security are adequate for the lifts, scaffolding, tools, and other equipment and that anchorage and loadings from the lifts, scaffolding, tools, and other equipment will not damage existing CATS or NCDOT property or structures. The plan shall also demonstrate how the workers will access the lifts and scaffolding without potentially fouling the trackway. Should damage to CATS or NCDOT property or structures occur, Contractor shall be responsible for all repairs. Construction submittal shall include any work platforms, with design loads and supporting calculations signed and sealed by a Professional Engineer in the State of North Carolina. The design of the system shall also be in accordance with OSHA and fully comply with all federal, state, and local environment laws, regulations, statutes, and ordinances at all times.

No ordering, fabrication, installation of such equipment, anchorage, and security methods, nor the use of lifts, scaffolding, tools, and other equipment may begin until anchorage and security plan submittal is approved by NCDOT and CATS.

If the plan for the anchorage and security is approved by NCDOT and CATS, Contractor may work during day or night hours, as allowed by CATS. If the anchorage and security plan is not approved, Contractor may perform work only during approved Red Tag hours established by CATS (typically between 2:00 a.m. and 4:00 a.m., daily)

- or during the annual CATS maintenance weekend. The date for the CATS maintenance weekend varies yearly. Contractor shall contact CATS for approval of Red Tag hours and to confirm dates of the annual maintenance weekend.
- D. Ballast Protection – A ballast protection system may be required at the sole discretion of CATS depending on the contractor’s proposed methods to perform the work. The system shall use filter fabric and indicate the anchorage system. The ballast protection is to extend a minimum of twenty-five feet (25’-0”) beyond the proposed limit of work or greater as determined by CATS and be continuously maintained to prevent all contaminants from entering the ballast section of all tracks for the entire duration of the project.
- E. Construction Schedule – Within 30 days of the pre-construction meeting, Contractor shall submit a detailed construction schedule for the duration of the project clearly indicating the time periods while working on and around CATS ROW. As the work progresses, the schedule shall be updated and resubmitted as necessary to reflect changes in work sequence, duration, and method, etc.
- F. Insurance – Submit all necessary insurance information in accordance with the current CATS Insurance Requirements for approval. The complete original policies should be submitted to:
- Chrislee Gibson, Insurance & Risk Coordinator
chrislee.gibson@charlottenc.gov
- The insurance policies will be required to be in place and approved prior to any work commencing on or that could potentially impact CATS ROW.
- G. Emergency Action Plan – Submit an emergency action plan indicating the location of the site, contact numbers, access to the site, instructions for emergency response and location of the nearest hospitals. This plan should cover all items required in the event of an emergency at the site including fire suppression. Coordinate the Emergency Action Plan with the safety related discussion of the Means and Methods submission discussed above. The plan should also include a method to provide this information to each project worker for each day on site.
- H. As-Built Conditions – Prior to beginning work, submit video documentation of the existing conditions of adjacent CATS property, including but not limited to hardscape, lighting, guard rails, ballast, rails/ties, and overhead catenary system.

VI. WORK FOR THE BENEFIT OF THE CONTRACTOR

- A. No temporary or permanent changes to wire lines or other facilities (other than third party fiber optic cable transmission systems) on CATS property that are considered necessary to the Work are anticipated or shown on the Plans. If any such changes are, or become, necessary in the opinion of CATS or NCDOT, such changes will be covered by appropriate revisions to the Plans and by preparation of a force account estimate. Such force account estimate may be initiated by either CATS or NCDOT but must be approved by both CATS and NCDOT. The Contractor shall be responsible for

arranging for the relocation of the third-party fiber optic cable transmission systems, at no cost or expense to CATS.

- B. Should the Contractor desire any changes in addition to the above, then it shall make separate arrangements with CATS for such changes to be accomplished at the Contractor's expense.

VII. HAUL ACROSS RAILROAD

- A. If Contractor desires access across CATS property or tracks at other than an existing and open public road crossing in or incident to construction of the Project, the Agency or Contractor must first obtain the permission of CATS and shall execute a license agreement or right of entry satisfactory to CATS, wherein Agency or Contractor agrees to bear all costs and liabilities related to such access.
- C. NCDOT and Contractor shall not cross CATS property and tracks with vehicles or equipment of any kind or character, except at such crossing or crossings as may be permitted pursuant to this section.
- D. Contractor access will be limited to the immediate project area only. The CATS ROW may not be used for contractor access to the project site and no temporary at-grade crossings will be allowed.

VIII. COOPERATION AND DELAYS

- A. The Contractor shall arrange a schedule with CATS for accomplishing work by CATS. In arranging its schedule, Contractor shall ascertain, from CATS, the lead time required for assembling crews and materials and shall make due allowance, therefore.
- B. The Contractor may not charge any costs or submit any claims against CATS for hindrance or delay caused by railroad traffic; work done by CATS or other delay incident to or necessary for safe maintenance of railroad traffic; or for any delays due to compliance with these Special Provisions.
- C. The Contractor shall cooperate with others participating on this Project to the end that all work may be carried on to the best advantage.
- E. The Contractor understands and agrees that neither NCDOT nor CATS assume any responsibility for work performed by others in connection with the Project. The Contractor further understands and agrees that they shall have no claim whatsoever against NCDOT or CATS for any inconvenience, delay or additional cost incurred by the Contractor on account of operations by others.

IX. CATS EMERGENCY NUMBER

The CATS telephone number for emergencies is Rail Operations Control Center: 704-432-5041. Reference the CATS Milepost BLN 0.61-1 12th Street Crossing, when calling.

X. STORAGE OF MATERIALS AND EQUIPMENT

The CATS ROW must remain clear for railroad use at all times. Contractor shall not store their materials or equipment on CATS property, ROW, or where they may potentially interfere with CATS operations, unless Contractor has received CATS Representative's prior written permission. Contractor understands and agrees that CATS will not be liable for any damage to such materials and equipment from any cause and that CATS may move, or require Contractor to move, such material and equipment at Contractor's sole expense. To minimize the possibility of damage to the railroad tracks resulting from the unauthorized use of equipment, all grading or other construction equipment that is left parked near the tracks unattended by watchmen shall be immobilized to the extent feasible so that it cannot be moved by unauthorized persons.

XI. CONSTRUCTION PROCEDURES**A. General**

1. Work on CATS property shall be subject to CATS inspection and approval.
2. Work on CATS property shall be in accord with CATS Requirements for Work Within or Adjacent to the RR ROW and with these Special Provisions.
3. Contractor shall complete and comply with the terms and rules of the CATS ROW Access Form, which Contractor shall be required to obtain from CATS, and in accord with any other instructions furnished by CATS or CATS Representative.
4. Contractor access will be limited to the immediate project area only. Unless otherwise approved by CATS, the CATS ROW may not be used for contractor access to the project site.
5. The Contractor will be required to abide by the provisions of the NCDOT/ CATS Railroad Agreement. Periodically, throughout the project duration, the Contractor will be required to meet, discuss, and, if necessary, take immediate action at the discretion of CATS personnel to comply with provisions of that agreement and these specifications.
6. Contractor agrees to fully comply with all federal, state, and local environmental laws, regulations, statutes, and ordinances at all times.

XII. MAINTENANCE OF DITCHES, PEDESTRIAN WALKWAYS, AND OTHER AREAS ADJACENT TO CATS TRACKS

Contractor shall maintain all ditches and drainage structures free of silt or other obstructions that may result from their operations. Contractor shall provide erosion control measures during construction and use methods that accord with applicable state standard specifications for road and bridge construction, including either (1) silt fence; (2) hay or straw barrier; (3) berm or temporary ditches; (4) sediment basin; (5) aggregate checks; and (6) channel lining.

No stormwater from the project may discharge onto the CATS ROW at any time during construction.

The Contractor must submit a detailed erosion control plan for review and written acceptance by CATS prior to performing any work.

Contractor shall adequately protect pedestrian walkways (concrete, brick, timber, etc.) and other areas adjacent to the CATS tracks with appropriate measures (such as plywood, matting, sand, etc.). Installation, maintenance, and removal of such measures are the responsibility of the Contractor. Protection measures shall be submitted and receive written approval by CATS prior to installation.

All such maintenance and repair of damages due to Contractor's operations shall be performed at Contractor's expense. Any repair methods or materials must receive CATS written approval prior to installation.

XIII. FLAGGING / INSPECTION SERVICE

- A. CATS has sole authority to determine the need for flagging required to protect its operations and property. In general, flagging protection will be required whenever Contractor or their equipment are, or are likely to be, working within fifty feet (50'-0") of live track or other track clearances specified by CATS, or over tracks.
- B. All equipment operations that could potentially impact CATS ROW must be coordinated with the CATS Flagman.
- C. NCDOT shall reimburse CATS directly for all costs of flagging that is required on account of work within CATS property shown in the Plans, or that is covered by an approved plan revision, supplemental agreement, or change order. All bills shall be prepared in accordance with the Federal-Aid Policy Guide 23 CFR 646B.
- D. The Contractor shall give a minimum of thirty (30) days advance notice to CATS Representative for anticipated need for flagging service. Flagging requests should be made to CATS during weekly CATS Track Allocation Meetings. No work shall be undertaken until the flag person(s) is/are at the job site. While CATS cannot guarantee the availability of flagmen at all requested times, every accommodation will be extended to the Contractor when forces are available. If it is necessary for CATS to advertise a flagging job for bid, it may take up to 90 days to obtain this service and CATS shall not be liable for the cost of delays attributable to obtaining such service. Termination or cancellation of a flagman requires ten (10) days notice to avoid incurring costs.
- E. CATS shall have the right to assign an individual to the site of the Project to perform inspection service whenever, in the opinion of CATS Representative, such inspection may be necessary. NCDOT shall reimburse CATS for the costs incurred by CATS for

such inspection service. Inspection service shall not relieve the Contractor from liability for its Work.

- F. CATS shall render invoices for, and NCDOT shall pay for, the actual pay rate of the flag persons and inspectors used, plus standard additives, whether that amount is above or below the rate provided in the Estimate. If the rate of pay that is to be used for inspector or flagging service is changed before the work is started or during the progress of the work, whether by law or agreement between CATS and its employees, or if the tax rates on labor are changed, bills will be rendered by CATS and paid by NCDOT using the new rates. The Contractor shall perform their operations that require flagging protection or inspection service in such a manner and sequence that the cost of such will be as economical as possible.

XIV. CLEAN-UP

The Contractor, upon completion of the Project, shall remove from CATS Property any temporary grade crossings, any temporary erosion control measures used to control drainage, all machinery, equipment, surplus materials, falsework, rubbish, or temporary buildings belonging to NCDOT or Contractor. The Contractor, upon completion of the Project, shall leave CATS Property in neat condition, satisfactory to CATS Representative.

XV. COMPLETION AND ACCEPTANCE OF WORK:

Upon completion of the work, the Contractor shall remove from within the limits of the CATS property all machinery, equipment, surplus materials, rubbish or temporary buildings of the Contractor, and leave said rights-of-way in a neat and orderly condition. After the final inspection has been made and work found to be completed in a satisfactory manner acceptable to the Department of Transportation and CATS, the Department of Transportation will be notified of CATS acceptance in writing by the CATS Representative within ten (10) days or as soon thereafter as practicable.

At project completion, a complete set of "As Built" plans for the proposed construction shall be submitted to CATS Rail Operations. CATS will keep these plans on file for future reference. Final acceptance of work is conditional upon receipt and approval of "As Built" plans. Please address these plans to:

Jill Brim, P.E.
Engineering & Implementation Manager
Charlotte Area Transit System
600 East 4th Street
Charlotte, NC 28202
704-651-3809
jill.brim@charlottenc.gov

XVI. FAILURE TO COMPLY

If Contractor violates or fails to comply with any of the requirements of these Special Provisions, (a) CATS may require Contractor to vacate CATS Property; and (b) CATS may withhold monies due Agency and/or Contractor; (c) CATS may require Agency to withhold monies due Contractor; and (d) CATS may cure such failure and the Contractor shall reimburse CATS for the cost of curing such failure.

XVIII. TRAIN DATA

Mecklenburg County Bridge #322

2 Tracks

15-25 MPH Speed

Passenger

XIX. MEASUREMENT AND PAYMENT

Containment Over Charlotte Area Transit System Rail Line will be paid at the lump sum contract price and will be full compensation for the design, materials, fabrication, installation, maintenance, routine cleaning, and removal of the required containment system, and returning the surrounding areas to a condition satisfactory to NCDOT and CATS.

No separate payment will be made for all other requirements of this provision. Costs for meeting all other requirements of this provision shall be incidental to other pay items.

**INSURANCE SPECIAL PROVISIONS FOR
CHARLOTTE AREA TRANSIT SYSTEM**

- A. In addition to any other forms of insurance or bonds required elsewhere in the contract documents, the Prime Contractor will be required to provide coverage conforming to the requirements of the Federal-Aid Policy Guide outlined under 23 CFR 646A for all work to be performed on CATS right(s)-of-way (ROW) under the terms of the contract by carrying insurance as listed below.

If any part of the work is sublet, similar insurance and evidence thereof in the same amounts as required of the Prime Contractor, shall be provided by the subcontractor to cover his operations on CATS ROW. As an alternative, the Prime Contractor may provide insurance for the subcontractor by means of separate and individual policies.

1. CONTRACTOR'S COMMERCIAL GENERAL LIABILITY INSURANCE:

The Contractor shall procure and maintain, at its expense, an original and one certified copy of the policy **to the Department** as evidence of:

- a. Statutory Worker's Compensation and Employers Liability Insurance with available limits of not less than \$1,000,000, which insurance must contain a waiver of subrogation against Charlotte Area Transit System (CATS) and its Affiliates.
- b. Commercial General Liability coverage (inclusive of contractual liability) with available limits of not less than \$5,000,000 in combined single limits for bodily injury and property damage per occurrence, and covering the contractual liabilities assumed under this Agreement.
- c. Commercial Automobile Liability insurance with limits of not less than \$1,000,000 combined single limit for bodily injury and/or property damage per occurrence.
- d. Such other insurance as CATS may reasonably require.

Upon request, Licensee shall provide CATS with a copy of Licensee's applicable insurance policies. A policy endorsement naming CATS as an additional insured and specifying such coverage shall be furnished to CATS, and the required coverage will be kept in force until all of the licensee's obligations under this Agreement have been fully discharged and fulfilled, or until Licensee shall have been specifically released by a written instrument signed by an authorized officer of CATS.

The insurance policies shall provide that the insurance carrier must give CATS notice at least thirty (30) days in advance of cancellation of coverage, of any change in coverage, or of cancellation of the policy. Notwithstanding any provisions of this Section, the liability assumed by Licensee shall not be limited to the required insurance.

2. RAILROAD PROTECTIVE LIABILITY INSURANCE:

The Contractor shall furnish **to the Department** an original and one duplicate of the Railroad Protective Liability Insurance Policy to protect CATS in connection with operations to be performed on or adjacent to CATS ROW. The specifications for proper evidence of insurance are as follows:

- a) The Insurer must be financially stable and rated A- or better in A. M. Best Insurance Reports.
- b) The policy must be written using the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.
- c) CATS Transportation must be the named insured on the Railroad Protective Liability Insurance Policy. The named insured's address should be listed as:

**City of Charlotte
600 East 4th Street
Charlotte, NC 28202**

- d) Limits of Liability: \$5,000,000 per occurrence, \$10,000,000 annual aggregate required.
- e) Name and Address of Contractor must be shown on the Declarations page.
- f) Name and Address of the Project Sponsor must be shown on the Declarations page.
- g) Terrorism Risk Insurance Act (TRIA) coverage must be included.

Description of operations must appear on the Declarations page and must match the project description, including project or contract identification numbers.

The Description and Designation shall read:

Charlotte, Mecklenburg, North Carolina - Concrete bridge deck rehabilitation by scarification, shot blast cleaning, and placement of polymer concrete; demolition and reconstruction of bridge deck joints and seals; demolition preparation, and application of concrete/ shotcrete repairs; epoxy injection of concrete cracks; epoxy coating of concrete bent caps on the existing Bridge 590322, I-277 over CATS Blue Line Milepost BLN 0.61-1 12th Street Crossing; NCDOT Project Number I-5746C.

Authorized endorsements:

A. Must include:

- 1) **Pollution Exclusion Amendment - CG 28 31**
(Not required with CG 00 35 01 96 and newer versions)
- 2) **Delete Common Policy Conditions** – Section E. Premiums

B. May Include:

- 1) Broad Form Nuclear Exclusion - IL 00 21
- 2) 30-day Advance Notice of Non-renewal
- 3) Required State Cancellation Endorsement
- 4) Quick Reference or Index - CL/IL 240

C. May not include:

- 1) Any Pollution Exclusion Endorsement except CG 28 31
- 2) Any Punitive or Exemplary Damages Exclusion
- 3) Any endorsement not named in A or B
- 4) Any type of deductible policy
- 5) An Endorsement that excludes TRIA coverage
- 6) An Endorsement that limits or excludes Professional Liability coverage
- 7) A Non-Cumulation of Liability or Pyramiding of Limits Endorsement
- 8) A Known Injury Endorsement
- 9) A Sole Agent Endorsement
- 10) A “Common Policy Conditions” Endorsement

- B. Prior to entry on CATS ROW, the **original** Railroad Protective Liability Insurance Policy shall be submitted by the Prime Contractor to the Department at the address below for its review and transmittal to CATS. In addition, certificates of insurance evidencing the Prime Contractor’s Commercial General Liability Insurance shall be “issued” to CATS **and** the Department at the addresses below and **forwarded to the Department** for its review and transmittal to CATS. No work will be permitted by CATS on its ROW until it has reviewed and approved the evidence of insurance required herein.

DEPARTMENT:

Department of Transportation

Rail Division

C/O Meredith McLamb, State Railroad Agent

1. 1556 Mail Service Center
Raleigh NC 27699-1556

RAILROAD:

City of Charlotte

600 East 4th Street

Charlotte, NC 28202

- C. Contractor must submit the complete Railroad Protective Liability policy, Certificates of Insurance and all notices and correspondence regarding the insurance policies in an electronic format to:

Chrislee Gibson, Insurance & Risk Coordinator
chrislee.gibson@charlottenc.gov

- D. The insurance required herein shall in no way serve to limit the liability of Department or its Contractors under the terms of this agreement.
- E. No extra allowance will be made for the insurance required hereunder; the entire cost of same is to be included in the unit contract price bids for the several pay items.

**RAILROAD GENERAL SPECIAL PROVISIONS - CSX
TRANSPORTATION, INC.**

(SPECIAL)

When performing work on, over, or adjacent to CSX transportation (“CSXT”) right-of-way or operations, selected contractor (“Contractor”) must abide by the current CSXT Special Provisions and the following additional requirements.

1. AUTHORITY OF CSXT ENGINEER

The CSXT Representative shall have final authority in all matters affecting the safe maintenance of CSXT operations and CSXT property, and his or her approval shall be obtained by the Contractor for methods of construction to avoid interference with CSXT operations and CSXT property and all other matters contemplated by the Agreement and these Special Provisions.

2. INTERFERENCE WITH CSXT OPERATIONS

- A. Contractor shall arrange and conduct its work so that there will be no interference with CSXT operations, including trail, signal, telephone and telegraphic services, or damage to CSXT’s property, or to poles, wires, and other facilities of tenants on CSXT’s Property or right-of-way. Contractor shall store materials so as to prevent trespassers from causing damage to trains, or CSXT Property. Whenever Work is likely to affect the operations or safety of trains, the method of doing such Work shall

first be submitted to the CSXT Representative for approval, but such approval shall not relieve Contractor from liability in connection with such Work.

- D. If conditions arising from or in connection with the Project require that immediate and unusual provisions be made to protect train operation or CSXT's property, Contractor shall make such provision. If the CSXT Representative determines that such provision is insufficient, CSXT may, at the expense of the Contractor, require or provide such provision as may be deemed necessary, or cause the Work to cease immediately.

3. NOTICE OF STARTING WORK

The Contractor shall not commence any work on CSXT Property or rights-of-way until it has complied with the following conditions:

- A. Notify CSXT in writing of the date that it intends to commence Work on the Project. Such notice must be received by CSXT at least ten business days in advance of the date the Contractor proposes to begin Work on CSXT property. The notice must refer to this Agreement by date. If flagging service is required, such notice shall be submitted at least thirty (30) business days in advance of the date scheduled to commence the Work.
- B. Obtain authorization from the CSXT Representative to begin Work on CSXT property. Such authorization to include an outline of specific conditions with which it must comply.
- D. Obtain from CSXT the names, addresses, and telephone numbers of CSXT's personnel who must receive notice under provisions in the Agreement. Where more than one individual is designated, the area of responsibility of each shall be specified.

4. WORK CORRESPONDENCE AND SUBMITTALS

All construction related correspondence will be directed to Arcadis, acting as the Construction Monitoring Representative ("CMR") on behalf of CSXT, with the following contact and address:

Mr. Randy Koonce
Construction Manager CSXT
Arcadis
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607
(919) 357-8777

Upon receipt of notification, the CMR will direct the Contractor to the local CSXT construction contact for the project.

All required work plan submittals shall be forwarded to and approved in writing by the Railroad Company prior to proceeding with the work of each applicable phase. Up to thirty (30) days will be required to review all submittals. Up to an additional thirty (30) days will be required to review any subsequent submissions returned not approved.

5. PRECONSTRUCTION MEETING

Prior to any construction activities on or about CSXT, the Contractor shall have a pre-construction meeting with CSXT's designated representative and the CMR to discuss potential on-track safety issues during project construction activities.

6. REQUIRED SUBMITTALS

The Contractor shall submit, including but not limited to, the following construction procedures and documents. The Contractor shall obtain written acceptance of each from CSXT, before proceeding with maintenance work or entering railroad right of way.

- F. Means and Methods – The Contractor shall develop a detailed submission indicating the progression of work with specific times when tasks will be performed during the project. This submission may require a walkthrough at which time CSXT and/or the CMR will be present. Work will not be permitted to commence until the Contractor has provided CSXT with a satisfactory plan that project will be undertaken without scheduling, performance or safety related issues. Provide a listing of the anticipated equipment to be used, the location of all equipment to be used and insure a contingency plan of action is in place should a primary piece of equipment malfunction. All work in the vicinity of CSXT property that has the potential of affecting CSXT train operations must be submitted and approved by CSXT prior to work being performed. This submission will also include a detailed narrative discussing the coordination of project safety issues between NCDOT, Contractor, CSXT and the CMR. The narrative shall address project level coordination and day to day, specific work operations including crane and equipment operations and debris containment.

- B. Containment System – Removed paint and debris may not be deposited on the CSXT right-of-way at any time during cleaning operations. Vacuum type systems for paint removal operations to prevent paint and debris deposits are required in lieu of a containment system over the track(s). The Contractor may submit a containment system for work over CSXT for acceptance by the railroad if the following CSXT horizontal and vertical clearance standards can be maintained. Any temporary containment system shall not encroach horizontally within eighteen feet (18') measured perpendicularly from the centerline of the nearest track. Any containment system must also maintain the existing vertical clearance over all tracks or a minimum of 23'-0" measured from top of high rail to the lowest point of structure in the clearance area which extends 6'-0" to both sides from centerline of track. If the

existing vertical clearance is less than 23'-0", no reduction in vertical clearance is permissible. Temporary reductions in vertical and horizontal clearances are not permitted. A construction submittal must be provided and include a written installation and removal procedure and a plan showing the details of the containment system. This submission is to include any work platforms with design loads and supporting calculations signed and sealed by a Professional Engineer in the State of North Carolina. The design of the system shall also be in accordance with OSHA and fully comply with all federal, state, and local environment laws, regulations, statutes and ordinances at all times.

- C. Ballast Protection – A ballast protection system may be required at the sole discretion of CSXT depending on the contractor's proposed methods to perform the work. The system shall use filter fabric and indicate the anchorage system. The ballast protection is to extend a minimum of 25' beyond the proposed limit of work or greater as determined by CSXT and be continuously maintained to prevent all contaminants from entering the ballast section of all tracks for the entire duration of the project.
- D. Construction Schedule – Within 30 days of the pre-construction meeting, Contractor shall submit a detailed construction schedule for the duration of the project clearly indicating the time periods while working on and around CSXT right-of-way. As the work progresses, the schedule shall be updated and resubmitted as necessary to reflect changes in work sequence, duration and method, etc.
- E. Insurance – Submit all necessary insurance information in accordance with the current CSXT Insurance Requirements for approval. The complete original policies should be submitted to: insurancedocuments@csx.com along with a copy to the CMR. The insurance policies will be required to be in place and approved prior to any work commencing on or that could potentially impact CSXT right-of-way.
- F. Emergency Action Plan – Submit an emergency action plan indicating the location of the site, contact numbers, access to the site, instructions for emergency response and location of the nearest hospitals. This plan should cover all items required in the event of an emergency at the site including fire suppression. Coordinate the Emergency Action Plan with the safety related discussion of the Means and Methods submission discussed above. The plan should also include a method to provide this information to each project worker for each day on site.

7. WORK FOR THE BENEFIT OF THE CONTRACTOR

- A. No temporary or permanent changes to wire lines or other facilities (other than third party fiber optic cable transmission systems) on CSXT property that are considered necessary to the Work are anticipated or shown on the Plans. If any such changes are, or become, necessary in the opinion of CSXT or NCDOT, such changes will be covered by appropriate revisions to the Plans and by preparation of a force account estimate. Such force account estimate may be initiated by either CSXT or NCDOT, but must be approved by both CSXT and NCDOT. The Contractor shall be responsible for

arranging for the relocation of the third party fiber optic cable transmission systems, at no cost or expense to CSXT.

- B. Should the Contractor desire any changes in addition to the above, then it shall make separate arrangements with CSXT for such changes to be accomplished at the Contractor's expense.

8. HAUL ACROSS RAILROAD

- B. If Contractor desires access across CSXT property or tracks at other than an existing and open public road crossing in or incident to construction of the Project, the Agency or Contractor must first obtain the permission of CSXT and shall execute a license agreement or right of entry satisfactory to CSXT, wherein Agency or Contractor agrees to bear all costs and liabilities related to such access.
- G. NCDOT and Contractor shall not cross CSXT's property and tracks with vehicles or equipment of any kind or character, except at such crossing or crossings as may be permitted pursuant to this section.
- H. Contractor access will be limited to the immediate project area only. The CSXT right-of-way may not be used for contractor access to the project site and no temporary at-grade crossings will be allowed.

9. COOPERATION AND DELAYS

- A. The Contractor shall arrange a schedule with CSXT for accomplishing work by CSXT. In arranging its schedule, Contractor shall ascertain, from CSXT, the lead time required for assembling crews and materials and shall make due allowance therefore.
- B. The Contractor may not charge any costs or submit any claims against CSXT for hindrance or delay caused by railroad traffic; work done by CSXT or other delay incident to or necessary for safe maintenance of railroad traffic; or for any delays due to compliance with these Special Provisions.
- C. The Contractor shall cooperate with others participating on this Project to the end that all work may be carried on to the best advantage.
- I. The Contractor understands and agrees that neither NCDOT nor CSXT assume any responsibility for work performed by others in connection with the Project. The Contractor further understands and agrees that they shall have no claim whatsoever against NCDOT or CSXT for any inconvenience, delay or additional cost incurred by the Contractor on account of operations by others.

10. CSXT EMERGENCY NUMBER

The CSXT telephone number for emergencies is 800-232-0144. Reference the CSXT Milepost SF 330.640 and DOT #631405U, when calling.

11. STORAGE OF MATERIALS AND EQUIPMENT

The CSXT right-of-way must remain clear for railroad use at all times. Contractor shall not store their materials or equipment on CSXT's property, right-of-way, or where they may potentially interfere with CSXT's operations, unless Contractor has received CSXT Representative's prior written permission. Contractor understand and agree that CSXT will not be liable for any damage to such materials and equipment from any cause and that CSXT may move, or require Contractor to move, such material and equipment at Contractor's sole expense. To minimize the possibility of damage to the railroad tracks resulting from the unauthorized use of equipment, all grading or other construction equipment that is left parked near the tracks unattended by watchmen shall be immobilized to the extent feasible so that it cannot be moved by unauthorized persons.

12. CONSTRUCTION PROCEDURES

B. General

7. Work on CSXT property shall be subject to CSXT inspection and approval.
8. Work on CSXT property shall be in accord with CSXT's written outline of specific conditions and with these Special Provisions.
9. Contractor shall observe the terms and rules of the CSXT Safe Way manual, which Agency and Contractor shall be required to obtain from CSXT, and in accord with any other instructions furnished by CSXT or CSXT's Representative.
10. Contractor access will be limited to the immediate project area only. The CSXT right-of-way may not be used for contractor access to the project site.
11. The Contractor will be required to abide by the provisions of the NCDOT/CSXT Railroad Agreement. Periodically, throughout the project duration, the Contractor will be required to meet, discuss and, if necessary, take immediate action at the discretion of CSXT personnel to comply with provisions of that agreement and these specifications.
12. Contractor agrees to fully comply with all federal, state, and local environmental laws, regulations, statutes and ordinances at all times

C. Blasting

1. Contractor shall obtain CSXT Representative's and Agency Representative's prior written approval for use of explosives on or adjacent to CSXT property. If permission for use of explosives is granted, Contractor must comply with the following:
 - a. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of Contractor.

- b. Electric detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.
 - c. No blasting shall be done without the presence of an authorized representative of CSXT. At least thirty (30) days advance notice to CSXT Representative is required to arrange for the presence of an authorized CSXT representative and any flagging that CSXT may require.
 - d. Contractor must have at the Project site adequate equipment, labor and materials, and allow sufficient time, to (i) clean up (at Contractor's expense) debris resulting from the blasting without any delay to trains; and (ii) correct (at Contractor's expense) any track misalignment or other damage to CSXT's property resulting from the blasting, as directed by CSXT Representative, without delay to trains. If Contractor's actions result in delay of any trains, including Amtrak passenger trains, Agency shall bear the entire cost thereof.
 - e. Contractor shall not store explosives on CSXT property.
2. CSXT Representative will:
- a. Determine the approximate location of trains and advise Contractor of the approximate amount of time available for the blasting operation and clean-up.
 - b. Have the authority to order discontinuance of blasting if, in his or her opinion, blasting is too hazardous or is not in accord with these Special Provisions.

D. DOT Number Identification

The Contractor shall paint on the structure the DOT Number assigned to the grade separation. The number assigned to this grade separation is DOT #631405U. This number shall be affixed at a location on each side of the CSXT tracks or property and in a manner such that it can be readily discerned and visible from track level. The font size of the DOT # numbers and letter should be at least four inches (4") tall and shall be black on a light-colored background or white on a dark-colored background of the grade separation component.

13. MAINTENANCE OF DITCHES ADJACENT TO CSXT TRACKS

Contractor shall maintain all ditches and drainage structures free of silt or other obstructions that may result from their operations. Contractor shall provide erosion control measures during construction and use methods that accord with applicable state standard specifications for road and bridge construction, including either (1) silt fence; (2) hay or straw barrier; (3) berm or temporary ditches; (4) sediment basin; (5) aggregate checks; and (6) channel lining. All such maintenance and repair of damages due to Contractor's operations shall be performed at Contractor's expense.

No stormwater from the project may discharge onto the CSXT right-of-way at any time during construction.

The Contractor may be required to submit a detailed erosion control plan for review and acceptance by CSXT or the CMR prior to performing any work.

14. FLAGGING/INSPECTION SERVICE

- A. CSXT has sole authority to determine the need for flagging required to protect its operations and property. In general, flagging protection will be required whenever Contractor or their equipment are, or are likely to be, working within fifty (50) feet of live track or other track clearances specified by CSXT, or over tracks.
- B. All equipment operations that could potentially impact CSXT right-of-way must be coordinated with the CSXT Flagman.
- C. NCDOT shall reimburse CSXT directly for all costs of flagging that is required on account of work within CSXT property shown in the Plans, or that is covered by an approved plan revision, supplemental agreement or change order. All bills shall be prepared in accordance with the Federal-Aid Policy Guide 23 CFR 646B.
- D. The Contractor shall give a minimum of thirty (30) days advance notice to CSXT Representative for anticipated need for flagging service. Flagging requests should be made to CSXT Roadmaster, Brandon Horne, at telephone (704) 401-3187. No work shall be undertaken until the flag person(s) is/are at the job site. While CSXT cannot guarantee the availability of flagmen at all requested times, every accommodation will be extended to the Contractor when forces are available. If it is necessary for CSXT to advertise a flagging job for bid, it may take up to 90 days to obtain this service and CSXT shall not be liable for the cost of delays attributable to obtaining such service. Termination or cancellation of a flagman requires ten (10) days notice to avoid incurring costs.
- E. CSXT shall have the right to assign an individual to the site of the Project to perform inspection service whenever, in the opinion of CSXT Representative, such inspection may be necessary. NCDOT shall reimburse CSXT for the costs incurred by CSXT for such inspection service. Inspection service shall not relieve the Contractor from liability for its Work.
- G. CSXT shall render invoices for, and NCDOT shall pay for, the actual pay rate of the flag persons and inspectors used, plus standard additives, whether that amount is above or below the rate provided in the Estimate. If the rate of pay that is to be used for inspector or flagging service is changed before the work is started or during the progress of the work, whether by law or agreement between CSXT and its employees, or if the tax rates on labor are changed, bills will be rendered by CSXT and paid by NCDOT using the new rates. The Contractor shall perform their operations that require flagging protection or inspection service in such a manner and sequence that the cost of such will be as economical as possible.

15. CLEAN-UP

The Contractor, upon completion of the Project, shall remove from CSXT's Property any temporary grade crossings, any temporary erosion control measures used to control drainage, all machinery, equipment, surplus materials, falsework, rubbish, or temporary buildings belonging to NCDOT or Contractor. The Contractor, upon completion of the Project, shall leave CSXT Property in neat condition, satisfactory to CSXT Representative.

16. COMPLETION AND ACCEPTANCE OF WORK

Upon completion of the work, the Contractor shall remove from within the limits of the railroad right of way all machinery, equipment, surplus materials, rubbish or temporary buildings of the Contractor, and leave said rights-of-way in a neat and orderly condition. After the final inspection has been made and work found to be completed in a satisfactory manner acceptable to the Department of Transportation and the Railroad Company, the Department of Transportation will be notified of the Railroad Company's acceptance in writing by the Railroad Engineer within ten (10) days or as soon thereafter as practicable.

At project completion, a complete set of "As Built" plans for the proposed construction shall be submitted to CSXT Bridge Maintenance and Design Group. CSXT will keep these plans on file in Jacksonville for future reference. Please address these plans to:

Mr. E. D. Sparks, II
Assistant Chief Engineer Structures
CSX Transportation
500 Water Street, J350
Jacksonville, FL 32202

17. FAILURE TO COMPLY

If Contractor violates or fails to comply with any of the requirements of these Special Provisions, (a) CSXT may require Contractor to vacate CSXT Property; and (b) CSXT may withhold monies due Agency and/or Contractor; (c) CSXT may require Agency to withhold monies due Contractor; and (d) CSXT may cure such failure and the Contractor shall reimburse CSXT for the cost of curing such failure.

18. TRAIN DATA

Freight
18 Trains
40 MPH
One track

INSURANCE SPECIAL PROVISIONS FOR CSX TRANSPORTATION, INC.

- A. In addition to any other forms of insurance or bonds required elsewhere in the contract documents, the Prime Contractor will be required to provide coverage conforming to the requirements of the Federal-Aid Policy Guide outlined under 23 CFR 646A for all work to

be performed on Railroad right(s)-of-way under the terms of the contract by carrying insurance as listed below.

If any part of the work is sublet, similar insurance and evidence thereof in the same amounts as required of the Prime Contractor, shall be provided by the subcontractor to cover his operations on railroad right-of-way. As an alternative, the Prime Contractor may provide insurance for the subcontractor by means of separate and individual policies.

3. CONTRACTOR'S COMMERCIAL GENERAL LIABILITY INSURANCE

The Contractor shall procure and maintain, at its expense, an original and one certified copy of the policy **to the Department** as evidence of:

- e. Statutory Worker's Compensation and Employers Liability Insurance with available limits of not less than \$1,000,000, which insurance must contain a waiver of subrogation against CSXT and its Affiliates.
- f. Commercial General Liability coverage (inclusive of contractual liability) with available limits of not less than \$5,000,000 in combined single limits for bodily injury and property damage per occurrence, and covering the contractual liabilities assumed under this Agreement.
- g. Commercial Automobile Liability insurance with limits of not less than \$1,000,000 combined single limit for bodily injury and/or property damage per occurrence.
- h. Such other insurance as CSXT may reasonably require.

Upon request, Licensee shall provide CSXT with a copy of Licensee's applicable insurance policies. A policy endorsement naming CSXT as an **additional insured** and specifying such coverage shall be furnished to CSXT, and the required coverage will be kept in force until all of the licensee's obligations under this Agreement have been fully discharged and fulfilled, or until Licensee shall have been specifically released by a written instrument signed by an authorized officer of CSXT.

The insurance policies shall provide that the insurance carrier must give CSXT notice at least thirty (30) days in advance of cancellation of coverage, of any change in coverage, or of cancellation of the policy. Notwithstanding any provisions of this Section, the liability assumed by Licensee shall not be limited to the required insurance.

4. RAILROAD PROTECTIVE LIABILITY INSURANCE

The Contractor shall furnish **to the Department** an original and one duplicate of the Railroad Protective Liability Insurance Policy to protect CSXT in connection with operations to be performed on or adjacent to CSXT right of way. The specifications for proper evidence of insurance are as follows:

- h) The Insurer must be financially stable and rated A- or better in A. M. Best Insurance Reports.
- i) The policy must be written using the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.
- j) CSX Transportation must be the named insured on the Railroad Protective Liability Insurance Policy. The named insured's address should be listed as:

**CSX Transportation, Inc.
Risk Management (C- 907)
500 Water Street
Jacksonville, FL 32202**

- k) Limits of Liability: \$5,000,000 per occurrence, \$10,000,000 annual aggregate required.
- l) Name and Address of Contractor must be shown on the Declarations page.
- m) Name and Address of the Project Sponsor must be shown on the Declarations page.
- n) Terrorism Risk Insurance Act (TRIA) coverage must be included.

Description of operations must appear on the Declarations page and must match the project description, including project or contract identification numbers.

The Description and Designation shall read:

Charlotte, Mecklenburg, North Carolina - repair section loss of steel beams; clean and paint existing bridge bearings with HRCSA; clean and spot paint locations of structural steel repairs; epoxy inject concrete cracks; clean and repair reinforcing in shotcrete and concrete repair areas; perform shotcrete and concrete repair in prepared areas; partially remove concrete bridge deck using scarifications and shotblasting methods; demolish existing bridge deck joints; overlay prepared bridge deck with polyester polymer concrete overlay; reconstruct bridge deck joints and install foam joint seals; and remove debris from bent caps and apply epoxy coating on Bridge 332 (I-277 over Johnson Street, NC Music Factory Boulevard, CSX Railroad, and Norfolk Southern Railroad), Florence Division; Charlotte Subdivision; Milepost SF 330.640; DOT# 631405U; NCDOT Project No. I-5746C.

Authorized endorsements:

A. Must include:

- 1) **Pollution Exclusion Amendment - CG 28 31**

(Not required with CG 00 35 01 96 and newer versions)

2) **Delete Common Policy Conditions** – Section E. Premiums

B. May Include:

- 1) Broad Form Nuclear Exclusion - IL 00 21
- 2) 30-day Advance Notice of Non-renewal
- 3) Required State Cancellation Endorsement
- 4) Quick Reference or Index - CL/IL 240

C. May not include:

- 1) Any Pollution Exclusion Endorsement except CG 28 31
- 2) Any Punitive or Exemplary Damages Exclusion
- 3) Any endorsement not named in A or B
- 4) Any type of deductible policy
- 5) An Endorsement that excludes TRIA coverage
- 6) An Endorsement that limits or excludes Professional Liability coverage
- 7) A Non-Cumulation of Liability or Pyramiding of Limits Endorsement
- 8) A Known Injury Endorsement
- 9) A Sole Agent Endorsement
- 10) A “Common Policy Conditions” Endorsement

F. Prior to entry on CSXT right-of-way, the **original** Railroad Protective Liability Insurance Policy shall be submitted by the Prime Contractor to the Department at the address below for its review and transmittal to CSXT. In addition, certificates of insurance evidencing the Prime Contractor’s Commercial General Liability Insurance shall be “issued” to CSXT **and** the Department at the addresses below, and **forwarded to the Department** for its review and transmittal to CSXT. No work will be permitted by CSXT on its right-of-way until it has reviewed and approved the evidence of insurance required herein.

DEPARTMENT:

Department of Transportation
Rail Division
c/o Meredith McLamb, State Railroad Agent

RAILROAD:

CSX Transportation, Inc.
Risk Management (C-907)
500 Water Street

1556 Mail Service Center
Raleigh NC 27699-1556

Jacksonville, FL 32202

- G. Contractor must submit the complete Railroad Protective Liability policy, Certificates of Insurance and all notices and correspondence regarding the insurance policies in an electronic format to:
insurancedocuments@csx.com
- H. The insurance required herein shall in no way serve to limit the liability of Department or its Contractors under the terms of this agreement.
- I. No extra allowance will be made for the insurance required hereunder; the entire cost of same is to be included in the unit contract price bids for the several pay items.

SPECIAL PROVISIONS FOR PROTECTION OF RAILWAY INTEREST (SPECIAL)

Under the terms of these provisions, the North Carolina Department of Transportation shall hereinafter be called “Sponsor”, and the Norfolk Southern Railway Company shall hereinafter be called “Railroad”.

The **Norfolk Southern – Special Provisions for Protection of Railway Interests**, found as Appendix E of the [Norfolk Southern Public Projects Manual](#), shall serve as the basis for the railroad provisions of this contract and are attached as part of this provision. The following additional statements are to be included as addendums to the attached provisions:

- Section 2.A.2 - should include the following contact information:

Unless noted elsewhere in these provisions, all contact with Railroad should be addressed to

Mr. Scott Overbey
Public Projects Engineer
scott.overbey@nscorp.com

- Section 7.A.3 - The following paragraph shall be added as the third paragraph

Should such violations or unscheduled, unauthorized work by the Contractor result in full time flagging being required by the Railroad, the additional cost of such flagging above normal flagging cost shall be deducted from the final payment to the Contractor as provided in Article 109-9 of the Standard Specifications. Neither Department nor Railroad will be liable for damages resulting from unscheduled or unauthorized work.

- Section 7.C.1 - Include the following sentence at the end of the first paragraph

The Contractor shall reimburse the Railroad for any costs of the flagging which is required for work for the benefit of the Contractor.

- Section 8.A - Include the following sentence at the end of the first paragraph

The Contractor will be required to bear all costs incidental, including flagging, to such crossings whether services are performed by his own forces or by Railroad personnel. Written approval from the Engineer is required prior to use of the crossings.

- Section 14.A.2.d - The Project Description and Designation on the Declarations shall read:

Bridge preservation activities on Mecklenburg County Bridge No. 332 carrying I-277/NC 16 over NC Music Factory Blvd., CSXT, and Norfolk Southern Railroad, near Milepost 0377.08 (Piedmont Division, Atlanta Washington Main Subdivision, Crossing # 716159A) identified for preliminary engineering as State Project I-5746C in Mecklenburg County and in connection therewith proposes to perform preservation work on the overhead structure and appurtenant works across Railroad's right of way, tracks and other facilities

- Section 14.C - Insurance documents shall be submitted to the Sponsor at the following address:

NCDOT Rail Division
Engineering & Safety Branch
C/O State Railroad Agent
1556 Mail Service Center
Raleigh, NC 27699-1556

E. NORFOLK SOUTHERN – SPECIAL PROVISIONS FOR PROTECTION OF RAILWAY INTERESTS

1. AUTHORITY OF RAILROAD ENGINEER AND SPONSOR ENGINEER:

Norfolk Southern Railway Company, hereinafter referred to as “Railroad”, and their authorized representative shall have final authority in all matters affecting the safe maintenance of railroad traffic including the adequacy of the foundations and structures supporting the railroad tracks. For Public Projects impacting the Railroad, the Railroad’s Public Projects Engineer, hereinafter referred to as “Railroad Engineer”, will serve as the authorized representative of the Railroad.

The authorized representative of the Project Sponsor (“Sponsor”), hereinafter referred to as the “Sponsor’s Engineer”, shall have authority over all other matters as prescribed herein and in the Project Specifications.

The Sponsor’s Prime Contractor, hereinafter referred to as “Contractor” shall be responsible for completing any and all work in accordance with the terms prescribed herein and in the Project Specifications. These terms and conditions are subject to change without notice, from time to time in the sole discretion of the Railroad. Contractor must request from Railroad and follow the latest version of these provisions prior to commencing work.

2. NOTICE OF STARTING WORK:

A. The Contractor shall not commence any work on railroad rights-of-way until he has complied with the following conditions:

1. Signed and received a fully executed copy of the required Norfolk Southern Contractor Right of Entry Agreement.
2. Given the Railroad written notice in electronic format to the Railroad Engineer, with copy to the Sponsor’s Engineer who has been designated to be in charge of the work, at least ten days in advance of the date he proposes to begin work on Railroad rights-of-way.
3. Obtained written approval from the Railroad of Railroad Protective Liability Insurance coverage as required by paragraph 14 herein. It should be noted that the Railroad does not accept notation of Railroad Protective insurance on a certificate of liability insurance form or Binders as Railroad must have the full original countersigned policy. Further, please note that mere receipt of the policy is not the only issue but review for compliance. Due

to the number of projects system-wide, it typically takes a minimum of 30-45 days for the Railroad to review.

4. Obtained Railroad's Flagger Services as required by paragraph 7 herein.
5. Obtained written authorization from the Railroad to begin work on Railroad's rights-of-way, such authorization to include an outline of specific conditions with which he must comply.
6. Furnished a schedule for all work within the Railroad's rights-of-way as required by paragraph 7.B.1.

- B. The Railroad's written authorization to proceed with the work shall include the names, addresses, and telephone numbers of the Railroad's representatives who are to be notified as hereinafter required. Where more than one representative is designated, the area of responsibility of each representative shall be specified.

3. INTERFERENCE WITH RAILROAD OPERATIONS:

- A. The Contractor shall so arrange and conduct his work that there will be no interference with Railroad's operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad or to poles, wires, and other facilities of tenants on the rights-of-way of the Railroad. Whenever work is liable to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor which requires flagging service or inspection service shall be deferred by the Contractor until the flagging service or inspection service required by the Railroad is available at the job site.
- B. Whenever work within Railroad's rights-of-way is of such a nature that impediment to Railroad's operations such as use of runaround tracks or necessity for reduced speed is unavoidable, the Contractor shall schedule and conduct his operations so that such impediment is reduced to the absolute minimum.
- C. Should conditions arising from, or in connection with the work, require that immediate and unusual provisions be made to protect operations and property of the Railroad, the Contractor shall make such provisions. If in the judgment of the Railroad Engineer, or in his absence, the Railroad's Division Engineer, such provisions is insufficient, either may require or provide such provisions as he deems necessary. In any event, such unusual provisions shall be at the Contractor's expense and without cost to the Railroad or the Sponsor.

- D. "One Call" Services do not locate buried Railroad utilities. The contractor shall contact the Railroad's representative 2 days in advance of work at those places where excavation, pile driving, or heavy loads may damage the Railroad's underground facilities. Upon request from the Contractor or Sponsor, Railroad forces will locate and paint mark or flag the Railroad's underground facilities. The Contractor shall avoid excavation or other disturbances of these facilities. If disturbance or excavation is required near a buried Railroad facility, the contractor shall coordinate with the Railroad to have the facility potholed manually with careful hand excavation. The facility shall be protected by the Contractor during the course of the disturbance under the supervision and direction of the Railroad's representative.

4. TRACK CLEARANCES:

- A. The minimum track clearances to be maintained by the Contractor during construction are shown on the Project Plans. If temporary clearances are not shown on the project plans, the following criteria shall govern the use of falsework and formwork above or adjacent to operated tracks.
1. A minimum vertical clearance of 22'-0" above top of highest rail shall be maintained at all times.
 2. A minimum horizontal clearance of 13'-0" from centerline of tangent track or 14'-0" from centerline of curved track shall be maintained at all times. Additional horizontal clearance may be required in special cases to be safe for operating conditions. This additional clearance will be as determined by the Railroad Engineer.
 3. All proposed temporary clearances which are less than those listed above must be submitted to Railroad Engineer for approval prior to construction and must also be authorized by the regulatory body of the State if less than the legally prescribed clearances.
 4. The temporary clearance requirements noted above shall also apply to all other physical obstructions including, but not limited to: stockpiled materials, parked equipment, placement or driving of piles, and bracing or other construction supports.
- B. Before undertaking any work within Railroad right-of-way, and before placing any obstruction over any track, the Contractor shall:
1. Notify the Railroad's representative at least 72 hours in advance of the work.

2. Receive assurance from the Railroad's representative that arrangements have been made for flagging service as may be necessary.
3. Receive permission from the Railroad's representative to proceed with the work.
4. Ascertain that the Sponsor's Engineer has received copies of notice to the Railroad and of the Railroad's response thereto.

5. CONSTRUCTION PROCEDURES:

A. General:

1. Construction work and operations by the Contractor on Railroad property shall be:
 - a. Subject to the inspection and approval of the Railroad Engineer or their designated Construction Engineering Representative.
 - b. In accordance with the Railroad's written outline of specific conditions.
 - c. In accordance with the Railroad's general rules, regulations and requirements including those relating to safety, fall protection and personal protective equipment.
 - d. In accordance with these Special Provisions.
2. Submittal Requirements
 - a. The Contractor shall submit all construction related correspondence and submittals electronically to the Railroad Engineer.
 - b. The Contractor shall allow for 30 days for the Railroad's review and response.
 - c. All work in the vicinity of the Railroad's property that has the potential to affect the Railroad's train operations or disturb the Railroad's Property must be submitted and approved by the Railroad prior to work being performed.
 - d. All submittals and calculations must be signed and sealed by a registered engineer licensed in the state of the project work.

- e. All submittals shall first be approved by the Sponsor's Engineer and the Railroad Engineer, but such approval shall not relieve the Contractor from liability.

- f. For all construction projects, the following submittals, but not limited to those listed below, shall be provided for review and approval when applicable:
 - (1) General Means and Methods
 - (2) Ballast Protection
 - (3) Construction Excavation & Shoring
 - (4) Pipe, Culvert, & Tunnel Installations
 - (5) Demolition Procedure
 - (6) Erection & Hoisting Procedure
 - (7) Debris Shielding or Containment
 - (8) Blasting
 - (9) Formwork for the bridge deck, diaphragms, overhang brackets, and protective platforms
 - (10) Bent Cap Falsework. A lift plan will be required if the contractor want to move the falsework over the tracks.

- g. For Undergrade Bridges (Bridges carrying the Railroad) the following submittals in addition to those listed above shall be provided for review and approval:
 - (1) Shop Drawings
 - (2) Bearing Shop Drawings and Material Certifications
 - (3) Concrete Mix Design
 - (4) Structural Steel, Rebar, and/or Strand Certifications
 - (5) 28 day Cylinder Test for Concrete Strength
 - (6) Waterproofing Material Certification
 - (7) Test Reports for Fracture Critical Members
 - (8) Foundation Construction Reports

Fabrication may not begin until the Railroad has approved the required shop drawings.

- h. The Contractor shall include in all submissions a detailed narrative indicating the progression of work with the anticipated timeframe to complete each task. Work will not be permitted to commence until the Contractor has provided the Railroad with a satisfactory plan that the project will be undertaken without scheduling, performance or safety related issues. Submission shall also provide a listing of the anticipated

equipment to be used, the location of all equipment to be used and insure a contingency plan of action is in place should a primary piece of equipment malfunction.

B. Ballast Protection

1. The Contractor shall submit the proposed ballast protection system detailing the specific filter fabric and anchorage system to be used during all construction activities.
2. The ballast protection is to extend 25' beyond the proposed limit of work, be installed at the start of the project and be continuously maintained to prevent all contaminants from entering the ballast section of all tracks for the entire duration of the project.

C. Excavation:

1. The subgrade of an operated track shall be maintained with edge of berm at least 10'-0" from centerline of track and not more than 24-inches below top of rail. Contractor will not be required to make existing section meet this specification if substandard, in which case existing section will be maintained.
2. Additionally, the Railroad will require the installation of an OSHA approved handrail and orange construction safety fencing for all excavations of the Railroad right-of-way.

D. Excavation for Structures and Shoring Protection:

1. The Contractor will be required to take special precaution and care in connection with excavating and shoring pits, and in driving piles or sheeting for footings adjacent to tracks to provide adequate lateral support for the tracks and the loads which they carry, without disturbance of track alignment and surface, and to avoid obstructing track clearances with working equipment, tools or other material.
2. All plans and calculations for shoring shall be prepared, signed, and sealed by a Registered Professional Engineer licensed in the state of the proposed project, in accordance with Norfolk Southern's Overhead Grade Separation Design Criteria, subsection H.1.6.E-Construction Excavation (Refer to Norfolk Southern Public Projects Manual Appendix H). The Registered Professional Engineer will be responsible for the accuracy for all controlling dimensions as well as the selection of soil design values which will accurately reflect the actual field conditions.

3. The Contractor shall provide a detailed installation and removal plan of the shoring components. Any component that will be installed via the use of a crane or any other lifting device shall be subject to the guidelines outlined in section 5.G of these provisions.
4. The Contractor shall be required to survey the track(s) and Railroad embankment and provide a cross section of the proposed excavation in relation to the tracks.
5. Calculations for the proposed shoring should include deflection calculations. The maximum deflection for excavations within 18'-0" of the centerline of the nearest track shall be 3/8". For all other cases, the max deflection shall not exceed 1/2".
6. Additionally, the Railroad will require the installation of an OSHA approved handrail and orange construction safety fencing for all excavations of the Railroad right-of-way.
7. The front face of shoring located to the closest NS track for all shoring set-ups located in Zone 2 as shown on NS Typical Drawing No. 4 – Shoring Requirements (Appendix I) shall remain in place and be cut off 2'-0" below the final ground elevation. The remaining shoring in Zone 2 and all shoring in Zone 1 may be removed and all voids must be backfilled with flowable fill.

E. Pipe, Culvert, & Tunnel Installations

1. Pipe, Culvert, & Tunnel Installations shall be in accordance with the appropriate Norfolk Southern Design Specification as noted below:
 - a. For Open Cut Method refer to Norfolk Southern Public Projects Manual Appendix H.4.6.
 - b. For Jack and Bore Method refer to Norfolk Southern Public Projects Manual Appendix H.4.7.
 - c. For Tunneling Method refer to Norfolk Southern Public Projects Manual Appendix H.4.8.
2. The installation methods provided are for pipes carrying storm water or open flow run-off. All other closed pipeline systems shall be installed in accordance Norfolk Southern's Pipe and Wire Program and the NSCE-8

F. Demolition Procedures

1. General

- a. Demolition plans are required for all spans over the track(s), for all spans adjacent to the track(s), if located on (or partially on) Railroad right-of-way; and in all situations where cranes will be situated on, over, or adjacent to Railroad right-of-way and within a distance of the boom length plus 15'-0" from the centerline of track.
- b. Railroad tracks and other Railroad property must be protected from damage during the procedure.
- c. A pre-demolition meeting shall be conducted with the Sponsor, the Railroad Engineer or their representative, and the key Contractor's personnel prior to the start of the demolition procedure.
- d. The Railroad Engineer or his designated representative must be present at the site during the entire demolition procedure period.
- e. Existing, obsolete, bridge piers shall be removed to a sufficient depth below grade to enable restoration of the existing/proposed track ditch, but in no case less than 2'-0" below final grade.

2. Submittal Requirements

- a. In addition to the submittal requirements outlined in Section 5.A.2 of these provisions, the Contractor shall submit the following for approval by the Railroad Engineer:
 - (1) A plan showing the location of cranes, horizontally and vertically, operating radii, with delivery or disposal locations shown. The location of all tracks and other Railroad facilities as well as all obstructions such as wire lines, poles, adjacent structures, etc. must also be shown.
 - (2) Rating sheets showing cranes or lifting devices to be adequate for 150% of the actual weight of the pick, including all rigging components. A complete set of crane charts, including crane, counterweight, and boom nomenclature is to be submitted. Safety factors that may have been "built-in" to the crane charts are not to be considered when determining the 150% factor of safety.

- (3) Plans and computations showing the weight of the pick must be submitted. Calculations shall be made from plans of the existing structure showing complete and sufficient details with supporting data for the demolition the structure. If plans do not exist, lifting weights must be calculated from field measurements. The field measurements are to be made under the supervision of the Registered Professional Engineer submitting the procedure and calculations.
- (4) The Contractor shall provide a sketch of all rigging components from the crane's hook block to the beam. Catalog cuts or information sheets of all rigging components with their lifting capacities shall be provided. All rigging must be adequate for 150% of the actual weight of the pick. Safety factors that may have been "built-in" to the rating charts are not to be considered when determining the 150% factor of safety. All rigging components shall be clearly identified and tagged with their rated lifting capacities. The position of the rigging in the field shall not differ from what is shown on the final plan without prior review from the Sponsor and the Railroad.
- (5) A complete demolition procedure, including the order of lifts, time required for each lift, and any repositioning or re-hitching of the crane or cranes.
- (6) Design and supporting calculations for the temporary support of components, including but not limited to the stability of the superstructure during the temporary condition, temporary girder tie-downs and falsework.

3. Overhead Demolition Debris Shield

- a. The demolition debris shield shall be installed prior to the demolition of the bridge deck or other relevant portions of the superstructure over the track area to catch all falling debris.
- b. The demolition debris shield shall provide a minimum vertical clearance as specified in Section 4.A.1 of these provisions or maintain the existing vertical clearance if the existing clearance is less than that specified in Section 4.A.1.

- c. The Contractor shall include the demolition debris shield installation/removal means and methods as part of the proposed Demolition procedure submission.
- d. The Contractor shall submit the demolition debris shield design and supporting calculations for approval by the Railroad Engineer.
- e. The demolition debris shield shall have a minimum design load of 50 pounds per square foot plus the weight of the equipment, debris, personnel, and other loads to be carried.
- f. The Contractor shall include the proposed bridge deck removal procedure in its demolition means and methods and shall verify that the size and quantity of the demolition debris generated by the procedure does not exceed the shield design loads.
- g. The Contractor shall clean the demolition debris shield daily or more frequently as dictated either by the approved design parameters or as directed by the Railroad Engineer.

4. Vertical Demolition Debris Shield

- a. A vertical demolition debris shield may be required for substructure removals in close proximity to the Railroad's track and other facilities, as determined by the Railroad Engineer.

G. Erection & Hoisting Procedures

1. General

- a. Erection plans are required for all spans over the track(s), for all spans adjacent to the track(s), if located on (or partially on) Railroad right-of-way; and in all situations where cranes will be situated on, over, or adjacent to Railroad right-of-way and within a distance of the boom length plus 15'-0" from the centerline of track.
- b. Railroad tracks and other Railroad property must be protected from damage during the erection procedure.
- c. A pre-erection meeting shall be conducted with the Sponsor, the Railroad Engineer or their representative, and the key Contractor's personnel prior to the start of the erection procedure.

- d. The Railroad Engineer or his designated representative must be present at the site during the entire erection procedure period.
- e. For field splices located over Railroad property, a minimum of 50% of the holes for each connection shall be filled with bolts or pins prior to releasing the crane. A minimum of 50% of the holes filled shall be filled with bolts. All bolts must be appropriately tightened. Any changes to previously approved field splice locations must be submitted to the Railroad for review and approval. Refer to Norfolk Southern's Overhead Grade Separation Design Criteria for additional splice details (Norfolk Southern Public Projects Manual Appendix H.1, Section 4.A.3.).

2. Submittal Requirements

- a. In addition the submittal requirements outlined in Section 5.A.2 of these provisions, the Contractor shall submit the following for approval by the Railroad Engineer:
 - (1) As-built beam seat elevations - All as-built bridge seats and top of rail elevations shall be furnished to the Railroad Engineer for review and verification at least 30 days in advance of the erection, to ensure that minimum vertical clearances as approved in the plans will be achieved.
 - (2) A plan showing the location of cranes, horizontally and vertically, operating radii, with delivery or staging locations shown. The location of all tracks and other Railroad facilities as well as all obstructions such as wire lines, poles, adjacent structures, etc. must also be shown.
 - (3) Rating sheets showing cranes or lifting devices to be adequate for 150% of the actual weight of the pick, including all rigging components. A complete set of crane charts, including crane, counterweight, and boom nomenclature is to be submitted. Safety factors that may have been "built-in" to the crane charts are not to be considered when determining the 150% factor of safety.

- (4) Plans and computations showing the weight of the pick must be submitted. Calculations shall be made from plans of the proposed structure showing complete and sufficient details with supporting data for the erection of the structure. If plans do not exist, lifting weights must be calculated from field measurements. The field measurements are to be made under the supervision of the Registered Professional Engineer submitting the procedure and calculations.
- (5) The Contractor shall provide a sketch of all rigging components from the crane's hook block to the beam. Catalog cuts or information sheets of all rigging components with their lifting capacities shall be provided. All rigging must be adequate for 150% of the actual weight of the pick. Safety factors that may have been "built-in" to the rating charts are not to be considered when determining the 150% factor of safety. All rigging components shall be clearly identified and tagged with their rated lifting capacities. The position of the rigging in the field shall not differ from what is shown on the final plan without prior review from the Sponsor and the Railroad.
- (6) A complete erection procedure, including the order of lifts, time required for each lift, and any repositioning or re-hitching of the crane or cranes.
- (7) Design and supporting calculations for the temporary support of components, including but not limited to temporary girder tie-downs and falsework.

H. Blasting:

1. The Contractor shall obtain advance approval of the Railroad Engineer and the Sponsor Engineer for use of explosives on or adjacent to Railroad property. The request for permission to use explosives shall include a detailed blasting plan. If permission for use of explosives is granted, the Contractor will be required to comply with the following:
 - a. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Contractor and a licensed blaster.
 - b. Electric detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way radios.

- c. No blasting shall be done without the presence of the Railroad Engineer or his authorized representative. At least 72 hours advance notice to the person designated in the Railroad's notice of authorization to proceed (see paragraph 2.B) will be required to arrange for the presence of an authorized Railroad representative and such flagging as the Railroad may require.
- d. Have at the job site adequate equipment, labor and materials and allow sufficient time to clean up debris resulting from the blasting without delay to trains, as well as correcting at his expense any track misalignment or other damage to Railroad property resulting from the blasting as directed by the Railway's authorized representative. If his actions result in delay of trains, the Contractor shall bear the entire cost thereof.
- e. The blasting Contractor shall have a copy of the approved blasting plan on hand while on the site.
- f. Explosive materials or loaded holes shall not be left unattended at the blast site.
- g. A seismograph shall be placed on the track shoulder adjacent to each blast which will govern the peak particle velocity of two inches per second. Measurement shall also be taken on the ground adjacent to structures as designated by a qualified and independent blasting consultant. The Railroad reserves the option to direct the placement of additional seismographs at structures or other locations of concern, without regard to scaled distance.
- h. After each blast, the blasting Contractor shall provide a copy of their drill log and blast report, which includes number of holes, depth of holes, number of decks, type and pounds of explosives used per deck.
- i. The Railroad may require top of rail elevations and track centers taken before, during and after the blasting and excavation operation to check for any track misalignment resulting from the Contractor's activities.

2. The Railroad representative will:

- a. Determine approximate location of trains and advise the Contractor the appropriate amount of time available for the blasting operation and clean up.
 - b. Have the authority to order discontinuance of blasting if, in his opinion, blasting is too hazardous or is not in accord with these special provisions.
3. The Contractor must hire, at no expense to the Railroad, a qualified and independent blasting consultant to oversee the use of explosives. The blasting consultant will:
- a. Review the Contractor's proposed drilling and loading patterns, and with the blasting consultant's personnel and instruments, monitor the blasting operations.
 - b. Confirm that the minimum amounts of explosives are used to remove the rock.
 - c. Be empowered to intercede if he concludes that the Contractor's blasting operations are endangering the Railway.
 - d. Submit a letter acknowledging that he has been engaged to oversee the entire blasting operation and that he approves of the blasting plan.
 - e. Furnish copies of all vibration readings to the Railroad representative immediately after each blast. The representative will sign and date the seismograph tapes after each shot to verify the readings are for that specific shot.
 - f. Advise the Railroad representative as to the safety of the operation and notify him of any modifications to the blasting operation as the work progresses.
4. The request for permission to use explosives on the Railroad's Right-of-Way shall include a blasting proposal providing the following details:
- a. A drawing which shows the proposed blasting area, location of nearest hole and distance to Railway structures, all with reference to the centerline of track.
 - b. Hole diameter.

- c. Hole spacing and pattern.
- d. Maximum depth of hole.
- e. Maximum number of decks per hole.
- f. Maximum pounds of explosives per hole.
- g. Maximum pounds of explosives per delay.
- h. Maximum number of holes per detonation.
- i. Type of detonator and explosives to be used. (Electronic detonating devices will not be permitted). Diameter of explosives if different from hole diameter.
- j. Approximate dates and time of day when the explosives are to be detonated.
- k. Type of flyrock protection.
- l. Type and patterns of audible warning and all clear signals to be used before and after each blast.
- m. A copy of the blasting license and qualifications of the person directly in charge of the blasting operation, including their name, address and telephone number.
- n. A copy of the Authority's permit granting permission to blast on the site.
- o. A letter from the blasting consultant acknowledging that he has been engaged to oversee the entire blasting operation and that he approves of the blasting plan.
- p. In addition to the insurance requirements outlined in Paragraph 14 of these Provisions, A certificate of insurance from the Contractor's insurer stating the amount of coverage for XCU (Explosive Collapse and Underground Hazard) insurance and that XCU Insurance is in force for this project.
- q. A copy of the borings and Geotechnical information or report.

I. Track Monitoring

- 1. At the direction of the Railroad Engineer, any activity that has the potential to disturb the Railroad track structure may require the Contractor to submit a detailed track monitoring program for approval by the Railroad Engineer.
- 2. The program shall specify the survey locations, the distance between the location points, and frequency of monitoring before, during, and after construction. Railroad reserves the right to modify the survey locations and monitoring frequency as necessary during the project.

3. The survey data shall be collected in accordance with the approved frequency and immediately furnished to the Railroad Engineer for analysis.
4. If any movement has occurred as determined by the Railroad Engineer, the Railroad will be immediately notified. Railroad, at its sole discretion, shall have the right to immediately require all Contractor operations to be ceased and determine what corrective action is required. Any corrective action required by the Railroad or performed by the Railroad including the monitoring of corrective action of the Contractor will be at project expense.

J. Maintenance of Railroad Facilities:

1. The Contractor will be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from his operations and provide and maintain any erosion control measures as required. The Contractor will promptly repair eroded areas within Railroad rights-of-way and repair any other damage to the property of the Railroad or its tenants.
2. If, in the course of construction, it may be necessary to block a ditch, pipe or other drainage facility, temporary pipes, ditches or other drainage facilities shall be installed to maintain adequate drainage, as approved by the Railroad Engineer. Upon completion of the work, the temporary facilities shall be removed and the permanent facilities restored.
3. All such maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.

K. Storage of Materials and Equipment:

1. Materials and equipment shall not be stored where they will interfere with Railroad operations, nor on the rights-of-way of the Railroad without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.
2. All grading or construction machinery that is left parked near the track unattended by a watchman shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save Railroad, and any associated, controlled or affiliated corporation, harmless from and against all losses, costs, expenses, claim or

liability for loss or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.

L. Cleanup:

1. Upon completion of the work, the Contractor shall remove from within the limits of the Railroad rights-of-way, all machinery, equipment, surplus materials, falsework, rubbish or temporary buildings of the Contractor, and leave said rights-of-way in a neat condition satisfactory to the Railroad Engineer or his authorized representative.

6. DAMAGES:

- A. The Contractor shall assume all liability for any and all damages to his work, employees, servants, equipment and materials caused by Railroad traffic.
- B. Any cost incurred by the Railroad for repairing damages to its property or to property of its tenants, caused by or resulting from the operations of the Contractor, shall be paid directly to the Railroad by the Contractor.

7. FLAGGING SERVICES:

A. Requirements:

1. Flagging services will not be provided until the Contractor's insurance has been reviewed & approved by the Railroad.
2. Under the terms of the agreement between the Sponsor and the Railroad, the Railroad has sole authority to determine the need for flagging required to protect its operations. In general, the requirements of such services will be whenever the Contractor's personnel or equipment are or are likely to be, working on the Railroad's right-of-way, or across, over, adjacent to, or under a track, or when such work has disturbed or is likely to disturb a Railroad structure or the Railroad roadbed or surface and alignment of any track to such extent that the movement of trains must be controlled by flagging.
3. Normally, the Railroad will assign one flagman to a project; but in some cases, more than one may be necessary, such as yard limits where three (3) flagmen may be required. However, if the Contractor works within distances that violate instructions given by the Railroad's authorized representative or performs work that has not been scheduled with the

Railroad's authorized representative, a flagman or flagmen may be required full time until the project has been completed.

4. For Projects exceeding 30 days of construction, Contractor shall provide the flagmen a small work area with a desk/counter and chair within the field/site trailer, including the use of bathroom facilities, where the flagman can check in/out with the Project, as well as to the flagman's home terminal. The work area should provide access to two (2) electrical outlets for recharging radio(s), and a laptop computer; and have the ability to print off needed documentation and orders as needed at the field/site trailer. This should aid in maximizing the flagman's time and efficiency on the Project.

B. Scheduling and Notification:

1. The Contractor's work requiring Railroad flagging should be scheduled to limit the presence of a flagman at the site to a maximum of 50 hours per week. The Contractor shall receive Railroad approval of work schedules requiring a flagman's presence in excess of 40 hours per week.
2. Not later than the time that approval is initially requested to begin work on Railroad right-of-way, Contractor shall furnish to the Railroad and the Sponsor a schedule for all work required to complete the portion of the project within Railroad right-of-way and arrange for a job site meeting between the Contractor, the Sponsor, and the Railroad's authorized representative. Flagman or Flagmen may not be provided until the job site meeting has been conducted and the Contractor's work scheduled.
3. The Contractor will be required to give the Railroad representative at least 10 working days of advance written notice of intent to begin work within Railroad right-of-way in accordance with this special provision. Once begun, when such work is then suspended at any time, or for any reason, the Contractor will be required to give the Railroad representative at least 3 working days of advance notice before resuming work on Railroad right-of-way. Such notices shall include sufficient details of the proposed work to enable the Railroad representative to determine if flagging will be required. If such notice is in writing, the Contractor shall furnish the Engineer a copy; if notice is given verbally, it shall be confirmed in writing with copy to the Engineer. If flagging is required, no work shall be undertaken until the flagman, or flagmen are present at the job site. It may take up to 30 days to obtain flagging initially from the Railroad. When flagging begins, the flagman is usually assigned by the Railroad to work at the project site on a continual basis until no longer needed and cannot be called for on a spot basis. If flagging becomes unnecessary and is suspended, it may take up to 30 days to again obtain from the Railroad. Due to Railroad labor

agreements, it is necessary to give 5 working days notice before flagging service may be discontinued and responsibility for payment stopped.

4. If, after the flagman is assigned to the project site, an emergency arises that requires the flagman's presence elsewhere, then the Contractor shall delay work on Railroad right-of-way until such time as the flagman is again available. Any additional costs resulting from such delay shall be borne by the Contractor and not the Sponsor or Railroad.

C. Payment:

1. The Sponsor will be responsible for paying the Railroad directly for any and all costs of flagging which may be required to accomplish the construction.
2. The estimated cost of flagging is the current rate per day based on a 10-hour work day. This cost includes the base pay for the flagman, overhead, and includes a per diem charge for travel expenses, meals and lodging. The charge to the Sponsor by the Railroad will be the actual cost based on the rate of pay for the Railroad's employees who are available for flagging service at the time the service is required.
3. Work by a flagman in excess of 8 hours per day or 40 hours per week, but not more than 12 hours a day will result in overtime pay at 1 and 1/2 times the appropriate rate. Work by a flagman in excess of 12 hours per day will result in overtime at 2 times the appropriate rate. If work is performed on a holiday, the flagging rate is 2 and 1/2 times the normal rate.
4. Railroad work involved in preparing and handling bills will also be charged to the Sponsor. Charges to the Sponsor by the Railroad shall be in accordance with applicable provisions of Subchapter B, Part 140, Subpart I and Subchapter G, Part 646, Subpart B of the Federal-Aid Policy Guide issued by the Federal Highway Administration on December 9, 1991, including all current amendments. Flagging costs are subject to change. The above estimates of flagging costs are provided for information only and are not binding in any way.

D. Verification:

1. Railroad's flagman will electronically enter flagging time via Railroad's electronic billing system. Any complaints concerning flagging must be resolved in a timely manner. If the need for flagging is questioned, please contact the Railroad Engineer. All verbal complaints will be confirmed in writing by the Contractor within 5 working days with a copy to the Sponsor's

Engineer. Address all written correspondence electronically to Railroad Engineer.

2. The Railroad flagman assigned to the project will be responsible for notifying the Sponsor Engineer upon arrival at the job site on the first day (or as soon thereafter as possible) that flagging services begin and on the last day that he performs such services for each separate period that services are provided. The Sponsor's Engineer will document such notification in the project records. When requested, the Sponsor's Engineer will also sign the flagman's diary showing daily time spent and activity at the project site.

8. HAUL ACROSS RAILROAD TRACK:

- A. Where the plans show or imply that materials of any nature must be hauled across Railroad's track, unless the plans clearly show that the Sponsor has included arrangements for such haul in its agreement with the Railroad, the Contractor will be required to make all necessary arrangements with the Railroad regarding means of transporting such materials across the Railroad's track. The Contractor or Sponsor will be required to bear all costs incidental to such crossings whether services are performed by his own forces or by Railroad personnel.
- B. No crossing may be established for use of the Contractor for transporting materials or equipment across the tracks of the Railroad unless specific authority for its installation, maintenance, necessary watching and flagging thereof and removal, until a temporary private crossing agreement has been executed between the Contractor and Railroad. The approval process for an agreement normally takes 90 days.

9. WORK FOR THE BENEFIT OF THE CONTRACTOR:

- A. All temporary or permanent changes in wire lines or other facilities which are considered necessary to the project are shown on the plans; included in the force account agreement between the Sponsor and the Railroad or will be covered by appropriate revisions to same which will be initiated and approved by the Sponsor and/or the Railroad.
- B. Should the Contractor desire any changes in addition to the above, then he shall make separate arrangements with the Railroad for same to be accomplished at the Contractor's expense.

10. COOPERATION AND DELAYS:

- A. It shall be the Contractor's responsibility to arrange a schedule with the Railroad for accomplishing stage construction involving work by the Railroad or tenants of the Railroad. In arranging his schedule he shall ascertain, from the Railroad,

the lead time required for assembling crews and materials and shall make due allowance therefore.

- B. No charge or claim of the Contractor against either the Sponsor or the Railroad will be allowed for hindrance or delay on account of railroad traffic; any work done by the Railroad or other delay incident to or necessary for safe maintenance of railroad traffic or for any delays due to compliance with these special provisions.

11. TRAINMAN'S WALKWAYS:

- A. Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than 10 feet from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while Railroad's protective service is provided shall be removed before the close of each work day. If there is any excavation near the walkway, a handrail, with 10'-0" minimum clearance from centerline of track, shall be placed and must conform to AREMA and/or FRA standards.

12. GUIDELINES FOR PERSONNEL ON RAILROAD RIGHT-OF-WAY:

- A. The Contractor and/or the Sponsor's personnel authorized to perform work on Railroad's property as specified in Section 2 above are not required to complete Norfolk Southern Roadway Worker Protection Training; However the Contractor and the Sponsor's personnel must be familiar with Norfolk Southern's standard operating rules and guidelines, should conduct themselves accordingly, and may be removed from the property for failure to follow these guidelines.
- B. All persons shall wear hard hats. Appropriate eye and hearing protection must be used. Working in shorts is prohibited. Shirts must cover shoulders, back and abdomen. Working in tennis or jogging shoes, sandals, boots with high heels, cowboy and other slip-on type boots is prohibited. Hard-sole, lace-up footwear, zippered boots or boots cinched up with straps which fit snugly about the ankle are adequate. Wearing of safety boots is strongly recommended. In the vicinity of at-grade crossings, it is strongly recommended that reflective vests be worn.
- C. No one is allowed within 25' of the centerline of track without specific authorization from the flagman.
- D. All persons working near track while train is passing are to lookout for dragging bands, chains and protruding or shifted cargo.
- E. No one is allowed to cross tracks without specific authorization from the flagman.

- F. All welders and cutting torches working within 25' of track must stop when train is passing.
- G. No steel tape or chain will be allowed to cross or touch rails without permission from the Railroad.

13. GUIDELINES FOR EQUIPMENT ON RAILROAD RIGHT-OF-WAY:

- A. No crane or boom equipment will be allowed to set up to work or park within boom distance plus 15' of centerline of track without specific permission from Railroad official and flagman.
- B. No crane or boom equipment will be allowed to foul track or lift a load over the track without flag protection and track time.
- C. All employees will stay with their machines when crane or boom equipment is pointed toward track.
- D. All cranes and boom equipment under load will stop work while train is passing (including pile driving).
- E. Swinging loads must be secured to prevent movement while train is passing.
- F. No loads will be suspended above a moving train.
- G. No equipment will be allowed within 25' of centerline of track without specific authorization of the flagman.
- H. Trucks, tractors or any equipment will not touch ballast line without specific permission from Railroad official and flagman. Orange construction fencing may be required as directed.
- I. No equipment or load movement within 25' or above a standing train or Railroad equipment without specific authorization of the flagman.
- J. All operating equipment within 25' of track must halt operations when a train is passing. All other operating equipment may be halted by the flagman if the flagman views the operation to be dangerous to the passing train.
- K. All equipment, loads and cables are prohibited from touching rails.

- L. While clearing and grubbing, no vegetation will be removed from Railroad embankment with heavy equipment without specific permission from the Railroad Engineer and flagman.
- M. No equipment or materials will be parked or stored on Railroad's property unless specific authorization is granted from the Railroad Engineer.
- N. All unattended equipment that is left parked on Railroad property shall be effectively immobilized so that it cannot be moved by unauthorized persons.
- O. All cranes and boom equipment will be turned away from track after each work day or whenever unattended by an operator.
- P. Prior to performing any crane operations, the Contractor shall establish a single point of contact for the Railroad flagman to remain in communication with at all times. Person must also be in direct contact with the individual(s) directing the crane operation(s).

14. INSURANCE:

- A. In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the Prime Contractor will be required to carry insurance of the following kinds and amounts:
 - 1. a. Commercial General Liability Insurance having a combined single limit of not less than \$2,000,000 per occurrence for all loss, damage, cost and expense, including attorneys' fees, arising out of bodily injury liability and property damage liability during the policy period. Said policy shall include explosion, collapse, and underground hazard (XCU) coverage, shall be endorsed to name Railroad specified in item A.2.c. below both as the certificate holder and as an additional insured, and shall include a severability of interests provision.
 - b. Automobile Liability Insurance with a combined single limit of not less than \$1,000,000 each occurrence for injury to or death of persons and damage to or loss or destruction of property. Said policy or policies shall be endorsed to name Railroad specified in item A.2.c. below both as the certificate holder and as an additional insured and shall include a severability of interests provision.
 - 2. Railroad Protective Liability Insurance having a combined single limit of not less than \$2,000,000 each occurrence and \$6,000,000 in the aggregate applying separately to each annual period. If the project involves track over which passenger trains operate, the insurance limits required are not less than a

combined single limit of \$5,000,000 each occurrence and \$10,000,000 in the aggregate applying separately to each annual period. Said policy shall provide coverage for all loss, damage or expense arising from bodily injury and property damage liability, and physical damage to property attributed to acts or omissions at the job site.

The standards for the Railroad Protective Liability Insurance are as follows:

- a. The insurer must be rated A- or better by A.M. Best Company, Inc. **NOTE: NS does not accept from insurers Chartis (AIG or Affiliated Company including Lexington Insurance Company), Hudson Group or Liberty or Affiliated Company, American Contractors Insurance Company and Erie Insurance Company including Erie Insurance Exchange and Erie Indemnity Company.**
- b. The policy must be written using one of the following combinations of Insurance Services Office ("ISO") Railroad Protective Liability Insurance Form Numbers:
 - (1) CG 00 35 01 96 and CG 28 31 10 93; or
 - (2) CG 00 35 07 98 and CG 28 31 07 98; or
 - (3) CG 00 35 10 01; or
 - (4) CG 00 35 12 04; or
 - (5) CG 00 35 12 07; or
 - (6) CG 00 35 04 13.
- c. The named insured shall read:

Norfolk Southern Corporation and its subsidiaries
Three Commercial Place
Norfolk, Virginia 23510-2191
Attn: Risk Manager

(NOTE: Railroad does not share coverage on RRPL with any other entity on this policy)

- d. The description of operations must appear on the Declarations, must match the project description in this agreement, and must include the appropriate Sponsor project and contract identification numbers.
- e. The job location must appear on the Declarations and must include the city, state, and appropriate highway name/number. **NOTE: Do not**

include any references to milepost, valuation station, or mile marker on the insurance policy.

- f. The name and address of the prime Contractor must appear on the Declarations.
 - g. The name and address of the Sponsor must be identified on the Declarations as the "Involved Governmental Authority or Other Contracting Party."
 - h. Endorsements/forms that are **required** are:
 - (1) Physical Damage to Property Amendment
 - (2) Terrorism Risk Insurance Act (TRIA) coverage must be included
 - i. Other endorsements/forms that will be accepted are:
 - (1) Broad Form Nuclear Exclusion – Form IL 00 21
 - (2) 30-day Advance Notice of Non-renewal or cancellation
 - (3) Required State Cancellation Endorsement
 - (4) Quick Reference or Index Form CL/IL 240
 - j. Endorsements/forms that are NOT acceptable are:
 - (1) Any Pollution Exclusion Endorsement except CG 28 31
 - (2) Any Punitive or Exemplary Damages Exclusion
 - (3) Known injury or Damage Exclusion form CG 00 59
 - (4) Any Common Policy Conditions form
 - (5) An Endorsement that limits or excludes Professional Liability coverage
 - (6) A Non-Cumulation of Liability or Pyramiding of Limits Endorsement
 - (7) An Endorsement that excludes TRIA coverage
 - (8) A Sole Agent Endorsement
 - (9) Any type of deductible endorsement or amendment
 - (10) Any other endorsement/form not specifically authorized in item no. 2.h above.
- B. If any part of the work is sublet, similar insurance, and evidence thereof as specified in A.1 above, shall be provided by or on behalf of the subcontractor to cover its operations on Railroad's right of way.
- C. All insurance required under the preceding subsection A shall be underwritten by insurers and be of such form and content, as may be acceptable to the Company. Prior to entry on Railroad right-of-way, the original Railroad Protective Liability Insurance

Policy shall be submitted by the Prime Contractor to the Department at the address below for its review and transmittal to the Railroad. In addition, certificates of insurance evidencing the Prime Contractor's and any subcontractors' Commercial General Liability Insurance shall be issued to the Railroad and the Department at the addresses below, and forwarded to the Department for its review and transmittal to the Railroad. The certificates of insurance shall state that the insurance coverage will not be suspended, voided, canceled, or reduced in coverage or limits without (30) days advance written notice to Railroad and the Department. No work will be permitted by Railroad on its right-of-way until it has reviewed and approved the evidence of insurance required herein.

SPONSOR:

RAILROAD:

Risk Management
Norfolk Southern Railway Company
Three Commercial Place
Norfolk, Virginia 23510-2191

- D. The insurance required herein shall in no way serve to limit the liability of Sponsor or its Contractors under the terms of this agreement.
- E. Insurance Submission Procedures
 - 1. Railroad will only accept initial insurance submissions via US Mail or Overnight carrier to the address noted in C above. Railroad will NOT accept initial insurance submissions via email or faxes. **Please provide point of contact information with the submission including a phone number and email address.**
NOTE: Only one (1) set of the original or certified true copy of the Railroad Protective Policy as required under section 14 (2) and the contractor's certificate of liability insurance as required for section 14(1) (a) and 14 (1) (b) as part of the project should be provided to NS.
 - 2. Railroad requires the following two (2) forms of insurance in the initial insurance submission to be submitted under a cover letter providing details of the project and contact information:
 - a. The full original or certified true countersigned copy of the railroad protective liability insurance policy in its entirety inclusive of all declarations, schedule of forms and endorsements along with the policy forms and endorsements.
 - b. The Contractor's commercial general, automobile, and workers' compensation liability insurance certificate of liability insurance evidencing a combined single limit of a minimum of \$2M per

occurrence of general and \$1M per occurrence of automobile liability insurance naming Norfolk Southern Railway Company, Three Commercial Place, Norfolk, VA 23510 as the certificate holder and as an additional insured on both the general and automobile liability insurance policy.

3. It should be noted that the Railroad does not accept notation of Railroad Protective insurance on a certificate of liability insurance form or Binders as Railroad must have the full original countersigned policy. Further, please note that mere receipt of the policy is not the only issue but review for compliance. Due to the number of projects system-wide, it typically takes a minimum of 30-45 days for the Railroad to review.

15. FAILURE TO COMPLY:

- A. In the event the Contractor violates or fails to comply with any of the requirements of these Special Provisions:
 1. The Railroad Engineer may require that the Contractor vacate Railroad property.
 2. The Sponsor's Engineer may withhold all monies due the Contractor on monthly statements.
- B. Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Sponsor's Engineer.

16. PAYMENT FOR COST OF COMPLIANCE:

- A. No separate payment will be made for any extra cost incurred on account of compliance with these special provisions. All such costs shall be included in prices bid for other items of the work as specified in the payment items.

17. PROJECT INFORMATION

- | | |
|---------------------------|---------------------|
| A. Date: | February 18, 2020 |
| B. NS File No.: | 117-14833/BR0014024 |
| C. NS Milepost: | 377.08 |
| D. Sponsor's Project No.: | I-5746C |

County : Mecklenburg

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
ROADWAY ITEMS						
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	1297000000-E	607	MILLING ASPHALT PAVEMENT, **** DEPTH (1-1/2")	10,608 SY		
0003	1523000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	1,080 TON		
0004	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	66 TON		
0005	1577000000-E	620	POLYMER MODIFIED ASPHALT BIN- DER FOR PLANT MIX	93 TON		
0006	1735000000-E	723	REPAIR OF JOINTED CONCRETE PAVEMENT SLABS	2,210 SY		
0007	1736000000-E	723	SELECT MATERIAL, CLASS IV	4,473 TON		
0008	1737000000-E	723	PATCHING CONCRETE PAVEMENT SPALLS	1,000 SF		
0009	1839140000-E	661	ULTRA-THIN BONDED WEARING COURSE	1,846 TON		
0010	1840000000-E	665	MILLED RUMBLE STRIPS (ASPHALT CONCRETE)	15,652 LF		
0011	1881000000-E	SP	GENERIC PAVING ITEM JOINT CONSTRUCTION, REPAIR AND SEALING	113,544 LF		
0012	1882000000-E	SP	GENERIC PAVING ITEM STRUCTURAL FOAM VOID FILL/ STABILIZATION	400 GAL		
0013	1891000000-E	SP	GENERIC PAVING ITEM FINE MILLING 5/8" DEPTH	43,591 SY		
0014	2845000000-N	858	ADJUSTMENT OF METER BOXES OR VALVE BOXES	1 EA		
0015	3030000000-E	862	STEEL BEAM GUARDRAIL	12,237 LF		
0016	3210000000-N	862	GUARDRAIL END UNITS, TYPE CAT-1	6 EA		
0017	3287000000-N	SP	GUARDRAIL END UNITS, TYPE TL-3	12 EA		

County : Mecklenburg

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0018	3317000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE B-77	20 EA		
0019	3360000000-E	863	REMOVE EXISTING GUARDRAIL	12,237 LF		
0020	3533000000-E	866	CHAIN LINK FENCE, *** FABRIC (60")	9,460 LF		
0021	3539000000-E	866	METAL LINE POSTS FOR *** CHAIN LINK FENCE (60")	946 EA		
0022	3545000000-E	866	METAL TERMINAL POSTS FOR *** CHAIN LINK FENCE (60")	237 EA		
0023	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	1,180 SF		
0024	4424000000-N	SP	WORK ZONE PRESENCE LIGHTING	8 EA		
0025	4434000000-N	SP	SEQUENTIAL FLASHING WARNING LIGHTS	36 EA		
0026	4455000000-N	1150	FLAGGER	8 DAY		
0027	4510000000-N	1190	LAW ENFORCEMENT	5,856 HR		
0028	4600000000-N	SP	GENERIC TRAFFIC CONTROL ITEM INTERSTATE LANE CLOSURE	612 EA		
0029	4600000000-N	SP	GENERIC TRAFFIC CONTROL ITEM RAMP/LOOP CLOSURE	120 EA		
0030	4600000000-N	SP	GENERIC TRAFFIC CONTROL ITEM STREET LANE CLOSURE	62 EA		
0031	4695000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	180 LF		
0032	4720000000-E	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (90 MILS)	12 EA		
0033	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	7 EA		
0034	4815000000-E	1205	PAINT PAVEMENT MARKING LINES (6")	109,734 LF		

County : Mecklenburg

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0035	4820000000-E	1205	PAINT PAVEMENT MARKING LINES (8")	180	LF	
0036	4825000000-E	1205	PAINT PAVEMENT MARKING LINES (12")	14,931	LF	
0037	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	45	LF	
0038	4840000000-N	1205	PAINT PAVEMENT MARKING CHARACTER	36	EA	
0039	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	21	EA	
0040	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM CONTRAST COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE II (9")	2,873	LF	
0041	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES, 12" 30 MILS (STANDARD GLASS BEADS)	4,977	LF	
0042	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES, 6", 30 MILS (STANDARD GLASS BEADS)	33,705	LF	
0043	4891000000-E	1205	GENERIC PAVEMENT MARKING ITEM THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS)	45	LF	
0044	4895000000-N	SP	GENERIC PAVEMENT MARKING ITEM NON-CAST IRON SNOWPLOWABLE PAVEMENT MARKER	805	EA	
0045	5255000000-N	1413	PORTABLE LIGHTING	Lump Sum	L.S.	
0046	6000000000-E	1605	TEMPORARY SILT FENCE	2,200	LF	
0047	6029000000-E	SP	SAFETY FENCE	800	LF	
0048	6071010000-E	SP	WATTLE	1,550	LF	
0049	6117500000-N	SP	CONCRETE WASHOUT STRUCTURE	16	EA	

County : Mecklenburg

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0050	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	620		
				LF		

STRUCTURE ITEMS

0051	8161000000-E	420	GROOVING BRIDGE FLOORS	264,843		
				SF		
0052	8296000000-N	442	POLLUTION CONTROL	Lump Sum	L.S.	
0053	8559000000-E	SP	CLASS II, SURFACE PREPARATION	98.2		
				SY		
0054	8660000000-E	SP	CONCRETE REPAIRS	589.6		
				CF		
0055	8664000000-E	SP	SHOTCRETE REPAIRS	3,668.6		
				CF		
0056	8678000000-E	SP	EPOXY RESIN INJECTION	908.8		
				LF		
0057	8860000000-N	SP	GENERIC STRUCTURE ITEM CLEANING & REPAINTING OF BRIDGE #320	Lump Sum	L.S.	
0058	8860000000-N	SP	GENERIC STRUCTURE ITEM CLEANING & REPAINTING OF BRIDGE #330	Lump Sum	L.S.	
0059	8860000000-N	SP	GENERIC STRUCTURE ITEM CONTAINMENT OVER CHARLOTTE AREA TRANSIT SYSTEM RAIL LINE	Lump Sum	L.S.	
0060	8860000000-N	SP	GENERIC STRUCTURE ITEM MURAL PAINT REPAIR	Lump Sum	L.S.	
0061	8860000000-N	SP	GENERIC STRUCTURE ITEM PAINTING CONTAINMENT FOR BRIDGE #320	Lump Sum	L.S.	
0062	8860000000-N	SP	GENERIC STRUCTURE ITEM PAINTING CONTAINMENT FOR BRIDGE #322	Lump Sum	L.S.	
0063	8860000000-N	SP	GENERIC STRUCTURE ITEM PAINTING CONTAINMENT FOR BRIDGE #326	Lump Sum	L.S.	

County : Mecklenburg

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0064	8860000000-N	SP	GENERIC STRUCTURE ITEM PAINTING CONTAINMENT FOR BRIDGE #327	Lump Sum	L.S.	
0065	8860000000-N	SP	GENERIC STRUCTURE ITEM PAINTING CONTAINMENT FOR BRIDGE #328	Lump Sum	L.S.	
0066	8860000000-N	SP	GENERIC STRUCTURE ITEM PAINTING CONTAINMENT FOR BRIDGE #330	Lump Sum	L.S.	
0067	8860000000-N	SP	GENERIC STRUCTURE ITEM PAINTING CONTAINMENT FOR BRIDGE #332	Lump Sum	L.S.	
0068	8860000000-N	SP	GENERIC STRUCTURE ITEM SPOT PAINTING OF STEEL STRUCTURE REPAIR AREAS	Lump Sum	L.S.	
0069	8860000000-N	SP	GENERIC STRUCTURE ITEM VOLUMETRIC MIXER	Lump Sum	L.S.	
0070	8867000000-E	SP	GENERIC STRUCTURE ITEM FOAM JOINT SEALS FOR PRESERVATION	3,794.2 LF		
0071	8881000000-E	SP	GENERIC STRUCTURE ITEM LATEX MODIFIED CONCRETE OVERLAY - EARLY STRENGTH	43.1 CY		
0072	8882000000-E	SP	GENERIC STRUCTURE ITEM CONCRETE FOR DECK REPAIR	21.3 CF		
0073	8882000000-E	SP	GENERIC STRUCTURE ITEM ELASTOMERIC CONCRETE FOR PRESERVATION	144 CF		
0074	8889000000-E	SP	GENERIC STRUCTURE ITEM BEAM REPAIR CUT-OUT	5,040 LB		
0075	8889000000-E	SP	GENERIC STRUCTURE ITEM BEAM REPAIR PLATING	4,016 LB		
0076	8892000000-E	SP	GENERIC STRUCTURE ITEM BRIDGE JOINT DEMOLITION	484.8 SF		
0077	8892000000-E	SP	GENERIC STRUCTURE ITEM EPOXY COATING	21,940 SF		

County : Mecklenburg

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0078	8893000000-E	SP	GENERIC STRUCTURE ITEM CONCRETE DECK REPAIR FOR POLY- MER CONCRETE OVERLAY	82.8 SY		
0079	8893000000-E	SP	GENERIC STRUCTURE ITEM HYDRO-DEMOLITION OF BRIDGE DECK	1,035 SY		
0080	8893000000-E	SP	GENERIC STRUCTURE ITEM PLACING & FINISHING LATEX MOD- IFIED CONCRETE OVERLAY - EARLY STRENGTH	1,035 SY		
0081	8893000000-E	SP	GENERIC STRUCTURE ITEM PLACING & FINISHING POLYMER CONCRETE OVERLAY	30,199 SY		
0082	8893000000-E	SP	GENERIC STRUCTURE ITEM SCARIFYING BRIDGE DECK	31,234 SY		
0083	8893000000-E	SP	GENERIC STRUCTURE ITEM SHOTBLASTING BRIDGE DECK	34,751 SY		
0084	8893000000-E	SP	GENERIC STRUCTURE ITEM SILANE DECK TREATMENT	3,517 SY		
0085	8897000000-N	SP	GENERIC STRUCTURE ITEM BEARING PLATE REPOSITIONING	1 EA		
0086	8897000000-N	SP	GENERIC STRUCTURE ITEM BEARING REPLACEMENT	2 EA		
0087	8897000000-N	SP	GENERIC STRUCTURE ITEM CLEANING AND PAINTING EXISTING BEARINGS WITH HIGH RATIO CALCIUM SULFONATE	1,336 EA		
0088	8897000000-N	SP	GENERIC STRUCTURE ITEM STEEL BEARING KEEPER ANGLE ASSEMBLY	37 EA		
0089	8897000000-N	SP	GENERIC STRUCTURE ITEM TYPE I BRIDGE JACKING BRIDGE #138	1 EA		
0090	8897000000-N	SP	GENERIC STRUCTURE ITEM TYPE I BRIDGE JACKING BRIDGE #320	1 EA		
0091	8897000000-N	SP	GENERIC STRUCTURE ITEM TYPE I BRIDGE JACKING BRIDGE #326	1 EA		

County : Mecklenburg

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0092	8897000000-N	SP	GENERIC STRUCTURE ITEM TYPE I BRIDGE JACKING BRIDGE #327	1 EA		
0093	8897000000-N	SP	GENERIC STRUCTURE ITEM TYPE I BRIDGE JACKING BRIDGE #328	1 EA		
0094	8897000000-N	SP	GENERIC STRUCTURE ITEM TYPE I BRIDGE JACKING BRIDGE #330	1 EA		
0095	8897000000-N	SP	GENERIC STRUCTURE ITEM TYPE I BRIDGE JACKING BRIDGE #332	7 EA		

***** BEGIN SCHEDULE AA *****
***** (2 ALTERNATES) *****

0096	8881000000-E	SP	GENERIC STRUCTURE ITEM POLYESTER POLYMER CONCRETE MATERIALS	1,997.9 CY		
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AA1

*** OR ***

0097	8881000000-E	SP	GENERIC STRUCTURE ITEM EPOXY POLYMER CONCRETE MATERIALS	1,997.9 CY		
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AA2

***** END SCHEDULE AA *****