

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION



DIVISION 13 BRIDGE MAINTENANCE

CONTRACT PROPOSAL

*****RE-ADVERTISEMENT*****

CONTRACT NO: 11407998
WBS ELEMENT: TO BE ASSIGNED
COUNTIES: BUNCOMBE, BURKE, MADISON, MCDOWELL, MITCHELL,
RUTHERFORD, AND YANCEY
DESCRIPTION: REPLACEMENT/REPAIR OF BRIDGE EXPANSION JOINTS,
DECK REPAIRS, AND FOAM INJECTIONS AT VARIOUS
BRIDGE SITES.
BID OPENING: 2:00 PM ON SEPTEMBER 17, 2014

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. THESE LAWS REQUIRE THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR GENERAL 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.

NAME OF BIDDER

N.C. CONTRACTOR'S LICENSE NUMBER

ADDRESS OF BIDDER

RETURN BIDS TO:

**Mr. Mike Calloway
Division 13 Project Manager
55 Orange Street
Asheville, NC 28801**

NO BID BOND REQUIRED

**PROPOSAL FOR THE CONSTRUCTION OF
CONTRACT No. 11407998 IN BUNCOMBE, BURKE, MADISON, MCDOWELL, MITCHELL,
RUTHERFORD, AND YANCEY COUNTIES, NORTH CAROLINA**

Date _____ 20 _____

**DEPARTMENT OF TRANSPORTATION,
ASHEVILLE, NORTH CAROLINA**

The Bidder has carefully examined the location of the proposed work to be known as Contract No. **11407998**; has carefully examined the plans and specifications, which are acknowledged to be part of the proposal, the special provisions, the proposal, the form of contract, and the forms of contract payment bond and contract performance bond; and thoroughly understands the stipulations, requirements and provisions. The undersigned bidder agrees to bound upon his execution of the bid and subsequent award to him by the Board of Transportation in accordance with this proposal to provide the necessary contract payment bond and contract performance bond within fourteen days after the written notice of award is received by him. The undersigned Bidder further agrees to provide all necessary machinery, tools, labor, and other means of construction; and to do all the work and to furnish all materials, except as otherwise noted, necessary to perform and complete the said contract in accordance with *the 2012 Standard Specifications for Roads and Structures* by the dates(s) specified in the Project Special Provisions and in accordance with the requirements of the Engineer, and at the unit or lump sum prices, as the case may be, for the various items given on the sheets contained herein.

The Bidder shall provide and furnish all the materials, machinery, implements, appliances and tools, and perform the work and required labor to construct and complete State Highway Contract No. **11407998** in **Buncombe, Burke, Madison, McDowell, Mitchell, Rutherford, and Yancey Counties**, for the unit or lump sum prices, as the case may be, bid by the Bidder in his bid and according to the proposal, plans, and specifications prepared by said Department, which proposal, plans, and specifications show the details covering this project, and hereby become a part of this contract.

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

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

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

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

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

Division 13 Project Manager

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INSTRUCTIONS TO BIDDERS

PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE PREPARING AND SUBMITTING YOUR BID.

All bids shall be prepared and submitted in accordance with the following requirements. Failure to comply with any requirement shall cause the bid to be considered irregular and may be grounds for rejection of the bid.

1. The bid sheet furnished by NCDOT with the proposal shall be used and shall not be altered in any manner. **THE ENTIRE PROPOSAL WITH THE BID SHEET COMPLETED ALONG WITH ANY ADDENDA SHALL BE SUBMITTED IN ORDER FOR THE BID TO BE CONSIDERED FOR AWARD. (SEE ITEM #11 BELOW)**
2. All entries on the bid sheet, including signatures, shall be written in ink.
3. The Bidder shall submit a unit price for every item on the bid form. The unit prices for the various contract items shall be written in figures. **UNIT PRICES SHALL BE ROUNDED OFF BY THE BIDDER TO CONTAIN NO MORE THAN FOUR DECIMAL PLACES.**
4. An amount bid shall be entered on the bid sheet for every item. The amount bid for each item shall be determined by multiplying each unit bid by the quantity for that item, and shall be written in figures in the "Amount Bid" column of the sheet.
5. The total amount bid shall be written in figures in the proper place on the bid sheet. The total amount shall be determined by adding the amounts bid for each item.
6. Changes in any entry shall be made by marking through the entry in ink and making the correct entry adjacent thereto in ink. A representative of the Bidder shall initial the change in ink.
7. The bid shall be properly executed. All bids shall show the following information:
 - a. Name of individual, firm, corporation, partnership, or joint venture submitting bid.
 - b. Name and signature of individual or representative submitting bid and position or title.
 - c. Name, signature, and position or title of witness.
 - d. Federal Identification Number (or Social Security Number of Individual)
 - e. Contractor's License Number (if Applicable)
8. Bids submitted by corporations shall bear the seal of the corporation.
9. The bid shall not contain any unauthorized additions, deletions, or conditional bids.
10. The bidder shall not add any provision reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.
11. **THE ENTIRE PROPOSAL WITH THE BID SHEET, AS WELL AS ANY PROJECT ADDENDA SHOULD BE STAPLED OR OTHERWISE SECURELY FASTENED AND SHALL BE PLACED IN A SEALED ENVELOPE AND SHALL HAVE BEEN DELIVERED TO AND RECEIVED IN THE DIVISION ENGINEER'S OFFICE AT 55 ORANGE STREET, ASHEVILLE, NC BY 2:00 P.M. ON WEDNESDAY SEPTEMBER 17, 2014 .**
12. The sealed bid must display the following statement on the front of the sealed envelope:

**QUOTATION FOR VARIOUS BRIDGE REPAIR ITEMS FOR ALL OF DIVISION 13'S SEVEN
COUNTIES TO BE OPENED AT 2:00 PM WEDNESDAY, SEPTEMBER 17, 2014.**

13. If delivered by mail, the sealed envelope shall be placed in another sealed envelope and the outer envelope shall be addressed as follows:

**North Carolina Department of Transportation
Division of Highways, Division13
55 Orange St.
Asheville, NC 28801
Attn: Mike Calloway**

PROJECT SPECIAL PROVISIONS - GENERAL

DESCRIPTION:

This contract is for the on-call repair and/or replacement of bridge deck expansion joints, bridge decks, and foam injection stabilization at various bridge sites in Division Thirteen, consisting of Buncombe, Burke, Madison, McDowell, Mitchell, Rutherford, and Yancey Counties. Specific work requests will be submitted to the contractor during the life of this contract. The Contractor shall furnish all labor, materials, and equipment necessary for the execution of said work.

CONTRACTOR PREQUALIFICATION:

In accordance with Subarticle 102-2(B) of the *Standard Specifications*, the Contractor shall be prequalified with the Contractual Services Unit at the time of bid opening. Bids submitted by contractors who are not prequalified will not be considered for award. Additional information regarding prequalification may be found at:

<https://connect.ncdot.gov/business/Prequal/Pages/default.aspx>

CONTRACT TIME:

The date of availability for this contract is **October 15, 2014**.

This is a **one-year contract**, which will expire on **October 15, 2015**.

The Contractor shall submit a bid for 1 year. At the option of the Department, this contract may be extended for 2 additional periods of 1 year each for a maximum period of 3 years total. If the contract is extended, the unit bid prices will be increased by 3% for each 1 year extension. No changes in the terms, conditions, etc. of this contract will be made when an extension to the contract is implemented. The Engineer will notify the Contractor in writing no later than 15 calendar days prior to the contract expiration if the contract is to be extended. The Contractor must notify the Engineer in writing within 15 calendar days of his acceptance or rejection of this offer. Failure on the part of the Contractor to reply will be considered as a rejection of contract extension.

PROSECUTION OF WORK AND LIQUIDATED DAMAGES:

The Contractor will be required to prosecute the work in a continuous and uninterrupted manner from the time he begins the work on each work request until completion and acceptance on that request. The Contractor will not be permitted to suspend his operations except for reasons beyond his control or except where the Engineer has authorized a suspension of the Contractor's operations in writing.

For each new notification, the Contractor shall complete the work at a given location within **sixty (60) consecutive calendar days** from the date of notification. Liquidated damages of **Two Hundred Fifty Dollars (\$250.00)** per calendar day will be charged for each calendar day after the allotted time that any part of the work required by the State has not been completed.

INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES:

(2-20-07)

108

SP1 G14 B

The Contractor shall not narrow or close a lane of traffic on **any route**, detain and /or alter the traffic flow on or during 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 **5:00 PM** December 31st and **8:00 AM** January 2nd. If New Year's Day is on a Friday, Saturday, Sunday or Monday, then until **8:00 AM** the following Tuesday.
3. For **Easter**, between the hours of **5:00 PM** Thursday and **8:00 AM** Monday.
4. For **Memorial Day**, between the hours of **5:00 PM** Friday and **8:00 AM** Tuesday.
5. For **Independence Day**, between the hours of **5:00 PM** the day before Independence Day and **8:00 AM** the day after Independence Day.

If **Independence Day** is on a Friday, Saturday, Sunday or Monday, then between the hours of **5:00 PM** the Thursday before Independence Day and **8:00 AM** the Tuesday after Independence Day.

6. For **Labor Day**, between the hours of **5:00 PM** Friday and **8:00 AM** Tuesday.
7. For **Thanksgiving Day**, between the hours of **5:00 PM** Tuesday and **8:00 AM** Monday.
8. For **Christmas**, between the hours of **5:00 PM** the Friday before the week of Christmas Day and **8:00 AM** the following Tuesday after the week of Christmas Day.

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 are not 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 herein and place traffic in the existing traffic pattern.

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

MOBILIZATION:

This work consists of preparatory work and operations to mobilize personnel, materials, and equipment to the project site.

Payment for mobilization will be made for each work request. A single work request may consist of work at more than one location within the Division.

Payment will be made under:

Pay Item	Pay Unit
Mobilization	Each

NO MAJOR CONTRACT ITEMS:

(2-19-02)(Rev. 8-21-07)	104	SP1 G31
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None of the items included in this contract will be major items.

NO SPECIALTY ITEMS:

(7-1-95)	108-6	SP1 G34
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None of the items included in this contract will be specialty items (see Article 108-6 of the 2012 Standard Specifications).

MINORITY BUSINESS ENTERPRISE AND WOMEN BUSINESS ENTERPRISE

(DIVISIONS):

(10-16-07)(Rev. 12-17-13)	102-15(J)	SP1 G67
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Description

The purpose of this Special Provision is to carry out the North Carolina Department of Transportation’s policy of ensuring nondiscrimination in the award and administration of contracts financed in whole or in part with State funds.

Definitions

Additional MBE/WBE Subcontractors - Any MBE/WBE submitted at the time of bid that will not be used to meet either the MBE or WBE goal. No submittal of a Letter of Intent is required.

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

Contract Goals Requirement - The approved MBE and WBE participation at time of award, but not greater than the advertised contract goals for each.

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

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

Minority Business Enterprise (MBE) - A firm certified as a Disadvantaged Minority-Owned Business Enterprise through the North Carolina Unified Certification Program.

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

North Carolina Unified Certification Program (NCUCP) - A program that provides comprehensive services and information to applicants for MBE/WBE certification.

The MBE/WBE program follows the same regulations as the federal Disadvantaged Business Enterprise (DBE) program 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.

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

Women Business Enterprise (WBE) - A firm certified as a Disadvantaged Women-Owned Business Enterprise through the North Carolina Unified Certification Program.

Forms and Websites Referenced in this Provision

Payment Tracking System - On-line system in which the Contractor enters the payments made to MBE and WBE 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 MBE/WBE firms working on the project. This form is for paper bid projects only.
<http://www.ncdot.org/doh/forms/files/DBE-IS.xls>

RF-1 MBE/WBE Replacement Request Form - Form for replacing a committed MBE or WBE.
<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 MBE/WBE subcontractor, manufacturer or regular dealer that affirms that a portion of said contract is going to be performed by the signed MBE/WBE for the amount listed at the time of bid.
<http://connect.ncdot.gov/letting/LetCentral/Letter%20of%20Intent%20to%20Perform%20as%20a%20Subcontractor.pdf>

Listing of MBE and WBE Subcontractors Form - Form for entering MBE/WBE subcontractors on a project that will meet this MBE and WBE goals. This form is for paper bids only.
[http://connect.ncdot.gov/municipalities/Bid%20Proposals%20for%20LGA%20Content/09%20MBE-WBE%20Subcontractors%20\(State\).doc](http://connect.ncdot.gov/municipalities/Bid%20Proposals%20for%20LGA%20Content/09%20MBE-WBE%20Subcontractors%20(State).doc)

Subcontractor Quote Comparison Sheet - Spreadsheet for showing all subcontractor quotes in the work areas where MBEs and WBEs 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>

MBE and WBE Goal

The following goals for participation by Minority Business Enterprises and Women Business Enterprises are established for this contract:

- (A) Minority Business Enterprises **0.0 %**
 - (1) *If the MBE goal is more than zero*, the Contractor shall exercise all necessary and reasonable steps to ensure that MBEs participate in at least the percent of the contract as set forth above as the MBE goal.
 - (2) *If the MBE goal is zero*, the Contractor shall make an effort to recruit and use MBEs during the performance of the contract. Any MBE participation obtained shall be reported to the Department.
- (B) Women Business Enterprises **0.0 %**
 - (1) *If the WBE goal is more than zero*, the Contractor shall exercise all necessary and reasonable steps to ensure that WBEs participate in at least the percent of the contract as set forth above as the WBE goal.

- (2) *If the WBE goal is zero*, the Contractor shall make an effort to recruit and use WBEs during the performance of the contract. Any WBE 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 MBE and WBE certified shall be used to meet the MBE and WBE goals respectively. The Directory can be found at the following link. <https://partner.ncdot.gov/VendorDirectory/default.html>

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

Listing of MBE/WBE Subcontractors

At the time of bid, bidders shall submit all MBE and WBE participation that they anticipate to use during the life of the contract. Only those identified to meet the MBE goal and the

WBE goal will be considered committed, even though the listing shall include both committed MBE/WBE subcontractors and additional MBE/WBE subcontractors. Any additional MBE/WBE subcontractor participation submitted at the time of bid will be used toward overall race-neutral goals. Only those firms with current MBE and WBE certification at the time of bid opening will be acceptable for listing in the bidder's submittal of MBE and WBE participation. The Contractor shall indicate the following required information:

- (A) *If either the MBE or WBE goal is more than zero*,
 - (1) Bidders, at the time the bid proposal is submitted, shall submit a listing of MBE/WBE participation, including the names and addresses on *Listing of MBE and WBE 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 MBE and WBE participation for the contract.
 - (2) If bidders have no MBE or WBE participation, they shall indicate this on the *Listing of MBE and WBE 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 MBE and WBE 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.
 - (3) The bidder shall be responsible for ensuring that the MBE/WBE 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 MBE's or WBE's participation will not

count towards achieving the corresponding goal.

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

MBE or WBE Prime Contractor

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

For example, on a proposed contract, the WBE goal is 10%, and the MBE goal is 8%. A WBE bidder puts in a bid where they will perform 40% of the contract work and have a WBE subcontractor which will perform another 5% of the work. Together the two WBE firms submit on the *Listing of MBE and WBE Subcontractors* a value of 45% of the contract which fulfills the WBE goal. The 8% MBE goal shall be obtained through MBE participation with MBE certified subcontractors or documented through a good faith effort. It should be noted that you cannot combine the two goals to meet an overall value. The two goals shall remain separate.

MBE/WBE prime contractors shall also follow Sections A or B listed under *Listing of MBE/WBE Subcontractors* just as a non-MBE/WBE bidder would.

Written Documentation – Letter of Intent

The bidder shall submit written documentation for each MBE/WBE that will be used to meet the MBE and WBE goals of the contract, indicating the bidder's commitment to use the MBE/WBE 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 Engineer no later than 12:00 noon of the sixth calendar day following opening of bids, unless the sixth day falls on Saturday, Sunday or an official state holiday. In that situation, it is due in the office of the Engineer no later than 12:00 noon on the next official state business day.

If the bidder fails to submit the Letter of Intent from each committed MBE and WBE to be used toward the MBE and WBE goals, or if the form is incomplete (i.e. both signatures are not present), the MBE/WBE participation will not count toward meeting the MBE/WBE goal. If the lack of this participation drops the commitment below either the MBE or WBE goal, the Contractor shall submit evidence of good faith efforts for the goal not met, completed in its entirety, to the Engineer no later than 12:00 noon of the eighth calendar day following opening of bids, unless the eighth day falls on Saturday, Sunday or an official state holiday. In that

situation, it is due in the office of the Engineer no later than 12:00 noon on the next official state business day.

Submission of Good Faith Effort

If the bidder fails to meet or exceed either the MBE or the WBE goal, the apparent lowest responsive bidder shall submit to the Department documentation of adequate good faith efforts made to reach that specific goal(s).

One complete set and 4 copies of this information shall be received in the office of the Engineer no later than 12:00 noon of the sixth calendar day following opening of bids, unless the sixth day falls on Saturday, Sunday or an official state holiday. In that situation, it is due in the office of the Engineer no later than 12:00 noon on the next official state business day.

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 MBE/WBE 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 MBE/WBE 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 MBE/WBE participation. Adequate good faith efforts also mean that the bidder actively and aggressively sought MBE/WBE 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 goals 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 MBEs/WBEs 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 MBEs/WBEs to respond to the solicitation. Solicitation shall provide the opportunity to MBEs/WBEs within the Division and surrounding Divisions where the project is located. The bidder must determine with certainty if the MBEs/WBEs are interested by taking appropriate steps to follow up initial solicitations.
- (B) Selecting portions of the work to be performed by MBEs/WBEs in order to increase the likelihood that the MBE and WBE goals will be achieved.
 - (1) Where appropriate, break out contract work items into economically feasible units

to facilitate MBE/WBE 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 MBE/WBE goals when the work to be sublet includes potential for MBE/WBE participation (2nd and 3rd tier subcontractors).
- (C) Providing interested MBEs/WBEs 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 MBEs/WBEs. It is the bidder's responsibility to make a portion of the work available to MBE/WBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available MBE/WBE subcontractors and suppliers, so as to facilitate MBE/WBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of MBEs/WBEs 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 MBEs/WBEs to perform the work.
 - (2) A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including MBE/WBE 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 MBEs/WBEs is not in itself sufficient reason for a bidder's failure to meet the contract MBE or WBE goals, 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 MBEs/WBEs if the price difference is excessive or unreasonable.
- (E) Not rejecting MBEs/WBEs 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 MBEs/WBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or bidder.
- (G) Making efforts to assist interested MBEs/WBEs 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 MBEs/WBEs. Contact within 7 days from the bid opening NCDOT's Business Development Manager in the Business Opportunity and Work Force Development Unit to give notification of the bidder's inability to get MBE or WBE quotes.

- (I) Any other evidence that the bidder submits which shows that the bidder has made reasonable good faith efforts to meet the MBE and WBE 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 MBE and WBE goals.
- (2) The bidders' past performance in meeting the MBE and WBE goals.
- (3) The performance of other bidders in meeting the MBE and WBE goals. For example, when the apparent successful bidder fails to meet the goals, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts the apparent successful bidder could have met the goals. If the apparent successful bidder fails to meet the MBE and WBE goals, but meets or exceeds the average MBE and WBE 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 MBE and WBE goals can be met or that an adequate good faith effort has been made to meet the MBE and WBE goals.

Non-Good Faith Appeal

The 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 Engineer. The appeal shall be made within 2 business days of notification of the determination of non-good faith.

Counting MBE/WBE Participation Toward Meeting MBE/WBE Goals

- (A) Participation

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

- (B) Joint Checks

Prior notification of joint check use shall be required when counting MBE/WBE 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 MBE/WBE may enter into subcontracts. Work that a MBE subcontracts to another MBE firm may be counted toward the MBE contract goal requirement. The same holds for work that a WBE subcontracts to another WBE firm. Work that a MBE subcontracts to a non-MBE firm does not count toward the MBE contract goal requirement. Again, the same holds true for the work that a WBE subcontracts to a non-WBE firm. If a MBE or WBE 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 MBE or WBE is not performing a commercially useful function. The MBE/WBE may present evidence to rebut this presumption to the Department. The Department's decision on the rebuttal of this presumption may be subject to review by the Office of Inspector General, NCDOT.

(D) Joint Venture

When a MBE or WBE 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 MBE or WBE in the joint venture, that portion of the total dollar value being a distinct clearly defined portion of work that the MBE or WBE performs with its forces.

(E) Suppliers

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

(F) Manufacturers and Regular Dealers

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

- (1) The fees or commissions charged by a MBE/WBE 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 MBE/WBE, 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) MBE/WBE Utilization

The Contractor may count toward its contract goal requirement only expenditures to MBEs and WBEs that perform a commercially useful function in the work of a contract. A MBE/WBE 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 MBE/WBE 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 MBE/WBE 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 MBE/WBE credit claimed for its performance of the work, and any other relevant factors.

(B) MBE/WBE Utilization in Trucking

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

- (1) The MBE/WBE 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 the MBE or WBE goal.
- (2) The MBE/WBE shall itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
- (3) The MBE/WBE 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 MBE may subcontract the work to another MBE firm, including an owner-operator who is certified as a MBE. The same holds true that a WBE may subcontract the work to another WBE firm, including an owner-operator who is certified as a WBE. When this occurs, the MBE or WBE who subcontracts work receives credit for the total value of the transportation services the subcontracted MBE or WBE provides on the contract. It should be noted that

every effort shall be made by MBE and WBE contractors to subcontract to the same certification (i.e., MBEs to MBEs and WBEs to WBEs), in order to fulfill the goal requirement. This, however, may not always be possible due to the limitation of firms in the area. If the MBE or WBE firm shows a good faith effort has been made to reach out to similarly certified transportation service providers and there is no interest or availability, and they can get assistance from other certified providers, the Engineer will not hold the prime liable for meeting the goal.

- (5) The MBE/WBE may also subcontract the work to a non-MBE/WBE firm, including from an owner-operator. The MBE/WBE who subcontracts the work to a non-MBE/WBE is entitled to credit for the total value of transportation services provided by the non-MBE/WBE subcontractor not to exceed the value of transportation services provided by MBE/WBE-owned trucks on the contract. Additional participation by non-MBE/WBE 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 MBE/WBE and the Contractor will not count towards the MBE/WBE contract requirement.
- (6) A MBE/WBE may lease truck(s) from an established equipment leasing business open to the general public. The lease must indicate that the MBE/WBE 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 MBE/WBE, so long as the lease gives the MBE/WBE absolute priority for use of the leased truck. This type of lease may count toward the MBE/WBE's credit as long as the driver is under the MBE/WBE's payroll.
- (7) Subcontracted/leased trucks shall display clearly on the dashboard the name of the MBE/WBE 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.

MBE/WBE Replacement

When a Contractor has relied on a commitment to a MBE or WBE firm (or an approved substitute MBE or WBE firm) to meet all or part of a contract goal requirement, the contractor shall not terminate the MBE/WBE 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 MBE/WBE subcontractor, a non-MBE/WBE subcontractor, or with the Contractor's own forces or those of an affiliate. A MBE/WBE may only be terminated after receiving the Engineer's written approval based upon a finding of good cause for the termination.

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

The Contractor shall comply with the following for replacement of a committed MBE/WBE:

(A) Performance Related Replacement

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

If a replacement MBE/WBE is not found that can perform at least the same amount of work as the terminated MBE/WBE, 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 MBEs/WBEs that their interest is solicited in contracting the work defaulted by the previous MBE/WBE or in subcontracting other items of work in the contract.
- (2) Efforts to negotiate with MBEs/WBEs for specific subbids including, at a minimum:
 - (a) The names, addresses, and telephone numbers of MBEs/WBEs who were contacted.
 - (b) A description of the information provided to MBEs/WBEs regarding the plans and specifications for portions of the work to be performed.
- (3) A list of reasons why MBE/WBE quotes were not accepted.
- (4) Efforts made to assist the MBEs/WBEs contacted, if needed, in obtaining bonding or insurance required by the Contractor.

(B) Decertification Replacement

- (1) When a committed MBE/WBE 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 MBE/WBE 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 MBE/WBE is decertified prior to the Department receiving the SAF (*Subcontract Approval Form*) for the named MBE/WBE firm, the Contractor shall take all necessary and reasonable steps to replace the MBE/WBE

subcontractor with another similarly certified MBE/WBE subcontractor to perform at least the same amount of work to meet the MBE/WBE goal requirement. If a MBE/WBE firm is not found to do the same amount of work, a good faith effort must be submitted to NCDOT (see A herein for required documentation).

Changes in the Work

When the Engineer makes changes that result in the reduction or elimination of work to be performed by a committed MBE/WBE, 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 MBE/WBE based upon the Contractor's commitment, the MBE/WBE shall participate in additional work to the same extent as the MBE/WBE 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 MBEs/WBEs 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 MBE/WBE, the Contractor shall seek participation by MBEs/WBEs 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 MBE/WBE, the Contractor shall seek additional participation by MBEs/WBEs equal to the reduced MBE/WBE 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 MBE/WBE subcontractor. The Department reserves the right to require copies of actual subcontract agreements involving MBE/WBE 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 MBE/WBE 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 MBE/WBE credit.

Reporting Minority and Women Business Enterprise Participation

The Contractor shall provide the Engineer with an accounting of payments made to all MBE and WBE 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 MBEs/WBEs, 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 further work on future projects until the required information is submitted.

Contractors reporting transportation services provided by non-MBE/WBE 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 on the Department's DBE-IS (*Subcontractor Payment Information*) with each invoice. Invoices will not be processed for payment until the DBE-IS is received.

Failure to Meet Contract Requirements

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

PAYMENT:

The Contractor may submit a request for partial payment on a monthly basis, or other interval as approved by the Engineer. Compensation for all pay items shall be in accordance with the *Standard Specifications*. The amount of partial payments will be based on the work accomplished and accepted as the last day of the approved pay period.

Request for payment shall be made by Contractor's Invoice submitted to:

NC Department of Transportation
Attention: Chris Medlin, PE
20 Old US 74
Asheville, NC 28803

All invoice items and unit costs shall correspond to contract pay items. In the event of error or discrepancy in items or unit costs, the Department may return the invoice to the Contractor for correction.

Form DBS-IS must be included with all requests for payment in order for that request to be processed. Information included on this form shall reflect actual payments made to DBE/MBE/WBE firms. It is available for download at <http://www.ncdot.org/doh/forms/files/DBE-IS.xls>. A responsible fiscal officer of the payee firm who can attest to the date and amounts of the payments shall certify that the accounting is correct. One hundred percent (100%) payment shall be made after successful completion of the work as verified by the final inspection.

CONTRACT BID QUANTITIES:

Contractor shall note that the contract quantities provided are used solely for determining the lowest responsible bidder. No minimum amount of work is guaranteed under this contract.

LOCATING EXISTING UNDERGROUND UTILITIES:

(3-20-12)

105

SP1 G115

Revise the *2012 Standard Specifications* as follows:

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

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

RESOURCE CONSERVATION:

(5-21-13)

104-13

SP1 G118

In accordance with North Carolina Executive Order 156, NCGS 130A-309.14(2), and NCGS 136-28.8, it is the policy of the Department to aid in the reduction of materials that become a part of our solid waste stream, to divert materials from landfills, and to find ways to recycle and reuse materials for the benefit of the Citizens of North Carolina.

Initiate, develop and use products and construction methods that incorporate the use of recycled or solid waste products in accordance with Article 104-13 of the *2012 Standard Specifications*. Report the quantities of reused or recycled materials either incorporated in the project or diverted from landfills on the Project Construction Reuse and Recycling Reporting Form.

A location-based tool for finding local recycling facilities and the Project Construction Reuse and Recycling Reporting Form are available at:

<http://connect.ncdot.gov/resources/Environmental/Pages/North-Carolina-Recycling-Locations.aspx>

DOMESTIC STEEL:

(4-16-13)

106

SP1 G120

Revise the *2012 Standard Specifications* as follows:

Page 1-49, Subarticle 106-1(B) Domestic Steel, lines 2-7, replace the first paragraph with the following:

All steel and iron products that are permanently incorporated into this project shall be produced in the United States except minimal amounts of foreign steel and iron products may be used provided the combined material cost of the items involved does not exceed 0.1% of the total amount bid for the entire project or \$2,500, whichever is greater. If invoices showing the cost of the material are not provided, the amount of the bid item involving the foreign material will be used for calculations. This minimal amount of foreign produced steel and iron products permitted for use is not applicable to high strength fasteners. Domestically produced high strength fasteners are required.

MAINTENANCE OF THE PROJECT:

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

104-10

SP1 G125

Revise the *2012 Standard Specifications* as follows:

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

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

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

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

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

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

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.

OUTSOURCING OUTSIDE THE USA:

(9-21-04) (Rev. 5-16-06)

SP1 G150

All work on consultant contracts, services contracts, and construction contracts shall be performed in the United States of America. No work shall be outsourced outside of the United States of America.

Outsourcing for the purpose of this provision is defined as the practice of subcontracting labor, work, services, staffing, or personnel to entities located outside of the United States.

The North Carolina Secretary of Transportation shall approve exceptions to this provision in writing.

GIFTS FROM VENDORS AND CONTRACTORS:

(12-15-09)

107-1

SP1 G152

By Executive Order 24, issued by Governor Perdue, and *N.C.G.S. § 133-32*, it is unlawful for any vendor or contractor (i.e. architect, bidder, contractor, construction manager, design professional, engineer, landlord, offeror, seller, subcontractor, supplier, or vendor), to make gifts or to give favors to any State employee of the Governor's Cabinet Agencies (i.e. Administration, Commerce,

Correction, Crime Control and Public Safety, Cultural Resources, Environment and Natural Resources, Health and Human Services, Juvenile Justice and Delinquency Prevention, Revenue, Transportation, and the Office of the Governor). This prohibition covers those vendors and contractors who:

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

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

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

EMPLOYMENT:

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

108, 102

SP1 G184

Revise the *2012 Standard Specifications* as follows:

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

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

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

STATE HIGHWAY ADMINISTRATOR TITLE CHANGE:

(9-18-12)

SP1 G185

Revise the *2012 Standard Specifications* as follows:

Replace all references to “State Highway Administrator” with “Chief Engineer”.

PROJECT SPECIAL PROVISIONS-ROADWAY

MATERIALS:

(2-21-12) (Rev. 5-20-14)

1000, 1002, 1005, 1024, 1050, 1056, 1074, 1078, 1080, 1081, 1086, 1084, 1087, 1092

SP10 R01

Revise the 2012 Standard Specifications as follows:

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

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

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

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

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

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

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

Item **Section**

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

TABLE 1005-1 AGGREGATE GRADATION - COARSE AGGREGATE													
Percentage of Total by Weight Passing													
Std. Size #	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4	#8	#10	#16	#40	#200	Remarks
4	100	90-100	20-55	0-15	-	0-5	-	-	-	-	-	A	Asphalt Plant Mix
467M	100	95-100	-	35-70	-	0-30	0-5	-	-	-	-	A	Asphalt Plant Mix
5	-	100	90-100	20-55	0-10	0-5	-	-	-	-	-	A	AST, Sediment Control Stone
57	-	100	95-100	-	25-60	-	0-10	0-5	-	-	-	A	AST, Str. Concrete, Shoulder Drain, Sediment Control Stone
57M	-	100	95-100	-	25-45	-	0-10	0-5	-	-	-	A	AST, Concrete Pavement
6M	-	-	100	90-100	20-55	0-20	0-8	-	-	-	-	A	AST
67	-	-	100	90-100	-	20-55	0-10	0-5	-	-	-	A	AST, Str. Concrete, Asphalt Plant Mix
78M	-	-	-	100	98-100	75-100	20-45	0-15	-	-	-	A	Asphalt Plant Mix; AST, Str. Conc. Weep Hole Drains
14M	-	-	-	-	-	100	35-70	5-20	-	0-8	-	A	Asphalt Plant Mix; AST, Weep Hole Drains, Str. Concrete
9	-	-	-	-	-	100	85-100	10-40	-	0-10	-	A	AST
ABC	-	100	75-97	-	55-80	-	35-55	-	25-45	-	14-30	4-12 ^B	Aggregate Base Course, Aggregate Stabilization
ABC (M)	-	100	75-100	-	45-79	-	20-40	-	0-25	-	-	0-12 ^B	Maintenance Stabilization
Light-C weight	-	-	-	-	100	80-100	5-40	0-20	-	0-10	-	0-2.5	AST

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

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

Use Type IL blended cement that meets AASHTO M 240, except that the limestone content is limited to between 5 and 12% by weight and the constituents shall be interground. Class F fly ash can replace a portion of Type IL blended cement and shall be replaced as outlined in Subarticle

1000-4(I) for Portland cement. For mixes that contain cement with alkali content between 0.6% and 1.0% and for mixes that contain a reactive aggregate documented by the Department, use a pozzolan in the amount shown in Table 1024-1.

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

All fencing material and accessories shall meet Section 106.

Page 10-73, Article 1056-1 DESCRIPTION, lines 7-8, delete the first sentence of the second paragraph and replace with the following:

Use geotextile fabrics that are on the NCDOT Approved Products List.

Page 10-73, Article 1056-2 HANDLING AND STORING, line 17, replace “mechanically stabilized earth (MSE) wall faces” with “temporary wall faces”.

Page 10-74, TABLE 1056-1 GEOTEXTILE REQUIREMENTS, replace table with the following:

TABLE 1056-1 GEOTEXTILE REQUIREMENTS						
Property	Requirement (MARV^A)					Test Method
	Type 1	Type 2	Type 3^B	Type 4	Type 5^C	
<i>Typical Application</i>	<i>Shoulder Drains</i>	<i>Under Rip Rap</i>	<i>Temporary Silt Fence</i>	<i>Soil Stabilization</i>	<i>Temporary Walls</i>	
Elongation (MD & CD)	≥ 50%	≥ 50%	≤ 25%	< 50%	< 50%	ASTM D4632
Grab Strength (MD & CD)	Table 1 ^D , Class 3	Table 1 ^D , Class 1	100 lb	Table 1 ^D , Class 3	-	ASTM D4632
Tear Strength (MD & CD)			-		-	ASTM D4533
Puncture Strength			-		-	ASTM D6241
Ultimate Tensile Strength (MD & CD)	-	-	-	-	2,400 lb/ft (unless required otherwise in the contract)	ASTM D4595
Permittivity	Table 2 ^D , 15% to 50% <i>in Situ</i> Soil Passing No. 200 ^E		Table 7 ^D	Table 5 ^D	0.20 sec ⁻¹	ASTM D4491
Apparent Opening Size					No. 30 ^E	ASTM D4751
UV Stability (Retained Strength)					70%	ASTM D4355

- A.** MARV does not apply to elongation
- B.** Minimum roll width of 36" required
- C.** Minimum roll width of 13 ft required
- D.** AASHTO M 288
- E.** US Sieve No. per AASHTO M 92

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

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

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

TABLE 1078-1 REQUIREMENTS FOR CONCRETE		
Property	28 Day Design Compressive Strength 6,000 psi or less	28 Day Design Compressive Strength greater than 6,000 psi
Maximum Water/Cementitious Material Ratio	0.45	0.40
Maximum Slump without HRWR	3.5"	3.5"
Maximum Slump with HRWR	8"	8"
Air Content (upon discharge into forms)	5 + 2%	5 + 2%

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

- (B) At least 3 panels prepared as specified in 5.5.10 of AASHTO M 300, Bullet Hole Immersion Test.
- (C) At least 3 panels of 4"x6"x1/4" for the Elcometer Adhesion Pull Off Test, ASTM D4541.
- (D) A certified test report from an approved independent testing laboratory for the Salt Fog Resistance Test, Cyclic Weathering Resistance Test, and Bullet Hole Immersion Test as specified in AASHTO M 300.
- (E) A certified test report from an approved independent testing laboratory that the product has been tested for slip coefficient and meets AASHTO M253, Class B.

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

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

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

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

For epoxy resin systems used for embedding dowel bars, threaded rods, rebar, anchor bolts and other fixtures in hardened concrete, the manufacturer shall submit test results showing that the bonding system will obtain 125% of the specified required yield strength of the fixture. Furnish certification that, for the particular bolt grade, diameter and embedment depth required, the anchor system will not fail by adhesive failure and that there is no movement of the anchor bolt. For

certification and anchorage, use 3,000 psi as the minimum Portland cement concrete compressive strength used in this test. Use adhesives that meet Section 1081.

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

Page 10-163, Table 1081-1 Properties of Mixed Epoxy Resin Systems, replace table with the following:

Table 1081-1 Properties of Mixed Epoxy Resin Systems							
Property	Type 1	Type 2	Type 3	Type 3A	Type 4A	Type 4B	Type 5
Viscosity-Poises at 77°F ± 2°F	Gel	10-30	25-75	Gel	40-150	40-150	1-6
Spindle No.	-	3	4	--	4	4	2
Speed (RPM)	-	20	20	--	10	10	50
Pot Life (Minutes)	20-50	30-60	20-50	5-50	40-80	40-80	20-60
Minimum Tensile Strength at 7 days (psi)	1,500	2,000	4,000	4,000	1,500	1,500	4,000
Tensile Elongation at 7 days (%)	30 min.	30 min.	2-5	2-5	5-15	5-15	2-5
Min. Compressive Strength of 2" mortar cubes at 24 hours	3,000 (Neat)	4,000-	6,000-	6,000 (Neat)	3,000	3,000	6,000
Min. Compressive Strength of 2" mortar cubes at 7 days	5,000 (Neat)	-	-	-	-	5,000	-
Maximum Water Absorption (%)	1.5	1.0	1.0	1.5	1.0	1.0	1.0
Min. Bond Strength Slant Shear Test at 14 days (psi)	1,500	1,500	2,000	2,000	1,500	1,500	1,500

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

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

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

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

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

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

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

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

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

1081-4 EPOXY RESIN ADHESIVE FOR BONDING TRAFFIC MARKINGS

(A) General

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

(B) Classification

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

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

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

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

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

(C) Requirements

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

(D) Prequalification

Refer to Subarticle 1081-1(E).

(E) Acceptance

Refer to Subarticle 1081-1(F).

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

Steel sheet piles detailed for permanent applications shall be hot rolled and meet ASTM A572 or ASTM A690 unless otherwise required by the plans. Steel sheet piles shall be coated as required by the plans. Galvanized sheet piles shall be coated in accordance with Section 1076. Metallized sheet piles shall be metallized in accordance to the Project Special Provision “Thermal Sprayed Coatings (Metallization)” with an 8 mil, 99.9% aluminum alloy coating and a 0.5 mil seal coating.

Any portion of the metallized sheet piling encased in concrete shall receive a barrier coat. The barrier coat shall be an approved waterborne coating with a low-viscosity which readily absorbs into the pores of the aluminum thermal sprayed coating. The waterborne coating shall be applied at a spreading rate that results in a theoretical 1.5 mil dry film thickness. The manufacturer shall issue a letter of certification that the resin chemistry of the waterborne coating is compatible with the 99.9% aluminum thermal sprayed alloy and suitable for tidal water applications.

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

The epoxy shall meet Article 1081-4.

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

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

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

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

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

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

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

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

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

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

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

TRAFFIC CONTROL:

The Contractor shall maintain traffic during construction and provide, install, and maintain all traffic control devices in accordance with these project guidelines, the Project Special Provisions, *2012 Standard Specifications*, *2012 Roadway Standard Drawings*, and the current edition of the *Manual of Uniform Traffic Control Devices (MUTCD)*.

The Contractor shall utilize complete and proper traffic controls and traffic control devices during all operations. All traffic control and traffic control devices required for any operation shall be functional and in place prior to the commencement of that operation. Signs for temporary operations shall be removed during periods of inactivity. The Contractor is required to leave the project in a manner that will be safe to the traveling public and which will not impede motorists.

When a temporary lane closure on a multi-lane roadway is shifted to another lane, the contractor will be paid for a Lane Closure Shift. On 2-lane, 2-way roadways, the contractor will be paid one Temporary Lane Closure for both lanes.

Payment will be made under:

Pay Item	Pay Unit
Temporary Lane Closure (2-Lane, 2-Way Roadway)	Each
Temporary Lane Closure (Multi-Lane Roadway)	Each
Lane Closure Shift (Multi-Lane Roadway)	Each
Nighttime Temporary Lane Closure (2-Lane, 2-Way Roadway)	Each
Nighttime Temporary Lane Closure (Multi-Lane Roadway)	Each
Nighttime Lane Closure Shift (Multi-Lane Roadway)	Each

PROJECT SPECIAL PROVISIONS - STRUCTURES

GENERAL:

The contractor shall notify the Bridge Engineer/Supervisor at the beginning of each week of his intended schedule of work. This will allow the Department to schedule inspections accordingly.

All existing joint material, concrete and asphalt removed shall become the property of the Contractor and shall be disposed of properly.

SILICON EXPANSION JOINT REPLACEMENT:

Contractor shall remove the existing expansion joint, clean the area in accordance with the manufacturer's recommendations, and place the silicon expansion joint in accordance with the manufacturer's recommendations. The expansion joint shall be replaced with the materials stated in this contract.

All materials shall be delivered unopened in their original containers bearing the manufacturer's label, date of manufacture, batch number, trade name brand, and quantity. Sufficient material to perform the entire expansion joint shall be "on hand" prior to removing the existing expansion joint. Stored materials may be inspected prior to their use and shall meet the requirements of these provisions. Each shipment of repair material shall be accompanied by Material Safety Data Sheets (MSDS) and a certificate of compliance certifying that the materials conform to the requirements of these provisions.

The repair material shall be one of the following approved products:

Joints less than or equal to 1" in width:

Sealant – Dow 888

Baysilon 960 (silicon based)

Joints greater than 1" in width:

Sealant – Dow 902 (silicon based)

All substructure expansion joints shall be repaired with Dow 902 unless otherwise determined by the Department. The entire cost for the silicon expansion joint replacement including but not limited to labor, maintenance, equipment, tools, and incidentals will be included in the unit prices for Silicon Joint Replacement.

Payment will be made under:

Pay Item

Silicon Joint Replacement (Less than 1" Wide)

Silicon Joint Replacement (1" to 2" Wide)

Silicon Joint Replacement (Greater than 2" Wide)

Pay Unit

Linear Foot

Linear Foot

Linear Foot

EVAZOTE EXPANSION JOINT REPLACEMENT:

Contractor shall remove the existing expansion joint, clean the area in accordance with the manufacturer's recommendations, and place the evazote expansion joint in accordance with the manufacturer's recommendations. Contractor shall have a manufacturer's representative present during the installation of the first evazote expansion joint of the project. The expansion joint shall be replaced with the materials stated in this contract.

All materials shall be delivered unopened in their original containers bearing the manufacturer's label, date of manufacture, batch number, trade name brand, and quantity. Sufficient material to perform the entire expansion joint shall be "on hand" prior to removing the existing expansion joint. Stored materials may be inspected prior to their use and shall meet the requirements of these provisions. Each shipment of repair material shall be accompanied by Material Safety Data Sheets (MSDS) and a certificate of compliance certifying that the materials conform to the requirements of these provisions.

Evazote Joint Seal Specifications

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 low-density closed cell, cross-linked ethylene vinyl acetate polyethylene copolymer nitrogen blown material for the seal. Use seals manufactured with grooves $1/8'' \pm$ wide by $1/8'' \pm$ deep and spaced between $1/4''$ and $1/2''$ apart along the bond surface running the length of the joint. Use seals sized so that the depth of the seal 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 $1/4''$. Splice the seal using the heat welding method by placing the joint material ends against a Teflon heating iron of 350°F for 7 - 10 seconds, then pressing the ends together tightly. Do not test the welding until the material has completely cooled. Use material that resists weathering and ultraviolet rays. Provide a seal that has a working range of 30% tension and 60% compression and is watertight along its entire length including the ends. Have the top of the evazote seal clearly shop marked. Inspect the evazote seals upon receipt to ensure that the marks are clearly visible upon installation.

Provide seals that meet the requirements given below:

Test	Test Method	Requirement
Elongation at break	ASTM D3575	210 ± 15%
Tensile strength, psi	ASTM D3575	110 ± 15
Compression Recovery (% of original width)	AASHTO T42 50% compr. for 22 hr. @ 73°F, 1/2 hr. recovery	87 ± 3
Weather/Deterioration	AASHTO T42 Accelerated Weathering	No deterioration for 10 years min.
Compression/Deflection	@ 50% deflection of original width	10 psi min.
	@ 50% deflection of original width	60 psi max.
Tear Strength, psi	ASTM D624	16 ± 3
Density	ASTM D545	2.8 to 3.4
Water Absorption (% vol/vol)	ASTM D3575 Total immersion for 3 months	3

Adhesives

Use a two component, 100% solid, modified epoxy adhesive with the seal that meets the requirements of ASTM C881, Type 1, Grade 3, Class B & C and has the following physical properties:

Tensile strength	3500 psi min.
Compressive strength	7000 psi min.
Shore D Hardness	75 psi min.
Water Absorption	0.25% by weight

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

Joint Preparation

After removal of existing joint, area must be sand-blasted immediately prior to installation of the new joint. Blasting medium shall be a non-silica product. Blasting medium shall be swept up and removed from the project. Traffic shall be protected from blasting operations. Joint shall be re-cleaned (and re-blasted if necessary), if joint installation is delayed and joint is determined to be unsuitable due to dirt, oils, etc.

Exact size of joint seals to be used where joints have been repaired with elastomeric concrete shall be determined after the elastomeric concrete work is completed.

Seal Installation

Do not install the joint seal if the ambient air temperature is below 45°F.

Begin installation at the low end of the joint after applying the mixed epoxy to the sides of both the joint material and both sides of the joint, making certain to completely fill the grooves with epoxy. With gloved hands, compress the material and with the help of a blunt probe, push it down into the joint until it is recessed approximately 1/4" below the surface. Do not push the seal at an angle that would stretch the material. Once work on a joint begins, do not stop until it is completed. Clean the excess epoxy off the surface of the joint material quickly and thoroughly. Do not use solvents to remove excess epoxy. Remove excess epoxy in accordance with the joint manufacturer's recommendations.

The entire cost for the evazote expansion joint replacement including but not limited to labor, maintenance, equipment, tools, and incidentals will be included in the unit prices for Evazote Joint Replacement.

Payments shall be made under:

Pay Item

Evazote Joint Replacement

Pay Unit

Linear Foot

SYNTHETIC RUBBER EXPANSION JOINT SEAL: Seals

Use an inverted "V" shaped, preformed extruded ethylene propylene diene monomer (M-class) rubber (EPDM), or silicone rubber seal compatible with concrete and resistant to abrasion, oxidation, oils, gasoline, salt and other materials that are spilled on or applied to the surface. Seal shall be secured to concrete surfaces with a single component silicone locking adhesive and a primer, or with a quick setting epoxy adhesive.

Use seals set in a sawed joint opening with a depth that meets the manufacturer's recommendation, and is not less than 1/2" below the top of the deck slab at the opening's minimum width specified in the plans. Seals edges shall be set on the bottom of the sawed joint opening that is at least 1/8" wide. Provide a seal that has a working temperature range of 0°F to 120°F and meets the requirements given below.

Test	Test Method	Requirement
Tensile Strength	ASTM D412	1,000 psi (min.)
Elongation at Break	ASTM D412	300% (min.)
Tear Strength	ASTM D624	100 ppi (min.)
Compression Set 212°F @ 70 hrs.	ASTM D395	30% (max.)
Water Resistance	ASTM D471	70 hrs. @ 212°F
Durometer (Shore A)	ASTM D2240	55-65 +/-5

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

For silicone adhesive, use a single component, 100% solid, silicone locking adhesive supplied by the joint seal manufacturer that meets the following requirements:

Test	Test Method	Requirement
Tensile strength	ASTM D412	200 psi (min.)
Tack Free Time	ASTM C679	20 minutes (max.)
Cure Time (1/4" Bead)	ASTM C679	24 hours (max.)
Resistance to UV	ASTM C793	No cracking, ozone chalking, or degradation
Elongation to Break	ASTM D412	450% (min.)

For epoxy adhesive, use a quick setting two-component thixotropic paste that is mixed in strict conformance to the manufacturer's instructions. Epoxy adhesive shall be supplied by the joint seal manufacturer and shall meet the following requirements:

Test	Test Method	Requirement
Tensile strength	ASTM D638	7000 psi (min.)
Bond Strength to Concrete	ASTM C881	1000 psi (min.)
Peel Adhesion	ASTM C794	50 pli
Gel Time		8 minutes
Pot Life		45 minutes
Cure Time		24 hours (max.)

Use an adhesive that is workable to 45°F. When installing in ambient air or surface temperatures below 45°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 joint opening shall be initially formed to the width shown on the plans including the blackout for the elastomeric concrete.

The elastomeric concrete shall have sufficient time to cure such that no damage can occur to the elastomeric concrete prior to sawing to the final width and depth as specified in the plans.

When sawing the joint to receive the joint 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 or two passes of the saw by placing and spacing two metal blades on the saw shaft to the desired width for the joint opening.

The desired depth of the saw cut is the depth of the seal plus 1/2" minimum above the top of the seal at the minimum sawed joint width. An irregular bottom of sawed joint is permitted as indicated on the plans. Maximum surface amplitude at the bottom of the saw cut joint is 1/8". Grind exposed corners on saw cut edges to a 1/4" 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

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. Seals shall be secured to substrate that is clean and sound.

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 elastomeric 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 herein. 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 insure the seal is the same length as the required seal length shown in the plans. Splices in joint seals will not be permitted.

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. The joint seal shall be installed to strict conformance with the manufacturer's requirements for atmospheric conditions, concrete surface preparation, mixing and application of adhesive, seal material installation procedure, minimum cure time prior to exposure to traffic, as well as worker health and safety. Once work on placing a seal begins, do not stop until it is completed. Clean any excess adhesive from the top of the joint seal immediately with a trowel. Do not use solvents or any cleaners to remove the excess adhesive from the top of the seal. Remove the protective cover at the joint edges and check for any adhesive on concrete surfaces. Remove excess adhesive 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. Do not place pavement markings on top of synthetic rubber joint seals.

Payments shall be made under:

Pay Item	Pay Unit
Synthetic Rubber Expansion Joint Seal (1" to 2" Wide)	Linear Feet
Synthetic Rubber Expansion Joint Seal (2" to 3.5" Wide)	Linear Feet

ASPHALT JOINT REPAIR AND REPLACEMENT:

This work shall consist of supplying and installing a binder and aggregate system composed of specially blended polymer modified asphalt and specific aggregate placed in layers into a prepared expansion joint block-out. When properly installed, the joint system will provide a flexible waterproof bridge joint, which will allow for a joint movement of 1" in expansion and 1" in compression.

Joint material shall be hot applied, pre-mixed bituminous material that will provide a smooth riding surface and a waterproof joint. The contractor shall prepare the surface to be repaired by saw cutting to a minimum of 20” wide and 2” in depth, per manufacturer’s specifications, or as directed by the Engineer, removing all loose material, and cleaning the area with compressed air.

No repairs shall be made during periods of rain, snow, or sleet. Standing water shall be removed prior to placement of material.

Steel bridging plates shall be used as needed to provide load transfer across the joint opening. Plates shall be plate steel, 1/8” to 1/4” thick, and 4” to 9” wide.

Bulking aggregate shall be chosen from the Basalt, Gritstone, Gabbro, or Granite Family. Only 1/2” to 1” size stone shall be used.

Materials

All materials shall meet the specifications as approved by the Engineer prior to use. The joint material shall be one of the following approved products:

FibreJoint, A/P Bridge Flex Joint, or other NCDOT approved material.

(A) Binder Material

The bridge joint binder shall be a polymer modified asphalt and shall meet the following requirements when tested according to ASTM test methods:

	Test Method	Typical Values
Softening Point	ASTM D-36	180° F
Tensile Adhesion	ASTM D-3583	750% min.
Ductility @ 77°F	ASTM D-113	40 cm min
Penetration	ASTM D-3407	
	77°F, 150g, 5 sec.	90 dmm max.
	0° F 200g, 60 sec.	10 dmm min.
Flow 5h @ 140° F	ASTM D-3407	3.0 mm max.
Resilience @ 77° F	ASTM D-3407	40% min.
Asphalt Compatibility	ASTM D-3407	Pass
Recommended Pouring Temperature	-	390° F
Safe Heating Temperature	-	410° F

(B) Aggregate

The stone type shall consist of Granite, Basalt, Gabbro, Porphyry or Gritstones. The specified aggregate shall be crushed, double washed, and shall meet the following requirements:

Gradation	
Sieve Size	3/4" Percent Passing
7/8"	95-100
5/8"	30-50
1/2"	10-30
3/8"	0-7
1/4"	-
#8	-

(C) Backer Rod

The backer rod shall be a closed cell, foam expansion joint filler, capable of withstanding the elevated temperature of the polymeric binder. The backer rod shall have the following typical physical properties using a 2" specimen and test method ASTM D-545:

Density	2.0 lbs/cf, min.
Tensile Strength	30 psi, min.
Compression	5 psi @ 25%, min.
Water Absorption	0.03 g/cc by weight, min.
Temperature @ 410°F	No Melting

(D) Bridging Plate

The bridging plate shall be a mild steel plate, 1/4" thick by 8" wide, cut in 4' to 5' lengths. Spike holes shall be drilled on a longitudinal centerline at 1' intervals.

Installation Crews

The joint system is to be installed only by factory trained and certified installation professionals.

Equipment

The equipment will consist of:

1. Small self-propelled dry cut saw
2. Pneumatic compressor of 185 CFM capacity.
3. One Hot-Compressed Air Lance (HCA Lance), capable of delivering flame retarded air stream with a temperature of 3,000°F, at a speed of 3,000 feet per second.
4. Rotating vented or un-vented drum type mixers each with a Hot-Compressed Air Lance (HCA Lance), or a pressure – air injection torch (PAT torch).
5. Melter unit equipped with agitation and an automatic temperature control which can accurately maintain the material temperature from 100°F - 650°F. A thermometer to

monitor the material temperature must be provided. The burner system shall have a safety pilot capable of shutting off the gas supply in the event of a flame-out.

6. 100 lbs. Bottles of propane or smaller
7. Vibratory roller or plate capable of compacting up to 1” in one pass.
8. Hand held calibrated digital temperature sensor.
9. Chop-saw with carbide blade, if needed.
10. Sandblasting equipment, required only for installation in a concrete overlay.
11. Safety clothing and equipment as required by OSHA.

Installation

The following procedures are to be followed to ensure a successful installation:

Note: Joint must be installed at a minimum depth of 2”.

Layout: Joint system shall be located centrally over the deck expansion gap or fixed joint and marked out to the recommended minimum width of 20”.

Excavation: The joint shall be excavated by the use of saws and pneumatic hand tools. Where possible, saws shall be set to cut the full required depth of the wearing surface and any membrane present. Variations in the depth of the wearing surface across the road should be considered to insure, where possible, that the deck is not damaged. All debris from the excavation channel shall be removed to allow the full volume of new joint to be installed.

Cleaning: The entire channel must be thoroughly cleaned and dried. Small debris will be removed by using compressed air. The Hot Compressed Air Lance will then be applied throughout the length of the channel. Installation in concrete overlays requires sandblasting of the concrete vertical walls and adjacent deck area prior to the use of the HCA Lance application.

Repairs: Spalled and defective concrete should be repaired with an approved material as agreed upon by the Engineer.

Caulking: The gap shall be caulked with the backer rod, allowing for approximately 1” of binder in the gap on top of the rod. If the previous caulking is intact and will hold the binder, it may be used to take the place of the backer rod. A small amount of hot binder should be placed onto the caulking to insure that the gap is adequately plugged.

Tanking: Immediately after cleaning and caulking, the entire channel shall be coated with a thin layer of hot binder. If significant delay occurs, the channel shall be inspected to determine if re-cleaning is necessary.

Plating: The gap shall be bridged with the steel plates centered over the gap by placing locating pins in the centerline of the plate. There must be at least 2” between the edge of the steel plate and the wall of the channel. Once the locating pins are in place, the top of the plate shall be coated with a thin layer of hot binder.

Material Preparation

Aggregate: The aggregate must be heated in a vented or un-vented rotating drum mixer by the use of a hot compressed air lance (HCA Lance), or a pressure air injection torch (PAT torch). Once the aggregate has been heated to a temperature of 370° - 380°F, it is then coated with a small quantity of binder. One gallon of binder per 100 lbs. of stone should be sufficient to coat the stone.

Binder: The binder shall be heated to the recommended pouring temperature, 370° - 385°F. At no time shall the recommended safe heating temperature of 400°F be exceeded.

Material Installation: Layers of hot pre-coated aggregate not more than 2.5” thick shall be placed in the channel and immediately covered to the level of the coated aggregate. This will ensure that the 3:1 weight ratio of aggregate to binder has been achieved. Layers shall be raked to insure the aggregate is completely coated and that all air pockets are eliminated. This process shall cease approximately 3/4” from the top of the channel.

Surface Layer: The surface layer shall be applied as other layers except that the pre-coated aggregate is not flooded with binder. The pre-coated aggregate shall be transferred to the joint and leveled slightly higher than the adjacent road surface. On a standard 2” deep joint, the topcoat should be 1/4” higher than the road surface. Deeper joints will require higher levels before tamping.

Compaction: Compaction should take place after the joint has cooled to approximately 225° F. The joint surface shall be made approximately level with the existing road surface by using the vibratory plate or roller.

Top Coating: After compaction, lines of 4” tape are placed one inch beyond the joint width on each side of the joint to insure evenness of appearance. The joint and at least one inch of the road surface shall be top-coated with the hot binder until the surface is smooth and absent of voids.

Note: If it is impossible to topcoat the joint during the same working day/night, it is allowable that the topcoat step be completed on the next working day/night. However, the surface must be cleaned, dried, and heated with the HCA Lance.

Surface Dressing: Immediately after top-coating, an anti-skid material is spread evenly over the joint to eliminate material tracking (Black Beauty Sand, Medium Grade).

Final Preparation: Prior to departure the crew will insure that the entire work area is clean of debris.

Temporary Joint: In the event of a work stoppage while constructing a joint, the following procedure can be used for low ADT roadways (<20,000). Fill the cavity with cold uncoated aggregate to the level of the road surface and top the aggregate with binder to form a temporary riding surface. Roadways with an ADT greater than 20,000 will require materials similar to cold patch asphalt. Be sure whatever is used is approved by the state agency.

Quality Control

Upon request, certifications of the materials will be provided.

The Project Engineer may require the contractor to provide samples during the course of the work for laboratory test of any or all of the properties specified.

Payments shall be made under:

Pay Item	Pay Unit
Asphalt Joint Repair/Replacement (18"-24" Wide, w/ Plate)	Cubic Foot

ELASTOMERIC CONCRETE PLACEMENT:

Contractor shall repair damaged concrete adjacent to expansion joints as directed by the Engineer with elastomeric concrete.

Contractor shall submit falsework plans for approval. Falsework plans shall take into account expansion of the bridge deck due to changes in temperature.

Do not place elastomeric concrete if the ambient air temperature is below 45°F. Prepare and apply a primer, as per manufacturer's recommendations, to all vertical concrete faces, all steel components to be in contact with elastomeric concrete, and to areas specified by the manufacturer. Align the angles with the joint opening.

Prepare, batch, and place the elastomeric concrete in accordance with the manufacturer's instructions. Place the elastomeric concrete while the primer is still tacky and within 2 hours after applying the primer. Pay careful attention to properly consolidate the elastomeric concrete around the steel and anchors.

Tarps are to be utilized under the mixing areas, and the bridge deck joint shall be taped off to protect the bridge deck from spills during elastomeric concrete installation.

Provide materials that comply with the following minimum requirements at 14 days.

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 D882 (D882M)	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, use elastomeric concrete that also resists water, chemical, UV, and ozone exposure and withstands extreme temperature (freeze-thaw) changes.

Furnish a manufacturer's certification verifying that the materials satisfy the above requirements. Provide samples of elastomeric concrete to the Engineer, if requested, to independently verify conformance with the above requirements.

The entire cost for joint repair using elastomeric concrete including but not limited to labor, maintenance, equipment, tools, and incidentals will be included in the unit prices for Joint Repair using Elastomeric Concrete. Linear feet measurement will include both sides of the joint to be repaired.

Payments shall be made under:

Pay Item	Pay Unit
Joint Repair using Elastomeric Concrete	Cubic Foot

CONCRETE/ASPHALT REPAIR (HOT APPLIED MASTIC ASPHALT BINDER):

Concrete/asphalt repairs shall be made using the following approved Hot Applied Flexible Repair Material:

Fibrecrete B or approved equal.

The Contractor shall prepare areas by removing any loose debris using a pavement breaker, by using a mechanical planer or as directed by the Engineer. The recess is then cleaned and dried using hot compressed air to thoroughly prepare the surface, removing all debris and loose material. The Hot Applied Flexible Repair Material is immediately poured and screeded to fill the recess flush with the surrounding area and overlap the edges. While the material is still

molten, a preheated high PSV aggregate is applied to the surface.

When repairing pot holes from 1-1/2” to full depth, the Contractor will include 1/2” – 1” washed aggregate at the rate of no more than 30% of volume as directed by the Engineer. The balance of the repair will be completed as previously stated.

All materials shall be delivered unopened in their original containers bearing the manufacturer’s label, specifying date of manufacture, batch number, trade name or brand and quantity.

Sufficient material to perform the entire repair application shall be in storage at the site or at the Contractors facility prior to any field preparation, so that there shall be no delay in procuring the material for each day’s application.

Stored materials may be inspected prior to their use and shall meet the requirements of these Special Provisions at the time of use.

Any material which is rejected because of failure to meet the required tests or that has been damaged so as to cause rejections shall be immediately replaced by the Contractor at no additional cost to the Department.

Each shipment of the Hot Applied Flexible Repair Material shall be accompanied by Material Safety Data Sheets (MSDS) and a Certificate of Compliance certifying that the materials conform to the requirements as approved by NCDOT Materials and Test Unit.

Materials

(A) Hot Applied Mastic Asphalt Binder

Material shall be a flexible repair material for joint/large crack, spalls and pot-hole repairs in asphalt and concrete. It is a hot-applied mastic asphalt binder with 36% bitumen content, polymers mixed with graded fillers, recycled steel fibers (less than 1% total weight), aggregates and recycled tire rubber (no less than 3% of total weight).

(B) Applications

Material shall be designed to replace traditional asphaltic repairs, which are prone to failure due to their stiffness. The material shall be resistant to water intrusion and to a broad range of salts, bases and organic materials.

(C) Material Specifications

The material shall be an electrometric polymer modified binder, installed in accordance with the manufacturer’s specification and shall conform to the following properties:

Binder Properties	Method	Requirement
Bond	ASTM D 1190	Pass, 3 cycles @ -20°C, 50%
Penetration	ASTM D 5329	1 mm min @ -18°C, 200 g, 60 sec
		9 mm max @ 25°C, 150 g, 5 sec

Ductility	ASTM D113	40 cm min @ 25°C
Flexibility	ASTM D5329	Pass @ -12°C
Flow	ASTM D5329	3 mm max @ 60° @ 5 hours
Resilience	ASTM D5329	40% min @ 25°C
Softening Point	ASTM D36	82°C min
Elongation	-	500% min
Wheel tracking@ 122°F	BS598	4.8mm/h
Safe Heating Temperature	-	230°C (440°F)
Recommended Pouring Temperature	-	185°C to 199°C (365°F-390°F)

Site Preparation

The joint/crack shall be milled with a mechanical planer to the specified width and depth (if required) all spalls and pot holes shall be milled or saw cut or jack hammered at the Engineer's discretion. The repair surfaces will be cleaned and dried with a hot air lance capable of producing temperatures in excess of 1400°C and directional velocities exceeding 750 meters per second. The recessed area and vertical walls will be treated with a primer agent to promote adhesion and prevent moisture intrusion (for concrete applications only).

Installation

Installation of the material shall be by factory trained and certified installation professionals. The material will be heated in a thermostatically controlled mixer, having a horizontal agitator that ensures complete mixing. Once the material has reached approximately 300°F, the molten material will be introduced into the prepared repair area, sealing the bottom of the repair from water intrusion. For depths greater than 1", heated 3/4" granite aggregate shall be added at a rate of 25% - 35% by volume. The final 3/4" of the repair will be the hot applied mastic asphalt binder material for optimum flexibility of the repair. Once this top layer has been screeded to a level grade, a high PSV aggregate will be applied to the top of the repair to ensure proper skid resistance.

Depending on the depth of the repair, the material will be ready for traffic return between 30 minutes to 1 hour.

All removed materials and residual repair materials will be recovered and disposed of away from the site according to the client's specifications.

Warranty

The supplier shall warrant that the material furnished shall perform for 2 years from date of installation when installed by the materials supplier's certified applicator and installed to the manufacturer's specifications.

The quantity of Hot Applied Flexible Repair Material for which payment will be made will be the actual pounds of material used. Payment shall be in full compensation for all labor, tools,

equipment and incidentals necessary for the completion of the work.

Payment will be made under:

Pay Item	Pay Unit
Concrete/Asphalt Deck Repair (Hot Applied Mastic Asphalt Binder)	Pounds

CONCRETE/ASPHALT REPAIR (HOT APPLIED SYNTHETIC POLYMER MODIFIED RESIN):

Concrete/asphalt repairs shall be made using the following approved Hot Applied Flexible Repair Material:

Fibrecrete G or approved equal

The Contractor shall prepare areas by removing any loose debris using a pavement breaker, by using a mechanical planer or as directed by the Engineer. The recess is then cleaned and dried using hot compressed air to thoroughly prepare the surface, removing all debris and loose material. The Hot Applied Flexible Repair Material is immediately poured or screeded to fill the recess and overlap the edges. While the material is still molten, a preheated high PSV aggregate is applied and then compacted to ensure that the finished repair is flush with the surrounding area.

When repairing pot holes from 1-1/2” to full depth, that are not adjacent to or spanning a joint, the Contractor will include 1/2” – 1” washed aggregate at the rate of no more than 30% of volume as directed by the Engineer. The balance of the repair will be completed as previously stated.

All materials shall be delivered unopened in their original containers bearing the manufacturer’s label, specifying date of manufacture, batch number, trade name or brand and quantity.

Sufficient material to perform the entire repair application shall be in storage at the site or at the Contractors facility prior to any field preparation, so that there shall be no delay in procuring the material for each day’s application.

Stored materials may be inspected prior to their use and shall meet the requirements of these Special Provisions at the time of use.

Any material which is rejected because of failure to meet the required tests or that has been damaged so as to cause rejections shall be immediately replaced by the Contractor at no additional cost to the Department.

Each shipment of the Hot Applied Flexible Repair Material shall be accompanied by Material Safety Data Sheets (MSDS) and a Certificate of Compliance certifying that the materials conform to the requirements as approved by NCDOT Materials and Test Unit.

Materials

(A) **Hot Applied Synthetic Polymer Modified Resin**

Material shall be a flexible repair material for joint/ large cracks, spalls and pot holes in concrete. It is a hot-applied, synthetic polymer modified resin compound containing mineral fillers, chopped fibers, and graded aggregates.

(B) Applications

Material shall be designed to replace traditional cementitious repairs, which are prone to failure due to their stiffness. The installed product shall be color-matched, a load-transferring repair that has superior tensile strength and shall have the flexibility to accommodate limited joint/crack movement. The material shall be resistant to water intrusion and to a broad range of salts, bases and organic materials, making the repair a long-term solution for highway maintenance projects.

(C) Material Specifications

The material shall be a synthetic polymer modified resin binder. Installed in accordance with the manufacturer’s specifications, the installed product will conform to the following properties:

Binder Properties	Method	Requirement
Bond	ASTM D 1190	Pass, 3 cycles @ -20°C, 50%
Penetration	ASTM D 5329	1 mm min @ -18°C, 200 g, 60 sec
		9 mm max @ 25°C, 150 g, 5 sec
Ductility	ASTM D113	40 cm min @ 25°C
Flexibility	ASTM D5329	Pass @ -12°C
Flow	ASTM D5329	3 mm max @ 60° @ 5 hours
Resilience	ASTM D5329	40% min @ 25°C
Softening Point	ASTM D36	82°C min
Elongation	FTL	500% min
Wheel tracking@ 122°F	BS598	4.8mm/h
Safe Heating Temperature	-	230°C
Recommended Pouring Temperature	-	185°C to 199°C

Site Preparation

The joint/crack, spall or pot hole will be saw-cut/milled to the specified width and depth (if required). The joint/crack, spall or pot whole surfaces will be cleaned and dried with a hot air lance capable of producing temperatures in excess of 1400°C and directional velocities exceeding 750 meters per second. The recessed area and vertical walls will be treated with a primer agent to promote adhesion and prevent moisture intrusion (for concrete applications only).

Installation

The material will be heated in a thermostatically controlled mixer, having a horizontal agitator that ensures complete mixing. Once the material has reached approximately 195°C, the molten material will be introduced into the prepared repair, sealing the bottom of the repair from water intrusion. The remainder of the repair process will consist of layering coarse hot angular aggregate (cleaned and dried) with the molten material until within 1/2” of the top of the repair. The final 1/2” of the repair will be hot applied synthetic polymer modified resin material for optimum flexibility of the repair. Once this top layer has been screened to a level grade, a high PSV aggregate will be applied to the top of the repair to ensure proper skid resistance. Depending on the depth of the repair, the material will be ready for traffic return between 30 minutes to 1 hour.

All removed materials and residual repair materials will be recovered and disposed of away from the site according to the client’s specifications.

Warranty

The supplier shall warrant that the materials furnished shall perform for 2 years from date of installation when installed by the materials supplier’s certified applicator and installed to the manufacturers specifications.

The quantity of Hot Applied Flexible Repair Material for which payment will be made will be the actual pounds of material used. Payment shall be in full compensation for all labor, tools, equipment and incidentals necessary for the completion of the work.

Payment will be made under:

Pay Item	Pay Unit
Concrete/Asphalt Deck Repair (Hot Applied Synthetic Polymer Modified Resin)	Pounds

HDPF SLAB LEVELING, UNDERSEALING, VOID FILLING: Material

The medium used for slab leveling, undersealing and void filling shall be blown, high-density polyurethane. The material shall be hydrophobic.

The high-density, closed cell, polyurethane system shall exhibit the following physical characteristics and properties:

Density, Lbs/Ft ASTM 1622	Compressive Strength ASTM 1621
3.0	40 psi
3.5	50 psi
4.0	60 psi
6.0	110 psi

The polyurethane foam system will have a free rise density of 3.0 – 4.2 lb/ft, with a minimum compressive strength of 40 psi. The expansion of the polyurethane foam under pressure increases the foam density above the original free rise density value. The compressive strength

is a function of density of the tested material; therefore the foam produced during the lifting process will normally have a higher compressive strength than foam produced without restriction (free rise).

Equipment

A listing of lifting and undersealing equipment shall be submitted to the Engineer prior to commencement of work for review. The minimum list of equipment required shall be as listed below. The listing is a minimum and shall not preclude the use of additional equipment.

- A. A pneumatic drill and an electric drill capable of drilling 5/8"- 3/4" diameter holes.
- B. A truck-mounted pumping unit capable of injecting the high-density polyurethane formulation below the concrete slab or asphalt pavement. This pumping unit will be capable of controlling the rate of rise of the pavement.
- C. Stringlines or dial indicators will be periodically monitored to ensure that the concrete slab or overlay is raised to the required elevation. These devices are not used to constantly monitor or determine the moment movement begins.

Construction Methods

Final elevations shall be within 1/4" of the elevations proposed by profile, to the extent permitted by the structure, existing construction and site conditions. A tight string line may be used to monitor and verify elevations for slab lengths of 50 feet or less. Elevations can also be verified by flooding the area to confirm that the paving has been realigned properly. The Contractor shall be responsible for any pavement blowouts or excessive pavement lifting which may result from process and shall repair the damaged area to the satisfaction of the Engineer without additional cost.

The HDPF shall reach 90% of the full compressive strength in 15 minutes after injection.

The Contractor shall prepare concrete to be leveled, undersealed or void filled by profiling existing pavement and determining where the pavement needs to be raised. A series of 5/8" holes shall be drilled into the pavement 3-6 foot O.C. (exact location and spacing to be determined in the field). Drilled holes shall extend through the pavement and into known voids. Holes shall not extend into the subgrade. The expanding HDPF material shall then be injected under the slab. The amount of rise shall be controlled by regulating the rate of HDPF injected. Injection holes shall be sealed with non-expansive cementitious grout once leveling is complete. The Contractor will be held responsible for any pavement blowouts, excessive pavement lifting or pavement damage that may occur as a result of the Contractor's work. The Contractor shall repair any such suspect areas to the satisfaction of the Engineer at the Contractor's expense. It will be the Contractor's responsibility to control these operations to make sure excessive rising of the slabs does not occur. Where such does happen, the Contractor shall be responsible for planning or replacing the existing pavement structure to provide, at the Engineer's discretion, a suitable riding surface.

Measurement

The polyurethane material shall be paid for by the pound, which will include furnishing and injecting material.

Verification of actual amount pumped will be accomplished as follows:

1. A conversion from pump counters to pounds will be provided with a manufacturer's certification of the accurate conversion factor.
2. A visual measurement conversion on the actual totes/barrels of pounds per inches pumped.

Basis of Payment

The quantity of material to be paid for shall be the quantity actual used, based on the contract unit price shown on the bid form. Only those items shown on the bid sheet shall be paid for directly. All other labor, tool, equipment, and incidentals necessary for the completion of the project shall be considered incidental to the contract bid items.

Payment will be made under:

Pay Item	Pay Unit
Slab Leveling, Undersealing, and Void Filling	Pounds

SOIL STABILIZATION:

Description

Pressure inject hydrophobic polyurethane injection resin into the soil at locations to be determined by the Engineer to permeate, stabilize weak and loose soils, and prevent water migration. The Contractor shall furnish all materials, labor, tools, and equipment to stabilize soils as specified.

(A) Quality Assurance

Manufacturer of polyurethane material shall have been in existence for a period of not less than 15 years.

The Contractor shall provide the Engineer with job references where they have successfully completed 10 projects using moisture activated hydrophobic polyurethane resins for soil stabilization.

(B) Delivery, Storage, and Handling

Deliver the specified products in original, unopened containers with manufacturer's name, labels, product identification, and batch numbers intact. Store and condition the specified product as recommended by the manufacturer.

(C) Site Conditions

Do not apply the material if it is or it appears that it will be raining or snowing unless precautions are taken to protect the material from moisture. If temperature is or will be below 34°F protect grout from freezing. Ice or the formation of ice can prevent grout penetration and travel.

Contractor shall take all precautions necessary to insure that no damage will occur to any work zone due to handling or pumping of the polyurethane resin.

Materials

(A) Acceptable Manufacturers

- (1) Prime Flex 920, as manufactured by Prime Resins, Inc., Conyers, Georgia (800-321-7212) is considered to conform to the requirements of this specification and has performed satisfactorily for soil stabilization.
- (2) The use of a product other than specified will be considered providing the Contractor requests its use in writing to the Engineer. The request shall be accompanied by a notarized certification of compliance from an approved independent testing laboratory that the proposed substitute product meets or exceeds the specified performance criteria, tested in accordance with the specified test standards, and documented proof that the proposed product has a proven record of performance of soil stabilization, confirmed by actual field tests and five successful installations that the Engineer can investigate.
- (3) The installing Contractor must have a minimum of at least 10 successful soil stabilization projects utilizing moisture activated hydrophobic polyurethane injection resins and be able to provide project lists and references to the Engineer.

(B) Performance Criteria

- (1) Physical properties of polyurethane resin:
 1. Water activated resin
 2. Variable cure rate
 3. Viscosity: 110-130 cps \pm 20 cps
 4. Solids Content: 100% solids
 5. Characteristics: Hydrophobic polymer
 6. Meets ANSI/NSF 61 Approval
- (2) Physical properties of catalyst:
 1. Appearance: Clear liquid
 2. Viscosity: 15-20 cps
 3. Solids Content: 100%
- (3) Physical properties of polyurethane resin cured under pressure:
 1. Shrinkage (ASTM D-1042 / D-756): None
 2. Tensile Properties (ASTM D-1623)

- a. Tensile strength: 23 psi
 - b. Elongation: 3%
3. ANSI/NSF 61 Approval

(C) Polyurethane Resin Specifications

- (1) Polyurethane resin shall be a single component material that requires catalyst. Adjusting the percentage of catalyst to the base resin shall control reaction time of the grout.
- (2) Material shall be a water-reactive grout.
- (3) Polyurethane resin shall be hydrophobic in nature.

Construction Methods

(A) Preparation

Prior to starting work the Owner shall provide the grouting contractor with detailed drawing of all underground utilities in the work zone and all utilities shall be properly marked on the site. If a soil analysis report is not part of the original documents the contractor has the right to request one be provided at no additional cost to the contractor. This may be needed to determine proper probe placement, to identify potential problem areas, and natural differences in soil composition.

Contractor shall determine appropriate spacing and depth placement for injection probes to successfully seal and stabilize area as shown in drawings. Test sections may be necessary to determine best probe spacing depending on soil types and conditions encountered. (Typical spacing will vary between 12” to 60” in each direction and if multiple rows are needed then each row shall be offset 1/2 the space distance.) Probes: Pipe shall utilize Expendable Drive Point or other acceptable means to keep dirt from clogging pipe during driving. Type and size to be determined by Contractor. Probes may be placed by manual driver, pneumatic driver, auger, or water jetting.

Prior to injecting grout Contractor shall ensure that the soils contain enough moisture to fully react the grout or shall use a plural component pump to inject water and grout simultaneously (twin streaming) through injection pipe/probe. When twin streaming is done a ratio of 10:1 (grout:water) shall be used. A pump capable of injection pressures from 100 psi to 3300 psi is recommended. Flow rate of pumps shall be 2.0 gpm minimum. Manually operated or “hand pumps” are considered unacceptable and cannot be used.

A grout log shall be maintained recording amount of grout and percentage of catalyst used for inspection by the Engineer at all times. Request for payment of grout shall include a copy of grout log detailing quantities used.

(B) Application

Contractor shall determine amount of grout to be injected into each probe to ensure all areas with the work area are fully grouted. Grouting shall use the “Lift Grouting Technique” where the pipe is raised or jacked up and grout is injected in 12” to 15” intervals or lifts. The amount of grout to be injected at each lift is to be determined by the contractor based on soil conditions for that particular area. Injection pressures will vary depending on soil conditions.

On below grade structures grouting can also be done via the “through wall” method. This involves drilling holes through a wall (or floor) and grouting via these holes. In some cases it may be necessary to install soil pipes to transfer grout further out into the soils. Contractor to determine appropriate hole spacing to ensure desired results.

Adhere to all limitations and cautions set forth by the manufacturer.

(C) Safety

Copy of 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.

(D) Cleaning

- (1) Flush the pump and hoses with approved pump flush. Do not use solvents to clean off human skin.
- (2) Uncured polyurethane resin can be removed from tools with an approved solvent. Cured polyurethane can only be removed mechanically.
- (3) Remove all pipes from work area.
- (4) Leave work area clean and neat.

Measurement and Payment

The quantity of material to be paid for shall be the quantity actual used, based on the contract unit price shown on the bid form. Only those items shown on the bid sheet shall be paid for directly. All other labor, tool, equipment, and incidentals necessary for the completion of the project shall be considered incidental to the contract bid items.

Payment will be made under:

Pay Item	Pay Unit
Slab Stabilization	Gallons

STRUCTURAL FOAM VOID FILL/SLAB STABILIZATION:

Description

Inject a structural, two-component, polyurethane foam at locations to be determined by the Engineer to stabilize slabs and structures with voids to prevent further movement or settling. The Contractor shall furnish all materials, labor, tools, and equipment to stabilize soils as specified.

(A) Quality Assurance

Manufacturer of polyurethane resin material shall have been in existence for a period of not less than 15 years.

The Contractor shall supply the Engineer with 10 job references where they successfully injected polyurethane resin for sub-sealing, void filling applications, or soil stabilization.

Contractor shall provide submittals prior to commencement of work that details the material to be used and that it conforms to the project specifications.

(B) Delivery, Storage, and Handling

Deliver the specified products in original, unopened containers with manufacturer's name, labels, product identification, and batch numbers intact. Store and condition the specified product as recommended by the manufacturer.

Materials

(A) Acceptable Manufacturers

- (1) Prime Flex 985 (LX-10 or LX-20) Structural Foam, as manufactured by Prime Resins, Inc., Conyers, Georgia (800-321-7212) is considered to conform to the requirements of this specification and has performed satisfactorily for the application of void filling and slab stabilization.
- (2) The use of other than the specified materials will be considered providing the Contractor requests their use in writing to the Engineer. This request shall be accompanied by: (1) a certificate of compliance from an approved independent testing laboratory that the proposed substitute products meet or exceed the specified performance criteria, tested in accordance with the specified test standards; and (2) documented proof that the proposed substitute product has a 5 year proven record of performance, confirmed by actual field tests and 5 successful installations that the Engineer can investigate. Instant or rapid set (less than 5 minutes) foams will not be approved due to lack of migration time needed for material travel between rock.

(B) Performance Criteria

- (1) Properties of the mixed polyurethane resin for void filling and stabilizing:
 1. Mix ration (by volume): 1:1 (A:B)
 2. Initial reaction time: 70 sec. @ 72°F (23°C)
 3. Set time: 8 min.
 4. Expansion (free rise): 10:1*
 5. Viscosity: Part "A" 270 cps
Part "B" 280 cps
 6. Compressive Strength (ASTM D-1621):
LX-10: 60 psi @ 4.5 lbs. density 9216 psf*
- * Expansion is affected by field conditions. Actual results may vary depending on temperature, mixing equipment and degree of constraint.

(C) Polyurethane Resin Specifications

- (1) Material shall be a two (2) component, structural polyurethane foam.
- (2) Cured foam shall be closed cell.
- (3) Minimum compressive strength of cured foam shall be 40-60 psi.
- (4) Minimum expansion rate shall be 10:1 by volume (free rise).
- (5) Heat shall not be used or required to activate foam.
- (6) Maximum exotherm temperature to not exceed 270°F per 10 cf.

Construction Methods

(A) Mixing

Automated 1:1 ratio positive displacement bulk pumps such as "The Flowmaster Pump" (Prime Resins, Inc., Conyers, GA, 800-321-7212 or www.primeresins.com) may be used to mix and dispense material.

(B) Application

Locate and mark areas with voids.

Using drill, drill a series holes as determined by contractor or engineer based on actual site conditions over area to be grouted. Over large areas stagger holes in an offset grid pattern by one half the distance spacing per row. Manufacturer of polyurethane resin can be contacted for assistance in hole pattern.

Use a 1/4" rod, dowel, or other instrument to determine depth of void under slab. After determining amount of void, calculate approximate amount of resin needed.

Using meter-mix, positive displacement pump, inject pre-determined amount (to be based on field conditions) of Prime-Flex 985 Structural Foam into void.

left open for venting of excess foam or plugged of with a wood dowel or other means. Removing plugs will also assist in relieving pressure by allowing excess foam to release out top.

After foam has fully reacted shave excess from slab surface. Holes may be left filled with foam or drilled out and filled as directed by engineer or owner.

(D) Cleaning

- (1) Clean the substrate to produce a finish appearance acceptable to the Engineer and Owner. Shave excess foam from area.
- (2) Clean 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.
- (3) Leave work area neat, clean, safe and without evidence of spillovers onto adjacent areas.

Measurement and Payment

The quantity of material to be paid for shall be the quantity actual used, based on the contract unit price shown on the bid form. Only those items shown on the bid sheet shall be paid for directly. All other labor, tool, equipment, and incidentals necessary for the completion of the project shall be considered incidental to the contract bid items.

Payment will be made under:

Pay Item	Pay Unit
Structural Foam Void Fill/Stabilization	Gallons

CLASS II CONCRETE DECK REPAIRS – HES CONCRETE

Class II Surface Preparation (Partial Depth): Remove by chipping with hand tools (or hydro-demolition) all loose, unsound and contaminated deck concrete to an average depth of approximately one half the deck thickness, but no less than 3/4 inch below the top mat of steel. In areas where the entire perimeter of the reinforcing steel bar is exposed, chip or use hand-held high velocity water-jet equipment to provide a minimum depth of 3/4 inch below the bar. Use a small chipping hammer (15 lb. class) to prepare the edges of the repair area to limit micro fractures. Dispose of the removed concrete, clean, repair or replace rusted or loose reinforcing steel, and thoroughly clean the newly exposed surface. Use a bonding agent in accordance with the manufacturer's recommendations.

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

In overhangs, removing concrete areas of less than 0.60 sf/ft length of bridge without overhang support will be permitted unless the Engineer directs otherwise. For concrete areas greater than 0.60 sf/ft length of bridge, approval of the overhang support will be required.

Refill areas where concrete was removed with a NCDOT approved high-early concrete material up to the finished deck surface and cure in accordance with the material manufacturer's recommendations. Provide a broom finish.

Basis of Payment

The quantity of Class II Concrete Deck Repairs for which payment will be made will be the actual square footage of concrete deck repaired. Payment shall be in full compensation for all labor, tools, equipment and incidentals necessary for the completion of the work. Payment shall be made as follows:

- Class II Concrete Deck Repairs – HES Concrete (0 – 15 SF). SF.**
- Class II Concrete Deck Repairs – HES Concrete (more than 15 SF). SF.**

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(E) of the *2012 Standard Specifications*.

ERRATA

(1-17-12) (Rev. 1-21-14)

Z-4

Revise the *2012 Standard Specifications* as follows:

Division 2

Page 2-7, line 31, Article 215-2 Construction Methods, replace “Article 107-26” with “Article 107-25”.

Page 2-17, Article 226-3, Measurement and Payment, line 2, delete “pipe culverts,”.

Page 2-20, Subarticle 230-4(B), Contractor Furnished Sources, change references as follows:

Line 1, replace “(4) Buffer Zone” with “(c) Buffer Zone”; **Line 12**, replace “(5) Evaluation for Potential Wetlands and Endangered Species” with “(d) Evaluation for Potential Wetlands and Endangered Species”; and **Line 33**, replace “(6) Approval” with “(4) Approval”.

Division 3

Page 3-1, after line 15, Article 300-2 Materials, replace “1032-9(F)” with “1032-6(F)”.

Division 4

Page 4-77, line 27, Subarticle 452-3(C) Concrete Coping, replace “sheet pile” with “reinforcement”.

Division 6

Page 6-7, line 31, Article 609-3 Field Verification of Mixture and Job Mix Formula Adjustments, replace “30” with “45”.

Page 6-10, line 42, Subarticle 609-6(C)(2), replace “Subarticle 609-6(E)” with “Subarticle 609-6(D)”.

Page 6-11, Table 609-1 Control Limits, replace “Max. Spec. Limit” for the Target Source of $P_{0.075}/P_{be}$ Ratio with “1.0”.

Page 6-40, Article 650-2 Materials, replace “Subarticle 1012-1(F)” with “Subarticle 1012-1(E)”

Division 8

Page 8-23, line 10, Article 838-2 Materials, replace “Portland Cement Concrete, Class B” with “Portland Cement Concrete, Class A”.

Division 12

Page 12-7, Table 1205-3, add “FOR THERMOPLASTIC” to the end of the title.

Page 12-8, Subarticle 1205-5(B), line 13, replace “Table 1205-2” with “Table 1205-4”.

Page 12-8, Table 1205-4 and 1205-5, replace “THERMOPLASTIC” in the title of these tables with “POLYUREA”.

Page 12-9, Subarticle 1205-6(B), line 21, replace “Table 1205-4” with “Table 1205-6”.

Page 12-11, Subarticle 1205-8(C), line 25, replace “Table 1205-5” with “Table 1205-7”.

Division 15

Page 15-4, Subarticle 1505-3(F) Backfilling, line 26, replace “Subarticle 235-4(C)” with “Subarticle 235-3(C)”.

Page 15-6, Subarticle 1510-3(B), after line 21, replace the allowable leakage formula with the following: $W = LD\sqrt{P} \div 148,000$

Page 15-6, Subarticle 1510-3(B), line 32, delete “may be performed concurrently or” and replace with “shall be performed”.

Page 15-17, Subarticle 1540-3(E), line 27, delete “Type 1”.

Division 17

Page 17-26, line 42, Subarticle 1731-3(D) Termination and Splicing within Interconnect Center, delete this subarticle.

Revise the *2012 Roadway Standard Drawings* as follows:

1633.01 Sheet 1 of 1, English Standard Drawing for Matting Installation, replace “1633.01” with “1631.01”.

PLANT AND PEST QUARANTINES

(Imported Fire Ant, Gypsy Moth, Witchweed, And Other Noxious Weeds)

(3-18-03) (Rev. 10-15-13)

Z-04a

Within Quarantined Area

This project may be within a county regulated for plant and/or pests. If the project or any part of the Contractor's operations is located within a quarantined area, thoroughly clean all equipment prior to moving out of the quarantined area. Comply with federal/state regulations by obtaining a certificate or limited permit for any regulated article moving from the quarantined area.

Originating in a Quarantined County

Obtain a certificate or limited permit issued by the N.C. Department of Agriculture/United States Department of Agriculture. Have the certificate or limited permit accompany the article when it arrives at the project site.

Contact

Contact the N.C. Department of Agriculture/United States Department of Agriculture at 1-800-206-9333, 919-733-6932, or <http://www.ncagr.gov/plantind/> to determine those specific project sites located in the quarantined area or for any regulated article used on this project originating in a quarantined county.

Regulated Articles Include

1. Soil, sand, gravel, compost, peat, humus, muck, and decomposed manure, separately or with other articles. This includes movement of articles listed above that may be associated with cut/waste, ditch pulling, and shoulder cutting.
2. Plants with roots including grass sod.
3. Plant crowns and roots.
4. Bulbs, corms, rhizomes, and tubers of ornamental plants.
5. Hay, straw, fodder, and plant litter of any kind.
6. Clearing and grubbing debris.
7. Used agricultural cultivating and harvesting equipment.
8. Used earth-moving equipment.
9. Any other products, articles, or means of conveyance, of any character, if determined by an inspector to present a hazard of spreading imported fire ant, gypsy moth, witchweed or other noxious weeds.

MINIMUM WAGES

(7-21-09)

Z-5

FEDERAL: The Fair Labor Standards Act provides that with certain exceptions every employer shall pay wages at the rate of not less than SEVEN DOLLARS AND TWENTY FIVE CENTS (\$7.25) per hour.

STATE: The North Carolina Minimum Wage Act provides that every employer shall pay to each of his employees, wages at a rate of not less than SEVEN DOLLARS AND TWENTY FIVE CENTS (\$7.25) per hour.

The minimum wage paid to all skilled labor employed on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS (\$7.25) per hour.

The minimum wage paid to all intermediate labor employed on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS (\$7.25) per hour.

The minimum wage paid to all unskilled labor on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS (\$7.25) per hour.

This determination of the intent of the application of this act to the contract on this project is the responsibility of the Contractor.

The Contractor shall have no claim against the Department of Transportation for any changes in the minimum wage laws, Federal or State. It is the responsibility of the Contractor to keep fully informed of all Federal and State Laws affecting his contract.

ON-THE-JOB TRAINING

(10-16-07) (Rev. 5-21-13)

Z-10

Description

The North Carolina Department of Transportation will administer a custom version of the Federal On-the-Job Training (OJT) Program, commonly referred to as the Alternate OJT Program. All contractors (existing and newcomers) will be automatically placed in the Alternate Program. Standard OJT requirements typically associated with individual projects will no longer be applied at the project level. Instead, these requirements will be applicable on an annual basis for each contractor administered by the OJT Program Manager.

On the Job Training shall meet the requirements of 23 CFR 230.107 (b), 23 USC – Section 140, this provision and the On-the-Job Training Program Manual.

The Alternate OJT Program will allow a contractor to train employees on Federal, State and privately funded projects located in North Carolina. However, priority shall be given to training employees on NCDOT Federal-Aid funded projects.

Minorities and Women

Developing, training and upgrading of minorities and women toward journeyman level status is a primary objective of this special training provision. Accordingly, the Contractor shall make every effort to enroll minority and women as trainees to the extent that such persons are available within a reasonable area of recruitment. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

Assigning Training Goals

The Department, through the OJT Program Manager, will assign training goals for a calendar year based on the contractors' past three years' activity and the contractors' anticipated upcoming year's activity with the Department. At the beginning of each year, all contractors eligible will be contacted by the Department to determine the number of trainees that will be assigned for the upcoming calendar year. At that time the Contractor shall enter into an agreement with the Department to provide a self-imposed on-the-job training program for the calendar year. This agreement will include a specific number of annual training goals agreed to by both parties. The number of training assignments may range from 1 to 15 per contractor per calendar year. The Contractor shall sign an agreement to fulfill their annual goal for the year. A sample agreement is available at www.ncbowd.com/section/on-the-job-training.

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.

12/19/89

LISTING OF MBE/WBE SUBCONTRACTORS

Sheet _____ of _____

Firm Name and Address	Circle One	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item
Name	MBE				
Address	WBE				
Name	MBE				
Address	WBE				
Name	MBE				
Address	WBE				
Name	MBE				
Address	WBE				
Name	MBE				
Address	WBE				
Name	MBE				
Address	WBE				
Name	MBE				
Address	WBE				

* The Dollar Volume shown in this column shall be the Actual Price Agreed Upon by the Prime Contractor and the MBE/WBE subcontractor, and these prices will be used to determine the percentage of the MBE/WBE participation in the contract.

** Dollar Volume of MBE/WBE Subcontractor Percentage of Total Contract Bid Price:

If firm is a Material Supplier Only, show Dollar Volume as 60% of Agreed Upon Amount from Letter of Intent.

If firm is a Manufacturer, show Dollar Volume as 100% of Agreed Upon Amount from Letter of Intent.

LISTING OF MBE/WBE SUBCONTRACTORS

Sheet _____ of _____

Firm Name and Address	Circle One	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item
Name	MBE				
Address	WBE				
Name	MBE				
Address	WBE				
Name	MBE				
Address	WBE				
Name	MBE				
Address	WBE				
Name	MBE				
Address	WBE				
Name	MBE				
Address	WBE				

* The Dollar Volume shown in this column shall be the Actual Price Agreed Upon by the Prime Contractor and the MBE/WBE subcontractor, and these prices will be used to determine the percentage of the MBE/WBE participation in the contract.

**** Dollar Volume of MBE Subcontractor** \$ _____

MBE Percentage of Total Contract Bid Price _____ %

**** Dollar Volume of WBE Subcontractor** \$ _____

WBE Percentage of Total Contract Bid Price _____ %

** Dollar Volume of MBE/WBE Subcontractor Percentage of Total Contract Bid Price:

If firm is a Material Supplier Only, show Dollar Volume as 60% of Agreed Upon Amount from Letter of Intent. If firm is a Manufacturer, show Dollar Volume as 100% of Agreed Upon Amount from Letter of Intent.

North Carolina Department of Transportation

BID FORM

CONTRACT: 11407998
WBS ELEMENT: To Be Assigned
COUNTIES: Buncombe, Burke, Madison, McDowell, Mitchell, Rutherford, and Yancey
DESCRIPTION: Replacement/Repair of Bridge Expansion Joints, Deck Repairs, and Foam Injections at Various Bridge Sites

ITEM	SECT	DESCRIPTION	QTY	UNIT	UNIT PRICE	AMOUNT BID
1	SP	MOBILIZATION	10	EA		
2	SP	SILICON JOINT REPLACEMENT (LESS THAN 1" WIDE)	500	LF		
3	SP	SILICON JOINT REPLACEMENT (1" TO 2" WIDE)	500	LF		
4	SP	SILICON JOINT REPLACEMENT (GREATER THAN 2" WIDE)	500	LF		
5	SP	EVAZOTE JOINT REPLACEMENT	500	LF		
6	SP	SYNTHETIC RUBBER EXPANSION JOINT (1" TO 2" WIDE)	400	LF		
7	SP	SYNTHETIC RUBBER EXPANSION JOINT (2" TO 3.5" WIDE)	400	LF		
8	SP	ASPHALT JOINT REPAIR/ REPLACEMENT (18-24" WIDE, W/ PLATE)	100	CF		
9	SP	JOINT REPAIR USING ELASTOMERIC CONCRETE	50	CF		
10	SP	ASPHALT/CONCRETE DECK REPAIR (HOT APPLIED MASTIC ASPHALT BINDER)	15,000	LB		
11	SP	ASPHALT/CONCRETE DECK REPAIR (HOT APPLIED SYNTHETIC POLYMER RESIN)	15,000	LB		
12	SP	SLAB LEVELING, UNDERSEALING AND VOID FILLING	5,000	LB		
13	SP	SOIL STABILIZATION	400	GAL		
14	SP	STRUCTURAL FOAM VOID FILL/ STABILIZATION	50	GAL		
15	SP	CL II CONC. DECK REPAIR-HES (0-15 SF)	200	SF		
16	SP	CL II CONC. DECK REPAIR-HES (>15 SF)	200	SF		
17	SP	TEMPORARY LANE CLOSURE (2-LANE, 2-WAY ROADWAY)	40	EA		
18	SP	TEMPORARY LANE CLOSURE (MULTI-LANE ROADWAY)	40	EA		
19	SP	LANE CLOSURE SHIFT (MULTI-LANE ROADWAY)	25	EA		
20	SP	NIGHTTIME TEMPORARY LANE CLOSURE (2-LANE, 2-WAY ROADWAY)	25	EA		
21	SP	NIGHTTIME TEMPORARY LANE CLOSURE (MULTI-LANE ROADWAY)	25	EA		
22	SP	NIGHTTIME LANE CLOSURE SHIFT (MULTI-LANE ROADWAY)	40	EA		

TOTAL BID FOR PROJECT: _____

THIS SECTION TO BE COMPLETED BY NC DEPARTMENT OF TRANSPORTATION

This bid has been reviewed in accordance with Article 103-1 of the Standard Specifications for Roads and Structures 2012.

Reviewed by _____ *Date* _____

Accepted by NCDOT Division Engineer _____ *Date* _____

EXECUTION OF BID

NON-COLLUSION AFFIDAVIT, DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION

CORPORATION

The person executing the bid, on behalf of the Bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee of the bidder has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the Bidder intends to do the work with its own bonafide employees or subcontractors and is not bidding for the benefit of another contractor.

In addition, execution of this bid in the proper manner also constitutes the Bidder's certification of status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF CONTRACTOR

Full name of Corporation

Address as Prequalified

Attest _____

Secretary/Assistant Secretary
Select appropriate title

By _____

President/Vice President/Assistant Vice President
Select appropriate title

Print or type Signer's name

Print or type Signer's name

CORPORATE SEAL

AFFIDAVIT MUST BE NOTARIZED

Subscribed and sworn to before me this the

_____ day of _____ 20__.

NOTARY SEAL

Signature of Notary Public

of _____ County

State of _____

My Commission Expires: _____

**EXECUTION OF BID
NON-COLLUSION AFFIDAVIT, DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION
PARTNERSHIP**

The person executing the bid, on behalf of the Bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee of the bidder has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the Bidder intends to do the work with its own bonafide employees or subcontractors and is not bidding for the benefit of another contractor.

In addition, execution of this bid in the proper manner also constitutes the Bidder's certification of status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF CONTRACTOR

_____ Full Name of Partnership

_____ Address as Prequalified

_____ By _____
Signature of Witness Signature of Partner

_____ Print or type Signer's name

_____ Print or type Signer's name

AFFIDAVIT MUST BE NOTARIZED

Subscribed and sworn to before me this the _____ day of _____ 20__.

NOTARY SEAL

_____ Signature of Notary Public

of _____ County

State of _____

My Commission Expires: _____

**EXECUTION OF BID
NON-COLLUSION AFFIDAVIT, DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION**

LIMITED LIABILITY COMPANY

The person executing the bid, on behalf of the Bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee of the bidder has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the Bidder intends to do the work with its own bonafide employees or subcontractors and is not bidding for the benefit of another contractor.

In addition, execution of this bid in the proper manner also constitutes the Bidder's certification of status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF CONTRACTOR

Full Name of Firm

Address as Prequalified

Signature of Witness

Signature of Member/Manager/Authorized Agent
Select appropriate title

Print or type Signer's name

Print or type Signer's Name

AFFIDAVIT MUST BE NOTARIZED

Subscribed and sworn to before me this the _____
_____ day of _____ 20__.

NOTARY SEAL

Signature of Notary Public

of _____ County

State of _____

My Commission Expires: _____

**EXECUTION OF BID
NON-COLLUSION AFFIDAVIT, DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION**

INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME

The person executing the bid, on behalf of the Bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee of the bidder has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the Bidder intends to do the work with its own bonafide employees or subcontractors and is not bidding for the benefit of another contractor.

In addition, execution of this bid in the proper manner also constitutes the Bidder's certification of status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF CONTRACTOR

Name of Contractor

_____ Individual name

Trading and doing business as

_____ Full name of Firm

_____ Address as Prequalified

_____ Signature of Witness

_____ Signature of Contractor, Individually

_____ Print or type Signer's name

_____ Print or type Signer's name

AFFIDAVIT MUST BE NOTARIZED

Subscribed and sworn to before me this the

NOTARY SEAL

_____ day of _____ 20__.

_____ Signature of Notary Public

of _____ County

State of _____

My Commission Expires: _____

EXECUTION OF BID
NON-COLLUSION AFFIDAVIT, DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION

INDIVIDUAL DOING BUSINESS IN HIS OWN NAME

The person executing the bid, on behalf of the Bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee of the bidder has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the Bidder intends to do the work with its own bonafide employees or subcontractors and is not bidding for the benefit of another contractor.

In addition, execution of this bid in the proper manner also constitutes the Bidder's certification of status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF CONTRACTOR

Name of Contractor _____
Print or type Individual name

Address as Prequalified

Signature of Contractor, Individually

Print or type Signer's Name

Signature of Witness

Print or type Signer's name

AFFIDAVIT MUST BE NOTARIZED

Subscribed and sworn to before me this the _____ day of _____ 20__.

NOTARY SEAL

Signature of Notary Public

of _____ County

State of _____

My Commission Expires: _____

DEBARMENT CERTIFICATION

Conditions for certification:

1. The prequalified bidder shall provide immediate written notice to the Department if at any time the bidder learns that his certification was erroneous when he submitted his debarment certification or explanation filed with the Department, or has become erroneous because of changed circumstances.
2. The terms *covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded*, as used in this provision, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. A copy of the Federal Rules requiring this certification and detailing the definitions and coverages may be obtained from the Contract Officer of the Department.
3. The prequalified bidder agrees by submitting this form, that he will not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in NCDOT contracts, unless authorized by the Department.
4. For Federal Aid projects, the prequalified bidder further agrees that by submitting this form he will include the Federal-Aid Provision titled *Required Contract Provisions Federal-Aid Construction Contract (Form FHWA PR 1273)* provided by the Department, without subsequent modification, in all lower tier covered transactions.
5. The prequalified bidder may rely upon a certification of a participant in a lower tier covered transaction that he is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless he knows that the certification is erroneous. The bidder may decide the method and frequency by which he will determine the eligibility of his subcontractors.
6. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this provision. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
7. Except as authorized in paragraph 6 herein, the Department may terminate any contract if the bidder knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available by the Federal Government.

DEBARMENT CERTIFICATION

The prequalified bidder certifies to the best of his knowledge and belief, that he and his principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records; making false statements; or receiving stolen property;
- c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph b. of this certification; and
- d. Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- e. Will submit a revised Debarment Certification immediately if his status changes and will show in his bid proposal an explanation for the change in status.

If the prequalified bidder cannot certify that he is not debarred, he shall provide an explanation with this submittal. An explanation will not necessarily result in denial of participation in a contract.

Failure to submit a non-collusion affidavit and debarment certification will result in the prequalified bidder's bid being considered non-responsive.

Check here if an explanation is attached to this certification.

Execution of Contract

Contract No: 11407998

County: Buncombe, Burke, Madison, McDowell, Mitchell, Rutherford, and Yancey

ACCEPTED BY THE DEPARTMENT OF TRANSPORTATION

Division Project Manager

Date

EXECUTION OF CONTRACT AND BONDS
APPROVED AS TO FORM:

Division Engineer

Date