

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

**SECOND INDUSTRY DRAFT REQUEST FOR PROPOSALS**



**DESIGN-BUILD PROJECT**

**TIP U-2925**

**September 10, 2012**



*VOID FOR BIDDING*

DATE AND TIME OF TECHNICAL AND PRICE PROPOSAL SUBMISSION: **October 31, 2012 BY 4:00 PM**

DATE AND TIME OF PRICE PROPOSAL OPENING: **November 20, 2012 AT 2:00 PM**

CONTRACT ID: C 202933

WBS ELEMENT NO. 34892.2.2

FEDERAL-AID NO. STP-0918(16)

COUNTY: Forsyth

ROUTE NO. US 52

MILES: 1.094

LOCATION: Salem Creek Connector from SR 4326 (Rams Drive (formerly Stadium Drive)) to SR 4325 (Martin Luther King Jr. Drive)

TYPE OF WORK: DESIGN-BUILD AS SPECIFIED IN THE SCOPE OF WORK  
CONTAINED IN THE REQUEST FOR PROPOSALS

NOTICE:

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

\_\_\_\_\_  
5% BID BOND OR BID DEPOSIT REQUIRED  
\_\_\_\_\_

**PROPOSAL FORM FOR THE CONSTRUCTION OF CONTRACT NO. C202933  
IN FORSYTH COUNTY, NORTH CAROLINA**

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

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

The Design-Build Team herein acknowledges that it has carefully examined the location of the proposed work to be known as Contract No. C202933; has carefully examined the Final Request for Proposals (RFP) and all addendums thereto, specifications, special provisions, the form of contract, and the forms of contract payment bond and contract performance bonds, which are acknowledged to be part of the Contract; and thoroughly understands the stipulations, requirements and provisions. The undersigned Design-Build Team agrees to be bound upon their execution of the Contract and including any subsequent award to them by the Secretary of Transportation in accordance with this Contract to provide the necessary contract payment bond and contract performance bond within fourteen calendar days after the written notice of award is received by them.

The undersigned Design-Build Team further agrees to provide all necessary materials, machinery, implements, appliances, tools, labor, and other means of construction, except as otherwise noted, to perform all the work and required labor to design, construct and complete all the work necessary for State Highway Contract No. C202933 in Forsyth County by no later than the dates(s) specified in the Final RFP or Technical Proposal, whichever is earlier, and in accordance with the requirements of the Engineer, the Final RFP and Addenda thereto, the *2012 Standard Specifications for Roads and Structures*, specifications prepared by the Department, the Technical Proposal prepared by the Design-Build Team, at the lump sum price(s) bid by the Design-Build Team in their Price Proposal.

The Design-Build Team shall provide signed and sealed documents prepared by the Design-Build Team, which specifications and plans show the details covering this project and adhere to the items noted above.

The Design-Build Team acknowledges that project documents furnished by the Department are preliminary and provided solely to assist the Design-Build Team in the development of the project design. Unless otherwise noted herein, the Department does not warrant or guarantee the sufficiency or accuracy of any information furnished by the Department.

The Department does not warrant or guarantee the sufficiency or accuracy of any investigations made, nor the interpretations made or opinions of the Department as to the type of materials and conditions to be encountered at the project site. The Design-Build Team is advised to make such independent investigations, as they deem necessary to satisfy their self as to conditions to be encountered on this project. The Design-Build Team shall have no claim for additional compensation or for an extension of contract time for any reason resulting from the actual conditions encountered at the site differing from those indicated in any of the information or documents furnished by the Department except as may be allowed under the provisions of the Standard Specifications.

Although the Department has furnished preliminary designs for this project, unless otherwise noted herein, the Design-Build Team shall assume full responsibility, including liability, for the

project design, including the use of portions of the Department design, modification of such design, or other designs as may be submitted by the Design-Build Team.

The Design-Build Team shall be fully and totally responsible for the accuracy and completeness of all work performed under this contract, and shall indemnify and hold the Department harmless for any additional costs and all claims against the Department or the State which may arise due to errors or omissions of the Department in furnishing the preliminary project designs and information, and of the Design-Build Team in performing the work.

The published volume entitled *North Carolina Department of Transportation, Raleigh, Standard Specifications for Roads and Structures, January 2012*, as well as, all design manuals, policy and procedures manuals, and AASHTO publications and guidelines referenced in the Request For Proposals, with all amendments and supplements thereto, are by reference, incorporated and made part of this contract; that, except as herein modified, all the design, construction and Construction Engineering Inspection included in this contract is to be done in accordance with the documents noted above and under the direction of the Engineer.

If the Design-Build Proposal is accepted and the award is made, the Technical Proposal submitted by the Design-Build Team is by reference, incorporated and made part of this contract. 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 by written approval as allowed by the Request for Proposals.

Accompanying the Design-Build Proposal shall be 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 Design-Build Team 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 them, as provided in the Standard Specifications; otherwise said deposit will be returned to the Design-Build Team.

TO  
BE  
SEALED  
IN  
FINAL  
RFP

*Transportation Program  
Management Director*

TO  
BE  
SEALED  
IN  
FINAL  
RFP

*State Contract Officer*

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**PROPOSAL FORMS - ITEMIZED SHEET, ETC.**

- Itemized Proposal Sheet (TAN SHEET)
- Fuel Usage Factor Chart and Estimate of Quantities
- Listing of DBE Subcontractors
- Execution of Bid, Non-Collusion Affidavit, Debarment Certification and Gift Ban Certification
- Signature Sheet

**\*\*\* PROJECT SPECIAL PROVISIONS \*\*\*****CONTRACT TIME AND LIQUIDATED DAMAGES**

07/12/07

DB1 G04A

The date of availability for this contract is **December 31, 2012**, except that the Design-Build Team shall not begin ground disturbing activities, including utility relocations and tree harvesting until a meeting is held between the NCDOT, the regulatory agencies and the Design-Build Team; and the required permits have been acquired, as stipulated in the Environmental Permits Scope of Work contained elsewhere in this Request for Proposals (RFP). The Design-Build Team shall consider this factor in determining the proposed completion date for this project.

The completion date for this contract is defined as the date proposed in the Technical Proposal by the proposer who is awarded the project. The completion date thus proposed shall not be later than **November 15, 2016**.

When observation periods are required by the special provisions, they are not a part of the work to be completed by the completion date and/or intermediate contract times. Should an observation period extend beyond the final completion date, the acceptable completion of the observation period shall be a part of the work covered by the performance and payment bonds.

The liquidated damages for this contract are **Four Thousand Dollars (\$4,000.00)** per calendar day. As an exception to this amount, where the contract has been determined to be substantially complete as defined by the Special Provision entitled "Substantial Completion" found elsewhere in this RFP, the liquidated damages will be reduced to **One Thousand Dollars (\$1,000.00)** per calendar day.

Where the Design-Build Team who is awarded the contract has proposed a completion date for the contract as required above, but also has proposed an earlier date for substantial completion, then both of these proposed dates will become contract requirements.

Liquidated damages of **Four Thousand Dollars (\$4,000.00)** per calendar day will be applicable to the early date for substantial completion proposed by the bidder. Liquidated damages of **One Thousand Dollars (\$ 1,000.00)** per calendar day will be applicable to the final completion date proposed by the bidder where the Design-Build Team has proposed an earlier date for substantial completion.

**OTHER LIQUIDATED DAMAGES AND INCENTIVES**

(3/22/07) (Rev. 02/14/08)

DB1 G11

**Refer to the Transportation Management Scope of Work for more information on the following time restrictions and liquidated damages:**

Liquidated Damages for Intermediate Contract Time #1 for lane narrowing, lane closure, holiday and special event time restrictions for US 52 (including ramps and loops) are \$2500.00 per 15-minute period, or any portion thereof.

Liquidated Damages for Intermediate Contract Time #2 for lane narrowing, lane closure, holiday and special event time restrictions for Rams Drive (including ramps and loops), are \$1000.00 per 15-minute period, or any portion thereof.

Liquidated Damages for Intermediate Contract Time #3 for lane narrowing, lane closure, holiday and special event time restrictions for MLK Jr. Dr. and Salem Creek Connector (including ramps and loops), are \$1000.00 per hour, or any portion thereof.

Liquidated Damages for Intermediate Contract Time #4 for US 52 (including ramps and loops) road closure time restrictions for certain construction operations are \$2500.00 per 15-minute period, or any portion thereof.

Liquidated Damages for Intermediate Contract Time #5 for failure to open the US 52 southbound exit ramp onto Salem Creek Connector within 14 days of closing the US 52 southbound entrance ramp from Rams Drive are \$2,000.00 per day, or any portion thereof.

**Refer to the ITS Scope of Work for more information on the following time restrictions and liquidated damages:**

Liquidated Damages for Intermediate Contract Time #6 for failure to repair a damaged fiber optic communication cables and restore communication within 48 hours are \$1,500 per 24-hour period or any portion thereof.

Liquidated damages for Intermediate Contract Time #7 for failure to relocate existing ITS communications cable and/or ITS devices and restore communication within 96 hours are \$1,500 per 24-hour period or any portion thereof.

**GATEWAY STRUCTURE ADD ALTERNATE**

The Design-Build Team shall provide a lump sum price adjustment for the gateway structure at US 52 and Salem Creek Connector as described in the Structures Scope of Work. All costs associated with providing this gateway structure shall be included in the lump sum price adjustment. The cost of the gateway structure shall be delineated on the Itemized Proposal Sheet as an add alternate, with the corresponding lump sum price adjustment.

After the contract is awarded, the gateway structure lump sum price adjustment will be reviewed by the Department and the City of Winston-Salem. The acceptance or rejection of this alternate gateway structure resides solely at the discretion of the Department and the City of Winston-Salem. The Department will notify the successful bidder within 60 days of the award of the contract as to the Department's intent to reject or accept the gateway structure lump sum price adjustment. The addition of the gateway structure, if so determined, will be by supplemental agreement, and will be at the lump sum price adjustment amount bid on the Itemized Proposal Sheet.



The determination of the lowest adjusted price will include the Lump Sum Total Amount of Bid for the Entire Project. The details of the gateway structure contained in the Technical Proposal and the cost of the gateway structure as reflected in the above lump sum price adjustment will not be considered in the evaluation, and subsequent determination of the lowest adjusted price.

### **PAYOUT SCHEDULE**

(11-16-09)

DB1 G13

No later than 12:00 o'clock noon on the sixth day after the opening of the Price Proposal, the responsive proposer with the lowest adjusted price shall submit a proposed Anticipated Monthly Payout Schedule to the office of the State Contract Officer. The information shall be submitted in a sealed package with the outer wrapping clearly marked "Anticipated Monthly Payout Schedule" along with the Design-Build Team name and the contract number. The Anticipated Monthly Payout Schedule will be used by the Department to establish the monthly funding levels for this project. The Anticipated Monthly Payout Schedule shall parallel, and agree with, the project schedule the Design-Build Team submits as a part of their Technical Proposal. The schedule shall include a monthly percentage breakdown (in terms of the total contract amount percentages) of the work anticipated to be completed. The schedule shall begin with the Date of Availability and end with the Actual Completion Date proposed by the Design-Build Team. If the Payout Schedule is not submitted as stated herein, the Technical and Price Proposals will be considered irregular by the Department, and the bid may be rejected.

Submit updates of the Anticipated Monthly Payout Schedule on March 15, June 15, September 15, and December 15 of each calendar year until project acceptance. Submit the all updates to the Resident Engineer with a copy to the State Construction Engineer at 1 South Wilmington St, 1543 Mail Service Center Raleigh, NC 27699-1543.

### **MOBILIZATION**

(9-1-11)

DB1 G15B

Revise the 2012 *Standard Specifications for Roads and Structures* as follows:

#### **Page 8-1, Subarticle 800-2, MEASUREMENT AND PAYMENT**

Delete this subarticle in its entirety and replace with the following:

#### **800-2 MEASUREMENT AND PAYMENT**

5 percent of the "Total Amount of Bid for Entire Project" shall be considered the lump sum amount for Mobilization. Partial payments for Mobilization will be made beginning with the first partial pay estimate paid on the contract. Payment will be made at the rate of 50 percent of the lump sum amount calculated for Mobilization. The remaining 50 percent will be paid with the partial pay estimate following approval of all permits required in the Environmental Permits Scope of Work for this project.

**SUBSTANTIAL COMPLETION**

(3-22-07)

DB1 G16

When the special provisions provide for a reduction in the rate of liquidated damages for the contract time or an intermediate contract time after the work is substantially complete, the work will be considered substantially complete when the following requirements are satisfied:

1. Through traffic has been placed along the project or along the work required by an intermediate contract time and the work is complete to the extent specified below, and all lanes and shoulders are open such that traffic can move unimpeded at the posted speed. Intersecting roads and service roads are complete to the extent that they provide the safe and convenient use of the facility by the public.
2. The final layers of pavement for all lanes and shoulders along the project or along the work required by an intermediate contract time are complete.
3. All signs are complete and accepted except for the signs on intersecting roadways.
4. All guardrails, drainage devices, ditches, excavation and embankment are complete.
5. Remaining work along the project consists of permanent pavement markings, permanent pavement markers or incidental construction that is away from the paved portion of the roadway.

Upon apparent substantial completion of the entire project or the work required by an intermediate contract time, the Engineer will make an inspection of the work. If the inspection discloses the entire project or the work required by an intermediate contract time is substantially complete; the Engineer will notify the Design-Build Team in writing that the work is substantially complete. If the inspection discloses the entire project or the work required by an intermediate contract time is not substantially complete, the Engineer will notify the Design-Build Team in writing of the work that is not substantially complete. The entire project or the work required by an intermediate contract time will not be considered substantially complete until all of the recommendations made at the time of the inspection have been satisfactorily completed.

**SUBMITTAL OF QUANTITIES, FUEL BASE INDEX PRICE AND OPT-OUT OPTION**

(06-08-11)

DB1 G43

**(A) Submittal of Quantities**

**Submit quantities** on the *Fuel Usage Factor Chart and Estimate of Quantities* sheet, located in the back of this RFP, following the Itemized Proposal Sheet.

The Design-Build Team shall prepare an Estimate of Quantities that they anticipate incorporating into the completed project and upon which the Price Proposal was based. The quantity breakdown shall include all items of work that appear in the *Fuel Usage Factor Chart and Estimate of Quantities* sheet. Only those items of work which are

specifically noted in the Fuel Usage Factor Chart will be subject to fuel price adjustments. The quantity estimate submitted in the Price Proposal shall be the final total quantity limit for which fuel price adjustments will be made for each item, regardless of supplemental agreements. The Department will review the Estimate of Quantities to ensure its reasonableness to the proposed design. Agreement of quantities will be a prerequisite prior to execution of the contract.

**Submittal** The submittal shall be signed and dated by an officer of the Design-Build Team. The information shall be copied and submitted in a separate sealed package with the outer wrapping clearly marked “Fuel Price Adjustment” and shall be delivered at the same time and location as the Technical and Price Proposal. The original shall be submitted in the Price Proposal.

**Trade Secret** Information submitted on the *Fuel Usage Factor Chart and Estimate of Quantities* sheet will be considered “Trade Secret” in accordance with the requirements of G.S. 66-152(3) until such time as the Price Proposal is opened.

**(B) Base Index Price**

The Design-Build Team’s Estimate of Quantities will be used on the various partial payment estimates to determine fuel price adjustments. The Design-Build Team shall submit a payment request for quantities of work completed based on the work completed for that estimate period. The quantities requested for partial payment shall be reflective of the work actually accomplished for the specified period. The Design-Build Team shall certify that the quantities are reasonable for the specified period. The base index price for DIESEL #2 FUEL is \$        per gallon.

**(C) Opt Out of Fuel Price Adjustment**

If the Design-Build Team elects not to pursue reimbursement for Fuel Price Adjustments, a quantity of zero shall be entered for all quantities in the *Fuel Usage Factor Chart and Estimate of Quantities* and the declination box shall be checked. Failure to complete this form will mean that the Design-Build Team is declining the Fuel Price Adjustments for this project.

**(D) Change Option**

The proposer will not be permitted to change the option after the Price Proposal and the copy of the *Fuel Usage Factor Chart and Estimate of Quantities* sheet are submitted.

**(E) Failure to Submit**

Failure to submit the *completed Fuel Usage Factor Chart and Estimate of Quantities* sheet separately and in the Price Proposal will result in the Technical and Price Proposal being considered irregular by the Department and the Technical and Price Proposal may be rejected.

**INDIVIDUAL MEETINGS WITH PROPOSERS**

(9-1-11)

DB1 G048

The Department will provide at least two Question and Answer Sessions to meet with each proposer individually to specifically address questions regarding the draft Requests for Proposals.

The Department will attempt to arrange for a meeting between each individual proposer and the affected utility owners.

The Department will afford each proposer one additional meeting with the Department to discuss project specifics and address the proposers' concerns and questions. This meeting may occur at any time after the first Question and Answer Session with the proposers and before two weeks prior to the date of Technical and Price Proposals submission. The proposer shall request this meeting in writing to the State Contract Officer, providing the Department a minimum of one week advance notice of the requested date. The proposer shall also state in the request those disciplines within the Department that are requested to be in attendance. The Department makes no assurance that the request may be honored on that specific date or that all disciplines requested can be in attendance.

Additional individual meetings may be permitted in accordance with the *Alternative Technical Concepts and Confidential Questions* Project Special Provision found elsewhere in this RFP.

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

(6-08-11)

DB1 G52

The Proposer's attention is directed to the various sheets in the Request for Proposals which are to be signed by the Proposer. A list of these sheets is shown below. The signature sheets are located behind the Itemized Proposal Sheet in this Request for Proposal. The NCDOT bid bond form is available on-line at:

**[http://www.ncdot.org/doh/preconstruct/altern/design\\_build/DesignbuildBidBond.pdf](http://www.ncdot.org/doh/preconstruct/altern/design_build/DesignbuildBidBond.pdf)**

or by contacting the Records and Documents office at 919-770-6900.

1. Applicable Signature Sheets: 1, 2, 3, 4, 5, or 6 (Bid)
2. Bid Bond dated the day of Technical and Price Proposal submission

The Proposer shall certify to the best of his knowledge all subcontractors, material suppliers and vendors utilized herein current status concerning suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency, in accordance with the "Debarment Certification" located behind the *Execution of Bid Non-Collusion Affidavit, Debarment Certification and Gift Ban Certification* signature sheets in this RFP. Execution of the bid signature sheets in conjunction with any applicable statements concerning exceptions, when such

statements have been made on the "Debarment Certification", constitutes the Proposer's certification of "status" under penalty of perjury under the laws of the United States.

### **SUBMISSION OF DESIGN-BUILD PROPOSAL**

(9-1-11)

DB1 G55A

The Proposer's attention is directed that each Proposer's Design-Build Proposal shall comply with the following requirements in order for that Design-Build Proposal to be responsive and considered for award.

1. The Proposer shall be prequalified with the Department prior to submitting a Design-Build Proposal.
2. The Proposer shall deliver the Design-Build Proposal to the place indicated, and prior to the time indicated in this Request for Proposals.
3. The Design-Build Proposal documents shall be signed by an authorized employee of the Proposer.
4. The Design-Build Proposal shall be accompanied by Bid surety in the form of a Bid Bond or Bid Deposit, dated the day of Technical and Price Proposal submission.
5. If Disadvantaged Business Enterprises (DBE) goals are established for this contract, the Proposer shall complete the form Listing of DBE Subcontractors contained elsewhere in this RFP in accordance with the Project Special Provision entitled Disadvantaged Business Enterprises.
6. The Design-Build Proposal shall address all the requirements as specified in this Request for Proposals.

In addition to the above requirements, failure to comply with any of the requirements of Article 102-8 of the Standard Special Provisions, Division One (found elsewhere in this RFP), Article 102-9 of the 2012 *Standard Specifications for Roads and Structures*, or Article 102-10 of the 2012 *Standard Specifications for Roads and Structures* and as amended in the Standard Special Provisions, Division One (found elsewhere in this RFP) may result in a Design-Build Proposal being rejected.

### **ALTERNATIVE TECHNICAL CONCEPTS AND CONFIDENTIAL QUESTIONS**

(06-08-11)

DB1 G56A

To accommodate innovation that may or may not be specifically allowed by the RFP, or other documents incorporated into the contract by reference, the Design-Build Team has the option of submitting Confidential Questions and Alternative Technical Concepts.

**Definitions**

A Confidential Question is defined as a private query to the Department containing information whose disclosure could alert others to certain details of doing business in a particular manner.

An Alternative Technical Concept is a private query to the Department that requests a variance to the requirements of the RFP, or other documents incorporated into the contract by reference, that is equal or better in quality or effect as determined by the Department in its sole discretion and that have been used elsewhere under comparable circumstances.

**Confidential Questions**

The Design-Build Team will be permitted to ask Confidential Questions of the Department, and neither the question nor the answer will be shared with other Design-Build Teams. The Department, in its sole discretion, will determine if a question is considered confidential.

Confidential Questions arising prior to issuance of the Final RFP will be allowed during the industry review of the draft RFP with the individual Design-Build Teams. The Department will answer the Confidential Question verbally at the industry review meeting, if possible, and/or through subtle changes in the Final RFP, which will clarify the scope by either allowing or disallowing the request. To the greatest extent possible, the revision will be made in such a manner as to not disclose the Confidential Question.

After the issuance of the Final RFP, Confidential Questions may be asked by requesting a meeting with the State Contract Officer. The request shall be in writing and provide sufficient detail to evaluate the magnitude of the request. Questions shall be of such magnitude as to warrant a special meeting. Minor questions will not be acknowledged or answered. After evaluation, the State Contract Officer will respond to the question in writing to the Design-Build Team and/or through subtle changes in the Final RFP as reflected in an addendum, which will clarify the scope by either allowing or disallowing the request. To the greatest extent possible, the revision will be made in such a manner as to not disclose the Confidential Question.

If the Design-Build Team includes work based on the Confidential Questions and answers, the work shall be discussed in the Technical Proposal.

**Alternative Technical Concepts**

The Design-Build Team may include an ATC in the Technical and Price Proposal only if the ATC has been received by the Department by no later than three weeks prior to the deadline for submitting Technical and Price Proposals and it has been approved by the Department (including conditionally approved ATCs, if all conditions are met).

The submittal deadline above applies only to initial ATC submittals. Resubmittal of an ATC that (1) has been revised in response to the Department's requests for further information concerning a prior submittal or (2) is a Formal ATC for a Preliminary ATC that received a favorable

response from the Department shall be received by the Department no later than one week prior to the deadline for submitting Technical and Price Proposals.

Should the Department revise the RFP after a Formal ATC has been approved, the Design-Build Team shall be solely responsible for reviewing the RFP and determining if the ATC deviates from the revised requirements. If necessary, the Design-Build Team must submit a request for approval of all additional required variance(s) within five business days of the revised RFP distribution.

An ATC shall in no way take advantage of an error or omission in the RFP, or other documents incorporated into the contract by reference. If, at the sole discretion of the Department, an ATC is deemed to take an advantage of an error or omission in the RFP, or other documents incorporated into the contract by reference, the RFP will be revised without regard to confidentiality. If at any time, the Department receives a question on the project similar to a concept submitted in the form of a Preliminary ATC or Formal ATC, the Department reserves the right to revise the RFP without further regard for confidentiality.

By approving an ATC, the Department acknowledges that the ATC may be included in the design and RFC plans; however, approval of any ATC in no way relieves the Design-Build Team of its obligation to satisfy (1) other contract requirements not specifically identified in the ATC submittal; (2) any obligation that may arise under applicable laws and regulations; and (3) any obligation mandated by the regulatory agencies as a permit condition.

### **ATC Submittals**

Each ATC submittal shall include three individually bound hard copies and an electronic pdf file of the entire submittal and shall be submitted to the State Contract Officer at the address provided elsewhere in this RFP.

### **Formal ATCs**

Each Formal ATC submittal shall include the following information:

- 1) Description. A detailed description and schematic drawings of the configuration of the ATC or other appropriate descriptive information (including, if appropriate, product details [i.e., specifications, construction tolerances, special provisions] and a traffic operational analysis, if appropriate);
- 2) Usage. Where and how the ATC would be used on the project;
- 3) Deviations. References to all requirements of the RFP, or other documents incorporated into the contract by reference, that are inconsistent with the proposed ATC, an explanation of the nature of the deviations from said requirements, and a request for approval of such variance(s);
- 4) Analysis. An analysis justifying use of the ATC and why the variance to the requirements of the RFP, or other documents incorporated into the contract by reference, should be allowed;

- 5) Impacts. Discussion of potential impacts on vehicular traffic, environmental impacts identified, community impact, safety and life-cycle project impacts, and infrastructure costs (including impacts on the cost of repair and maintenance);
- 6) History. A detailed description of other projects where the ATC has been used, the success of such usage, and names and telephone numbers of project owners that can confirm such statements;
- 7) Risks. A description of added risks to the Department and other entities associated with implementing the ATC; and
- 8) Costs. An estimate of the ATC implementation costs to the Department, the Design-Build Team, and other entities (right-of-way, utilities, mitigation, long term maintenance, etc.).

The Formal ATC, if approved, shall be included in the Price Proposal if the Design-Build Team elects to include it in their Technical Proposal.

### **Review of ATCs**

A panel will be selected to review each ATC, which may or may not include members of the Technical Review Committee. The Design-Build Team shall make no direct contact with any member of the review panel, except as may be permitted by the State Contract Officer. Unapproved contact with any member of the review panel will result in a disqualification of that ATC.

The Department may request additional information regarding a proposed ATC at any time. To the greatest extent possible, the Department will return responses to, or request additional information from, the Design-Build Team within 15 business days of the original submittal of a Formal ATC. If additional information is requested, the Department will provide a response within 5 business days of receipt of all requested information.

The Department may conduct confidential one-on-one meeting(s) to discuss the Design-Build Team's ATC. Under no circumstances will the Department be responsible or liable to the Design-Build Team or any other party as a result of disclosing any ATC materials, whether the disclosure is deemed required by law, by an order of court, or occurs through inadvertence, mistake or negligence on the part of the Department or their respective officers, employees, contractors, or consultants.

In the event that the Department receives ATCs from more than one Design-Build Team that are deemed by the Department to be similar in nature, the Department reserves the right to modify the RFP without further regard for confidentiality.

### **The Department Response to Formal ATCs**

The Department will review each Formal ATC and will respond to the Design-Build Team with one of the following determinations:

- 1) The ATC is approved;
- 2) The ATC is not approved;



- 3) The ATC is not approved in its present form, but may be approved upon satisfaction, in the Department's sole discretion, of certain identified conditions that shall be met or certain clarifications or modifications that shall be made (conditionally approved);
- 4) The submittal does not qualify as an ATC but may be included in the Proposal without an ATC (i.e., the concept complies with the baseline requirements of the RFP);
- 5) The submittal does not qualify as an ATC and may not be included in the Proposal;
- 6) The ATC is deemed to take advantage of an error or omission in the RFP, or other documents incorporated into the contract by reference, in which case the ATC will not be considered, and the RFP will be revised to correct the error or omission.
- 7) A question has been received outside of the ATC process on the same topic and the RFP will be revised to address that question; or
- 8) More than one ATC has been received on the same topic and the Department has elected to exercise its right to revise the RFP. This response could also follow and supersede one of the other previously supplied responses above.

### **Formal ATC Inclusion in Technical Proposal**

The Design-Build Team may incorporate one or more approved Formal ATCs as part of its Technical and Price Proposals. If the Department responded to an Formal ATC by stating that it would be approved if certain conditions were met, those conditions shall be stipulated and met in the Technical Proposal.

In addition to outlining each implemented Formal ATC, and providing assurances to meet all attached conditions, The Design-Build Team shall also include a copy of the Formal ATC approval letter from the State Contract Officer in each of the twelve Technical Proposals submitted. This letter will be included in the distribution of the Technical Proposals to the Technical Review Committee.

Approval of an Formal ATC in no way implies that the Formal ATC will receive a favorable review from the Technical Review Committee. The Technical Proposals will be evaluated in regards to the evaluation criteria found in this RFP, regardless of whether or not Formal ATCs are included.

The Price Proposal shall reflect all incorporated Formal ATCs. Except for incorporating approved Formal ATCs, the Technical Proposal may not otherwise contain exceptions to, or deviations from, the requirements of the RFP, or other documents incorporated into the contract by reference.

**Preliminary ATCs**

At the Design-Build Team’s option, a Preliminary ATC submittal may be made that presents a concept and a brief narrative of the benefits of said concept. The purpose of allowing such a Preliminary ATC is to limit the Design-Build Team’s expense in the pursuit of a Formal ATC that may be quickly denied by the Department.

To the greatest extent possible, the Department will review Preliminary ATCs within 10 business days of submittal and provide written comments and one of the responses noted below. The Department’s response to a Preliminary ATC submittal will be either (1) that the Preliminary ATC is denied; (2) that the Preliminary ATC would be considered as a Formal ATC if the Team so elects to pursue a Formal ATC submission; (3) that an ATC is not required; (4) a question has been received outside of the ATC process on the same topic and the RFP will be revised to address that question; or (5) that the ATC takes advantage of an error or omission in the RFP or other documents incorporated into the contract by reference, in which case the ATC will not be considered and the RFP will be revised to correct the error or omission. The Department in no way warrants that a favorable response to a Preliminary ATC submittal will translate into a favorable response to a Formal ATC submittal. Likewise, a favorable response to a Preliminary ATC submittal is not sufficient to include the ATC in a Technical Proposal.

**VALUE ANALYSIS**

(9-1-11)

DB1 G57

Value Engineering Proposals, as specified in Article 104-12 of the 2012 *Standard Specifications for Roads and Structures* will be accepted. Only proposals, which alter the requirements of the RFP issued by the Department, will be considered as Value Engineering Proposals.

**SCHEDULE OF ESTIMATED COMPLETION PROGRESS**

(9-1-11)

DB1 G58

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

<u>Fiscal Year</u>	<u>Progress (Dollar Value)</u>
2013 (07/01/12 – 06/30/13)	10 % of Total Amount Bid
2014 (07/01/13 – 06/30/14)	32 % of Total Amount Bid
2015 (07/01/14 – 06/30/15)	32 % of Total Amount Bid
2016 (07/01/15 – 06/30/16)	21 % of Total Amount Bid
2017 (07/01/16 – 06/30/17)	5 % of Total Amount Bid

The Design-Build Team shall also furnish its own progress schedule in accordance with Article 108-2 of the 2012 *Standard Specifications for Roads and Structures*. Any acceleration of the progress as shown by the Design-Build Team's progress schedule over the progress as shown above shall be subject to the approval of the Engineer.

**DISADVANTAGED BUSINESS ENTERPRISE**

(9-1-11)

DB1 G061

**Description**

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

**Definitions**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

*Listing of DBE Subcontractors Form* - Form for entering DBE subcontractors on a project that will meet this DBE goal contained elsewhere in this RFP.

*Subcontractor Quote Comparison Sheet* - Spreadsheet for showing all subcontractor quotes in the work areas where DBEs quoted on the project. This sheet is submitted with good faith effort packages.  
[http://www.ncdot.gov/business/ocs/goodfaith/excel/Ex\\_Subcontractor\\_Quote\\_Comparison.xls](http://www.ncdot.gov/business/ocs/goodfaith/excel/Ex_Subcontractor_Quote_Comparison.xls)

### **DBE Goal**

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

Disadvantaged Business Enterprises     **13 %**

- (A) *If the DBE goal is more than zero*, the Design-Build Team shall exercise all necessary and reasonable steps to ensure that DBEs participate in at least the percent of the contract as set forth above as the DBE goal.

- (B) *If the DBE goal is zero*, the Design-Build Team shall make an effort to recruit and use DBEs during the performance of the contract. Any DBE participation obtained shall be reported to the Department.

This goal is to be met through utilization of highway construction contractors and/or right-of-way acquisition firms. Utilization of DBE firms performing design, other preconstruction services, or Construction Engineering and Inspection are not included in this goal.

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

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

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

### **Listing of DBE Subcontractors**

At the time of bid, Proposers shall submit all DBE participation that they anticipate to use during the life of the contract. Only those identified to meet the DBE goal will be considered committed, even though the listing shall include both committed DBE subcontractors and additional DBE subcontractors. Additional DBE subcontractor participation submitted at the time of bid will be used toward the Department's overall race-neutral goal. Only those firms with current DBE certification at the time of Price Proposal opening will be acceptable for listing in the Proposer's submittal of DBE participation. The Design-Build Team shall indicate the following required information:

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

- (1) *If the DBE goal is more than zero*,
- (a) Proposers, at the time the Price Proposal is submitted, shall submit a listing of DBE participation, including the names and addresses on *Listing of DBE Subcontractors* contained elsewhere in the contract documents in order for the Price Proposal to be considered responsive. Proposers shall indicate the total dollar value of the DBE participation for the contract.
  - (b) If Proposers have no DBE participation, they shall indicate this on the *Listing of DBE Subcontractors* by entering the word "None" or the number "0." This form shall be completed in its entirety.

- (c) The Proposer shall be responsible for ensuring that the DBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the opening of the Price Proposals, that DBE's participation will not count towards achieving the DBE goal.
- (2) *If the DBE goal is zero*, Proposers, at the time the Price Proposal is submitted, shall enter the word "None"; or the number "0"; or if there is participation, add the value on the *Listing of DBE Subcontractors* contained elsewhere in the contract documents.

### **DBE Prime Contractor**

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

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

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

### **Written Documentation – Letter of Intent**

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

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

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

in the office of the State Contractor Utilization Engineer no later than 12:00 noon on the next official state business day.

### **Submission of Good Faith Effort**

If the Proposer fails to meet or exceed the DBE goal the Proposer with the apparent adjusted low price shall submit to the Department documentation of adequate good faith efforts made to reach the DBE goal.

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

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

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

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

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

- (A) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices through the use of the NCDOT Directory of Transportation Firms) the interest of all certified DBEs who have the capability to perform the work of the contract. The Proposer must solicit this interest within at least 10 days prior to the opening of the Price Proposals to allow the DBEs to respond to the solicitation. Solicitation shall provide the opportunity to DBEs within the Division and surrounding Divisions where the project is located. The Proposer must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.

- (B) Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.
- (C) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- (D)
  - (1) Negotiating in good faith with interested DBEs. It is the Proposer's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.
  - (2) A proposer using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a proposer's failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the Proposer of the responsibility to make good faith efforts. Proposing Design-Build Teams are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.
- (E) Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The Proposer'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 Proposer's efforts to meet the project goal.
- (F) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or proposer.
- (G) Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.
- (H) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; Federal, State, and local minority/women business



assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs. Contact within 7 days from the opening of the Price Proposals the Business Development Manager in the Business Opportunity and Work Force Development Unit to give notification of the Proposer's inability to get DBE quotes.

- (I) Any other evidence that the Proposer submits which shows that the Proposer has made reasonable good faith efforts to meet the DBE goal.

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

- (1) Whether the Proposer's documentation reflects a clear and realistic plan for achieving the DBE goal.
- (2) The Proposer's past performance in meeting the DBE goals.
- (3) The performance of other proposers in meeting the DBE goal. For example, when the Proposer with the apparent adjusted low price fails to meet the DBE goal, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts the Proposer with the apparent adjusted low price could have met the goal. If the Proposer with the apparent adjusted low price fails to meet the DBE goal, but meets or exceeds the average DBE participation obtained by other proposers, the Department may view this, in conjunction with other factors, as evidence of the Proposer with the apparent adjusted low price having made a good faith effort.

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

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

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

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

- (A) Participation

The total dollar value of the participation by a committed DBE will be counted toward the contract goal requirement. The total dollar value of participation by a committed

DBE will be based upon the value of work actually performed by the DBE and the actual payments to DBE firms by the Design-Build Team.

(B) Joint Checks

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

(C) Subcontracts (Non-Trucking)

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

(D) Joint Venture

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

(E) Suppliers

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

(F) Manufacturers and Regular Dealers

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

- (1) The fees or commissions charged by a DBE firm for providing a *bona fide* service, such as providing bonds or insurance specifically required for the performance of a DOT-assisted contract, provided the fees or commissions are determined to be reasonable and not excessive as compared with fees and commissions customarily allowed for similar services.

- (2) With respect to materials or supplies purchased from a DBE, which is neither a manufacturer nor a regular dealer, count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site (but not the cost of the materials and supplies themselves), provided the fees are determined to be reasonable and not excessive as compared with fees customarily allowed for similar services.

### **Commercially Useful Function**

#### **(A) DBE Utilization**

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

#### **(B) DBE Utilization in Trucking**

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

- (1) The DBE shall be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there shall not be a contrived arrangement for the purpose of meeting DBE goals.
- (2) The DBE shall itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
- (3) The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
- (4) The DBE may subcontract the work to another DBE firm, including an owner-operator who is certified as a DBE. The DBE who subcontracts work to

another DBE receives credit for the total value of the transportation services the subcontracted DBE provides on the contract.

- (5) The DBE may also subcontract the work to a non-DBE firm, including from an owner-operator. The DBE who subcontracts the work to a non-DBE is entitled to credit for the total value of transportation services provided by the non-DBE subcontractor not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE subcontractors receives credit only for the fee or commission it receives as a result of the subcontract arrangement. The value of services performed under subcontract agreements between the DBE and the Design-Build Team will not count towards the DBE contract requirement.
- (6) A DBE may lease truck(s) from an established equipment leasing business open to the general public. The lease must indicate that the DBE has exclusive use of and control over the truck. This requirement does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. This type of lease may count toward the DBE's credit as long as the driver is under the DBE's payroll.
- (7) Subcontracted/leased trucks shall display clearly on the dashboard the name of the DBE that they are subcontracted/leased to and their own company name if it is not identified on the truck itself. Magnetic door signs are not permitted.

### **DBE Replacement**

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

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

The Design-Build Team shall comply with the following for replacement of a committed DBE:

(A) Performance Related Replacement

When a committed DBE is terminated for good cause as stated above, an additional DBE that was submitted at the time of bid may be used to fulfill the DBE commitment.

A good faith effort will only be required for removing a committed DBE if there were no additional DBEs submitted at the time of bid to cover the same amount of work as the DBE that was terminated.

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

- (1) Copies of written notification to DBEs that their interest is solicited in contracting the work defaulted by the previous DBE or in subcontracting other items of work in the contract.
  - (2) Efforts to negotiate with DBEs for specific subbids including, at a minimum:
    - (a) The names, addresses, and telephone numbers of DBEs who were contacted.
    - (b) A description of the information provided to DBEs regarding the plans and specifications for portions of the work to be performed.
  - (3) A list of reasons why DBE quotes were not accepted.
  - (4) Efforts made to assist the DBEs contacted, if needed, in obtaining bonding or insurance required by the Design-Build Team.
- (B) Decertification Replacement
- (1) When a committed DBE is decertified by the Department after the SAF (*Subcontract Approval Form*) has been received by the Department, the Department will not require the Design-Build Team to solicit replacement DBE participation equal to the remaining work to be performed by the decertified firm. The participation equal to the remaining work performed by the decertified firm will count toward the contract goal requirement.
  - (2) When a committed DBE is decertified prior to the Department receiving the SAF (*Subcontract Approval Form*) for the named DBE firm, the Design-Build Team shall take all necessary and reasonable steps to replace the DBE subcontractor with another DBE subcontractor to perform at least the same amount of work to meet the DBE goal requirement. If a DBE firm is not found to do the same amount of work, a good faith effort must be submitted to NCDOT (see A herein for required documentation).

### **Changes in the Work**

When the Engineer makes changes that result in the reduction or elimination of work to be performed by a committed DBE, the Design-Build Team will not be required to seek additional participation. When the Engineer makes changes that result in additional work to be performed

by a DBE based upon the Design-Build Team's commitment, the DBE shall participate in additional work to the same extent as the DBE participated in the original contract work.

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

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

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

### **Reports and Documentation**

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

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

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

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

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

- (A) Withholding of money due in the next partial pay estimate; or
- (B) Removal of an approved Prime Contractor or other affiliated companies within the Design-Build Team from the prequalified bidders' list or the removal of other entities from the approved subcontractors list.

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

Failure on the part of the Design-Build Team to submit the required information in the time frame specified may result in the disqualification of that Prime Contractor and any affiliate companies within the Design-Build Team 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 Prime Contractor or any affiliate companies within the Design-Build Team from being approved for work on future DOT projects until the required information is submitted.

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

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

The Design-Build Team shall report the accounting of payments through the Department's DBE Payment Tracking System.

### **Failure to Meet Contract Requirements**

Failure to meet contract requirements in accordance with Subarticle 102-15(J) of the *2012 Standard Specifications* may be cause to disqualify the Prime Contractor or any affiliated companies within the Design-Build Team from further bidding for a specified length of time.

### **CERTIFICATION FOR FEDERAL-AID CONTRACTS**

(3-21-90)

DB1 G85

The Proposer certifies, by signing and submitting a Design-Build Proposal, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a

Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, *Disclosure Form to Report Lobbying*, in accordance with its instructions.

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

The Proposer also agrees by submitting a Design-Build Proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such sub-recipients shall certify and disclose accordingly.

### **CONTRACTOR'S LICENSE REQUIREMENTS**

(7-1-95)

DB1 G88

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

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

(11-22-94)

DB1 G100

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

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

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

### **SUBSURFACE INFORMATION**

(3-22-07)

DB1 G119

Available subsurface information will be provided on this project. The Design-Build Team shall be responsible for additional investigations and for verifying the accuracy of the subsurface information supplied by the Department.



**COOPERATION BETWEEN CONTRACTORS**

(9-1-11)

DB1 G133

The Design-Build Team's attention is directed to Article 105-7 of the 2012 *Standard Specifications for Roads and Structures*.

Project U-2826B is located approximately 2000' North of U-2925 with an anticipated completion date of November 2012.

Project U-2826A is located approximately 1.5 miles North of U-2925 with an anticipated completion date of May 2013.

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

**BID DOCUMENTATION**

(1-1-02) (Rev. 07-31-12)

DB1 G142

**General**

The successful Design-Build Team shall submit the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation used to prepare the Price Proposal for this contract to the Department within 10 days after receipt of notice of award of contract. Such documentation shall be placed in escrow with a banking institution or other bonded document storage facility selected by the Department.

The Department will not execute the contract until the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation has been received by the Department.

**Terms**

*Bid Documentation* – Bid Documentation shall mean all written information, working papers, computer printouts, electronic media, charts, and all other data compilations which contain or reflect information, data, and calculations used by the Proposer in the preparation of the Price Proposal. The term *bid documentation* includes, but is not limited to, Design-Build Team equipment rates, Design-Build Team overhead rates, labor rates, efficiency or productivity factors, arithmetical calculations, and quotations from subcontractors and material suppliers to the extent that such rates and quotations were used by the Proposer in formulating and determining the Price Proposal. The term *bid documentation* also includes any manuals, which are standard to the industry used by the Proposer in determining the Price Proposal. Such manuals may be included in the bid documentation by reference. Such reference shall include the name and date of the publication and the publisher. *Bid Documentation* does not include bid documents provided by the Department for use by the Proposer in bidding on this project.

*Design-Build Team's Representative* – Officer of the Prime Contractor's company; if not an officer, the Contractor shall supply a letter signed and notarized by an officer of the Prime

Contractor's company, granting permission for the representative to sign the escrow agreement on behalf of the Prime Contractor.

*Escrow Agent* – Officer of the select banking institution or other bonded document storage facility authorized to receive and release bid documentation.

### **Escrow Agreement Information**

A copy of the Escrow Agreement will be mailed to the Proposer with the notice of award for informational purposes. The Proposer and Department will sign the actual Escrow Agreement at the time the bid documentation is delivered to the escrow agent.

### **Failure to Provide Bid Documentation**

The Proposer's failure to provide the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation within 10 days after the notice of award is received by him may be just cause for rescinding the award of the contract and may result in the removal of the Proposer from the Department's list of qualified bidders for a period of up to 180 days. Award may then be made to the Proposer with the next lowest adjusted price or the work may be readvertised and constructed under the contract or otherwise, as the Department may decide.

### **Submittal of Bid Documentation**

- (A) Appointment – Email [specs@ncdot.gov](mailto:specs@ncdot.gov) or call 919.707.6900 to schedule an appointment.
- (B) Delivery - A representative of the Proposer shall deliver the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation to the Department, in a container suitable for sealing, within 10 days after the notice of award is received by him. Bid documentation will be considered a certified copy if the Proposer includes a letter to the Department from a chief officer of the company stating that the enclosed documentation is an *EXACT* copy of the original documentation. The letter shall be signed by a chief officer of the company, have the person's name and title typed below the signature, and the signature shall be notarized at the bottom of the letter.
- (C) Packaging – The container shall be no larger than 15.5 inches in length by 12 inches wide by 11 inches high and shall be water resistant. The container shall be clearly marked on the face and the back of the container with the following information: Bid Documentation, Proposer's Name, Proposer's Address, Date of Escrow Submittal, Contract Number, TIP Number if applicable, and County.

### **Affidavit**

In addition to the bid documentation, an affidavit signed under oath by an individual authorized by the Proposer to execute the bid shall be included. The affidavit shall list each bid document with sufficient specificity so a comparison may be made between the list and the bid documentation to ensure that all of the bid documentation listed in the affidavit has been

enclosed. The affidavit shall attest that the affiant has personally examined the bid documentation, that the affidavit lists all of the documents used by the Proposer to determine the Price Proposal for this project, and that all such bid documentation has been included.

### **Verification**

Upon delivery of the bid documentation, the Department's Contract Officer and the Proposer's representative will verify the accuracy and completeness of the bid documentation compared to the affidavit. Should a discrepancy exist, the Proposer's representative shall immediately furnish the Department's Contract Officer with any other needed bid documentation. The Department's Contract Officer upon determining that the bid documentation is complete will, in the presence of the Proposer's representative, immediately place the complete bid documentation and affidavit in the container and seal it. Both parties will deliver the sealed container to the escrow agent for placement in a safety deposit box, vault, or other secure accommodation.

### **Confidentiality of Bid Documentation**

The bid documentation and affidavit in escrow are, and will remain, the property of the Proposer. The Department has no interest in, or right to, the bid documentation and affidavit other than to verify the contents and legibility of the bid documentation unless the Design-Build Team gives written notice of intent to file a claim, files a written claim, files a written and verified claim, or initiates litigation against the Department. In the event of such written notice of intent to file a claim, filing of a written claim, filing a written and verified claim, or initiation of litigation against the Department, or receipt of a letter from the Design-Build Team authorizing release, the bid documentation and affidavit may become the property of the Department for use in considering any claim or in litigation as the Department may deem appropriate.

Any portion or portions of the bid documentation designated by the Proposer as a *trade secret* at the time the bid documentation is delivered to the Department's Contract Officer shall be protected from disclosure as provided by *G.S. 132-1.2*.

### **Duration and Use**

The bid documentation and affidavit shall remain in escrow until 60 calendar days from the time the Contractor receives the final estimate; or until such time as the Design-Build Team:

- (A) Gives written notice of intent to file a claim,
- (B) Files a written claim,
- (C) Files a written and verified claim,
- (D) Initiates litigation against the Department related to the contract; or
- (E) Authorizes in writing its release.

Upon the giving of written notice of intent to file a claim, filing a written claim, filing a written and verified claim, or the initiation of litigation by the Design-Build Team against the Department, or receipt of a letter from the Design-Build Team authorizing release, the Department may obtain the release and custody of the bid documentation.

The Proposer certifies and agrees that the sealed container placed in escrow contains all of the bid documentation used to determine the Price Proposal and that no other bid documentation shall be relevant or material in litigation over claims brought by the Design-Build Team arising out of this contract.

### **Release of Bid Documentation to the Contractor**

If the bid documentation remains in escrow 60 calendar days after the time the Design-Build Team receives the final estimate and the Design-Build Team has not filed a written claim, filed a written and verified claim, or has not initiated litigation against the Department related to the contract, the Department will instruct the escrow agent to release the sealed container to the Prime Contractor.

The Contractor will be notified by certified letter from the escrow agent that the bid documentation will be released to the Contractor. The Contractor or his representative shall retrieve the bid documentation from the escrow agent within 30 days of the receipt of the certified letter. If the Contractor does not receive the documents within 30 days of the receipt of the certified letter, the Department will contact the Contractor to determine final dispersion of the bid documentation.

### **Payment**

The cost of the escrow will be borne by the Department. There will be no separate payment for all costs of compilation of the data, container, or verification of the bid documentation. Payment at the various contract unit or lump sum prices in the contract will be full compensation for all such costs.

### **TWELVE MONTH GUARANTEE**

(7-15-03)

DB1 G145

- (A) The Design-Build Team 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 Design-Build Team will not be responsible for damage due to 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 Design-Build Team shall be responsible for invoking the warranted repair work with the manufacturer. The Design-Build Team'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 Design-Build Team 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 Design-Build Team to return to the project to make repairs or perform additional work that the Department would normally compensate the Design-Build Team 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. In addition, failure on the part of the responsible entity(ies) of the Design-Build Team to perform guarantee work within the terms of this provision shall be just cause to remove the responsible entity(ies) from the Department's corresponding prequalified list. The Design-Build Team will be removed for a minimum of 6 months and will be reinstated only after all work has been corrected and the Design-Build Team requests reinstatement in writing.

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

### **EROSION & SEDIMENT CONTROL / STORMWATER CERTIFICATION**

(1-16-07) (Rev 07-13-12)

DB1 G180

#### **General**

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

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

- (A) *Certified Supervisor* – Provide a certified Erosion and Sediment Control / Stormwater (E&SC/SW) Supervisor to manage the Design-Build Team and subcontractor(s) operations, ensure compliance with Federal, State and Local ordinances and regulations, and manage the Quality Control Program.
- (B) *Certified Foreman* – Provide a certified, trained foreman for each construction operation that increases the potential for soil erosion or the possible sedimentation and turbidity of surface waters.
- (C) *Certified Installer* – Provide a certified installer to install or direct the installation for erosion and sediment / stormwater control practices.

- (D) *Certified Designer* – Provide a certified designer for the design of the erosion and sediment control / stormwater component of reclamation plans and, if applicable, for the design of the project erosion and sediment control / stormwater plan.

### **Roles and Responsibilities**

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

changes for use and review by Department personnel as well as regulatory agencies.

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

- (a) Follow permit requirements related to the Design-Build Team and subcontractors' construction activities.
- (b) Ensure that all operators and / or subcontractor(s) on site have the proper erosion and sediment control / stormwater certification.
- (c) Notify the Engineer when the required certified erosion and sediment control / stormwater personnel are not available on the job site when needed.
- (d) Conduct the inspections required by the NPDES permit.
- (e) Take corrective actions in the proper timeframe as required by the NPDES permit for problem areas identified during the NPDES inspections.
- (f) Incorporate erosion control into the work in a timely manner and stabilize disturbed areas with mulch / seed or vegetative cover on a section-by-section basis.
- (g) Use flocculants approved by state regulatory authorities where appropriate and where required for turbidity and sedimentation reduction.
- (h) Ensure proper installation and maintenance of temporary erosion and sediment control devices.
- (i) Remove temporary erosion or sediment control devices when they are no longer necessary as agreed upon by the Engineer.
- (j) The Design-Build Team's quality control and inspection procedures shall be subject to review by the Engineer. Maintain NPDES inspection records and make records available at all times for verification by the Engineer.

(B) *Certified Foreman* - At least one Certified Foreman shall be onsite for each type of work listed herein during the respective construction activities to control erosion, prevent sedimentation and follow permit provisions:

- (1) Foreman in charge of grading activities
- (2) Foreman in charge of bridge or culvert construction over jurisdictional areas
- (3) Foreman in charge of utility activities

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

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

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

- (1) Seeding and Mulching
- (2) Temporary Seeding



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

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

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

### **Preconstruction Meeting**

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

### **Ethical Responsibility**

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

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

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

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

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

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

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

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

Failure to appeal within 10 calendar days will result in the proposed adverse action becoming effective on the date specified on the certified notice. Failure to appeal within the time specified will result in a waiver of all future appeal rights regarding the adverse action taken. The certificant will not be allowed to perform duties associated with the certification during the appeal process. The Chief Engineer will hear the appeal and make a decision within 7 days of hearing the appeal. The decision of the Chief Engineer will be final and will be made in writing to the certificant.

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

### **Measurement and Payment**

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

### **PROCEDURE FOR MONITORING BORROW PIT DISCHARGE**

(2-20-07)

DB1 G181

Water discharge from borrow pit sites shall not cause surface waters to exceed 50 NTUs (nephelometric turbidity unit) in streams not designated as trout waters and 10 NTUs in streams,

lakes or reservoirs designated as trout waters. For lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTUs. If the turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased.

If during any operating day, the downstream water quality exceeds the standard, the Design-Build Team shall do all of the following:

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

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

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

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

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

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

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

### **CLEARING AND GRUBBING**

(9-1-11)

DB2 R01

With the exception of areas with Permanent Utility Easements, perform clearing on this project to the limits established by Method III shown on Standard No. 200.03 of the 2012 *NCDOT Roadway Standard Drawings*. In areas with Permanent Utility Easements, clearing shall extend to the Right of Way limits.

### **BURNING RESTRICTIONS**

(7-1-95)

DB2 R05

Open burning is not permitted on any portion of the right of way limits established for this project. The Design-Build Team shall not burn the clearing, grubbing or demolition debris designated for disposal and generated from the project at locations within the project limits, off the project limits or at any waste or borrow sites in Forsyth County. The Design-Build Team shall dispose of the clearing, grubbing and demolition debris by means other than burning and in accordance with state and local rules and regulations.

### **BUILDING AND APPURTENANCE REMOVAL / DEMOLITION**

(9-1-11)

DB2 R12A

Unless otherwise as agreed upon by the Department, seal all wells and remove or demolish all buildings and appurtenances, in their entirety, that are located either partially or completely within the project's right of way limits or are located outside the project's right of way limits but within property purchased as an uneconomical remnant in accordance with Sections 205, 210 and 215 of the 2012 *Standard Specifications for Roads and Structures*.

The Department will perform all assessment, removal and disposal of asbestos. Once the Design-Build Team has acquired a parcel and all buildings and appurtenances have been vacated, the Design-Build Team shall immediately notify the Division Right of Way Agent in writing. Upon receipt of the written notification, the Department then requires 60 days to assess and remove any asbestos prior to the Design-Build Team demolishing any building or appurtenance.

### **DRAINAGE PIPE**

(9-1-11)

DB3 R36

#### **Description**

Where shown in the plans developed by the Design-Build Team, the Contractor shall use Reinforced Concrete Pipe, Corrugated Aluminum Alloy Pipe, Aluminized Corrugated Steel Pipe, Corrugated Polyethylene Pipe (HDPE Pipe) or Polyvinyl-Chloride Pipe (PVC Pipe) in accordance with the following requirements:

All pipe types are subject to the maximum and minimum fill height requirements as found on Roadway Standard Drawing 300.01 - Sheet 3 of 3. The appropriate Reinforced Concrete Pipe class and the appropriate gage thickness for Corrugated Aluminum Alloy Pipe and Aluminized Corrugated Steel Pipe shall be selected based on fill height.

Site specific conditions may limit a particular material beyond what is identified in this Special Provision. These conditions include, but are not limited to, abrasion, environmental, soil resistivity and pH, high ground water and special loading conditions. The Design-Build Team shall determine if additional restrictions are necessary.

Slope drains shall be Corrugated Aluminum Alloy Pipe, Aluminized Corrugated Steel Pipe, Corrugated Polyethylene Pipe (HDPE Pipe) or Polyvinyl-Chloride Pipe (PVC Pipe).

Transverse median drains, storm drainage system pipes, and open-ended cross drains shall be Reinforced Concrete Pipe unless the pipe slope is greater than 10%, in which case the pipe shall be either Corrugated Aluminum Alloy Pipe or Aluminized Corrugated Steel Pipe.

### **CEMENT AND LIME STABILIZATION OF SUB-GRADE SOILS**

(9-1-11)

DB5 R21

#### **General**

The Design-Build Team shall be responsible for the following:

1. Performing all laboratory tests in a laboratory certified by the AMRL / NCDOT Laboratory Proficiency Program
2. Sampling Sub-grade soils
3. Conducting Laboratory tests to determine:
  - a. Soil classifications
  - b. Moisture-density relationships

- c. Quantity of lime or cement required to achieve specified strengths
- 4. Designating areas to be stabilized by either lime or cement and the required rates of application
- 5. Conducting field tests to determine unconfined compressive strength

**Sampling**

The Design-Build Team shall take soil samples, after the project has been graded to within 2 inches of final sub-grade elevation. The Design-Build Team shall sample the top 8 inches at a minimum frequency of one sample per 1,000 feet, per each lane, for classification tests; and one sample per 3,000 feet, per each lane, for moisture density tests and lime or cement mix design tests. Additional samples shall be taken to ensure that all the predominant soil types, limits of distribution of these soils and different site conditions have been represented.

**Classification Tests**

The Design-Build Team shall perform the following tests to determine AASHTO classifications of different soils in accordance with AASHTO specifications as modified by NCDOT. Copies of these modified procedures can be obtained from Materials and Test Unit’s Soils Laboratory.

**TABLE 1**

<b><u>TEST</u></b>	<b><u>AASHTO DESIGNATION</u></b>
Dry Preparation of Disturbed Soils	T-87
Particle Size Analysis of Soils	T-88
Determining the Liquid Limit of Soils	T-89
Determining the Plastic Limit and Plasticity Index of Soils	T-90

**Moisture Density Test**

Based on the criteria set in Table 2, below, the Design-Build Team shall perform the Moisture Density Tests, using either lime or cement. The Design-Build Team shall use 10% cement by weight in soil cement and 4% lime by weight, in soil-lime mixtures. The Design-Build Team shall conduct the tests in accordance with AASHTO T-99, and T-134 for soil-lime and soil-cement mixtures, respectively. In each case, The Design-Build Team shall determine the maximum dry density and optimum moisture content.

**TABLE 2**

<b><u>CRITERIA FOR SELECTING LIME OR CEMENT</u></b>		
<b>PROPERTY</b>	<b>A</b>	<b>B</b>
Percent passing #200 Sieve	35 Max	36 Min
Liquid Limit	40 Max	41 Min
Plasticity Index	10 Max	25 Min

The Design-Build Team shall use cement for all soils meeting criteria in Column A and lime for all soils meeting criteria in Column B. The Design-Build Team may choose either lime or cement for all soils not meeting all criteria in either Column A or B.

### **DETERMINING THE APPLICATION RATES FOR SOIL-CEMENT AND SOIL-LIME MIXTURES**

#### **Soil-Cement Mixtures**

For soil-cement mixtures, the Design-Build Team shall be required to do the following:

- Make specimens at optimum moisture content using a quantity of cement in the range of 5 to 12 percent by weight.
- Compact the specimens to a minimum density of 95% of maximum dry density obtained using AASHTO T 134.
- Make a minimum of 2 specimens for each selected cement rate.
- Cure the specimens for 7 days in a moist room maintained at a temperature of 73°F ±2.7° and a humidity of 100%. At the end of the curing period, immerse the specimens in water for 4 hours.
- After immersion, test the specimens in unconfined compression in accordance with ASTM D 1633.
- Report the maximum strength obtained and the corresponding percent strain.
- Select the rate of cement that provides a minimum unconfined compressive strength of 200 psi and a maximum of 400 psi.

#### **Soil-Lime Mixtures**

For soil-lime mixtures, the Design-Build Team shall be required to do the following:

- Make specimens at optimum moisture content using a quantity of lime in the range of 3.5 to 6.5 percent by weight.
- Compact specimens to a minimum density of 95% of maximum dry density obtained by AASHTO T99.
- Make a minimum of two specimens for each selected lime rate.
- Cure the specimens in sealed plastic bags for 48 hours in an oven at a temperature of 118 °F. Do not immerse the specimens in water at the end of the curing period.
- Test the specimens in unconfined compression in accordance with AASHTO T 208. Report the maximum strength obtained and the corresponding percent strain.
- Select the rate of lime that provides a minimum unconfined compressive strength of 60 psi.

### **Submittals for Review and Approval Prior to Construction**

The Design-Build Team shall adhere to the following submittal guidelines:

- Submit all laboratory test results for review.
- Submit a sketch in plan view showing areas of the project to be stabilized by either lime or cement and application rates for each stabilizer.
- Submit any other documentation that supports the Design-Build Team's recommendations.

### **Construction of Lime Treated Subgrade**

The Design-Build Team shall construct the lime treated sub-grade as specified in Section 501 of the North Carolina Department of Transportation *2012 Standard Specifications for Roads and Structures* with the following exceptions:

#### **Subsection 501-4 Equipment**

Contractor's equipment will not require engineer's approval.

#### **Subsection 501-8 (A) General**

Paragraph #1 is not applicable to this project.

#### **Subsection 501-9 (B) Preliminary Curing**

Amend as follows: Allow a minimum of 2 days and a maximum of 4 days for preliminary curing.

#### **Subsection 501-10 Compacting, Shaping, and Finishing**

Last paragraph is not applicable.



**Subsection 501-11 Thickness**

Last two paragraphs are not applicable.

**Construction of Cement Treated Subgrade**

The Design-Build Team shall construct the soil cement sub-grade as specified in section 542 of the *2012 Standard Specifications for Roads and Structures*, with the following exceptions:

**Subsection 542-4 Equipment**

Contractor's equipment will not require Engineer's approval.

**Subsection 542-7 Application of Cement**

First paragraph is not applicable.

**Subsection 542-11 Thickness**

Paragraphs 2 and 3 are not applicable.

**Unconfined Compressive Strength**

The lime-stabilized subgrades shall be tested using Dynamic Cone Penetrometer (DCP) and/or by making field specimens. DCP testing shall be in accordance with *Quality Assurance Testing of Lime-Treated Soils Utilizing the Dynamic Cone Penetrometer*, Test Method #1-2005. The Design-Build Team shall adhere to the testing equipment requirements and procedures as outlined in *Dynamic Cone Penetrometer Testing for Subgrade Stability* except that the minimum penetration depth shall be eight inches. Upon request, a copy of the aforementioned documents can be obtained from the NCDOT Geotechnical Engineering Unit. The required unconfined compressive strength for lime shall be 60 psi, which corresponds to a penetration per blow of approximately 0.5 inches of the Dynamic Cone Penetrometer. If field specimens are made, cure them for seven days and test them in the laboratory. The minimum required unconfined compressive strength for lime-stabilized subgrade shall be 60 psi.

For cement-stabilized subgrades, the Design-Build Team shall make field specimens, cure them for seven days and test them in the laboratory. The minimum and maximum required unconfined compressive strength for soil cement shall be 200 psi and 400 psi, respectively.

For both lime and cement stabilized subgrades, one test shall be required for every 400 feet per lane width at random locations selected using random number tables.

**Submittals for Review During Construction**

The Design-Build Team shall submit the unconfined compressive strength and dynamic cone penetrometer test results for review and acceptance.

**PRICE ADJUSTMENTS FOR ASPHALT BINDER**

(9-1-11)

DB6 R25

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

When it is determined that the monthly selling price of asphalt binder on the first business day of the calendar month during which the last day of the partial payment period occurs varies either upward or downward from the Base Price Index, the partial payment for that period will be adjusted. The partial payment will be adjusted by adding the difference (+ or -) of the base price index subtracted from the monthly selling price multiplied by the total theoretical quantity of asphalt binder authorized for use in the plant mix placed during the partial payment period involved.

The base price index for asphalt binder for plant mix is \$ **PRICE TO BE INCLUDED IN THE FINAL RFP** per ton.

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on **\_\_\_\_\_**.

**PRICE ADJUSTMENTS - ASPHALT CONCRETE PLANT MIX**

(9-1-11)

DB6 R26

Revise the 2012 *Standard Specifications for Roads and Structures* as follows:

**Page 6-18, Article 609-11 and Page 6-35, Article 610-14**

Add the following paragraph before the first paragraph:

The "Asphalt Price" used to calculate any price adjustments set forth in this section shall be \$35 per theoretical ton. This price shall apply for all mix types.

**SEALING EXISTING PAVEMENT CRACKS - Polymer Patch**

(5-4-07)(5-19-09)

DB7 R 05A

**Description**

This provision applies to those areas to be milled and resurfaced along US 52.

The Design-Build Team shall prepare and clean the cracks in failing concrete and shall place Polypatch, Fibrescreed, Fibrecrete or like material that meets the specifications in areas designated by the Engineer. Proper placement shall be performed as described by the manufacturer. The Design-Build Team will not be required to seal the existing joints.

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

Sufficient material to perform the entire crack or spall repair application shall be in storage at the site or at the Design-Build Teams facility prior to any field preparation, so that there will 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 material that has been damaged so as to cause rejections shall be immediately replaced by the Design-Build Team at no additional cost to the Department.

Each shipment of Polypatch, Fibrescreed, Fibrecrete or like material that meets the Specifications shall be accompanied by Material Safety Data Sheets (MSDS) and a Certificate of Compliance certifying that the materials conform to the requirements of these Special Provisions.

### **Materials Requirements**

All materials shall meet the specifications as approved by the Engineer prior to use.

Material Data:

Specific Gravity	1.8
Application Temperature (degrees)	350° F to 392° F
Application Thickness	400 mils plus
Curing Time	10 – 40 minutes
Shelf Life	unlimited
Flash Point	446° F

### **Construction Requirements**

The Design-Build Team shall prepare areas by removing any loose debris by using a pavement breaker, by using a mechanical planer, and other methods as directed by the Engineer. When using a planer, the surface shall be milled out to a width and depth as directed by the Engineer. The recess shall then be cleaned and dried using hot compressed air to thoroughly prepare the surface, removing all debris and loose material. Use a concentrated hot air jet that is a minimum of 3000° F in temperature and that has a minimum air jet force of 3000 feet per second of blasting. Polypatch, Fibrescreed, Fibrecrete or like material shall be immediately poured or screeded to fill the recess, with edges overlapped by two inches. While the compound is still molten, a preheated high P.S.V. aggregate shall be applied and then compacted to ensure that the finished repair is flush with the surrounding surface.

When repairing pot holes deeper than two inches, that are not adjacent to or spanning the edge of pavement joints or cracks, the Design-Build Team shall include 1/2 - 1" sized washed aggregate at the rate of no more than 50% of volume as directed by the Engineer. Then complete repair as previously stated.

**FIELD OFFICE**

(6-1-07)

DB 08-01

**Description**

This work consists of furnishing, erecting, equipping, and maintaining a field office for the exclusive use of Department Engineers and Inspectors at a location on the project approved by the Engineer. Provide a field office that complies with the current A.D.A. Design and Accessibility Standards, the National Electric Code, local, state, and federal regulations, and the following:

**Procedures**

The field office and equipment shall remain the property of the Design-Build Team upon completion of the contract. The field office must be separated from buildings and trailers used by the Design-Build Team and be erected and functional as an initial operation. Failure to have the field office functional when work first begins on the project will result in withholding payment of the Design-Build Team's monthly progress estimate. The field office must be operational throughout the duration of the project and be removed upon completion and final acceptance of the project.

Provide a field office that is weatherproof, tightly floored and roofed, constructed with an air space above the ceiling for ventilation, supported above the ground, has a width of at least 10 feet, and the floor-to-ceiling height that is at least 7 feet 6 inches. Provide inside walls and a ceiling that are constructed of plywood, masonite, gypsum board, or other suitable materials. Have the exterior walls, ceiling, and floor insulated.

Provide a field office with a minimum floor space of 500 square feet and that is equipped with the following:

<b><u>Number</u></b>	<b><u>Item</u></b>
1	Double-pedestal desk (approximately 60 by 34 inches, at least 2,000 square inches)
1	Plan and drafting table (approximately 30 by 96 inches) with adjustable stool
1	Computer table having a minimum size of 48 by 30 by 29 inches
1	Plan rack for 24 by 36 inch drawings with 6 plan clamps
1	Printing calculator
2	2-drawer fire protection file, 15 inch drawer width, minimum UL rating of Class 350
6	Office chairs with a minimum of two having casters
2	Wastebaskets
1	Pencil sharpener
1	Copy machine (8 inch x 11 inch copies)
1	Telephone
1	Fax Machine
1	Answering machine

**Windows and Doors**

Provide a field office with at least three windows, with blinds, each having an area of at least 540 square inches, capable of being easily opened and secured from the inside and having at least two exterior passage doors. Provide doors at least 30 inches in width and 78 inches in height. Provide screens for windows and doors. Equip exterior passage door(s) with lock(s), and furnish at least two keys to the Engineer or inspector.

**Steps**

Provide accessibility in compliance with the current A. D. A. Design and Accessibility Standards, and the State Building Code and maintain them free from obstructions.

**Storage Facility For Nuclear Gage**

Furnish the field office with an outside storage facility for the Department's nuclear gage. The storage facility shall not be located within 10 feet of any other structure including the field office.

**Lighting, Heating, and Air Conditioning**

The field office must have satisfactory lighting, electrical outlets, heating equipment, an exhaust fan, and an air conditioner connected to an operational power source. Provide at least one of the light fixtures that is a fluorescent light situated over the plan and drafting table. Furnish electrical current and fuel for heating equipment.

**Fire Extinguishers**

Furnish and maintain one fire extinguisher for each required exterior passage door. Fire extinguisher(s) may be chemical or dry powder. UL Classification 10-B:C (minimum), suitable for Type A:B:C: fires. Mount and maintain fire extinguisher(s) in accordance with OSHA Safety and Health Standards.

**Toilets**

Provide a toilet conforming to the requirements of the state and local boards of health or other bodies or courts having jurisdiction in the area. When separate facilities for men and women are not available, place a sign with the words "Rest Room" (with letters at least 1 inch in height) over the doorway, and provide an adequate positive locking system on the inside of the doorway. Maintain responsibility for the water and sewer connections or the installation and connection of a water well and septic tank and drain field. These facilities must conform to all local and state permits.

## Utilities

Except for telephone service, make arrangement for necessary utility connections, maintain utilities, pay utility service fees and bills, and make arrangements for final disconnection of utilities. Furnish a telephone in each field office and permit the work necessary to install it. Installation and service fees for the telephone will be paid for by the Department.

## Storage Facility for Test Equipment

Provide the field office with a storage facility, separate from the office for storage of test equipment, other than the nuclear gage. Provide a facility that has a minimum floor space of 64 square feet, is weatherproof, tightly floored and roofed, and has a tamper resistant key operated lock.

## Miscellaneous Items

The field office must also include the following:

1. A certification that the office is free of asbestos and other hazardous materials.
2. A broom, dust pan, mop and bucket, and general cleaning supplies.
3. Provide and maintain an all weather parking area for six vehicles, including graveled access to the paved surface.

## **DYNAMIC MESSAGE SIGN**

(7-10-12)

DB 08-04

## I. General Requirements

Conform to these Project Special Provisions, Project Plans developed by the Design-Build Team, and the 2012 *Standard Specifications for Roads and Structures*.

The first item of work on this project shall be the installation of all electrical service poles to expedite the power service connections.

## II. Dynamic Message Signs (DMS)

### Description

Furnish and install NTCIP compliant DMS that is fully compatible with Vanguard<sup>®</sup> V4 DMS control software to ensure seamless integration of new signs with the existing central command and control system.

Furnish and install DMS that is compliant with UL Standards 48, 50, 879 and 1433.

Add and configure the new DMS in the system using State furnished Vanguard software and computer system. Furnish, install, test, integrate and make fully operational the new DMSs at locations shown on the project plans developed by the Design-Build Team.

Furnish operating DMS systems consisting of, but not limited to, the following:

Full Matrix, 27 pixel high and 90 pixels wide LED Dynamic Message Signs (DMS),

Pedestal type or overhead DMS support structures (structure type must be approved by the Engineer) and mounting hardware,

DMS controllers, Uninterruptible Power Supplies (UPS), cabinets and accessories with interconnect and power cabling and conduit,

Electrical service and related equipment,

All other equipment and incidentals required for furnishing, installing, and testing system and system components.

Use only UL listed and approved electronic and electrical components in the DMS system.

## **Materials**

### **A. Environmental Requirements**

Construct the DMS and DMS controller-cabinet so the equipment within shall be protected against moisture, dust, corrosion, and vandalism.

Design the DMS system to comply with the requirements of Section 2.1 (Environmental and Operating Standards) of NEMA TS 4-2005.

### **B. Full Matrix LED Dynamic Message Sign (DMS)**

Construct the DMS to display at least three lines of text that, when installed, are clearly visible and legible to a person with 20/20 corrected vision from a distance of 900 feet in advance of the DMS at an eye height of 3.5 feet along the axis.

When displaying three lines, each line must display at least 15 equally spaced and equally sized alphanumeric individual characters. Each character must be at least 18 inches in height and composed from a luminous dot matrix. The entire LED matrix shall be at the minimum 27 pixels high and 90 pixels wide.

#### **1. DMS Enclosure**

The DMS enclosure construction shall comply with the requirements of Section 3 (Sign Mechanical Construction) of NEMA TS 4-2005 as it applies to Walk-in enclosures. The following requirements complement TS 4-2005:

- Construct the DMS with a metal walk-in enclosure excluding the face. Provide an aluminum walking platform inside the enclosure that is at least 28 inches wide. The width of the walking platform shall be free

of obstructions to a height of 7 feet. Construct the enclosure of welded aluminum type 6061-T6, 5052-H38, 5052-H34, or of an Engineer approved alternate at least 1/8-inch thick. Perform all welding of aluminum and aluminum alloys in accordance with the latest edition of AWS D1.2, Structural Welding Code - Aluminum. Continuously weld the seams using Gas Metal Arc Welding (GMAW).

- All exterior and interior DMS enclosure surfaces shall be natural, mill-finish aluminum. All grind marks and discoloration shall be removed from the surfaces.
- All nuts, bolts, washers, and other mounting and bonding parts and components used on the exterior of the DMS enclosure shall be corrosion resistant and sealed against water intrusion.
- Provide one key lockable, hinged, gasket-sealed inspection door for service and maintenance along each side of the enclosure. Install one appropriately sized fire extinguisher within 12 inches of each maintenance door. Equip the DMS enclosure with internal fluorescent lighting controlled by timers installed close to each inspection door. No light emitted from the fluorescent tubes or any other light source inside the enclosure not comprising the display shall leak to the outside of the enclosure. Equip the door with a door-hold-open device. Install GFCI duplex utility receptacles every 6 feet along the width of the DMS in convenient locations for powered service tools.
- Do not place a manufacturer name, logo, or other information on the front face of the DMS or shield visible to the motorist.
- Provide power supply monitoring circuitry to detect power failure in the DMS and to automatically report this fault to the Control Software. This requirement shall be in addition to reporting power failure at the controller cabinet.
- Do not paint the stainless steel bolts on the Z-bar assembly used for mounting the enclosure.

## **2. DMS Interior Environment Control**

Design the local field controller to monitor and control the interior DMS environment. Design environmental control to maintain the internal DMS temperature within +/- 10° F of the outdoor ambient temperature. Provide the DMS environmental control system with four primary subsystems as follows:

1. Internal Temperature Sensors – Provide the DMS with two internally mounted temperature sensors which are equipped with external thermocouples and which the Field Controller continuously monitors.



Design the Field Controller to use this temperature information to determine when to activate and deactivate the environmental control systems described herein. Locate sensors on opposite ends of the upper 1/3 of the LED display matrix with their external thermocouples attached to and making contact with an LED pixel circuit board. Design the thermocouple and LED board to be easily detachable, in the event that one of the units requires removal and replacement. Provide sensors capable of measuring temperatures from  $-40^{\circ}$  F to  $+185^{\circ}$  F. Design the Field Controller to automatically shut down the LED display whenever one or both sensors indicates that LED board temperature has exceeded  $+140^{\circ}$  F, and to automatically restart the LED display whenever the suspect temperature falls below  $+130^{\circ}$  F. Design both shutdown and re-start temperature thresholds to be user-programmable. Design the field controller to report sensor temperatures and DMS shutdown/re-start events to the DMS Control Software.

2. Housing Cooling System – Provide the DMS housing with a cooling system which circulates outside air into the DMS housing whenever the LED board temperature exceeds a user-programmable threshold. Provide this system with enough ventilation fans to exchange the internal DMS housing air volume at a minimum rate of 4 times per minute. Provide steel ball-bearing type fans. Mount fans in a line across the upper rear wall of the DMS housing to direct air out of the cabinet. Provide one filtered air intake port for each exhaust fan. Locate intake ports in a line across the lower rear wall of the DMS housing. Provide intake ports with a removable filter that will remove airborne particles measuring 500 microns in diameter and larger. Provide a filter that is of a size and style that is commercially readily available. Program the Field Controller to activate the DMS housing cooling system whenever the LED board temperature exceeds  $+90^{\circ}$  F and to turn the cooling system off whenever LED board temperature falls below  $+85^{\circ}$  F. On the DMS housing rear exterior wall, cover all air intake and exhaust ports on their top, front, and sides by an aluminum shroud fabricated from 0.090-inch aluminum sheeting. Taper the shrouds at the top to discourage birds from nesting in them. Securely fasten shrouds to the DMS housing, and provide gaskets at the interface to prevent water from entering the DMS. Design all air filters and fans to be removable from inside the DMS housing. Provide the DMS housing cooling system with an adjustable timer that will turn fans off after the set time has expired. Provide a timer that is adjustable to at least 4 hours, and locate it just inside the DMS housing door, within easy reach of a maintenance technician standing outside the DMS doorway.
3. LED Display Cooling System – Provide the DMS with an LED display cooling system which directs air across the LED display modules whenever LED board temperature exceeds a user-programmable threshold. Direct fan-forced air vertically across the backside of the entire LED display matrix using multiple ball-bearing fans. Program the Field Controller to activate the LED cooling fan system whenever LED board temperature exceeds  $+90^{\circ}$  F and to deactivate the system whenever LED board temperature falls to  $+85^{\circ}$

F. Locate cooling fans so as not to hinder removal of LED display modules and driver boards.

4. Front Face Panel Defog/Defrost System – Provide the DMS with a defog/defrost system which circulates warm, fan-forced air across the inside of the polycarbonate front face whenever LED board temperature falls below a user-programmable threshold. Provide multiple steel ball-bearing fans that provide uniform airflow across the face panel. Program the Field Controller to activate the defog / defrost system whenever LED board temperature falls below +40° F) and to deactivate the defog / defrost system whenever LED board temperature exceeds +106° F. Mount a 100-watt pencil-style heating element in front of each defog / defrost fan to warm the air directed across the DMS face. Design heating elements to be on only when the defog/defrost fans are on.

Install additional fans and / or heaters as needed to maintain the temperature inside the DMS enclosure within the operating temperature range of the equipment within the DMS enclosure as recommended by the equipment manufacturer(s).

### **3. Front Panel**

Protect the DMS face with contiguous, weather-tight, removable panels. Manufacture these panels of sheets of polycarbonate materials that are ultraviolet protected, have an antireflection coating, and are a minimum of 1/8- inch thick. For substitutes, submit one 12” x 12” sample of the proposed material together with a description of the material attributes to the Engineer for review and approval. Install a .09” aluminum mask on the front of the panel (facing the motorists) that contains circular openings for each LED pixel. Front side of the aluminum mask, which faces the viewing motorists, shall be primed and coated with automotive-grade flat black acrylic enamel paint or an approved equivalent. All painted surfaces shall provide a minimum outdoor service life of 20 years.

Design the panels so they will not warp nor reduce the legibility of the characters. Differential expansion of the DMS case and the front panel must not cause damage to either component or allow openings for moisture or dust. Glare from sunlight, roadway lighting, commercial lighting, or vehicle headlights must not reduce the legibility or visibility of the DMS. Install the panels so that a maintenance person can easily remove or open them for cleaning.

### **4. Display Modules**

Manufacture each display module with a standard number of pixels, not to exceed an array of 9 x 5 that can be easily removed. Assemble the modules onto the DMS assembly contiguously to form a continuous matrix to display the required number of lines, characters, and character height.

Design display modules that are interchangeable and replaceable without using special tools. All power and communication cables connected to a display module shall be plug-in types to allow easy removal for maintenance and repair.

Construct each display module as a rectangular array of 5 horizontal pixels by 7 to 9 vertical pixels. Provide the module with an equal vertical and horizontal pitch between pixels, and columns that are perpendicular to the rows (i.e., no slant). Design each module to display:

- All upper and lower case letters
- All punctuation marks
- All numerals 0 to 9
- Special user-created characters

Display upper-case letters and numerals over the complete height of the module. Optimize the LED grouping and mounting angle within a pixel for maximum readability.

## 5. Discrete LEDs

Provide discrete LEDs with a nominal viewing cone of **30 degrees** with a half-power angle of 15 degrees measured from the longitudinal axis of the LED. Viewing cone tolerances shall be as specified in the LED manufacturer's product specifications and shall not exceed +/- 3 degrees half-power viewing angle of 30 degrees.

Provide LEDs that are untinted, non-diffused, high output solid state lamps utilizing indium gallium aluminum phosphide (InGaAlP) technology. No substitutions will be allowed. Provide T1 <sup>3</sup>/<sub>4</sub>, 0.2 inch size LEDs that emit a true amber color at a wavelength of 590 ± 5 nm. Provide identical LEDs at all locations capable of being interchanged throughout the system

Provide LEDs with a MTBF (Mean Time Before Failure) of at least 100,000 hours of permanent use at an operating point of 140° F or below at a specific forward current of 20mA. Discrete LED failure is defined as the point at which the LED's luminous intensity has degraded to 50% or less of its original level.

Obtain the LEDs used in the display from a single LED manufacturer that have a single part number. Obtain them from batches sorted for luminous output, where the highest luminosity LED is not more than fifty percent more luminous than the lowest luminosity LED when the LEDs are driven at the same forward current. Do not use more than two successive and overlapping batches in the LED display. Document the procedure to be used to comply with this requirement as part of the catalog cut submittal.

Individually mount the LEDs on circuit boards that are at least 1/16" thick FR-4 fiberglass, flat black printed circuit board in a manner that promotes cooling. Protect

all exposed metal on both sides of the LED pixel board, except the power connector, from water and humidity exposure by a thorough application of acrylic conformal coating. Design the boards so bench level repairs to individual pixels, including discrete LED replacement and conformal coating repair is possible.

Operate the LED display at a low internal DC voltage not to exceed 24 Volts.

Design the LED display operating range to be  $-20^{\circ}$  F to  $+14^{\circ}$  F at 95% relative humidity, non-condensing.

Supply the LED manufacturer's technical specification sheet with the catalog cuts.

## **6. LED Power Supplies**

Power the LED Display by means of multiple regulated switching DC power supplies that operate from 120 volts AC input power and have an output of 24 volts DC or less. Wire the supplies in a redundant parallel configuration that uses multiple power supplies per display. Provide the supplies with current sharing capability that allows them to provide equal amounts of current to their portion of the LED display. Provide power supplies rated such that if one supply fails the remaining supplies will be able to operate their portion of the display under full load conditions (all pixels on at maximum brightness) and at a temperature of  $140^{\circ}$  F.

Provide power supplies to operate within a minimum input voltage range of +90 to +135 volts AC and within a temperature range of  $-22^{\circ}$  F to  $140^{\circ}$  F. Power supply output at  $140^{\circ}$  F must not deteriorate to less than 65% of its specified output at  $70^{\circ}$  F. Provide power supplies that are overload protected by means of circuit breakers, and that have an efficiency rating of at least 75%, a power factor rating of at least .95, and are UL listed. Provide all power supplies from the same manufacturer and with the same model number. Design the power driver circuitry to minimize power consumption.

Design the Field Controller to monitor the operational status (normal or failed) of each individual power supply and be able to display this information on the Client Computer screen.

## **7. LED Pixels**

A pixel is defined as the smallest programmable portion of a display module that consists of a cluster of closely spaced discrete LEDs. Design each pixel to be a maximum of 2 inches in diameter.

Pixels shall be constructed with two strings of LEDs. The number of LEDs in each string shall be determined by the manufacturer to produce the candela requirement as stated herein.

Each pixel shall produce a luminous intensity of 40 Cd when driven with an LED drive current of 20 mA per string.

Power the LEDs in each pixel in strings. Use a redundant design so that the failure of an LED in one string does not affect the operation of any other string within the pixel. Provide the sign controller with the ability to detect the failure of any LED string and identify which LED string has failed. Submit a complete schematic of the LED power and driver circuits with the catalog cuts.

## **8. Character Display**

Design display modules to be easily removable without the use of tools. Position cooling fans so they do not prevent removal of an LED pixel board or driver board.

Use continuous current to drive the LEDs at the maximum brightness level. Design the light levels to be adjustable for each DMS / controller so the Engineer may set levels to match the luminance requirements at each installation site.

Design the controller to automatically detect failed LED strings or drivers and initiate a report of the event to the Control Software. Design the controller to be able to read the internal temperature of the DMS enclosure and the ambient temperature outside the DMS enclosure and report these to the Control Software.

## **9. Display Capabilities**

Design the DMS with at least the following message displays:

- Static display
- Flashing display with Dynamic flash rates
- At least two alternating Static and / or Flashing sequences (multi-page messages)

## **10. DMS Mini Controller**

Furnish and install a mini controller inside the DMS that is interconnected with the main controller using a fiber optic cable, CAT-5 cable, or an approved alternate. The mini controller will enable a technician to perform all functions available from the main controller. Provide the mini controller with an LCD / keypad interface. Size the LCD display screen to allow preview of an entire one-page message on one screen. Provide a 4 X 4 keypad.

Alternatively, install an EIA/TIA-232E port inside the DMS enclosure to enable a maintenance technician to communicate with the DMS main controller and obtain access to and perform all functions of the main controller.

### **C. DMS Enclosure Structure Mounting**

Mount the DMS enclosure and interconnect system securely to supporting structures of the type specified in the plans developed by the Design-Build Team. Design the DMS enclosure supports and structure to allow access to the DMS enclosure inspection door.

Submit plans for the DMS enclosure, structure, mounting description and calculations to the Engineer for approval. Have such calculations and drawings approved by a Professional Engineer registered in the state of North Carolina, and bear his signature, seal and date of acceptance.

Provide removable lifting eyes or the equivalent on the DMS enclosure rated for its total weight to facilitate handling and mounting the DMS enclosure.

Design the DMS structure to conform to the applicable requirements of the *Standard Specifications for Structural Supports for Highway Signs, Luminaires*, and the section titled "Dynamic Message Sign Assembly" of these Project Special Provisions.

### **D. DMS / DMS Controller Interconnect**

Furnish and install all necessary cabling, conduit, and terminal blocks to connect the DMS and the DMS controller. Use approved manufacturer's specifications and project plans for cable and conduit types and sizes. Use fiber optic cable to interconnect sign and controller. Install fiber optic interconnect centers in the sign enclosure and cabinet to securely install and terminate the fiber optic cable. Submit catalog cut sheets for the interconnect centers for approval.

### **E. DMS Controller and Cabinet**

Furnish and install one DMS controller with accessories per DMS in a protective cabinet. Mount the controller cabinet on the DMS support structure. Install cabinet so that the height to the middle of the cabinet is 4 feet.

Provide the DMS controller as a software-oriented microprocessor and with resident software stored in non-volatile memory. The Control Software, controller and communications must comply with the NTCIP Standards identified in these project special provisions. Provide sufficient non-volatile memory to allow storage of at least 500 multi-page messages and a test pattern program.

Furnish the controller cabinet with, but not limited to, the following:

- Power supply and distribution assembly
- Power line filtering hybrid surge protectors
- Radio Interference Suppressor
- Communications surge protection devices
- Industrial-Grade UPS system and local disconnect

- Microprocessor-based controller
- Display driver and control system (unless integral to the DMS)
- Industrial-grade dial-up modem and interface cable
- Industrial-grade telephone line surge and lightning protector
- Serial interface port for local laptop computer
- Local user interface
- Interior lighting and duplex receptacle
- Adjustable shelves as required for components
- Temperature control system
- All interconnect harnesses, connectors, and terminal blocks
- All necessary installation and mounting hardware

Furnish the DMS controller and associated equipment completely housed in a NEMA 3R cabinet made from 5052-H32 sheet aluminum at least 1/8" thick. Use natural aluminum cabinets. Perform all welding of aluminum and aluminum alloys in accordance with the latest edition of AWS D1.2, Structural Welding Code - Aluminum. Continuously weld the seams using Gas Metal Arc Welding (GMAW).

Slant the cabinet roof away from the front of the cabinet to prevent water from collecting on it.

Do not place a manufacturer name, logo or other information on the faces of the controller cabinet visible to the motorist.

Provide cabinets capable of housing the components and sized to fit space requirement. Design the cabinet layout for ease of maintenance and operation, with all components easily accessible. Submit a cabinet layout plan for approval by the Engineer.

Locate louvered vents with filters in the cabinet to direct airflow over the controller and auxiliary equipment, and in a manner that prevents rain from entering the cabinet. Fit the inside of the cabinet, directly behind the vents, with a replaceable, standard-size, commercially available air filter of sufficient size to cover the entire vented area.

Provide a torsionally rigid door with a continuous stainless steel hinge on the side that permits complete access to the cabinet interior. Provide a gasket as a permanent and weather resistant seal at the cabinet door and at the edges of the fan / exhaust openings. Use a non-absorbent gasket material that will maintain its resiliency after long-term exposure to the outdoor environment. Construct the doors so that they fit firmly and evenly against the gasket material when closed. Provide the cabinet door with louvered vents near the bottom, and with air filters as described in the paragraph above.

Provide an acrylic glass rack of appropriate size at a convenient location on the inside of the door to store the cabinet wiring diagrams and other related cabinet drawings. Provide a Corbin #2 main door lock made of non-ferrous or stainless steel material. Key all locks on the project alike, and provide 10 keys to the Engineer. In addition, design the handle to permit padlocking.

Provide the interior of the cabinet with ample space for housing the controller and all associated equipment and wiring; use no more than 75% of the useable space in the cabinet. Provide ample space in the bottom of the cabinet for the entrance and exit of all power, communications, and grounding conductors and conduit.

Arrange the equipment so as to permit easy installation of the cabling through the conduit so that they will not interfere with the operation, inspection, or maintenance of the unit. Provide adjustable metal shelves, brackets, or other support for the controller unit and auxiliary equipment. Leave a 3 inch minimum clearance from the bottom of the cabinet to all equipment, terminals, and bus bars.

Provide power supply monitoring circuitry to detect power failure and to automatically report the occurrence to the Control Software.

Install two 15-watt fluorescent light strips with shields, one in the top of the cabinet and the other under the bottom shelf. Design both lights to automatically turn on when the cabinet door is opened and turn off when the door closes.

Mount and wire a 120V ( $\pm 10\%$ ) GFCI duplex receptacle of the 3-wire grounding type in the cabinet in a location that presents no electrical hazard when used by service personnel for the operation of power tools and work lights.

No cabinet resident equipment shall utilize the GFCI receptacle. There shall be one spare non-GFCI receptacle for future addition of equipment.

Mount a bug-proof and weatherproof thermostatically controlled fan and safety shield in the top of the cabinet. Size the fan to provide at least for two air exchanges per minute. Fuse the fan at 125% of the capacity of the motor. The magnetic field of the fan motor must not affect the performance of the control equipment. Use a fan thermostat that is manually adjustable to turn on between 80° F and 160° F with a differential of not more than 10° F between automatic turn-on and turn-off. Mount it in an easily accessible location, but not within 6 inches of the fan.

Install additional fans and / or heaters as needed to maintain the temperature inside the cabinet within the operating temperature range of the equipment within the cabinet as recommended by equipment manufacturer(s).

## **1. Wiring**

The requirements stated herein shall apply wherever electrical wiring is needed for any DMS system assemblies and subassemblies such as controller cabinet, DMS enclosure, electrical panel boards and etc.



Neatly arrange and secure the wiring inside the cabinet. Where cable wires are clamped to the walls of the control cabinet, provide clamps made of nylon, metal, plastic with rubber or neoprene protectors, or similar. Lace and jacket all harnesses, or tie them with nylon tie wraps spaced at 6 inches maximum to prevent separation of the individual conductors.

All conductors shall be individually and uniquely labeled. All conductor labels shall be clearly visible without moving the conductor. All terminal conductors shall connect to the terminal strip in right angles. Excess conductor shall be removed before termination of the conductor. The conductor shall be molded in such a fashion as to retain its relative position to the terminal strip if removed from the strip. No conductor shall run across a work surface with the exception of connecting to that work surface. No conductor bundles can be support by fasteners that support work surfaces. All connectors, devices and conductors shall be installed in accordance to manufactures guidelines. All wiring shall comply with the latest NEC guideline in effect during installation. No conductor or conductor bundle shall hang loose or create a snag hazard. All conductors shall be protected from damage. All solder joints shall be completed using industry accepted practices and shall not fail due to vibration or movement. All welds must be in a manner that will not fail due to vibration. Lamps and control boards shall be protected from damage.

Insulate all conductors and live terminals so they are not hazardous to maintenance personnel.

Route and bundle all wiring containing line voltage AC and / or shield it from all low voltage control circuits. Install safety covers to prevent accidental contact with all live AC terminals located inside the cabinet.

Use industry standard, keyed-type connectors with a retaining feature for connections to the Controller.

Label all equipment and equipment controls clearly.

Supply each cabinet with one complete set of wiring diagrams that identify the color-coding or wire tagging used in all connections. Furnish a water-resistant packet adequate for storing wiring diagrams, operating instructions, and maintenance manuals with each cabinet.

## **2. Power Supply and Circuit Protection**

Design the DMS and controller for use on a system with a line voltage of  $120V \pm 10\%$  at a frequency of  $60 \text{ Hz} \pm 3 \text{ Hz}$ . Under normal operation, do not allow the voltage drop between no load and full load of the DMS and its controller to exceed 3% of the nominal voltage.

Blackout, brownout, hunting, line noise, chronic over-voltage, sag, spike, surge, and transient effects are considered typical AC voltage defects. Protect the DMS

system equipment so that these defects do not damage the DMS equipment or interrupt their operation. Equip all cabinets with devices to protect the equipment in the cabinet from damage due to lightning and external circuit power and current surges.

### 3. Circuit Breakers

Protect the DMS controller, accessories, and cabinet utilities with thermal magnetic circuit breakers. Provide the controller cabinet with a main circuit breaker sized according to the NEC. Use appropriately sized branch circuit breakers to protect the controller and accessories and for servicing DMS equipment and cabinet utilities.

### 4. Surge Suppressor

Install and clearly label filtering hybrid power line surge protectors on the load side of the branch circuit breakers in a manner that permits easy servicing. Ground and electrically bond the surge protector to the cabinet within 2 inches.

Provide power line surge protector that meets the following requirements:

Peak surge current occurrences	20 minimum
Peak surge current for an 8 x 20 microsecond wave-shape	50,000 amperes
Energy Absorption	> 500 Joules
Clamp voltage	240 volts
Response time	<1 nanosecond
Minimum current for filtered output	15 amperes for 120VAC*
Temperature range	-40° F to +158° F

Capable of handling the continuous current to the equipment

### 5. Radio Interference Suppressor

Provide each controller cabinet with sufficient electrical and electronic noise suppression to enable all equipment in it to function properly. Provide one or more radio interference suppressors (RIS) connected between the stages of the power line surge suppressor that minimize interference generated in the cabinet in both the broadcast and the aircraft frequencies. Each RIS must provide a minimum attenuation of 50 decibels over a frequency range of 200 KHz to 75 MHz. Clearly label the suppressor(s) and size them at least at the rated current of the main circuit breaker but not less than 50 amperes.

Provide RIS that are hermetically sealed in a substantial metal case which is filled with a suitable insulating compound and have nickel-plated 10/24 brass stud terminals of sufficient external length to provide space to connect #8 AWG wires. Mount them so that the studs cannot be turned in the case. Properly insulate ungrounded terminals from each other, and maintain a surface linkage distance of not less than 1/4” between any exposed current conductor and any other metallic parts. The terminals must have an insulation factor of 100-200 MΩ, dependent on external circuit conditions. Use RIS designed for 120 VAC ± 10%, 60Hz, and which meet the standards of UL and the Radio Manufacturers Association.

**6. Communications Surge Protector**

Equip the cabinet with properly labeled hybrid data line surge protectors that meet the following general requirements:

Surge current occurrences at 2000 ampere, 8 x 20 microsecond waveform	> 80
Surge current occurrences at 400 ampere, 10x700 microsecond waveform	> 80
Peak surge current for 8 x 20 microsecond waveform	10,000 A (2500 A/line)
Peak surge current for 10x700 microsecond waveform	500 A/line
Response time	< 1 nanosecond
Series resistance	< 15 Ω
Average capacitance	1500 pF
Temperature range	-10° F to 150° F
Clamp Voltage	As required to match equipment in application

**7. Lightning Arrester**

Protect the system with an UL-approved lightning arrester installed at the main service disconnect. It shall meet the following requirements:

Type of design	Silicon Oxide Varistor
Voltage	120 / 240 Single phase, 3 wires
Maximum current	100,000 amps
Maximum energy	3000 joules per pole
Maximum number of surges	Unlimited

Response time one milliamp test	5 nanoseconds
Response time to clamp 10,000 amps	10 nanoseconds
Response time to clamp 50,000 amps	25 nanoseconds
Leak current at double the rated voltage	None
Ground Wire	Separate

## 8. Uninterruptible Power Supply (UPS)

Provide the cabinet with an industrial grade power conditioning UPS unit to supply continuous power to operate the equipment connected to it if the primary power fails. The UPS must detect a power failure and provide backup power within 20 milliseconds. Transition to the UPS source from primary power must not cause loss of data or damage to the equipment being supplied with backup power. Provide an UPS with at least three outlets for supplying conditioned AC voltage to the DMS controller and modem. Provide a unit to meet the following requirements:

- Input Voltage Range: 120VAC +12%, -25%
- Power Rating: 1000 VA, 700 Watts
- Input Frequency: 45 to 65 Hz
- Input Current: 7.2A
- Output Voltage: 120VAC +/- 3%
- Output Frequency: 50/60 +/-1 Hz
- Output Current: 8.3A
- Output Crest Factor Ration: @50% Load Up to 4.8:1  
@75% Load Up to 3.2:1  
@100% Load Up to 2.4:1
- Output THD: 3% Max. (Linear)  
5% Max. (Non-Linear)
- Output Overload: 110% for 10 min; 200% for 0.05 sec.
- Output Dynamic Response: +/- 4% for 100% Step Load Change  
0.5 ms Recovery Time.
- Output Efficiency @ 100% Load:90% (Normal Mode)
- Operating Temperature: -40° F to +165° F
- Humidity: 0% to 95% Non-condensing

- Remote Monitoring Interface: RS-232
- Protection: Input/Output Short Circuit  
Input/Output Overload  
Excessive Battery Discharge
- Specifications: UL1778, FCC Class A, IEEE 587

Provide the UPS unit capable of supplying 30 minutes of continuous backup power to the equipment connected to it when these equipment are operating at full load.

### **9. Controller Communications Interface**

The controller shall have the following interface ports:

- An EIA/TIA-232E port for remote communication using NTCIP
- An 10/100 Ethernet port for remote communication using NTCIP
- An EIA/TIA-232E port for onsite access using a laptop
- An EIA/TIA-232E auxiliary port for communication with a field device such as a UPS
- Fiber Optic ports for communication with the sign
- RJ45 ports for communication with the sign using CAT-5 cable
- RJ45 ports for communication with mini-controller located inside the sign enclosure

### **10. Controller Local User Interface**

Provide the controller with a Local User Interface (LUI) for at least the following functions:

- On / Off Switch: controls power to the controller.
- Control Mode Switch: for setting the controller operation mode to either remote or local mode.
- LCD Display and Keypad: Allow user to navigate through the controller menu for configuration (display, communications parameter, etc) running diagnostics, viewing peripherals status, message creation, message preview, message activation, and etc. Furnish a LCD display with a minimum size of 240x64 dots with LED back light.

### **11. Controller Address**

Assign each DMS controller a unique address. Preface all commands from the Control Software with a particular DMS controller address. The DMS controller compares its address with the address transmitted; if the addresses match, then the controller processes the accompanying data.

### **12. Controller Functions**

Design the DMS controller to continuously control and monitor the DMS independent of the Control Software.

Design the controller to display on the sign a message sent by the Control Software, a message stored in the sign controller memory, or a message created on-site by an operator using the controller keypad.

Provide the DMS controller with a watchdog timer to detect controller failures and to reset the microprocessor, and with a battery backed-up clock to maintain an accurate time and date reference. Set the clock through an external command from the Control Software or the Local User Interface.

### **13. DMS Controller Memory**

Furnish each DMS controller with non-volatile memory. Use the non-volatile memory to store and reprogram at least one test pattern sequence and 500 messages containing a minimum of two pages of 45 characters per page. The Control Software can upload messages into and download messages from each controller's non-volatile memory remotely.

Messages uploaded and stored in the controller's non-volatile memory may be erased and edited using the Control Software and the controller. New messages shall be uploaded to and stored in the controller's non-volatile memory using the Control Software and the controller.

### **14. Telephone Modem**

Furnish and install industrial-grade modems with a data rate of 56 kbps. The modem must have a watchdog circuitry to continuously monitor the power supply, internal hardware, and operational software. In the event of a hardware or software problem the modem shall automatically reset itself.

### **15. Telephone Line Surge and Lightning Protector**

Provide telephone line surge and lightning protectors that are UL rated for industrial use and meet the following specifications:

Technology	Solid state with fast acting fuses and resistors
Usage	Telephone Line
Ports Protected	1 (2 lines per port)
Connectors	RJ11/12
Surge Capacity	1.9 kA / line
Clamp & Rated Voltage	270 V and 200 V
Max Frequency	50 MHz
Operating Temperature	-40° F to 185° F
Max Inline Resistance	22 Ohms
Ratings	UL 497A, IEC801-5, CCITT (ITU-T) K17

#### F. Photo-Electric Sensors

Install three photoelectric sensors with ½ inch minimum diameter photosensitive lens inside the DMS enclosure. Use sensors that will operate normally despite continual exposure to direct sunlight. Place the sensors so they are accessible and field adjustable. Point one sensor north or bottom of the sign. Place the other two, on the back wall and one on the front wall of the sign enclosure. Alternate design maybe accepted provided the sensor assembly is accessible and serviceable from inside the sign enclosure.

Provide controls so that the Engineer can field adjust the following:

The light level emitted by the pixels elements in each Light Level Mode.

The ambient light level at which each Light Level Mode is activated.

#### G. Equipment List

Provide a general description of all equipment and all information necessary to describe the basic use or function of the major system components. Include a general "block diagram" presentation. Include tabular charts listing auxiliary equipment, if any is required. Include the nomenclature, physical and electrical characteristics, and functions of the auxiliary equipment unless such information is contained in an associated manual; in this case include a reference to the location of the information. Include an itemized list of equipment costs.

Include a table itemizing the estimated average and maximum power consumption for each major piece of equipment.

## **H. Physical Description**

Provide a detailed physical description of size, weight, center of gravity, special mounting requirements, electrical connections, and all other pertinent information necessary for proper installation and operation of the equipment.

## **I. Parts List**

Provide a parts list that contains all information needed to describe the characteristics of the individual parts, as required for identification. Include a list of all equipment within a group and a list of all assemblies, sub-assemblies, and replacement parts of all units. Arrange this data in a table, in alpha-numerical order of the schematic reference symbols, which gives the associated description, manufacturer's name, and part number, as well as alternate manufacturers and part numbers. Provide a table of contents or other appropriate grouping to identify major components, assemblies, etc.

## **J. Character Set Submittal**

Submit an engineering drawing of the DMS character set including 26 upper case and lower case letters, 10 numerals, an asterisk (\*), a dash, a plus sign (+), a designated lane diamond, a slash, an ampersand, and arrows at 0, 45, 90, 135, 180, 225, 270, and 315 degrees.

## **K. Wiring Diagrams**

Provide a wiring diagram for each DMS and each controller cabinet, as well as interconnection wiring diagrams for the system as a whole.

Complete and detailed schematic diagrams to component level shall be provided for all DMS assemblies and subassemblies such as driver boards, control boards, DMS controller, power supplies, and etc. Such schematics shall enable an electronics technician to successfully identify any component on a board or assembly and trace its incoming and outgoing signals.

## **L. Routine of Operation**

Describe the operational routine, from necessary preparations for placing the equipment into operation to securing the equipment after operation. Show appropriate illustrations with the sequence of operations presented in tabular form wherever applicable. Include in this section a total list of the test instruments, aids and tools required to perform necessary measurements and measurement techniques for each component, as well as set-up, test, and calibration procedures.

## **M. Maintenance Procedures**

Specify the recommended preventative maintenance procedures and checks at pre-operation, monthly, quarterly, semi-annual, annual, and "as required" periods to



assure equipment operates reliably. List specifications, including tolerances, for all electrical, mechanical, and other applicable measurements and / or adjustments.

#### **N. Repair Procedures**

Include in this section all data and step-by-step procedures necessary to isolate and repair failures or malfunctions, assuming the maintenance technicians are capable of analytical reasoning using the information provided in the section titled “Wiring Diagrams and Theory of Operation”.

Describe accuracy, limits, and tolerances for all electrical, physical, or other applicable measurements. Include instructions for disassembly, overhaul, and re-assembly, with shop specifications and performance requirements.

Give detailed instructions only where failure to follow special procedures would result in damage to equipment, improper operation, danger to operating or maintenance personnel, etc. Include such instructions and specifications only for maintenance that specialized technicians and engineers in a modern electromechanical shop would perform. Describe special test set-up, component fabrication, and the use of special tools, jigs, and test equipment.

#### **O. Field Trial**

At the request of the Engineer, supply a three character demonstration module with characters of the size and type specified for the project, an appropriate control device and power supply to allow character display within 30 working days of the request. Perform a field trial on this module at a time and location selected by the Engineer.

This trial will allow the Engineer or his selected representatives to test the readability of the DMS at the maximum distance required for specified character size. Test the module with the sun directly above the DMS, and near the horizon in front of and behind the DMS (washout and back-lit conditions).

### **Construction Methods**

#### **A. Description**

This article establishes practices and procedures and gives minimum standards and requirements for the installation of Dynamic Message Sign systems, auxiliary equipment and the construction of related structures.

Provide electrical equipment described in this specification that conforms to the standards of NEMA, UL, or Electronic Industries Association (EIA), wherever applicable. Provide connections between controllers and electric utilities that conform to NEC standards. Express wire sizes according to the American Wire Gauge (AWG).

Provide stainless steel screws, nuts, and locking washers in all external locations. Do not use self-tapping screws unless specifically approved by the Engineer. Use parts made of corrosion-resistant materials, such as plastic, stainless steel, brass, or aluminum. Use construction materials that resist fungus growth and moisture deterioration. Separate dissimilar metals by an inert dielectric material.

## **B. Layout**

The Design-Build Team shall be responsible for the proper elevation, offset, level, and orientation of all DMS assemblies. Make actual field measurements to place service poles, controller cabinets and conduit at the required location. Mark the proposed location of circuits and all other components for the Engineer's approval prior to installation. Submit a drawing showing all underground conduits and cables dimensioned from fixed objects or station marks.

## **C. Construction Submittal**

When the work is complete, submit "as built" plans, inventory sheets, and any other data required by the Engineer to show the details of actual construction and installation and all changes made during installation.

The "as built" plans will show: the DMS, controller, and service pole locations; DMS enclosure and controller cabinet wiring layouts; and wire and conduit routing. Include detailed drawings that identify the routing of all conductors in the system by cable type, color code, and function. Clearly label all equipment in the DMS system, controller cabinet, and DMS enclosure.

## **D. Conduit**

Install the conduit system in accordance with section 1715 of Standard Specification and NEC requirements for an approved watertight raceway.

Make bends in the conduit so as not to damage it or change its internal diameter. Install watertight and continuous conduit with as few couplings as standard lengths permit.

Clean conduit before, during, and after installation. Install conduit in such a manner that temperature changes will not cause elongation or contraction that might damage the system.

Attach the conduit system to and install along the structural components of the DMS structure assembly with beam clamps or stainless steel strapping. Install strapping according to the strapping manufacturer's recommendations. Do not use welding or drilling to fasten conduit to structural components. Space the fasteners at no more than 4 feet for conduit 1.5 inches and larger, or 6 feet for conduit 1.25 inches and smaller. Place fasteners no more than 3 feet from the center of bends, fittings, boxes, switches, and devices.

Locate underground conduit in a manner consistent with these Project Special Provisions.

Do not exceed the appropriate fill ratio on all cable installed in conduit as specified in the NEC.

#### **E. Wiring Methods**

Do not pull permanent wire through a conduit system until the system is complete and has been cleaned.

Color-code all conductors per the NEC (grounded neutral-WHITE, grounding-BARE or GREEN, and phase conductors RED and BLACK). Use approved marking tape, paint, sleeves or continuous colored conductors for No.8 AWG and larger. Do not mark a white conductor in a cable assembly any other color. You may strip a white, red or black conductor at all accessible points and use it as a bare equipment-grounding conductor.

Bury underground circuits at the depth shown in the plans developed by the Design-Build Team and surround with at least 3 inches of sand or earth back-fill free of rocks and debris. Compact backfill in 6-inch layers. Do not splice underground circuits unless specifically noted in the plans developed by the Design-Build Team and approved by the Department.

#### **F. Equipment and Cabinet Mounting**

Mount equipment securely at the locations shown in the plans developed by the Design-Build Team, in conformance with the dimensions shown. Install fasteners as recommended by the manufacturer and space them evenly. Use all mounting holes and attachment points for attaching DMS enclosures and controller cabinets to the structures.

Drill holes for expansion anchors of the size recommended by the manufacturer of the anchors and thoroughly clean them of all debris.

Provide one key-operated, pin tumbler, dead bolt padlock, with brass or bronze shackle and case, conforming to Military Specification MIL-P-17802E (Grade I, Class 2, Size 2, Style A) for each electrical panel and switch on the project. Key all padlocks alike, and provide 10 keys to the Engineer.

Provide cabinets with all mounting plates, anchor bolts, and any other necessary mounting hardware in accordance with these Project Special Provisions and the project plans developed by the Design-Build Team.

Seal all unused conduit installed in cabinets at both ends to prevent water and dirt from entering the conduit and cabinet with approved sealing material.

Install a ground bushing attached inside the cabinet on all metal conduits entering the cabinet. Connect these ground bushings to the cabinet ground bus.

### **G. Cabinet and System Grounding**

Ground the controller cabinet, DMS enclosure, DMS structure, and service entrance equipment per Sections 1098 and 1700 of the Standard Specifications, applicable addenda, typical drawings, the plans developed by the Design-Build Team and these Project Special Provisions. Provide grounding circuits that are permanent and electrically continuous with a current carrying capacity high enough and an impedance low enough to limit the potential above ground to a safe level.

Run the power company neutral, conduit grounds, and all equipment grounds directly and independently of the ground bus. Use ground clamps, grounding and bonding bushings, lock nuts, and grounding electrodes that comply with UL Standard Electric Grounding and Bonding Equipment. Use ground rods of 5/8 inch minimum diameter, 10 feet long, and made of copper-clad steel.

Make connections between ground electrodes and the ground wire using an exothermic welding process, cadweld or equivalent.

Ensure completed cabinet grounds have a resistance to ground of not more than 25 Ohms.

### **H. Work Site Clean-Up**

Clean the site of all debris, excess excavation, waste packing material, wire, etc. Clean and clear the work site at the end of each workday. Do not throw waste material in storm drains or sewers.

## **III. NTCIP Requirements**

This portion of the specification defines the detailed NTCIP requirements for the Dynamic Message Signs.

For compatibility with VG software, implement all objects found on the attached MIB file except for the objects that are exclusively applicable to proprietary hardware features found in VG DMSs.

### **References**

This specification references several standards through their NTCIP designated names. The following list provides the full reference to the current version of each of these standards.

Implement the most recent version of the standard including any and all Approved or Recommended Amendments to these standards for each NTCIP Component covered by these project specifications.

**Table 1: NTCIP Standards**

<b>Abbreviated Number</b>	<b>Full Number</b>	<b>Title</b>
NTCIP 1101	<b>NTCIP 1101:1997</b>	<i>Simple Transportation Management Framework</i>
NTCIP 1201	<b>NTCIP 1201:1997</b>	<i>Global Object Definitions</i>
NTCIP 1203	<b>NTCIP 1203:1997</b>	<i>Object Definitions for Dynamic Message Signs</i>
NTCIP 2001	<b>NTCIP 2001:1997</b>	<i>Class B Profile</i>
NTCIP 2101	<b>NTCIP 2101</b>	<i>SP-PMPP/232 Subnet Profile for PMPP over RS-232</i>
NTCIP 2102	<b>NTCIP 2102</b>	<i>SP-PMPP/FSK Subnet Profile for PMPP over FSK Modem</i>
NTCIP 2103	<b>NTCIP 2103</b>	<i>SP-PPP/232 Subnetwork Profile for PPP over RS232 (Dial Up)</i>
NTCIP 2104	<b>NTCIP 2104</b>	<i>SP-Ethernet Subnet Profile for Ethernet</i>
NTCIP 2201	<b>NTCIP 2201</b>	<i>TP-Null Transport Profile</i>
NTCIP 2202	<b>NTCIP 2202</b>	<i>TP-Internet Internet Transport Profile (TCP/IP and UDP/IP)</i>
NTCIP 2301	<b>NTCIP 2301</b>	<i>AP-STMF AP for Simple Transportation Management Framework</i>

## General Requirements

### 1. Subnet Level

Ensure each serial port on each NTCIP Component supports NTCIP 2103 over a dial-up connection with a contractor provided external modem with data rates of 28.8 kbps, 19.2 kbps, 14.4 kbps, 9600 bps, 4800 bps, 2400 bps, 1200 bps, 600 bps, and 300 bps. Enable the NTCIP Component to make outgoing and receive incoming calls as necessary and support the following modem command sets:

- Hayes AT - Command Set
- MNP5
- MNP10
- V.42bis

Ensure each serial port on each NTCIP Component supports NTCIP 2103 over a null-modem connection with data rates of 19.2 kbps, 14.4 kbps, 9600 bps, 4800 bps, 2400 bps, 1200 bps, 600 bps, and 300 bps.

Ensure each serial port on each NTCIP Component supports NTCIP 2101 with data rates of 9600 bps, 4800 bps, 2400 bps, 1200 bps, 600 bps, and 300 bps.

Additionally, NTCIP components shall support NTCIP 2102 and NTCIP 2104.

NTCIP Components may support additional Subnet Profiles at the manufacturer's option. At any one time, only one Subnet Profile shall be active on a given serial port of the NTCIP Component. Ensure the NTCIP Component can be configured to allow the field technician to activate the desired Subnet Profile and provide a visual indication of the currently selected Subnet Profile.

## **2. Transport Level**

Ensure each NTCIP Component complies with NTCIP 2201 and 2202.

NTCIP Components may support additional Transport Profiles at the manufacturer's option. Ensure Response datagrams use the same Transport Profile used in the request. Ensure each NTCIP Component supports the receipt of datagrams conforming to any of the identified Transport Profiles at any time.

## **3. Application Level**

Ensure each NTCIP Component complies with NTCIP 1101 and 2301 and meets the requirements for Conformance Level 1 (NOTE - See Amendment to standard).

Ensure each NTCIP Component supports SNMP traps. An NTCIP Component may support additional Application Profiles at the manufacturer's option. Ensure Responses use the same Application Profile used by the request. Ensure each NTCIP Component supports the receipt of Application data packets at any time allowed by the subject standards.

## **4. Information Level**

Each NTCIP Component shall provide Full, Standardized Object Range Support of all objects required by these procurement specifications unless otherwise indicated below. The maximum Response Time for any object or group of objects shall be 200 milliseconds.

Design the DMS to support all mandatory objects of all mandatory Conformance Groups as defined in NTCIP 1201 and NTCIP 1203. Table 2 indicates the modified object requirements for these mandatory objects.

**Table 2: Modified Object Ranges for Mandatory Objects**

Object	Reference	Project Requirement
ModuleTableEntry	NTCIP 1201 Clause 2.2.3	Contains at least one row with moduleType equal to 3 (software). The moduleMake specifies the name of the manufacturer, the moduleModel specifies the manufacturer's name of the component and the modelVersion indicates the model version number of the component.
MaxGroupAddresses	NTCIP 1201 Clause 2.7.1	At least 1
CommunityNamesMax	NTCIP 1201 Clause 2.8.2	At least 3
DmsNumPermanentMsg	NTCIP 1203 Clause 2.6.1.1.1.1	At least 1*
DmsMaxChangeableMsg	NTCIP 1203 Clause 2.6.1.1.1.3	At least 21
DmsFreeChangeableMemory	NTCIP 1203 Clause 2.6.1.1.1.4	At least 20 when no messages are stored.
DmsMessageMultiString	NTCIP 1203 Clause 2.6.1.1.1.8.3	The DMS supports any valid MULTI string containing any subset of those MULTI tags listed in Table 4
DmsControlMode	NTCIP 1203 Clause 2.7.1.1.1.1	Support at least the following modes:  Local  External central  Central Override

\* Ensure the Permanent Messages display the content shown in Table 3.

Ensure the sign blanks if a command to display a message contains an invalid Message CRC value for the desired message.

**Table 3: Content of Permanent Messages**

<b>Permanent Message Number</b>	<b>Description</b>
1	Permanent Message # 1 blanks the display (i.e. consists of an empty MULTI string). It has a run-time priority of one (1)

**Table 4: Required MULTI Tags**

<b>Code</b>	<b>Feature</b>
f1	field 1 - time (12hr)
f2	field 2 - time (24hr)
f8	field 8 – day of month
f9	field 9 – month
f10	field 10 - 2 digit year
f11	field 11 - 4 digit year
fl (and /fl)	flashing text on a line by line basis with flash rates controllable in 0.5 second increments.
fo	Font
jl2	Justification – line – left
jl3	Justification – line – center
jl4	Justification – line – right
jl5	Justification – line – full
jp2	Justification – page – top
jp3	Justification – page – middle
jp4	Justification – page – bottom
Mv	moving text
Nl	new line
Np	new page, up to 2 instances in a message (i.e., up to 3 pages/frames in a message counting first page)
Pt	page times controllable in 0.5 second increments.



The NTCIP Component implements all mandatory and optional objects of the following optional conformance groups with FSORS.

**5. Test Heading**

**a. Time Management**

As defined in NTCIP 1201

**b. Timebase Event Schedule**

As defined in NTCIP 1201. The following list indicates the modified object requirements for this conformance group.

**Table 5: Modified Object Ranges for the Timebase Event Schedule Conformance Group**

Object	Reference	Project Requirement
MaxTimeBaseScheduleEntries	NTCIP 1201 Clause 2.4.3.1	At least 28
maxDayPlans	NTCIP 1201 Clause 2.4.4.1	At least 14
maxDayPlanEvents	NTCIP 1201 Clause 2.4.4.2	At least 10

**c. Report**

As defined in NTCIP 1201. The following list indicates the modified object requirements for this conformance group.

**Table 6: Modified Object Ranges for the Report Conformance Group**

Object	Reference	Project Requirement
maxEventLogConfigs	NTCIP 1201 Clause 2.5.1	At least 50
eventConfigurationMode	NTCIP 1201 Clause 2.4.3.1	The NTCIP Component supports the following Event Configuration Modes: onChange greaterThanValue smallerThanValue
MaxEventLogSize	NTCIP 1201 Clause 2.5.3	At least 200
MaxEventClasses	NTCIP 1201 Clause 2.5.5	At least 16

**d. PMPP**

**e. Font Configuration**

As defined in NTCIP 1203. The following list indicates the modified object requirements for this conformance group.

**Table 7: Modified Object Ranges for the Font Configuration Conformance Group**

Object	Reference	Project Requirement
NumFonts	NTCIP 1203 Clause 2.4.1.1.1.1	At least 4*
MaxFontCharacters	NTCIP 1203 Clause 2.4.1.1.1.3	At least 127**

\* Upon delivery, the first font is a standard 18” font. The second font is a double-stroke 18” font. The third font is a 28” font. The fourth font is empty.

\*\* Upon delivery, the first three font sets are configured in accordance with the ASCII character set for the following characters:

- “A” thru “Z”- All upper case letters.
- “0” thru “9”- All decimal digits.
- Space (i.e., ASCII code 0x20).
- Punctuation marks shown in brackets [ . , ! ? - ‘ ’ “ ” / ( ) ]
- Special characters shown in brackets [ # & \* + < > ]

**f. DMS Configuration**

As defined in NTCIP 1203.

**g. MULTI Configuration**

As defined in NTCIP 1203. The following list indicates the modified object requirements for this conformance group.

**Table 8: Modified Object Ranges for the MULTI Configuration Conformance Group**

<b>Object</b>	<b>Reference</b>	<b>Project Requirement</b>
DefaultBackgroundColor	NTCIP 1203 Clause 2.5.1.1.1.1	The DMS supports the following background colors: black
DefaultForegroundColor	NTCIP 1203 Clause 2.5.1.1.1.2	The DMS supports the following foreground colors: amber
DefaultJustificationLine	NTCIP 1203 Clause 2.5.1.1.1.6	The DMS supports the following forms of line justification: left center right full
defaultJustificationPage	NTCIP 1203 Clause 2.5.1.1.1.7	The DMS supports the following forms of page justification: top middle bottom
defaultPageOnTime	NTCIP 1203 Clause 2.5.1.1.1.8	The DMS supports the full range of these objects with step sizes no larger than 0.5 seconds
defaultPageOffTime	NTCIP 1203 Clause 2.5.1.1.1.9	The DMS supports the full range of these objects with step sizes no larger than 0.5 seconds
defaultCharacterSet	NTCIP 1203 Clause 2.5.1.1.1.10	The DMS supports the following character sets: eightBit

- h. Default Message Control** as defined in NTCIP 1203
- i. Pixel Service Control** as defined in NTCIP 1203
- j. MULTI Error Control** as defined in NTCIP 1203

**k. Illumination / Brightness Control**

As defined in NTCIP 1203. The following list indicates the modified object requirements for this conformance group.

**Table 9: Modified Object Ranges for the Illumination/Brightness Control Conformance Group**

Object	Reference	Project Requirement
dmsIllumControl	NTCIP 1203 Clause 2.8.1.1.1.1	The DMS supports the following illumination control modes: photocell timer manual
dmsIllumNumBrightLevels	NTCIP 1203 Clause 2.8.1.1.1.4	At least 16

**l. Auxiliary I/O****m. Scheduling**

As defined in NTCIP 1203. The following list indicates the modified object requirements for this conformance group.

**Table 10: Modified Object Ranges for the Scheduling Conformance Group**

Object	Reference	Project Requirement
NumActionTableEntries	NTCIP 1203 Clause 2.9.1.1.1.1	At least 21

**n. Sign Status** as defined in NTCIP 1203

**o. Status Error** as defined in NTCIP 1203

**p. Pixel Error Status** as defined in NTCIP 1203

**q. Fan Error Status** as defined in NTCIP 1203

**r. Power Status** as defined in NTCIP 1203

**s. Temperature Status** as defined in NTCIP 1203

Install necessary hardware for the support of items q, r and s above.

**Table 11: Some Optional Object Requirements**

<b>Object</b>	<b>Reference</b>	<b>Project Requirement</b>
DefaultFlashOn	NTCIP 1203 Clause 2.5.1.1.1.3	The DMS supports the full range of these objects with step sizes no larger than 0.5 seconds
DefaultFlashOff	NTCIP 1203 Clause 2.5.1.1.1.4	The DMS supports the full range of these objects with step sizes no larger than 0.5 seconds
DmsMultiOtherErrorDescription	NTCIP 1203 Clause 2.7.1.1.1.20	If the vendor implements any vendor-specific MULTI tags, the DMS shall provide meaningful error messages within this object whenever one of these tags generates an error.

## 6. Documentation

Supply software with full documentation, including a CD-ROM containing ASCII versions of the following Management Information Base (MIB) files in Abstract Syntax Notation 1 (ASN.1) format:

- The relevant version of each official standard MIB Module referenced by the device functionality.
- If the device does not support the full range of any given object within a Standard MIB Module, a manufacturer specific version of the official Standard MIB Module with the supported range indicated in ASN.1 format in the SYNTAX and/or DESCRIPTION fields of the associated OBJECT TYPE macro. Name this file identical to the standard MIB Module, except that it will have the extension ".man".
- A MIB Module in ASN.1 format containing any and all manufacturer-specific objects supported by the device with accurate and meaningful DESCRIPTION fields and supported ranges indicated in the SYNTAX field of the OBJECT-TYPE macros.
- A MIB containing any other objects supported by the device.

Allow the use of any and all of this documentation by any party authorized by the Procuring Agency for systems integration purposes at any time initially or in the future, regardless of what parties are involved in the systems integration effort.

### **NTCIP Acceptance Testing**

Test the NTCIP requirements outlined above by a third party testing firm. Submit to the Engineer for approval a portfolio of the selected firm. Include the name, address, and a history of the selected firm in performing NTCIP testing along with references. Also provide a contact person's name and phone number. Submit detailed NTCIP testing plans and procedures including a list of hardware and software to the Engineer for review and approval 10 days in advance of a scheduled testing date. Develop test documents based on the NTCIP requirements of these Project Special Provisions. The acceptance test will use the NTCIP Exerciser, and/or other authorized testing tools and will follow the guidelines established in the ENTERPRISE Test Procedures. Conduct the test in North Carolina on the installed system at the presence of the Engineer. Document and certify the results of the test by the firm conducting the test and submit the Engineer for review and approval. In case of failures, remedy the problem and have the Firm retest in North Carolina. Continue process until all failures are resolved. The Department reserves the right to enhance these tests as deemed appropriate to ensure device compliance.

## **IV. DMS Testing Requirements**

### **General Test Procedure**

Test the DMS system in a series of design approval and functional tests. The results of each test must meet the specified requirements. These tests should not damage the equipment. The Engineer will reject equipment that fails to fulfill the requirements of any test. Resubmit rejected equipment after correcting non-conformities and re-testing; completely document all diagnoses and corrective actions. Modify all equipment furnished under this contract, without additional cost to the North Carolina Department of Transportation, to incorporate all design changes necessary to pass the required tests.

Provide 4 copies of all test procedures and requirements to the Engineer for review and approval at least 30 days prior to the testing start date.

Only use approved procedures for the tests. Include the following in the test procedures:

- A step-by-step outline of the test sequence, showing a test of every function of the equipment or system tested
- A description of the expected nominal operation, output, and test results, and the pass / fail criteria
- An estimate of the test duration and a proposed test schedule
- A data form to record all data and quantitative results obtained during the test.
- A description of any special equipment, setup, manpower, or conditions required by the test

Provide all necessary test equipment and technical support. Use test equipment calibrated to National Institute of Standards and Technology (NIST) standards. Provide calibration documentation upon request.

Conform to these testing requirements and the requirements of these specifications. The Engineer will reject all equipment not tested according to these requirements. It is the Design-Build Team's responsibility to ensure the DMS system functions properly even after the Engineer accepts the DMS test results.

Provide 4 copies of the quantitative test results and data forms containing all data taken, highlighting any non-conforming results and remedies taken, to the Engineer for approval. An authorized representative of the manufacturer must sign the test results and data forms.

### **Design Approval Tests**

The Design Approval Tests consists of all tests described in Section 2.2 "DMS Equipment Tests" of NEMA TS 4-2005 (Hardware Standards for Dynamic Message Signs with NTCIP Requirements). Perform all tests and submit certified results for review and approval.

PROTOTYPE – Manufacture a prototype Dynamic Message Sign and controller of the type and size described in the project special provisions. Test the prototype according to the Design Approval and Operational Tests. When all corrections and changes (if any) have been made, the Department may accept the prototype DMS and controller as the physical and functional standard for the system furnished under this contract. The Design-Build Team may use the prototype units on this project if, after inspection and rework (if necessary), they meet all physical and functional specifications. In the case of standard product line equipment, if the Design-Build Team can provide test results certified by an independent testing facility as evidence of prior completion of successful design approval tests, then the Engineer may choose to waive these tests.

In each Design Approval Test, successfully perform the Functional Tests described below. Apply the extreme conditions to all associated equipment unless stated otherwise in these Project Special Provisions (PSP).

### **Operational Field Test (On-Site Commissioning)**

Conduct an Operational Field Test of the DMS system installed on the project to exercise the normal operational functions of the equipment. The Operational Field Test will consist of the following tests as a minimum:

#### **A. Physical Examination**

Examine each piece of equipment to verify that the materials, design, construction, markings, and workmanship comply with the mechanical, dimensional, and assembly requirements of these Project Special Provisions.

Perform the following tests as a minimum:

- Verify that all surfaces are free of dents, scratches, weld burns, or abrasions. Round sharp edges and corners.
- Verify bend radius of cables is not excessive or could potentially cause damage.
- Verify all modules, lamps, and components are properly secured.
- Verify that there are no exposed live terminals.

## **B. Continuity Tests**

Check the wiring to assure it conforms to the requirements of the appropriate paragraphs of this Specification.

## **C. Functional Tests**

Perform the following functional tests:

- Start-up and operation of the DMS locally using a laptop computer.
- Use automatic (photo-electric sensor controlled), DMS Control Software to switch between “dim”, “normal”, and “bright” light levels.
- Operation of the DMS with all display elements flashing continuously for 10 minutes at the maximum flash rate.
- Exercise the DMS by displaying static messages, flashing messages, and alternating static and flashing message sequences.
- Automatic polling of the DMS by the Control Software at various intervals and verification of data received by Control Software from DMS.
- Downloading and editing messages using Control Software.
- Execute status request on the DMS controller.
- Normal operations during uploading and downloading.
- Selection of messages from the sign controller’s local user interface.
- Test sequence activation at chosen intervals.
- Display and verification of all stored messages.
- Resumption of standard operation upon interruption of electrical power.
- Demonstration of the Failure Detection and Response functions.
- Demonstrate proper operation of the Failure Log.
- Set controller clock using the Control Software.
- Execute system shutdown using first the Control Software and local user interface.



- Detection of power failure in the DMS enclosure and reporting of such failure to the Control Software.

Approval of Operational Field Test results does not relieve the Design-Build Team to conform to the specifications in these Project Special Provisions. If the DMS system does not pass these tests, document a correction or substitute a new unit as approved by the Engineer. Re-test the system until it passes all requirements.

### **30-Day Observation Period**

The 30-Day Observation Period is part of work to be completed by the project completion date. Upon completion of all project work, the successful completion of the component tests and the System Test, and the correction of all deficiencies, including minor construction items, a 30-day Observation Period shall commence. This observation shall consist of a 30-day period of normal operations of the new field equipment in operation with the new central equipment without any failure. The 30-day Observation Period shall be warranted by the payment and performance bond. The purpose of this period is to ensure that all components of the system function in accordance with the plans developed by the Design-Build Team and these Special Project Provisions over an extended length of time.

All training shall have been completed at least thirty (30) calendar days prior to the start of the 30-Day Observation Period.

Respond to system or component failures (or reported failures) that occur during the 30-day Observation Period within twenty-four (24) hours. Correct said failures within forty-eight (48) hours. Failures that affect any of the major system components defined below for more than forty-eight (48) hours shall suspend the timing of the 30-day Observation Period beginning at the time when the failure occurred. After the cause of such failures has been corrected, timing of the 30-day Observation Period shall resume. System or components failures that necessitate a redesign of any component and failures in any of the major system components exceeding a total of three (3) occurrences, shall terminate the 30-day Observation Period and shall cause the 30-day Observation Period to be restarted from zero when the redesigned components have been installed and/or the failures corrected. The major system components are:

- DMS Field Controller
- DMS Display Module
- DMS Workstation software

## **V. DMS Structure**

### **Description**

This section includes all design, fabrication, furnishing, and erection of the Dynamic Message Sign (DMS) assembly; ladder and access platform to the DMS inspection door; and attachment of the DMS enclosure to the structure in accordance with the requirements of the plans developed by the Design-Build Team and the provisions of this specification. Fabricate the supporting DMS assembly from tubular steel. Singular (monotube) horizontal members shall not

be allowed for DMS signs. Cantilevered DMS signs shall not be allowed. The DMS assembly shall be a pedestal type or overhead structure as shown on the plans developed by the Design-Build Team and as approved by the Engineer.

The pedestal structure shall provide a minimum of 25 feet clearance from the high point of the road to the bottom of the DMS enclosure. Provide overhead structures with a minimum of 20 feet clearance from the high point of the road to the bottom of the DMS enclosure.

Design the DMS assembly including footings and submit shop drawings for approval.

Where the Standard Specifications or plans developed by the Design-Build Team require the design of a DMS assembly, including footings, submit design computations and shop drawings to the Engineer for acceptance. A Professional Engineer that is registered in the state of North Carolina shall prepare such computations and drawings. These must bear his signature, seal, and date of acceptance.

The provisions of Section 900 apply to all work covered by this section.

### **Material**

Use materials that meet the following requirements of the NCDOT Standard Specifications:

Structural Steel	Section 1072
Overhead Structures	Section 1096
Signing Materials	Section 1092
Organic-Zinc Repair Paint	Article 1080-9
Reinforcing Steel	Sub-article 1070
Direct Tension Indicators	Sections 440 and 1072

### **Construction Methods**

#### **A. General**

Fabricate the DMS assembly in accordance with the details shown in the approved shop drawings and the requirements of these specifications.

No welding, cutting, or drilling in any manner will be permitted in the field, unless approved by the Engineer.

Drill bolt holes and slots to finished size. Holes may also be punched to finished size, provided the diameter of the punched holes is at least twice the thickness of the metal being punched. Flame cutting of bolt holes and slots will not be permitted.

Use two coats of a zinc-rich paint to touch up minor scars on all galvanized materials.

## **B. Shop Drawing**

Submit to the Engineer for approval a complete design for the DMS assembly, including footings, DMS assembly hardware, brackets for supporting the DMS and the access platform. Base the design on the line drawings and correct wind speed in accordance with the "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals".

The manufacturer of the DMS assembly must ensure that design of the assembly is totally compatible with the DMS for mounting and attachment.

Submit six copies of completely detailed shop drawings and one copy of the design computations for the DMS assembly to the Engineer for approval prior to fabrication. Show in the shop drawings complete design and fabrication details including foundations, provisions for attaching DMS and access platform to supporting structures, applicable material specifications, and any other information necessary for procuring and replacing any part of the complete Dynamic message sign assembly.

Allow a minimum of 10 working days for shop drawing approval after the Engineer receives them. If revised drawings are necessary, allow an additional 10 working days for review and approval of final shop drawings.

Approval of shop drawings by the Engineer will not relieve the Design-Build Team of his responsibility for the correctness of drawings, or for the fit of all shop and field connections and anchors.

## **C. Design and Fabrication**

For additional design and fabrication requirements, reference the Overhead Sign Supports Project Special Provision..

### **1. Dynamic Message Sign Assembly**

Fabricate the DMS assembly in accordance with the details shown in the approved shop drawings and with the requirements of this Project Special Provisions.

Determine the actual DMS assembly dimensions from field measurements and DMS enclosure dimensions and furnish revised plans. Attach the DMS assembly to the concrete foundation by the use of galvanized anchor bolts. Furnish anchor bolts with galvanized nuts, flat washers and lock washers. Provide anchor bolts that have an anchor plate with a nut at the end embed in concrete.

Fabricate the attachment assembly for mounting DMS in a manner that will ensure easy removal the DMS.

## 2. Access Platform

Provide an access platform, a minimum of three feet wide with open skid-resistant surface and safety railing, on the DMS assembly for access to the DMS inspection door. Provide platforms with fixed safety railings along both sides from the beginning of the platform to the inspection door.

Ensure the design, fabrication and installation of the access platforms on new DMS structures complies with the following:

1. The top of the platform grading surface is vertically aligned with the bottom of the DMS door. Ensure the platform extends from the DMS enclosure to the access ladder.
2. The DMS door will open 90-degrees from its closed position without any obstruction from the platform or safety handrails.
3. The platform is rigidly and directly connected to the walkway brackets and there is no uneven surface between sections.
4. Install a 4" x 4" safety angle parallel to and along both sides of the platform and extend it the entire length of the platform. Design the safety angle to withstand loading equivalent to the platform.
5. Ensure the platform design allows full access to the DMS enclosure inspection door with no interference or obstructions.

## 3. DMS Access Ladder

Provide a fixed ladder, of the same material as the pedestal structures, leading to the access platform. Equip the ladder with a security cover (ladder guard) and lock to prohibit access by unauthorized persons. Start the first ladder rung no more than 18 inches above finished ground and end it at the access platform. Design the rungs on 12-inch center to center typical spacing. Attach the security cover approximately 6 feet above the finished ground. Design the ladder and security cover as a permanent part of the DMS assembly and include complete design details in the DMS assembly shop drawings. Fabricate the ladder and cover to meet all OSHA requirements and applicable state and local codes, including but not limited to providing a ladder cage. Attached the bottom of the ladder to a concrete pad a minimum of 4 inches deep, 24 inches wide, and 36 inches long.

Furnish and install a level concrete pad a minimum of 4 inches deep, 24 inches wide and 36 inches long to serve as a landing pad for accessing the ladder. Design the landing pad to be directly below the bottom rung. Access to the ladder shall not be obstructed by the DMS foundation. Provide pre-formed or cast-in place concrete pads.

**4. Anchor Rod Nut Tightening Requirements**

For nut tightening requirements, reference the Foundations and Anchor Rod Assemblies for Metal Poles Project Special Provision (SP9 R05Rev).

**VI. DMS Foundation**

The work covered by this provision consists of the design and construction of DMS foundations in accordance with the submitted approved plans developed by the Design-Build Team and the Overhead and Dynamic Message Sign Foundations Project Special Provision located at:

<http://www.ncdot.gov/doh/preconstruct/traffic/congestion/sign/projprovision/overheadsignfoundations.pdf>

**VII. Documents and Submittals**

**General**

The submittals listed below complement requirements stated throughout these Project Special Provisions and do not replace them.

Provide all drawings on 24" X 36" sheet of paper unless approved by the Engineer otherwise. The drawing must fill the entire sheet of paper excluding a 2" border all around.

Supplement each drawing by catalog cut sheets and parts list. Provide parts list in the following format:

Part ID	Source	Part number	Alternate source	Alternate Part number	Description

**Drawings and Documents' Certification**

Provide the following drawings, documents, plans and calculations approved by a Professional Engineer registered in the state of North Carolina that bears his/her signature, seal, and date of acceptance:

- Plans for the DMS enclosure, mounting description, and shop drawings.
- Plans for overhead sign assembly, footings, design computations and shop drawings.
- Electrical power distribution drawings and power consumption calculations.

**Mechanical**

This set of submittals includes, but is not limited to, material specifications, catalog cut sheets, parts list, and fabrication drawings for DMS controller cabinet(s), DMS enclosure,

character assemblies, DMS overhead assembly, DMS to DMS overhead assembly mounting, and etc. Engineering calculations must accompany drawings as needed and applicable.

### **Electrical**

This set of submittals includes, but is not limited to, material specifications, catalog cut sheets, parts list, and wiring diagrams within the DMS controller cabinet, DMS enclosure, DMS controller cabinet/enclosure, service entrance cabinet / panels, and etc. This set of submittals also includes power consumption calculations, wire and conduit size calculations, voltage drop calculation, and etc. The DMS electrical system: wires, conduits, breakers, panel-boards, and etc. must meet the latest edition of NEC requirements and must be sealed and signed by a Professional Engineer registered in the state of North Carolina.

### **Electronics**

This set of submittals includes, but is not limited to, material specifications, catalog cut sheets, parts list, and schematic diagrams for all electronics assemblies and sub-assemblies used in the system.

### **Block Diagrams**

A block diagram shall be provided for the following:

- DMS System
- DMS Controller Cabinet
- DMS Enclosure
- DMS Controller
- DMS Display Boards
- DMS Driver Board(s)
- DMS Lighting Control Board(s)
- Interface Board(s)
- And other system's boards / assemblies that help in understanding, troubleshooting, and repairing the system and / or system's components.

### **LEDs**

This set of submittals shall include LED data / specification sheets and the LED selection procedure as required by Discrete LEDs found elsewhere in this Project Special Provision.

### **CCTV CAMERAS**

(7/11/12)

#### 1. New CCTV Cameras

The Design-Build Team shall provide and install the new CCTV cameras on metal poles at the locations approved by the Engineer. The existing CCTV equipment (cameras and matrix switcher) installed in the Region is manufactured by Pelco. All new CCTV equipment

furnished and installed by the Design-Build Team shall be fully compatible with all existing equipment. The Design-Build Team shall furnish and install the following equipment at the minimum:

CCTV Camera Assembly shall consist of:

- Automatic gain control charged-coupled device Color Cameras shall meet or exceed the following requirements:
  1. Video signal format: NTSC composite color video output, 1-volt peak to peak
  2. Automatic Gain Control (AGC): 0-20 dB, peak-average adjustable
  3. Automatic focus: Automatic with manual override
  4. White balance: Automatic through the lens with manual override
  5. Electronic-Shutter: dip-switch selectable electronic shutter with speed range from 1/60 of a second (off) to 1/30,000th of a second
  6. Overexposure protection: The camera must have built-in circuitry or a protection device to prevent any damage to the camera when pointed at strong light sources, including the sun
  7. Sensitivity: 1.5 lux at 90% scene reflectance
  8. Signal to noise ratio: Greater than 48-dB
  9. Video output Connection: 1-volt peak to peak, 75 ohms terminated, BNC connector
  10. Power: 24 VAC or less
  
- Zoom lens shall meet or exceed the following requirements:
  1. Automatic iris control with manual override and neutral density spot filter
  2. Focal length: 0.16" – 3.45", 35X optical zoom, 12X electronic zoom
  3. Preset positioning: 64 presets
  
- Dome style enclosure Camera Housing with internal heater  
(Enclosure shall meet or exceed NEMA 4X rating)
  
- Pan and Tilt Units shall meet or exceed the following:
  1. Pan: continuous 360 Degrees
  2. Tilt: up / down 180 degrees minimum
  3. Input voltage: 24 VAC 50/60Hz
  4. Motors: Two-phase induction type, continuous duty, instantaneous reversing
  5. Preset Positioning: 64 PTZ presets per camera
  
- Control Receiver/Drivers shall meet or exceed the following functions:
  1. Zoom in / out
  2. Automatic focus with manual override

3. Tilt up / down
4. Automatic iris with manual override
5. Minimum 64 preset positions for pan, tilt, and zoom

- Surge Suppression

As a minimum, all equipment at the top of the pole shall be protected by grounded metal oxide varistors connecting each power and control conductor to ground. Coaxial cable from each camera shall be protected by a surge protector at each end of the cable.

- Equipment Cabinets

The Design-Build Team shall furnish and install 336 stretch cabinets to house CCTV control and transmission equipment and fiber optic interconnect centers for terminating, splicing, and cross-connecting fiber optic cables. The 336 stretch CCTV cabinets shall consist of a cabinet housing, 19-inch EIA mounting cage, and power distribution assembly (PDA #3 as described in the CALTRANS TSCES).

The cabinet shall have the following:

1. Shelf Drawer
2. Cabinet Light
3. Thermostatically Controlled Ventilation Fans
4. Surge Protection for System Equipment
5. Fiber Optic Interconnect Center
6. Ground Bus

The Design-Build Team shall perform System Test on the newly integrated CCTV Cameras.

## **I. CCTV Camera Pole (50')**

The Design-Build Team shall furnish and install metal poles that comply with the guidelines found at:

<http://www.ncdot.gov/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html>

The Design-Build Team shall determine CCTV pole locations and obtain written approval from the Department prior to installation.

The Design-Build Team shall mount the CCTV camera units at a height of 45 feet above ground level and position the CCTV to adequately view traffic in all directions. The Design-Build Team shall mount the CCTV camera units such that a minimum 5 feet of clearance is maintained between the camera and the top of the pole. The Design-Build Team shall mount CCTV camera on side of pole nearest intended field of view and avoid occluding the view with the pole. The



Design-Build Team shall obtain written approval of camera orientation from the Department prior to installation.

The Design-Build Team shall furnish and install poles with ½-inch x 36-inch copper-clad air terminal (Class II), with ½-inch diameter, 28-strand (minimum) Class II, bare copper down-conductor. Electrical Service details for the CCTV camera installations must be approved by the Engineer prior to installation.

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

(6-24-12)

DB9 R05

### **Description**

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

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

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

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

### **Materials**

Refer to the *Standard Specifications*.

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

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

Use conduit type in accordance with the contract. Use Class A concrete for footings and pedestals, Class Drilled Pier concrete for drilled piers and Class AA concrete for grade beams and wings including portions of drilled piers above bottom of wings elevations. Corrugated temporary casings may be accepted at the discretion of the Engineer. A list of approved polymer slurry products is available from:

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

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

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

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

### **Construction Methods**

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

#### **(A) Drilled Piers**

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

meeting.

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

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

Construct drilled piers with the minimum required diameters shown in the accepted plans developed by the Design-Build Team. Install piers with tip elevations no higher than shown in the plans or approved by the Engineer.

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

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

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

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

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

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

Remove soft and loose material from bottom of holes using augers to the satisfaction of the Engineer. Assemble rebar cages and place cages and Drilled Pier concrete in

accordance with Subarticle 411-4(E) except for the following:

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

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

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

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

If a drilled pier is under further investigation, do not grout core holes, backfill around the pier or perform any work on the drilled pier until the Engineer accepts the pier. If the drilled pier is accepted, dewater and grout core holes and backfill around the pier with approved material to finished grade. If the Engineer determines a pier is unacceptable, remediation is required in accordance with Article 411-6 of the *Standard Specifications*. No extension of completion date or time will be allowed for remediation of unacceptable drilled piers or post repair testing.

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

**(B) Footings, Pedestals, Grade Beams and Wings**

Excavate as necessary for footings, grade beams and wings in accordance with the plans, accepted submittals and Section 410 of the *Standard Specifications*. If unstable, caving or sloughing materials are anticipated or encountered, shore foundation excavations as needed with an approved method. Notify the Engineer when foundation excavation is

complete. Do not place concrete or reinforcing steel until excavation dimensions and foundation material are approved.

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

**(C) Anchor Rod Assemblies**

Size anchor rods for design and the required projection above top of foundations. Determine required anchor rod projections from nut, washer and base plate thicknesses and the following:

- (1) Protrusion of 3 to 5 anchor rod threads above top nuts after tightening and
- (2) Distance of one nut thickness between top of foundations and bottom of leveling nuts.

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

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

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

- (1) Turn leveling nuts onto anchor rods to a distance of one nut thickness between the top of foundation and bottom of leveling nuts. Place washers over anchor rods on top of leveling nuts.
- (2) Determine if nuts are level using a flat rigid template on top of washers. If necessary, lower leveling nuts to level the template in all directions or if applicable, lower nuts to tilt the template so the metal pole or upright truss will lean as shown in the plans. If leveling nuts and washers are not in full contact with the template, replace washers with galvanized beveled washers.

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

<b>NUT ROTATION REQUIREMENTS (Turn-of-Nut Pretensioning Method)</b>	
<b>Anchor Rod Diameter, inch</b>	<b>Requirement</b>
$\leq 1 \frac{1}{2}$	1/3 turn (2 flats)
$> 1 \frac{1}{2}$	1/6 turn (1 flat)

Follow a star pattern cycling through each nut at least twice.

- (11) Ensure nuts, washers and base plates are in firm contact with each other for each anchor rod. Cables, mast arms and trusses may now be attached to metal poles and upright trusses.

- (12) Between 4 and 14 days after pretensioning top nuts, use a torque wrench calibrated within the last 12 months to check nuts in the presence of the Engineer. Completely erect mast arm poles and cantilever signs and attach any hardware before checking top nuts for these structures. Check that top nuts meet the following torque requirements:6

<b>TORQUE REQUIREMENTS</b>	
<b>Anchor Rod Diameter, inch</b>	<b>Requirement, ft-lb</b>
7/8	180
1	270
1 1/8	380
1 1/4	420
≥ 1 1/2	600

If necessary, retighten top nuts in the presence of the Engineer with a calibrated torque wrench to within ± 10 ft-lb of the required torque. Do not overtighten top nuts.

- (13) Do not grout under base plate.

**OVERHEAD SIGN SUPPORTS**

(7-10-12)

DB11 R012

**Description**

Design, fabricate, furnish and erect various types of overhead sign assemblies. Fabricate supporting structures using tubular members of either aluminum or steel. The types of overhead sign assemblies included in this specification are span structures and cantilever structures.

**Materials**

Structural Steel.....	Section 1072
Overhead Sign Structures.....	Section 1096
Signing Materials.....	Section 1092
Organic Zinc Repair Paint .....	Article 1080-9
Reinforcing Steel .....	Section 1070
Direct Tension Indicators.....	Sections 440 and 1072

**Construction Methods**

**A. General**

Fabricate overhead sign assemblies in accordance with the details shown in the approved working drawings and the requirements of these specifications.

No welding, cutting or drilling will be permitted in the field, unless approved by the Engineer.

Drill bolt holes and slots to finished size. Holes may also be punched to finished size, provided the diameter of the punched holes is at least twice the thickness of the metal being punched. Flame cutting of bolt holes and slots is not permitted.

Erect sign panels in accordance with the requirements for Type A or B signs as indicated in the plans or Roadway Standard Drawings. Field drill two holes per connection in the Z bars for attaching signs to overhead structures. Provide two U-bolts at each U-bolt connection such as each truss chord to sign hanger and each truss chord to walkway support or light support. Provide two U-bolts at each U-bolt connection where ends of truss chords are supported. The minimum diameter of all U-bolts is ½ inch.

For all U-bolt connections of hanger beams to overhead assembly truss chords, provide all U-bolts with a flat washer and double nuts at each end of the U-bolts. All double nuts that are on any U-bolt shall be the same thickness and weight. When assembled, the double nuts shall be brought tight against each other by the use of two wrenches.

Use two coats of a zinc-rich paint to touch up minor scars on all galvanized materials.

For high strength bolted connections, use direct tension indicators. Galvanize bolts, nuts and washers in accordance with the 2012 *Standard Specifications for Roads and Structures*.

## **B. Shop Drawings**

Design the overhead sign supports, including foundations, prior to fabrication. Submit design calculations and working drawings of the designs to the Engineer for review and acceptance.

Have a professional engineer registered in the State of North Carolina perform the computations and render a set of sealed, signed and dated drawings detailing the construction of each structure.

Submit to the Engineer for review and acceptance complete design and fabrication details for each overhead sign assembly, including foundations and brackets for supporting the signs, and maintenance walkways, if applicable, electrical control boxes, and lighting luminaires. Base design upon the revised structure line drawings, wind load area and the wind speed shown in the plans, and in accordance with the 2009 AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5th Edition*, and the 2010 and 2011 Interim Revisions.

Submit thirteen (13) copies of completely detailed working drawings and one copy of the design calculations including all design assumptions for each overhead sign assembly to the Engineer for approval prior to fabrication. Working drawings shall include complete design and fabrication details (including foundations); provisions for attaching signs,



maintenance walkways (when applicable), lighting luminaires to supporting structures, applicable material specifications, and any other information necessary for procuring and replacing any part of the complete overhead sign assembly.

Allow 15 days for initial working drawing review after the Engineer receives them. If revisions to working drawings are required, an additional 15 days shall be required for review and approval of the final working drawings.

Approval of working drawings by the Engineer shall not relieve the Design-Build Team of responsibility for the correctness of the drawings, or for the fit of all shop and field connections and anchors.

### **C. Design and Fabrication**

The following criteria govern the design of overhead sign assemblies:

Design shall be in accordance with the 2009 AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5th Edition*, and the 2010 and 2011 Interim Revisions.

Within this Specification, there are several design criteria that are owner specified. They include:

- Overhead cantilever sign structures shall include galloping loads (exclude four-chord horizontal trusses).
- The natural wind gust speed in North Carolina shall be assumed to be 11.6 mph.
- The fatigue importance category used in the design, for each type of structure, shall be for:
  - Cantilever structures with span greater than 50 feet – Fatigue Category I
  - Cantilever structures with span less than or equal to 50 feet – Fatigue Category II
  - Non-cantilever structures – Fatigue Category II

The following Specification interpretations or criteria shall be used in the design of overhead sign assemblies:

- For design of supporting upright posts or columns, the effective length factor for columns “K”, as provided for in Appendix B, Section B.5, shall be taken as the following, unless otherwise approved by the Engineer:

Case 1 For a single upright post of cantilever or span type overhead sign structure, the effective column length factor, “K”, shall be taken as 2.0.

Case 2 For twin post truss-type upright post with the post connected to one chord of a horizontal truss, the effective column length factor for that column shall be taken as 2.0.

Case 3 For twin post truss-type upright post with the post connected to two truss chords of a horizontal tri-chord or box truss, the effective column length factor for that column shall be taken as 1.65

- For twin post truss-type uprights, the unbraced length of the post shall be from the chord to post connection to the top of base plate.

For twin post truss-type uprights, when the post is subject to axial compression, bending moment, shear, and torsion the post shall satisfy the 2009 AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5th Edition*, and the 2010 and 2011 Interim Revisions Equations 5-17, 5-18 and 5-19. To reduce the effects of secondary bending, in lieu of Equation 5-18, the following equation may be used:

$$\frac{f_a}{F_a} + \frac{f_b}{\left(1 - \frac{0.6f_a}{F_c}\right)F_b} + \left(\frac{f_v}{F_v}\right)^2 \leq 1.0$$

Where  $f_a$  = Computed axial compression stress at base of post

- The base plate thickness for all uprights and poles shall be a minimum of 2" but not less than that determined by the following criteria and design.

Case 1 Circular or rectangular solid base plates with the upright pole welded to the top surface of base plate with full penetration butt weld, and where no stiffeners are provided. A base plate with a small center hole, which is less than 1/5 of the upright diameter, and located concentrically with the upright pole, may be considered as a solid base plate.

The magnitude of bending moment in the base plate, induced by the anchoring force of each anchor bolt shall be calculated as  $M = (P \times D_1) / 2$ .

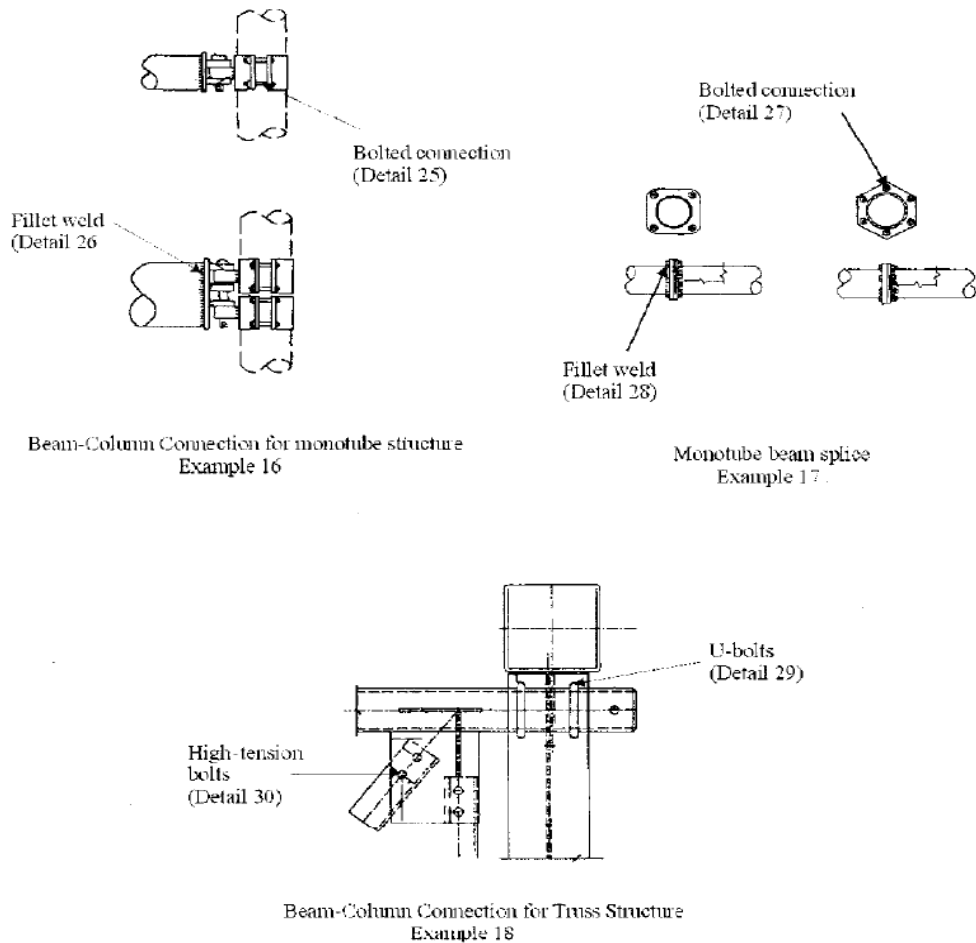
Case 2 Circular or rectangular base plate with the upright pole socketed into and attached to the base plate with two lines of fillet weld, and where no stiffeners are provided, or any base plate with a center hole that is larger in diameter than 1/5 of the upright diameter

The magnitude of bending moment induced by the anchoring force of each anchor bolt shall be calculated as  $M = P \times D_2$ .

- ***M*** - ***bending moment at the critical section of the base plate induced by one anchor bolt***
  - ***P*** - ***anchoring force of each anchor bolt***
  - ***D<sub>1</sub>*** - ***horizontal distance between the center of the anchor bolt and the outer face of the upright, or the difference between the radius of the bolt circle and the outside radius of the upright***
  - ***D<sub>2</sub>*** - ***horizontal distance between the face of the upright and the face of the anchor bolt nut***
- The critical section shall be located at the face of the anchor bolt and perpendicular to the radius of the bolt circle. The overlapped part of two adjacent critical sections shall be considered ineffective.
  - The thickness of Case 1 base plate shall not be less than that calculated based on formula for Case 2.
  - Uprights, foundations, and trusses that support overhead signs shall be designed in accordance with the Overhead and Dynamic Message Sign Foundations Project Special Provision for the effects of torsion. Torsion shall be considered from dead load eccentricity of these attachments, as well as for attachments such as walkways, supporting brackets, lights, etc., that add to the torsion in the assembly. Truss vertical and horizontal truss diagonals in particular and any other assembly members shall be appropriately sized for these loads.
  - Uprights, foundations, and trusses that support overhead mounted signs shall be designed for the proposed sign wind area and future wind areas. The design shall consider the effect of torsion induced by the eccentric force location of the center of wind force above (or below) the center of the supporting truss. Truss vertical and horizontal truss diagonals in particular and any other assembly members shall be appropriately sized for these loads.

For non-cantilevered monotube sign support structures, the following table and figures are considered as a required addition to the 2009 AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5th Edition*, and the 2010 and 2011 Interim Revisions:

<b>Construction</b>	<b>Detail</b>	<b>Stress Category</b>	<b>Application</b>	<b>Example</b>
Mechanically Fastened Connections	25. Bolts in Tension	D	Beam column connection for monotube structures	16
Fillet Weld Connections	26. Fillet welded with one side normal to applied stress	E'	Beam column connection for monotube structures	17
Mechanically Fastened Connections	27. High strength bolts in tension	D	Monotube or truss-chord splice	17
Fillet Weld Connections	28. Fillet welded with one side normal to applied stress	E'	Monotube or truss-chord splice	17
Mechanically Fastened Connections	29. U-bolts tied to transverse truss column to keep chords in place	D	Horizontal truss connection with vertical truss	18
Mechanically Fastened Connections	30. Net section of full-tightened, high tension bolts in shear	B	Truss bolted joint	18

Add to the Specifications, Figure 11-1:

Fabricate all overhead sign assemblies, including but not limited to foundations, in accordance with the details shown on the approved shop drawings and with the requirements of these Specifications.

Fabricate the span and cantilever supporting structures using tubular members of either aluminum or steel, using only one type of material throughout the project.

Horizontal components of the supporting structures for overhead signs may be of a truss design or a design using singular (monotube) horizontal members to support the sign panels.

Truss or singular member centerline must coincide with the centerline of sign design area shown on the structure line drawing.

Provide permanent camber in addition to dead load camber in accordance with the 2009 AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5th Edition*, and the 2010 and 2011 Interim Revisions.

Indicate on the shop drawings the amount of camber provided and the method employed in the fabrication of the support to obtain the camber.

Use cantilever sign structures that meet the following design criteria:

*a. Do not exceed an  $L / 150$  vertical dead load deflection at the end of the arm due to distortions in the arm and vertical support, where  $L$  is the length of the arm from the center of the vertical support to the outer edge of the sign.*

*b. Do not exceed an  $L / 40$  horizontal deflection at the end of the arm due to distortions in the arm and vertical support, as a result of design wind load.*

Fabricate attachment assemblies for mounting signs in a manner that allows easy removal of sign panels for repair.

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

(9-1-11)

DB11 R013

### **Description**

Sign foundations include foundations for overhead and dynamic message signs (DMS) supported by metal poles or upright trusses. Sign foundations consist of footings with pedestals or drilled piers with or without grade beams or wings, conduit and anchor rod assemblies. Construct sign foundations in accordance with the contract and accepted submittals. Define “cantilever sign” as an overhead cantilever sign support in accordance with Figure 1-1 of the 2009 *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5<sup>th</sup> Edition*, and the 2010 and 2011 Interim Revisions.

### **Materials**

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

### **Assumed Subsurface Conditions**

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

- (A) Unit weight = 120 lb/cf,
- (B) Friction angle = 30 degrees,
- (C) Cohesion = 0 lb/sf, and
- (D) Groundwater 7 ft below finished grade.

A subsurface investigation is required if the Engineer determines these assumed subsurface conditions do not apply to a sign location and the sign cannot be moved. Subsurface conditions

requiring a subsurface investigation include but are not limited to weathered or hard rock, boulders, very soft or loose soil, muck or shallow groundwater. No extension of completion date or time will be allowed for subsurface investigations.

### **Subsurface Investigations**

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

Use the computer software gINT version 8.0 or later manufactured by Bentley Systems, Inc. with the current NCDOT gINT library and data template to produce SPT boring logs. Provide boring logs sealed by a geologist or engineer licensed in the state of North Carolina.

### **Sign Foundation Designs**

Design sign foundations for the appropriate wind zone and the clearances shown in the plans developed by the Design-Build Team and the slope of finished grade at each sign location. Use the assumed soil parameters and groundwater elevation above for sign foundation designs unless a subsurface investigation is performed or required by the Engineer. For sign locations requiring a subsurface investigation, design sign foundations for the subsurface conditions at each sign location. Design footings, pedestals, drilled piers, grade beams and wings in accordance with the 2009 *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5<sup>th</sup> Edition*, and the 2010 and 2011 Interim Revisions. In some instances, conflicts with drainage structures may dictate sign foundation types.

Design footings in accordance with Section 4.4 of the *AASHTO Standard Specifications for Highway Bridges*. Do not use an allowable bearing pressure of more than 3,000 lb/sf for footings.

Design drilled piers for side resistance only in accordance with Section 4.6 of the *AASHTO Standard Specifications for Highway Bridges* except reduce ultimate side resistance by 25% for uplift. Use the computer software LPILE version 5.0 or later manufactured by Ensoft, Inc. to analyze drilled piers. Provide drilled pier designs with a horizontal deflection of less than 1" at top of piers. For cantilever signs with single drilled pier foundations supporting metal poles, use wings to resist torsion forces. Provide drilled pier designs with a factor of safety of at least 2.0 for torsion.

For drilled pier sign foundations supporting upright trusses, use dual drilled piers connected with a grade beam having a moment of inertia approximately equal to that of either pier. The Broms' method is acceptable to analyze drilled piers with grade beams instead of LPILE. Use a safety factor of at least 3.5 for the Broms' design method in accordance with C13.6.1.1 of the 2009 *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5<sup>th</sup> Edition*, and the 2010 and 2011 Interim Revisions.

Submit boring logs, if any, working drawings and design calculations for acceptance in

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

### **Construction Methods**

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

### **HIGH MOUNT FOUNDATIONS**

(9-1-11)

DB11 R014

### **Description**

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

### **Materials**

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

### **High Mount Standard Foundations**

Construct high mount standard foundations for the appropriate wind zone and high mount heights shown in the accepted plans developed by the Design-Build Team unless the following assumed site conditions are not applicable to high mount locations:

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

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



### **Subsurface Investigations**

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

Use the computer software gINT version 8.0 or later manufactured by Bentley Systems, Inc. with the current NCDOT gINT library and data template to produce SPT boring logs. Provide boring logs sealed by a geologist or engineer licensed in the state of North Carolina.

### **High Mount Foundation Designs**

Design high mount foundations for the wind zone and high mount heights shown in the accepted plans developed by the Design-Build Team and the slope of finished grade and subsurface conditions at each high mount location. Design drilled piers, footings and pedestals in accordance with the 4<sup>th</sup> Edition of the 2009 *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5<sup>th</sup> Edition*, and the 2010 and 2011 Interim Revisions.

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

Design footings in accordance with Section 4.4 of the *AASHTO Standard Specifications for Highway Bridges*. Do not use an allowable bearing pressure of more than 3,000 lb/sf for footings.

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

### **Construction Methods**

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

**SOUND BARRIER WALL**

(5-31-12)

**Description**

This work consists of furnishing precast panels, structural steel, concrete, and all other materials; handling, transporting, fabricating, galvanizing, and storing materials; furnishing erection drawings, pile excavation, backfilling, erecting and installing the sound barrier wall members and all other materials as required by the plans, Standard Specifications and this Special Provision.

The plans allow for a choice of 10 or 15 feet pile spacing. Pile spacing greater than 15 feet will not be permitted. Provide consistent pile spacing the entire length of the wall. Use odd pile spacing, if necessary, only at the ends of the wall and at turning points as approved by the Engineer.

A maximum one foot drop or rise in elevation between wall sections is permitted. Elevation changes greater than one foot, if necessary, will be allowed only at the end of the wall. Top of wall elevation changes that result in a jagged appearance will not be allowed.

**Alternate Pile Spacing**

As an alternate, the Contractor may submit plans for pile spacing greater than 10 feet and less than 15 feet for review and approval. The excavated hole diameter, excavation depth and reinforcing steel shall be equal to the amount shown on the existing plans for the 15 feet pile spacing. A variance in the reinforcing steel will be allowed for the length of horizontal and number of vertical reinforcement bars in the precast panel for the alternate pile spacing.

Submit two sets of detailed plans for review. Include all details in the plans, including the size and spacing of required reinforcement necessary to fabricate the precast panels. Have a North Carolina Registered Professional Engineer check, seal and date the plans. After the plans are reviewed and, if necessary, the corrections made, submit one set of reproducible tracings on 22" x 34" sheets to become part of the contract plans.

**Alternate Wall Type**

Walls that have been assigned "Approved" or "Approved for Provisional Use" status by the Product Evaluation Program will be considered for substitution to the detailed Standard Sound Barrier Wall only when noted on the plans. Alternate walls must meet the design and construction requirements of the project. Alternate wall structural stability and connection details shall conform to the current edition of the AASHTO LRFD Bridge Design Specifications.

Prior to submittal of Working Drawings, as described herein, submit a copy of the signed NCDOT Product Status Notification Letter and two sets of preliminary plans for review and approval. Include material specifications for all components. Once preliminary plans are approved, submit Working Drawings in accordance with all applicable portions of the requirements herein, including details necessary to fabricate and construct the proposed alternate.

Have a North Carolina Registered Professional Engineer check, seal and date the plans and, when requested, calculations. After the plans are reviewed and, if necessary, corrections made, submit one set of reproducible tracings on 22" x 34" sheets to become part of the contract plans.

### **Materials and Fabrication**

Provide Materials and fabricate members in accordance with the Architectural Concrete Surface Treatment project Special Provision and the requirements of Division 10 of the Standard Specifications for Roads and Structures.

Provide precast panels that are nominally 4 inches  $\pm$  1/4 inch thick with a simulated stone masonry textured surface on both faces. All texture shall extend outward from the nominal panel thickness. Furnish three 24" x 24" samples for approval which establish the acceptable variations in color, texture, and uniformity. After the color, texture, and uniformity of the furnished samples are approved, produce a full scale panel unit meeting design requirements. This mock-up and the furnished samples establish the standard quality for determining acceptance of the panels. When producing the final installed panels, use fine and coarse aggregate, retarder, and cement from the same source as those used in the approved sample panels.

### **Construction Methods**

Complete the final survey of existing ground profile after clearing the wall area but prior to submitting any working drawings. Submit the final groundline survey with the working drawings.

Excavate holes with the diameters shown on the plans. Perform pile excavation to the depths shown on the plans and install piles as shown on the plans or in the accepted submittals with a tolerance of 1/2 inch per foot from vertical. Backfill excavations with concrete after placing piles.

#### **A. Pile Excavation**

Use equipment of adequate capacity and capable of drilling through soil and non-soil including rock, boulders, debris, man-made objects and any other materials encountered. Blasting is not permitted to advance the excavation. Blasting for core removal is only permitted when approved by the Engineer. Dispose of drilling spoils in accordance with Section 802 of the Standard Specifications and as directed by the Engineer. Drilling spoils consist of all excavated material including water removed from the excavation either by pumping or drilling tools.

If unstable, caving or sloughing soils are anticipated or encountered, stabilize excavations with either slurry or steel casing. When using slurry, submit slurry details including product information, manufacturer's recommendations for use, slurry equipment information and written approval from the slurry supplier that the mixing water is acceptable before beginning drilling. When using steel casing, use either the sectional type or one continuous corrugated or non-corrugated piece. Steel casings should consist of clean watertight steel of ample strength to withstand handling and

driving stresses and the pressures imposed by concrete, earth or backfill. Use steel casings with an outside diameter equal to the hole size and a minimum wall thickness of 1/4 inch.

#### B. Concrete Placement

Before placing concrete, center and support the pile in the excavation and check the water inflow rate in the excavation after any pumps have been removed. If the inflow rate is less than 6 inches per half hour, remove any water and free fall the concrete into the excavation. Ensure that concrete flows completely around the pile. If the water inflow rate is greater than 6 inches per half hour, propose a concrete placement procedure to the Engineer. The Engineer shall approve the concrete placement procedure before placing concrete.

Fill the excavation with Class A concrete in accordance with Section 1000 of the Standard Specifications except as modified herein. Provide concrete with a slump of 6 to 8 inches. Use an approved high-range water reducer to achieve this slump. Place concrete in a continuous manner and remove all casings.

#### **Working Drawings**

Submit casting drawings for the precast face panels for approval in accordance with Article 1077-2 of the Standard Specifications prior to casting. Show the inserts, method of handling, and support details used for transportation on casting drawings. Submit metalwork fabrication drawings for approval prior to fabrication of steel wall components. Submit an erection plan and concrete face panel placing plan, including location of various heights of panels, for review and acceptance prior to fabrication of metalwork. Submit five sets of detail drawings.

#### **ARCHITECTURAL CONCRETE SURFACE TREATMENT**

(5-31-12)

##### **General**

The work covered by this special provision shall consist of constructing a simulated stone masonry textured surface on both faces of pre-cast concrete panels used in sound barrier walls as indicated on the Plans and in this Special Provision. The Contractor shall furnish all materials, labor, equipment, and incidentals necessary for the construction of architectural concrete surface treatment using simulated stone masonry form liners (molds) and a compatible concrete coloring system.

The Contractor is required to use the same source of form liner and color stains for all sound barrier wall panels. The architectural concrete surface treatment should match the appearance (stone size and shape, stone texture, pattern and relief) of natural stone to resemble a rustic ashlar stone pattern with medium to dark gray coloration. Prior to construction, the contractor shall submit the proposed stone pattern and color to the Engineer for review and approval. All texture is to be in addition to the nominal thickness of the wall panels of 4 inches  $\pm$  1/4 inch. Concrete columns are to remain unstained in their natural concrete color. There shall be an appreciable contrast between the colors of the unstained concrete columns and the stained panels. For

information purposes only, sources of form liners in a rustic ashlar stone pattern include, but are not limited to:

Scott System, Inc.  
10777 E. 45th Avenue  
Denver, Colorado 80239  
www.scottsystem.com  
Pattern: Rustic Random Ashlar # 1232

Architectural Polymers, Inc.  
1220 Little Gap Road  
Palmerton, PA 18071  
www.architecturalpolymers.com  
Pattern: Rustic Ashlar Stone # 898

Custom Rock Formliner  
2020 West 7<sup>th</sup> Street  
St. Paul, Minnesota 55116  
www.customrock.com  
Pattern: Rustic Ashlar # 1103

## Submittals

**Shop Drawings** – The Contractor shall submit for review and acceptance, plan and elevation views and details showing overall simulated stone pattern, joint locations, form tie locations, and end, edge or other special conditions. The drawings should include typical cross sections of applicable surfaces, joints, corners, stone relief, stone size, pitch/working line, mortar joint and bed depths. If necessary, the Contractor shall revise the shop drawings until the proposed form liner patterns and arrangement have been accepted by the Engineer. Shop drawings should be of sufficient scale to show the detail of all stone and joints patterns. The size of the sheets used for the shop drawings shall be 22" x 34" (560mm x 864mm).

The form liner shall be patterned such that long continuous horizontal or vertical lines do not occur on the finished exposed surface. The line pattern shall be random in nature and shall conceal construction joint lines. Special attention should be given to details for wrapping form liners around corners. The top 1'-0" of the top panel shall remain untreated. This portion shall have a smooth, non-textured finish, and remain its natural concrete color.

Shop drawings shall be reviewed and accepted prior to fabrication of form liners.

**Sample Panels** – After shop drawings have been reviewed and accepted by the Engineer, the Contractor shall construct three 24" x 24" transportable sample panel(s) at the project site. The materials used in construction of the sample panel(s) shall comply with section 420 of the Standard Specifications. The sample panel(s) shall be constructed using approved form liners. Any sample panel that is not accepted by the Engineer is to be removed from the project site and a new sample panel produced at no additional expense to the Department.

After the color, texture, and uniformity of the furnished samples are approved, produce a full scale unit meeting the design requirements. This mock-up and the furnished samples establish the standard quality for determining the acceptance of the panels.

Architectural surface treatments and patterns of the finished work shall achieve the same final effect as demonstrated on the accepted sample panel(s). Upon acceptance by the Engineer, the sample panel(s) shall be used as the quality standard for the project. After the acceptance of the completed structure, the Contractor shall dispose of the sample panels as directed by the Engineer.

### **Material Requirements**

**Form Liner** – The form liner shall be a high quality, reusable product manufactured of high strength urethane rubber or other approved material which attaches easily to the form work system, and shall not compress more than 1/4” when concrete is poured at a rate of 10 vertical feet per hour. The form liners shall be removable without causing deterioration of the surface or underlying concrete.

**Form Release Agent** – Form release agent shall be a non-staining petroleum distillate free from water, asphaltic, and other insoluble residue, or an equivalent product. Form release agents shall be compatible with the color system applied and any special surface finish.

**Form Ties** – Form ties shall be set back a minimum of 2” from the finished concrete surface. The ties shall be designed so that all material in the device to a depth of at least 2” back of the concrete face (bottom of simulated mortar groove) can be disengaged and removed without spalling or damaging the concrete. The Contractor shall submit the type of form ties to the Engineer for approval.

**Concrete Color System/Stain** – Special surface color system shall be performed using approved coloring systems/stains suitable for the purpose intended and applied in a manner consistent with the design intent of the project. The approved sample panel shall be the basis for determining the appropriate color/stain application.

Color stains shall be a special penetrating stain mix as provided by the manufacturer and shall be medium to dark gray to achieve a full, natural color in the finished surface. The stain shall create a surface finish that is breathable (allowing water vapor transmission), and that resists deterioration from water, acid, alkali, fungi, sunlight, or weathering. Stain mix shall meet the requirements for mildew resistance of Federal Test Method Standard 144, Method 6271, and requirements for weathering resistance of 1,000 hours accelerated exposure measures by Weatherometer in accordance with ASTM G 26. Color samples must be submitted for approval. Final coloring system and the medium to dark gray colors are subject to acceptance by the Engineer.

**Quality Standards** – Manufacturer of simulated stone masonry form liners and custom coloring system shall have at least five years’ experience making stone masonry molds and color stains to create formed concrete surfaces to match natural stone shapes, surface textures and colors.

The Contractor shall schedule a pre-installation conference with manufacturer representative and the Engineer to assure understanding of simulated stone masonry form liner use, color application, requirements for construction of sample panel(s), and to coordinate the work. The Contractor shall be required to disclose their source of simulated stone masonry manufacturer and final coloration contractor at the Preconstruction Conference.

## **Construction**

**Form Liner Preparation** – Prior to each concrete pour, the form liners shall be clean and free of build-up. Each liner shall be visually inspected for blemishes and tears. Repairs shall be made in accordance with the manufacturer's recommendations. Repairs shall be accepted by the Engineer before being used. Form liner panels that do not perform as intended or are no longer repairable shall be replaced.

**Form Liner Attachment** – Form liners shall be securely attached to forms in accordance with the manufacturer's recommendations, with less than a 1/4" seam. Blend form liner butt joints into the stone pattern and finish off the final concrete surface. Create no visible **vertical** or horizontal seams or conspicuous form liner butt joint marks. At locations where the form liners are joined, carefully blend to match the balance of the stone pattern. Form liners shall be installed to withstand anticipated concrete placement pressures without leakage and without causing physical or visual defects. Wall ties shall be coordinated with the form liner system. The Contractor shall have a technical representative from the form liner manufacturer on site for technical supervision during the installation and removal of form liners. Unless directed by the Engineer, installation and removal of form liners shall not be permitted if the technical representative is not present.

**Form Release Agent** – Form release agent shall be applied in accordance with the manufacturer's recommendations. The material shall be compatible with the form liner material and the concrete coloring system and in accordance with this Special Provision. Form release agent should be worked into all areas, especially pattern recesses.

**Patching** – All form tie holes and other defects in finished uncolored surface shall be filled **or** repaired within 48 hours of form removal. Use patching materials and procedures in accordance with the manufacturer's recommendations.

**Surface Finish** – All surfaces that are to receive coloring agent application shall be free of all laitance, dirt, dust, grease, efflorescence, paint or any other foreign material prior to the application of coloring agent. Cleaning of surfaces shall be accomplished by pressure washing with water set at 3000 psi to remove laitance. The fan nozzle shall be held perpendicular to the surface at a distance of 1 to 2 feet. Sandblasting will not be permitted.

Final surface shall be free of blemishes, discolorations, surface voids, and other irregularities. All patterns should be continuous without visual disruption.

Reinforced concrete shall be finished in accordance with the Standard Specifications, except that curing of concrete should be done to accommodate the application of coloring and surface finish treatment.

**Grout Pattern Joints** – Grout pattern joints shall be constructed to simulate the appearance of mortared joints produced in laid up masonry work. Grout pattern joints shall be produced in accordance with the form liner / concrete color system manufacturer.

**Color/Stain Application** – Finished concrete and patches shall stand in place 30 days after form liners are removed prior to application of coloring/staining agent. Maintain the concrete temperature between 40°F and 85°F during color/stain application and for 48 hours after color/stain application. Consult the manufacturer's recommendations for preparation, application, curing, and storage of coloring agents/stains. The contractor shall provide a Color Application Artist who is trained in the special techniques to achieve realistic surface appearances, if requested by the Engineer. Treated surfaces located adjacent to exposed soil or pavement shall be temporarily covered to prevent dirt or soil splatter from rain.

Following the completion of all work, repairs of any damage made by other construction operations shall be made to the form lined and colored surfaces as directed by the Engineer.

**Experience and Qualifications** – The Contractor shall have a minimum of three consecutive years' experience in architectural concrete surface treatment construction on similar types of projects. The Contractor shall furnish to the Engineer 5 references who were responsible for supervision of similar projects and will testify to the successful completion of these projects. Include name, address, telephone number, and specific type of application.



**GENERAL**

The State will not be bound by oral explanations or instructions given at any time during the bidding process or after award. Only information that is received in response to this RFP will be evaluated; reference to information previously submitted will not suffice as a response to this solicitation.

**NO CONTACT CLAUSE**

To ensure that information is distributed equitably to all short-listed Design-Build Teams, all questions and requests for information shall be directed to the State Contract Officer through the Design-Build e-mail address. This precludes any Design-Build Team Member, or representative, from contacting representatives of the Department, other State Agencies or Federal Agencies either by phone, e-mail or in person concerning the Design-Build Project.

**USE OF TERMS**

Throughout this RFP and all manuals, documents and standards referred to in the RFP the terms Contractor, Bidder, Design-Builder, Design-Build Team, Team, Firm, Company, and Proposer are synonymous.

Throughout this RFP and all manuals, documents and standards referred to in the RFP, the terms NCDOT, Department, Engineer, and State are synonymous.

Throughout this RFP and all documents referred to in the RFP, references to the Technical Proposal include all Technical Proposal supplemental information that may be submitted in response to a Best and Final Offer RFP.

**DESIGN REFERENCES**

Design references developed and published by NCDOT and those developed and published by other agencies and adopted for use by NCDOT which are to be used in the design of this project may be obtained by contacting Contract Standards and Development within the Technical Services Division. Standard prices for materials, which the Department normally sells for a fee, will be in effect. The Design-Build Team shall be responsible for designing in accordance with the applicable documents and current revisions and supplements thereto.

**REVIEW OF SUBMITTALS**

Major design milestones and required design submittals shall be identified as activities on a CPM, bar chart, or other scheduling tool. This schedule shall be submitted to the Transportation Program Management Director and Resident Engineer concurrently with the first design submittal, or within 30 days of the contract award, whichever is earlier. The schedule shall be revised and resubmitted as design milestones change or as directed by the Transportation Program Management Director. Submittals will be reviewed within 10 working days (15 days for temporary structures, overhead sign assemblies, MSE walls, FEMA compliance documents, curved steel girder working drawings and temporary shoring) from the date of receipt by

NCDOT unless otherwise stipulated in the scope of work. All submittals shall be prepared and submitted in accordance with the *Design-Build Submittal Guidelines*, which by reference are incorporated and made a part of this contract. All submittals shall be made simultaneously to the Transportation Program Management Director and the Resident Engineer. The Department will not accept subsequent submittals until prior submittal reviews have been completed for that item. The Design-Build Team shall inform the Transportation Program Management Director in writing of any proposed changes to the NCDOT preliminary designs, Technical Proposal and / or previously reviewed submittals and obtain approval prior to incorporation. The Design-Build Team shall prioritize submittals in the event that multiple submittals are made based on the current schedule. All submittals shall include pertinent Special Provisions. No work shall be performed prior to Department review of the design submittals.

## OVERVIEW

The Design-Build Project, U-2925, is the Salem Creek Connector in Forsyth County. The project extends from Rams Drive (SR 4326) to Martin Luther King Jr. Drive (SR 4325) on new location. The total project length is approximately 1.1 miles. The project will construct a four-lane divided facility, reconfigure the Diggs Boulevard / US 52-311 / NC 8 interchange and remove the SR 4326 (Rams Drive) / US 52-311 / NC 8 interchange ramps. The Salem Creek Connector / US 52 interchange will be a full control of access facility.

Project services shall include, but are not limited to:

- **Design Services** – completion of construction plans, including Record Drawings
- **Construction Services** – necessary to build and ensure workmanship of the designed facility
- **Permit Preparation / Application** - development of all documents for required permits
- **Right of Way** – acquisition of right of way necessary to construct project

The Environmental Assessment (EA) was approved on October 31, 2011

The Finding of No Significant Impacts (FONSI) was approved on April 30, 2012.

**Construction Engineering Inspection will be provided by the NCDOT.**

## GENERAL SCOPE

The scope of work for this project includes design, construction and management of the project. The design work includes all aspects to construct approximately 1.1 miles of a four-lane divided facility. The designs shall meet all appropriate latest versions of AASHTO *Policy on Geometric Design of Highways and Streets*, AASHTO *LRFD Bridge Design Specifications*, *Manual of Uniform Traffic Control Devices*, and all NCDOT design policies that are current as of the Technical and Price Proposal submission date or the Best and Final Offer submission date.

Construction shall include, but not be limited to, all necessary clearing, grading, roadway, drainage, structures, utility coordination and relocation, and erosion and sediment control work items for the proposed four-lane facility and installation of the control of access fence. Construction engineering and management shall be the responsibility of the Design-Build Team.

Construction shall comply with 2012 NCDOT *Standard Specifications for Roads and Structures* and any special provisions.

Areas of work required for this project shall include, but are not limited to the following items:

- Roadway Design
- Structure Design
- Hydraulic Design
- Permit Application
- Railroad Coordination
- Subgrade Stabilization
- Foundation Design for Structures and Roadway
- Erosion and Sediment Control Design and Implementation
- R/W Utilities, Conflicts and / or Construction
- Work Zone Traffic Control Design
- Sign Design
- Pavement Marking Design
- ITS Design
- Traffic Management and Signal System Design
- Construction
- Project Management
- Design and Construction Management
- Construction Surveying
- Location and Surveys
- Lighting (Construction Only)
- Right of Way Acquisition
- Public Information

All designs shall be in Microstation format using Geopak software (current version used by the Department).

#### **DESIGN AND CONSTRUCTION PERFORMED BY DESIGN-BUILD TEAM**

The design work consists of the preparation of all construction documents for constructing approximately 1.1 miles of a four-lane divided facility as outlined in the Scope of Work section of this RFP. The Design-Build Team shall prepare final designs, construction drawings and special provisions.

The Design-Build Team shall acknowledge that project documents furnished by the Department are preliminary and provided solely to assist the Design-Build Team in the development of the project design. The Design-Build Team shall be fully and totally responsible for the accuracy and completeness of all work performed under this contract and shall save the State harmless and shall be fully liable for any additional costs and all claims against the State which may arise due to errors, omissions and negligence of the Design-Build Team in performing the work required by this contract.

There shall be no assignment, subletting or transfer of the interest of the Design-Build Team in any of the work covered by the Contract without the written consent of the State, except that the Design-Build Team may, with prior written notification of such action to the State, sublet property searches and related services without further approval of the State.

The Design-Build Team shall certify all plans, specifications, estimates and engineering data furnished by the Team.

All work by the Design-Build Team shall be performed in a manner satisfactory to the State and in accordance with the established customs, practices, and procedures of the North Carolina Department of Transportation, and in conformity with the standards adopted by the American Association of State Highway Transportation Officials, and approved by the U.S. Secretary of Transportation as provided in Title 23, U.S. Code, Section 109 (b). The decision of the Engineer / State / Department shall control in all questions regarding location, type of design, dimension of design, and similar questions.

Alternate designs, details, or construction practices (such as those employed by other states, but not standard practice in NC) are subject to Department review and will be evaluated on a case by case basis.

The Design-Build Team shall not change team members, subconsultants or subcontractors identified in the Statement of Qualifications (SOQ) or Technical Proposal without written consent of the Engineer or the State Contract Officer. In addition, subconsultants and subcontractors not identified in the SOQ or Technical Proposal shall not perform any work without written consent by the Engineer. Individual offices of the Design-Build Team not identified in the Statement of Qualifications or the Technical Proposal submitted shall not perform any work without written consent by the Engineer. Failure to comply with this requirement may be justification for removing the Team from further consideration for this project and disqualification from submitting on future Design-Build Projects.

All firms shall be prequalified by the Department for the work they are to perform. Joint Ventures, LLCs or any legal structure that are different than the existing prequalification status must be prequalified prior to the Technical and Price Proposal submittal deadline. Subcontractors need only be prequalified prior to performing the work. Design firms should be prequalified prior to the Technical and Price Proposal submittal deadline. If not prequalified at the time of the Technical and Price Proposal submittal deadline, the prime contractor shall be solely responsible for either (1) ensuring that the design firm is prequalified prior to its first design submittal or (2) replacing that firm with a prequalified firm. Design firms and Natural Systems firms are prequalified by the particular office performing the work. If the work is to be performed by an office other than the one that is prequalified, that office shall be prequalified prior to any design submittals.

#### **ACCESS TO PROVIDED MATERIALS**

To facilitate distribution of documents that may be helpful to the Design-Build Teams in their development of a Technical and Price Proposal and subsequent designs, project material will be made accessible through a secure web portal. The Design-Build Project Manager for each short-

listed team shall provide a list of team members that will require access to this portal. This list shall include the name, e-mail address, and North Carolina Identity Management (NCID) for each individual team member. Once the list is complete, it shall be submitted to the Design-Build e-mail address (designbuild@ncdot.gov). No distribution of Provided Materials will be possible prior to this list being submitted and the access privileges established as noted herein.

To create an NCID account, each individual shall go to NCDOT's Connect website (<https://connect.ncdot.gov>) and click on the "How to get an Account" link and then, "Create NCID".

The Department will obtain access rights for these individuals and notify the Design-Build Project Manager accordingly. Individuals may then re-enter the "Connect" site and login with their NCID account. Once logged in, the Teamsite "U-2925 Project" link will be apparent on the left side of the webpage.

Please note that all material provided, including the material provided through this portal, is provided for informational purposes only and is provided solely to assist the Design-Build Team in the development of the project design. By submitting a Technical Proposal and Price Proposal, the Design-Build Team acknowledges that they are fully and totally responsible for the project design, including the use of portions of the Department design, modification of such design, or other designs as may be submitted by the Design-Build Team. The Design-Build Team further acknowledges that they are fully and totally responsible for the accuracy and completeness of all work performed, including the determination of the accuracy of the information provided through this portal, and to the extent that the Design-Build Team chooses to rely on such information.

## **ETHICS POLICY**

Employees employed by the Design-Build Team or employees employed by any subconsultant for the Design-Build Team to provide services for this project shall comply with the Department's ethics policy. Failure to comply with the ethics policy will result in the employee's removal from the project and may result in removal of the Company from the Department's appropriate prequalified list.

## **APPROVAL OF PERSONNEL**

The Department will have the right to approve or reject any personnel, assigned to a project by the Design-Build Team.

In the event of engagement of a former employee of the Department, the Design-Build Team or their subcontractors shall restrict such person or persons from working on any of the Design-Build Team's contracted projects in which the person or persons were "formerly involved" while employed by the State. The restriction period shall be for the duration of the contracted project with which the person was involved. *Former Involvement* shall be defined as active participation in any of the following activities:

Drafting the contract  
 Defining the contract scope of the contract  
 Design-Build Team selection  
 Negotiation of the contract cost (including calculating manhours or fees); and  
 Contract administration

An exception to these terms may be granted when recommended by the Secretary and approved by the Board of Transportation.

Failure to comply with the terms stated above in this section shall be grounds for termination of this contract and / or not being considered for selection of work on future contracts for a period of one year.

### **SUBMITTAL OF TECHNICAL AND PRICE PROPOSALS**

**Technical and / or Price Proposals that do not adhere to all the requirements noted below may be considered non-responsive and may result in the Department not considering the Design-Build Team for award of the contract or reading their Price Proposal publicly.**

#### **GENERAL**

Technical and Price Proposals will be accepted until **4:00 p.m. Local Time on Wednesday, October 31, 2012**, at the office of the State Contract Officer:

Mr. Randy A. Garris, PE  
 Contract Standards and Development  
 1020 Birch Ridge Drive  
 Century Center Complex - Building B  
 Raleigh, NC 27610

**No Proposals will be accepted after the time specified.**

Proposals shall be submitted in 2 separate, sealed parcels containing the Technical Proposal in one and the Price Proposal in the other parcel.

#### **TECHNICAL PROPOSAL**

Technical Proposals shall be submitted in a sealed package. The outer wrapping shall clearly indicate the following information:

Technical Proposal  
 Submitted By: (Design-Build Team's Name)  
 Design-Build Team Address  
 Contract Number C 202933  
 TIP Number U-2925  
 Forsyth County

Salem Creek Connector from SR 4326 (Rams Drive) to SR 4325 (Martin Luther King, Jr. Drive)

If delivered by mail, the sealed envelope shall be placed in another sealed envelope and the outer envelope addressed to the Contract Officer as stated in the Request for Proposals. The outer envelope shall also bear the statement "Technical Proposal for the Design-Build of State Highway Contract No. C 202933.

### Technical Proposal Requirements

12 Copies

8 ½ inch by 11 inch pages

No fold-out sheets allowed

Printed on one side only

Double-spaced

Font size 12

Minimal font size 10 is permissible within embedded tables, charts, or graphics. No more than 40 pages, excluding the introductory letter to Mr. Randy Garris, P.E. (two-page maximum length) and the 11 inch by 17 inch appropriate plan sheets

24 x 36 inch fold out sheets will only be allowed to present interchange plans

**Project team members**, identified in the Statement of Qualifications, shall not be modified in the Technical Proposal without written approval of the Department. Any such request should be sent to the attention of Mr. Randy Garris, PE, at the address below:

NCDOT- Contract Standards and Development  
 Century Center Complex - Building B  
 1020 Birch Ridge Drive  
 Raleigh, NC 27610

### **PRICE PROPOSAL**

Price Proposals shall be submitted in a sealed package. The outer wrapping will clearly indicate the following information:

Price Proposal  
 Submitted by (Design-Build Team's Name)  
 Design-Build Team Address  
 Contract Number C 202933  
 TIP Number U-2925  
 Forsyth County

Salem Creek Connector from SR 4326 (Rams Drive) to SR 4325 (Martin Luther King, Jr. Drive)

The Price Proposal shall be submitted by returning the Request for Proposals with the item sheets completed, and all required signatures and bonds. Failure to execute the required documents may render the proposal non-responsive.

If delivered by mail, the sealed envelope shall be placed in another sealed envelope and the outer envelope addressed to the Contract Officer as stated in the Request for Proposals. The outer

envelope shall also bear the statement "Price Proposal for the Design-Build of State Highway Contract No. C 202933.

### **EVALUATIONS**

Decisions based on cost alone will not establish the design standards for the project. Technical Proposals shall address the technical elements of the design and construction of the project. The Technical Review Committee will consider the understanding of the project, the anticipated problems and the solutions to those problems, in addition to other evaluation criteria identified herein.

The Design-Build Team's Technical Proposal shall be developed using narratives, tables, charts, plots, drawings and sketches as appropriate. The purpose of the Technical Proposal is to document the firm's understanding of the project, demonstrate the Team's capabilities to complete the project, document their selection of appropriate design criteria, and state their approach and schedule for completing all design and construction activities.

The review of design plans by the Department is not intended to reflect a reviewer's personal preferences, but rather to ensure that all contract requirements are met, sound engineering judgment is exercised by the Design-Build Team, and that the Design-Build Team adheres to all referenced documents, including but not limited to, design standards, codes, memos and manuals. As such, the award of the Design-Build contract does not in any way imply that the NCDOT accepts the details of the Technical Proposal submitted by the Design-Build Team.

The Technical Proposal will be evaluated in each of the following major categories:

<b>EVALUATION FACTORS</b>	<b>POINTS</b>
1. Management	10
2. Responsiveness to Request for Proposal	35
3. Long Term Maintenance	5
4. Schedule and Milestones	20
5. Innovation	5
6. Maintenance of Traffic and Safety Plan	20
7. Oral Interview	5

### **TECHNICAL PROPOSAL EVALUATION CRITERIA**

#### **1. Management – 10 points**

##### ***Design-Build Team Management***

- Describe the Design-Build Team's concept of design management. The proposal shall identify key positions and subordinate organizational units.
- Describe the plan for the coordination of civil / structural, utilities, traffic maintenance, constructability and environmental responsibility.
- Provide a narrative description of the proposed location of the design office(s) and their respective responsibilities.



- Describe how the designs developed by different firms and offices will be integrated.
- Describe how design personnel will interface with the construction personnel.
- Describe the overall strengths of the Design Team and their ability to fulfill the design requirements of this project.
- List projects, including description and similarity to the subject project, that the Design-Build Team's designer(s) have developed Transportation Management Plans, Pavement Marking Plans, Traffic Signal Plans and Signing Plans.

### ***Quality Management***

- Describe how the Design-Build Team will comply with the quality control requirements for both design and construction. Specifically, include a narrative describing the Design-Build Team's understanding of the Department's construction quality control philosophy for this project and how the Design-Build Team will implement it.
- The Design-Build Team should detail the number of inspectors they expect the Department to furnish, during various phases, to allow satisfactory progress of project construction.
- Describe any significant quality control issues experienced on NCDOT projects in the last ten years and how those issues will be addressed for this project.
- The narrative shall include both design and construction activities.

### ***Construction Management***

- Describe the Design-Build Team's concept of the project construction management organization and how it interrelates with the other elements of the Design-Build Team's organization for the project.
- Provide a brief narrative description of the Design-Build Team's proposed plan for performing construction on the project. This description shall include at least the following:
  - A construction organization chart for the project, showing the relationships between functions shown on the chart and the functional relationships with subcontractors.
  - The chart shall indicate how the Design-Build Team intends to divide the project into work segments to enable optimum construction performance.
  - Descriptions of those categories of work that the Design-Build Team anticipates will be performed by the Design-Build Team's own direct labor force and those categories that will be performed by subcontractors.
  - The Design-Build Team's plans and procedures to insure timely deliveries of materials to achieve the project schedule.
  - Describe the overall strengths of the construction team and their ability to fulfill the construction and construction management requirements of this project.
  - Describe the Design-Build Team's approach to site access and material staging.

## 2. Responsiveness to RFP – 35 points

### *Natural Environmental Responsibility*

- Describe the Design-Build Team’s approach to addressing environmental concerns within the project boundaries.
- Identify efforts to minimize impacts on wetlands, streams, riparian buffers, and other environmentally sensitive areas.
- Identify innovative approaches to minimize any impacts in environmentally sensitive areas. Describe any temporary impacts and associated minimization approaches.
- Describe the Design-Build Team’s understanding of the overall approach to permitting and the Team’s comfort level with obtaining the required permits within the allowed timeframe.
- Identify methods of construction in wetlands, streams, and buffers.
- Describe any Notice of Violations (NOV’s) the Design-Build Team members have received from regulatory agencies in North Carolina or any other State within the last five years and the disposition of each listed NOV.
- Describe the Design-Build Teams approach to Sedimentation and Erosion Control for the project.
- Provide a narrative overview of the Design-Build Team’s Vegetation Management Procedure.
- Describe efforts to minimize excavation within the contaminated sites and associated disturbance to underlying soil.

### *Design Features*

- Show plan view of design concepts with key elements noted.
- Identify preliminary horizontal and vertical alignments of all roadway elements.
- Provide Design Criteria.
- Show typical sections for the mainline of the project, specifying the pavement alternate chosen.
- Identify proposed deviations to the preliminary design provided by the Department.
- Identify the appropriate design criteria for each feature if not provided.
- Identify any deviations, including proposed design exceptions, from the established design criteria that will be utilized. Explain why the deviation is necessary.
- Identify drainage designs to be implemented.
- Describe the anticipated impacts to the Salem Creek, Cloverleaf Branch and Stadium Branch floodplains. Specifically, discuss the extent and limits of the rise in water elevation, identify potentially impacted insurable structures, specify areas anticipated to require additional surveys and estimate the anticipated additional right of way impacts outside the project construction limits.
- Identify the mainline pavement design chosen. The pavement type chosen for the mainline will not be a part of the Technical Proposal evaluation and the selection thereof will not impact the Technical Scores; although an alternate pavement design, as approved as an ATC, may be considered in the evaluation.

- Specify the base option chosen (ABC or asphalt) for all -Y- Lines.
- Identify all bridge types to be constructed, including any special design features or construction techniques needed.
- Describe any geotechnical investigations to be performed by the Design-Build Team and note any deviations to NCDOT requirements for subsurface investigations noted in the Geotechnical Scope of Work.
- Describe bridge, sound barrier wall, and retaining wall aesthetic treatments in accordance with the RFP requirements.
- Identify other aesthetics features, beyond those specifically required by the RFP, that will be provided.
- Describe and present a depiction of the gateway structure proposed at US 52 and Salem Creek Connector. Note that the gateway structure description/depiction will not be used in the evaluation of the Technical Proposal.
- Describe how any utility conflicts will be addressed and any special utility design considerations. Describe how the Design-Build Team's design and construction methods minimize the Department's utility relocation costs.
- Identify, if any, the extent of impacts to landfill areas.
- Identify the months the Department should schedule the 4B and 4C Meetings.
- Identify any right of way needed and how the design will affect the Department's right of way costs.
- Identify types of any retaining walls and / or sound barrier walls, if applicable.
- Identify the black ornamental metal picket control of access fence to be installed along Salem Creek Connector.
- Identify the roundabout landscape(s) and hardscape(s).
- Indicate the construction timeframe for activities in proximity to the Salem Academy and College soccer fields and any associated self-imposed liquidated damages.
- Indicate if, and to what extent, the Diggs Elementary School will be impacted.

### **3. Long Term Maintenance – 5 points**

- Describe any special materials, not referenced elsewhere in the RFP, incorporated into the project that would result in long term reduction in maintenance.
- Describe any special designs or construction methods that would reduce future maintenance costs to the Department.
- Estimate a minimum ten-year cost saving resulting from incorporation of these special materials, design or construction methods into the project.

### **4. Schedule and Milestones – 20 points**

- Provide a detailed schedule for the project including both design and construction activities. The schedule shall show the sequence and continuity of operations, as well as the month of delivery of usable segments of the project.
- The schedule shall also include the Design-Build Team's final completion date and, if proposed, their substantial completion date. **These dates shall be clearly indicated**

**on the Project Schedule and labeled “Final Completion Date” and “Substantial Completion Date”.**

### **5. Innovation – 5 points**

- Identify any aspects of the design or construction elements that the Design-Build Team considers innovative. Include a description of alternatives that were considered whether implemented or not.

### **6. Maintenance of Traffic and Safety Plan – 20 points**

#### ***Maintenance of Traffic***

- Describe any traffic control requirements that will be used for each construction phase.
- Describe how traffic will be maintained as appropriate and describe the Design-Build Team’s understanding of any time restrictions noted in the RFP.
- Specifically describe how business, school, and residential access will be maintained, if applicable.
- Indicate how hauling will be conducted, including but not limited to, hauling of materials to and from the site and hauling materials within the NCDOT right of way.
- Identify a Traffic Control Supervisor and their qualifications.
- If a temporary portable barrier system will be utilized, provide the type and why it is needed.
- If temporary shoring will be required, provide the type and why it is required.
- Identify all proposed offsite detours, including justification and duration for each. The duration of all offsite detours shall be provided in calendar days.
- Address where and how law enforcement officers will be used.

#### ***Safety Plan***

- Describe the safety considerations specific to the project.
- Discuss the Design-Build Team's overall approach to safety.
- Describe any proposed improvements that will be made prior to or during construction that will enhance the safety of the work force and / or travelling public both during and after the construction of the project.

### **7. Oral Interview – 5 points**

- The Design-Build Team’s Project Management Team shall present a brief introduction of the project team and design / construction approach.
- Introductory comments shall be held to no more than 30 minutes.
- The Department will use this interview to ask specific questions about the Team’s Technical Proposal, background, philosophies, and approach to the project.
- Presentation, questions, and answers shall not exceed 90 minutes. No more than 10 people from the Design-Build Team may attend.

The Department will use the information presented in the oral interview to assist in the evaluation of the Technical Proposal.

### **Additional Warranty and / or Guarantee**

- **The Extra Credit for this project shall be a Maximum of 5 Points.**

A twelve-month guarantee as outlined in the *Twelve-Month Guarantee* Project Special Provision is required for this project. However, the Design-Build Team may provide additional warranties and / or guarantees at their discretion. The Design-Build Team may be awarded additional points as “extra credit” to be added to the Technical Score.

The Design-Build Team may provide warranties and / or guarantees for major components of the project. Examples of major components are pavements, bridge components, and sign structures. If additional warranties and / or guarantees are offered, the Design-Build Team shall indicate in the Technical Proposal the general terms of the warranties and / or guarantees, a list of the items covered, performance parameters, notification and response parameters for corrective action, and evaluation periods. The Department will be responsible for annual inspections of the components covered by all warranties and / or guarantees offered by the Design-Build Team that extend beyond the required Twelve-Month Guarantee. The warranties and / or guarantees shall also define how disputes will be handled. Prior to the first partial payment, the Design-Build Team shall submit a document that provides additional warranty / guarantee specifics in sufficient detail that allows the document to be made a part of the contract through supplemental agreement.

No direct payment will be made for warranties and / or guarantees. Payment will be considered incidental to the lump sum price for the contract.

### ***SELECTION PROCEDURE***

There will be a Technical Review Committee (TRC) composed of five or more senior personnel from involved engineering groups that will evaluate the Technical Proposal on the basis of the criteria provided in the Request for Proposals.

The selection of a Design-Build Team will involve both technical quality and price. The Technical Proposals will be presented to the TRC for evaluation. The TRC shall first determine whether the proposals are responsive to the requirements of the Request for Proposals. The Department reserves the right to ask for clarification on any item in the Technical Proposal. A written response to this request for clarification shall be provided to the Department prior to the opening of the Price Proposals. The contents of the written response may affect the Technical Review Committee’s determination of the Technical Proposal’s responsiveness and/or the overall evaluation of the Technical Proposal. If any commitments or clarifications provided in the written response conflict with the contents of the Technical Proposal, the contents of the written response will govern and be incorporated into the contract.

Each responsive Technical Proposal shall be evaluated based on the rating criteria provided in the Request for Proposals. The TRC will submit an overall consensus Technical Proposal score for each Design-Build Team to the State Contract Officer.

### Quality Credit Evaluation Factors for Technical Proposals

Management	10
Responsiveness to Request for Proposal	35
Long Term Maintenance	5
Schedule and Milestones	20
Innovation	5
Maintenance of Traffic and Safety Plan	20
Oral Interview	5
<b>Maximum Score</b>	<b>100</b>

The State Contract Officer will use a table based on the maximum quality credit percentage to assign a Quality Credit Percentage to each proposal based on the proposal's overall Technical Score. The maximum quality credit percentage for this project will be **30%**. The Technical Review Committee may elect to assign point values to the nearest one-half of a point (e.g. 90.5). In this event, the Quality Credit Percentage will be determined by linearly interpolating within the table entitled "Quality Credit Percentage for Technical Proposals".

### Quality Credit Percentage for Technical Proposals

Technical Score	Quality Credit (%)	Technical Score	Quality Credit (%)
100	30.00	84	14.00
99	29.00	83	13.00
98	28.00	82	12.00
97	27.00	81	11.00
96	26.00	80	10.00
95	25.00	79	9.00
94	24.00	78	8.00
93	23.00	77	7.00
92	22.00	76	6.00
91	21.00	75	5.00
90	20.00	74	4.00
89	19.00	73	3.00
88	18.00	72	2.00
87	17.00	71	1.00
86	16.00	70	0.00
85	15.00		

**The maximum Technical Score, including any extra credit given for warranties or guarantees, shall not exceed 100 points in determining the Quality Credit percentage.**

If any of the Technical Proposals are considered non-responsive, the State Contract Officer will notify those Design-Build Teams of that fact. The State Contract Officer shall publicly open the sealed Price Proposals and multiply each Design-Build Team's Price Proposal by the Quality Credit Percentage earned by the Design-Build Team's Technical Proposal to obtain the Quality Value of each Design-Build Team's Technical Proposal. The Quality Value will then be subtracted from each Design-Build Team's Price Proposal to obtain an Adjusted Price based upon Price and Quality combined. Unless all Proposals are rejected or the Department elects to proceed with the Best and Final Offer process, the Department will recommend to the State Transportation Board that the Design-Build Team having the lowest adjusted price be awarded the contract. The cost of the Design-Build contract will be the amount received as the Price Proposal.

The following table shows an example of the calculations involved in this process.

### **An Example of Calculating Quality Adjusted Price Ranking**

<b>Proposal</b>	<b>Technical Score</b>	<b>Quality Credit (%)</b>	<b>Price Proposal (\$)</b>	<b>Quality Value (\$)</b>	<b>Adjusted Price (\$)</b>
A	95	25.00	3,000,000	750,000	2,250,000
B	90	20.00	2,900,000	580,000	2,320,000
C *	90	20.00	2,800,000	560,000	2,240,000
D	80	10.00	2,700,000	270,000	2,430,000
E	70	0.00	2,600,000	0	2,600,000
* Successful Design-Build Team – Contract Cost \$2,800,000					

### **Opening of Price Proposals**

Prior to opening the Price Proposals, the State Contract Officer will provide to each Design-Build Team their Technical Score in a sealed envelope. The sealed envelope will contain that Team's score only.

At the time and date specified, the State Contract Officer will open the Price Proposals and calculate the percentage difference between the Price Proposals submitted and the Engineer's Estimate.

Should all of the Price Proposals be within an acceptable range or below the Engineer's Estimate the State Contract Officer will proceed to calculate the quality credit and publicly read the Price Proposal, Technical Score, and Adjusted Price as outlined in the selection procedure above.

Should any one or more of the Price Proposals be within an acceptable range or below the Engineer's Estimate and the remaining Price Proposals exceed an acceptable range of the Engineer's Estimate the State Contract Officer will go to a separate location to calculate the quality credit and determine if the Design-Build Team with the lowest Adjusted Price is within an acceptable range of the Engineer's Estimate. Should the Price Proposal of the Design-Build Team with the lowest Adjusted Price be within an acceptable range of the Engineer's Estimate or below the Engineer's Estimate the State Contract Officer will proceed to publicly read the Price Proposals, Technical Scores, and Adjusted Prices. Should the Price Proposal of the Design-Build

Team with the lowest Adjusted Price exceed an acceptable range of the Engineer's Estimate the State Contract Officer will publicly read the Price Proposals only and the Department will then determine whether to proceed to request a Best and Final Offer (BAFO) as outlined below.

Should all Price Proposals submitted exceed an acceptable range of the Engineer's Estimate the State Contract Officer will publicly read the Price Proposals only. The Department will then determine whether to proceed to request a Best and Final Offer (BAFO) as outlined below.

In the event that the Department elects to not proceed with a Best and Final Offer (BAFO), then the State Contract Officer will schedule a date and time to publicly reiterate all Price Proposals, and read all Technical Scores and Adjusted Prices.

Provided the Department elects to proceed to request a Best and Final Offer (BAFO), at the date and time specified, the State Contract Officer will open the Best and Final Offer Price Proposals and proceed to publicly read all Price Proposals, Technical Scores and Adjusted Prices.

### **Best and Final Offer**

In the event initial Price Proposals exceed an acceptable range of the Engineer's Estimate or if the Department feels it is necessary for any reason the Department may choose to make amendments to the details of the RFP and request a Best and Final Offer from all of the previously short-listed teams. Alternately, the Department may choose to redistribute to the short-listed Design-Build Teams another RFP for the project with no amendments to the RFP scope.

After receipt of the redistributed RFP, the Design-Build Team has the option of changing their Technical Proposal details. If the Design-Build Team changes any component of the Technical Proposal, the TRC will review those amended components of the Technical Proposal and reevaluate the scores accordingly. The Design-Build Team shall highlight the changes to bring them to the Department's attention. A revised total score will be calculated, if appropriate, based on these amendments to the Technical Proposal.

Additional oral interviews will not be held. The Design-Build Teams shall submit both a revised Price Proposal and a revised Technical Proposal (if applicable) at the time, place, and date specified in the redistributed RFP. A revised Quality Credit Percentage (if required) and Adjusted Price will be determined. This will constitute the Design-Build Team's Best and Final Offer. Award of the project may be made to the Design-Build Team with the lowest Adjusted Price on this Best and Final Offer for the project.

### **Stipend**

A stipulated fee of **\$75,000** will be awarded to each short-listed Design-Build Team that provides a responsive, but unsuccessful, Design-Build Proposal. If a contract award is not made, all short-listed Design-Build Teams that provide a responsive Design-Build Proposal shall receive the stipulated fee. Once award is made, or a decision is made not to award, unsuccessful Design-Build Teams can apply for the stipulated fee by notifying the State Contract Officer in writing and providing an original invoice. If the Design-Build Team accepts the stipulated fee,



the Department reserves the right to use any ideas or information contained in the Design-Build Proposals in connection with any contract awarded for the project, or in connection with any subsequent procurement, with no obligation to pay additional compensation to the unsuccessful Design-Build Team. The stipulated fee shall be paid to eligible Design-Build Teams within ninety days after the award of the contract or the decision not to award. Unsuccessful Design-Build Teams may elect to refuse payment of the stipulated fee and retain any rights to its Design-Build Proposal and the ideas and information contained therein.

In the event that the Department suspends or discontinues the procurement process prior to the Design-Build Proposal submittal date current at the time of the suspension, no stipulated fee will be paid.

**ROADWAY SCOPE OF WORK** (8-24-12)**Project Details**

- The Design-Build Team shall design and construct a four-lane divided facility with a minimum 23-foot median on new location from SR 4326 (Rams Drive) to SR 4325 (Martin Luther King Jr. Drive) in Forsyth County. Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct the -L- Line providing the same or better access, widening, improvements and level of service included in the U-2925 Combined Public Hearing Map provided by the Department. The limits of -L- Line construction shall be of sufficient length to tie to existing based upon the current NCDOT guidelines and standards. Excluding the Diverging Diamond cross-over maneuvers, the mainline shall be designed and constructed to meet a 40 mph design speed for a rolling urban collector. The Design-Build Team shall provide all other design criteria in the Technical Proposal.
- The Design-Build Team shall install 2'-6" curb and gutter along the -L- Line outside travel lanes. Excluding areas with 5" keyed-in concrete monolithic median islands, the Design-Build Team shall install 1'-6" curb and gutter along the -L- Line median. The Design-Build Team shall install 2'-6" curb and gutter along the Salem Creek Connector / US 52 Diverging Diamond Interchange ramp channelization islands.
- Outside the Salem Creek Connector / US 52 interchange limits, the Design-Build Team shall design and construct 11-foot travel lanes, with 12-foot outside berms, along the -L- Line. Excluding the east side of the -L- Line, from the proposed greenway located south of Salem Creek to Rams Drive, the Design-Build Team shall design and construct five-foot sidewalk, located six feet from the back of curb, on the aforementioned 12-foot berms. Along the east side of the -L- Line, from the proposed greenway located south of Salem Creek to Rams Drive, the Design-Build Team shall design and construct six-inch thick ten-foot wide sidewalk, located adjacent to the back of curb, on the aforementioned 12-foot berm.
- Within the Salem Creek Connector / US 52 interchange limits, the Design-Build Team shall design and construct 12-foot travel lanes, with ten-foot outside berms, along the -L- Line. Excluding the median section between the Salem Creek Connector / US 52 Diverging Diamond Interchange ramps, the Design-Build Team shall design and construct five-foot sidewalk on both sides of the -L- Line. Through the Salem Creek Connector / US 52 Diverging Diamond Interchange ramps, the Design-Build Team shall provide a minimum ten-foot wide pedestrian accommodation within the -L- Line median. The Design-Build Team shall provide concrete barrier along both sides of the aforementioned median pedestrian accommodation. The Design-Build Team shall not design or construct any obstruction within the ten-foot median pedestrian accommodation, including but not limited to bridge piers.
- Between the Salem Creek Connector and I-40 Business interchanges, the Design-Build Team shall design and construct northbound and southbound auxiliary lanes on US 52.

- The Design-Build Team shall coordinate the Salem Creek Connector / Rams Drive intersection design and construction with TIP Project U-4918.
- Excluding the roundabout, the Design-Build Team shall design and construct 11-foot lanes on City Yard Drive.
- Throughout the construction limits, the Design-Build Team shall design and construct sidewalk at the following locations:
  - Five-foot sidewalk, located four-foot from the back of curb on ten-foot berms, along both sides of Martin Luther King, Jr. Drive
  - Excluding the roundabout, five-foot sidewalk, located six-foot from the back of curb on 12-foot berms, along both sides of City Yard Drive
  - Five-foot sidewalk, located four-foot from the back of curb on a ten-foot berm, along the north side of Rams Drive
  - Five-foot sidewalk, located four-foot from the back of curb on a ten-foot berm, along the south side of Rams Drive west of the bridge over US 52 (-Y2-)
  - Eight-foot sidewalk, located at the back of curb on a ten-foot berm, along the south side of Rams Drive from the eastern terminus of the bridge over US 52 (-Y2-) to Martin Luther King Jr. Drive
  - Five-foot sidewalk, located at the back of curb on six-foot berms, along both sides of Salem Avenue
- Five-foot sidewalk connector from Humphrey Street to the Salem Creek Connector
- Along US 52 (-Y2-), the Design-Build Team shall design and construct 14-foot outside shoulders, 12-foot of which shall be full depth paved shoulders. These outside shoulders shall be designed and constructed to accommodate a future travel lane with appropriate cross slope.
- The Design-Build Team shall provide milled rumble strips along the -Y2- median paved shoulders. The Design-Build Team shall provide thermoplastic rumble strips along the -Y2- outside paved shoulders, including ramp and loop terminals, and acceleration, deceleration and auxiliary lanes, in accordance with the January 2012 NCDOT *Roadway Standard Drawings*.
- The Design-Build Team shall design and construct one-lane ramps that provide a minimum 16-foot lane width. The Design-Build Team shall design and construct two lane ramps that provide minimum 12-foot lanes. One-lane and two-lane ramps shall have 14-foot outside shoulders, four-foot of which shall be full depth paved shoulders and 12-foot inside shoulders, four-foot of which shall be full depth paved shoulders.

- The Design-Build Team shall design and construct loops that adhere to Table 3-29, Design Widths of Pavements for Turning Roadways, shown in AASHTO's *A Policy on Geometric Design of Highways and Streets* (2011) – Case II / Condition C for one-lane loops; Case III / Condition C for two-lane loops. All loops shall have 12-foot outside shoulders, four-foot of which shall be full depth paved shoulders. All loops shall have 2'-6" curb and gutter along the inside edge of pavement, with a 14-foot berm. Unless noted otherwise elsewhere in this RFP, the minimum loop design shall be 30 mph with a minimum 250-foot radius.
- Excluding the Salem Creek Connector / US 52 Diverging Diamond Interchange, the Design-Build Team shall design and construct at-grade intersections with the lane configurations noted in the Congestion Management U-2925 2004 and 2030 Capacity Analysis Memorandum dated April 21, 2009. The Design-Build Team shall design and construct at-grade intersections for the Salem Creek Connector / US 52 Diverging Diamond Interchange with the lane configurations noted in the Congestion Management U-2925 2030 Diverging Diamond Interchange Capacity Analysis Memorandum dated November 3, 2010. All turn lane lengths shall meet the current NCDOT standards where vehicle storage does not govern or the lengths required by the aforementioned Congestion Management Memorandums, whichever is greater. This determination shall be made by calculating the recommended treatment for turn lanes, incorporating the minimum deceleration lengths as defined in the NCDOT Roadway Design Manual, (Reference Section 9-1, Figure F-4A) and comparing the calculated values with the NCDOT minimum turn lane lengths. The Design-Build Team shall accommodate the right turn maneuver at all intersections in accordance with the NCDOT Roadway Design Manual (Reference Section 9-1, Figure F-4C).
- The mainline grade point shall be located at the median centerline. In a normal crown section, the mainline lanes shall slope in the same direction from the pavement edge adjacent to the median curb and gutter to the outside edge of pavement at a 0.020 cross slope.
- Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct -Y- Lines, ramps, service roads and cul-de-sacs providing the same or better access, widening, improvements and level of service included in the U-2925 Combined Public Hearing Map provided by the Department. The limits of -Y- Line and service road construction shall be of sufficient length to tie to existing based upon the current NCDOT guidelines and standards.
- Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct bridge rail offsets as indicated in the NCDOT *Roadway Design Manual* or that are equal to the approach roadway paved shoulders, whichever is greater. Narrower bridge rail offsets based on bridge length will not be allowed.
- Unless noted otherwise elsewhere in this RFP, all guardrail / guiderail placement shall be in accordance with the January 2012 NCDOT *Roadway Standard Drawings* and / or approved details in lieu of standards. Along all 3:1 fill slopes, constructed at fill heights that are equal to or greater than 12 feet, the Design-Build Team shall install guardrail. Along all fill slopes steeper than 3:1, constructed at fill heights that are equal to or greater than six feet, the

Design-Build Team shall install guardrail. The guardrail / guiderail design shall be submitted for review with the Preliminary Plans submittal.

- Unless noted otherwise elsewhere in this RFP, the maximum allowable cut and fill slope shall be 2:1. (Reference the Geotechnical Engineering Scope of Work found elsewhere in this RFP) The slopes in the interchange area shall follow the requirements set forth in the *Roadway Design Guidelines for Design-Build Projects* located on the Design-Build web site.
- Within the vehicle recovery area, the Design-Build Team shall design and construct single faced concrete barrier in front of all sound barrier walls located on the outside shoulder in fill sections, retaining walls and all elements acting as a retaining wall.
- The Design-Build Team shall design and construct all greenways shown on the U-2925 Combined Public Hearing Map in accordance with the NCDOT North Carolina Bicycle Facilities Planning and Design Guidelines and in compliance with the Americans with Disabilities Act. All greenways shall be a minimum ten-foot width. Unless the Design-Build Team designs and constructs a greenway detour that adheres to the aforementioned greenway requirements, the existing Salem Creek Greenway Trail shall remain operational at all times.
- Along all -Y- Lines and driveway intersection radii, the proposed sidewalk shall parallel the curb and gutter, terminating at the radius point.
- The Design-Build Team shall remove the existing US 52 / Vargrave Street and US 52 / Rams Drive interchanges within the entire limits of the entrance and exit ramps / loops. At a minimum, the Design-Build Team shall remove and dispose of the existing pavement structure and subgrade.
- The Design-Build Team shall not impact or remove the existing Vargrave Street bridge over Salem Creek.
- The existing private roadway connection between Martin Luther King, Jr. Drive and Diggs Boulevard shall be re-connected to Salem Creek Connector. The Design-Build Team shall design and construct this connector with a minimum 36-foot drop-curb access onto the Salem Creek Connector that only allows right-in and right-out maneuvers.
- Between the Salem Creek Connector and Salem Creek, the Design-Build Team shall provide a 24-foot drop-curb driveway connection on the west side of Martin Luther King, Jr. Drive. This driveway shall be shifted south of the existing Martin Luther King, Jr. Drive / Diggs Boulevard intersection to allow only right-in and right-out access.
- Outside the project limits, the Design-Build Team will not be allowed to use the NCDOT right of way and / or property for borrow or waste sites. Within the project limits, the Design-Build Team shall adhere to the following:
  - Only clean waste material may be wasted within the NCDOT right of way or property.

- Debris shall not be buried within the NCDOT right of way or property.
- Normal grading operations shall occur, including but not limited to, removal of the existing embankments supporting all removed roadway sections.
- The Design-Build Team shall design and construct all lane drops from the outside travelway.
- US 52 (-Y2-) is a full control of access facility. The Design-Build Team shall bring to the Transportation Program Management Director's attention any deviations from the proposed control of access shown on the U-2925 Combined Public Hearing Map provided by the Department. Prior to negotiating right of way, easements and / or control of access with property owners, the Design-Build Team shall delineate the proposed acquisitions on the Right of Way Plans developed by the Design-Build Team for the Department's review and acceptance. The Design-Build Team shall be responsible for coordinating with, and obtaining approval from, the NCDOT for the control of access fence placement. All control of access fence shall be a minimum of four feet tall with maximum four-inch openings. The Design-Build Team shall install black vinyl coated chain-link control of access fence along US 52. The Design-Build Team shall install black ornamental metal picket control of access fence along Salem Creek Connector. The Design-Build Team shall be responsible for installation of the control of access fence, including the replacement of all existing control of access fence within the project limits with fence that adheres to the requirements noted above. The Design-Build Team shall identify the black ornamental metal picket control of access fence to be installed along Salem Creek Connector in the Technical Proposal. (Reference the Right of Way Scope of Work found elsewhere in this RFP)
- The Department has followed the Merger 01 Process used by the Environmental Agencies and the Department to obtain environmental permits. Any variations in the Department's proposed design and / or construction methods that nullify any concurrence points obtained or decisions reached between the Department and the Environmental Agencies; and / or require additional coordination with the Environmental Agencies shall be the sole responsibility of the Design-Build Team. The Department will not allow any contract time extensions or additional compensation associated with any coordination or approval process resulting from design and / or construction modifications.
- Within the project limits, the Design-Build Team shall be responsible for the location and installation of all right of way monuments. The Design-Build Team shall replace all existing right of way monuments damaged and / or relocated during construction. For all parcels, the Design-Build Team shall furnish and place rebar and caps with carsonite posts for right of way monument locations.
- The Design-Build Team shall not further impact any cultural, historical, or otherwise protected landmark or topographic feature beyond that shown on the U-2925 Combined Public Hearing Map provided by the Department. The Design-Build Team shall not acquire right of way or easements from the aforementioned features unless shown on the U-2925 Combined Public Hearing Map provided by the Department.

- The security fence along the Salem Academy and College's property located on Salem Avenue shall be operational at all times. If the aforementioned security fence is impacted during construction, the Design-Build Team shall 1) repair the fence or provide temporary fence and 2) install permanent fence that is similar to the existing fence.
- The Design-Build Team's design, construction and / or right of way acquisition shall not impact the large oak tree located on the east side of Salem Avenue, across from the Winston-Salem City Employees' Credit Union, on the Salem Academy and College property. Prior to construction, the Design-Build Team shall provide tree protection fencing, that completely encompasses the aforementioned oak tree, throughout construction.
- The Design-Build Team's design and / or construction may impact the Diggs Elementary School. However, the school shall remain operational until completion of the 2012 – 2013 school year. The Design-Build Team shall indicate if, and to what extent, the Diggs Elementary School will be impacted in the Technical Proposal.
- The Design-Build Team shall minimize impacts to the Salem Academy and College soccer fields and surrounding landscaping. It is desirable that all construction in proximity to these soccer fields begin after Thanksgiving and finish prior to February 15<sup>th</sup> of the following year. The Design-Build Team shall indicate the construction timeframe for activities in proximity to the Salem Academy and College soccer fields and any associated self-imposed liquidated damages in the Technical Proposal. The Department will design and plant the landscaping, sod and trees, required for impacts to the landscaping in proximity to the aforementioned soccer fields.
- To eliminate future damage to the Salem Creek Connector, -Y- Line and driveway pavement structures, the Design-Build Team shall provide and install conduit for future pedestrian lighting as noted below. All conduits shall be 1.5" and adhere to all NCDOT and AASHTO requirements. All conduits under pavement shall be installed a minimum of three feet below the pavement structure; all other conduits shall be installed a minimum of three feet below the finished grade. All conduits shall be installed with stub-outs, including but not limited to elbows, vertical pipe and removable cap located flush with the finished elevation. The Design-Build Team shall identify all stub-out locations (horizontally and vertically) on the Roadway Release for Construction Plans and permanently in the field.
  1. Along the mainline, the Design-Build Team shall install conduit in the center of the grass median and within 12 inches of the outside curb and gutter (both sides).
  2. At all intersections along the Salem Creek Connector, the Design-Build Team shall install conduit under all roadway approaches. The Design-Build Team shall connect this conduit to the conduit defined in Item No. 1 above.
  3. The Design-Build Team shall install conduit under the Salem Creek Connector at increments not to exceed 1,000 feet. The Design-Build Team shall connect this conduit to the conduit defined in Item No. 1 above.

- Excluding haul roads, the Design-Build Team shall design and construct resurfacing grades for all roadways impacted by construction. All resurfacing grades shall adhere to the design criteria and standards, provide all required pavement wedging (Reference the Pavement Management Scope of Work found elsewhere in this RFP) and adhere to the minimum requirements noted below:
  - The Design-Build Team shall resurface all lanes and shoulders of an undivided facility throughout the limits of proposed widening and construction.
  - The Design-Build Team shall resurface each one-way roadway of a divided facility throughout the limits of the one-way roadway widening and construction allowing varying resurfacing limits for the opposing directions of travel.
  - For both divided and undivided facilities, the Design-Build Team shall resurface all lanes and shoulders within the outermost construction limits of all proposed widening and construction, including any gaps along the facility where construction activities are not required.
  - The Design-Build Team shall resurface all existing facilities to the limits of pavement marking obliterations / revisions.
- Design exceptions will not be allowed for the -L- Line, including all ramps and loops. NCDOT prefers not to have design exceptions for the -Y- Lines and service roads. If the Design-Build Team anticipates any design exceptions, they shall be clearly noted in the Technical Proposal. Prior to requesting / incorporating a design exception into the Final Plans, the Design-Build Team must obtain prior conceptual approval from the Transportation Program Management Director and the FHWA. If approval is obtained, the Design-Build Team shall be responsible for the development and approval of all design exceptions.
- Excluding Wall #3, the Design-Build Team shall design and construct the sound barrier walls defined in the June 29, 2012 Design Noise Report, including any geotechnical investigations necessary to design the foundations. As a result of the balloting process, Wall #3 shall not be constructed. The sound barrier walls shall adhere to the wall envelope details provided in the aforementioned Design Noise Report. The Design-Build Team will not be required to provide overlaps between sound barrier walls at cut and fill transitions, as shown in Section 2-8 of the NCDOT Roadway Design Manual. If the Design-Build Team revises the horizontal and / or vertical alignments such that greater noise impacts are possible on the surrounding receptors, the Design-Build Team shall re-analyze and complete a revised noise report, if necessary, for NCDOT and FHWA review and acceptance. The June 29, 2012 Design Noise Report will be provided to the Design-Build Team to assist in their determination of anticipated additional noise impact on current receptors due to a design change. If adjustments to, or addition of, sound barrier walls are required as a result of design deviations, the Design-Build Team shall be responsible for all costs associated with the adjustments and / or additions. (Reference the Structures Scope of Work found elsewhere in this RFP)



- The minimum width of all grass covered islands shall be eight feet, measured face to face. All grass covered islands shall be constructed with topsoil and appropriate cross slope and median drain with pipe to prevent groundwater and surface water infiltration into the subgrade and / or pavement structure. Prior to construction of the grass covered islands and / or the median drain with pipe, the Design-Build Team shall submit the proposed number of drains, drain locations within the typical section, topsoil specifications and construction details to the Transportation Program Director for review and acceptance. Within all proposed grass covered island limits, the Design-Build Team shall completely remove and dispose of the exiting pavement structure.
- At all intersections impacted by the Design-Build Team's design and / or construction methods, excluding resurfacing, the following design vehicles shall be required for all turning movements:
  - WB-67 at ramp / loop intersections with -Y- Lines (For side-by-side turning maneuvers, WB-67 for the outside movement only and SU-30 for the inside movements)
  - WB-62 at all other intersections
- All roundabout(s) shall adhere to the design and operation parameters as detailed in *Roundabouts: An Informational Guide, Second Edition* (NCHRP Report 672). Prior to incorporation, the Design-Build Team shall provide a traffic analysis of the proposed roundabout(s), utilizing the 2030 traffic volumes and SIDRA Intersection 5.1 analysis software, for NCDOT review and approval. The Design-Build Team shall provide landscape and hardscape (brick, concrete pavers, stamped concrete, cobblestone, etc.) for all roundabout aprons. Prior to incorporation, the Design-Build Team shall coordinate the roundabout landscape(s) and hardscape(s) with the NCDOT, Old Salem and Salem Academy and College. The Design-Build Team shall identify the roundabout landscape(s) and hardscape(s) in the Technical Proposal.
- The Design-Build Team shall be responsible for the evaluation of the algebraic difference in rates of cross slope (roll-over) between existing shoulders and roadways and the associated suitability for carrying traffic during construction, if necessary. In the event that the roll-over is found to be unacceptable for the proposed temporary traffic patterns, the Design-Build Team shall be responsible for providing cross slopes that meet design standards and eliminate roll-over concerns.
- At all at-grade intersections with restricted movements impacted by the Design-Build Team's design and / or construction methods, excluding resurfacing, 5" keyed-in concrete monolithic channelization islands shall be provided.
- Functional classifications that have a defined usable shoulder width shall have the appropriately wider overall shoulder width.
- The Design-Build Team shall provide turn arounds on all roads that are dead-ended.

- The Design-Build Team shall inform the Transportation Program Management Director, in writing, of any proposed changes to the NCDOT preliminary design, previously reviewed submittals or the Design-Build Team's Technical Proposal and obtain approval prior to incorporation. The Design-Build Team shall note in the Technical Proposal any proposed deviations to the preliminary design shown on the U-2925 Combined Public Hearing Map provided by the Department. The Design-Build Team shall be responsible for any activities, as deemed necessary by the Department or the FHWA, resulting from changes to the NCDOT preliminary design, including but not limited to, public involvement and NEPA re-evaluation. The Department shall not honor any requests for additional contract time or compensation for completion of the required activities resulting from changes to the NCDOT preliminary design.
- The Design-Build Team shall submit Structure Recommendations and Design Criteria for NCDOT and FHWA review and acceptance prior to submittal of the Preliminary Plans. The Design-Build Team shall develop Structure Recommendations that adhere to the format noted in the March 25, 2003 and September 1, 2004 memos from Mr. Jay Bennett, PE, State Roadway Design Engineer. Unless noted otherwise elsewhere in this RFP, the design speed for all roadways shall be the greater of the minimum design speed for the facility type or the anticipated / actual posted speed limit plus five-mph. If a speed limit is not physically posted on an existing facility, General Statutes mandate the speed limit as 55 mph, resulting in a 60 mph design speed.
- For all vertical clearance critical points, the Design-Build Team shall submit vertical clearance design calculations and post construction surveyed points for all bridges over roadways.
- The Design-Build Team shall provide horizontal and vertical alignments for all driveways that require 100 feet or longer to tie to existing. The maximum driveway grade shall be 10%.

## General

- The design shall be in accordance with the 2011 AASHTO *A Policy on Geometric Design of Highways and Streets*, 2002 NCDOT *Roadway Design Manual*, including all revisions effective on the Technical Proposal submittal date, January 2012 NCDOT *Roadway Standard Drawings*, or as superseded by detail sheets located at [http://www.ncdot.org/doh/preconstruct/ps/std\\_draw/default.html](http://www.ncdot.org/doh/preconstruct/ps/std_draw/default.html), *Roadway Design Policy and Procedure Manual*, *Roadway Design Guidelines for Design-Build Projects*, 2012 *North Carolina Standard Specifications for Roads and Structures* and the 2011 AASHTO *Roadside Design Guide*, 4<sup>th</sup> Edition and 2012 Errata.
- If the NCDOT *Roadway Design Manual*, the 2011 AASHTO *A Policy on Geometric Design of Highways and Streets*, the 2012 *Roadway Standard Drawings* and / or any other guidelines, standards or policies have desirable and / or minimum values, the Design-Build Team shall use the desirable values unless noted otherwise elsewhere in this RFP. Similarly, in case of conflicting design parameters, and / or ranges, in the various resources, the

proposed design shall adhere to the most conservative values, unless noted otherwise elsewhere in this RFP.

- A sag vertical curve low point shall not be located on any bridge or approach slab.
- The Design-Build Team shall contact Mr. Gary W. Thompson, North Carolina Geodetic Survey Director, prior to disturbing any geodetic monuments.
- The project shall follow the NCDOT-FHWA Oversight Agreement. This agreement will be provided. Any changes that affect previous approvals shall be re-submitted by the Design-Built Team for FHWA acceptance.
- The Design-Build Team shall identify the need for any special roadway design details (i.e. any special drainage structures, rock embankment, rock plating, special guardrail, retaining walls, concrete barrier designs, etc.) and shall provide special design drawings. The Contract Standards and Development Unit may have special details available that can be provided to the Design-Build Team upon request.

### **NCDOT Information Supplied**

- The NCDOT will provide copies of the U-2925 Environmental Assessment (EA), Finding of No Significant Impact (FONSI), consultations, the latest list of environmental commitments and all pertinent approvals and correspondence. Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall adhere to all commitments stated in the aforementioned environmental documents.
- The NCDOT will provide electronic surveys to the Design-Build Team. Any supplemental surveys, including but not limited to additional topography, existing and proposed roadway, structure sites, underground and overhead utilities, existing and proposed drainage, wetland delineation, right of way, parcel names, and deed research and descriptions shall be the responsibility of the Design-Build Team to acquire and process. Known existing utilities have been located and will be included with the survey data. The Design-Build Team shall be responsible for confirming the location of the utilities and the type / size of facilities. All supplemental Subsurface Utility Engineering (SUE) work shall be the responsibility of the Design-Build Team.
- The NCDOT will provide the U-2925 Combined Public Hearing Map developed by the Department. The Design-Build Team is cautioned that the preliminary designs shown on the aforementioned map are provided solely to assist the Design-Build Team in the development of the project design. The Design-Build Team shall be fully and totally responsible for the accuracy and completeness of the project design, including, but not limited to, the use of the NCDOT's design, the use of portions of the NCDOT's design or modifications to the NCDOT's design.

- The NCDOT will provide final pavement designs for U-2925. The Design-Build Team shall be responsible for all temporary pavement designs. (Reference the Pavement Management Scope of Work found elsewhere in this RFP)
- The NCDOT will provide a Geotechnical Subsurface Investigation for U-2925. The Design-Build Team shall be responsible for any additional geotechnical information, all geotechnical recommendations, as well as supplemental structural and roadway investigations. (Reference the Geotechnical Engineering Scope of Work found elsewhere in this RFP)

**PAVEMENT MANAGEMENT SCOPE OF WORK** (8-31-12)

The pavement design for the mainline shall consist of one of the following alternates:

<u><b>Alternate 1</b></u>	<u><b>Alternate 2</b></u>	<u><b>Alternate 3</b></u>
3.0” S9.5B	3.0” S9.5B	8.0” Concrete
4.0” I19.0B	4.0” I19.0B	3.0” B25.0B
3.0” B25.0B	8.0” ABC	1.25” S9.5A
Subgrade Stabilization	Subgrade Stabilization	Subgrade Stabilization

The Design-Build Team shall maintain the same pavement design for the mainline as identified above throughout the project. The Design-Build Team shall specify the pavement alternate to be used in the Technical Proposal.

Other pavement designs for this project are listed in the table below:

<b>Line</b>	<b>Surface</b>	<b>Intermediate</b>	<b>Base</b>	<b>ABC</b>
-Y1- (City Yard Drive), -Y1A- (Salem Avenue), and Ramps A, B, C & D @ -Y2-	3.0” S9.5B	4.0” I19.0B	-----	8.0”
-Y2- (US 52)	12” Concrete, 4” B25.0B and Subgrade Stabilization			
-Y3- (Vargrave Street), Rams Drive, -Y5- (Diggs Boulevard), and -Y6A&B- (Cunningham Avenue)	3.0” S9.5B	2.5” I19.0B	-----	8.0”
-Y4- (MLK Jr. Drive)	3.0” S9.5B	4.0” I19.0B	4.0” B25.0B	-----
Cul-De-Sacs	1.5” S9.5B	-----	4.0” B25.0B	-----
Greenways (Option 1) OR Greenways (Option 2)	2.0” SF9.5A  2.0” S9.5B			* 6.0”  * 8.0”

\* Prime Coat Required

For each greenway, the Design-Build Team shall maintain the same pavement design, as identified above, throughout the construction limits.

Warm mix asphalt will be allowed.

For the -Y- Lines noted in the table above, the Design-Build Team may substitute an asphalt base course layer for the ABC layer. If such an alternative is proposed, the Design-Build Team shall use an asphalt base course mix that matches the asphalt base course mix specified for the roadway. If an asphalt base course mix is not specified, the Design-Build Team shall use B25.0B base course. The additional thickness of the asphalt base course, used as a substitute for the ABC layer, shall be equal to half of the proposed ABC thickness specified for the roadway. The Design-Build Team shall maintain the same pavement design throughout the -Y- Line construction limits. In the Technical Proposal, the Design-Build

Team shall specify the base option chosen (ABC or asphalt) for all -Y- Lines. The Design-Build Team may substitute an asphalt base course layer for an ABC layer, as described above, for tie-ins and narrow widening.

On all ramps and loops, the adjacent through lane pavement structure design shall extend to the back of the gore (12-foot width).

For the -Y2- travel lanes impacted by the Design-Build Team's design or construction, the Design-Build Team shall mill the existing Novachip, seal the existing cracks and joints, and resurface the existing pavement with an Ultrathin Bonded Wearing Course. For all other -Y- Lines, the Design-Build Team shall resurface the existing pavement with a minimum pavement depth that equals the full thickness of surface course as provided in the table above.

Unless noted otherwise elsewhere in this RFP, the minimum narrow widened width shall be six feet. The minimum narrow widened width may be reduced to four feet only if the Design-Build Team demonstrates that their equipment properly compacts narrow widening and obtains prior Department approval. Tapers that tie proposed pavement to existing pavement are excluded from the narrow widening requirements noted above.

In areas where the existing paved shoulders are proposed to be incorporated into a permanent travel lane, the Design-Build Team shall be responsible for evaluating the existing paved shoulder regarding its suitability for carrying the projected traffic volumes. In the event that the existing paved shoulder is found to be inadequate, the Design-Build Team shall be responsible for upgrading the existing paved shoulder to an acceptable level or replacing the existing paved shoulder. The Design-Build Team shall submit their evaluation and proposed use of existing paved shoulders to the Transportation Program Management Director for review and acceptance or rejection.

The Design-Build Team shall pave from the edge of the proposed paved shoulder to the face of all sound barrier walls located on the outside shoulder in fill sections and to the face of all guardrail with 6" of ABC (or 4" B25.0B or B25.0C), a split seal and at least one lift of surface course. If a split seal is not used, the ABC pavement design shall require prime coat at the normal application rate. In these areas, the Design-Build Team's installation of ABC or black base shall be consistent with the pavement type for the specific roadway. As an alternative to the above pavement design for paving the shoulders to the face of the guardrail, the Design-Build Team may use the adjacent travel lane pavement design.

All driveways, up to the radius point, shall be constructed with the full-depth pavement design of the intersecting roadway. The entire impacted length of all non-concrete driveways with a 10% or steeper grade shall be constructed with 1.5" S9.5B (or SF9.5A) and 8" ABC. Unless otherwise noted above, the Design-Build Team shall adhere to the following for all driveway construction:

For existing gravel and soil driveways, use 8" ABC.

For existing asphalt driveways, use 1.5" S9.5B (or SF9.5A) and 8" ABC.

For existing concrete driveways, use 6" jointed concrete reinforced with woven wire mesh.

The Design-Build Team shall be responsible for the design of all temporary pavements and for the evaluation of existing shoulders and roadways regarding their suitability for carrying traffic during construction, if necessary. In the event that the existing shoulders and roadways are found to be inadequate for the proposed temporary traffic volumes and duration, the Design-Build Team shall be responsible for upgrading the pavement to an acceptable level. Temporary pavements shall be designed in accordance with the Department's April 1, 2000 *Interim Pavement Design Procedure* and November 2007 *Modifications to the April 2000 Interim Pavement Design Procedure*. Temporary pavement designs shall be submitted for review and comments using the Design-Build submittal process. The expected duration for traffic on temporary pavement must be included as part of the submittal.

The rate of application and the maximum and minimum thickness per application and layer shall be in accordance with the NCDOT Roadway Design Manual.

Shoulder drains are not required.

When a resurfacing grade ties to existing pavement, the Design-Build Team shall perform incidental milling, such that the new pavement ties flush with the existing pavement. When tying to the existing pavement, the Design-Build Team shall not reduce the minimum required surface layer pavement thickness noted above. The Design-Build Team shall not perform incidental milling more than 72 hours prior to placement of the asphalt surface layer.

**STRUCTURES SCOPE OF WORK** (8-22-12)**Project Details**

The Design-Build Team shall be responsible for all structures necessary to complete the project, including at the following locations:

- -L- (Salem Creek Connector) over Salem Creek
- Winston-Salem Railroad at -L- (Salem Creek Connector)
- -Y2- (US 52) at -L- (Salem Creek Connector)
- Winston Salem Railroad over -Y2- (US 52), -Y3- (Vargrave Street), and Ramps B & C
- -Y2- (US 52) over Salem Creek
- Ramp A over Salem Creek
- Ramp D over Salem Creek
- Rams Drive (formerly Stadium Drive) over -Y2- (US 52)
- Sound barrier walls listed in the June 29, 2012 Design Noise Report, with the exception of Wall #3
- All retaining walls

All new bridges shall be of sufficient length, width and vertical clearance to accommodate a future outside lane in each direction, with appropriate shoulders, on US 52 (six-lane divided facility).

The bridges on Winston Salem **Southbound** Railroad shall be designed and constructed to accommodate the realigned current track and one future track centered 15' east of the realigned track.

The Design-Build Team shall design and construct 5'-6" sidewalk, with 3-bar metal rail, on both sides of the Rams Drive bridge. The Design-Build Team shall design and construct 10'-6" sidewalk and 5'-6" sidewalk, with 3-bar metal rail, on the east and west sides of the Salem Creek Connector bridge over Salem Creek, respectively.

Minimum vertical clearances for bridges **over roadways** shall be in accordance with the Highway Design Manual.

All the bridges over Salem Creek shall provide vertical and horizontal clearances for the existing greenway on the south side and a future ten-foot wide greenway on the north side. Minimum vertical clearance over the existing and future greenways shall be 10 feet.

Under bridges crossing pedestrian accommodations, provide conduit for future lighting above or along the accommodations as directed by the Engineer.

The Design-Build Team shall be responsible for all required railroad coordination, including but not limited to securing Railroad Agreements. (Reference the Railroad Coordination Scope of Work found elsewhere in this RFP)



All bridges shall meet approved roadway typical sections and grades. Bridge geometry (width, length, skew, span arrangement, etc.) shall be in accordance with the accepted Structure Recommendations prepared by the Design-Build Team.

A live load rating chart for proposed girders shall be included with the highway bridge plans and shall state design assumptions and methodology used in the load rating calculations. The load rating shall be in accordance with the NCDOT *Structures Management Unit Manual* (including policy memos) and *AASHTO's Manual for Bridge Evaluation*.

Sound barrier walls shall be in accordance with Structure Standards SBW1 and SBW2 and the Sound Barrier Wall and Architectural Concrete Surface Treatment Project Special Provisions. Concrete piles shall be used. To the greatest extent practicable, the top of the noise wall shall be constructed to provide a continuous elevation transition, minimizing the number of steps in top of wall elevation.

To the greatest extent practicable, retaining walls shall be designed and constructed without the use of visible columns or piles and avoid sharp changes in top of wall elevations. The caps or coping of retaining walls shall be consistent with the appearance of the face of the walls. The retaining walls, and supporting foundations, shall be detailed such that future brick veneer can be constructed or attached to the façade in the future. The façade of all retaining walls to be designed and constructed as part of this project is preferred to have a horizontal, running bond, stone masonry appearance.

For the bridges on Rams Drive over US 52 and on US 52 over Salem Creek Connector:

- If a median pier is used, it shall be a solid concrete wall with a red brick veneer on each face. The brick shall be similar to that of the surrounding communities such as Pine Hall, Old Yorktown, oversized brick, or approved equal. The ends of the center pier wall shall be detailed to be similar in color to the bridge beams.
- Abutment walls and turned back wings shall also have a brick veneer as described above.
- For the bridge on Rams Drive over US 52 only, pilasters shall be provided at the ends of the bridge rails with the bridge rails having an integral transition to the pilasters.

For all the bridges over Salem Creek, the following aesthetic treatments shall be designed and constructed:

- The girder depth shall be maintained for the length of the structure.
- The use of abutment walls (or vertical abutments) is preferred but subject to scour design requirements as stated in the Geotechnical Scope of Work.
- Exposed concrete on abutment walls and wing walls shall be form-lined using a natural stone or rustic ashlar stone pattern and stained medium to dark gray.

Cored slab, box beam, fracture critical, cast-in-place deck slab and deck girder bridges will not be allowed on this project.

Precast barrier rails will not be allowed.

The empirical method for deck design will not be allowed.

Attachment of sign structures to bridges will not be allowed.

Any required bridge attachments (e.g. ITS conduit, water lines) will not be allowed in the overhang of grade separations. Casting of conduit in the bridge deck or barrier rail will not be allowed on highway bridges.

### **Structure Removal**

The Design-Build Team shall be responsible for the removal and disposal of:

- Municipal pedestrian bridge (Bridge No. 136) over -Y2- (US 52)
- Winston Salem Southern Railway Bridge over -Y2- (US 52)
- -Y2- (US 52) Bridge (Bridge No. 143) over Diggs Boulevard
- -Y2- (US 52) Bridge (Bridge No. 152) over Salem Creek
- Stadium Drive Bridge (Bridge No. 49) over -Y2- (US 52)

The Design-Build Team shall be responsible for handling, removing, shipping, and disposing of these materials in accordance with the 2012 NCDOT *Standard Specifications for Roads and Bridges*.

### **Add Alternate – Gateway Structure**

The City of Winston-Salem has identified the US 52 crossing at the Salem Creek Connector as a potential location for a gateway structure. A concept has been developed and the available information has been provided. The tubular structure shall be free-standing and independent from the bridge, including all foundations. Ample room between various gateway structure components and bridge components shall be provided to ensure ready access for inspection and maintenance of both structures. The vertical clearance of the gateway structure shall be a minimum of 17 feet above the entire bridge deck width. The structure shall be in close conformity to the concept provided and be painted as specified below:

- Aluminum Finish: Fluoropolymer standard 2-coat thermocured system (Kynar type) composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70% polyvinylidene fluoride resin by weight, complying with AAMA 2605. Color will be Pantone PMS 364.

This gateway structure shall be depicted in the Technical Proposal and bid in accordance with the Project Special Provision entitled “Gateway Structure Add Alternate.”

**General**

The Design-Build Team's primary design firm shall be on the Highway Design Branch list of firms qualified for structure design and maintain an office in North Carolina.

Design shall be in accordance with the latest edition of the *AASHTO LRFD Bridge Design Specifications* (with exceptions noted in the NCDOT *Structures Management Unit Manual*), NCDOT LRFD Driven Pile Foundation Design Policy, NCDOT *Structures Management Unit Manual* (including policy memos) and NCDOT Bridge Policy Manual except as noted otherwise elsewhere in this RFP.

Construction and materials shall be in accordance with 2012 NCDOT *Standard Specifications for Roads and Structures*, NCDOT Structures Management Unit Project Special Provisions and NCDOT Structures Management Unit Standard Drawings.

Alternate designs, details or construction practices (such as those employed by other states, but not standard practice in NC) are subject to Department review and approval, and will be evaluated on a case by case basis.

**RAILROAD COORDINATION SCOPE OF WORK** (9-6-12)

The Design-Build Team shall be responsible for coordinating all Winston Salem Southbound Railroad (WSS) design and construction details on Railroad Right of Way. The Design-Build Team shall be responsible for securing structure agreement and crossing agreements, including wireline and pipeline agreements. Coordination shall include any necessary agreements required by the NCDOT and / or Railroad. The Design-Build Team shall be responsible for all Railroad costs associated with this project to include, but not be limited to, crossing surfaces, track materials, track switches, insurance, flagging, right of way acquisition, and construction engineering.

The Design-Build Team shall be responsible for all construction required below the subballast. Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall subcontract the construction of all remaining items as directed by the Railroad, including but not limited to construction from the subballast up, with a WSS approved Railroad Contractor. WSS, or their representative, will construct the throw-overs between the existing track alignments and all proposed temporary and / or permanent track alignments. The Design-Build Team shall be responsible for track work design plans and all costs associated with track work, including but not limited to labor and material provided by the Railroad.

**Preparation for Construction within the Existing Railroad Right of Way**

The Design-Build Team shall be required to use the following guidelines and any other guidelines as required by the Railroad. As primary owner of WSS, the CSX Transportation (CSXT) standards and guidelines shall govern.

- (A) AREMA Manual for Railroad Engineering, latest edition
- (B) CSX Transportation Public Project Information, last revised 4-9-2012
- (C) CSX Transportation Special Provisions
- (D) CSX Transportation Criteria for Ballast Deck Railroad Bridges
- (E) Federal Aid Policy Guide 23 CFR 140I
- (F) Federal Aid Policy Guide 23 CFR 646
- (G) NCDOT Construction Manual Section 105-8
- (H) NCDOT Standard Specifications for Roads and Structures Section 107-9 (Excluding Paragraph 2)
- (I) North Carolina Administrative Code Section T19A: 02B, 0150 through 0158
- (J) CSX Transportation Construction Submission Criteria
- (K) WSS / CSXT Insurance Requirements

Per AECOM (representing CSX Transportation), 2 trains per day (one in each direction) pass through the site at a maximum speed of 20 miles per hour. The Design-Build Team shall be responsible for verifying the number of trains per day and maximum speed allowed. The Design-Build Team shall be responsible for verifying this information with the Railroad.

The Design-Build Team shall be responsible for ensuring that WSS remains capable of providing rail service to all industries currently served by WSS south of the proposed underpass over US 52 and Vargrave Street in a manner commensurate with that which currently exists.

### **Arrangements for Protection and Adjustments to Existing and Proposed Railroad Crossing Surface and Roadbeds**

The Design-Build Team shall make the necessary arrangements with WSS for the installation of permanent and temporary grade crossing surfaces, removal of temporary construction crossings after completion of the project, shoring plans, encroachment agreements, and railroad force account estimates and agreements. All permanent crossing surfaces shall be concrete, both field and gauge. All crossing surfaces shall be procured and installed by the Design-Build Team.

The Design-Build Team shall not commence any work on the Railroad right of way until all agreements have been executed, insurance acquired and approved, and all construction plans have been approved by the Railroad. The Design-Build Team shall make the necessary arrangements with the Railroad that are required to protect against property damage that may result in loss of service, expense, or loss of life. The Design-Build Team shall be responsible for all damage to the Railroad resulting from their operations and the Railroad may issue a stop order until all dangerous situations are remedied.

The Design-Build Team shall be responsible for providing Railroad Protective Liability Insurance for Bodily Injury Liability, Property Damage Liability, and Physical Damage to Property in the amount of \$5,000,000 Per Occurrence. The Design-Build Team shall obtain \$10,000,000 in Aggregate coverage Per Annual. Said policy shall provide coverage for all loss, damage or expense arising from bodily injury and property damage liability, and physical damage to property attributed to acts or omissions at the job site. The Design-Build Team shall be responsible for verifying and obtaining the appropriate insurance and coverage with the WSS / CSXT. Other insurance requirements, including those for all subcontractors, are detailed in the documents referenced herein.

The Design-Build Team shall be required to use the Standard NCDOT Agreements and Insurance Special Provisions forms, which will be supplied by the NCDOT Rail Division, State Railroad Agent upon request. As owners of WSS, CSXT and Norfolk Southern Corporation shall sign all Railroad Agreements.

After negotiations between the Design-Build Team and the Railroad have been finalized, the Design-Build Team shall submit executed agreements and plans to NCDOT's Rail Division, State Railroad Agent, via the Transportation Program Management Director, for plan approval and final agreement execution by NCDOT, prior to authorizing railroad work. After approval by NCDOT, one copy of the executed agreement will be returned to the Design-Build Team and one copy forwarded to the NCDOT's Resident Engineer, prior to any construction work by the Design-Build Team or Railroad.

### **Coordination with Winston Salem Southbound**

The Design-Build Team shall coordinate with the primary owner of WSS, CSXT through the CSXT general Engineering Consultant (GEC), AECOM. The contact at AECOM is Mr. Patrick DesMarais, 1700 Market Street Suite 1600, Philadelphia, PA 19103, (215) 735 0832 to obtain coordination procedures for plan approval and, if needed, a partially executed legal agreement with CSXT, Norfolk Southern Railway and the Department of Transportation as the parties in the agreement for proposed roadway work. The Department will review the agreement prior to submittal to the Railroad. The Department will execute and distribute the Agreement within 14 calendar days of Board of Transportation approval. The agreement shall include necessary Force Account items such as preliminary engineering, construction engineering, flagging, signal and communication lines, and other work performed by the Railroad, as necessary. The WSS has sole authority to determine the need for flagging required to protect its operations and property. The Department shall reimburse the WSS directly for all costs of flagging that is required on account of construction within the Railroad property shown in the Design-Build Team's plans, or that is covered by an approved plan revision, supplemental agreement or change order. The Department will be responsible for payment of the Railroad Force Account work; however, the Design-Build Team shall reimburse the Department for these costs including any Force Account estimate overruns. This reimbursement shall be incidental to the lump sum price bid for the project. Upon request, the Department will provide copies of the railroad's invoices to the Design-Build Team for review. The Design-Build Team shall have ten (10) days to provide comments to the Department, after which the Department will pay the invoice. The Design-Build Team shall be responsible for maintaining records to verify the invoice items.

The preliminary plan submittal to the Railroad shall include roadway plans, the Railroad's "Overhead Bridge Crossing Data," appropriate roadway plan sheets showing impacts to the Railroad's right of way, erosion control plans, and drainage calculations for any drainage on or across the Railroad's right of way. An electronic version of the preliminary plans and data shall be submitted to AECOM through the NCDOT Transportation Program Management Director. If the Railroad requires RFC's and / or final plans, then five (5) half size sets shall be provided to the Railroad. If any re-submittals of plans or any additional information is required, five (5) half size sets shall be submitted to the Railroad. Working Drawings affecting the Railroad's operations and / or right of way shall follow submittal process as outlined in the 2012 *Standard Specifications for Roads and Structures* or Special Provisions.

**GEOTECHNICAL ENGINEERING SCOPE OF WORK** (8-13-12)**I. GENERAL:**

All geotechnical data, tests, computations and supporting subsurface investigations and documentation submitted by the Design-Build Team shall be provided in English Units.

Obtain the services of a firm prequalified for geotechnical work as listed in the Directory of Transportation Firms. The prequalified geotechnical firm shall prepare foundation design recommendation reports for use in designing structure foundations, roadway foundations, retaining walls, sound barrier foundations, overhead sign structure and luminary foundations, and temporary structures.

The Engineer of Record who prepares the foundation design recommendation reports shall be a Professional Engineer registered in the State of North Carolina who has completed a minimum of three geotechnical design projects of scope and complexity similar to that anticipated for this project using the load and resistance factor design (LRFD) method and in accordance with the latest edition of the AASHTO *LRFD Bridge Design Specification*. If the Engineer of Record cannot demonstrate the aforementioned LRFD experience, then the design must undergo a peer review by an individual with such experience. In such case, the reviewer must be a registered Professional Engineer, but not necessarily in the State of North Carolina. Prior to the first geotechnical design submittal, the Design-Build Team shall provide a letter to the NCDOT Design-Build Office that documents the reviewer's LRFD experience for review and acceptance. Furthermore, with each geotechnical design submittal, the reviewer shall provide a sealed letter stating that he / she has carefully reviewed and approved the specific submittal details.

The prequalified geotechnical firm shall also determine if additional subsurface information, other than that required and noted elsewhere in this RFP, is required based upon the subsurface information provided by the NCDOT and the final roadway and structure designs. If a determination is made that additional subsurface information is required; the Design-Build Team shall use a prequalified geotechnical firm to perform all additional subsurface investigation and laboratory testing in accordance with the current NCDOT Geotechnical Engineering Unit *Guidelines and Procedures Manual for Subsurface Investigations*. Submit additional information collected by the Design-Build Team to the Geotechnical Engineering Unit for review. The Design-Build Team shall provide the final Subsurface Investigation report in electronic and hardcopy format to the NCDOT for its records.

A minimum of 2 standard penetration test (SPT) / rock core borings shall be required per bent for all bridges except dual bridges. A minimum of 3 SPT / rock core borings shall be required across the roadway typical section, at each bent location for dual bridges. All borings shall be located within 25 feet of the centerline of each bent location to be counted for these minimum requirements. Extend all borings to a depth below the foundation element required to show a complete subsurface profile. The Design-Build Team shall be responsible for obtaining the borings noted above for all bents where

subsurface information is not sufficient or is warranted by variability in the geology unless the prequalified geotechnical firm submits documented justification that the subsurface investigation provided by the NCDOT is adequate for design purposes and the justification is acceptable to the Department. Any deviations to the requirements noted above shall require acceptance from the NCDOT Geotechnical Engineering Unit prior to construction.

The maximum spacing between borings for retaining walls and sound barrier walls shall be 200 feet, with a minimum of two borings; one at each end of the wall. Drill borings for retaining walls a minimum depth below the bottom of the wall equal to twice the maximum height of the wall. Boring depths for sound barriers shall be equal to the maximum height of the wall or to SPT refusal.

The Design-Build Team is permitted to design bridges on this project using software that accounts for the structural effects of soil / pier interaction.

## II. DESCRIPTION OF WORK:

Unless otherwise noted herein, the Design-Build Team shall design foundations (except for railroad bridges and sign foundations), embankments, slopes, retaining walls, and sound barriers in accordance with the current edition of the AASHTO *LRFD Bridge Design Specifications*, NCDOT *LRFD Driven Pile Foundation Design Policy*, all applicable NCDOT Geotechnical Engineering Unit Standard Provisions, NCDOT *Structures Management Unit Manual*, and NCDOT *Roadway Design Manual*. The NCDOT *LRFD Driven Pile Foundation Design Policy* is located on the NCDOT Geotechnical Engineering Unit's website at:

<http://www.ncdot.org/doh/preconstruct/highway/geotech/LRFDPolicy/>

For *Geotechnical Guidelines For Design-Build Projects*, the Design-Build Team shall adhere to the guidelines located at the following website:

[http://www.ncdot.org/doh/preconstruct/altern/design\\_build/default.html](http://www.ncdot.org/doh/preconstruct/altern/design_build/default.html)

### A. Structure Foundations

End bent fill slopes up to 35 feet in height (defined as the difference between grade point elevation and finished grade at toe of slope) shall be 1.5:1 (H:V) or flatter. End bent fill slopes with heights greater than 35 feet shall be 2:1 or flatter. All end bent cut slopes shall be 2:1 or flatter. For 1.5:1 fill slopes, extend end bent slope protection from the toe of slope to berm and to 1.75:1 (H:V) slope or to the limits of the superstructure. For cut slopes and for 2:1 or flatter end bent fill slopes, extend end bent slope protection from the toe of slope to berm and to the limits of the superstructure.

Analyze drilled pier and pile bent foundations using either L-Pile or FB-Pier. Design drilled piers and vertical piles with a sufficient embedment in soil and/or rock to achieve "fixity".



Design sound barrier foundations in accordance with current allowable stress design AASHTO Guide Specifications for Structural Design of Sound Barriers. A minimum factor of safety of 1.5 shall be required for shaft embedment depths.

## **B. Roadway Foundations**

Unless otherwise noted herein, all unreinforced proposed fill slopes shall be 2:1 (H:V) or flatter except bridge end bent slopes (see Section A – Structure Foundations). All proposed soil cut slopes shall be 2:1 (H:V) or flatter, unless the slopes are designed with adequate reinforcement to provide the required stability. If steeper than 2:1 (H:V), all reinforced cut slopes, rock cuts and fill slopes may only be used if detailed design calculations and a slope stability analysis are submitted to the NCDOT Geotechnical Engineering Unit, via the Transportation Program Management Director, for review and acceptance prior to construction.

Design and construct bridge approach embankments such that no more than ½ inch of settlement shall occur after the waiting period or monitoring ends or embankment fill is constructed to subgrade elevation. Soil improvement techniques to mitigate long term settlement problems or to transfer the embankment load to a deeper bearing stratum are allowed. Soil improvement techniques shall follow the current industry standard practices and the guidelines of *Ground Improvement Methods FHWA publication NHI-04-001 or Geosynthetic Design and Construction Guidelines FHWA-HI-95-038*.

Embankment settlement monitoring shall be required when a waiting period of more than one month is recommended in the foundation design recommendation reports. When embankment monitoring is required, construct the embankment and approach fill to the proposed roadway grade prior to monitoring. In the absence of embankment settlement monitoring, monitor approach fill settlement after the construction of the approach fill and prior to construction of the approach slab when the approach fill height exceeds 15% of total fill height. Approach fill height is defined as difference between proposed grade and bottom of cap elevations. Use an appropriate method to monitor settlement across the length of the embankment (from toe to toe) such as settlement gauges, surveyed stakes on finished subgrade or other methods but submit documentation describing the method and procedures to the NCDOT Geotechnical Engineering Unit, via the Transportation Program Management Director, for review and acceptance prior to construction of the embankment.

Reinforced bridge approach fills in accordance with the NCDOT standard shall be required for end bents on all bridges.

Mitigate all unsuitable soils to the extent that is required to improve the stability of the proposed embankment or subgrade. Use any suitable material to backfill undercut areas except when employing shallow undercut in accordance with Section 505 of the NCDOT 2012 *Standard Specifications for Roads and*

*Structures* which requires the use of Select Material, Class IV. For undercut backfilling in water, use Select Material, Class III.

### C. Permanent Retaining Wall Structures

Retaining walls or abutment walls will not be allowed at any location where more than five feet of scour is calculated at the base of the wall.

For design and construction of mechanically stabilized earth (MSE) retaining walls, refer to the NCDOT *Policy for Mechanically Stabilized Earth Retaining Walls* which can be found at the NCDOT Geotechnical Engineering Unit's website at:

**[http://www.ncdot.org/doh/preconstruct/highway/geotech/msewalls/10-07-19\\_MSE\\_Retaining\\_Walls\\_Policy.pdf](http://www.ncdot.org/doh/preconstruct/highway/geotech/msewalls/10-07-19_MSE_Retaining_Walls_Policy.pdf)**

Design and construct permanent retaining walls, with the exception of gravity walls, in accordance with the applicable NCDOT Geotechnical Engineering Unit *Project Special Provisions*, which can be provided upon request by the Design-Build Team. Geotechnical Provisions and Notes can be found at the NCDOT Geotechnical Engineering Unit's website at:

**<http://www.ncdot.org/doh/preconstruct/highway/geotech/provnote/>**

For each retaining wall, with the exception of gravity walls, submit a wall layout and design. The wall layout submittal shall include the following:

- Wall envelope with top of wall, bottom of wall, existing ground and finished grade elevations at incremental stations
- Wall alignment with stations and offsets
- Typical sections showing top and bottom of wall, drainage, embedment, slopes, barriers, fences, etc.
- Calculations for bearing capacity, global stability and settlement
- Details of conflicts with utilities and drainage structures
- Roadway plan sheets showing the wall (half size)
- Roadway cross sections showing the wall (half size)
- Traffic control plans showing the wall (half size)

Gravity walls shall be designed and constructed in accordance with the NCDOT Structure Standard Drawings and the NCDOT *2012 Standard Specifications*. Gravity walls shall be identified in the roadway foundation design recommendation report. Cast-in-place cantilever walls shall be designed and constructed in accordance with the NCDOT *2012 Standard Specifications*. Conceptual wall layouts and wall designs shall be submitted for NCDOT for review and acceptance.

Locate retaining walls at toes of slopes unless restricted by right of way limits. The Design-Build Team shall submit global stability calculations for slopes at

retaining walls and obtain acceptance from the NCDOT prior to construction. Any slopes behind walls shall be 2:1 (H:V) or flatter.

Drainage over the top of retaining walls shall not be allowed. Sags in the top of walls are not permissible. Direct runoff above and below walls away from walls, if possible, or collect runoff at the walls and transmit it away. Curb and gutter or cast-in-place single faced barrier with paving up to the wall shall be required when runoff can not be directed away from the back or front of the wall. A paved concrete ditch with a minimum depth of six inches shall be required at the top of walls when slopes steeper than 6:1 (H:V) intersect the back of walls.

Precast or cast-in-place coping shall be required for walls without a cast-in-place face with the exception of when a barrier is integrated into the top of the wall. Extend coping or cast-in-place face a minimum of six inches above where the finished or existing grade intersects the back of the wall. A fence shall be required on top of the facing, coping or barrier or immediately behind the wall, if there is no slope behind the wall.

Deep foundations shall be used for end bents when abutment retaining walls are employed. When using abutment retaining walls, design and construct the end bent and the wall independent of each other. When using abutment retaining walls, the end bent foundation shall be designed and constructed with one of the following deep foundations: (1) a single row of plumb piles with brace piles battered toward the wall, (2) a single row of plumb piles with MSE reinforcement connected to the back of the cap, (3) a double row of plumb piles, (4) integral abutment with a single row of plumb piles and no reinforcement connected to the back of the cap in accordance with FHWA GEC 11 pages 6-8 through 6-10, or (5) drilled piers. If fill is required around piles or drilled piers, install foundations before placing any fill. Wing walls independent of abutment retaining walls shall be required unless accepted otherwise by the NCDOT. Do not consider lateral support from any fill placed around drilled piers behind abutment retaining walls when analyzing end bent stability. All pile foundations for end bents with abutment retaining walls shall penetrate minimum 10 feet into natural ground. For bearing piles behind such retaining walls, the penetration can be reduced to 5 feet below the bottom of the wall provided the Design-Build Team analyzes and determines that the vertical piles are “fixed” in natural ground such that the decrease in pile embedment shall not significantly increase the top deflection under lateral loading. The calculations and supporting documentation for this analysis shall be submitted to the NCDOT for review and acceptance prior to construction.

#### **D. Temporary Structures**

Design temporary retaining structures, which include earth retaining structures and cofferdams, in accordance with current allowable stress design AASHTO *Guide Design Specifications for Bridge Temporary Works* and the *Temporary*

*Shoring* Special Provision. The only submittal required to use the standard sheeting design is the “Standard Shoring Selection Form”.

Design and construct temporary retaining walls in accordance with the applicable NCDOT *Project Special Provision* available upon request by the Design-Build Team. Traffic Control barrier on top of walls shall be in accordance with the NCDOT Work Zone Traffic Control Unit details available upon request by the Design-Build Team. If anchored barrier is required, then anchor the barrier in accordance with NCDOT *2012 Roadway Standard Drawing* Detail No. 1170.01.

### III. CONSTRUCTION REQUIREMENTS:

All construction and materials shall be in accordance with the NCDOT *2012 Standard Specifications* and current NCDOT *Project Special Provisions* unless otherwise stated in this scope of work. The Design-Build Team shall be responsible for investigating, proposing and incorporating remedial measures for any construction problems related to foundations, retaining walls, subgrades, settlement, slopes, and construction vibrations. The NCDOT Geotechnical Engineering Unit shall review and accept these proposals.

The Design-Build Team shall be responsible for any damage or claim caused by construction, including damage caused by vibration (see Article 107-14 NCDOT *2012 Standard Specifications for Roads and Structures*). The Design-Build Team shall be responsible for deciding what, if any, pre and post-construction monitoring and inventories need to be conducted to satisfy their liability concerns. Any monitoring and inventory work shall be performed by a qualified private engineering firm experienced in the effects of construction on existing structures.

The prequalified geotechnical firm that prepared the foundation designs shall review the settlement monitoring data a minimum of once a month and issue a letter prior to releasing the embankment or approach fill from monitoring. Monitoring may not be ended until less than 0.10 inch of settlement is measured over a period of four weeks. Submit the settlement monitoring data to the Transportation Program Management Director prior to issuing the release letter.

The prequalified geotechnical firm that prepared the foundation designs shall review and approve all pile driving hammers and drilled pier construction sequences. After the prequalified geotechnical firm has approved these submittals, the Design-Build Team shall submit to the NCDOT for review prior to beginning construction.

Perform hammer approvals with GRLWEAP Version 2002 or later and in accordance with the NCDOT LRFD Driven Pile Foundation Design Policy. Provide pile driving inspection charts or tables for all approved pile hammers.

Limit driving stresses in accordance with the AASHTO LRFD *Bridge Design Specifications*. If a tip elevation is noted on the plans, drive piles to the minimum required driving resistance and tip elevation. Otherwise, drive piles to the minimum required driving resistance and a penetration into natural ground of at least 10 ft. Unless

otherwise approved, stop driving piles when refusal is reached. Refusal is defined as 240 blows per foot or any equivalent set.

Perform Pile Driving Analyzer (PDA) testing using a NCDOT prequalified company to develop pile driving inspection charts or tables. For each permanent bridge that includes driven pile bents or driven pile footings, perform a minimum of one (1) PDA test (dual bridges are counted as one structure) for each pile size, pile type (material or shape) and pile driving hammer combination. Additional PDA tests may be required based upon the AASHTO LFRD Bridge Design Specifications. If the bridge length with driven pile foundations is longer than 400 feet, perform an additional PDA test at every 400 feet interval. Provide additional PDA testing for any revisions to pile type, size or hammer previously approved. The locations of specific piles to be tested must be accepted by the NCDOT prior to any PDA test. Perform PDA tests in accordance with ASTM D 4945-89, Standard Test Method for High Strain Dynamic Testing of Piles and this scope of work.

Analyze data with the Case Pile Wave Analysis Program (CAPWAP), version 2006 or later. At a minimum, analysis is required for a hammer blow near the end of initial drive and for each restrrike and redrive. Additional CAPWAP analysis may be required as determined by the Engineer.

Meet the guidelines for NCDOT PDA reports from the Geotechnical Engineering Testing Contract for PDA test reports. To obtain a list of pre-approved Geotechnical Engineering Testing Contract companies to perform PDA testing and guidelines for PDA test report, contact the Geotechnical Engineering Unit at 919-707-6850. PDA testing may be performed by a technician, but PDA testing must be overseen and the reports sealed by a Professional Engineer registered in the State of North Carolina. Submit a complete PDA report sealed by the professional engineer who performed the test to the foundation design firm. The foundation design firm shall develop pile driving inspection charts or tables for acceptance by the NCDOT prior to pile installation.

For drilled-in piles, the following additional requirements apply:

1. Prequalification of contractors is not required for pile excavation or drilled-in pile holes that are 30 inches in diameter or less.
2. Use Class A Concrete in accordance with Article 1000-4 of the NCDOT *2012 Standard Specifications for Roads and Structures* except as modified herein. Provide concrete with a slump of 6 to 8 inches. Use an approved high-range water reducer to achieve this slump. Perform pile excavation to specified elevations shown on the plans. Excavate holes with diameters that will result in at least 3 inches of clearance all around piles. Before filling holes, support and center piles in excavations and when noted on the plans, drive piles to the required driving resistance. Remove any fluid from excavations and fill holes with concrete.
3. Blasting for core removal is only permitted when approved by the Engineer. Dispose of drilling spoils in accordance with Section 802 of the NCDOT *2012 Standard*

*Specifications for Roads and Structures* and as directed by the Engineer. Drilling spoils consist of all excavated materials including fluids removed from excavations by pumps or drilling tools. If unstable, caving or sloughing soils are anticipated or encountered, stabilize excavations with either slurry or steel casing. When using slurry, submit slurry details including product information, manufacturer's recommendations for use, slurry equipment details and written approval from the slurry supplier that the mixing water is acceptable before beginning drilling. When using steel casing, use either the sectional type or one continuous corrugated or non-corrugated piece. Steel casings should consist of clean watertight steel of ample strength to withstand handling and driving stresses and the pressures imposed by concrete, earth and backfill. Use steel casings with an outside diameter equal to the hole size and a minimum wall thickness of ¼ inch.

4. Check the water inflow rate at the bottom of holes after all pumps have been removed. If the inflow rate is less than 6 inches per half hour, remove any fluid and free fall concrete into excavations. Ensure that concrete flows completely around piles. If the water inflow rate is greater than 6 inches per half hour, propose and obtain acceptance of a procedure for placing concrete before filling holes. Place concrete in a continuous manner and remove all casings.

Use current NCDOT inspection forms for drilled piers available on the NCDOT Geotechnical Engineering Unit's webpage. Construct and inspect drilled piers in accordance with the NCDOT *Drilled Piers Special Provision*. The Design-Build Team shall inspect drilled piers using their Shaft Inspection Device (SID) for any pours using the wet method of concrete placement and for any drilled pier excavations that have remained open greater than 24 hours. Install Crosshole Sonic Logging (CSL) tubes in all drilled piers. CSL test a minimum of 25% of drilled piers at each bridge or one per bent, whichever is greater. If a CSL test identifies any defect in the drilled pier, the Department has the right to request additional CSL testing as needed. The Department will determine which piers will be CSL tested. Submit CSL test information and results to the Geotechnical Engineering Unit, via the Transportation Program Management Director, for review and acceptance.

The prequalified geotechnical firm that prepared the original design shall perform any changes to the foundation designs. All changes shall be based upon additional information, subsurface investigation and / or testing. Drilled pier tip elevations shall not be changed during construction unless the prequalified geotechnical firm that prepared the bridge foundation design redesigns the drilled pier from either an SPT / rock core boring, performed in accordance with ASTM standards at the subject pier location, or observations of the drilled pier excavation. If a drilled pier is designed based on a boring, do not drill a boring inside an open drilled pier excavation. Locate the boring within three pier diameters of the center of the subject pier and drill to a depth of two pier diameters below the revised tip elevation. If a drilled pier is redesigned based upon observations of the drilled pier excavation, the geotechnical engineer of record shall be present during the excavation to determine the actual subsurface conditions. Send copies of revised designs including additional subsurface information, calculations and any other

supporting documentation sealed by a professional engineer registered in the State of North Carolina to the NCDOT for review.

Conduct proofrolling in accordance with Section 260 of the 2012 *Standard Specifications for Roads and Structures*.

Send copies of any inspection forms related to foundations, settlement or retaining walls to the NCDOT for review.

**HYDRAULICS SCOPE OF WORK** (8-22-12)

- The Design-Build Team shall employ a private engineering firm to perform hydraulic design for all work required under this contract. The private engineering firm shall be prequalified for hydraulic design work under the Department's normal prequalification procedures prior to the Technical Proposal submittal date.
- The Design-Build Team shall hold a pre-design meeting with the Transportation Program Management Director and Hydraulic Review Engineer upon acceptance of the Preliminary Roadway Plans developed by the Design-Build Team.
- The Design-Build Team shall design all storm drainage systems using Geopak Drainage.
- The Design-Build Team shall provide Culvert Survey Reports and Bridge Survey Reports in accordance with the guidelines noted below. If vertical abutments are proposed, the Design-Build Team shall provide abutment scour calculations, done in accordance with HEC-18, for the Department's review and acceptance.
- The Design-Build Team shall provide a bridge or reinforced concrete box culvert, without supplemental pipes, for all hydraulic structures requiring conveyance greater than a single 72-inch pipe.
- The Design-Build Team shall design bridge drainage without the use of Bridge Scuppers (open-grated inlets). If a closed drainage system is used on a bridge, the closed drainage system shall use vertical pipes at the flow line through the deck with no elbow and shall be consistent with that shown in the current NCDOT Stormwater Best Management Practices Toolbox.
- Using Best Management Practices, the Design-Build Team shall develop a Stormwater Management Plan, that at a minimum, demonstrates the following:
  - Stormwater runoff from the project site does not threaten water quality
  - Stormwater runoff is controlled by minimizing built-upon surfaces
  - To the maximum extent practicable, stormwater runoff is diverted away from surface waters
  - To the maximum extent practicable, on-site stormwater control measures, as identified in the most current NCDOT BMP Toolbox, are employed to minimize water quality impacts
- The Design-Build Team shall provide permit drawings, calculations and impact summary sheets for USACE 404 Permit and NCDWQ Section 401 Certification.



- The Design-Build Team shall conduct an interagency hydraulic design review meeting (4B) and an interagency permit impacts meeting (4C) prior to submittal of the environmental permit applications. All work resulting from the hydraulic design and permit reviews shall be the responsibility of the Design-Build Team. The Design-Build Team shall provide hydraulic plans and permit impact sheets, in hard copy and .pdf format, to the Transportation Program Management Director a minimum of five weeks prior to the applicable interagency meeting. The Design-Build Team shall take minutes of the interagency meetings and provide them to the Department within three business days of the aforementioned meetings
- The Design-Build Team shall prepare Outfall Analyses for increases in discharge and take appropriate action in accordance with the guidelines stated below to make sure that additional drainage is adequately handled.
- The Design-Build Team shall use a minimum ditch grade of 0.3% and avoid using ditches in wetlands.
- Raised median island cuts will not be allowed.
- For all FEMA regulated streams impacted by the Design-Build Team's design and / or construction the Design-Build Team shall adhere to the following requirements:
  - The Design-Build Team shall prepare a CLOMR or MOA package for the Department's submittal to the North Carolina Floodplain Mapping Program (NCFMP). The Design-Build Team shall obtain NCFMP approval prior to performing any construction activity in a FEMA regulated floodplain.
  - The Design-Build Team shall notify the Transportation Program Management Director in writing of all structures that may require purchase due to a rise in the floodplain water elevation. The Department will be responsible for all surveys to ascertain insurable structures within the impacted area of the floodplain(s). The Design-Build Team shall discuss the extent and limits of the rise in water elevation in the Salem Creek, Cloverleaf Branch and Stadium Branch floodplains, identify potentially impacted insurable structures, specify areas anticipated to require additional surveys and estimate the anticipated additional right of way impacts outside the project construction limits in the Technical Proposal. (Reference the Right of Way Scope of Work found elsewhere in this RFP)
  - The Department will be responsible for all fees associated with the CLOMR(s) and / or MOA(s).
  - The Design-Build Team shall ensure that construction of all structures in FEMA regulated floodplains adheres to the approved CLOMR(s) and / or MOA(s). Within three months of completion of a structure in a FEMA regulated floodplain, the Design-Build Team shall provide sealed Record Drawings for the structure

that verify construction adheres to the approved CLOMR or MOA. The Design-Build Team shall prepare a new FEMA model and / or package and be responsible for all associated costs resulting from any construction variation from the approved CLOMR(s) and / or MOA(s).

- The Department will allow no direct **contact** between the Design-Build Team **and** the NCFMP representatives. No contact between the Design-Build Team, the NCFMP and / or personnel under contract with NCFMP shall be allowed either by phone, e-mail, or in person, without Department representatives present. A representative from the Transportation Program Management Unit shall be included on all correspondence.

### **General**

- The Design-Build Team shall design in accordance with criteria provided in the North Carolina Division of Highways *Guidelines for Drainage Studies and Hydraulics Design-1999* and the addendum *Handbook of Design for Highway Drainage Studies-1973*, North Carolina Department of Transportation “Stormwater Best Management Practices Toolbox – 2008” and the North Carolina Division of Highways Hydraulics Unit website:

**<http://www.ncdot.org/doh/preconstruct/highway/hydro/>**

**ENVIRONMENTAL PERMITS SCOPE OF WORK** (7-6-12)**General**

The Design-Build Team shall be responsible for preparing all documents necessary for the Department to obtain the environmental permits for the construction requirement for this project. Permit applications shall be required for the: US Army Corps of Engineers (USACE) Section 404 Permit, NC Department of Natural Resources (DENR) Division of Water Quality (DWQ) Section 401 Water Quality Certification, NC Department of Natural Resources (DENR) State Stormwater Permit.

The Design-Build Team shall not begin ground-disturbing activities, including utility relocation in jurisdictional areas, until the environmental permits have been issued (this does not include permitted investigative borings covered under a Nationwide Permit No. 6 and utility relocation work outside jurisdictional resources noted below). The Design-Build Team shall coordinate with the Transportation Program Management Director to determine if a Preconstruction Notification (PCN) is required for the Nationwide Permit No. 6. If a PCN is required, the Design-Build Team shall submit all necessary documents and forms to the Transportation Program Management Director for submittal to the appropriate agencies. If a PCN is not required, the Design-Build Team may proceed with geotechnical investigations outside jurisdictional resources, provided all of the Nationwide Permit No. 6 General Conditions are adhered to.

The Design-Build Team may begin utility relocation work prior to obtaining the aforementioned permits provided that (1) the Department is notified in writing prior to these activities; (2) such activities are outside jurisdictional resources; (3) a meeting is held with the NCDOT and permitting agencies prior to beginning work, if necessary; and (4) the Design-Build Team submits a Preconstruction Notification for the Department to forward to the permitting agencies, if necessary.

The Department will allow no direct contact between the Design-Build Team and representatives of the environmental agencies. No contact between the Design-Build Team and the environmental agencies shall be allowed either by phone, e-mail or in person, without representatives of the Department's Project Development & Environmental Analysis (PDEA) Unit and / or the Division's Environmental Officer present. A representative from the Transportation Program Management Unit shall be included on all correspondence.

The Department has reached Concurrence Point 4A in the Merger 01 Process used by the environmental agencies and the Department to obtain environmental permits for projects. Design-Build Team shall participate and present information for Concurrence Points 4B and 4C that are necessary to complete the Merger 01 Process. The Design-Build Team shall follow the appropriate details in the document titled "Merger Implementation Team – Merger Process Information" which will be provided by the Department.

Any variations in the Department's proposed design and / or construction methods that nullify any Concurrence Points obtained or decisions reached between the Department and environmental agencies; and / or require additional coordination with the environmental agencies shall be the sole responsibility of the Design-Build Team. The Department will not allow any contract time extensions associated with this additional coordination. The Department will not honor any requests for additional contract time or compensation for any efforts required in order to obtain any permit or permit modification, including but not limited to public involvement, additional design effort, additional construction effort and / or additional environmental agency coordination and approvals.

Unless stipulated otherwise in the Technical Proposal, the Department will schedule the 4B and 4C Meetings for U-2925 for April 2013 and July 2013, respectively. The Design Build Team shall clearly identify in the Technical Proposal what months they would like the Department to schedule these meetings. Failure on the part of the Design-Build Team to meet these dates places all responsibility for delays resulting from missing these dates solely in the hands of the Design-Build Team.

Unless noted otherwise in this RFP, the Design-Build Team shall be bound by the terms of all signed planning documents and approved minutes and commitments of all concurrence meetings. The Design-Build Team shall be held accountable for meeting all permit conditions. The Design-Build Team shall be required to staff any personnel necessary to provide permit compliance.

### **Major Permit Application Process**

It shall be the Design-Build Team's responsibility to acquire information and prepare permit drawings that reflect the impacts and minimization efforts resulting from the Merger 01 Process and from the project as designed by the Design-Build Team. Further it shall be the Design-Build Team's responsibility to provide these permit impact sheets (drawings) depicting the design and construction details to the Department as part of the permit application. The Design-Build Team shall be responsible for developing the permit application for all jurisdictional impacts. The permit application shall include all utility relocations required by the project. At a minimum, the permit application shall consist of the following:

- Cover Letter
- Minutes from the 4B and 4C Meetings
- Permit drawings (with and without contours)
- Half-size plans
- Completed forms (Section 404 ENG 4345, etc.) appropriate for impacts

The Department will re-verify and update, as needed, the required environmental data that expires prior to the completion of the activity causing the impact in the jurisdictional areas. These include, but are not limited to, federally protected species, re-verification of wetland jurisdictional areas, historic and archaeological sites and 303d (impaired) streams.

The Design-Build Team shall submit one permit application for the entire project. The Design-Build Team shall not submit multiple applications to develop a “staged permitting” process to expedite construction activities in a phased fashion.

Direct coordination between the Design-Build Team, the Department’s Transportation Program Management Director, Resident Engineer, Division Environmental Officer (DEO) and the Project Development and Environmental Analysis Unit - Natural Environment Section (PDEA-NES) shall be necessary to ensure proper permit application development. Upon completion of the permit application package, the Design-Build Team shall concurrently forward the package to the Transportation Program Management Director, Resident Engineer, Division Environmental Officer (DEO), Hydraulics Unit and PDEA-NES for review and approval. After all revisions are complete, the Department will subsequently forward the package to the appropriate environmental agencies.

Any temporary construction measures, including de-watering, construction access, etc. shall be addressed in the permit application. Impacts that result from so-called temporary measures may not be judged to be temporary impacts by the environmental agencies. These issues shall be addressed and reviewed by PDEA-NES prior to the 4B and 4C Meetings and resolved with the environmental agencies during the aforementioned meetings.

The Design-Build Team shall clearly indicate the location of and impacts of haul roads and utility relocations on jurisdictional areas. The Design-Build Team shall also identify all proposed borrow and waste sites. The description of the temporary impacts (haul roads, utility relocations, work bridges, etc.) shall include restoration plans, schedules, and disposal plans. Further, the Design-Build Team shall describe the construction methods of all structures. The aforementioned information, descriptions and details shall be presented during the 4B and 4C Meetings and be included in the permit application.

The NCDOT hereby commits to ensuring, to the greatest extent possible, that the footprint of the impacts in areas under the jurisdiction of the federal Clean Water Act will not be increased during the Design-Build effort. All fill material shall be immediately stabilized and maintained to prevent sediment from entering adjacent waters or wetlands. The Design-Build Team shall be responsible for ensuring that the design and construction of the project will not impair the movement of aquatic life.

Requests made for modifications to the permits obtained by the Design-Build Team shall only be allowed if the Engineer determines it to be in the best interest of the Department and shall be strongly discouraged. The Design-Build Team shall not take an iterative approach to hydraulic design issues. The design shall be complete prior to permit application.

### **Individual Permit Timeframe**

The Design-Build Team should expect it to take up to 11 months to accurately and adequately complete all designs necessary for permit application, submit application to the Department, and obtain approval for the permits from the environmental agencies. Environmental agency review

time will be approximately 90 days from receipt of a “complete” package. No requests for additional contract time or compensation will be allowed if the permits are obtained within this 11-month period. With the exception of location and survey work, utility relocation work outside jurisdictional resources that adheres to the aforementioned requirements, permitted investigative borings covered under a Nationwide Permit No. 6 and / or Preconstruction Notification secured by the Design-Build Team, no mobilization of men, materials, or equipment for site investigation or construction of the project shall occur prior to obtaining the permits (either within the 11-month period or beyond the 11-month period). The Department will not honor any requests for additional contract time or compensation, including idle equipment or mobilization or demobilization costs, for the Design-Build Team mobilizing men, materials (or ordering materials), or equipment prior to obtaining all permits. The Department will consider requests for contract time extensions for obtaining the permits only if the Design-Build Team has pursued the work with due diligence, the delay is beyond the Design-Build Team’s control, and the 11-month period has been exceeded. If time were granted it would be only for that time exceeding the 11-month period. This 11-month period is considered to begin on the Date of Availability as noted in this RFP.

The Design-Build Team needs to be aware that the timeframes listed above for the NCDWQ, and the USACE to review a permit application begin only after a fully complete and 100% accurate submittal.

### **Mitigation Responsibilities of the Design-Build Team**

The Department has acquired the compensatory mitigation for unavoidable impacts to wetlands and surface waters due to the project construction from the Ecosystem Enhancement Program (EEP). This mitigation was based on impacts as identified in the planning stage.

Any changes proposed by the Design-Build Team to any design or construction details provided by the Department shall be approved by the Department prior to being submitted to the environmental agencies for their approval.

Should additional jurisdictional impacts result from revised design and / or construction methods, suitable compensatory mitigation for wetlands and / or streams shall be the sole responsibility of the Design-Build Team. Therefore, it is important to note that additional mitigation will have to be approved by the environmental agencies and such approval shall require, at a minimum, the preparation and approval of a Mitigation Plan before permits are approved and before construction can commence. To mitigate for these additional jurisdictional impacts, the Design-Build Team shall be responsible for all costs associated with acquiring suitable mitigation. Construction of any on-site mitigation shall be performed by a contractor that has successfully constructed similar on-site mitigation. In the absence of suitable on-site mitigation, the Design-Build Team shall be responsible for acquiring additional mitigation from the EEP.

The Design-Build Team shall analyze all new areas to be impacted that have not been analyzed during the NEPA Process and any staging areas that are located outside the project right of way.

This analysis shall include performing all environmental assessments. These assessments shall require the Design-Build Team to engage the services of a competent environmental consultant to conduct a full environmental investigation to include, but not be limited to, Federally Listed Threatened and Endangered Species, wetlands, streams, avoidance and minimization in jurisdictional areas, compensatory mitigation, FEMA compliance, and historical, archaeological, and cultural resource surveys in these areas. The environmental consultant shall obtain concurrence through PDEA-NES and from the United States Fish and Wildlife Service to document compliance with Section 7 of the *Endangered Species Act* for those species requiring such concurrence. In addition, the Design-Build Team shall identify additional mitigation required, identify the amount of time beyond the 11-month period, and fulfill all other requirements that the permitting agencies impose to obtain the permit. Any contract time extensions resulting from additional environmental assessments required by the Design-Build Team's design and / or construction methods impacting areas outside those previously analyzed through the NEPA Process shall be solely at the Department's discretion.

### **Commitments**

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize wetland impacts and to provide full compensatory mitigation of all remaining wetland impacts. Avoidance measures were taken during the planning and NEPA Process and minimization measures were incorporated as part of the preliminary design. The Design-Build Team shall incorporate these avoidance and minimization features, plus any minimization identified during the 4B and 4C Meetings into the design.

All work by the Design-Build Team must be accomplished in strict compliance with the plans submitted with the permit applications and in compliance with all conditions of all permits and certifications issued by the environmental agencies. The Design-Build Team shall provide each of its contractors and / or agents associated with the construction or maintenance of this project with a copy of the permits.

Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall strictly adhere to these commitments, as well as others, including but not limited to, those included in the EA, FONSI, all permits, Merger 01 Meetings and site visits.

If the Design-Build Team discovers any previously unknown historic or archeological remains while accomplishing the authorized work, they shall immediately notify NCDOT Staff Archaeologist and / or NCDOT Project Development Engineer, as listed below, who will initiate the required State / Federal coordination. A representative from the Transportation Program Management Unit will also be notified. All questions regarding these sites should be addressed to Mr. Matthew Wilkerson, NCDOT Archaeology (919) 707-6089, or Ms. Lisa Feller, NCDOT Project Development Engineer (919) 707-6022.

**GEOENVIRONMENTAL SCOPE OF WORK** (8-16-12)**I. DEFINITION**

For the purpose of this scope of work, contamination / contaminants are defined as any substance, which when discharged in any quantity may present an imminent and substantial danger to the public health or welfare. Petroleum is defined as any oil of any kind and in any form, including, but not limited to, crude oil, diesel fuel, fuel oil, gasoline, lubrication oil, oil refuse, oil mixed with other waste, oil sludge, petroleum related products or by-products, and all other liquid hydrocarbons, regardless of specific gravity, whether singly or in combination with other substances.

**II. DESCRIPTION OF WORK**

Three sites of concern were identified in the *Revised Hazardous Materials Report, Hazardous Materials Evaluation*, dated April 11, 2011. The Design-Build Team shall hold a right of way consultation meeting with the Department's GeoEnvironmental staff, Transportation Program Management Director, and key Design-Build Team members upon submittal of the preliminary roadway plans. To accelerate the Department's work described herein, approximate limits of right of way shall be shown on these preliminary plans in the areas adjacent to the sites of concern.

Sites of concern within the proposed right of way and any other sites identified during the right of way consultation with the Design-Build Team shall be investigated by the Department. The Department shall require 90 days from the date of the right of way consultation meeting to investigate and provide a Landfill Investigation Report, Preliminary Site Assessment Reports, Right of Way Recommendations and any associated design recommendations. The Right of Way Consultation shall occur prior to the Design Build Team making offers to purchase the right of way.

**\*\* NOTE\*\*** Paragraph deleted

**Sites of Concern**

One municipal maintenance yard with former and active USTs, and one closed municipal landfill are within the project limits; Winston-Salem Sanitation Building and the former City of Winston-Salem landfill. Both sites are owned by the City of Winston-Salem.

Two known active USTs remain on the Winston-Salem Sanitation Building site. Petroleum contaminated soil and groundwater is present at the southern portion of the site. Fifteen USTs were removed from this property between 1993 and 1999.

The former City of Winston-Salem landfill is located between Salem Creek to the north, Williamson Street to the south, Martin Luther King Jr. Drive to the east, and US 52 to the west. Geotechnical borings completed by the Geotechnical Engineering Unit's Charlotte Office confirm that embankment fill was emplaced over the original floodplain along Diggs Boulevard. Landfill material and petroleum contaminated soil was found in one boring between Bowman Gray Stadium and Diggs Boulevard.



**\*\* NOTE\*\*** Paragraph deleted

### **Right of Way Acquisition**

The Design-Build Team shall adhere to all Right of Way Branch procedures regarding the acquisition of contaminated property and if applicable, any Right of Way Acquisition Recommendations provided by the Department.

The Design-Build Team shall notify the Transportation Program Management Director in writing of any underground fuel, chemical, or heating oil tanks found during property appraisals. The Department shall require 30 business days to investigate the property and provide right of way recommendations after receiving written notification from the Design-Build Team.

The Department will remove, and replace with suitable material, any landfill debris, contaminated material, and / or fuel tanks to the limits necessary to complete the construction project. All remaining contaminated material will be left in place and undisturbed. The Department will complete the aforementioned removal and replacement within 30 days of receiving written notification from the Design-Build Team that the property has been acquired and cleared of all above ground structures.

### **III. INFORMATION PROVIDED BY NCDOT**

- U-2925 Revised Hazardous Materials Report, Hazardous Materials Evaluation, April 11, 2011
- U-2925 Hazardous Materials Report, Hazardous Materials Evaluation, March 9, 2009
- GeoEnvironmental Impact Evaluation, March 27, 2003
- Landfill Investigation Report
- Preliminary Site Assessment Reports
- Right of Way Recommendations
- Design Recommendation

### **IV. UNKNOWN CONTAMINATED SITES**

In the unlikely event that the contractor encounters contaminated materials, these materials will be handled in accordance with Article 107-25 of the Standard Specifications.

**TRANSPORTATION MANAGEMENT SCOPE OF WORK** (8-23-12)**I. Traffic Management Plans****A. Design Parameters**

The Design-Build Team shall prepare the Transportation Management Plans which includes the Temporary Traffic Control Plan, the Traffic Operations Plan, the Public Information Plan as it relates to the Traffic Control Devices, and temporary pavement markings for this project following the parameters listed below. Use the most recent manuals, publications, and resources listed in this Scope of Work.

For additional information regarding the components of the Transportation Management Plan, review the *Work Zone Safety and Mobility Policy* found on the Work Zone Traffic Control Website at:

<http://www.ncdot.gov/doh/preconstruct/wztc/>

1. Except as otherwise allowed herein, maintain a minimum of two 11-foot travel lanes in each direction on US 52. Maintain 4-foot inside and outside paved shoulders in each direction of US 52 unless temporary barrier is placed on the paved shoulder or otherwise allowed herein.
2. Maintain existing number of travel lanes, lane widths, and paved shoulder widths on all roads unless otherwise stated in this scope of work.
3. Traffic control devices shall be located a minimum 2-foot offset (shy distance) from the edge of an open travel lane.
4. Use of temporary barrier systems shall be shown on the Traffic Management Staging Concept. Temporary barrier systems shall be designed in accordance with the following requirements:
  - Determine the need for temporary barrier in accordance with the *FHWA Final Rule on Temporary Traffic Control Devices (23 CFR 630 Subpart K)*. Reference the NCDOT Work Zone Traffic Control website noted below for examples and Guidelines on the Use of Positive Protection in Work Zones.

<http://ncdot.org/doh/preconstruct/wztc/DesRes/English/DesResEng.html>

- The Design-Build Team shall adhere to the Roadside Design Guide in determining the length of need, flare rate and clear zone. The Design-Build Team shall adhere to the possible deflection of the proposed temporary barrier system in accordance with NCHRP-350 deflections from crash testing. Providing less than the minimum deflection distance shall require the use of anchored temporary barrier systems in accordance with the NCDOT 2012 *Standard Specifications for Roads and Structures*.

5. The Design-Build Team shall design the Transportation Management Plan for the posted speed limit. Upon formal request from the Design-Build Team, a speed reduction ordinance will be allowed on US 52 to reduce the existing speed limit of 55 mph down to 45 mph during construction; therefore temporary alignments on US 52 shall be designed at a minimum of 45 mph. The minimum allowable design speed for temporary alignments of NC, other US routes and secondary roads shall be 10 mph below the posted speed.
6. *Roadway Standard Drawing* No. 1101.11 shall be used for calculating the length of temporary merges for lane closures and temporary traffic shifts. For temporary traffic shifts that will remain in place for a period longer than 3 days, no breaks in the superelevation will be allowed within the shifting taper. Except in merges, shifts and temporary alignments, changes in pavement cross slopes shall only occur on a lane line or lane midpoint. Any changes in pavement cross slopes within traveled area shall not exceed 0.04.
7. Temporary traffic shifts requiring vertical grades shall be considered a temporary alignment. All temporary alignments shall adhere to the NCDOT Roadway Design Manual, AASHTO A Policy on Geometric Design of Highways and Streets and the most current Highway Capacity Manual.
8. Maintain access at all times to all residences, schools, bus stops, mass transit facilities (park and ride lots), emergency services, businesses, and all other facilities at all times. Obtain written approval from the Engineer on method to maintain access, prior to incorporation.
9. Traffic traveling in the same direction shall not be split (i.e. separation by any type of barrier, bridge piers, existing or proposed median, etc.).
10. Obtain written approval from the Engineer for all road closures, prior to incorporation.
11. All offsite detour routes shall be approved in writing by the Engineer, prior to incorporation and adhere to the following requirements:
  - The Design-Build Team shall coordinate with the City of Winston-Salem Transportation Department and the Division to determine acceptable detour routes.
  - The Design-Build Team shall be responsible for investigating all detour routes including but not limited to, analyzing traffic capacity, investigating impacts to emergency services and schools, analyzing design characteristics to ensure the design supports the traffic volumes, and investigating pavement structural adequacy including any bridge postings on the detour route.

- The Design-Build Team shall determine and provide improvements required to accommodate detoured traffic prior to utilizing detour routes.
  - Offsite detours that have non-signalized at-grade railroad crossings shall not be allowed.
  - Submit the detour route and all associated sign designs for review and acceptance prior to incorporation.
  - Upon incorporation of an approved off-site detour, and in accordance with all other requirements noted herein, closure of the following roads will be permitted:
    - Salem Avenue
    - Rams Drive and associated ramps / loops
    - City Yard Dr.
    - Vargrave Street and associated ramps / loops
    - Diggs Boulevard
  - US 52 shall not be closed except as provided for in ICT #4. On-site detours will be allowed and shall follow the criteria found elsewhere in this Transportation Management Scope of Work. Any such on-site detour shall be incorporated into the Technical Proposal and will require approval by the Department.
  - All proposed road closures, detour routes, durations, and justifications shall be incorporated into the Technical Proposal. Such proposal will require approval by the Department.
12. The Design-Build Team shall provide safe access for wide-loads and oversized permitted vehicles through the work zone. Safe access shall entail, but is not limited to, a sufficient pavement structure (Reference the Pavement Management Scope of Work found elsewhere in this RFP), required vertical clearance and minimum clear widths as follows:

<b>Roadway</b>	<b>Minimum Clear Width</b>
US 52	20 feet
All other roadways	18 feet

13. The Design-Build Team shall coordinate with the Triad Traffic Management Center to manage traffic operations within the work zone and other roadways within the network that may be affected by the work zone activities. Coordination includes providing notification of planned lane or road closures, traffic detours, public information, traffic management, access management, incidents, etc.
14. To provide alternate route, detour route, and travel time information, the Design-Build Team shall provide the eight Changeable Message Signs (CMSs) and eleven

- stationary sign assemblies shown on the U-2925 Alternate Route Signing Map provided by the Department. The Design-Build Team shall not perform any construction related activities until the CMSs are fully integrated and communicating effectively with the Triad Triangle Management Center and the stationary sign assemblies have been installed as directed by the Engineer. The Triad Triangle Management Center will operate the CMSs. The Design-Build Team shall fabricate, install, relocate and maintain the CMSs and stationary sign assemblies during the project duration. Upon completion of the project, or completion of their usefulness, the Design-Build Team shall remove and dispose of the CMSs and stationary sign assemblies. (Reference the ITS Scope of Work found elsewhere in this RFP for additional requirements)
15. The Design-Build Team shall make all modifications to existing pavement markings, markers, and / or signing located outside the project limits that are necessitated by the Transportation Management Plans on all roads.
  16. Except as allowed by Intermediate Contract Time #5 below, Rams Drive and associated access ramps from and to US 52 shall not be closed and traffic re-routed to the off-site detour until all movements at the Salem Creek Connector / US 52 interchange are open to traffic.

## **B. Transportation Management Plan Requirements**

The Design-Build Team shall select a Private Engineering Firm (PEF) that has experience designing and sealing Transportation Management Plans for the North Carolina Department of Transportation (NCDOT) on comparable projects. The Design-Build Team shall list projects in the Technical Proposal that the Transportation Management Designer has developed. This list shall include a description and similarity to the subject project.

The Design-Build Team shall develop Transportation Management Plans that maintain all types of traffic (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) as defined by the *Manual for Uniform Traffic Control Devices (MUTCD)*.

The Transportation Management Plans shall adhere to the “*Design-Build Submittal Guidelines*” and the “*Guidelines for Preparation of Traffic Control and Pavement Marking Plans for Design-Build Projects*”, which by reference are incorporated herein and are a part of the contract. These documents are available on the Design-Build website.

The Work Zone Traffic Control website contains useful information that may be needed for the design of the Transportation Management Plans:

<http://www.ncdot.org/doh/preconstruct/wztc/>

The Staging Concept shall meet the Contract requirements and be accepted by the Department before the first phase can be submitted. Construction shall not begin until the first phase submittal meets the contract requirements and is accepted by the Department. Construction shall not begin on subsequent phase submittals until they meet the requirements of the Contract and are accepted by the Department. Any changes to the staging concept after acceptance shall require a submittal for review prior to any future phasing submittals being submitted. All submittals shall follow the 2012 *NCDOT Roadway Standard Drawings*, *NCDOT 2012 Standard Specifications for Roads and Structures*, the “*Guidelines for Preparation of Traffic Control and Pavement Marking Plans for Design-Build Projects*”, *Manual for Uniform Traffic Control Devices*, and the “*Design-Build Submittal Guidelines*”.

**II. Project Operations Requirements**

The following are Time Restrictions and notes that shall be included with the Transportation Management Plans General Notes, unless noted otherwise elsewhere in this RFP:

**A. Time Restrictions**

**1. Intermediate Contract Times #1 through #3 for Lane Narrowing, Closure, Holiday, and Special Event Restrictions**

As a minimum, the Design-Build Team shall maintain the existing number of lanes and shall not close or narrow a lane or shoulder during the times below. These same time restrictions will apply to proposed ramps and spurs once open to traffic.

Road Name	Day and Time Restrictions
US 52 and Rams Drive (including ramps / loops)	Monday thru Friday: 6:00 a.m. to 8:00 p.m. Saturday: 8:00 a.m. to 8:00 p.m. Sunday: 10:00 a.m. to 8:00 p.m.
The time restrictions for Rams Drive and ramps / loops will remain in effect until Rams Drive is closed using an approved off-site detour.	
MLK Jr. Drive Salem Creek Connector (including ramps / loops)	Monday thru Friday: 7:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m.
The time restrictions for Salem Creek Connector and ramps / loops will not be in effect until all movements at the Salem Creek Connector / US 52 interchange are open to traffic.	

The Design-Build Team shall not install, reset, and / or remove any traffic control device during the times listed above.

In addition, the Design-Build Team shall not close or narrow a lane of traffic, detain the traffic flow or alter the traffic flow on or during holidays, holiday weekends, special events, or any other time when traffic is unusually heavy, including the following schedules:

- (a) For New Year's between the hours of 6:00 a.m. December 31<sup>st</sup> and 8:00 p.m. January 2<sup>nd</sup>. If New Year's Day is on a Friday, Saturday, Sunday, or Monday then to 8:00 p.m. the following Tuesday.
- (b) For Easter, between the hours of 6:00 a.m. Thursday and 8:00 p.m. Monday.
- (c) For Memorial Day, between the hours of 6:00 a.m. Friday and 8:00 p.m. Tuesday.
- (d) For Independence Day, between the hours of 6:00 a.m. July 3<sup>rd</sup> and 8:00 p.m. July 5<sup>th</sup>. If Independence Day is on a Friday, Saturday, Sunday or Monday, then between the hours of 6:00 a.m. the Thursday before Independence Day and 8:00 p.m. the Tuesday after Independence Day.
- (e) For Labor Day, between the hours of 6:00 a.m. Friday and 8:00 p.m. Tuesday.
- (f) For Thanksgiving Day, between the hours of 6:00 a.m. Tuesday and 8:00 p.m. Monday.
- (g) For Christmas, between the hours of 6:00 a.m. the Friday before the week of Christmas Day and 8:00 p.m. the following Tuesday after the week of Christmas Day.
- (h) For Wake Forest University football games, occurring at Groves Stadium between four (4) hours before the start and four (4) hours after the end of the Wake Forest University football games.
- (i) For the NCAA Tournament, occurring at Greensboro Coliseum Complex between the hours of 6:00 a.m. the day before the start of the Tournament and 8:00 p.m. the day after the end of the Tournament.
- (j) For the ACC Tournament, occurring at Greensboro Coliseum Complex between the hours of 6:00 a.m. the day before the start of the Tournament and 8:00 p.m. the day after the end of the Tournament.
- (k) For The Dixie Classic Fair in Winston-Salem between the hours of 6:00 a.m. the day before the start of The Dixie Classic Fair and 8:00 p.m. the day after the end of The Dixie Classic Fair.
- (l) For The Furniture Markets, between the hours of 6:00 a.m. the Friday before the start of The Furniture Markets and 8:00 p.m. the Friday after the end of The Furniture Markets.

- (m) For car races at Bowman Gray Stadium, four (4) hours before the start and four (4) hours after the end of the races.
- (n) For **football games and other special events** at Winston-Salem State, four (4) hours before the start and four (4) hours after the end of the event.
- (o) For Air Show in Winston-Salem, between the hours of 6:00 a.m. the Friday before the start of the Air Show and 8:00 p.m. the Monday after the end of the Air Show.
- (p) For Dash Baseball games in Winston-Salem, between four (4) hours before the start of a game and four (4) hours after the end of a game.

**Liquidated Damages for Intermediate Contract Time #1 for the above lane narrowing, lane closure, holiday, and special event time restrictions for US 52 are \$2500.00 per 15-minute period, or any portion thereof.**

**Liquidated Damages for Intermediate Contract Time #2 for the above lane narrowing, lane closure, holiday, and special event time restrictions for Rams Drive, including ramps and loops, are \$1000.00 per 15-minute period, or any portion thereof.**

**Liquidated Damages for Intermediate Contract Time #3 for the above lane narrowing, lane closure, holiday, and special event time restrictions for MLK Jr. Dr. and Salem Creek Connector and Ramps/Loops, are \$1000.00 per hour or any portion thereof.**

## **2. Intermediate Contract Time #4 for Road Closure Restrictions for Construction Operations**

As a minimum, the Design-Build Team shall maintain the existing traffic pattern for all roadways and follow the road closure restrictions listed below. When a road closure is used, the Design-Build Team shall reopen the travel lanes by the end of the road closure duration to allow the traffic queue to deplete before re-closing the roadway.

The Design-Build Team shall not close any direction of travel for the following roads during the times noted below. Closure of these roads shall only be allowed for the operations listed below:

<b>Road Name</b>	<b>Day and Time Restrictions</b>
US 52 (including ramps / loops)	Every Day: 5:00 a.m. to 12:00 a.m. (midnight)

Maximum road closure duration of **30 minutes** shall be allowed for the roadways listed above (unless a detour is proposed and approved by NCDOT and the City) for the following operations:



- Girder installation
- Girder removal
- Installation of overhead sign assemblies over travel lanes
- Traffic shifts

The Design-Build Team may propose a different traffic control method for the above mentioned construction activities in the Technical Proposal. Such proposal will require approval by the Department.

Proposed road closures for any road within the project limits shall be approved by the Engineer prior to incorporation in the Transportation Management Plans.

**Liquidated Damages for Intermediate Contract Time #4 for the above road closure time restrictions for US 52, including ramps and loops, are \$2500.00 per 15-minute period, or any portion thereof.**

### **3. Intermediate Contract Time #5 for Failure to Open the US 52 Southbound Exit Ramp Onto Salem Creek Connector**

Contingent on all other Salem Creek Connector / US 52 interchange movements being operational, the Design-Build Team will be allowed to close the US 52 southbound entrance ramp from Rams Drive for a maximum of 14 days immediately prior to opening the US 52 southbound exit ramp onto Salem Creek Connector. The Design-Build Team shall only close the US 52 southbound entrance ramp from Rams Drive to tie the aforementioned US 52 southbound exit ramp to the US 52 southbound travel lanes.

During this 14-day ramp closure, the Design-Build Team shall install a detour that begins on Rams Drive, turns onto southbound Salem Creek Connector and terminates along the US 52 southbound entrance ramp from Salem Creek Connector.

**Liquidated Damages for Intermediate Contract Time #5 for failure to open the US 52 southbound exit ramp onto Salem Creek Connector within 14 days of closing the US 52 southbound entrance ramp from Rams Drive are \$2,000.00 per day, or any portion thereof.**

### **4. Hauling Restrictions**

The Design-Build Team shall adhere to the hauling restrictions noted in the NCDOT 2012 *Standard Specifications for Roads and Structures*.

The Design-Build Team shall conduct all hauling operations as follows:

- The Design-Build Team shall not conduct any hauling operations against the flow of traffic of an open travelway unless an approved temporary traffic barrier or guardrail separates the traffic from the hauling operation.

- The Design-Build Team shall not haul on US 52 during the holiday and special events time restrictions listed as Items (a) – (p) in Intermediate Contract Time #1, unless the hauling operation occurs completely behind temporary traffic barrier or guardrail and does not impact US 52 traffic operations.
- All entrances and exits for hauling to and from the work zone shall conform to the Roadway Standard Drawings.
- Design access locations so that haul vehicles do not enter and / or exit an open travel lane at speeds more than 10 mph below the posted speed limit.
- Hauling access to the construction area on US 52 will be allowed at the beginning and end of the project. Additional hauling access points on US 52 shall be limited to one per direction, at a location chosen by the Design-Build Team and approved by the Department.
- Hauling entrances, exits and crossings shall be shown on the Transportation Management Plan.
- The Design Build Team shall install a CMS on the shoulder of the open roadway 1000 ft. in advance of each truck entrance leading to the work site. The CMS shall display the following messages: “TRUCKS PULLING OFF ROAD” and “DO NOT FOLLOW TRUCKS”.

Hauling operations that perpendicularly cross a roadway shall require Traffic Control and is subject to the time restrictions, and holiday, holiday weekend and special event restrictions listed in ICT #1 through #3.

The Design-Build Team shall address how hauling will be conducted in the Technical Proposal, including but not limited to, hauling of any materials to and from the site and hauling material within the NCDOT right of way.

Hauling shall not be allowed ingress and egress from any open travel lane during the following time restrictions:

Road Name	Time Restrictions
US 52 (including ramps / loops) and MLK Jr. Drive	Monday through Friday:  6:00 a.m. to 10:00 a.m. and 4:00 p.m. to 7:00 p.m.

**Lane and Shoulder Closure Requirements**

The Design-Build Team shall remove lane closure devices from the lane when work is not being performed behind the lane closure or when a lane closure is no longer needed.

When personnel and / or equipment are working within 15 feet of an open travel lane, the Design-Build Team shall close the nearest open shoulder using NCDOT 2012 Roadway Standard Drawing No. 1101.04, unless the work area is protected by an approved temporary traffic barrier or guardrail.

When barrier is placed on the shoulder of a roadway, install shoulder closure signs and devices using NCDOT 2012 Roadway Standard Drawing No. 1101.04 in advance of the barrier.

When personnel and / or equipment are working on the shoulder adjacent to an undivided facility and within 5 feet of an open travel lane, the Design-Build Team shall close the nearest open travel lane using NCDOT 2012 Roadway Standard Drawing No. 1101.02, unless the work area is protected by an approved temporary traffic barrier or guardrail.

When personnel and / or equipment are working on the shoulder adjacent to a divided facility and within 10 feet of an open travel lane, the Design-Build Team shall close the nearest open travel lane using NCDOT 2012 Roadway Standard Drawing No. 1101.02, unless the work area is protected by an approved temporary traffic barrier or guardrail.

When personnel and / or equipment are working within a lane of travel of an undivided or divided facility, the Design-Build Team shall close the lane using the appropriate roadway standard drawing from the NCDOT 2012 *Roadway Standard Drawings*. The Design-Build Team shall conduct the work so that all personnel and / or equipment remain within the closed travel lane.

The Design-Build Team shall not perform work simultaneously within 15 feet on both sides of an open travelway, ramp, or loop within the same location unless protected with guardrail or barrier.

The Design-Build Team shall not install more than 1.5 miles of lane closure on US 52 and no more than one mile on any other roadway measured from the beginning of the merge taper to the end of the lane closure.

The Design-Build Team shall not install more than one lane closure in either direction on a two-lane, two-way undivided roadway.

The Design-Build Team shall not install more than one lane closure in any one direction on a multi-lane divided roadway, unless a minimum distance of 4 miles is maintained between the lane closure limits. A lane closure may be installed in opposing directions on a multi-lane divided roadway (maximum of one in each direction) as needed.

## **B. Pavement Edge Drop off Requirements**

The Design-Build Team shall backfill at a 6:1 slope up to the edge and elevation of the existing pavement in areas adjacent to an opened travel lane that has an edge of pavement drop-off as follows:

- Elevation differences that exceed 2 inches on roadways with posted speed limits of 45 mph or greater and a paved shoulder four-foot wide or less.
- Elevation differences greater than 3 inches on roadways with posted speed limits less than 45 mph and with a paved shoulder four-foot wide or less.
- Refer to the current *AASHTO Roadside Design Guide* for proper treatment of all other conditions.

Do not exceed a difference of 2 inches in elevation between open lanes of traffic for nominal lifts of 1.5 inches. Install advance warning “UNEVEN LANES” signs (W8-11) 1000 feet in advance and a minimum of every half mile throughout the uneven area.

## **C. Traffic Pattern Alterations**

The Design-Build Team shall notify the Engineer in writing at least twenty-one (21) calendar days prior to any traffic pattern alteration. (Reference the Public Information Scope of Work found elsewhere in this RFP for public information requirements)

## **D. Signing**

The Design-Build Team shall install advance work zone warning signs when work is within 40 feet from the edge of travel lane and no more than three days prior to the beginning of construction.

When no work is being conducted for a period longer than one week, the Design-Build Team shall remove or cover all advance work zone warning signs, as directed by the Engineer. Stationary work zone warning signs shall be covered with an opaque material that prevents reading of the sign at night by a driver traveling in either direction.

When portable work zone signs are not in use for periods longer than 30 minutes, the Design-Build Team shall lay the portable work zone sign flat on the ground and collapse the sign stand and lay it flat on the ground.

The Design-Build Team shall be responsible for the installation and maintenance of all detour signing and devices required for road closures. The Design-Build Team shall cover or remove all detour signs within and off the project limits when a detour is not in operation.

The Design-Build Team shall ensure proper signing (including but not limited to guide signs) is in place at all times during construction, as required by the *MUTCD*. All temporary signing shall be shown on the Traffic Control Plan or a Temporary Signing Plan to be approved by the Work Zone Traffic Control Section and/or the Signing and Delineation Unit.

#### **E. Traffic Barrier**

The Department will not provide any type of barrier for this project. The Design-Build Team shall use only an NCDOT approved temporary traffic barrier system and adhere to the following requirements:

- Install temporary traffic barrier system a maximum of two (2) weeks prior to beginning work in any location. Once the temporary traffic barrier system is installed at any location, proceed in a continuous manner to complete the proposed work in that location.
- Do not place temporary barrier used for traffic control directly on any surface other than asphalt or concrete.
- Once the temporary traffic barrier system is installed and no work has been or will be performed behind the temporary traffic barrier system for a period longer than two (2) months, remove / reset the temporary traffic barrier system unless the barrier is protecting traffic from a hazard.
- Install temporary barrier with the traffic flow beginning with the upstream side of traffic. Remove temporary barrier against the traffic flow beginning with the downstream side of traffic.
- Install and space drums no greater than twice the posted speed limit (mph) to close or keep the section of the roadway closed until the temporary traffic barrier system can be placed or after the temporary traffic barrier system has been removed.
- Protect the approach end of the temporary traffic barrier system at all times during the installation and removal of the barrier by either a truck mounted impact attenuator (maximum 72 hours) or a temporary crash cushion.
- Protect the approach end of the temporary traffic barrier system from oncoming traffic at all times by a temporary crash cushion unless the approach end of the temporary traffic barrier system is offset from oncoming traffic as follows:

<b>Posted speed limit (mph)</b>	<b>Minimum offset (feet)</b>
40 or less	15
45 - 50	20
55	25
60 mph or higher	30

- The Design-Build Team shall minimize the presence of portable concrete barrier along acceleration ramps / loops. The Design-Build Team shall provide the duration in which the portable concrete barrier is present along acceleration ramps / loops in the Technical Proposal. The Technical Score for Traffic Control will be affected by the duration.
- The Design-Build Team shall be responsible for providing proper connection between the existing bridge rails and temporary barrier systems and include this information in the appropriate plans.

#### **F. Traffic Control Devices**

The Design-Build Team shall use traffic control devices that conform to all NCDOT requirements and are listed on the Approved Products List. The Approved Products List is shown on NCDOT's Work Zone Traffic Control website at <http://www.ncdot.org/doh/preconstruct/wztc/>. The use of any devices that are not shown on the Approved Product List shall require written approval from the Transportation Program Management Director prior to incorporation.

Channelizing device spacing shall not exceed a distance in feet equal to twice the posted speed limit. Channelization devices shall be spaced 10 feet on-center in radii. Skinny drums shall only be allowed as defined in Section 1180 of the NCDOT 2012 *Standard Specifications for Roads and Structures*.

Place Type III barricades, with "ROAD CLOSED" signs (R11-2) attached, of sufficient length to close entire roadway. Stagger or overlap barricades to allow for ingress or egress.

Place sets of three drums perpendicular to the edge of the travelway on 500-foot centers when unopened lanes are closed to traffic. These drums shall be in addition to channelizing devices.

When a CMS is placed within the clear zone, provide proper delineation and protection for the traveling public.

#### **G. Temporary Pavement Markings, Markers and Delineation**

The Design-Build Team shall show temporary pavement marking on the Traffic Control Plan that meet the requirements of the RFP and the *Guidelines for Preparation of Traffic Control and Pavement Marking Plans for Design-Build Projects*.

The Design-Build Team shall use pavement marking and marker products that conform to all NCDOT requirements and are listed on the NCDOT Approved Products List. The use of any devices that are not shown on the NCDOT Approved Products List shall require approval from the Transportation Program Management Unit Director prior to incorporation.

The Design-Build Team shall install pavement markings and markers in accordance with the NCDOT 2012 *Standard Specifications for Roads and Structures*, and in accordance with the manufacturer's procedures and specifications.

The Design-Build Team shall install temporary pavement markings that are the same width as existing pavement marking on all roadways, except that 6 inch markings shall be used on US-52. For roadways that do not have existing pavement marking, install temporary pavement markings that are the same width as required in the Pavement Marking Scope of Work for the final pavement marking.

The Design-Build Team shall install temporary pavement markings and temporary pavement markers on the interim surface or temporary pattern as follows:

<b>Road</b>	<b>Marking</b>	<b>Marker</b>
All Roads	Any Marking on the Approved Product List	Raised Temporary
All Structures	Cold Applied Plastic Type 4 - Removable Tape	Raised Temporary

The Design-Build Team may use any type of pavement markings on the NCDOT Approved Products List for temporary patterns. However, the Design-Build Team shall maintain a minimum retroreflectivity for pavement markings on all roads (existing and temporary markings) at all times during construction, as follows:

White:	125 mcd / lux / m <sup>2</sup>
Yellow:	100 mcd / lux / m <sup>2</sup>

When using Cold Applied Plastic (Type IV) pavement markings, place temporary raised markers half on and half off edgelines and centerlines to help secure the tape to the roadway. Markers shall be spaced the appropriate distance apart as described by the 2012 *Roadway Standard Drawing* 1250.01, Sheet 1 of 3.

Tie proposed pavement marking lines to existing pavement marking lines.

Remove / Replace any conflicting / damaged pavement markings and markers by the end of each day's operation.

Prior to opening a roadway to traffic on facilities that the installation of a proposed monolithic island has not occurred, outline the location of the proposed monolithic island with the proper color pavement marking.

The Design-Build Team shall not place temporary markings other than Cold Applied Plastic Type 4 – Removable Tape on any final pavement surface unless the temporary markings are placed in the exact location of the final pavement markings.

Unless noted otherwise in this RFP, removal of the temporary pavement markings on asphalt surfaces shall be accomplished by an NCDOT approved system to minimize

damage to the road surface. Temporary pavement markings shall not be obliterated with any type of Black Pavement Markings (paint or other material). The Design-Build Team shall remove all temporary pavement markings without removing more than 1/32 inch of the pavement surface.

#### **H. Temporary Traffic Signals**

Use the following notes if the Design-Build team recommends using temporary signals for maintenance of traffic. All recommended traffic signals must be approved by the Regional Traffic Engineer before implementation.

- Notify the Engineer in writing a minimum of two months before a traffic signal installation is required.
- Shift and revise all signal heads as shown on the accepted Design-Build Signal Plans.

#### **I. Towing of Disabled Vehicles**

The work covered by this section consists of furnishing on call towing services for all disabled vehicles displaying a lime green sticker within the US 52 construction limits and ½-mile beyond the US 52 construction limits in each direction.

The Design-Build Team shall provide a towing service that relocates disabled vehicles to secure pre-arranged locations outside of the project limits and off NCDOT right of way. The Design-Build Team shall provide tow vehicles capable of towing automobiles and light trucks (up to 10,000 pound gross vehicle weight) and medium and heavy-duty trucks (greater than 10,000 pound gross vehicle weight). All tow vehicles shall be able to tow using the "wheel lift" method and the conventional boom lift method.

The Design-Build Team shall immediately place a lime green Tow Sticker (provided by the Department) on all disabled vehicles. The Design-Build Team shall provide pertinent information on the sticker, including the designated tow location and the signature and agency of the person authorizing the tow.

A disabled vehicle shall be towed within **15 minutes** of placement of the lime green Tow Sticker. Only tow vehicles displaying a lime green sticker.

For all vehicles towed, the Design-Build Team shall keep a record of the approximate vehicle location, vehicle type, including make and color, and the vehicle license plate number. Maintain a record of the information on the Tow Stickers, including the exact time the vehicle was removed and the exact location of where the vehicle was towed. Immediately give this information to the Resident Engineer. Within 30 minutes of a vehicle being towed, the Design-Build Team shall contact the Highway Patrol and provide them with all the information necessary for the Highway Patrol Database.



Prior to any construction, the Design-Build Team shall arrange and attend a towing coordination meeting. The Design-Build Team shall coordinate this meeting with the Division and the Transportation Program Management Director. The meeting shall determine where vehicles will be towed, confirm towing requirements and determine how specific towing information will be conveyed to the appropriate personnel.

The towing service shall commence the date construction begins and shall be provided on each day of active construction. Prior to beginning construction on any given day, tow disabled vehicles prior to beginning work. The towing service base of operations shall have a publically accessible published telephone number that shall be manned, or have call forwarding to an employee on call, during the aforementioned towing service operation times. The towing service base of operation shall have an answering service at all other times.

If the Design-Build Team provides a project website, towing operation information shall be displayed on the website. This information shall include, but not be limited to, vehicle tow locations, reasons for work zone towing, time frame allowed before the abandoned vehicle will be towed, how to retrieve the vehicle and any necessary phone numbers for retrieval.

#### **J. Traffic Control Supervisor**

The Design-Build Team shall provide the service of at least one qualified Traffic Control Supervisor for the project in accordance with Section 1101-13 of the Standard Specifications for Roads and Structures.

The Traffic Control Supervisor shall be knowledgeable of Traffic Control Plan design, devices and application, and has full authority to ensure traffic is maintained in accordance with the plans and specifications.

The Design-Build Team shall identify a Traffic Control Supervisor in their Technical Proposal that has the following qualifications:

The Traffic Control Supervisor for the project shall be capable of performing the following:

- (1) Be available and on call at all times to direct / make any necessary changes in the traffic control operations in a timely and safe manner. The Design Build Team shall provide the Engineer with back up contacts for times when the Traffic Control Supervisor is not available at the project.
- (2) Coordinate and cooperate with traffic control supervisors of adjacent, and overlapping construction projects, as well as construction projects in proximity to the subject project, to ensure safe and adequate traffic control setup is maintained throughout the project at all times, including periods of construction inactivity.
- (3) Coordinate and cooperate with Forsyth County Maintenance Engineer in the event of a serious backup or incident on US 52.

- (4) Coordinate and cooperate with personnel at the Metrolina and Triad Traffic Management Centers and the City of Winston Salem Transportation Department to ensure proper messages are displayed on the CMSs and DMSs.
- (5) Provide traffic control setup that ensures safe traffic operations and workers' safety throughout the construction area.
- (6) Attend all scheduled incident management, traffic control coordination, and team meetings, as required by the Engineer.
- (7) Monitor traffic delays and backups within the work zone.
- (8) Coordinate and cooperate with personnel from City of Winston-Salem Transportation Department.
- (9) The above requirements are the primary responsibilities of the TC supervisor. Any other functions that are assigned by Design Build Team to the TC supervisor shall be secondary to the Traffic control duties.

#### **K. Miscellaneous**

Provide portable temporary lighting to conduct night work in accordance with the NCDOT 2012 *Standard Specifications for Roads and Structures*.

Provide proper drainage for all temporary alignments and / or traffic shifts.

Law enforcement officers may be used to maintain traffic through the work area and / or intersections. Law enforcement officers shall be used during any rolling road block operations and to direct traffic when installing/removing/shifting traffic signal heads at intersections. The Design-Build Team shall:

- Be responsible for coordinating with the law enforcement agency for the use of law enforcement officers.
- Only utilize officers who are outfitted with law enforcement uniforms and marked vehicles, which are equipped with proper lights mounted on top of the vehicle and agency emblems.

In the Technical Proposal, the Design-Build Team shall address where and how law enforcement officers will be used.

The Design-Build Team may request a \$250 speeding penalty ordinance for this project for US 52.

The Design-Build Team shall request a No Parking - Tow Away Zone ordinance for US 52 through the City of Winston-Salem Transportation Department. "No Parking, Tow Away Zone" Signs shall be installed before any towing is allowed on US 52.

Coordinate with the Contractor and NCDOT Resident Engineer in charge of any project in the vicinity of this project for any work that may affect the construction and the temporary traffic control of this project.

Coordinate with the Contractor and NCDOT Resident Engineer in charge of any project in the vicinity of this project to determine the placement of advance warning signs on all roads within the project limits.

The Design-Build Team shall be responsible for all required temporary shoring, including but not limited to providing, installing, maintaining and removing. Temporary shoring for the maintenance of traffic is defined as shoring necessary to provide lateral support to the side of an excavation or embankment parallel to an open travelway when a theoretical 2:1 (H:V) slope from the bottom of the excavation or embankment intersects the existing ground line closer than 5 feet from the edge of pavement of the open travelway. The Design-Build Team shall identify locations where “temporary shoring for maintenance of traffic” will be required on the Traffic Control Staging Concept. The Design-Build Team shall install temporary traffic barrier as shown on the “PCB at Temporary Shoring Locations” detail available on the Work Zone Traffic Control Section website. This detail provides design information on the temporary traffic barrier location in relation to the temporary shoring and traffic location. The NCDOT Geotechnical Engineering Unit website has more information on temporary shoring. (Notes related to Temporary Shoring are not required in the General Notes sheet for the Traffic Control Plans)

**<http://www.ncdot.org/doh/preconstruct/highway/geotech/formdet/standards.html>**

The Design-Build Team shall identify on the appropriate traffic control detail where temporary shoring will be used by providing station limits, offsets, type of shoring and where temporary traffic barrier will be located, if needed.

The Design-Build Team shall coordinate with the Engineer and the Work Zone Traffic Control Section to schedule and attend Traffic Safety and Operations Meetings. These meetings are held to monitor and assess safety and mobility during construction. The Traffic Safety and Operations Meetings may be held on monthly or on as needed basis during construction of the project. Additional Traffic Safety and Operations Meetings may be held to address any specific issue, as directed by the Engineer.

**PAVEMENT MARKINGS SCOPE OF WORK** (7-6-12)**General**

The Design-Build Team shall prepare Final Pavement Marking Plans in accordance with the *Manual on Uniform Traffic Control Devices (MUTCD)* effective on the Technical Proposal submittal date, the 2012 NCDOT Roadway Standard Drawings, *Guidelines for Preparation of Traffic Control and Pavement Marking Plans for Design-Build Projects* the *Design-Build Submittal Guidelines* and the contract requirements contained herein.

**Final Pavement Marking Plan Requirements**

The Design-Build Team shall select a Private Engineering Firm (PEF) that has experience designing and sealing Pavement Marking Plans for NCDOT on comparable projects.

The Design-Build Team shall develop Pavement Marking Plans that maintain all types of traffic (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) as defined by the *Manual for Uniform Traffic Control Devices*.

The Design-Build Team shall show and station all curb ramps in the Pavement Marking Plans (signalized and non-signalized intersections and / or points of pedestrian crossings). Curb ramps shall be constructed per current ADA standards with guidance from the Roadway Standard Drawings. If the roadway geometry does not allow for the use of the standard details provided, contact Contract Standards & Development Unit with the Department for alternative approved curb ramp designs.

The Design-Build Team shall provide stamped and colored asphalt crosswalks along Salem Creek Connector, City Yard Drive and Diggs Boulevard. The aforementioned crosswalks shall consist of six-inch tile patterns, colored Santa Fe Clay, that are banded with eight-inch wide white crosswalk band markings.

**Final Pavement Marking Project Limits**

The Final Pavement Marking Plan shall address any required modifications to existing pavement markings located outside the project limits to ensure appropriate tie-ins. The Design-Build Team shall install all pavement markings and markers located within and outside the project limits, resulting from the project construction.

The Design-Build Team shall only remove pavement markings from concrete surfaces by hydroblasting.

**Pavement Markings, Markers and Delineation**

The Design-Build Team shall not place any final pavement markings or markers until the Final Pavement Marking Plans have been accepted by the Department.

The Design-Build Team shall use pavement marking and marker products that conform to all NCDOT requirements and are listed on the NCDOT's Approved Products List. The use of any devices that are not shown on the Approved Product List shall require written approval from the Engineer.

The Design-Build Team shall install pavement markings and markers in accordance with the NCDOT 2012 *Standard Specifications for Roads and Structures*, and in accordance with the manufacturer's procedures and specifications.

The Design-Build Team shall install pavement markings and pavement markers on the final surface as follows:

<b>Road</b>	<b>Marking</b>	<b>Marker</b>
-L- and -Y2- (US 52)	Polyurea with Highly Reflective Elements	Snowplowable
All other -Y- Lines	Same as above	Match existing

On asphalt surfaces, the Design-Build Team shall install Heated-in-Place Thermoplastic or Extruded Thermoplastic markings for stop bars, symbols, crosswalk bands, characters and diagonals.

On concrete surfaces, the Design-Build Team shall install Cold Applied Plastic Tape (Type II or Type III) or Heated-in-Place Thermoplastic for stop bars, symbols, crosswalk bands, characters and diagonals.

The Design-Build Team shall tie proposed pavement marking lines to existing pavement marking lines.

The Design-Build Team shall replace any pavement markings that have been damaged by the end of each day's operation.

Using approved methods, the Design-Build Team shall remove all residue and surface laitance on concrete bridge decks prior to placing polyurea pavement marking materials.

**RIGHT OF WAY SCOPE OF WORK** (7-5-12)

Excluding acquisition services required outside of the project construction limits due solely to a rise in the floodplain water elevation on insurable structures, the Design-Build Team shall employ qualified, competent personnel who are currently **approved by the NCDOT Right of Way Branch**, herein after referred to as the Department, to provide all services necessary to perform all appraisal, appraisal review, negotiation and relocation services required for all right of way and easements, including but not limited to permanent utility easements, necessary for completion of the project in accordance with G.S. 136-28.1 of the General Statutes of North Carolina, as amended, and in accordance with the requirements set forth in the *Uniform Appraisal Standards and General Legal Principles for Highway Right of Way*, the *North Carolina Department of Transportation's Right of Way Manual*, the *North Carolina Department of Transportation's Rules and Regulations for the Use of Right of Way Consultants*, the *Code of Federal Regulations*, and *Chapter 133 of the General Statutes of North Carolina from Section 133-5 through 133-18*, hereby incorporated by reference, including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. For a list of firms currently approved, the Design-Build Team should contact Mr. Neal Strickland, in the NCDOT Right of Way Branch, at 919-707-4364. The Design-Build Team shall perform the services as set forth herein and furnish and deliver to the Department reports accompanied by all documents necessary for the settlement of claims and the recordation of deeds, or necessary for condemnation proceedings covering said properties. The Design-Build Team, acting as an agent on behalf of the State of North Carolina shall provide right of way acquisition services for TIP U-2925 in Forsyth County.

Acquisition services required outside of the project construction limits due solely to a rise in the floodplain water elevation on insurable structures will be considered extra work and paid for in accordance with Article 104-7 of the 2012 *Standard Specifications for Roads and Structures*.

**The Design-Build Team shall carry out the responsibilities as follows:**

- With respect to the payments, costs and fees associated with the acquisition of right of way in this contract, the Department will be responsible for only direct payments to property owners for negotiated settlements, recording fees, any relocation benefits, and deposits and fees involved in the filing of condemnation of any claims. The Department will assume responsibility for all costs associated with the litigation of condemned claims, including testimony by the appraiser(s). The Design-Build Team shall be responsible for all other acquisition related payments, costs and fees, including but not limited to attorney fees required for all non-condemnation acquisitions.
- A Department representative will be available to provide technical guidance on right of way acquisition procedures and to make timely decisions on approving relocation benefits and approving administrative adjustment settlements on behalf of the Department over and above the authority granted to the Department Right of Way Consultant Project Managers.

- The Design-Build Team shall submit a right of way project tracking report and right of way quality control plan to the Department. The Department standard forms and documents shall be used to the extent possible.
- The Design-Build Team shall provide a current title certificate for each parcel as of the date of closing or the date of filing of condemnation, unless required otherwise in the Department's Right of Way Manual.
- The Design-Build Team shall prepare all Final Condemnation Reports.
- The following shall be required:
  - The Design-Build Team shall prepare, execute and record documents conveying title to acquired properties to the Department with the Register of Deeds
  - The Design-Build Team shall deliver all executed and recorded deeds and easements to the Department.
  - For all property purchased in conjunction with the project, title shall be acquired in fee simple or easement and shall be conveyed to “The North Carolina Department of Transportation”, free and clear of all liens and encumbrances except permitted encumbrances.
- It is understood and agreed by and between the parties hereto that all reports, surveys, studies, specifications, memoranda, estimates, etc., secured by and for the Design-Build Team shall become and remain the sole property of the Department upon termination or completion of the work, and the Department shall have the right to use same for any public purpose without compensation to the Design-Build Team.
- The Design-Build Team shall prepare appraisals in accordance with the Department's *Uniform Appraisal Standards and General Legal Principles for Highway Right of Way Acquisitions*. The Design-Build Team's appraiser shall be on the Department's approved state certified appraiser list. The Design-Build Team may request its state certified appraiser be added to the approved state certified appraiser list, subject to approval by the Department's State Appraiser.
- The Design-Build Team shall provide appraisal reviews complying with The Department's *Uniform Appraisal Standards and General Legal Principles for Highway Right of Way Acquisitions*. The reviewer shall determine that the appraisal meets the Department's guidelines and requirements, conforms to acceptable appraisal standards and techniques, does not include any non-compensible items or exclude any compensible items and that the value conclusions are reasonable and based on facts presented in the appraisal. The reviewer has the authority to approve, adjust, request additional data or corrections, or not to recommend and request another appraisal. The reviewer has the authority to approve appraisals not in excess of \$750,000.00. All appraisals showing compensation in excess of \$750,000.00 shall be referred to the Department's State Appraiser for approval, with the written

recommendation of the reviewer. The Design-Build Team's reviewer shall be on the Department's approved state certified reviewer appraiser list. The Design-Build Team may request its state certified review appraiser to be added to the approved state certified reviewer appraiser list, subject to approval by the Department's State Appraiser. Any appraisal over \$1,000,000.00 must have two appraisals.

- The Design-Build Team shall provide a right of way certification prior to entering the property.
- The Design-Build Team shall prepare Value Findings and / or Narrative Appraisals for all right of way and easement acquisitions. Claim Reports will not be allowed for any acquisition.



**UTILITIES COORDINATION SCOPE OF WORK** (8-17-12)

The Design-Build Team shall obtain the services of a Private Engineering Firm (PEF) knowledgeable in the NCDOT Utility Coordination Process involved with utility relocation / installation and highway construction. The Design-Build Team shall be responsible for coordinating all utility relocations, removals, and / or adjustments where the Design-Build Team and Utility Company, with concurrence from the Department, determine that such work is essential for highway safety and performance of the required highway construction. Coordination shall be for all utilities whether or not they are specifically identified in this scope of work and shall include any necessary utility agreements when applicable. NCDOT will be the approving authority for all utility agreements and approval of plans.

**Cost Responsibility**

The Design-Build Team shall be responsible for all costs associated with relocating water and sewer facilities.

Unless otherwise noted above, The NCDOT will be responsible for all other non-betterment utility relocation cost when the utility company has prior rights of way / compensable interest. The utility company shall be responsible for the relocation costs if they can not furnish evidence of prior rights of way or a compensable interest in their facilities. The Design-Build Team shall be responsible for determining the cost responsibility for the utility relocations. The Design-Build Team shall be responsible for all costs associated with utility relocations due to haul roads and / or any other temporary conditions resulting from the Design-Build Team's methods of operation or sequence of work. NCDOT will be the approving authority for all utility agreements and approval of plans

**Project Details**

The Design-Build Team shall be responsible for verifying the utility locations, type of facilities, and identifying the utility owners in order to coordinate the relocation of any utilities, known and unknown, in conflict with the project. The following utilities are known to be located within the project construction limits:

<b>Utility Owner</b>	<b>Utility Type</b>	<b>Cost Responsibility</b>
Duke Energy Distribution and Transmission	Power	NCDOT
DukeNet Communications	Telecommunications	Utility Owner
Piedmont Natural Gas	Gas Line	Utility Owner
AT&T	Telecommunications	Utility Owner
CenturyLink/Embarq	Telecommunications	Utility Owner
Winston-Salem Forsyth W&S	Water and Sewer	Utility Owner (Utility Owner will reimburse NCDOT)
Time Warner Cable	Cablevision	Utility Owner
Level 3 Communications	Telecommunications	Utility Owner

## **Water and Sewer**

If the Design-Build Team's design and / or construction requires the relocation and / or encasement of existing water or sewer facilities, designs shall be coordinated with the NCDOT Utility Coordination Unit. All costs associated with the design and construction for relocation and / or encasement of these existing water and / or sewer facilities shall be the responsibility of the Design-Build Team and shall be included in the lump sum bid for the project. The Design-Build Team shall develop designs; prepare all plans for needed agreements and permits; submit permits directly to the agencies and obtain approval from the agencies. The Design-Build Team shall be responsible for all permit fees.

Designs shall be coordinated with the NCDOT Utility Coordination Unit. The Design-Build Team shall be responsible for submitting five (5) sets of 11 x 17 utility construction drawings to the State Utility Agent, via the Transportation Program Management Director, for further handling. Each set shall include a title sheet, plan sheets, profiles and special provisions if required. Once approved by the State Utility Agent, the plans, with the appropriate agreement, will be sent out to Winston-Salem/Forsyth Utilities for their review and concurrence.

The relocation of all water and sewer facilities shall be done in accordance with the NCDOT policies. The materials and appurtenances proposed by the Design-Build Team shall require approval by both NCDOT and Winston-Salem/Forsyth Utilities Commission prior to installation. The Design-Build Team will not be allowed to install PVC or plastic pipe for water or sewer facilities.

## **Utility Relocation Plans**

In the event of a utility conflict, the Design-Build Team shall request that the utility company submit relocation plans (Highway Construction Plans to be provided by the Design-Build Team to Utility Owners) that show existing utilities and proposed utility relocations for approval by the NCDOT.

The Design-Build Team shall submit (3) three copies of the Utility Relocation Plans to the NCDOT State Utility Agent, via the Transportation Program Management Director, for review and approval prior to relocation work beginning. The Design-Build Team shall also be responsible for submitting the appropriate agreements to be used with the Utility Relocation Plans (See Agreements found elsewhere in this scope of work). After the review process is complete, the NCDOT Utility Coordination Unit will submit one (1) copy of the Utility Relocation Plans, executed agreements and any necessary comments back to the Design-Build Team. The NCDOT Utility Coordination Unit will also submit a copy of the approved Utility Relocation Plans to the Department's Resident Engineer. If the Utility Relocation Plans are approved subject to changes, it shall be the Design-Build Team's responsibility to coordinate these changes with the appropriate utility company.

### **Compensable Interest**

Typically, affidavits, recorded easements or NCDOT agreements can serve as evidence of prior rights. A compensable interest is identified as follows:

- (A) Existing or prior easement rights within the limits of the project, either by recorded right of way or adverse possession (Utility occupying the same location for twenty (20) plus years outside the existing highway rights of way).
- (B) Entities covered under *General Statute 136-27.1* and *136-27.2*. Statute requires the NCDOT to pay the non-betterment cost for certain water, sewer and gas relocations.
- (C) Utilities that have a joint-use agreement that constitutes a compensable interest with entities that have existing or prior easements rights within the project limits.

### **Work Performed by Design-Build Team for Utility Owners**

If the Design-Build Team elects to make arrangements with a Governmental Agency or any other utility owner for proposed utility construction, in which the Agency / Utility Owner shall be responsible for the costs of work to be performed by the Design-Build Team, the Design-Build Team shall be responsible for negotiating all costs associated with the proposed construction. Once the Design-Build Team and the Agency / Utility Owner agree on a plan and a lump sum estimated cost for the utility construction, the Design-Build Team shall be responsible for submitting five (5) sets of 11 x 17 utility construction drawings to the State Utility Agent, via the Transportation Program Management Director, for further handling. Each set shall include a title sheet, plan sheets, profiles and special provisions if required. Also, a letter from the Agency / Utility Owner agreeing to the plans and lump sum cost must accompany this package. The NCDOT will reimburse the Design-Build Team the estimated lump sum cost under a Supplemental Agreement. The necessary Utility Agreement to the Agency / Utility Owner for reimbursement shall be a two party agreement between the NCDOT and the Agency / Utility Owner; and will be developed and executed by the Department.

If the Design-Build Team is requested, in writing, by a utility company to relocate facilities not impacted by the project's construction, and / or upgrade or incorporate new facilities as part of the highway construction, designs shall be coordinated with the Utility Owner and NCDOT Utility Coordination Unit. The associated design and construction costs shall be negotiated and agreed upon between the Design-Build Team and the utility company. The Design-Build Team shall develop designs; prepare all plans for needed agreements and permits; submit permits directly to the agencies and obtain approval from the agencies. The Design-Build Team shall be responsible for all permit fees.

**Cable TV**

The cost in relocating CATV due to the highway construction shall be the responsibility of the CATV Company; however, under the following conditions the **Department will** bear the relocation expense:

- (A) If the CATV Company can validate a recorded easement for facilities outside the maintained NCDOT rights of way.
- (B) The adjustment is needed on existing utility poles to accommodate a proposed NCDOT Traffic Management System Fiber Optic Communication Cable Project.

The NCDOT will not permit CATV to place poles within the highway rights of way but will allow down guys for their facilities within the highway rights of way. Under most circumstances, the CATV Company will continue a joint-use attachment with the local Power and Telephone Company. If the CATV proposed relocation places buried facilities within the highway rights of way then plans and encroachment agreements shall be required by the NCDOT.

**Communication Cables/Electrical Services for Lighting, Signing and ITS Devices:**

Prior to establishing the location for new meter poles, the Design Build Team shall coordinate with the local Power Distribution company concerning accessibility of E/C service and safety in maintenance of the meter.

All service taps that require a parallel installation within the C/A shall require plans for review and approval by the NCDOT prior to installation.

Preferably, parallel service installations within a C/A shall be buried and located as close to the R/W line as practical. However, due to unusual circumstances the NCDOT may approve aerial installations.

The Design Build Team shall be responsible for any cost concerning service taps provided by the utility company.

**Adjusting Existing Utilities due to Proposed Traffic Management Systems Fiber Optic Communications Cables:**

The Design Build Team shall be responsible for all costs for coordinating and adjusting any utilities that are in conflict with any proposed ITS or signal communication cables.

**Requirements for attachments to existing and / or proposed structures**

The Design-Build Team shall avoid attachments to structures where feasible. Attachments shall only be considered when other alternatives are cost prohibitive and / or are not feasible due to

environmental or geographical features. Attachments shall be prohibited under the following conditions:

- (A) Unless noted otherwise elsewhere in this RFP, no attachments shall be allowed to a bridge located parallel within the C/A carrying the freeway over streams, other roadways or railroads. (No parallel utility installations within the C/A)
- (B) Unless noted otherwise elsewhere in this RFP, no attachments shall be allowed to cored-slab bridges.
- (C) Unless noted otherwise elsewhere in this RFP, no attachments shall be allowed to curved bridges.

Attachments to structures, if allowed, shall meet the following criteria:

- (A) No attachments shall be allowed below the bottom of the beams and / or girders.
- (B) Drilling of, or attachments to, beams and / or girders shall not be allowed. Attachments shall only be allowed to the bottom of the bridge deck.
- (C) For water and sewer force mains, only restrained joint ductile iron pipe shall be allowed.
- (D) A minimum of 18" of clearance to beams and / or girders shall be maintained if possible.

Documentation of adverse conditions or cost estimates of all feasible alternatives shall be submitted to the NCDOT State Utility Agent, via the Director of Transportation Management, when seeking approval of a structure attachment. Cost estimates shall consider all costs involved with each alternative and impacts to the utility and the highway project as a whole.

## **General**

The Design-Build Team shall not commence work at points where the highway construction operations are adjacent to utility facilities, until making arrangements with the utility company to protect against damage that might result in expense, loss, disruption of service or other undue inconvenience to the public or utility owner. The Design-Build Team shall be responsible for damage to the existing or relocated utilities resulting from the Team's operations. In the event of interruption of any utilities by the project construction, the Design-Build Team shall promptly notify the proper authority (Utility Company) and cooperate with the authority in the prompt restoration of service.

The Design-Build Team shall accommodate utility adjustments, reconstruction, new installation and routine maintenance work that may be underway or take place during the progress of the contract.

If total property acquisition is unavoidable due to encroachment into wells and / or septic systems, then the Design-Build Team shall investigate and determine if extending water and / or sewer lines to the affected property is cost effective. If the Department concurs with the determination that a utility extension is cost effective, the costs associated with the utility construction shall be addressed in accordance with Article 104-7 of the Standard Specifications.

The Design-Build Team shall make arrangements to relocate water, sewer, or gas line facilities in which the entities are covered under General Statute 136-27.1 or 136-27.2 and/or occupy a compensable interest. Unless noted otherwise elsewhere in this RFP, the non-betterment costs associated with this work shall be borne by the Design-Build Team.

The Design-Build Team shall be required to use the guidelines as set forth in the following:

- (A) *NCDOT Utility Manual - Policies & Procedures for Accommodating Utilities on Highway Rights of Way*
- (B) *Federal Aid Policy Guide - Subchapter G, Part 645, Subparts A & B*
- (C) *Federal Highway Administration's Program Guide, Utility Adjustments & Accommodations on Federal Aid Highway Projects*
- (D) *NCDOT Construction Manual Section 105-8*
- (E) *NCDOT Right of Way Manual - Chapter 16 Utility Relocations*
- (F) *NCDENR Public Water Supply - Rules governing public water supply*
- (G) *NCDENR Division of Water Quality - Title 15A - Environment and Natural Resources*

## **Agreements**

If a utility company can provide evidence of prior rights of way or a compensable interest in their facilities, the Design-Build Team shall coordinate the non-betterment utility relocation costs with the utility company and develop the Utility Relocation Agreement and / or Encroachment Agreement.

The NCDOT State Utility Agent must execute approved agreements on Design-Build highway projects. The Utility Relocation Agreements (Cost Agreement) and Encroachment Agreements are available from the NCDOT Utility Coordination Unit. Reference Pages 59 and 60 of the *NCDOT Utility Manual on Policies & Procedures for Accommodating Utilities on Highway Rights of Way* for the different types of Encroachment Agreements available for use.

The Design-Build Team shall be required to utilize the NCDOT Standard Utility Encroachment Agreements as necessary in relocating utilities. The Encroachment Agreements shall be used under the following conditions:

- (A) If a utility company is not occupying a valid right of way / compensable interest and the proposed relocation will place the relocated utilities within the existing or proposed highway rights of way.
- (B) For **all** new utility installations within the existing or proposed highway rights of way. This includes all water, sewer and gas lines owned by entities covered under *General Statute 136-27.1* and *136-27.2*.
- (C) In either case above, the Design-Build Team shall submit 5 copies of the encroachment plans plus 2 originals and 3 copies of the encroachment agreement to the NCDOT State Utility Agent, via the Transportation Program Management Director, for approval.

**SIGNING SCOPE OF WORK** (8-7-12)**General**

The Design-Build Team shall prepare Signing Plans in accordance with the *Manual on Uniform Traffic Control Devices (MUTCD)* effective on the Technical Proposal submittal date, the 2011 *NC Supplement to the MUTCD*, *NCDOT Standard Specifications for Roads and Structures* (January 2012), the NCDOT Roadway Standard Drawings (January 2012) for the design and development of Signing Plans, the latest Standard Specifications for *Structural Supports for Highway Signs, Luminaires, and Traffic Signals* published by AASHTO, “*Guidelines for Preparation of Signing Plans for Design-Build Projects*”, the “*Design-Build Submittal Guidelines*” and the contract requirements contained herein.

**Signing Plan Requirement**

The Design-Build Team shall select a Private Engineering Firm (PEF) that has experience in designing and sealing Signing Plans for NCDOT on projects comparable to this project. The Technical Proposal shall list projects, where Signing Plans were developed by the PEF, including description and similarity to the subject project.

**Signs Furnished by Design-Build Team**

The Design-Build Team shall furnish signs in accordance with the specifications provided by the NCDOT.

**Signing Project Limits**

The Design-Build Team shall be responsible for the design, fabrication and installation of all signs required through the construction limits of the mainline, all -Y- Lines, all roundabouts and all cul-de-sacs. The Design-Build Team shall also be responsible for the design, fabrication and installation of all signs required beyond the construction limits of the mainline, all -Y- Lines, all roundabouts and all cul-de-sacs to ensure adequate advance signage and spacing is provided.

The Design-Build Team shall design, fabricate and install Advance Guide Signs for the Salem Creek Connector interchange on northbound and southbound US 52.

The Design-Build Team shall remove and dispose of Stadium Drive interchange signs.

The posted speed limit for the -L- Line (Salem Creek Connector) shall be 35 mph. The posted speed limit for -Y2- (US 52) shall be 55 mph.

**Sign Design**

The Design-Build Team shall be responsible for the design, fabrication and installation of all signs required for the mainline, as well as all -Y- Lines, roundabouts, and cul-de-sacs. The Design-Build Team shall be responsible for all Type A, B and D sign designs, fabrications and installations for



ground mounted signs. The Design-Build Team shall be responsible for sizing, fabricating, locating and installing all Type E (warning and regulatory signs), Type F signs (route marker assemblies) and milemarkers.

Within the project limits, the Design-Build Team shall design, fabricate and install milemarkers every mile on the US 52 outside shoulders. Each milemarker location shall have a milemarker, mounted on one U-Post, for each direction of travel. The milemarker designs shall be in accordance with the Intermediate Enhanced Reference Location Signs (D10-4) referenced in the *Standard Highway Signs* (2004 Edition).

All sign designs shall be included in the Signing Plans. All sign designs shall be prepared using the latest version of GuideSign software. The latest GuideSign updates are located at the following website:

<http://www.ncdot.org/doh/preconstruct/traffic/congestion/SIGN/default.html>

### **Sign Maintenance**

The Design-Build Team shall maintain all existing signs during construction, including temporary installations of Guide Signs on supports to ensure signs are properly maintained and visible during project construction. The Design-Build Team shall be responsible for designing and installing temporary sign supports.

### **Temporary Signs**

The Design-Build Team shall design, fabricate and install all temporary signs and supports. (Reference the Signing Section of the Traffic Management Scope of Work found elsewhere in this RFP for additional temporary signing requirements.)

### **Sign Locations**

The Design-Build Team shall be responsible for determining the station locations for all signs. To avoid sign placement in locations where their usefulness will be short-lived, the Design-Build Team shall coordinate the proposed sign designs and locations with the Department.

### **Ground Mounted Supports**

Unless otherwise approved by the Engineer, ground mounted signs on a freeway or expressway, with breakaway or yielding supports, shall be located a minimum of 30 feet from the edge of the outside travel lane to the nearest edge of the sign. All other ground mounted signs on a freeway or expressway shall be positively protected.

NCDOT will provide the software for ground mounted sign support designs. The Design-Build Team shall be responsible for all design, fabrication and installation of ground mounted supports and signs. Instructions for loading support design software will be made available upon request.

Exit gore signs shall be erected on omni-directional breakaway supports.

### **Signing Roadway Standards, Typical Sheets and Specifications**

Signing roadway standards and typical sheets to be used in summarizing quantities, standard specifications, and compiling Type E and F signs can be located at the following website:

<http://www.ncdot.org/doh/preconstruct/traffic/congestion/SIGN/default.html>

The Design-Build Team shall incorporate the appropriate information onto these sheets and submit them to the Transportation Program Management Director for review and acceptance.

### **Removal and Disposal of Existing Signs**

The Design-Build Team shall be responsible for determining those existing signs that will no longer be needed upon completion of the project, such as on -Y- Lines and project tie-ins. The Design-Build Team shall be responsible for removal and disposal of these signs and supports. The Design-Build Team shall show and note these signs on the signing plan view sheets.

### **Construction Revisions**

After submittal of RFC Signing Plans, all construction revisions shall be submitted to NCDOT for review and acceptance prior to incorporation.

**TRAFFIC SIGNALS SCOPE OF WORK** (8-24-12)**I. GENERAL**

The Design-Build Team shall design and prepare plans for the traffic signal installations. This work shall include, but not be limited to, the preparation of Traffic Signal Plans, Metal Pole Loading Diagrams, Electrical and Programming Details, Utility Make-Ready Plans, Communications Cable & Conduit Routing Plans and Project Special Provisions. These plans shall be prepared in accordance with the *Design-Build Submittal Guideline* and the *Guidelines for Preparation of Traffic Signal & Intelligent Transportation System Plans on Design-Build Projects* available on NCDOT's website.

The Design-Build Team shall select a Private Engineering Firm (PEF) that has experience designing ITS & Signal Plans for NCDOT on comparable projects. The Technical Proposal shall list projects, including description and similarity to the subject project, for which the PEF has developed ITS & Signal Plans.

A pre-design meeting shall take place between the NCDOT ITS & Signals Unit, the NCDOT Division 9 Traffic Engineer, the Design-Build Team, the City of Winston-Salem Transportation Department and any other pertinent NCDOT personnel before signal designs begin. ITS & Signal Plan submittals shall only be reviewed and accepted by the Department after this pre-design meeting. The Design-Build Team shall concurrently provide plan submittals to the Department and the City of Winston-Salem Transportation Department. However, the Department will ultimately be responsible for the traffic signal submittal reviews and comments.

The Design-Build Team shall coordinate and implement all signal designs at appropriate time as directed by the Engineer. The Design-Build Team shall maintain, monitor and adjust the signals, both traffic and pedestrian, as needed throughout the project. The Design-Build Team shall design, implement and field evaluate / verify modifications to the existing coordinated signal system timing plans during construction to accommodate traffic pattern changes. The Design-Build Team shall design, implement and field evaluate / verify modifications to the coordinated signal system timing plans for the final traffic pattern, including but not limited to traffic responsive plans that are dependent on the traffic demands and / or projections. All signal system timing plans shall be reviewed and accepted by the Department prior to implementation. The Design-Build Team shall also be responsible for the design and implementation of all temporary signal designs needed to maintain traffic during construction. The Design-Build Team shall maintain full actuation of the traffic signals on this project, as well as the system communications, during the life of the project

The Traffic Signal Plans shall designate the loop and system detector locations for all traffic signals identified in this Scope of Work. However, the Design-Build Team will not be required to install the loop or system detectors for the future traffic signals.

The Design-Build Team shall incorporate all signals on this project into the Winston-Salem Signal System, which is currently being upgraded as part of TIP Project C-5224, and provide equipment that is compatible with the Winston-Salem Signal System. To connect sidewalk networks, the Design-Build Team shall provide crosswalks and pedestrian heads for all approaches, as appropriate. Unless noted otherwise below, all new final signal installations shall

utilize black powder coated metal poles with mast arms for support. All temporary signal installations and existing signals with wood signal supports may utilize wood poles for signal supports.

Signal Inventory Numbers (SIN) will be assigned for each new signalized location by the NCDOT ITS & Signals Unit. Once all the traffic signal locations have been finalized and accepted by the Department, the Design-Build Team shall submit a written request for the SINs to the NCDOT ITS & Signals Unit. At a minimum, this request shall list each signal location that requires a SIN and include the following:

- County
- Nearest Municipality
- Names of all intersecting roads that will be under signal control, including state route numbers (Interstate, US, NC or SR) and common street names
- The dominant through movement

The Design-Build Team shall be responsible for a safe and economical design for the public. The Design-Build Team shall be responsible for ensuring that all plans and designs conform to the current design standards of the ITS & Signals Unit. Current ITS & Signals Unit design standards include, but are not limited to, the version of the following documents effective on the Technical Proposal submittal date:

- NCDOT 2012 *Standard Specifications for Roads and Structures*
- NCDOT *Standard Roadway Drawings*
- ITS & Signals Unit Project Special Provisions
- ITS & Signals Unit Design Manual
- *Manual on Uniform Traffic Control Devices (MUTCD)*
- *North Carolina Supplement to the Manual on Uniform Traffic Control Devices (NCMUTCD)*

Links to additional ITS & Signals Unit design standards and aides are available on website noted below:

**<http://www.ncdot.gov/doh/preconstruct/traffic/ITSS/>**

## **II. TRAFFIC SIGNALS**

The Design-Build Team shall provide four new traffic signals, upgrade three existing traffic signals, accommodate two future traffic signals and remove an existing traffic signal. Excluding the signal to be removed, the Design-Build Team shall connect all traffic signals to the City of Winston-Salem Signal System. The required traffic signal work and signal communications for each intersection are listed below:

<b>Proposed Signals (4)</b>		
<b>Signal Inventory Number</b>	<b>Intersection Description</b>	<b>Work Requirements</b>
<b>TBD</b>	Salem Creek Connector at US 52 Southbound Ramps	<p>The Design-Build Team shall design and install a new, fully actuated traffic signal at these locations. They shall include a 2070L controller operating OASIS software, including base adapters / extenders, in a 170 cabinet.</p> <p>Unless the Department provides written approval otherwise, all final signal designs shall utilize inductive loop detection.</p>
<b>TBD</b>	Salem Creek Connector at US 52 Northbound Ramps	<p>The Design-Build Team shall use NCDOT standard black powder coated metal poles with mast arms as the signal supports for the final traffic patterns. The Design-Build Team may use wood poles as the signal supports for temporary construction phases.</p>
<b>TBD</b>	Rams Drive at Salem Creek Connector	<p>The Design-Build Team shall provide pedestrian signal heads at each approach with existing or proposed sidewalk.</p>
<b>TBD</b>	SR 4325 (MLK Drive) at Salem Creek Connector	<p>Prior to final design and installation, the Design-Build Team shall coordinate all signal phasing recommendations for NCDOT signals with the Division Traffic Engineer, the Regional Traffic Engineer, the ITS &amp; Signals Unit and the City of Winston Salem.</p> <p>Prior to final design and installation, the Design-Build Team shall coordinate all signal phasing recommendations for City signals with the City of Winston Salem.</p> <p>The Design-Build Team shall incorporate these signals in the Winston-Salem Signal System.</p> <p>Upon placing these signals in operation (includes temporary operation), the Design-Build Team shall install the required system communication equipment as described in Section III.</p>

<b>Existing Signals to be Upgraded (3)</b>		
<b>Signal Inventory Number</b>	<b>Intersection Description</b>	<b>Work Requirements</b>
<b>09-0059</b>	SR 4325 (MLK Drive) at Rams Drive	<p>The Design-Build Team shall upgrade these existing traffic signals to match any temporary construction phasing and the proposed final traffic pattern. This may require signal phasing changes, signal head changes, installation of an auxiliary file, closed loop system detectors and / or system interconnections equipment.</p> <p>The Design-Build Team shall install a new 2070L controller operating OASIS software, including base adapters / extenders, in a 170 cabinet.</p> <p>Unless the Department provides written approval otherwise, all final signal designs shall utilize inductive loop detection.</p>
<b>09-1283</b>	SR 4325 (MLK Drive) at Reynolds Park Road	<p>The Design-Build Team shall provide pedestrian signal heads at each approach with existing or proposed sidewalk.</p>
<b>City Signal</b>	Salem Drive at Rams Drive	<p>Prior to final design and installation, the Design-Build Team shall coordinate all signal phasing recommendations for NCDOT signals with the Division Traffic Engineer, the Regional Traffic Engineer, the ITS &amp; Signals Unit and the City of Winston Salem.</p> <p>Prior to final design and installation, the Design-Build Team shall coordinate all signal phasing recommendations for the City signal with the City of Winston Salem.</p> <p>For the City Signal only, the Design-Build Team shall use NCDOT standard black powder coated metal poles with mast arms as the signal supports for the final traffic patterns. The Design-Build Team may use wood poles as the signal supports for all other signal locations and for all temporary construction phases.</p> <p>The Design-Build Team shall incorporate these signals in the Winston-Salem Signal System.</p> <p>Upon placing these signals in operation (includes temporary operation), the Design-Build Team shall install the required system communication equipment as described in Section III.</p>

<b>Future Signals (2)</b>		
<b>Signal Inventory Number</b>	<b>Intersection Description</b>	<b>Work Requirements</b>
<b>TBD</b>	Salem Creek Connector at Diggs Boulevard	<p>The Design-Build Team shall make field provisions that prepare these locations for future fully actuated signals that are incorporated in the Winston-Salem Signal System. The Design-Build Team is cautioned that the quantity and type of equipment required for the future signals shall be dependent on the Traffic Signal Plans and Communication Plans developed by the Design-Build Team and accepted by the Department.</p> <p>At a minimum, the Design-Build Team shall install the following at these locations:</p> <ul style="list-style-type: none"> <li>• Fiber optic cable and / or cable drops</li> <li>• Splice boxes and / or junction boxes</li> <li>• Cabinet foundations</li> <li>• Signal pole foundations</li> <li>• <b>** NOTE ** Deleted bullet on closed loop system detectors and system interconnection equipment</b></li> </ul>
<b>TBD</b>	Salem Creek Connector at City Yard Drive	<p>The Design-Build Team shall provide all other equipment required to make the signal operational to the City of Winston-Salem, for their installation at a later date. This equipment shall include, but is not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Black powder coated metal poles</li> <li>• Black powder coated metal mast arms</li> <li>• Signal heads – With provisions for Flashing Yellow Arrow signal heads for all protected / permissive left turns</li> <li>• 170 Cabinets</li> <li>• 2070 Controllers operating OASIS software, including base adapters / extenders</li> <li>• System interconnection equipment</li> <li>• Pedestrian signal heads</li> <li>• Signal Cable</li> <li>• Lead-in Cable</li> </ul>

<b>Existing Signal to be Removed (1)</b>		
<b>09-0157</b>	Rams Drive at US 52 Southbound Ramps	<p>This signal shall remain operational during construction. The Design-Build Team shall maintain this signal during construction and modify / upgrade / relocate the signal to accommodate traffic shifts / patterns required for the construction phasing.</p> <p>The Design-Build Team shall remove this existing traffic signal. The Design-Build Team shall coordinate the removal of this traffic signal with the Division Traffic Engineer and the Regional Traffic Engineer. However, this traffic signal shall not be removed prior to the permanent closure of the southbound US 52 exit and entrance ramps to / from Rams Drive.</p> <p>The Design-Build Team shall return the traffic signal controller, cabinet and signal heads to the Division 9 Traffic Operations Office located at 375 Silas Creek Parkway, Winston-Salem, NC 27127. The Design-Build Team shall dispose of and / or retain ownership of all other equipment.</p>

**III. SIGNAL COMMUNICATIONS**

The Design-Build Team shall coordinate their design with the city of Winston-Salem, NCDOT Intelligent Transportation Systems (ITS) & Signals Unit, the NCDOT Division 9 Traffic Engineer, and the consulting firm of Atkins whom is currently designing the Winston-Salem Signal System under TIP Project C-5224.

The Design-Build Team shall install, re-design, and / or maintain a fiber optic Ethernet based communications system which serves as the communications medium between existing, new and / or future traffic signals as part of the Winston Salem Signal System.

The Design-Build Team shall ensure that all Ethernet Edge Switches are compatible with the Winston Salem Signal System. The Design-Build Team shall furnish new equipment that is compatible with the Winston Salem Signal System.

To maintain operation, the Design-Build Team shall relocate, repair and / or reinstall all existing equipment being utilized by the Winston Salem Signal System (CCTV Cameras, Fiber Optic Splice Cabinets, etc.) impacted by construction.

**Communications Cable & Conduit Routing Plans, and Project Special Provisions**

Prior to construction, the Design-Build Team shall provide a detailed set of Communications Plans and Project Special Provisions for the Department’s review and acceptance. No



construction related to the installation of the communications system shall begin until NCDOT has accepted the RFC Plans and Project Special Provisions.

The Communications Plans and Project Special Provisions shall consist of the three major items listed below:

- Communications Plans including Splice Plans
- Project Special Provisions
- Catalog Cut Sheets

### **Utility Make-Ready Plans**

In conjunction with the development of the Communications Cable and Conduit Routing Plans and Traffic Signal Plans, the Design-Build Team shall also develop a set of Utility Make-Ready Plans.

The Design-Build Team shall transfer / install all signal equipment, communications cables and conduit systems in such a manner that avoids conflicts with other utilities. All aerial communications cable installations shall be installed in accordance with the National Electrical Safety Code. The Design-Build team is responsible for coordinating all Utility Make Ready Work with the proper utility representatives.

**LIGHTING SCOPE OF WORK** (7-5-12)

Provide and install roadway lighting equipment and materials, in accordance with the Final Lighting Plans provided by the Department, Division 14 of the 2012 NCDOT *Standard Specifications for Roads and Structures*, and the *Roadway Standard Drawings*, except as amended below. Prior to the Technical Proposal submittal date, the NCDOT will provide the Preliminary Lighting Plans. The Department will finalize the lighting design based upon the Design-Build Team's Release for Construction (RFC) Roadway Plans.

The Design-Build Team shall include all costs required to construct the roadway lighting shown in the aforementioned Preliminary Lighting Plans provided by the Department in their lump sum price bid for the entire project. The Department shall only compensate the Design-Build Team for additional lighting construction costs that result from design revisions incorporated at the Department's discretion and / or that result from errors or omissions in the Department's Preliminary Lighting Plans. The Design-Build Team shall be solely responsible for all additional lighting construction costs that result from design revisions incorporated at the Design-Build Team's discretion.

After the RFC Roadway Plans have been accepted by the Transportation Program management Director, the Design-Build Team shall submit MicroStation files of the RFC Roadway Plans for the Department to complete the lighting design. The Design-Build Team shall allow the Department ten days after this submittal to update and finalize the lighting design.

The Design-Build Team shall allow ten days for Department review of each submittal for all materials including poles and foundation designs. An additional ten days shall be required for pole submittals from vendors that do not commonly do business with the Department.

Reference the Traffic Management Scope of Work found elsewhere in this RFP for time restrictions and lane closure requirements.

**MAINTENANCE**

Assume responsibility for routine maintenance of the lighting system(s) for the duration of the contract in accordance with Division 14 of the 2012 NCDOT *Standard Specifications for Roads and Structures*, except as amended below.

NCDOT will assume maintenance responsibility for the completed lighting systems after the project is accepted, and there is no chance of construction-related damage.

The Design-Build Team shall re-lamp, repair and / or replace any newly installed non-functional luminaires with the project limits. All luminaires must be operational at project acceptance.

**EROSION AND SEDIMENTATION CONTROL SCOPE OF WORK** (8-5-12)

The NCDOT Roadside Environmental Unit (REU) shall review and accept all Erosion and Sedimentation Control Plans. Clearing & Grubbing and Final Grade Release for Construction (RFC) Erosion Control Plans shall be submitted to all NCDOT Personnel listed in the Design-Build Submittal Guidelines before **any** land disturbing activities, including clearing and grubbing, can commence. If the Design-Build Team chooses to perform the work in discrete sections, then a complete set of Clearing & Grubbing and Final Grade RFC Erosion Control Plans shall be submitted, accepted, and distributed as noted above prior to land disturbing activities, including clearing and grubbing, commencing in that section. No land disturbing activities, including clearing and grubbing, shall occur in any location that does not have accepted Clearing & Grubbing and Final Grade RFC Erosion Control Plans. Refer to the most recent version of the *NC DENR - Erosion and Sediment Control Planning and Design Manual* for erosion control design guidelines not addressed in this Scope of Work.

To ensure adherence with the August 3, 2011 NCG-010000 General Construction Permit, issued by the North Carolina Department of Environment and Natural Resources, Division of Water Quality, the Design-Build Team shall formally submit a project-wide Vegetation Management Procedure for the Department's review and acceptance prior to any land disturbing activities. After this initial review, the Design-Build Team shall concurrently provide the Resident Engineer and Roadside Environmental Field Operations Engineer updated versions of the Vegetation Management Procedure on a monthly basis. These updated versions will not require formal submittal to the Transportation Program Management Office, but will be subject to review comments by the aforementioned field personnel. All versions of the Vegetation Management Procedure shall include, but not be limited to, provisions for the early establishment of grasses / vegetation, and procedure and schedule details for fertilizer topdressing, supplemental seeding, mowing and repair seeding. The Vegetation Management Procedure shall be closely coordinated with the grading and hauling operations. The Design-Build Team shall provide a narrative overview of the Vegetation Management Procedure in the Technical Proposal.

From the beginning through the end of construction, the Design-Build Team shall maintain comprehensive "red-line" As-Built Plans that detail when and where permanent / temporary / repair seeding and topdressing have been performed.

Erosion and Sedimentation Control Plans shall at a minimum address the following:

**I. Complete Set of Plans****A. Clearing and Grubbing Phase**

1. Use correct NCDOT symbology
2. Protect existing drainage structure inlets with Rock Inlet Sediment Trap Type 'A' (RIST-A), Rock Inlet Sediment Trap Type 'C' (RIST-C), Rock Pipe Inlet Sediment Trap Type 'A' (PIST-A), etc.

3. Utilize adequate perimeter controls (temporary silt ditches (TSD), temporary silt fence (TSF), etc.)
4. Utilize skimmer basins and rock measures with sediment control stone (Temporary Rock Sediment Dam Type 'B' (TRSD-B), Temporary Rock Silt Check Type 'A' (TRSC-A), etc.) at drainage outlets
5. Take into account existing topography and show contour lines
6. Utilize Temporary Rock Silt Checks Type 'B' (TRSC-B) to reduce velocity in existing ditches with spacing of 250 feet divided by percentage of ditch grade. Also utilize TRSC-Bs in proposed TSDs and temporary diversions (TD)
7. Protect existing streams; do not place erosion control devices in live streams
8. Provide adequate silt storage for 3600 cubic feet per disturbed acre and sediment basins shall be sized with surface area equal to 435 square feet per cubic foot per second (cfs) of the peak inflow rate, Q10, using 10-year peak rainfall data (*NCDENR - Erosion and Sediment Control Planning and Design Manual* or NOAA's National Weather Service website [http://hdsc.nws.noaa.gov/hdsc/pfds/orb/nc\\_pfds.html](http://hdsc.nws.noaa.gov/hdsc/pfds/orb/nc_pfds.html) for partial duration (ARI) time series type). A Sediment Basin Designer Spreadsheet will be provided by the NCDOT Roadside Environmental Unit (REU) upon request.
9. Design Riser Basins to the following standards:
  - a. Surface Area shall be determined by Equation A (sq. feet) = Q10 (cfs) \* 435
  - b. Volume requirement shall be 1800 cubic feet per disturbed acre draining to the riser basin
  - c. Riser Pipe shall have a cross-sectional area 1.5 times that of the barrel pipe
  - d. The riser pipe shall be non-perforated with a skimmer attached to the bottom of the pipe 1 ft. from the bottom of the basin
  - e. See *NCDENR - Erosion and Sediment Control Planning and Design Manual* for additional design criteria
10. Skimmer Basins shall provide adequate silt storage for 1800 cubic feet per disturbed acre with surface area equal to 325 square feet per cubic foot per second (cfs) of the peak inflow rate, Q10, using the 10-year peak rainfall data (*NCDENR - Erosion and Sediment Control Planning and Design Manual* or NOAA's National Weather Service website [http://hdsc.nws.noaa.gov/hdsc/pfds/orb/nc\\_pfds.html](http://hdsc.nws.noaa.gov/hdsc/pfds/orb/nc_pfds.html) for partial duration (ARI) time series type). A Skimmer Basin Designer Spreadsheet will be provided by the NCDOT Roadside Environmental Unit (REU) upon request.
11. The minimum and maximum length to width ratio of all Sediment Basins shall be 2:1 and 6:1, respectively.
12. Coir Fiber Baffles shall be installed in all silt basins and sediment dams at drainage outlets. For silt basins with a 20-foot or longer length, three Coir Fiber Baffles shall be installed with a spacing of 1/4 the basin length. For silt basins with a length less than 20 feet, a minimum of two Coir Fiber Baffles shall be installed, with a spacing of 1/3 the basin length. The Design-Build Team will not be required to show the individual baffles on the Erosion Control Plans, but shall be required to incorporate the Coir Fiber Baffle Detail on the Erosion Control Plans.
13. Include any culvert and / or pipe construction sequence plan sheets in the Clearing & Grubbing Erosion Control Plans; all pipes 48 inches or larger, or any combination of pipes that total 48 inches or more require a construction sequence. Prior to

- installation of pipes smaller than 48 inches in jurisdictional areas, the Design-Build Team shall submit a phasing plan for managing the watercourse to the Resident Engineer for review and acceptance. The phasing plan shall be in accordance with the Best Management Practices for Construction and Maintenance Activities.
14. Incorporate temporary sediment basins into permanent stormwater devices.
  15. Utilize Coir Fiber Wattles with Polyacrylamide (PAM) and / or TRSC-As with Matting and PAM in temporary and permanent, existing and proposed ditches at a spacing of 50 feet in areas where sediment basins are not feasible at drainage outlets, and in areas where sediment basins at drainage outlets with sediment traps (i.e. PIST-A, RIST-A, etc.), cannot be properly sized to surface area and / or sediment storage requirements due to safety concerns, right of way restrictions, utility conflicts or other construction limitations approved by the Roadside Environmental Unit.

#### B. Final Grade Phase

1. Use correct NCDOT symbology
2. Protect existing and proposed drainage structure inlets with RIST-A, RIST-C, PIST-A, etc.
3. Utilize adequate perimeter controls (TSD, TSF, etc.)
4. Utilize TRSC-Bs to reduce velocity in existing and proposed ditches with spacing of 250 feet divided by percentage of ditch grade. Also, utilize TRSC-Bs in proposed TSDs and TDs
5. Utilize temporary slope drains and earth berms at top of fill slopes 8 feet or higher and a fill slope grade of 3:1 or steeper, or where there are superelevations above 0.04 and fills are greater than 5 feet. Maximum slope drain spacing shall be 200 feet.
6. Utilize rock energy dissipater and / or silt basin at outlet of slope drain
7. Devices at all drainage turnouts shall utilize skimmer or sediment control stone (TRSD-B, TRSC-A, etc.) and a spillway with an adequately designed base length to distribute outflow
8. Provide adequate silt storage for 3600 cubic feet per disturbed acre and sediment basins shall be sized with surface area equal to 435 square feet per cubic foot per second (cfs) of the peak inflow rate, Q10, using 10-year peak rainfall data (*NCDENR - Erosion and Sediment Control Planning and Design Manual* or NOAA's National Weather Service website [http://hdsc.nws.noaa.gov/hdsc/pfds/orb/nc\\_pfds.html](http://hdsc.nws.noaa.gov/hdsc/pfds/orb/nc_pfds.html) for partial duration (ARI) time series type). A Sediment Basin Designer Spreadsheet will be provided by NCDOT Roadside Environmental Unit upon request
9. Provide matting for erosion control in all ditch lines, including but not limited to temporary ditch lines (TDs) utilized to divert offsite runoff around construction areas, where the velocity is greater than 2.0 ft/s, and the shear stress is 1.55 psf or less. For ditch lines with a shear stress above 1.55 psf, Permanent Soil Reinforcement Mat or Rip Rap shall be utilized
10. Provide matting for erosion control on all fill slopes 2:1 or steeper
11. Design Riser Basins to the following standards:
  - a. Surface Area shall be determined by Equation A (sq. feet) = Q10 (cfs) \* 435

- b. Volume requirement shall be 1800 cubic feet per disturbed acre draining to the riser basin
  - c. Riser Pipe shall have a cross-sectional area 1.5 times that of the barrel pipe
  - d. The riser pipe shall be non-perforated with a skimmer attached to the bottom of the pipe one foot from the bottom of the basin
  - e. See *NCDENR - Erosion and Sediment Control Planning and Design Manual* for additional design criteria
12. Skimmer Basins shall provide adequate silt storage for 1800 cubic feet per disturbed acre with surface area equal to 325 square feet per cubic foot per second (cfs) of the peak inflow rate, Q10, using the 10-year peak rainfall data (*NCDENR - Erosion and Sediment Control Planning and Design Manual* or NOAA's National Weather Service web site [http://hdsc.nws.noaa.gov/hdsc/pfds/orb/nc\\_pfds.html](http://hdsc.nws.noaa.gov/hdsc/pfds/orb/nc_pfds.html) for partial duration (ARI) time series type). A Sediment Basin Designer Spreadsheet will be provided by the NCDOT Roadside Environmental Unit (REU) upon request
  13. The minimum and maximum length to width ratio of all Sediment Basins shall be 2:1 and 6:1, respectively
  14. Coir Fiber Baffles shall be installed in all silt basins and sediment dams at drainage outlets. For silt basins with a 20-foot or longer length, three Coir Fiber Baffles shall be installed with a spacing of 1/4 the basin length. For silt basins with a length less than 20 feet, a minimum of two Coir Fiber Baffles shall be installed, with a spacing of 1/3 the basin length. The Design-Build Team will not be required to show the individual baffles on the Erosion Control Plans, but shall be required to incorporate the Coir Fiber Baffle Detail on the Erosion Control Plans
  15. Incorporate temporary sediment basins into permanent stormwater devices
  16. Utilize Coir Fiber Wattles with Polyacrylamide (PAM) and/or TRSC-A's with Matting and PAM in temporary and permanent, existing and proposed ditches at a spacing of 50 feet in areas where sediment basins are not feasible at drainage outlets, and in areas where sediment basins at drainage outlets with sediment traps (i.e. PIST-A, RIST-A, etc.), cannot be properly sized to surface area and / or sediment storage requirements due to safety concerns, right of way restrictions, utility conflicts or other construction limitations approved by the Roadside Environmental Unit.

### C. Intermediate Phase

Intermediate Erosion Control Plans shall only be required if design modifications and / or site conditions require additional erosion control design or design revisions to the RFC Clearing and Grubbing and / or RFC Final Grade Erosion Control Plans. Intermediate Plans shall be submitted for review and shall be accepted prior to construction of any aspect impacted by the revised erosion control design. For any intermediate phase, comply with Section B, "Final Grade Phase" above.

## II. Detail Sheets and Notes

- A. Provide project specific special notes and details such as skimmer basin, coir fiber wattle with Polyacrylamide (PAM), etc.

- B. Provide matting summary sheet(s): matting for erosion control and permanent soil reinforcement mat
- C. Provide reforestation sheet(s): regular, wetland, streambank and / or buffer showing appropriate species

### **III. Title Sheet**

- A. Show correct notes: HQW, ESA, clearing and grubbing, etc.
- B. Show correct standards for project
- C. List of standard NCDOT symbology
- D. Show name and certification number of Level IIIA certified individual responsible for designing and / or reviewing Erosion and Sedimentation Control Plans

### **IV. Special Provisions**

- A. Erosion Control Special Provisions are available at the following website:  
[http://www.ncdot.org/doh/operations/dp\\_chief\\_eng/roadside/soil\\_water/special\\_provisions/](http://www.ncdot.org/doh/operations/dp_chief_eng/roadside/soil_water/special_provisions/)
- B. References in Erosion Control Special Provisions from the aforementioned website to Method of Measurement, Basis of Payment, or any other statement regarding direct payment for Erosion and Sedimentation Control measures shall be disregarded
- C. Erosion Control / Stormwater Certification found elsewhere in this RFP

### **V. Miscellaneous**

- A. Plan submittals shall include all pertinent design information required for review, such as design calculations, drainage areas, etc.
- B. The NCDOT Roadside Environmental Unit will provide a sample set of Erosion and Sedimentation Control Plans (including any special details or special provisions used by the NCDOT Roadside Environment Unit) and MicroStation Erosion Control Workspace to the Design-Build Team for reference upon request.
- C. Plans shall address any environmental issues raised during the permitting process.
- D. Sufficient time shall be allowed for the Design-Build Team to make any changes to the Erosion and Sedimentation Control Plans deemed necessary by the NCDOT Roadside Environmental Unit.
- E. Temporary access and haul roads, other than public roads, constructed or used in connection with the project shall be considered a part of the project and addressed in the Erosion and Sedimentation Control Plans.
- F. Borrow or waste areas that are part of the project shall require a separate Reclamation Plan, unless the borrow or waste activity is regulated under the *Mining Act of 1971*, or is a landfill regulated by the Division of Solid Waste Management (NCDENR). The Design-Build Team shall submit the location and permit number for waste / borrow sites covered by the Mining Act or regulated by DSWM (DENR) concurrently to the Transportation Program Management Director and the Resident Engineer. For Reclamation Procedures, see:

[http://www.ncdot.org/doh/operations/dp\\_chief\\_eng/roadside/fieldops/downloads/Files/ContractedReclamationProcedures.pdf](http://www.ncdot.org/doh/operations/dp_chief_eng/roadside/fieldops/downloads/Files/ContractedReclamationProcedures.pdf)

- G. Whenever the Engineer determines that significant erosion and sedimentation continues despite the installation of approved protective practices, the Design-Build Team shall be required to and shall take additional protective action.
- H. An accepted Erosion and Sedimentation Control Plan does not exempt the Design-Build Team from making every effort to contain sediment onsite.
- I. Any Erosion Control Design revisions made during the construction of the project shall be submitted to NCDOT REU by the 15<sup>th</sup> of the month via the Transportation Program Management Director. At anytime requested by the Engineer or the Roadside Environmental Unit, the Design-Build Team shall provide an updated version of the Erosion and Sedimentation Control Plans for distribution to all parties involved in the construction process.
- J. The Design-Build Team shall comply with the *North Carolina Administrative Code Title 15 A Department of Environment and Natural Resources Chapter 4, Sediment Control*.
- K. A pre-design meeting shall take place between the NCDOT REU Soil & Water Engineering Section, the Design-Build Team, and any other pertinent NCDOT personnel before any Erosion and Sedimentation Control Designs are submitted to NCDOT REU. Erosion and Sedimentation Control Plan submittals shall only be reviewed and accepted by NCDOT REU after the Erosion Control Pre-Design Meeting. The Design Build Team shall be required to submit a tentative Erosion and Sedimentation Control Plan submittal schedule at the pre-design meeting.
- L. At minimum, the Design-Build Team shall bring one erosion control plan sheet with a Clearing & Grubbing erosion control design to the Erosion and Sedimentation Control Plan pre-design meeting.
- M. All RFC Erosion and Sedimentation Control Plans, including any red line revisions, shall be kept on site at all times throughout the duration of the project.
- N. Immediately after the clearing and grubbing erosion control measures have been installed for the entire project, or for individual sections if the Design-Build Team has divided the project into construction segments, the Design-Build Team's erosion and sedimentation control designer shall field verify constructed dimensions and installation of all erosion control devices. After this initial inspection(s), the aforementioned designer shall review the project conditions a minimum of every 30 days during the heavy grading operations to verify the field conditions of disturbed areas draining to erosion control devices. The erosion and sedimentation control designer shall make appropriate design revisions to the Clearing and Grubbing and / or Final Grade Erosion Control Plans resulting from / required by these field inspections for the Department's review and acceptance, in accordance with the Design-Build Submittal Guidelines. The Design-Build Team shall concurrently provide written documentation of all field verifications / inspections to the NCDOT Roadside Environmental Unit, Soil and Water Engineering and Field Operations Section, and the Resident Engineer. At a minimum, this documentation shall detail what was observed during the field verification / inspection and all resulting required actions with a timeframe for implementation.



- O. Erosion Control / Stormwater Certification shall be required according to the Project Special Provision found elsewhere in this RFP.
- P. Prior to installation of any erosion control devices, the Design-Build Team shall verify boundaries of jurisdictional areas in the field and delineated with Safety Fence or flagging. For guidance on Safety Fence and flagging in jurisdictional areas, see:

**[http://www.ncdot.org/doh/operations/dp\\_chief\\_eng/roadside/fieldops/downloads/](http://www.ncdot.org/doh/operations/dp_chief_eng/roadside/fieldops/downloads/)**

- Q. Once RFC Erosion and Sedimentation Control Plans are issued, any major design change or addition, any change that involves calculations, and any addition, deletion, or relocation of a sediment basin shall be submitted to the NCDOT REU for review and acceptance. Minor changes such as moving silt fence, adding or moving temporary ditches (unless adding new flow to a sediment basin), and adding or moving slope drains shall be reviewed by the Engineer in the field.
- R. Sediment basins that drain directly into jurisdictional water or have a total drainage area of one acre or more, shall be designed and constructed with outlet structures that only withdraw water from the surface. For sediment basins that do not drain directly into jurisdictional water or have less than one acre of total drainage area, surface dewatering outlets and stone outlets may be provided.
- S. Ground cover stabilization shall comply with the timeframe guidelines specified by the North Carolina Department of Environment and Natural Resources Division of Water Quality NCG-010000 General Construction Permit that became effective on August 3, 2011. Excluding the slopes noted below, temporary and permanent ground cover stabilization shall be provided within seven calendar days from the last land-disturbing activity. The Design-Build Team shall label all slopes subject to the seven-day ground cover stabilization requirements on all Erosion and Sedimentation Control Plans submitted to the Department for review and acceptance.

For the slopes noted below, temporary and permanent ground cover stabilization shall be provided within 14 calendar days from the last land-disturbing activity:

Slopes between 2:1 and 3:1, with a slope length of ten feet or less

Slopes 3:1 or flatter, with a slope length of 50 feet or less

Slopes 4:1 or flatter

Temporary and permanent ground cover stabilization shall be provided in accordance with the provisions in this contract and the Vegetation Management Procedure developed by the Design-Build Team.

Ground cover stabilization shall be done in accordance with the following:

**Short Term Stabilization: 0 – 14 Days**

At a minimum, erodible areas that will not be disturbed for 14 days or less shall be stabilized utilizing non-vegetative cover. Non-vegetative cover options include straw mulch, hydraulic applied erosion control products or rolled erosion control products.

**Mid-Term Stabilization: 14 – 90 Days**

Erodible areas that will not be disturbed for more than 14 days and less than 90 days shall be stabilized utilizing the following stabilization protocol:

**September 1 – May 31**

50# Rye Grain or Wheat  
500# Fertilizer  
4000# Limestone

**June 1 – August 31**

50# German or Browntop Millet  
500# Fertilizer  
4000# Limestone

**Long Term Stabilization: 90+ Days**

Erodible areas that will not be disturbed for more than 90 days shall be stabilized utilizing the following stabilization protocol:

**Shoulder and Median Areas**

**September 1 – May 31**

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

**June 1 – August 31**

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

**Areas Beyond the Mowing Pattern, Waste and Borrow Areas**

**September 1 – May 31**

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

**June 1 – August 31**

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

**\*Approved Kentucky Bluegrass Cultivars**

Alpine	Bariris	Envicta	Rugby
Apollo	Bedazzled	Impact	Rugby II
Arcadia	Bordeaux	Kenblue	Showcase
Arrow	Champagne	Midnight	Sonoma
Award	Chicago II	Midnight II	

**\*\* Approved Hard Fescue Cultivars**

Chariot	Nordic	Rhino	Warwick
Firefly	Oxford	Scaldis II	
Heron	Reliant II	Spartan II	
Minotaur	Reliant IV	Stonehenge	

**\*\*\* Approved Tall Fescue Cultivars**

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

From January 1 – December 31, the Design-Build Team shall apply an additional 20# of Sericea Lespedeza on cut and fill slopes 2:1 or steeper.

Fertilizer shall be 10-20-20 analysis or a different analysis that provides a 1-2-2 ratio applied at a rate that provides the same amount of plant food as a 10-20-20 analysis and as directed.

**Soil Analysis**

If vegetation establishment indicates a deficiency in soil nutrients or an incurred pH level is present, the Design-Build Team shall take soil samples and apply additional soil amendments to the affected area and as directed.

**Fertilizer Topdressing**

Fertilizer used for topdressing shall be 10-20-20 analysis applied at a rate of 500 pounds per acre; or a different analysis that provides a 1-2-2 ratio applied at a rate that provides the same amount of plant food as a 10-20-20 analysis and as directed.

Fertilizer used for waste and borrow areas shall be 16-8-8 grade applied at a rate of 500 pounds per acre; or a different analysis that provides a 2-1-1 ratio applied at a rate that provides the same amount of plant food as a 16-8-8 analysis and as directed.

**Supplemental Seeding**

For all supplemental seeding, the kinds of seed and proportions shall be the same as specified above for *Long Term Stabilization*. The rate of application for supplemental seeding shall be between 25# to 75# per acre. Prior to topdressing, the Design-Build Team shall determine the actual rate per acre for supplemental seeding and submit the supplemental seeding rate and areas to the Department for review and acceptance.

To prevent disturbance of existing vegetation, minimum tillage equipment, consisting of a sod seeder, shall be used to incorporate seed into the soil where degree of slope allows. Where degree of slope prevents the use of a sod seeder, a clodbuster (ball and chain) may be used.

**Mowing**

The minimum mowing height shall be six inches.

**EROSION CONTROL LIQUIDATED DAMAGES**

The Design-Build Team shall observe and comply with Federal and State Laws, Local Laws, Ordinances, and Regulations; as well as Orders and Decrees of Bodies having any jurisdiction or authority in accordance with Section 107 of the 2012 *Standard Specifications for Roads and Structures*.

The Design-Build Team shall take all reasonable precautions to comply with all regulations of all authorities having jurisdiction over public and private land governing the protection of erosion and sedimentation. Any fines, remediation required or charges levied against the Department for failing to comply with all rules and regulations concerning erosion and sediment control, due to the Design-Build Team's negligence, carelessness, or failure to implement the Erosion and

Sedimentation Control Plans and Specifications; or failure to maintain an approved Storm Water Pollution Prevention Plan (SWPPP), regardless of absence of neglect, shall be deducted from monies due the Design-Build Team. In addition to said fines, remediation required, or charges levied, any associated engineering costs or actions taken by the Department in order for the Department to comply with rules and regulations, as a result of the Design-Build Team's negligence, carelessness, or failure to implement the Erosion and Sedimentation Control Plans and Specifications; and / or the SWPPP, regardless of absence of neglect, shall be deducted from the monies due to the Design-Build Team.

**PUBLIC INFORMATION SCOPE OF WORK** (9-5-12)

NCDOT will take the lead role on this project and be responsible for a portion of the public information efforts through the Department's Communications Office. The NCDOT responsibilities will include:

- Organizing public meetings, including venue selection, reservation and fee
- Providing media announcements
- Soliciting and administering advertisements, as deemed necessary
- Mailings to the identified target audiences, including postage.

The Design-Build Team shall coordinate with the Department to promote public awareness for this project. The Design-Build Team's responsibilities shall include:

- Developing and producing informational print materials for all meetings and workshops, subject to review and approval by the Department.
- Providing details surrounding the impacts to the public
- Providing advance notice to the Department of upcoming project impacts
- Assisting the Department in the development of the target audience list
- Attending and / or speaking at public meetings, including assistance with set-up and break-down
- Hand delivery of time sensitive informational materials.

The Design-Build Team shall hold an initial project coordination meeting with NCDOT one month prior to start of construction to discuss project impacts to the public. This information will be used by the Department to create a Public Information Plan.

The Design-Build Team shall inform the Department at least three weeks in advance of any construction activity that will have significant impact on the public, including, but not limited to, the start of construction, major traffic shifts, road closures, ramp closures, detours, night work and project completion.

NCDOT will determine the project outreach area. NCDOT will develop, with the assistance of the Design-Build Team, the specific list of target audiences for this project. The following groups are identified as typical target audiences to receive informational materials:

- Governmental agencies
- Municipalities directly affected by construction
- Transportation services
- Emergency services
- Neighborhood groups and private homes
- Industry and businesses
- Chamber of Commerce
- Individual schools effected by the project
- County / City school systems
- Any other organization as deemed necessary by the Department.

The amount of public involvement required for this project is directly based on the Design-Build Team's Traffic Control Plans and construction details. The minimum public information requirements solely associated with the Traffic Control Plans shall include, but not be limited to the following:

- Public Meetings – If Beginning of Construction meeting for area businesses and residents is held, attending and / or speaking at this event.
- Distribution of Informational Materials – For beginning of construction and for all road closures with detour routes, the Design-Build Team shall be responsible for delivering time sensitive informational material provided by the NCDOT directly to portions of the target audience. If the Design-Build Team informs the Department of the aforementioned activities less than three weeks in advance, the Design-Build Team shall hand deliver the informational materials to the impacted target audiences.

The Design-Build Team shall be responsible for establishing and creating the initial project website for this project. The website shall be housed on an NCDOT server. The project website shall use the current NCDOT Communications Office project web design template and adhere to current software development, security and technical infrastructure standards. All project website design and implementation shall be coordinated with Ms. Dara Demi, Lead Communications Officer, NCDOT Communications Office. After the initial content is established, the maintenance and any further updates to the website will be performed by the Department. However, throughout the project duration, the Design-Build Team shall coordinate with the NCDOT Communications Office to ensure the accuracy of the aforementioned project updates. The NCDOT will be responsible for establishment of social media and responses to website inquiries. However, the Design-Build Team shall provide the assistance, input and / or updates required for the aforementioned social media and inquiries. At a minimum, the Design-Build Team shall designate a contact for public information inquiries / coordination. Throughout construction, this contact shall provide weekly updates to the NCDOT Communications Office, including, but not limited to, traffic control phasing, graphic illustrations, project pictures, etc. All costs associated with setting up a project website and coordinating project updates shall be included in the lump sum price bid for the entire project.

The Design-Build Team shall include in their Lump Sum Bid price for the project, all costs associated with their involvement in the Public Information Scope of Work.

**ITS SCOPE OF WORK** (8-21-12)**GENERAL**

Design, furnish, and install the following ITS devices and communications cable system along US 52. Integrate the devices into the Triad Regional Traffic Management Center (TRTMC) located at 201 South Chimney Rock Road, Greensboro, NC 27409.

- Conduit System (two – 2 inch conduits)
- 72 fiber single-mode fiber optic communications cable
- Drop cable assemblies
- Junction boxes
- Splice enclosures
- Four (4) CCTV cameras
- One (1) New Dynamic Message Sign (DMS)
- Relocate One (1) Existing Dynamic Message Sign (DMS) to New Location on a New DMS Structure
- Power service equipment
- Field and Central communications equipment

Furnish and install guardrail to protect the ITS devices as required.

Remove one existing DMS enclosure, cabinet, DMS structure, and foundations. Reuse the existing DMS enclosure and cabinet at a new location and on a new DMS structure.

Determine the location of each ITS device, obtain the Engineer's approval of the locations, install and implement test procedures, and integrate the devices with the TRTMC.

Prior to any underground work, locate existing utilities, communications cable, power cable, and adjust work activities to protect these facilities. Immediately cease work and notify the Engineer and the affected owners if damage to existing utilities occurs. Repair damages to existing utilities, communications cable, and / or power cable at no cost to the Department.

**PROJECT OPERATION REQUIREMENTS****A. Intermediate Contract Time #6 for Failure to Repair a Damaged Underground or Overhead Fiber optics Communications Cables and Restore Communication**

The Design Build Team shall be responsible for repairing all existing underground or overhead fiber optics communication cables damaged during construction. The Design-Build Team shall immediately report damages to the Engineer and TRTMC at (336) 315-7080. The Design-Build Team shall repair all damages within 24 hours at no cost to the Department. The Design-Build Team shall bring all affected fiber optics communication cables back on line within the same 24 hours.



**Liquidated Damages for Intermediate Contract Time #6 for failure to repair a damaged fiber optic communication cables and restore communication within 48 hours are \$1,500 per 24-hour period or any portion thereof.**

**B. Intermediate Contract Time #7 for Failure to Relocate Existing ITS Communications Cable and / or ITS Devices and Restore Communication to those ITS Devices.**

Determine if any of the existing ITS communications cable (included but not limited to existing traffic signal communications cable) or ITS devices (including any not described herein) within the project limits need to be relocated to resolve any construction conflicts. Any communications cable relocated must fall between two existing splice enclosures near the project limits. Determine the device relocation, cable relocation route, prepare the routing plans, and obtain the Engineer's approval. Ensure communications to TRTMC and / or traffic signal systems are not interrupted for more than 4 days (96 hours) including weekends.

The Design-Build Team shall be responsible for the required relocation of all existing ITS devices and communications cable including but not limited to all related material and labor. The Design-Build Team shall complete all ITS relocations and restore communication within 96 hours.

**Liquidated damages for Intermediate Contract Time #7 for failure to relocate existing ITS communications cable and / or ITS devices and restore communication within 96 hours are \$1,500 per 24-hour period or any portion thereof.**

Perform all work in accordance with the Dynamic Message Sign Project Special Provision, CCTV Cameras Project Special Provision and Traffic Signals Scope of Work found elsewhere in this RFP, January 2012 *NCDOT Standard Specifications for Roads and Structures* and the 2012 *NCDOT Roadway Standard Drawings*.

## **DESIGN REQUIREMENTS**

All ITS field devices shall be linked to the TRTMC over new and existing fiber-optic cable. Design the field-to-center communication network using Gigabit Fiber Optic Ethernet technology. For all equipment not specified herein, including but not limited to encoders and Ethernet equipment, provide product specifications for the Department's review and approval prior to incorporation. Furnish, install, and / or upgrade all fields, central equipment, including but not limited to, encoders and switches.

Relocate any additional ITS devices not called for in this RFP that may be impacted by work on this project, if necessary. Reuse and maintain the current fiber optic network equipment and configuration.

## **CCTV CAMERAS**

Strategically locate four (4) CCTV cameras at the locations described below so the cameras cumulatively provide full view of the routes indicated.

- **CCTV #1:** At Martin Luther King, Jr. and Salem Creek Connector
- **CCTV #2 & CCTV #3:** At the interchange of US 52 and Salem Creek Connector to view US 52 NB/SB, the on/off ramps and the Salem Creek Connector
- **CCTV #4:** Along US 52 between US 52/Waughtown Street from the existing CCTV and the proposed Salem Creek Interchange.

Determine the exact location of each CCTV camera, obtain Engineer's approval of the locations, and install the cameras. The Engineer may require site surveys, including but not limited to bucket truck surveys, to ensure camera coverage areas are acceptable.

### **DMS**

Determine the exact location of the DMSs, obtain Engineer's approval of the location, and install the DMSs.

Remove the existing DMS, cabinet, overhead structure, and foundations at US 52 SB (south of Vargrave St.) that will be impacted by the reconstruction of the railroad bridge under this project. Reuse the existing DMS enclosure and cabinet on a new DMS structure south on US 52 past the proposed Salem Creek Connector on-ramp. Dispose of the existing DMS overhead structure and foundations.

Install a new DMS and structure along southbound US 52 prior to the Rams Drive overpass.

### **CONDUIT**

Furnish and install two (2) – 2 inch conduits and all necessary hardware by trenching or directional drilling in accordance with Section 1715 of the Standard Specifications.

Upon completion of the conduit installation furnish the Engineer with a plan of record drawings showing the horizontal and vertical locations of the installed conduits.

### **JUNCTION BOXES**

Furnish and install junction boxes (pull boxes) with all necessary hardware in accordance with Section 1098-5 of Standard Specifications. Provide junction boxes with minimum inside dimensions of 30(l) x 15(w) x 24(d) inches. Install junction boxes at maximum intervals of fifteen hundred (1500) feet or at locations where underground splicing is necessary.

### **FIBER OPTIC CABLE / DROP CABLE**

Furnish and install a 72 single mode fiber-optic communications cable, drop cable assemblies, and all necessary hardware in accordance with the Section 1098-10 Standard Specifications.

**ELECTRICAL SERVICE**

Install new electrical service with 200Amps, 240/120 VAC service drops for each ITS device.

**FIBER-OPTIC SPLICE CENTERS**

Furnish and install fiber-optic splice enclosures and all necessary hardware where required to join fiber optic cables. Comply with the Section 1731 Standard Specifications.

Modify existing splice enclosures impacted by the project if necessary. Obtain approval from the Engineer prior to entering any existing splice enclosures.

Within enclosures, provide the necessary number of hinged mountable splice trays to store the number of splices required, plus the capacity to house twelve (12) additional splices. Provide a fiber containment basket for storage of loose buffer tubes that are expressed through the enclosure. Ensure enclosures allow sufficient space to prevent damage of the buffer tubes when coiled.

**OTHER CODES AND STANDARDS**

All ITS materials shall conform to the latest version of the applicable standards of the National Electrical Code (NEC), National Electric Manufacturer's Association (NEMA), the Underwriters' Laboratories, Inc. (UL), the Electronic Industries Association (EIA), the International Municipal Signal Association (IMSA), and the National Electrical Safety Code (NESC). All materials and workmanship must conform to the requirements of the NESC, standards of the American Society for Testing and Materials (ASTM); American National Standards Institute (ANSI). Comply with all federal laws, state laws, and city codes in accordance with Section 17 of the Standard Specifications.

**SUBMITTALS**

Submit a 90% set of preliminary plans and 100% set of project plans including specifications for materials, catalog cuts, and installation and testing requirements for review and approval by the Department. No construction of the ITS devices and relocation of communications cable shall begin until the Department has accepted the 100% plans and specifications. Provide the Department with a minimum of 10 working days for each review.

**MATERIALS & CONSTRUCTION**

Furnish and install new materials and hardware that meet the requirements of the Standard Specifications and this Scope of Work.

**CCTV CAMERAS**

Install each CCTV camera on a 50-foot metal pole. Install CCTV equipment in a 336S equipment cabinet mounted on the pole. Install the following minimum equipment in each CCTV equipment cabinet:

- Digital Video Encoder
- 4-port Field Ethernet switch with two long haul fiber optic ports for single mode fiber optic cable
- Fiber optic Interconnect Center
- Power equipment including power supplies, circuit breakers, surge protectors, and other related materials.

At each CCTV camera location, install 6-fiber fiber optic drop cable in 2-inch underground conduit. Splice the drop cable into the new or existing 72-fiber fiber optic trunk cable as approved by the Engineer.

Refer to the CCTV Cameras Project Special Provision found elsewhere in this RFP for detailed material specifications and construction requirements.

### **DYNAMIC MESSAGE SIGNS**

Install DMSs on a single steel pedestal type structure or overhead full span type structure with ladders, ladder safety cages, and access platforms leading to the DMS maintenance access door. The DMSs shall be installed 25-foot over the high point of the road for pedestal type structures and 20-foot over the high point of the road for overhead full span type structures as measured from the bottom of the DMS. Install DMS equipment in an approved equipment cabinet mounted on the structure. Install the following minimum equipment in each DMS equipment cabinet:

- DMS controller
- 4-port Field Ethernet switch with two long haul fiber optic ports for single mode fiber optic cable
- Fiber optic Interconnect Center
- UPS and power equipment including power supplies, circuit breakers, surge protectors, and other related materials.

At each DMS location, install 6-fiber fiber optic drop cable in 2-inch underground conduit. Splice the drop cable into the new or existing 72-fiber fiber optic trunk cable as approved by the Engineer.

Refer to the Dynamic Message Sign Project Special Provision found elsewhere in this RFP for detailed material specifications and construction requirements.

### **COMMUNICATIONS CABLE RELOCATION**

Prior to decommissioning any **underground** segment of communications cable to be relocated, install two 2-inch underground conduits with tracer wire. Install oversized junction boxes every 1500-foot, at each end of **an underground** segment, and at each splice enclosure location. Pull new 72-fiber single mode fiber optic cable through one of the conduits. Splice the new fiber to existing fiber at the predetermined splice enclosures **and conduct OTDR testing on the new fiber**

optic cable. Submit the test results to the Engineer for review and approval. Complete all splicing within 96 hours.

Reference the Traffic Signals Scope of Work found elsewhere in this RFP for additional traffic signal fiber optic communications cable and traffic signal communication requirements.

### **SINGLE MODE FIBER OPTIC COMMUNICATIONS CABLE AND DROP CABLE**

Refer to Section 1098-10, 1098-11, 1730, and 1731 of the 2012 NCDOT Standard Specifications for Roads and Structures.

### **MULTI-DUCT CONDUIT**

Furnish and install two (2) – 2-inch inside diameter multi-duct conduit system and all necessary hardware in accordance with the provisions of Sections 1091 and 1715 of the Standard Specifications.

### **TRACER WIRE**

Furnish "green" insulated Number 14 AWG, THWN, stranded, copper wire to serve as a tracer wire in one of the conduits. Install the tracer wire in the same conduit through the entire length of the conduit system. Where tracer wire is spliced, provide waterproof butt splices. Splicing is allowed only in junction boxes.

### **OVERSIZED JUNCTION BOXES**

Furnish and install oversized junction boxes (pull boxes) at maximum intervals of fifteen hundred (1500) feet and as necessary for future device installation and directional drilling conduit segments in accordance with Sections 1098-5, and 1716 of the Standard Specifications.

Provide junction box covers with standard "NCDOT Fiber-Optic Cable" logo, pull slots and stainless steel pins.

Comply with Article 1411-3 of the Standard Specifications, except as follows:

Install junction boxes flush with finished grade.

Do not install sealant compound between junction boxes and covers.

Install junction boxes where underground splicing of cable is necessary and where transitioning from below ground to above ground installation or vice-versa.

### **DELINEATOR MARKERS**

Furnish and install delineator markers with all necessary hardware in accordance with the provisions of Section 1098-13 and 1733 of the Standard Specifications.

Place delineator marker at every splice and junction box location.

Provide text, including the division contact number that is hot stamped in black on a yellow background material that will not fade or deteriorate over time. Provide delineator markers with a nominal message height of 15 inches and that contain the following text visible from all directions approaching the assembly:

**WARNING  
NCDOT FIBER OPTIC CABLE  
BEFORE EXCAVATING OR  
IN AN EMERGENCY  
CALL: (336) 315-7080**

Install delineator markers at fifteen hundred (1500) feet intervals. Install delineator markers using a method that securely anchors the delineator marker in the ground to prohibit twisting and easy removal.

### **QUALIFIED PRODUCTS LIST**

Submit a listing of items including Dynamic Message Signs on the NCDOT Qualified Products List (QPL) to receive approval for use on the project. Catalog cuts will not be required for items on the QPL. The QPL web site is:

<http://www.ncdot.org/doh/preconstruct/traffic/ITSS/SMS/qpl/>

### **MAINTENANCE AND REPAIR REQUIREMENTS**

Maintain and repair the ITS devices within the project scope until the final acceptance of the project by the NCDOT. After the acceptance of the project, the Design-Build Team shall be responsible for repairing the system due to faulty materials or workmanship in accordance with the Project Special Provision "Twelve-month Guarantee" or longer warranty period offered by the Design-Build Team.

### **PLAN OF RECORD DOCUMENTATION**

Prepare and submit to the Department Plan of Record (POR) documentation that depicts the conduit and ITS device locations. Submit final POR documentation in electronic and hard copy format for approval by the Department. Provide electronic plans in MicroStation (latest release in use by the Department) format on CD. Submit hard copy documentation on 22X34 inch plan sheets. POR documentation shall include the final location and depth of conduits, wiring external to the cabinets, locations of splice closures, junction box locations, and SMFO cable terminations. Include in the POR documentation real world coordinates for all ITS devices, splice enclosures, junction boxes, and equipment cabinets installed or utilized under this project. Provide the coordinates in feet units using the North Carolina State Plane coordinate system (1983 North American Datum also known as NAD '83). Furnish coordinates that do not deviate

more than 1.7 feet in the horizontal plane and 3.3 feet in the vertical plane. Global positioning system (GPS) equipment able to obtain the coordinate data within these tolerances may be used.

## **INTEGRATION**

Upon completion of the ITS devices' installation, integrate the new devices with the TRTMC TMS. Provide all necessary central equipment, including but not limited to, digital video decoders, central Ethernet switch with appropriate number of copper and fiber optic ports, fiber optic and copper patch cords, and all other material and labor required for the successful integration of new devices.

Modify, as necessary, existing central hardware and software modules including databases, to provide operators access to new devices through operators' Graphical User Interface. Coordinate with and obtain Engineer's approval prior to starting any work in the TRTMC and modifying any existing hardware and software.

## **TESTING**

Develop unit and system test plans and procedures for each ITS device and component and submit to the Engineer for review and approval. This includes but is not limited to CCTVs, DMSs, fiber optic communications cable and central equipment.

Upon completion of the system installation and integration, conduct unit and system tests according to approved test plans and procedures. Provide all necessary test equipment. In case of failures and substandard performance, the Design Build Team shall identify the cause, repair or replace the faulty parts and components and repeat the test. If the problem persists, the entire unit causing the problem shall be replaced prior to retest.

After successful completion of all units and system test, submit the test reports along with the record of repairs and part replacements to the Engineer.

**\*\*\* STANDARD SPECIAL PROVISIONS \*\*\*****PLANT AND PEST QUARANTINES****(Imported Fire Ant, Gypsy Moth, Witchweed, And Other Noxious Weeds)**

(3-18-03)

DB1 G130

**Within Quarantined Area**

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

**Originating in a Quarantined County**

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

**Contact**

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

**Regulated Articles Include**

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

**GIFTS FROM VENDORS AND CONTRACTORS**

(12-15-09)

DB1 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:

- (1) have a contract with a governmental agency; or
- (2) have performed under such a contract within the past year; or
- (3) 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 *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.

#### **STATE HIGHWAY ADMINISTRATOR TITLE CHANGE:**

(07-31-12)

DB1 G185

Revise the *2012 Standard Specifications* as follows:

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

#### **BRIDGE APPROACH FILLS**

(9-1-11)

DB4 R01

##### **Description**

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

##### **Materials**

Refer to Division 10 of the *Standard Specifications*.

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

For bridge approach fills for sub regional tier bridges, provide Type 1 geotextile for filtration

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

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

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

### **Construction Methods**

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

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

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

For reinforced bridge approach fills, construct one foot square drains consisting of 4" diameter continuous perforated PVC pipes surrounded by No. 78M stone wrapped in Type 1 geotextiles. Install drains in accordance with Standard Drawing No. 422.10. For bridge approach fills for sub regional tier bridges, install 4" diameter continuous perforated PVC drain pipes in accordance with Standard Drawing No. 422.11.

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

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

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

#### **ASPHALT PAVEMENTS - SUPERPAVE**

(6-19-12)

605

DB6 R01

Revise the 2012 *Standard Specifications* as follows:

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

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

<b>TABLE 605-1 APPLICATION RATES FOR TACK COAT</b>	
<b>Existing Surface</b>	<b>Target Rate (gal/sy)</b>
	<b>Emulsified Asphalt</b>
New Asphalt	0.04 ± 0.01
Oxidized or Milled Asphalt	0.06 ± 0.01
Concrete	0.08 ± 0.01

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

<b>TABLE 605-2</b>	
<b>APPLICATION TEMPERATURE FOR TACK COAT</b>	
<b>Asphalt Material</b>	<b>Temperature Range</b>
Asphalt Binder, Grade PG 64-22	350 - 400°F
Emulsified Asphalt, Grade RS-1H	130 - 160°F
Emulsified Asphalt, Grade CRS-1	130 - 160°F
Emulsified Asphalt, Grade CRS-1H	130 - 160°F
Emulsified Asphalt, Grade HFMS-1	130 - 160°F
Emulsified Asphalt, Grade CRS-2	130 - 160°F

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

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

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

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

#### **PREPARATION OF SUBGRADE AND BASE**

(9-1-11)

DB5 R05

On mainline portions and ramps of this project, prepare the subgrade and base beneath the pavement structure in accordance with the applicable sections of the 2012 *Standard Specifications for Roads and Structures* except use an automatically controlled fine grading machine utilizing string lines, laser controls, or other approved methods to produce final subgrade and base surfaces meeting the lines, grades, and cross sections required by the plans or established by the Engineer.

#### **ASPHALT PAVER - FIXED AND MOBILE STRING LINE**

(9-1-11)

DB6 R07

A mobile string line consisting of a 30 to 40 foot long ski is required for the widening and resurfacing on this project. A fixed string line is required for the new pavement construction on this project.

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

(6-07-12)

DB6 R15

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

Asphalt Concrete Base Course	Type B 25.0_	4.4%
Asphalt Concrete Intermediate Course	Type I 19.0_	4.8%
Asphalt Concrete Surface Course	Type S 4.75A	6.8%
Asphalt Concrete Surface Course	Type SA-1	6.8%

Asphalt Concrete Surface Course	Type SF 9.5A	6.7%
Asphalt Concrete Surface Course	Type S 9.5_	6.0%
Asphalt Concrete Surface Course	Type S 12.5_	5.6%

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

### **ASPHALT PLANT MIXTURES**

(07-01-95)

DB6 R20

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

### **FINAL SURFACE TESTING - ASPHALT PAVEMENTS**

(9-1-11)

DB6 R45

Perform acceptance testing of the longitudinal profile of the finished pavement surface in accordance with Article 610-13 of the 2012 Standard Specification for Roads and Structures using an Inertial Profiler. The Hearne straightedge will not be allowed on this project.

### **OPEN GRADED ASPHALT FRICTION COURSE, PERMEABLE ASPHALT DRAINAGE COURSE, AND ULTRA-THIN BONDED WEARING COURSE:**

(4-17-12)

609

DB6 R62

When producing and constructing open graded asphalt friction course, permeable asphalt drainage course, and ultra-thin bonded wearing course revise the *2012 Standard Specifications* as follows:

**Page 6-10, Subarticle 609-6(B) Required Sampling and Testing Frequencies**, delete the third paragraph and replace with the following:

Sample and test the completed mixture from each mix design per plant per year at the following minimum frequency during mix production:

<u>Accumulative Production Increment</u>	<u>Number of Samples per Increment</u>
500 tons	1

**Page 6-10, Subarticle 609-6(C) Control Charts**, delete the fourth paragraph and replace with the following:

Record the following data on the standardized control charts and in accordance with the requirements of Section 7.4 of the *HMA/QMS Manual*:

- (a) Aggregate Gradation Test Results:
1. 12.5 mm (Types P57 & FC-2 Mod. Only)
  2. 9.5 mm (Excluding Type P57)
  3. 4.75 mm
  4. 2.36 mm
  5. 0.075 mm Sieves
- (b) Binder Content, %,  $P_b$

**Page 6-11, Subarticle 609-6(D) Control Limits, Table 609-1 CONTROL LIMITS**, replace with the following:

<b>TABLE 609-1 CONTROL LIMITS</b>			
<b>Mix Control Criteria</b>	<b>Target Source</b>	<b>Moving Average Limit</b>	<b>Individual Limit</b>
12.5 mm Sieve (Types P57 & FC-2 Mod)	JMF	$\pm 4.0$	$\pm 8.0$
9.5 mm Sieve (Excluding Type P57)	JMF	$\pm 4.0$	$\pm 8.0$
4.75 mm Sieve	JMF	$\pm 4.0$	$\pm 8.0$
2.36 mm Sieve	JMF	$\pm 4.0$	$\pm 8.0$
0.075 mm Sieve	JMF	$\pm 1.5$	$\pm 2.5$
Binder Content	JMF	$\pm 0.3$	$\pm 0.7$
TSR (Ultra-thin Only)	Min. Spec. Limit	-	- 15%

**Page 6-12, Subarticle 609-6(F) Allowable Retesting for Mix Deficiencies, Table 609-2 RETEST LIMITS FOR MIX DEFICIENCIES**, replace with the following:

<b>TABLE 609-2 RETEST LIMITS FOR MIX DEFICIENCIES</b>	
<b>Property</b>	<b>Limit</b>
% Binder Content	by more than $\pm 1.0\%$
12.5 mm Sieve (Types P 57 & FC-2 Mod)	by more than $\pm 9.0\%$
9.5 mm Sieve (Excluding Type P 57)	by more than $\pm 9.0\%$
4.75 mm sieve	by more than $\pm 9.0\%$
2.36 mm sieve	by more than $\pm 9.0\%$
0.075 mm sieve	by more than $\pm 3.0\%$
TSR (Ultra-thin only)	by more than -15% from Specification limit

**Page 6-17, Subarticle 609-9(C) Limits of Precision, Table 609-3 LIMITS OF PRECISION FOR TEST RESULTS, replace with the following:**

<b>TABLE 609-3</b>	
<b>LIMITS OF PRECISION FOR TEST RESULTS</b>	
<b>Mix Property</b>	<b>Limits of Precision</b>
12.5 mm Sieve (Types P 57 & FC-2 Mod. Only)	± 6.0%
9.5 mm Sieve (Excluding Type P 57)	± 5.0%
4.75 mm Sieve	± 5.0%
2.36 mm Sieve	± 5.0%
0.075 mm Sieve	± 2.0%
Asphalt Binder Content	± 0.5%
TSR (Ultra-thin HMA Only)	± 15.0%

**TYING PROPOSED CONCRETE PAVEMENT TO EXISTING CONCRETE PAVEMENT**

(07-01-95)

DB7 R05

Tie proposed concrete pavement on this project to existing concrete pavement in accordance with the detail shown in the plans and the following provision:

1. Drill holes in the existing concrete pavement 1/8" greater than the diameter of the dowel bar. After drilling, blow the hole out with air and allow to dry.
2. Next, place the cement grout or epoxy resin in the back of the dowel hole. The placement of grout can be achieved by using a flexible tube with a long nose that places the material in the back of the dowel hole; the placement of epoxy-type materials can be achieved by using a cartridge with a long nozzle that dispenses the material to the rear of the dowel hole.
3. Insert the dowel into the hole with a slight twisting motion so that the material in the back of the hole is forced up and around the dowel bar to ensure a uniform coating of the anchoring material over the dowel bar.
4. Place a thin nylon or plastic grout retention disk, (1/16" minimum thickness) manufactured to slip tightly over the dowel over the dowel and against the slab face to prevent the anchoring material from flowing out of the hole, and to create an effective face at the entrance of the dowel hole.

**SUBSURFACE DRAINAGE**

(9-1-11)

DB8 R05

Revise the *2012 Standard Specifications for Roads and Structures* as follows:

**Page 8-11, Article 815-1, Delete the first sentence and replace with the following:**

The Design-Build Team shall construct subsurface drains, underdrains, blind drains and other types of drains where groundwater is within 6 feet of subgrade.

**GUARDRAIL ANCHOR UNITS, TYPE 350**

(9-1-11)

DB8 R65

**Description**

Furnish and install guardrail anchor units in accordance with the details in the plans as developed by the Design-Build Team, the applicable requirements of Section 862 of the 2012 *Standard Specifications for Roads and Structures*, and at locations shown in the plans.

**Materials**

The Design-Build Team may at his option, furnish any one of the guardrail anchor units or approved equal.

Guardrail anchor unit (ET-2000) as manufactured by:

TRINITY INDUSTRIES, INC.  
2525 N. STEMMONS FREEWAY  
DALLAS, TEXAS 75207  
TELEPHONE: 800-644-7976

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

ROAD SYSTEMS, INC.  
3616 OLD HOWARD COUNTY AIRPORT  
BIG SPRING, TEXAS 79720  
TELEPHONE: 915 263-2435

Prior to installation the Design-Build Team shall submit to the Engineer:

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

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



**Construction**

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

**IMPACT ATTENUATOR UNITS, TYPE 350**

(9-1-11)

DB8 R75

**Description**

Furnish and install impact attenuator units and any components necessary to connect the impact attenuator units in accordance with the manufacturer's requirement, the details in the plans and at locations shown in the plans.

**Materials**

The Design-Build Team shall at their option, furnish any one of the impact attenuator units or approved equal:

**NON-GATING IMPACT ATTENUATOR UNITS:**

The impact attenuator unit (QUADGUARD) as manufactured by:

ENERGY ABSORPTION SYSTEMS, INC.  
ONE EAST WACKER DRIVE  
CHICAGO, ILLINOIS 60601-2076  
TELEPHONE: 312-467-6750

The impact attenuator unit (TRACC) as manufactured by:

TRINITY INDUSTRIES, INC.  
2525 N. STEMMONS FREEWAY  
DALLAS, TEXAS 75207  
TELEPHONE: 1-800-644-7976

**GATING IMPACT ATTENUATOR UNITS:**

The impact attenuator unit (BRAKEMASTER) as manufactured by:

ENERGY ABSORPTION SYSTEMS, INC.  
ONE EAST WACKER DRIVE  
CHICAGO, ILLINOIS 60601-2076  
TELEPHONE: 312-467-6750

The impact attenuator unit (CAT) as manufactured by:

TRINITY INDUSTRIES, INC.  
2525 N. STEMMONS FREEWAY  
DALLAS, TEXAS 75207  
TELEPHONE: 1-800-644-7976

Prior to installation the Design-Build Team shall submit to the Engineer:

1. FHWA acceptance letter for each impact attenuator unit certifying it meets the requirements of NCHRP Report 350, Test Level 3, in accordance with Section 106-2 of the 2012 *Standard Specifications for Roads and Structures*.
2. Certified working drawings and assembling instructions from the manufacturer for each impact attenuator unit in accordance with Section 105-2 of the 2012 *Standard Specifications for Roads and Structures*.

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

**Construction Methods**

If the median width is 40 feet or less, the Design-Build Team shall supply one of the NON-GATING Impact Attenuator Units listed in the Materials Section herein.

If the median width is greater than 40 feet, the Design-Build Team may use any of the GATING or NON-GATING Impact Attenuator Units listed in the Materials Section herein.

**PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON**

(08-24-09)

DB8 R105

**Description**

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

**Materials**

<b>Item</b>	<b>Section</b>
Plain rip rap	1042
Filter Fabric	1056

The permanent soil reinforcement matting shall be permanent erosion control reinforcement mat and shall be constructed of synthetic or a combination of coconut and synthetic fibers evenly distributed throughout the mat between a bottom UV stabilized netting and a heavy duty UV stabilized top net. The matting shall be stitched together with UV stabilized polypropylene

thread to form a permanent three dimensional structure. The mat shall have the following minimum physical properties:

<i>Property</i>	<i>Test Method</i>	<i>Value Unit</i>
Light Penetration	ASTM D6567	9 %
Thickness	ASTM D6525	0.40 in
Mass Per Unit Area	ASTM D6566	0.55 lb/sy
Tensile Strength	ASTM D6818	385 lb/ft
Elongation ( Maximum)	ASTM D6818	49 %
Resiliency	ASTM D1777	>70 %
UV Stability *	ASTM 4355	≥80 %
Porosity (Permanent Net)	ECTC Guidelines	≥85 %
Maximum Permissible Shear Stress (Vegetated)	Performance Bench Test	≥8.0 lb/ft <sup>2</sup>
Maximum Allowable Velocity (Vegetated)	Performance Bench Test	≥16.0 ft/s

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

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

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

### **Construction Methods**

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

### **DETECTABLE WARNINGS FOR PROPOSED CURB RAMPS:**

(9-1-11)

DB8 R126

### **Description**

Construct detectable warnings consisting of integrated raised truncated domes on proposed concrete curb ramps in accordance with the *2012 Standard Specifications*, plan details, the requirements of the *28 CFR Part 36 ADA Standards for Accessible Design* and this provision.

### **Materials**

Detectable warning for proposed curb ramps shall consist of integrated raised truncated domes. The description, size and spacing shall conform to Section 848 of the *Standard Specifications*.

Use material for detectable warning systems as shown herein. Material and coating specifications must be stated in the Manufacturers Type 3 Certification and all Detectable Warning systems must be on the NCDOT Approved Product List for Curb Ramps.

Install detectable warnings created from one of the following materials: precast concrete blocks or bricks, clay paving brick, gray or ductile iron castings, mild steel, stainless steel, and engineered plastics, rubber or composite tile. Only one material type for detectable warning will be permitted per project, unless otherwise approved by the Engineer.

- (A) **Detectable Warnings shall** consist of a base with integrated raised truncated domes, and **when constructed of precast concrete** they shall conform to the material requirements of Article 848-2 of the *Standard Specifications*.
- (B) **Detectable Warnings shall** consist of a base with integrated raised truncated domes, and **may be comprised of other materials including, but not limited, to clay paving brick, gray iron or ductile iron castings, mild steel, stainless steel, and engineered plastics, rubber or composite tile**, which are cast into the concrete of the curb ramps. The material shall have an integral color throughout the thickness of the material. The detectable warning shall include fasteners or anchors for attachment in the concrete and shall be furnished as a system from the manufacturer.

Prior to installation, the Contractor shall submit to the Engineer assembling instructions from the manufacturer for each type of system used in accordance with Article 105-2 of the *Standard Specifications*. The system shall be furnished as a kit containing all consumable materials and consumable tools, required for the application. They shall be capable of being affixed to or anchored in the concrete curb ramp, including green concrete (concrete that has set but not appreciably hardened). The system shall be solvent free and contain no volatile organic compounds (VOC). The static coefficient of friction shall be 0.8 or greater when measured on top of the truncated domes and when measured between the domes in accordance with ASTM C1028 (dry and wet). The system shall be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to degradation by motor fuels, lubricants and antifreeze.

- (C) When steel or gray iron or ductile iron casting products are provided, only products that meet the requirements of Article 106-1(B) of the *Standard Specifications* may be used. Submit to the Engineer a Type 6 Certification, catalog cuts and installation procedures at least 30 days prior to installation for all.

### **Construction Methods**

- (A) Prior to placing detectable warnings in proposed concrete curb ramps, adjust the existing subgrade to the proper grade and in accordance with Article 848-3 of the *Standard Specifications*.
- (B) Install all detectable warning in proposed concrete curb ramps in accordance with the manufacturer's recommendations.

**STREET SIGNS AND MARKERS AND ROUTE MARKERS**

(07-01-95)

DB9 R01

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

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

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

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

**MATERIALS:**

(Rev. 7-31-12)

1005, 1081, 1092

DB 10 R001

Revise the *2012 Standard Specifications* as follows:

**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.
Units	psi					inch	inch	lb/cy	lb/cy	lb/cy	lb/cy
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 10-23, Table 1005-1, AGGREGATE GRADATION-COARSE AGGREGATE, replace with the following:

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

Std. Size #	Percentage of Total by Weight Passing													Remarks
	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4	#8	#10	#16	#40	#200		
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, Str. Conc., Weep Hole Drains	
14M	-	-	-	-	-	100	35-70	5-20	-	0-8	-	A	Asphalt Plant Mix, AST, Weep Hole Drains, Str. Concrete	
9	-	-	-	-	-	100	85-100	10-40	-	0-10	-	A	AST	
ABC	-	100	75-97	-	55-80	-	35-55	-	25-45	-	14-30	4-12 <sup>B</sup>	Aggregate Base Course, Aggregate Stabilization	
ABC (M)	-	100	75-100	-	45-79	-	20-40	-	0-25	-	-	0-12 <sup>B</sup>	Maintenance Stabilization	
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 10-126, Table 1078-1, REQUIREMENTS FOR CONCRETE**, replace with the following:

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

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

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

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

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

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

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



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

**SELECT MATERIAL, CLASS III, TYPE 3:**  
(12-02-11)

DB10 R005

Revise the *2012 Standard Specifications* as follows:

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

**Type 3 Select Material**

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

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

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

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

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

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

Subdrain coarse aggregate shall meet Class V select material.

**TEMPORARY SHORING**

(5-13-12)

DB11 R02

**Description**

Temporary shoring includes cantilever, braced and anchored shoring and temporary mechanically stabilized earth (MSE) walls. Temporary shoring does not include trench boxes. At the Design-Build Team's option, use any type of temporary shoring. In addition, the Design-Build Team may elect to consider the use of standard shoring where appropriate. In such case, the Standard Shoring Project Special Provision, standard shoring selection forms, and Standard Temporary Shoring Drawings No. 1801.01 and/or 1801.02 will apply. The Standard Shoring provision can be found at:

**[www.ncdot.org/doh/preconstruct/highway/geotech/provnote/2012/](http://www.ncdot.org/doh/preconstruct/highway/geotech/provnote/2012/)**

and the standard shoring selection forms and aforementioned drawings may be found at:

**[www.ncdot.org/doh/preconstruct/highway/geotech/formdet/2012/](http://www.ncdot.org/doh/preconstruct/highway/geotech/formdet/2012/)**

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

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

**(A) Cantilever and Braced Shoring**

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

**(B) Anchored Shoring**

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

**(C) Temporary MSE Walls**

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

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

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

**(D) Embedment**

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

**(E) Positive Protection**

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

**Materials**

Refer to the 2012 *Standard Specifications for Roads and Structures*.

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

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

For drilled-in H-piles, use nonshrink neat cement grout or Class A concrete that meets Article 450-2 of the 2012 *Standard Specifications for Roads and Structures*. Provide concrete with a slump of 6" to 8". Use an approved high-range water reducer to achieve this slump.

Use untreated timber with a thickness of at least 3" and a bending stress of at least 1,000 psi for timber lagging. Provide steel bracing that meets ASTM A36.

**(A) Shoring Backfill**

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

**(B) Anchors**

Store anchor materials on blocking a minimum of 12" above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign materials. Load, transport, unload and store anchor materials such that they are kept clean and free of damage. Damaged or deformed materials will be rejected.

**(1) Ground Anchors**

Use high-strength steel bars that meet AASHTO M 275 or seven-wire strands that meet ASTM A886 or Article 1070-5 of the 2012 *Standard Specifications for Roads and Structures*. Splice bars in accordance with Article 1070-9 of the 2012 *Standard Specifications for Roads and Structures*. Do not splice strands.

Provide bondbreakers, spacers and centralizers that meet Article 6.3.5 of the *AASHTO LRFD Bridge Construction Specifications*.

**(2) Helical Anchors**

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

**(3) Anchorages**

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

**(C) Temporary Walls**

**(1) Welded Wire Facing**

Use welded wire reinforcement for welded wire facing, struts and wires. For temporary wire walls, provide welded wire facing supplied by the Wire Wall

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

(2) Geotextiles

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

(3) Geogrid Reinforcement

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

Use geogrids with a roll width of at least 4 ft and an “approved” or “approved for provisional use” status code. Geogrids are approved for short-term design strengths for a 3-year design life in the MD and CD based on material type. The list of approved geogrids with short-term design strengths is available from:

[www.ncdot.org/doh/operations/materials/soils/gep.html](http://www.ncdot.org/doh/operations/materials/soils/gep.html)

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

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

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

(4) Welded Wire Grid and Metallic Strip Reinforcement

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

## **Preconstruction Requirements**

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

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

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

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

### **(C) Temporary Shoring Designs**

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

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

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

## (1) Soil Parameters

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

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

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

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

## (2) Traffic Surcharge

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

## (3) Cantilever, Braced and Anchored Shoring Designs

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

Define “top of shoring” for cantilever, braced and anchored shoring as where the grade intersects the back of sheet piles or H-piles and timber lagging. Design cantilever, braced and anchored shoring for a traffic impact load of 2,000 lb/ft applied 18" above top of shoring if concrete barrier is above and next to shoring or temporary guardrail is above and attached to shoring. For anchored shoring designs, apply traffic impact load as horizontal load ( $P_{H1}$ ) in accordance with Figure 3.11.6.3-2(a) of the *AASHTO LRFD specifications*.

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

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

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

(4) Temporary Wall Designs

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

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

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

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

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



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

**(D) Preconstruction Meeting**

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

**Construction Methods**

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

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

**(A) Tolerances**

Construct shoring with the following tolerances:

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

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

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

**(1) Pile Installation**

Install piles with the minimum required embedment and extension in accordance with Subarticles 450-3(D) and 450-3(E) of the 2012 *Standard Specifications for*

*Roads and Structures* except that a pile driving equipment data form is not required. Piles may be installed with a vibratory hammer as approved by the Engineer.

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

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

(2) Excavation

Excavate in front of piles from the top down in accordance with the accepted submittals. For H-piles with timber lagging and braced and anchored shoring, excavate in staged horizontal lifts with a maximum height of 5 ft. Remove flowable fill and material in between H-piles as needed to install timber lagging. Position lagging with at least 3" of contact in the horizontal direction between the lagging and pile flanges. Do not excavate the next lift until timber lagging for the current lift is installed and if applicable, bracing and anchors for the current lift are accepted. Backfill behind cantilever, braced or anchored shoring with shoring backfill.

(3) Anchor Installation

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

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

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

(4) Anchor Testing

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

(a) Anchor Acceptance

Anchor acceptance is based in part on the following criteria.

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

(b) Anchor Test Results

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

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

**(C) Temporary Wall Installation**

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

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

Wrap geotextile reinforcement and retention geotextiles behind welded wire facing as shown in the plans and accepted submittals and cover geotextiles with at least 3" of shoring backfill. Overlap adjacent geotextile reinforcement and retention and separation

geotextiles at least 18" with seams oriented perpendicular to the wall face. Hold geotextiles in place with wire staples or anchor pins as needed.

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

Place shoring backfill in the reinforced zone in 8" to 10" thick lifts. Compact A-2-4 soil and Class II, Type 1 and Class III select material in accordance with Subarticle 235-3(C) of the 2012 *Standard Specifications for Roads and Structures*. Use only hand operated compaction equipment to compact backfill within 3 ft of welded wire facing. At a distance greater than 3 ft, compact shoring backfill with at least 4 passes of an 8 ton to 10 ton vibratory roller in a direction parallel to the wall face. Smooth wheeled or rubber tired rollers are also acceptable for compacting backfill. Do not use sheepsfoot, grid rollers or other types of compaction equipment with feet. Do not displace or damage reinforcement when placing and compacting shoring backfill. End dumping directly on geotextile or geogrid reinforcement is not permitted. Do not operate heavy equipment on reinforcement until it is covered with at least 8" of shoring backfill. Replace any damaged reinforcement to the satisfaction of the Engineer.

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

**TRUCK MOUNTED CHANGEABLE MESSAGE SIGNS:**

(06-27-2012)

1101.02

DB11 R10

Revise the 2012 *Roadway Standard Drawings* as follows:

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

- 11- Truck Mounted Changeable Message Signs (TMCMS) used on shadow vehicles for "in lane" activities shall be a minimum of 43" X 73". The display panel shall have full matrix capability with the capability to provide 2 message lines with 7 characters per line with a minimum character height of 18". For addition messaging, contact the work zone traffic control section.
- 12- TMCMS used for advanced warning on vehicles located on the shoulder may be smaller than 43" X 73". The display panel shall have the capability to provide 2 messages lines

with 7 characters per line with a minimum character height of 18". For additional messaging, contact the work zone traffic control section.

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

- 12- Truck Mounted Changeable Message Signs (TMCMS) used on shadow vehicles for "in lane" activated shall be a minimum of 43" X 73". The display panel shall have full matrix capability with the capability to provide 2 message lines with 7 characters per line with a minimum character height of 18". For additional messaging, contact the work zone traffic control section.
- 13- TMCMS used for advanced warning on vehicles located on the shoulder may be smaller than 43" X 73". The display panel shall have the capability to provide 2 message lines with 7 characters per line with a minimum character height of 18". For additional messaging, contact the work zone traffic control section.

### **COORDINATION OF LIGHTING WORK**

(04-03-07)

DB14 R01

Complete the required work as described in the "Lighting" Plans and Specifications, so that lighting is maintained for all areas shown on the plans by either the existing or the proposed lights.

Use care in working around the lights and circuitry and phase operations so that the lighting systems will not be disrupted. Make repairs or replacements in conformance with the "Lighting" Special Provisions. Should the Design-Build Team fail to make such repairs within the time frame allowed, the Department will cause the necessary repairs to be made by others.

### **ON-THE-JOB TRAINING**

(10-16-07) (Rev. 06-03-09)

Z-10

#### **Description**

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

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

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

## **Minorities and Women**

Developing, training and upgrading of minorities and women toward journeymen 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.

## **Assessing Training Goals**

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

## **Training Classifications**

The Contractor shall provide on-the-job training aimed at developing full journeyman level workers in the construction craft / operator positions. Preference shall be given to providing training in the following skilled work classifications:

Equipment Operators	Office Engineers
Truck Drivers	Estimators
Carpenters	Iron / Reinforcing Steel Workers
Concrete Finishers	Mechanics
Pipe Layers	Welders

The Department has established common training classifications and their respective training requirements that may be used by the contractors. However, the classifications established are not all-inclusive. Where the training is oriented toward construction applications, training will be allowed in lower-level management positions such as office engineers and estimators. Contractors shall submit new classifications for specific job functions that their employees are performing. The Department will review and recommend for acceptance to FHWA the new classifications proposed by contractors, if applicable. New classifications shall meet the following requirements:

Proposed training classifications are reasonable and realistic based on the job skill classification needs, and

The number of training hours specified in the training classification is consistent with common practices and provides enough time for the trainee to obtain journeyman level status.

The Contractor may allow trainees to be trained by a subcontractor provided that the Contractor retains primary responsibility for meeting the training and this provision is made applicable to the subcontract. However, only the Contractor will receive credit towards the annual goal for the trainee.

Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training course leading to journeyman level status or in which they have been employed as a journeyman.

### **Records and Reports**

The Contractor shall maintain enrollment, monthly and completion reports documenting company compliance under these contract documents. These documents and any other information, as requested, shall be submitted to the OJT Program Manager.

Upon completion and graduation of the program, the Contractor shall provide each trainee with a certification Certificate showing the type and length of training satisfactorily completed.

### **Trainee Interviews**

All trainees enrolled in the program shall 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 NCDOL and the Department.

**Achieving or Failing to Meet Training Goals**

The Contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and who receives training for at least 50 percent of the specific program requirement. Trainees will be allowed to be transferred between projects if required by the Contractor's scheduled workload to meet training goals.

If a contractor fails to attain their training assignments for the calendar year, they may be taken off the NCDOT's Bidders List.

**Measurement and Payment**

No compensation will be made for providing required training in accordance with these contract documents.



**STANDARD SPECIAL PROVISION****AVAILABILITY OF FUNDS – TERMINATION OF CONTRACTS**

(9-1-11)

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 Article 108-13(E), of the *North Carolina Department of Transportation Standard Specifications for Roads and Structures*, dated January 2012 and as amended by the Standard Special Provision, Division One found elsewhere in this RFP.

**\*\*\* STANDARD SPECIAL PROVISIONS \*\*\*****NCDOT GENERAL SEED SPECIFICATIONS FOR SEED QUALITY**

(5-7-11)

Z-3

Seed shall be sampled and tested by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory. When said samples are collected, the vendor shall supply an independent laboratory report for each lot to be tested. Results from seed so sampled shall be final. Seed not meeting the specifications shall be rejected by the Department of Transportation and shall not be delivered to North Carolina Department of Transportation warehouses. If seed has been delivered it shall be available for pickup and replacement at the supplier's expense.

Any re-labeling required by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory, that would cause the label to reflect as otherwise specified herein shall be rejected by the North Carolina Department of Transportation.

Seed shall be free from seeds of the noxious weeds Johnsongrass, Balloonvine, Jimsonweed, Witchweed, Itchgrass, Serrated Tussock, Showy Crotalaria, Smooth Crotalaria, Sicklepod, Sandbur, Wild Onion, and Wild Garlic. Seed shall not be labeled with the above weed species on the seed analysis label. Tolerances as applied by the Association of Official Seed Analysts will NOT be allowed for the above noxious weeds except for Wild Onion and Wild Garlic.

Tolerances established by the Association of Official Seed Analysts will generally be recognized. However, for the purpose of figuring pure live seed, the found pure seed and found germination percentages as reported by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory will be used. Allowances, as established by the NCDOT, will be recognized for minimum pure live seed as listed on the following pages.

The specifications for restricted noxious weed seed refers to the number per pound as follows:

<b>Restricted Noxious Weed</b>	<b>Limitations per Lb. of Seed</b>	<b>Restricted Noxious Weed</b>	<b>Limitations per Lb. of Seed</b>
Blessed Thistle	4 seeds	Cornflower (Ragged Robin)	27 seeds
Cocklebur	4 seeds	Texas Panicum	27 seeds
Spurred Anoda	4 seeds	Bracted Plantain	54 seeds
Velvetleaf	4 seeds	Buckhorn Plantain	54 seeds
Morning-glory	8 seeds	Broadleaf Dock	54 seeds
Corn Cockle	10 seeds	Curly Dock	54 seeds
Wild Radish	12 seeds	Dodder	54 seeds
Purple Nutsedge	27 seeds	Giant Foxtail	54 seeds
Yellow Nutsedge	27 seeds	Horsenettle	54 seeds
Canada Thistle	27 seeds	Quackgrass	54 seeds
Field Bindweed	27 seeds	Wild Mustard	54 seeds
Hedge Bindweed	27 seeds		

Seed of Pensacola Bahiagrass shall not contain more than 7% inert matter, Kentucky Bluegrass, Centipede and Fine or Hard Fescue shall not contain more than 5% inert matter whereas a maximum of 2% inert matter will be allowed on all other kinds of seed. In addition, all seed shall not contain more than 2% other crop seed nor more than 1% total weed seed. The germination rate as tested by the North Carolina Department of Agriculture shall not fall below 70%, which includes both dormant and hard seed. Seed shall be labeled with not more than 7%, 5% or 2% inert matter (according to above specifications), 2% other crop seed and 1% total weed seed.

Exceptions may be made for minimum pure live seed allowances when cases of seed variety shortages are verified. Pure live seed percentages will be applied in a verified shortage situation. Those purchase orders of deficient seed lots will be credited with the percentage that the seed is deficient.

#### FURTHER SPECIFICATIONS FOR EACH SEED GROUP ARE GIVEN BELOW:

Minimum 85% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 83% pure live seed will not be approved.

Sericea Lespedeza  
Oats (seeds)

Minimum 80% pure live seed; maximum 1% total weed seed; maximum 2% total other crop; maximum 144 restricted noxious weed seed per pound. Seed less than 78% pure live seed will not be approved.

Tall Fescue (all approved varieties)	Bermudagrass
Kobe Lespedeza	Browntop Millet
Korean Lespedeza	German Millet - Strain R
Weeping Lovegrass	Clover - Red/White/Crimson
Carpetgrass	

Minimum 78% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 76% pure live seed will not be approved.

Common or Sweet Sundangrass

Minimum 76% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 74% pure live seed will not be approved.

Rye (grain; all varieties)  
Kentucky Bluegrass (all approved varieties)  
Hard Fescue (all approved varieties)  
Shrub (bicolor) Lespedeza

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 noxious weed seed per pound. Seed less than 70% pure live seed will not be approved.

Centipede grass  
Crownvetch  
Pensacola Bahiagrass  
Creeping Red Fescue

Japanese Millet  
Reed Canary Grass  
Zoysia

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 5% inert matter; maximum 144 restricted noxious weed seed per pound.

Barnyard Grass  
Big Bluestem  
Little Bluestem  
Bristly Locust  
Birdsfoot Trefoil  
Indiangrass  
Orchardgrass  
Switchgrass  
Yellow Blossom Sweet Clover

**STANDARD SPECIAL PROVISION****ERRATA**

(1-17-12) (Rev. 7-31-12)

Z-4

Revise the *2012 Standard Specifications* as follows:

**Division 2**

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

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

**Page 2-20, Subarticle 230-4(B), Contractor Furnished Sources, change references as follows:** **Line 1**, replace “(4) Buffer Zone” with “(c) Buffer Zone”; **Line 12**, replace “(5) Evaluation for Potential Wetlands and Endangered Species” with “(d) Evaluation for Potential Wetlands and Endangered Species”; and **Line 33**, replace “(6) Approval” with “(4) Approval”.

**Division 4**

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

**Division 6**

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

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

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

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

**Division 10**

**Page 10-74, Table 1056-1 Geotextile Requirements**, replace “50%” for the UV Stability (Retained Strength) of Type 5 geotextiles with “70%”.

**Division 12**

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

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

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

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

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

#### **Division 15**

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

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

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

#### **Division 17**

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

Revise the *2012 Roadway Standard Drawings* as follows:

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

**\*\*\* STANDARD SPECIAL PROVISIONS \*\*\***

**AWARD OF CONTRACT**

(6-28-77)

Z-6

“The North Carolina Department of Transportation, in accordance with the provisions of *Title VI of the Civil Rights Act of 1964* (78 Stat. 252) and the Regulations of the Department of Transportation (*49 C.F.R., Part 21*), issued pursuant to such act, hereby notifies all bidders that it will affirmatively insure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the ground of race, color, or national origin”.

**\*\*\* STANDARD SPECIAL PROVISIONS \*\*\*****MINORITY AND FEMALE EMPLOYMENT REQUIREMENTS**

(12-18-07)

Z-7

**NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE NUMBER 11246)**

1. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, see as shown on the attached sheet entitled "Employment Goals for Minority and Female Participation".

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The Contractor's compliance with the Executive Order and the regulations in *41 CFR Part 60-4* shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in *41 CFR 60-4.3(a)*, and its effort to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project or the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the executive Order and the regulations in *41 CFR Part 60-4*. Compliance with the goals will be measured against the total work hours performed.

2. As used in this Notice and in the contract resulting from this solicitation, the "covered area" is the county or counties shown on the cover sheet of the proposal form and contract.



**EMPLOYMENT GOALS FOR MINORITY  
AND FEMALE PARTICIPATION**

Economic Areas

**Area 023 29.7%**

Bertie County  
Camden County  
Chowan County  
Gates County  
Hertford County  
Pasquotank County  
Perquimans County

**Area 024 31.7%**

Beaufort County  
Carteret County  
Craven County  
Dare County  
Edgecombe County  
Green County  
Halifax County  
Hyde County  
Jones County  
Lenoir County  
Martin County  
Nash County  
Northampton County  
Pamlico County  
Pitt County  
Tyrrell County  
Washington County  
Wayne County  
Wilson County

**Area 025 23.5%**

Columbus County  
Duplin County  
Onslow County  
Pender County

**Area 026 33.5%**

Bladen County  
Hoke County  
Richmond County  
Robeson County  
Sampson County  
Scotland County

**Area 027 24.7%**

Chatham County  
Franklin County  
Granville County  
Harnett County  
Johnston County  
Lee County  
Person County  
Vance County  
Warren County

**Area 028 15.5%**

Alleghany County  
Ashe County  
Caswell County  
Davie County  
Montgomery County  
Moore County  
Rockingham County  
Surry County  
Watauga County  
Wilkes County

**Area 029 15.7%**

Alexander County  
Anson County  
Burke County  
Cabarrus County  
Caldwell County  
Catawba County  
Cleveland County  
Iredell County  
Lincoln County  
Polk County  
Rowan County  
Rutherford County  
Stanly County

**Area 0480 8.5%**

Buncombe County  
Madison County

**Area 030 6.3%**

Avery County  
Cherokee County  
Clay County  
Graham County  
Haywood County  
Henderson County  
Jackson County  
McDowell County  
Macon County  
Mitchell County  
Swain County  
Transylvania County  
Yancey County

**SMSA Areas**

**Area 5720 26.6%**

Currituck County

**Area 9200 20.7%**

Brunswick County

New Hanover County

**Area 2560 24.2%**

Cumberland County

**Area 6640 22.8%**

Durham County

Orange County

Wake County

**Area 1300 16.2%**

Alamance County

**Area 3120 16.4%**

Davidson County

Forsyth County

Guilford County

Randolph County

Stokes County

Yadkin County

**Area 1520 18.3%**

Gaston County

Mecklenburg County

Union County

**Goals for Female**

**Participation in Each Trade**

(Statewide) 6.9%

## STANDARD SPECIAL PROVISION

### REQUIRED CONTRACT PROVISIONS FEDERAL - AID CONSTRUCTION CONTRACTS

FHWA - 1273 Electronic Version - May 1, 2012

Z-8

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

#### ATTACHMENTS

- A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

#### I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.
3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.
4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

#### II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are

incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

- a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.
- b. The contractor will accept as its operating policy the following statement:  
"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."
2. **EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.
3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
  - a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
  - b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
  - c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.
  - d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
  - e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.
  - a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.
  - b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.
  - c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.
5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:
  - a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
  - b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
  - c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
  - d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.
6. **Training and Promotion:**
  - a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.
  - b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).
  - c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
  - d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.
7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

- a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.
  - b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
  - c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.
  - d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.
8. **Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.
  9. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.
    - a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.
    - b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.
  10. **Assurance Required by 49 CFR 26.13(b):**
    - a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.
    - b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.
  11. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.
    - a. The records kept by the contractor shall document the following:
      - (1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;
      - (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and
      - (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;
    - b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

### III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

### IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

#### 1. Minimum wages

- a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is

attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

- b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:
  - (i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
  - (ii) The classification is utilized in the area by the construction industry; and
  - (iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.
- c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.
2. **Withholding.** The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.
3. **Payrolls and basic records**
  - a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
  - b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee ( e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is

available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency.

- (2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
    - (i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
    - (ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
    - (iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
  - (3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.
  - (4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### 4. Apprentices and trainees

- a. Apprentices (programs of the USDOL). Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- b. Trainees (programs of the USDOL). Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.
- d. Apprentices and Trainees (programs of the U.S. DOT). Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.
- 5. **Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.
- 6. **Subcontracts.** The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.
- 7. **Contract termination:** debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
- 8. **Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.
- 9. **Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.
- 10. **Certification of eligibility.**
  - a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
  - b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
  - c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

#### V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

- 1. **Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- 2. **Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.
- 3. **Withholding for unpaid wages and liquidated damages.** The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.
- 4. **Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

#### VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

- 1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).
  - a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:
    - (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
    - (2) the prime contractor remains responsible for the quality of the work of the leased employees;
    - (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and



- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.
- b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.
2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
  3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.
  4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.
  5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

#### **VII. SAFETY: ACCIDENT PREVENTION**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

#### **VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

#### **IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

#### **X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

**1. Instructions for Certification – First Tier Participants:**

- a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.
- d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contractor). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).
- f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
- g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.
- h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.
- i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

\* \* \* \* \*

**2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:**

- a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:
  - (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;
  - (2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
  - (3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and
  - (4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

**2. Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
- d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of

Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.
- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.
- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

\* \* \* \* \*

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

\* \* \* \* \*

**XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
  - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
  - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**STANDARD SPECIAL PROVISION**  
**MINIMUM WAGES**  
**GENERAL DECISION NC120091 01/06/2012 NC91**

Z-91

Date: January 6, 2012

General Decision Number: NC120091 01/06/2012 NC91

Superseded General Decision Numbers: NC20100128

State: North Carolina

Construction Type: HIGHWAY

**COUNTIES:**

Alamance	Forsyth	Yadkin
Davie	Stokes	

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

Modification Number  
0

Publication Date  
01/06/2012

SUNC2011-072 09/16/2011

	Rates	Fringes
CARPENTER (Form Work Only)		
Alamance County	13.04	
Davie	13.41	
Forsyth, Stokes, and Yadkin Counties	13.10	
CEMENT MASON/CONCRETE FINISHER		
Alamance County	14.08	
Davie, Forsyth, Stokes, and Yadkin Counties	14.51	
IRONWORKER (Reinforcing)	14.88	
LABORER		
Asphalt, Asphalt Distributor, Raker, and Spreader		
Alamance County	12.20	
Davie, Forsyth, Stokes, and Yadkin Counties	12.32	
Common or General		
Alamance County	10.10	
Davie County	10.72	
Forsyth County	10.03	
Stokes County	9.54	
Yadkin County	10.86	
Concrete Saw	13.52	
Landscape	9.89	
Luteman	12.73	
Mason Tender (Cement/Concrete)	11.43	
Pipelayer	12.69	
Traffic Control (Cone Setter)		
Alamance County	11.15	
Davie, Forsyth, Stokes, and Yadkin Counties	12.25	

	Rates	Fringes
Traffic Control (Flagger)		
Alamance and Davie Counties	8.93	
Forsyth, Stokes, and Yadkin Counties	7.25	
<b>POWER EQUIPMENT OPERATORS</b>		
Backhoe/Excavator/Trackhoe		
Alamance County	14.78	
Davie County	15.43	
Forsyth, Stokes, and Yadkin Counties	14.96	
Broom/Sweeper	14.82	
Bulldozer		
Alamance County	14.66	
Davie, Forsyth, Stokes, and Yadkin Counties	16.15	
Crane		
Alamance County	16.83	
Davie County	16.31	
Forsyth, Stokes, and Yadkin Counties	16.13	
Curb Machine	14.43	
Distributor	15.27	
Drill	18.28	
Grader/Blade		
Alamance County	14.83	
Davie, Forsyth, Stokes, and Yadkin Counties	16.03	
Loader		
Alamance County	14.43	
Davie, Forsyth, Stokes, and Yadkin Counties	14.48	
Mechanic	14.00	
Milling Machine	14.38	
Oiler	13.58	
Paver		
Alamance County	16.00	
Davie, Forsyth, Stokes, and Yadkin Counties	16.06	
Roller	13.15	
Scraper	14.00	
Screed	14.85	
Tractor	12.94	
<b>TRUCK DRIVER</b>		
Distributor	16.75	
Dump Truck		
Alamance County	11.69	
Davie, Forsyth, and Stokes Counties	11.50	
Yadkin County	11.80	
Flatbed Truck	15.02	
Lowboy Truck	15.34	
Off the Road Truck	13.78	
Single Axle Truck	13.40	
Tack Truck	16.51	
Water Truck	13.03	

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

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

### **Union Identifiers**

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters, PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rate.

### **Non-Union Identifiers**

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

## **WAGE DETERMINATION APPEALS PROCESS**

- 1.) Has there been an initial decision in the matter? This can be:
  - \* an existing published wage determination
  - \* a survey underlying a wage determination
  - \* a Wage and Hour Division letter setting forth a position on a wage determination matter
  - \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U. S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, D.C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, D.C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, D.C. 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

**\*\*\* STANDARD SPECIAL PROVISIONS \*\*\***

(3-1-12)

**DIVISION ONE OF STANDARD SPECIFICATIONS**

**Division One of the 2012 NCDOT Standard Specifications for Roads and Structures (Standard Specifications) shall apply except as follows:**

**Definitions:** Throughout Division One of the *Standard Specifications*, the term “Contractor” is replaced with “Design-Build Team”, the term “Bidder” is replaced with “Proposer,” the term “Bid” is replaced by “Price Proposal,” and the phrase “lowest Responsible Bidder” is replaced with “responsible Proposer with the lowest adjusted price.” The replacement of “Contractor” with “Design-Build Team” does not apply to Article 102-2. The replacement of the above terms also does not apply when the terms are part of a phrase (e.g. bid bond, prime contractor, total amount bid, etc.)

**Deletions:** Articles 102-4, 102-9(C)(2), 103-2(B), and 103-4(B) of the *Standard Specifications* are deleted from Design-Build Contracts.

**Modifications:** The remainder of this Standard Special Provision includes modifications to Division One of the *Standard Specifications*.

## **SECTION 101 DEFINITION OF TERMS**

**Page 1-3, Article 101-3, replace and add certain definitions as follows:**

### **ADDITIONAL WORK**

Additional work is that which results from a change or alteration to the contract and for which there are contract unit prices in the original contract or an executed supplemental agreement.

### **ADVERTISEMENT**

The public advertisement inviting Statements of Qualifications for the design and construction of specific projects.

### **AWARD**

The decision of the Department of Transportation to accept the proposal of the selected Design-Build Team for work which is subject to the furnishing of payment and performance bonds, and such other conditions as may be otherwise provided by law, the Request for Proposals, and the *Standard Specifications*.

### **CONTRACT**

The executed agreement between the Department and the successful proposer, covering the performance of, and compensation for, the work. The term contract is all inclusive with reference to all written agreements affecting a contractual relationship and all documents referred to therein. The contract shall include, but not be limited to, the Request for Proposals, the Technical Proposal, the Price Proposal, the printed contract form and attachments, contract



bonds, plans and associated special provisions prepared by the Design-Build Team, standard specifications and supplemental specifications standard special provisions and project special provisions contained in the Request for Proposals or as developed by the Design-Build Team and accepted by the Department, and all executed supplemental agreements. The contract shall constitute one instrument.

#### **DATE OF AVAILABILITY**

That date set forth in the Request for Proposals, by which it is anticipated that the Contract will be executed and sufficient design efforts or work sites within the project limits will be available for the Design-Build Team to begin his controlling operations or design.

#### **DESIGN-BUILD**

A form of contracting in which the successful proposer undertakes responsibility for both the design and construction of a project.

#### **DESIGN-BUILD TEAM**

An individual, partnership, joint venture, corporation or other legal entity that furnishes the necessary design and construction services, whether by itself or through subcontracts.

#### **DESIGN-BUILD PROPOSAL**

A proposal to contract consisting of a separately sealed Technical Proposal and a separately sealed Price Proposal submitted in response to a Request for Proposals on a Design-Build project.

#### **PLANS**

The project plans, Standard Drawings, working drawings and supplemental drawings, or reproductions thereof, accepted by the Engineer, which show the location, character, dimensions and details of the work to be performed.

(A) Standard Drawings:

Drawings approved for repetitive use, showing details to be used where appropriate. All Standard Drawings approved by the Department plus subsequent revisions and additions. Standard Drawings are available for purchase from:

Randy A. Garris, PE  
State Contract Officer  
1591 Mail Service Center  
Raleigh, NC 27699-1591

(B) Preliminary Plans:

Department-furnished drawings distributed in concert with a Request for Proposals, or as developed by the Design-Build Team.

(C) Project Plans:

Construction drawings prepared, sealed and completed by the Design-Build Team, or as provided by the Department, that contain specific details and dimensions peculiar to the work.

(D) Working Drawings and Supplemental Drawings:

Supplemental design sheets, shop drawings, or similar data which the Design-Build Team is required to submit to the Engineer.

(E) As-Constructed Drawings:

Final drawings prepared by the Design-Build Team, documenting the details and dimensions of the completed work.

### **PRICE PROPOSAL**

The offer of a Proposer, submitted on the prescribed forms, to perform the work and furnish the labor and materials at the price quoted.

### **PROPOSAL (OR REQUEST FOR PROPOSALS)**

The paper document provided by the Department that the proposer uses to develop his paper offer to perform the work at designated bid prices.

### **PROPOSER**

An individual, partnership, firm, corporation, LLC, or joint venture formally submitting a Technical Proposal and Price Proposal in response to a Request for Proposals.

### **RIGHT OF WAY**

The land area shown on the plans as right of way within which the project is to be constructed.

### **SCHEDULE OF VALUES**

A schedule of work items necessary to complete work, along with the progress of each work item, primarily for the purpose of partial payments.

### **TABLE OF QUANTITIES**

A listing of work items (corresponding to the items in the Transport pay item list) that contributes to a project completion. The table shall include estimated quantities for each work item.

### **TECHNICAL PROPOSAL**

A submittal from a proposer, in accordance with requirements of the Request for Proposals, for the purpose of final selection. The Technical Proposal is defined to also include any supplemental information requested by the Department from a proposer prior to opening bids.

## **SECTION 102 PROPOSAL REQUIREMENTS AND CONDITIONS**

**Page 1-9, delete Article 102-1 and replace with the following:**

### **102-1 INVITATION TO BID**

After the advertisement has been made, an Invitation to Bid will be made available to known prequalified contractors and any other contracting firms, material suppliers and other interested parties who have requested they be placed on the Invitation to Bid mailing list, informing them that Statements of Qualifications and Proposals will be received for the construction of specific projects. Such invitation will indicate the contract identification number, length, locations and descriptions; a general summary of the scope of work to be performed; and information on how to receive a Request for Qualifications.

All projects will be advertised in daily newspapers throughout the state before the bid opening.

**Page 1-12, delete Article 102-3 and replace with the following:**

### **102-3 CONTENTS OF REQUEST FOR PROPOSALS**

A Request for Proposals will be furnished by the Department to the selected proposers from among the respondents to the Request for Qualifications. Each Request for Proposals will be marked on the front cover by the Department with an identifier of the Proposer to whom it is being furnished. This Request for Proposals will state the location of the project and will show a schedule of contract items for which Technical and Price Proposals are invited. It will set forth the date and time Technical and Price Proposals are to be submitted and when the Price Proposals will be opened. The Request for Proposals will also include special provisions or requirements that vary from or are not contained in any preliminary design information or standard specifications.

The Request for Proposals will also include the printed contract forms and signature sheets for execution by both parties to the contract. In the event the Proposer is awarded the contract, execution of the Request for Proposals by the Proposer is considered the same as execution of the contract.

Standard specifications, sealed plans specifically identified as the Department's responsibility and other documents designated in the Request for Proposals shall be considered a part of the Request for Proposals whether or not they are attached thereto. All papers bound with the proposal are necessary parts thereof and shall not be detached, taken apart, or altered.

The names and identity of each prospective Proposer that receives a copy of the Request for Qualifications for the purposes of submitting a Statement of Qualifications shall be made public, except that a potential Proposer who obtains a Request for Qualifications may, at the time of ordering, request that his name remain confidential.

One copy of the Final Request for Proposals will be furnished to each prospective Proposer. Additional copies may be purchased for the sum of \$25 each. The copy of the Final Request for

Proposals marked with the Proposer's name and prequalification number shall be returned to the Department as the Proposer's Price Proposal.

**Page 1-14, Article 102-7, 4<sup>th</sup> paragraph, delete the first two sentences and replace with the following:**

The Proposer is cautioned that details shown in the subsurface investigation report are preliminary only. The subsurface investigation and subsurface report, if provided, is done so for information purposes only.

**Pages 1-14, delete Article 102-8 and replace with the following:**

#### **102-8 PREPARATION AND SUBMISSION OF BIDS**

All Price Proposals shall be prepared and submitted in accordance with the following requirements:

1. The Request for Proposals provided by the Department shall be used and shall not be taken apart or altered. The Price Proposal shall be submitted on the same form, which has been furnished to the Proposer by the Department as identified by the Proposer's name marked on the front cover by the Department.
2. All entries including signatures shall be written in ink.
3. The Proposer shall submit a lump sum or unit price for every item in the Price Proposal. The lump sum or unit prices bid for the various contract items shall be written in figures.
4. An amount bid shall be entered in the Request for Proposals for every item and the price shall be written in figures in the "Amount Bid" column in the Request for Proposals.
5. An amount bid shall be entered in the proposal for every item on which a unit price has been submitted. The amount bid for each item other than lump sum items shall be determined by multiplying each unit bid price by the quantity for that item and shall be written in figures in the Amount Bid column in the proposal.
6. The total amount bid shall be written in figures in the proper place in the Request for Proposals. The total amount bid shall be determined by adding the amounts bid for each lump sum item.
7. 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 Proposer shall initial the change in ink.
8. The Price Proposal shall be properly executed. To constitute proper execution, the Price Proposal shall be executed in strict compliance with the following:
  - a. If a Price Proposal is by an individual, it shall show the name of the individual and shall be signed by the individual with the word "Individually" appearing under the signature. If the individual operates under a firm name, the bid shall be signed in the name of the individual doing business under the firm name.
  - b. If the Price Proposal is by a corporation, it shall be executed in the name of the corporation by the President, Vice President, or Assistant Vice President. It shall be

- attested by the Secretary or Assistant Secretary. The seal of the corporation shall be affixed. If the Price Proposal is executed on behalf of a corporation in any other manner than as above, a certified copy of the minutes of the Board of Directors of said corporation authorizing the manner and style of execution and the authority of the person executing shall be attached to the Price Proposal or shall be on file with the Department.
- c. If the Price Proposal is made by a partnership, it shall be executed in the name of the partnership by one of the general partners.
  - d. If the Price Proposal is made by a limited liability company, it shall be signed by the manager, member, or authorized agent and notarized.
  - e. If the Price Proposal is made by a joint venture, it shall be executed by each of the joint venturers in the appropriate manner set out above. In addition, the execution by the joint venturers shall appear below their names.
  - f. The Price Proposal execution shall be notarized by a notary public whose commission is in effect on the date of execution. Such notarization shall be applicable both to the Price Proposal and to the Non-Collusion Affidavit, Debarment Certification and Gift Ban Certification that is part of the signature sheets.
9. The Price Proposal shall not contain any unauthorized additions, deletions, or conditional bids.
  10. The Proposer 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 Price Proposal shall be accompanied by a bid bond on the form furnished by the Department or by a bid deposit. The bid bond shall be completely and properly executed in accordance with the requirements of Article 102-10 and as modified herein. The bid deposit shall be a certified check or cashier check in accordance with Article 102-10 and as modified herein.
  12. The Price Proposal shall be placed in a sealed envelope and shall have been delivered to and received by the Department prior to the time specified in the Request for Proposals.

**Page 1-18, Article 102-10, 3rd paragraph, delete the fifth sentence and replace with the following:**

The condition of the bid bond or bid deposit is: the Principal shall not withdraw its bid within 75 days after the submittal of the same, and if the Department shall award a contract to the Principal, the Principal shall within 14 calendar days after the notice of award is received by him, give payment and performance bonds with good and sufficient surety as required for the faithful performance of the contract and for the protection of all persons supplying labor and materials in the prosecution of the work.

**Page 1-18, Article 102-10, delete the end of the Article beginning with, and inclusive of, the 6<sup>th</sup> paragraph.**

**Pages 1-19, delete Article 102-12 and replace with the following:**

**102-12 WITHDRAWAL OR REVISION OF BIDS**

A Design-Build Team will not be permitted to withdraw its Technical and Price Proposals after they have been submitted to the Department, unless allowed under Article 103-3 or unless otherwise approved by the Chief Engineer.

**Page 1-19, delete Article 102-13 and replace with the following:**

**102-13 RECEIPT AND OPENING OF BIDS**

Price Proposals will be opened and read publicly on the date and time indicated in the Request for Proposals. The scores of the previously conducted evaluation of the Technical Proposals will also be read publicly in accordance with the procedures outlined in the Request for Proposals. Proposers, their authorized agents, and other interested parties are invited to be present.

**Page 1-19, Article 102-14, Replace the 1<sup>st</sup> paragraph with the following:**

**102-14 REJECTION OF BIDS**

Any Price Proposal submitted which fails to comply with any of the requirements of Articles 102-8, 102-9 or 102-10, or with the requirements of the project scope and specifications shall be considered irregular and may be rejected. A Price Proposal that does not contain costs for all proposal items shall be considered irregular and may be rejected.

**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.

**SECTION 103  
AWARD AND EXECUTION OF CONTRACT**

**Page 1-21, delete Article 103-1 and replace with the following:**

**103-1 CONSIDERATION OF PRICE PROPOSALS**

After the Price Proposals are opened and read, they will be tabulated. The Price Proposal and score of the Technical Proposal will be made available in accordance with procedures outlined in the Request for Proposals. In the event of errors, omissions, or discrepancies in the bid prices, corrections to the Price Proposal will be made in accordance with the provisions of Article 103-2. Such corrected bid prices will be used to determine the lowest adjusted price.

After the reading of the Price Proposals and technical scores, the Department will calculate the lowest adjusted price as described in the Request for Proposals.

The right is reserved to reject any or all Price Proposals, to waive technicalities, to request the Proposer with the lowest adjusted price to submit an up-to-date financial and operating statement, to advertise for new proposals, or to proceed to do the work otherwise, if in the judgment of the Department, the best interests of the State will be promoted thereby.

**Page 1-21, Subarticle 103-2(A), add items (6) and (7) as follows:****(6) Discrepancy in the “Total Amount Bid” and the addition of the “Amount Bid” for each line Item**

In the case of the Total Amount Bid does not equal the summation of each Amount Bid for the line items, the summation of each Amount Bid for the line items shall be deemed to be the correct Total Amount Bid for the entire project.

**(7) Omitted Total Amount Bid –Amount Bid Completed**

If the Total Amount Bid is not completed and the Amount Bid for all line items is completed the Total Amount Bid shall be the summation of the Amount Bid for all line items.

**Page 1-24, Subarticle 103-4(A), first paragraph, replace the 4<sup>th</sup> and 5th sentences with the following:**

Where award is to be made, the notice of award will be issued within 75 days after the submittal of Price Proposals, except with the consent of the responsible Proposer with the lowest adjusted price the decision to award the contract to such bidder may be delayed for as long a time as may be agreed upon by the Department and such Proposer. In the absence of such agreement, the Proposer may withdraw his Price Proposal at the expiration of the 75 days without penalty if no notice of award has been issued.

**Page 1-25, Article 103-6, delete the 1<sup>st</sup> and 2<sup>nd</sup> paragraphs and replace with the following:**

Checks that have been furnished as a bid deposit will be retained until after the contract bonds have been furnished by the successful proposer, at which time the checks that were furnished as a bid deposit will be returned.

## **SECTION 104 SCOPE OF WORK**

**Page 1-26, delete Article 104-1 and replace with the following:****104-1 INTENT OF CONTRACT**

The intent of the contract is to prescribe the work or improvements that the Design-Build Team undertakes to perform, in full compliance with the contract documents. In case the method of construction or character of any part of the work is not covered by the contract, this section shall apply. The Design-Build Team shall perform all work in accordance with the contract or as may be modified by written orders, and shall do such special, additional, extra, and incidental work as may be considered necessary to complete the work to the full intent of the contract. Unless otherwise provided elsewhere in the contract, the Design-Build Team shall furnish all implements, machinery, equipment, tools, materials, supplies, transportation, and labor necessary for the design, prosecution and completion of the work.

**Page 1-26, Article 104-3, replace “plans or details of construction” with “contract” in all instances within this Article.**

**Page 1-35, Article 104-10, replace the first paragraph with the following:**

**104-10 MAINTENANCE OF THE PROJECT**

The Design-Build Team shall maintain the project from the date of beginning construction on the project until the project is finally accepted. For sections of facilities impacted by utility construction / relocation performed by the Design-Build Team prior to beginning construction on the roadway project, maintenance of the impacted sections of facilities shall be performed by the Design-Build Team beginning concurrently with the impact. All existing and constructed guardrail / guiderail within the project limits shall be included in this maintenance. This maintenance shall be continuous and effective and shall be prosecuted with adequate equipment and forces to the end that all work covered by the contract is kept in satisfactory and acceptable conditions at all times. The Design-Build Team 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, add the following after the last paragraph:**

The Design-Build Team will not be compensated for performance of weekly inspections and damage reports for the guardrail / guiderail. Other maintenance activities for existing guardrail / guiderail will be handled in accordance with Articles 104-7 and 104-8.

**SECTION 105  
CONTROL OF WORK**

**Pages 1-40, delete Article 105-2 and replace with the following:**

**105-2 PLANS AND WORKING DRAWINGS**

All plans shall be supplemented by such approved working drawings as are necessary to adequately control the work. Working drawings furnished by the Design-Build Team and approved by the Engineer shall consist of such detailed drawings as may be required to adequately control the work. They may include stress sheets, shop drawings, erection drawings, falsework drawings, cofferdam drawings, bending diagrams for reinforcing steel, catalog cuts, or any other supplementary drawings or similar data required of the Design-Build Team. When working drawings are approved by the Engineer, such approval shall not operate to relieve the Design-Build Team of any of his responsibility under the contract for the successful completion of the work.

Changes on shop drawings after approval and/or distribution shall be subject to the approval of the Engineer and he shall be furnished a record of such changes.

**Page 1-41, Article 105-3, add the following after the 3<sup>rd</sup> paragraph:**

The Design-Build Team shall bear all the costs of providing the burden of proof that the nonconforming work is reasonable and adequately addresses the design purpose. The Design-



Build Team shall bear all risk for continuing with nonconforming work in question until it is accepted.

The Engineer may impose conditions for acceptance of the nonconforming work. The Design-Build Team shall bear all costs for fulfilling the conditions.

The decisions whether the product satisfies the design purpose, whether the nonconforming work is reasonably acceptable and the conditions for acceptance are at the sole discretion of the Engineer.

**Pages 1-41, delete Article 105-4 and replace with the following:**

**105-4 COORDINATION OF PLANS, SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS, AND SPECIAL PROVISIONS**

The Request for Proposals, all construction Plans, the Standard Specifications, Supplemental Specifications and Special Provisions and all supplementary documents are essential parts of the contract and a requirement occurring in one is as binding as though occurring in all. They are complementary and describe and provide the complete contract.

In case of discrepancy or conflict, the order in which they govern shall be as follows:

- (A) Request for Proposals, in which Project Special Provisions govern Standard Special Provisions
- (B) Technical Proposal from the Design-Build Team
- (C) Accepted Plans and Details from the Design-Build Team, or sealed plans provided by the Department, as applicable
- (D) Standard Drawings
- (E) Standard Specifications

Where dimensions on the plans are given or can be computed from other given dimensions they shall govern over scaled dimensions.

The Design-Build Team shall take no advantage of any error or omission in the plans, estimated quantities, or specifications. In the event the Design-Build Team discovers an error or omission, he shall immediately notify the Engineer.

**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.

**Page 1-44, delete Article 105-9 and replace with the following:**

**105-9 CONSTRUCTION STAKES, LINES, AND GRADES**

The Design-Build Team shall be responsible for all surveying, construction staking and layout required in the performance of the work. He will be responsible for the accuracy of lines, slopes, grades and other engineering work which he provides under this contract.

## **SECTION 106 CONTROL OF MATERIAL**

**Page 1-49, Article 106-2, add the following after the second paragraph:**

Prior to beginning construction, the Design-Build Team shall provide a Table of Quantities as described in Article 101-3 of these specifications.

The Table of Quantities Work Items shall correspond to Pay Items as defined in the Standard Specifications. These Work Items have associated Materials and Conversion Factors. For non-standard Work Items, a Generic Work Item with the correct Unit of Measure and in an appropriate category will be used. For example, “GENERIC TRAFFIC CONTROL ITEM – EA” or “GENERIC RETAINING WALL ITEM – LF”. For these Generic Work Items, Materials must be defined and appropriate conversion factors submitted.

An initial Table of Quantities shall be submitted no later than 30 calendar days after the date of award. The Table of Quantities shall be updated and resubmitted within 14 days of when a set of Plans is sealed as Release for Construction (RFC) Plans, and whenever there are substantial changes to the Quantities on previously incorporated RFC Plans.

**Page 1-51, Article 106-6, add the following after the last paragraph:**

For items normally pretested by the Department, the Design-Build Team shall provide a minimum of 30 days notice prior to the beginning of production of the items for this project along with final approved shop drawings.

## **SECTION 107 LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC**

**Page 1-61, delete Article 107-18 and replace with the following:**

### **107-18 FURNISHING RIGHT OF WAY**

The responsibility for coordinating the securing of all necessary rights of way is as outlined in the Request for Proposals.

## **SECTION 108 PROSECUTION AND PROGRESS**

**Page 1-64. Article 108-2, replace the 2<sup>nd</sup> paragraph with the following:**

The Design-Build Team shall submit a Progress Schedule for review within thirty (30) calendar days of receiving Notice of Award. The Department will review the Progress Schedule within twenty-one (21) calendar days of receipt. The Design-Build Team shall make any necessary corrections and adjustments to the Progress Schedule as necessitated by the Department’s review within seven (7) calendar days. The Department will review the revised Progress Schedule within seven (7) calendar days of receipt.

**Page 1-64, Subarticle 108-2(A)(1), add the following:**

- (k) Utility relocation and construction

**Page 1-65, Subarticle 108-2(A)(2), add the following:**

- (h) Critical design submittal dates
- (i) Critical permitting dates
- (j) Completion of right of way acquisition
- (k) Completion of utility relocation and construction

**Page 1-65, Article 108-2, add the following:**

- (D) The Design-Build Team shall provide a written narrative each month detailing the work and percentage of work completed, anticipated sequence of upcoming work (2 month forecast), controlling operation(s), intermediate completion dates, and milestones. If any milestones are exceeded or will not be achieved, the Design-Build Team shall provide in the written narrative details of the delay; controlling operation affected, impacts to other operations, revisions to future intermediate completion dates and milestones, and remedial action necessary to get the project back to the original completion date.

**Page 1-65, delete Article 108-3 and replace with the following:****108-3 PRECONSTRUCTION AND PRE-DESIGN CONFERENCES**

The selected Design-Build Team shall meet with the Engineer for a pre-design conference concerning the design phase of the work. This conference shall be held prior to the commencement of work, as it is determined according to Article 108-1, and will be scheduled by the Engineer. At the predesign conference, the Design-Build Team shall furnish authorized signature forms and a list of any proposed subcontractors associated with the design of the project.

A preconstruction conference shall be held at least 10 working days before construction activity begins. This second conference, concerning the construction phase, shall also be scheduled by the Engineer. The Design-Build Team shall give the Engineer a minimum of 45 days notice before he plans to begin construction activities. This will allow the Engineer time for any environmental agency representatives involved in the permitting process, as well as any other pertinent entities, to be scheduled to attend the preconstruction conference. If the Design-Build Team is responsible for utilities in accordance with Article 105-8 and the Request for Proposals, he shall be responsible for coordinating with the Engineer in scheduling their attendance and for notifying them. The Design-Build Team shall also be responsible for coordinating with the Engineer in scheduling the attendance of subcontractors and others deemed appropriate, and for notifying them.

At the preconstruction conference, a list of any proposed subcontractors and major material suppliers associated with the construction of the project will be submitted.

If the contract has a DBE requirement, the Design-Build Team shall submit copies of completed and signed DBE subcontracts, purchase orders, or invoices to the Department.

The Design-Build Team shall submit a traffic control plan in accordance with Article 1101-5 and the Request for Proposals. The Design-Build Team shall designate an employee who is competent and experienced in traffic control to implement and monitor the traffic control plan. The qualifications of the designated employee must be satisfactory to the Engineer.

The Design-Build Team shall submit a safety plan and designate an employee as Safety Supervisor.

Both plans shall be submitted at the preconstruction conference and must be satisfactory to the Engineer. Should the design plan include activities that would place personnel on the work site, traffic control and safety plans for those activities shall be submitted at the predesign conference.

During the preconstruction conference, the Engineer will designate a Department employee or employees who will be responsible to see that the traffic control plans and any alterations thereto are implemented and monitored to the end that traffic is carried through the work in an effective manner. If approved by the Engineer, the Design-Build Team may designate one employee to be responsible for both the traffic control and safety plans. The Design-Build Team shall not designate its superintendent as the responsible person for either the traffic control plan or the safety plan, unless approved by the Engineer.

If the project requires that Design-Build Team or State personnel work from falsework, within shoring, or in any other hazardous area the Design-Build Team shall submit, as part of the Design-Build Team's safety plan, specific measures it will use to ensure worker safety.

The Design-Build Team shall also submit a program for erosion control and pollution prevention on all projects involving clearing and grubbing, earthwork, structural work, or other construction, when such work is likely to create erosion or pollution problems.

If the Design-Build Team fails to provide the required submissions, the Engineer may order the preconstruction conference suspended until such time as they are furnished. Work shall not begin until the preconstruction conference has been concluded and the safety plan has been approved, unless authorized by the Engineer. The Design-Build Team shall not be entitled to additional compensation or an extension of contract time resulting from any delays due to such a suspension.

The Design-Build Team shall designate a qualified employee as Quality Control Manager. The Quality Control Manager shall be responsible for implementing and monitoring the quality control requirements of the project.

**Page 1-65, Article 108-4, add the following sentence to the end of this article:**

The Design-Build Team shall record the proceedings of these conferences and distribute the final minutes of the conferences to all attendees.

**Page 1-65, Article 108-5, delete the first sentence of the second paragraph and delete the first word of the second sentence of the second paragraph.**

**Page 1-66, Article 108-6, replace “40%” with “30%” in the 1st paragraph.**

**Page 1-66, Article 108-6, replace “35%” with “25%” in the 2<sup>nd</sup> paragraph.**

**Pages 1-68, delete Article 108-8 and replace with the following:**

**108-8 FAILURE TO MAINTAIN SATISFACTORY PROGRESS**

The Engineer will check the Design-Build Team’s progress at the time each partial pay request is received. The Design-Build Team’s progress may be considered as unsatisfactory if, according to the Progress schedule, the projected finish date for all work exceeds the scheduled finish date by more than 10%.

When the Design-Build Team's progress is found to be unsatisfactory as described above, the Engineer may make written demand of the Design-Build Team to state in writing the reason for the unsatisfactory progress and produce such supporting data as the Engineer may require or the Design-Build Team may desire to submit. The Engineer will consider the justifications submitted by the Design-Build Team and extensions of the completion date that have or may be allowed in accordance with Article 108-10(B) and as modified herein.

When the Design-Build Team cannot satisfactorily justify the unsatisfactory progress the Engineer may invoke one or more of the following sanctions:

1. Withhold anticipated liquidated damages from amounts currently due or which become due.
2. Remove the Design-Build Team and individual managing firms of the Design-Build Team and/or prequalified design firms from the Department’s Prequalified Bidders List.

When any of the above sanctions have been invoked, they shall remain in effect until rescinded by the Engineer.

**Page 1-71, Article 108-10(B), add the following as the first paragraph:**

Only delays to activities which affect the completion date or intermediate contract date will be considered for an extension of contract time. No extensions will be granted until a delay occurs which impacts the project’s critical path and extends the work beyond the contract completion date or intermediate completion date. Any extension to the completion date or intermediate contract date will be based on the number of calendar days the completion date or intermediate completion date is impacted as determined by the Engineer’s analysis.

**Pages 1-71, delete Subarticle 108-10(B)(1) in its entirety.**

**Page 1-75, Article 108-13, delete bullet (E)(2) in its entirety.**

**SECTION 109  
MEASUREMENT AND PAYMENT**

**Page 1-76, Article 109-2, delete the last sentence of the 1<sup>st</sup> paragraph and replace with the following:**

Payment to the Design-Build Team will be made only for the work completed, certified and accepted in accordance with the terms of the contract.

**Pages 1-81, delete Article 109-4(A) and replace with the following:**

**109-4 PARTIAL PAYMENTS**

**(A) General:**

Partial payments will be based upon progress estimates prepared by the Engineer at least once each month on the date established by the Engineer. Partial payments may be made twice each month if in the judgment of the Engineer the amount of work performed is sufficient to warrant such payment. No partial payment will be made when the total value of work performed since the last partial payment amounts to less than \$10,000.00. Partial payments will be approximate only and will be subject to correction in the final estimate and payment.

When the contract includes one lump sum price for the entire work required by the contract, partial payments for the lump sum design-build price shall be based on a certified Schedule of Values submitted by the successful Design-Build Team and approved by the Engineer. The certification shall indicate the Design-Build Team has reviewed the information submitted and the information accurately represents the work performed for which payment is requested. The certified Schedule of Values shall be submitted no later than 30 calendar days after the date of award. Each item on the certified Schedule of Values shall be assigned a cost and quantity and shall be identified as an activity on the progress schedule. A revised certified Schedule of Values shall be submitted with each update of the Progress schedule as described in Article 108-2, and as modified herein, or when requested by the Engineer. A certified copy of the Table of Quantities shall also be submitted with each payment request. The certification of the Table of Quantities shall indicate the Design-Build Team has reviewed the information submitted and the information accurately represents the materials for the work performed for which payment is requested.

When the contract includes lump sum items for portions of the work required by the contract, and the applicable section of the Specifications or Request for Proposals specify the means by which the total amount bid be included in the partial pay estimates, the Engineer will determine amounts due on the partial pay estimate in accordance with the applicable portion of the Specifications or Request for Proposals.

The Engineer will withhold an amount sufficient to cover anticipated liquidated damages as determined by the Engineer.

**Page 1-82, Subarticle 109-5(D), delete the 4th and 5th paragraphs and replace with the following:**

Partial payments will not be made on seed or any living or perishable plant materials.

Partial payment requests shall not be submitted by the Design-Build Team until those items requested have corresponding signed and sealed RFC plans accepted by the Department.

**Pages 1-84, Article 109-10, add the following as bullets (E) and (F) under the 1<sup>st</sup> paragraph.**

- (E)** As-constructed plans or other submittals as required by the Contract.
- (F)** Documents or guarantees to support any warranty provided by the Design Build Team.

**ITEMIZED PROPOSAL FOR CONTRACT No. C 202933**

Feb 15, 2012 12:30 pm

Page 1 of 1

County: Forsyth

Line #	Item Number #	Sec #	Description	Quantity	Unit Cost	Amount
<b>ROADWAY ITEMS</b>						
0001	0000900000-N	SP	GENERIC MISCELLANEOUS ITEM DESIGN & CONSTRUCTION	Lump Sum	L.S.	

1230/Feb15/Q1.0/D900000/E1

Total Amount Of Bid For Entire Project: \_\_\_\_\_

---

**\*\*\*\*\*GATEWAY STRUCTURE ALTERNATE ITEMS \*\*\*\*\***  
**(Reference Gateway Structure Add Alternate Project Special Provision)**

0002	0000900000-N	SP	GENERIC MISCELLANEOUS ITEM Gateway Structure	Lump Sum	L.S.	
------	--------------	----	---	----------	------	--

1230/Feb15/Q1.0/D900000/E1

Total Amount Of Lump Sum Price Adjustment: \_\_\_\_\_

**FUEL USAGE FACTOR CHART AND ESTIMATE OF QUANTITIES**

Description of Work	Units	Fuel Usage Factor Diesel #2	Estimate of Quantities
Unclassified Excavation	Gal / CY	0.29	_____ CY
Borrow Excavation	Gal / CY	0.29	_____ CY
Class IV Subgrade Stabilization Aggregate Base Course Aggregate for Cement Treated Base Course Portland Cement for Cement Treated Base Course	Gal / Ton	0.55	_____ Tons
Asphalt Concrete Base Course Asphalt Concrete Intermediate Course Asphalt Concrete Surface Course Open-Graded Asphalt Friction Course Sand Asphalt Surface Course, Type F-1	Gal / Ton	2.90	_____ Tons
Portland Cement Concrete Pavement Concrete Shoulders Adjacent to Pavement	Gal / CY	0.98	_____ CY
Structural Concrete (Cast-in-Place Only)	Gal / CY	0.98	_____ CY

The above quantities represent a reasonable estimate of the total quantities anticipated, for each item, as pertaining to fuel price adjustments, and is representative of the design proposed in the Technical Proposal submitted under separate cover.

Or

The Design-Build Team elects not to pursue reimbursement for Fuel Price Adjustments on this project.

**The information submitted on this sheet is claimed as a "Trade Secret" in accordance with the requirements of G.S. 66-152(3) until such time as the Price Proposal is opened.**

\_\_\_\_\_  
Signature, Title

\_\_\_\_\_  
Dated

\_\_\_\_\_  
Print Name, Title

*(Submit a copy of this sheet in a separate sealed package with the outer wrapping clearly marked "Fuel Price Adjustment" and deliver with the Technical and Cost Proposal.)*



<b>LISTING OF DBE SUBCONTRACTORS</b>				Sheet _____	of _____
Firm Name and Address	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item	
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					

**This form must be completed in order for the Bid to be considered responsive and be publicly read. Bidders with no DBE participation must so indicate this on the form by entering the word or number *zero*.**

<b>LISTING OF DBE SUBCONTRACTORS</b>				Sheet _____	of _____
Firm Name and Address	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item	
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					

**This form must be completed in order for the Bid to be considered responsive and be publicly read. Bidders with no DBE participation must so indicate this on the form by entering the word or number *zero*.**

<b>LISTING OF DBE SUBCONTRACTORS</b>				Sheet _____	of _____
Firm Name and Address	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item	
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					
<b>Name</b> Address					

**This form must be completed in order for the Bid to be considered responsive and be publicly read. Bidders with no DBE participation must so indicate this on the form by entering the word or number *zero*.**

<b>LISTING OF DBE SUBCONTRACTORS</b>				
			Sheet _____	of _____
Firm Name and Address	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item
<b>Name</b>  Address				
<b>Name</b>  Address				
<b>Name</b>  Address				
<b>Name</b>  Address				

**COST OF CONSTRUCTION WORK ONLY** \$ \_\_\_\_\_

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

\*\* Dollar Volume of DBE Subcontractor \$ \_\_\_\_\_

Percentage of Total Construction Cost \_\_\_\_\_ %

(Including Right of Way Acquisition Services)

\*\* - Must have entry even if figure to be entered is zero.

\*\* - *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.*

**This form must be completed in order for the Bid to be considered responsive and be publicly read. Bidders with no DBE participation must so indicate this on the form by entering the word or number zero.**

**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\_\_\_\_

\_\_\_\_\_  
Signature of Notary Public  
Of \_\_\_\_\_ County  
State of \_\_\_\_\_  
My Commission Expires \_\_\_\_\_

**NOTARY SEAL**

**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 \_\_\_\_.

\_\_\_\_\_ Signature of Notary Public

of \_\_\_\_\_ County

State of \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

**NOTARY SEAL**

**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 Member/Manager/Authorized Agent**

\_\_\_\_\_ Individually

\_\_\_\_\_ 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
JOINT VENTURE (2) or (3)

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 CONTRACTORS

Instructions: 2 Joint Venturers Fill in lines (1), (2) and (3) and execute. 3 Joint Venturers Fill in lines (1), (2), (3) and (4) and execute. On Line (1), fill in the name of the Joint Venture Company. On Line (2), fill in the name of one of the joint venturers and execute below in the appropriate manner. On Line (3), print or type the name of the other joint venturer and execute below in the appropriate manner. On Line (4), fill in the name of the third joint venturer, if applicable and execute below in the appropriate manner.

(1) Name of Joint Venture

(2) Name of Contractor

Address as prequalified

Signature of Witness or Attest By Signature of Contractor

Print or type Signer's name Print or type Signer's name

If Corporation, affix Corporate Seal and

(3) Name of Contractor

Address as prequalified

Signature of Witness or Attest By Signature of Contractor

Print or type Signer's name Print or type Signer's name

If Corporation, affix Corporate Seal and

(4) Name of Contractor (for 3 Joint Venture only)

Address as prequalified

Signature of Witness or Attest By Signature of Contractor

Print or type Signer's name Print or type Signer's name

If Corporation, affix Corporate Seal

NOTARY SEAL

Affidavit must be notarized for Line (2)

Subscribed and sworn to before me this day of 20

Signature of Notary Public of County State of My Commission Expires:

NOTARY SEAL

Affidavit must be notarized for Line (3)

Subscribed and sworn to before me this day of 20

Signature of Notary Public of County State of My Commission Expires:

NOTARY SEAL

Affidavit must be notarized for Line (4)

Subscribed and sworn to before me this 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 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 \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_.

\_\_\_\_\_  
Signature of Notary Public  
of \_\_\_\_\_ County  
State of \_\_\_\_\_  
My Commission Expires: \_\_\_\_\_

**NOTARY SEAL**

**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\_\_.

\_\_\_\_\_  
Signature of Notary Public  
of \_\_\_\_\_ County  
State of \_\_\_\_\_  
My Commission Expires: \_\_\_\_\_

**NOTARY SEAL**

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

**DEBARMENT CERTIFICATION**

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

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

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

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

Check here if an explanation is attached to this certification.

**Contract No**      **C 202933 (U-2925)**

**County:**            **Forsyth**

ACCEPTED BY THE  
DEPARTMENT OF TRANSPORTATION

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Contract Officer

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Date

Execution of Contract and Bonds  
Approved as to Form:

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Attorney General