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

SECOND INDUSTRY DRAFT RFP

DESIGN-BUILD PROJECT

TIP I-4744

April 29, 2009

VOID FOR BIDDING

DATE AND TIME OF TECHNICAL AND PRICE PROPOSAL SUBMISSION: **June 12, 2009** BY **4:00 PM**

DATE AND TIME OF PRICE PROPOSAL OPENING: **June 25, 2009 AT 10:00 AM**

CONTRACT ID: C 202238

WBS ELEMENT NO. 36597.3.GV1

FEDERAL-AID NO. IMNHF-040-4(140)289

COUNTY: Wake

ROUTE NO. I-40

MILES: 6.2

LOCATION: I-40 from SR 1728 (Wade Avenue Milepost 289) to I-440 / US 1-64 (Milepost 293)

I-40 from SR 1728 (Wade Avenue) to east of I-440 / US 64 (MP 302) and I-440, US 1 / 64 at I-40 to I-40 near SR 2544 (Sunnybrook Road)

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. C 202238

IN WAKE 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. C 202238; 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 Board 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. C 202238 in Wake 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 *2006 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, JULY 2006,* 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.

Director of the Transportation
Program Management Unit

State Contract Officer

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*** PROJECT SPECIAL PROVISIONS ***

CONTRACT TIME AND LIQUIDATED DAMAGES

04/15/07 DB1 G06

The date of availability for this contract is August 3, 2009.

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 **June 15, 2012**.

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 **Ten Thousand Dollars ($10,000.00)** per calendar day.

INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES

(3-22-07) DB G07

The Design-Build Team shall complete all work associated with the installation of positive median protection throughout the I-40 widening project limits (Reference the Traffic Control and Pavement Markings Scope of Work found elsewhere in this RFP) within 75 days of the date of availability of this contract.

The date of availability for this intermediate contract time is date of availability of this contract.

The liquidated damages for Intermediate Contract Time #1 are **Five Hundred Dollars ($ 500.00)** per calendar day or any portion thereof.

OTHER LIQUIDATED DAMAGES

(3/22/07) (Rev. 02/14/08) DB1 G11

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

Liquidated Damages for Intermediate Contract Time #2 for lane narrowing, lane closure, holiday and special event time restrictions for I-40, I-40 ramps, US 1 / US 64, US 1 / US 64 ramps and Wade Avenue are $2,500.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #3 for lane narrowing and lane closure, holiday and special event time restrictions for Cary Towne Boulevard and NC 54 are $1,500.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #4 for road closure time restrictions, available only for certain construction operations, for I-40, I-40 ramps, US 1 / US 64,

US 1 / US 64 ramps and Wade Avenue are $5,000.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #5 for road closure time restrictions, available only for certain construction operations, for Cary Towne Boulevard and NC 54 are $2,500.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #6 for continuous weekend lane closure time restrictions for I-40 are $2,500.00 per 15-minute period or any portion thereof.

Refer to the ITS Scope of Work for more information on the following liquidated damages:

Liquidated Damages for Intermediate Contract Time #7 for failure to repair NCDOT fiber optic communication cable and / or conduit systems, and restore communication within 48 hours are $1,500.00 per 24-hour period or any portion thereof.

Liquidated Damages for Erosion Control efforts apply to this project. Reference the Erosion and Sedimentation Control Scope of Work for additional information under Liquidated Damages.

PROGRESS SCHEDULE

(12-18-07) DB1 G12

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 1-72, Article 108-2 Progress Schedule, delete in its entirety and replace with the following:

The Design-Build Team shall prepare and submit for review and approval a schedule of proposed working progress. This schedule shall be submitted on forms supplied by the Engineer or in a format that is approved by the Engineer. A detailed Critical Path Method (CPM) schedule shall not be submitted to replace the progress schedule details required below.

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.

When the Engineer has extended the completion date the Design-Build Team shall submit a revised progress schedule to the Engineer for review and approval. If plan revisions are anticipated to change the sequence of operations in such a manner as will effect the progress but not the completion date, then the Design-Build Team shall submit

a revised progress schedule for review and approval but the completion date shall remain unchanged.

The proposed progress schedule shall contain the following items:

(A) A time scale diagram with major work activities and milestone dates clearly labeled.

(B) A cash curve corresponding to the milestones and work activities established above.

(C) A written narrative that explains the sequence of work, the controlling operation(s), intermediate completion dates, milestones, project phasing, anticipated work schedule, and estimated resources. In addition, explain how permit requirements, submittal tracking, and coordination with subcontractors, utility companies and other entities will be performed.

Major work activities are defined as components comprising more than 5% of the total project cost or occupying more than 10% of total contract time and shall include, if applicable, the following:

Clearing and grubbing
Grading
Drainage
Soil stabilization
Aggregate base course
Pavement
Culverts
Bridges
Signals, ITS and lighting
Overhead signs
Utility relocation and construction

Major Milestones are derived from the project construction phasing and shall include, if applicable, the following:

Critical design submittal dates
Critical permitting dates
Completion of right of way acquisition
Completion of Utility Conflicts
Start of construction
Intermediate completion dates or times
Seasonal limitation / observation periods / moratoriums
Traffic shifts
Beginning and end of each traffic control phase or work area
Road openings
Completion date

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.

PAYOUT SCHEDULE

(5-23-07) 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.

MOBILIZATION

(10-31-05) (Rev 01-3-07) DB1 G15A

Revise the 2006 *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 second partial pay estimate.

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

(08-21-07) 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 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** 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.

PARTNERING

04/03/07 DB1 G49

As a part of its quality management program, the North Carolina Department of Transportation intends to encourage the formation of a cohesive relationship with the Design-Build Team and its principal subcontractors and suppliers. This relationship will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives are safe, effective, and efficient contract performance; and completion within budget, on schedule, and in accordance with the plans and specifications.

This relationship will be bilateral in makeup and participation will be totally voluntary. The cost associated with effectuating this relationship will be agreed to by both parties and shall be shared equally. The Design-Build Team shall hire an independent professional facilitator for this workshop. Compensation for the Department's share of the partnering costs will be by Supplemental Agreement.

To implement this initiative prior to starting work in accordance with the requirements of Section 108 of the Standard Specifications and the Standard Special Provision for Division One (found elsewhere in this RFP), and prior to the preconstruction conference, the Design-Build Team's management personnel and Division Construction Engineer will initiate a partnering development seminar/team building workshop. Project personnel working with the assistance of the Construction Unit will make arrangements to determine attendees at the workshop, agenda of the workshop, duration, and location. Persons required to be in attendance will be the NCDOT Resident Engineer, the NCDOT Division Construction Engineer, and key project personnel; the Design-Build Team's senior management personnel, the Design-Build Team's on-site project manager, and key project supervisory personnel for both the Design-Build Team and principal subcontractors and suppliers. The project design engineers, FHWA, and key local government personnel will also be invited to attend as necessary.

Follow-up workshops may be held periodically throughout the duration of the contract as agreed upon by the Design-Build Team and the North Carolina Department of Transportation. In the event that additional workshops are held, compensation for the Department's share of the follow-up partnering workshops will be by Supplemental Agreement.

The establishment of the partnering charter on a project will not change the legal relationship to the contract nor relieve either party from any of the terms of the contract.

EXECUTION OF SIGNATURE SHEETS AND DEBARMENT CERTIFICATION

(9/07/05) 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://ncdot.org/doh/forms/files/bidbond.pdf** or by contacting the Records and Documents office at 919-250-4124.

1. Applicable Signature Sheets: 1, 2, 3, 4, 5, or 6 (Bid)

2. Bid Bond

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 Noncollusion Affidavit and Debarment 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

04/03/07 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.

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) or Articles 102-9, 102-10, or 102-11 of the 2006 *Standard Specifications for Roads and Structures* may result in a Design-Build Proposal being rejected.

CONFIDENTIAL QUESTIONS

(1-5-07) DB1 G56

The Design-Build Team will be permitted to ask confidential questions of the Department, which neither the question nor answer will be shared with other proposing teams. For the purpose of this provision, "confidential question" is defined as a private inquiry containing information whose disclosure could alert others to certain details of doing business in a particular manner. The Department will determine if the question is considered a confidential question.

I. Confidential questions arising prior to issuance of the Final Request for Proposals will be allowed at the Industry Draft RFP review with the individual teams.

   The Department will answer the confidential question verbally at the meeting if possible. If not answered verbally during the meeting, the Department will answer the confidential question by subtle changes in the Final Request for Proposals, which will clarify the scope by either allowing or disallowing the request. The revision will be made in such a manner as to not disclose the confidential question.

II. After the issuance of the Final Request for Proposals, confidential questions may be asked by requesting a meeting with the 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 Contract Officer will respond to the question in writing to the Design-Build Team only. Other teams will not be notified of the question or answer.

If the Design-Build Team includes work based on the confidential questions and answers, the work shall be included and discussed in the Technical Proposal. The Technical Proposal will be evaluated in accordance with existing policies.

VALUE ANALYSIS

(1-5-07) DB2 R12

Value Engineering Construction Proposals (VECP), as identified in Article 104-12 of 2006 *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 Construction Proposals.

SCHEDULE OF ESTIMATED COMPLETION PROGRESS

(07-15-08) 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:

Fiscal Year	Progress (Dollar Value)
2010 (07/01/09 – 06/30/10)	20% of Total Amount Bid
2011 (07/01/10 – 06/30/11)	46% of Total Amount Bid
2012 (07/01/11 – 06/30/12)	34% of Total Amount Bid

The Design-Build Team shall also furnish its own progress schedule in accordance with Project Special Provision entitled “Progress Schedule” (found elsewhere in this RFP). 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.

REVISION TO FHWA-1273 CONCERNING PERSONAL INFORMATION ON PAYROLL SUBMISSIONS

(1-20-09) DB1G59

Revise the *Standard Special Provision FHWA-1273 Required Contract Provisions Federal-Aid Construction Contracts* as follows:

Section V, Paragraph 2b is replaced with the following:

The payroll records shall contain the name, and the last four digits of the social security number of each such employee, his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof 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.

DISADVANTAGED BUSINESS ENTERPRISE

(10-16-07) (Rev. 12/04/07) DB1 G61

Policy

It is the policy of the North Carolina Department of Transportation that Disadvantaged Business Enterprises (DBEs) as defined in *49 CFR Part 26* shall have the equal opportunity to compete fairly for and to participate in the performance of contracts financed in whole or in part by Federal Funds.

Obligation

The Design-Build Team, subcontractor, and sub-recipient shall not discriminate on the basis of race, religion, color, national origin, age, disability or sex in the performance of this contract.

The Design-Build Team shall comply with applicable requirements of *49 CFR Part 26* in the award and administration of federally assisted contracts. Failure by the Design-Build Team to comply with these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the Department deems necessary.

Definitions

Commitment - The approved DBE participation submitted by the Design-Build Team during the bidding process.

Committed DBE - Any DBE listed on the DBE commitment list approved by the Department at the time of Price Proposal submission or any DBE utilized as a replacement for a DBE firm listed on the commitment list.

Department - North Carolina Department of Transportation

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

Goal - The DBE participation specified herein

Letter of Intent – Written documentation of the Design-Build Team's commitment to use a DBE subcontractor and confirmation from the DBE that it is participating in the contract.

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 or operates distribution equipment. Brokers and packagers are not regarded as manufacturers or regular dealers within the meaning of this section.

Form RS-1-D - Form for subcontracts involving DBE subcontractors attesting to the agreed upon unit prices and extensions for the affected contract items.

North Carolina Unified Certification Program - A program that provides comprehensive information to applicants for 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*.

USDOT - United States Department of Transportation, including the Office of the Secretary, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the Federal Aviation Administration (FAA).

Contract Goal

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

Disadvantaged Business Enterprises **12%**

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

(B) *If the goal is zero,* the Design-Build Team shall continue to recruit the DBEs and report the use of DBEs during the construction of the project. A good faith effort will not be required with a zero goal.

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

Contract Requirement

The approved DBE participation submitted by the Design-Build Team shall be the **Contract Requirement**.

Certified Transportation Firms Directory

Real-time information about firms doing business with the Department and firms that are certified through North Carolina's Unified Certification Program is available in the Directory of Transportation Firms. The Directory can be accessed by the link on the Department's homepage or by entering https://apps.dot.state.nc.us/vendor/directory/ in the address bar of your web browser. Only firms identified as DBE certified in the Directory can be utilized to meet the contract goals.

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

Listing of DBE Subcontractors in Contract

Only those DBE firms with current certification are acceptable for listing in the Proposer's submittal of DBE participation. The Design-Build Team shall indicate the following required information:

(1) *If the goal is more than zero,* Proposers at the time the Price Proposal is submitted, shall submit a listing of DBE participation on the appropriate form (or facsimile thereof) contained elsewhere in the RFP in order for the Price Proposal to be considered responsive. Proposers shall indicate the total dollar value of the DBE participation for the contract. If Proposers have no DBE participation, they shall indicate this on the form "Listing of DBE Subcontractors" by entering the word or number zero. This form shall be completed in its entirety. **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 Price Proposals. The Department will not consider these Price Proposals for award and the Price Proposal will be returned to the Proposer.

(2) *If the goal is zero,* Proposers at the time the Price Proposal is submitted, the Proposer shall enter the word "zero" or number "0" or if there is participation, add the value on the "Listing of DBE Subcontractors" (or facsimile thereof) contained elsewhere in the RFP.

Written Documentation – Letter of Intent

The Proposer shall submit written documentation of the Proposer's commitment to use a DBE subcontractor whose participation it submits to meet a contract goal and written confirmation from each DBE, listed in the proposal, indicating their participation in the contract. This documentation shall be submitted on the Department's form titled "Letter of Intent to Perform as a Subcontractor". This letter of intent form is available at:

http://www.ncdot.org/doh/preconstruct/ps/contracts/letterofintent.pdf

It shall be received in the office of the State Contractor Utilization Engineer no later than 12:00 noon of the sixth calendar day following opening of Price Proposals.

If the Proposer fails to submit the letter of intent from each committed DBE listed in the proposal indicating their participation in the contract, the DBE participation will not count toward meeting the goal.

Counting DBE Participation toward Meeting DBE Goal of Zero or More

(A) If a firm is determined to be an eligible DBE firm, the total dollar value of the participation by the DBE will be counted toward the contract requirement. The total dollar value of participation by a certified 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) When a DBE performs as a participant in a joint venture, the Design-Build Team may count toward its DBE goal 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.

(C) (1) The Design-Build Team may count toward its DBE 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 other relevant factors.

(2) A DBE may enter into subcontracts. Work that a DBE subcontracts to another DBE firm may be counted toward the contract requirement. Work that a DBE subcontracts to a non-DBE firm does not count toward the contract 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, the DBE shall be presumed not to be performing a commercially useful function. The DBE may present evidence to rebut this presumption to the Department for commercially useful functions. 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.

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

(a) 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.

(b) The DBE shall itself own and operate at least one fully licensed, insured, and operational truck used on the contract.

(c) 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.

(d) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.

(e) The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit for the total value of transportation services provided by non-DBE lessees not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE lessees receives credit only for the fee or commission it receives as a result of the lease arrangement.

(f) For purposes of this paragraph, a lease shall indicate that the DBE has exclusive use of and control over the truck. This 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. Leased trucks shall display the name and identification number of the DBE.

(D) 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 DBE regular dealer and 100 percent of such expenditures to a DBE manufacturer.

(E) 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 professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a DOT-assisted contract, provided the fees or commissions are determined to be reasonable and not excessive as compared with fees and commissions customarily allowed for similar services.

(2) The fees or commissions charged for assistance in the procurement of the materials and supplies, or for 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 not from a manufacturer or regular dealer and provided the fees are determined to be reasonable and not excessive as compared with fees customarily allowed for similar services.

Good Faith Effort for Projects with Goals More than Zero

If the DBE participation submitted in the Price Proposal by the Propser with the apparent adjusted low price does not meet or exceed the DBE contract goal, this Proposer shall submit to the Department documentation of its good faith efforts made to reach the contract goal. One

complete set and 9 copies of this information shall be received in the office of the State Contractor Utilization Engineer no later than 12:00 noon of the sixth calendar day following opening of Price Proposals. 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 as necessary to demonstrate compliance with the factors listed below which the Department considers in judging good faith efforts. This documentation may include written subcontractor quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

The following factors will be used to determine if the Proposer has made adequate good faith effort:

(A) Whether the Proposer attended any pre-bid meetings that were scheduled by the Department to inform DBEs of subcontracting opportunities.

(B) Whether the Proposer provided solicitations through all reasonable and available means (e.g. advertising in newspapers owned and targeted to the Disadvantaged at least 10 calendar days prior to Price Proposal opening). Whether the Proposer provided written notice to all DBEs listed in the NCDOT Directory of Transportation Firms, within the Divisions and surrounding Divisions where the project is located, that specialize in the areas of work (as noted in the DBE Directory) that the Proposer will be subletting.

(C) Whether the Proposer followed up initial solicitations of interests by contacting DBEs to determine with certainty whether they were interested. If a reasonable amount of DBEs within the targeted Divisions do not provide an intent to quote or no DBEs specialize in the subcontracted areas, the Proposer shall notify DBEs outside of the targeted Divisions that specialize in the subcontracted areas, and contact the Business Development Manager in the NCDOT Office of Civil Rights to give notification of the Proposer's inability to get DBE quotes.

(D) Whether the Proposer selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Proposer might otherwise perform these work items with its own forces.

(E) Whether the Proposer provided interested DBEs with adequate and timely information about the plans, specifications and requirements of the contract.

(F) Whether the Proposer negotiated in good faith with interested DBEs without rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be noted in writing with a description as to why an agreement could not be reached.

(G) Whether quotations were received from interested DBE firms but rejected as unacceptable without sound reasons why the quotations were considered unacceptable. The fact that the DBE firms quotation for the work is not the lowest quotation received will not in itself be considered as a sound reason for rejecting the quotation as unacceptable. The fact that the Proposer has the ability and / or desire to perform the contract work with its own forces will not be considered as sound reason for rejecting a DBE quote. Nothing in this provision shall be construed to require the Proposer to accept unreasonable quotes in order to satisfy contract goals.

(H) Whether the Proposer specifically negotiated with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be sublet includes potential for DBE participation.

(I) Whether the Proposer made any efforts and / or offered assistance to interested DBEs in obtaining the necessary equipment, supplies, materials, insurance, and / or bonding to satisfy the work requirements in the RFP.

(J) Any other evidence that the Proposer submits which show that the Proposer has made reasonable good faith efforts to meet the contract goal.

If a Proposer is the Proposer with the apparent adjusted low price or apparent lowest responsive bidder on more than one project within the same letting located in the same geographic area of the state, as a part of the good faith effort the Department will consider allowing the Proposer to combine the DBE participation as long as the overall DBE goal value of the combined projects is achieved.

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 apparent adjusted low price that can satisfy the Department that the contract goal can be met or that adequate good faith efforts have been made to meet the goal.

DBE Replacement

The Design-Build Team shall not terminate a committed DBE subcontractor for convenience or perform the work with its own forces or those of an affiliate. If the Design-Build Team fails to demonstrate reasonable efforts to replace a committed DBE firm that does not perform as intended with another committed DBE firm or completes the work with its own forces without the Engineer's approval, the Design-Build Team and any of its affiliated companies 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 committed DBE.

(A) Performance Related Replacement

When a DBE is terminated or fails to complete its work on the contract for any reason, the Design-Build Team shall take all necessary, reasonable steps to replace the DBE

subcontractor with another DBE subcontractor to perform at least the same amount of work as the DBE that was terminated. The Design-Build Team is encouraged to first attempt to find another DBE firm to do the same work as the DBE that was being terminated.

To demonstrate necessary, reasonable good faith efforts, the Design-Build Team shall document the steps they have taken to replace any DBE subcontractor who is unable to perform successfully with another DBE subcontractor. Such documentation shall include but not be limited to the following:

(1) Copies of written notification to DBEs that their interest is solicited in subcontracting the work defaulted by the previous DBE subcontractor 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) For each DBE contacted but rejected as unqualified, the reasons for the Design-Build Team's conclusion.

(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 a Request for Subcontract 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 requirement.

(2) When a committed DBE is decertified prior to the Department receiving a Request for Subcontract 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 contract goal or demonstrate that it has made a good faith effort to do so.

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 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

All requests for subcontracts involving DBE subcontractors shall be accompanied by a certification executed by both the Design-Build Team and the DBE subcontractor attesting to the agreed upon unit prices and extensions for the affected contract items. This information shall be submitted on the Department Form RS-1-D, located at:

http://www.ncdot.org/doh/forms/files/FORMRS-1-D.doc

unless otherwise approved by the Engineer. The Department reserves the right to require copies of actual subcontract agreements involving DBE subcontractors.

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

All certifications will be considered a part of the project records, and consequently will be subject to penalties under Federal Law associated with falsifications of records related to projects.

Reporting Disadvantaged Business Enterprise Participation

(A) The Design-Build Team shall provide the Engineer with an accounting of payments made to Disadvantaged Business Enterprise firms, including material suppliers, 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:

(1) Withholding of money due in the next partial pay estimate; or

(2) Removal of any affiliated company of the Design-Build Team from the Department's appropriate prequalified list or the removal of other entities from the approved subcontractors list.

(B) The Design-Build Team shall report the accounting of payments through the Department's DBE Payment Tracking System, which is located at:

https://apps.dot.state.nc.us/Vendor/PaymentTracking/.

The Design-Build Team shall also provide the Engineer an affidavit attesting the accuracy of the information submitted in the Payment Tracking System. This too shall be submitted for any given month by the end of the following month.

(C) 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.

Prior to payment of the final estimate, the Design-Build Team shall furnish an accounting of total payment to each DBE. A responsible fiscal officer of the payee contractor, subcontractor, or second tier subcontractor who can attest to the date and amounts of the payments shall certify that the accounting is correct.

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 Design-Build Team and any of its affiliated companies from further bidding until the required information is submitted.

Failure on the part of any subcontractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from working on any DOT project until the required information is submitted.

Failure to Meet Contract Requirements

Failure to meet contract requirements in accordance with Article 102-16(J) of the 2006 *Standard Specifications for Roads and Structures* may be cause to disqualify the Design-Build Team.

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

(7/1/95) DB1 G133

The Design-Build Team's attention is directed to Article 105-7 of the 2006 *Standard Specifications for Roads and Structures*.

TIP Projects

- **I-5112** – I-40 from I-540 to Wade Avenue (SR 1728) and Wade Avenue (SR 1728) from I-40 to Edwards Mill Road (SR 1669) is currently under contract.

- **I-5114** – Bonded overlay removal on I-440 from I-40 (Exit 301) to US 264 / US 64 Bypass (Exit 14) is currently under contract.

- **I-5115** - Milling and resurfacing on I-440 from pavement joint at Wade Avenue (SR 1728) to Wake Forest Road (SR 2026) is currently under contract.

- **I-5116** – Milling and resurfacing on I-540 from I-40 to US 70 is currently under contract.

- **I-5124** – Installation of ITS devices on I-440 from I-40 to I-40 / US 1 / 64 has an anticipated June 2009 Let Date.

- **I-5125** – Bridge painting on I-440 from Glen Eden Drive to US 1 is currently under contract.

- **R-2000AF** – I-540 / I-40 interchange improvements has an anticipated January 2010 Let Date.

- **U-4763B** – NCTA Project – Triangle Parkway is anticipated to be under contract by the summer of 2009.

The Design-Build Team on this project shall cooperate with the Contractor or Design-Build Team working within, adjacent or in proximity 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

(7/18/06) 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. Such documentation shall be placed in escrow with a banking institution or other bonded document storage facility selected by the Department and preserved by that institution or facility as specified in the following sections of this provision.

Bid Documentation

The terms “bid documentation” as used in this provision means all written information, working papers, computer printouts and electronic media, charts, and all other data compilations which contain or reflect information, data, and calculations used by the Proposer in the preparation of their 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. The term does not include bid documents provided by the Department for use by the Proposer in bidding on this project.

Submittal of Bid Documentation

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 ten (10) days after the notice of award is received by the Proposer. 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 must 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. 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. The container shall be clearly marked "Bid Documentation" and shall also show on the face of the container the Proposer's name, Proposer's address, the date of submittal, the Project Number, and the 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 a banking institution or other bonded document storage facility selected by the Department for placement in a safety deposit box, vault, or other secure accommodation.

Duration and Use

The bid documentation and affidavit shall remain in escrow until 60 calendar days from the time the Design-Build Team receives the final estimate; or until such time as 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 related to the contract; or until authorized in writing by the Design-Build Team. 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. 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 shall instruct the banking institution or other bonded document storage facility to release the sealed container to the Design-Build Team.

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.

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 the Proposer may be just cause for rescinding the award of the contract and may result in the removal of the Proposer from the Department's appropriate prequalified list for a period 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 Board of Transportation may decide.

Escrow Agreement

The Proposer will be required to sign an Escrow Agreement within 10 days after the Proposer receives the notice of award. A copy of this Escrow Agreement document will be mailed to the Proposer with the notice of award for informational purposes. The Proposer and Department will sign the Escrow Agreement at the time that the bid documentation is delivered to a Banking Institution or other facility as outlined above. The Proposer's failure to sign the Escrow Agreement at the time the bid documentation is delivered may be just cause for rescinding the award of the contract and may result in the removal of the Proposer from the Department's appropriate prequalified list for a period 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 Board of Transportation may decide.

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.

Cost and Escrow Instructions

The cost of the escrow will be borne by the Department. The Department will provide escrow instructions to the banking institution or other bonded document storage facility consistent with this provision.

Payment

There will be no separate payment for all costs of compilation of the data, container, or verification of the bid documentation. Payment at the lump sum price for the Design-Build project 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 faulty design, normal wear and tear, for negligence on the part of the Department, and/or for use in excess of the design.

(B) Where items of equipment or material carry a manufacturer's guarantee for any period in excess of twelve months, then the manufacturer's guarantee shall apply for that particular piece of equipment or material. The Department's first remedy shall be through the manufacturer although the 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.

OUTSOURCING OUTSIDE THE USA

(5-16-06) DB1 G150

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

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

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

CLEARING AND GRUBBING

(01-22-08) DB2 R01

With the exception of the Cary Towne Blvd loop, perform clearing on this project to the limits established by Method "III" shown on Standard No. 200.03 of the 2006 *NCDOT Roadway Standard Drawings*.

SHPO DOCUMENTATION FOR BORROW / WASTE SITES

(12-18-07) DB8 R02

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Division 2 Earthwork

Page 2-16, Subarticle 230-1(D), add the words: *The Contractor specifically waives* as the first words of the sentence.

Page 2-17, Subarticle 230-4(B) Contractor Furnished Sources, first paragraph, first sentence replace with the following:

Prior to the approval of any borrow sources developed for use on any project, obtain certification from the State Historic Preservation Officer of the State Department of Cultural Resources certifying that the removal of the borrow material from the borrow sources(s) will have no effect on any known district, site building, structure, or object, architectural and / or archaeological that is included or eligible for inclusion in the National Register of Historic Places.

Division 8 Incidentals

Page 8-9, Article 802-2 General Requirements, add the following as the 1st paragraph:

Prior to the removal of any waste from any project, obtain certification from the State Historic Preservation Officer of the State Department of Cultural Resources certifying that the deposition of the waste material to the proposed waste area will have no effect on any known district, site building, structure, or object, architectural and / or archaeological that is

included or eligible for inclusion in the National Register of Historic Places. Furnish a copy of this certification to the Engineer prior to performing any work in the proposed waste site.

Page 8-10, Article 802-2, General Requirements, 4th paragraph, add the following as the 2nd sentence:

The Department's borrow and waste site reclamation procedures for contracted projects is available on the NCDOT website and shall be used for all borrow and waste sites on this project.

EROSION & SEDIMENT CONTROL / STORMWATER CERTIFICATION

1-16-07 (Rev 1-15-08) (DB Rev. 12/05/07) 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 to 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 control / stormwater 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.

In the case of difference of opinion or interpretation of plan or contract requirements between the Design-Build Team and the Engineer, the Engineer's determination and decision will be final.

Roles and Responsibilities

(A) *Certified Supervisor* - The Certified Supervisor shall be responsible for ensuring erosion and sediment control / stormwater is adequately implemented and maintained on the project and conducting the quality control program. The Certified Supervisor shall be on the project within 24 hours from initial exposure of an erodible surface to the project's final acceptance when questions or concerns arise with erosion and sedimentation control / stormwater issues. Perform the following duties:

(1)

(a) 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.

(b) Oversee the work of subcontractors so that appropriate erosion and sediment control / stormwater preventive measures are conformed to at each stage of the work.

(c) Prepare the required weekly erosion control punchlist and submit to the Engineer.

(d) Attend all weekly or monthly construction meetings to discuss the findings of the NPDES inspection and other related issues.

(e) Implement the erosion and sediment control / stormwater site plans requested.

(f) Provide for erosion and sediment control / stormwater methods 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.

(g) Acquire applicable permits and comply with requirements for borrow pits, dewatering, and any temporary work conducted by the Design-Build Team in jurisdictional areas.

(h) Conduct all erosion and sediment control / stormwater work in a timely and workmanlike manner.

(i) Fully install erosion and sediment control / stormwater work prior to suspension of the work.

(j) 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.

(k) Ensure that proper cleanup occurs from vehicle tracking on paved surfaces and / or any location where sediment leaves the Right-of-Way.

(l) Have available a set of erosion control plans that has been 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 permit 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. 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. 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 at least once every 7 calendar days, twice weekly for 303(d) impaired streams, and within 24 hours after a significant rainfall event of 0.5 inches within 24 hours.
(c) Maintain an onsite rain gauge and a 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 and waste sites.
(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 NPDES Permit requirements, and the requirements of the *General Permit, NCG010000*.
(i) Report violations of the NPDES permit to the Engineer who will notify the DWQ Regional Office within 24 hours.

(3) Quality Control Program - Maintain a quality control program to control erosion, prevent sedimentation and follow provisions 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) Maintain temporary erosion and sediment control devices.
(h) Remove temporary erosion or sediment control devices when they are no longer necessary as agreed upon by the Engineer.

(i) 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 *Certified Installer* is not onsite, the Design-Build Team may substitute a Level I Installer with a Level II Foreman, 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 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 - Operations to the certification entity, certification for Supervisor, Certified Foreman, Certified Installer and Certified Designer may be revoked or suspended with the issuance of a Continuing Immediate Corrective Action (Continuing ICA), Notice of Violation (NOV), or Cease and Desist Order for erosion and sediment control / stormwater related issues.

Should any of the following circumstances occur, the Chief Engineer may suspend or permanently revoke such certification.

(A) Failure to adequately perform the duties as defined within the certification program
(B) Issuance of a Continuing 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 within another state

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

A registrant 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 - Operations
1537 Mail Service Center
Raleigh, NC 27699-1537

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 registrant 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 registrant.

If a certification is temporarily suspended, the registrant 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 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 superceding 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.

PRICE ADJUSTMENTS FOR ASPHALT BINDER

(3-22-07) DB6 R25

Price adjustments for asphalt binder for plant mix will be made in accordance with Section 620 of the 2006 *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

(04-03-07) DB6 R26

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 6-27, Article 609-8 and Page 6-49, Article 610-13

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.

REPAIR OF JOINTED CONCRETE PAVEMENT SLABS

(03-10-09) DB 07 R008

Description

Remove and satisfactorily dispose of existing damaged jointed concrete pavement slabs and associated asphalt repair work and furnish and place new jointed concrete pavement slabs with dowels at the locations identified in the Pavement Management Scope of Work.

Materials

Refer to Divisions 10 of the 2006 *Standard Specifications for Roads and Structures.*

Item	Section
Portland Cement Concrete	1000
Select Material, Class IV	1016
Water	1024-4
Curing Agents	1026
Fabric for Soil Stabilization	1056
Dowels and Tie Bars	1070-6
Epoxy	1081

Use Select Material, Class IV for Class IV Subgrade Stabilization. If Class IV Subgrade Stabilization does not meet the requirements of Article 1010-2 of the 2006 *Standard Specifications for Roads and Structures*, the Engineer may consider the material reasonably acceptable in accordance with Article 105-3 of the 2006 *Standard Specifications for Roads and Structures.*

Construction Methods

Submit a plan for removing the pavement areas to the Engineer for approval. Pavement to be removed may consist of concrete slabs, concrete slabs that have been repaired with asphalt and / or asphalt that has replaced concrete slabs. The removal method shall minimize damage to the subgrade and to adjacent pavement and shoulders. Take necessary measures to protect the exposed subgrade and base from damage resulting from surface water and rain during the period between the pavement removal and replacement.

Meet the applicable requirements of Section 700 of the 2006 *Standard Specifications for Roads and Structures* and the following provisions:

Conduct the repair of jointed concrete pavement slabs in one lane at a time. The work shall be accomplished with other operations in progress in the same area.

Remove the entire 12' width and at least 6 feet in the travel direction. Any remaining portion of a slab that is removed shall not be less than 6 feet in the travel direction. As a result of the full depth sawing of the existing pavement to remove the distressed area, saw cuts that extend into the adjacent pavement shall be filled with epoxy Type 3, prior to placing traffic on the new area.

At locations as directed by the Engineer, the Design-Build Team shall:

(A) Remove unsuitable aggregate base material and backfill with Class IV Subgrade Stabilization; or
(B) Remove unsuitable aggregate base material, undercut the subgrade, place Fabric for Soil Stabilization, and backfill with Class IV Subgrade Stabilization.

Conform to the requirements of Section 270 of the 2006 *Standard Specifications for Roads and Structures* for the Fabric for Soil Stabilization. The Engineer shall direct which method of repair shall be used at each location.

Thoroughly tamp any loosened subgrade or base material to the satisfaction of the Engineer before the pavement is replaced. Cast new pavement to match the thickness of the adjacent slabs.

Use pneumatic or hydraulic drills and bits that will drill a hole in the existing concrete faces for placement of the dowels at location specified on the plans. Operate the equipment to prevent damage to the pavement being drilled. The drilling procedure shall be approved by the Engineer prior to drilling. Thoroughly clean the drilled holes of all contaminants. The dowels of specified type and size shall then be set into the hardened concrete face of the existing pavement with an epoxy-bonding compound Type 3A. Place the dowels at locations as directed by the Engineer with one-half of dowel protruding beyond the hardened face of existing pavement and placed at correct horizontal and vertical alignment with misalignment not to exceed 0.4 inches in the vertical or oblique plane. Allow the epoxy to harden sufficiently prior to placing concrete to prevent any movement of the dowels during the placement of the concrete. Place a sufficient amount of epoxy in the back of the hole so that the entire cavity around the dowel is completely filled upon insertion of the dowel bars. Remove all excess epoxy.

Use dowels of the type, size, spacing, and at the location specified in 2006 *Standard Specifications for Roads and Structures Drawing* 700.01 Sheet 1 of 2. Do not drive any dowel into a dowel hole with sledgehammers or other devices. Any dowel that cannot be freely inserted into a dowel hole shall be rejected for use.

Where two or more adjacent slabs in a single lane are being repaired, construct the joint between the two slabs as specified in the 2006 *Standard Specifications for Roads and Structures*. Include dowel assemblies as shown in Standard Drawing No. 700.03.

Prior to placing concrete, thoroughly clean the vertical exposed faces of the existing slabs of contaminates using wire brushing or other methods approved by the Engineer. Use extra care to remove all existing silicone or other joint sealant from the exposed concrete faces.

Deposit the concrete within the slab replacement area in such a manner as to require as little re-handing as possible to prevent segregation of the mix. Minimize hand spreading as much as possible, but where necessary, it shall be done with shovels, not rakes. Do not walk in the fresh concrete with shoes coated with earth or other foreign substances. The replaced slab area shall be filled with concrete and thoroughly consolidated by rodding, spading, and sufficient vibration to form a dense homogeneous mass throughout the area. The final surface area shall be uniform in appearance and free of irregularities and porous areas.

Meet a surface tolerance of 1/8 " in 10' in any direction of the finished surface, including joints. Grind all necessary corrections. Any replaced slab which is low in relation to adjacent slabs may be ordered replaced by the Engineer. Replacement of such a slab would generally be required if

excessive grinding of the adjacent pavement is necessary to match the profile of the full depth slab replacement or if a drainage problem would be created by grinding the adjacent pavement.

The surface finish of the proposed concrete pavement shall be a burlap drag finish and conform to the cross-section of adjacent pavement. The method of finishing shall be approved by the Engineer prior to finishing. Immediately after finishing operations have been completed and surface water has disappeared, all exposed surfaces of the pavement shall be cured in accordance with the applicable provisions of Article 700-9 Curing of the 2006 *Standard Specifications for Roads and Structures.*

CHANGEABLE MESSAGE SIGNS

(11-21-06) DB 11 R11

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 11-9, Article 1120-3

Replace the 3rd sentence with the following:

Sign operator shall adjust flash rate so that no more than two messages are displayed and are legible to a driver when approaching the changeable message sign at the posted speed.

OVERHEAD SIGN SUPPORTS

NOTE: All references to "plans" in the Overhead Sign Supports Project Special Provision refer to the I-4902 Signing Plans signed and sealed on March 31, 2009 and the I-4744 Signing Plans developed by the Design-Build Team.

Description

Design, fabricate, furnish and erect various types of overhead sign assemblies with maintenance walkways. The types of overhead sign assemblies included in this specification are span structures, cantilever structures and sign structures attached to bridges.

Materials

Structural Steel……...……..……. Section 1072
Overhead Structures……. Section 1096
Signing Materials …….……..... Section 1092
Organic Zinc Repair Paint …… Article 1080-9
Reinforcing Steel ……..... Section 1070

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 in any manner shall be permitted in the field, unless prior approval by the Engineer is obtained.

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 shall not be 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. Use two bolts at each connection.

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

B. Shop Drawings

Design the overhead sign supports, including foundations, prior to fabrication. Submit computations 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. Base design upon the revised structure line drawings, wind load area and the wind speed shown in the plans, and in accordance with the *Standard Specifications for Structural Structures for Highway Signs, Luminaires and Traffic Signals*.

Submit thirteen (13) copies of completely detailed working drawings and one (1) copy of the design computations 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), 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 governs the design of overhead sign assemblies:

Design shall be in accordance with the *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 4th Edition, 2001,* and the latest Interim Specifications.

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

- The wind pressure map that is developed from the 3-second gust speeds, as provided in Article 3.8, shall be used.
- Overhead cantilever sign structures shall include galloping loads (exclude four-chord horizontal trusses), truck-induced gust loading and natural wind gust loading in the fatigue design, as provided for in Article 11.7.1, 11.7.4 and 11.7.3 respectively.
- The natural wind gust speed in North Carolina shall be assumed to be 5 meters per second or 11.6 mph for inland areas.
- The fatigue importance category used in the design, for each type of structure, as provided for in Article 11.6, Fatigue Importance Factors, shall be Category II unless otherwise shown on the contract plans.

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 upright post, the unbraced length shall be from the chord to post connection to the top of base plate.

- For twin post truss-type upright post, that is subject to axial compression, bending moment, shear, and torsion the post shall satisfy *Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals* 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:

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

Where fa = 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, $M = (P \times D_1) / 2$.

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 $M = P \times D_2$.

- M - bending moment at the critical section of the base plate induced by one anchor bolt
- P - anchoring force of each anchor bolt
- D_1 - 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_2 - 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 base plate of Case 1 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 Sign Foundation Project Special Provision found elsewhere in this RFP 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.

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. Sign support structures that are to be attached to bridges shall be fabricated using other structural shapes.

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. Provide permanent camber in addition to dead load camber in accordance with the *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*. 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.

Attach the overhead sign assemblies to concrete foundations by the use of galvanized anchor bolts with galvanized nuts, flat washers, and lock washers. For cantilever structure use a minimum of eight anchor bolts. Provide anchor bolts that have an anchor plate with nut at the end to be embedded in concrete.

Fabricate attachment assemblies for mounting signs in a manner that allows easy removal of sign panels for repair. Provided adequate supporting frames for mounting the lighting luminaires in the positions shown in the plans or approved shop drawings for all overhead sign assemblies to be illuminated.

Anchor Rod Assembly

Attach the overhead sign structure to concrete foundations by the use of straight galvanized anchor bolts with galvanized heavy hex nuts and flat washers. The rods and nuts shall be galvanized in accordance with AASHTO M232. The washers shall be galvanized in accordance with AASHTO M298 Class C. For cantilever structures, use a minimum of eight anchor rods. Provide anchor rods that have an anchor plate with nut at the end to be embedded in concrete.

Ensure material used in steel anchor rods conforms to AASHTO M 314 or ASTM F1554, and the specified yield strength does not exceed 55,000 psi. Compute the required projection of the anchor rod above the foundation top. Compute the total projection based on the following:

- Provide between 3 and 5 threads of anchor rod projection above the top nut after tightening is complete. Avoid any additional projection, or a normal depth socket torque wrench shall not be used on top nuts.

- Include the sum of the thickness of top nut, top nut flat washer or top nut beveled washers, base plate, leveling nut flat washer or leveling nut beveled washers, leveling nut.

- Set the maximum distance between the bottom of the leveling nut and the foundation top to one nut height to avoid excessive bending stresses in the anchor rod under service conditions.

- Do not use lock washers.

Anchor Rod Nut Tightening Requirements

Prior to installation:

1. Protect the anchor rod threads from damage prior to and during installation.

2. Prior to installation of the rods in the foundation, turn nuts onto and off the rods, well past the elevation of the bottom of the leveling nuts. Turn by the effort of one worker using an ordinary wrench without a cheater bar. Report to the Engineer thread damage requiring unusually large effort.

During installation:

1. Place leveling nuts (bottom nuts) on the anchor rod.

2. Place leveling nut washers on top of the anchor rod leveling nuts.

3. Place a rigid template on top of the leveling nuts to check the level of the nuts. If the anchor nut and washer cannot be brought into firm contact with the template, then beveled washers shall be used.

4. Verify that the distance between the bottom of the leveling nut and the top of the concrete foundation is no more than one anchor rod diameter. If an upright is required to be back-raked, then the distance between the bottom of the leveling nut and the top of the concrete foundation shall be no more than one anchor rod diameter, averaged over the anchor rod group.

5. Place the base plate and structural element to which it is attached. However, do not attach to the upright element, during tightening of the anchor nuts, cantilever beams or arms with span in excess of 10 feet. Luminaire arms and fixtures may be attached prior to standing the pole on the foundation.

6. Place top nut washers.

7. Do not use lock washers.

8. Lubricate threads and bearing surfaces of top nuts. Lubricant shall be beeswax, stick paraffin, or other lubricant approved by the Engineer.

9. Place top nuts. If the anchor nut and washer cannot be brought into firm contact with the base plate, then beveled washers shall be used.

10. Tighten top nuts to snug-tight. A snug-tight condition is defined as the washer and nut being in full contact with the base plate, and the application of the full effort of a workman on a 12-inch wrench. Turn top nuts in increments following a star pattern (using at least two full tightening cycles).

11. To ensure proper pretensioning, after all top nuts have been brought to snug-tight condition, repeat the procedure on the leveling nuts. Turn leveling nuts in increments following a star pattern (using at least two full tightening cycles).

12. At this point, verify if beveled washers are required. Beveled washers shall be required under the leveling nut or top nut if any face of the base plate has a slope greater than 1:20 and / or any nut can not be brought into firm contact with the base plate.

13. Before further nut turning, mark the reference position of the nut in the snug-tight condition with a suitable marking (ink or paint that is not water-soluble). Mark on the corner at the intersection of two flats with a corresponding reference mark on the base plate at each nut. After tightening, verify the nut rotation.

14. Achieve pretensioning by turn-of-nut method. Turn the top nuts to 1/6 of a turn. Do so in a star pattern using at least two full-tightening cycles.

15. After installation, ensure that firm contact exists between the anchor rod nuts, washers, and base plate on any anchor rod installed.

16. For overhead sign assemblies: The span type truss or the cantilever truss may be placed on the uprights or attached to the upright at this time. For signal support structures: The span wires or mast arms may be attached to the upright at this time.

17. After a period of no less than 4 days, and no more than 2 weeks, and in the presence of the Engineer, use a torque wrench to verify that a torque at least equal to 600 foot-pounds is provided on each top nut. For cantilever structures, verify the torque after erection of the remainder of the structure and any heavy attachments to the structure.

18. If any top nut torque reveals less than 600 foot-pounds of effort is required to move the nut, then tighten the nut to no less than 600 foot-pounds.

19. The Design-Build Team shall calibrate the torque indicator, and obtain corresponding certification, for all torque wrenches used for anchor nut tightening. The calibration and certification shall have occurred no more than 12 months prior to use of the torque wrench. Torque wrenches that were calibrated and certified more than twelve months prior to anchor nut tightening shall be re-calibrated and re-certified prior to use. Provide the Engineer a certification of such calibration.

20. Because inspection or re-tightening of the leveling nuts would be prevented, and to reduce moisture retention and associated corrosion, grout shall not be allowed under the base plate.

OVERHEAD SIGN FOUNDATIONS

NOTE: All references to "plans" in the Overhead Sign Foundations Project Special Provision refer to the I-4902 Signing Plans signed and sealed on March 31, 2009 and the I-4744 Signing Plans developed by the Design-Build Team.

Description

The work covered by this project special provision consists of the design and construction of overhead sign foundations in accordance with the submitted approved plans and this provision. Design and construct either spread footing type foundations and / or drilled pier type foundations for each overhead sign unless otherwise directed by the Engineer.

Materials

Portland Cement Concrete Production and Delivery ...……...…….....Section 1000
Reinforcing Steel ...……..Section 1070
Anchor Bolts ...……..Article 1072-6
Structural Steel and Overhead Sign Structures .……...Section 1072 and 1096

Construction Methods

A) General

A North Carolina Licensed Professional Engineer shall seal all design calculations, drawings and recommendations. Design foundations for the effects of dead, wind and ice loads in accordance with the wind zone load shown on the plans and Section 3 of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signal*s (including interims). Use either spread footing or drilled pier foundations. In some instances, conflicts with drainage structures may dictate a certain type of foundation. Spread footings or dual drilled pier foundations shall be required for full span overhead signs (no single drilled pier foundations). When designing dual drilled pier foundations, a rectangular grade beam with a moment of inertia approximately equal to either of the drilled piers shall be required to connect the pier tops.

Provide reinforced concrete design in accordance with either Section 13.7.2 or 13.6.2 (whichever is applicable), allowable stress design method, of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals* (including interims).

Consider sloping ground in the design, if applicable. Do not exceed an allowable bearing pressure of 3 ksf for spread footings. For drilled pier foundations, do not exceed an allowable lateral soil pressure of 4 ksf for AASHTO Group II Loading. Use the following default soil parameters and groundwater elevation for foundation design in the absence of a site-specific subsurface investigation in accordance with this project special provision.

Total Unit Weight = 120 pcf

Friction Angle = 30 degrees

Cohesion = 0 psf

Assume the groundwater elevation is at a depth of 7 feet below the ground surface. If the groundwater is encountered at a depth shallower than 7 feet, the overhead sign foundation shall be redesigned based upon the actual field conditions. The default soil parameters and allowable pressures shall not apply to very soft or loose soil, muck (generally, SPT blow counts per foot less than 4), weathered rock or hard rock (generally, SPT refusal). If soft or loose soil, muck, weathered rock or hard rock conditions are present, a site-

specific subsurface investigation and foundation design shall be required in accordance with this project special provision.

Design spread footings in accordance with Sections 4.4.1 through 4.4.10, allowable stress design method, of the *AASHTO Standard Specifications for Highway Bridges* (including interims). Restrict uplift due to the eccentricity of the loading to one corner of the footing and the tension area shall not exceed 25% of the total bearing area of the spread footing.

Design drilled piers in accordance with Sections 4.6.1 through 4.6.5, allowable stress design method, of the *AASHTO Standard Specifications for Highway Bridges* (including interims). If drilled piers are designed for skin friction only, increase the required length of each drilled pier a minimum of 6 inches to allow for sediment. If drilled piers are designed for end bearing, no additional length is required; however, the drilled piers shall be subject to the cleanliness requirements in Bottom Cleanliness under "Drilled Pier Construction:" below. Clearly state on the plans whether end bearing was accounted for in the foundation design.

Calculate expected vertical, lateral and torsional movements for single drilled pier foundations. Provide drilled pier foundations that result in a horizontal lateral movement of less than 1 inch at the top of the pier and a horizontal rotational movement of less than 1 inch at the edge of the pier. Also, use a factor of safety of 2.0 for lateral and torsion failure. Preliminary design methods described in Section 13.6.1.1 of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals* (including interims) shall be used to incorporate a factor of safety in foundation design for lateral failure. Wings shall be required to increase torsion resistance for cantilever signs supported by a single drilled pier.

If a site-specific subsurface investigation is performed, use only an NCDOT Highway Design Branch Pre-Qualified Geotechnical Engineering Firm to provide a site specific foundation design.

B) Subsurface Investigation

The Design-Build Team may elect to conduct a site specific subsurface investigation at each proposed overhead sign foundation location in lieu of using the default soil parameters and allowable pressures referenced above. In this case, and subject to the requirements below, perform a boring at each overhead sign foundation location and provide boring data on an NCDOT Standard Boring Log form. Download this form from the NCDOT site at

http://www.ncdot.org/doh/preconstruct/highway/geotech/contractserv/investigation/Documents/BoringLogs.zip.

A licensed geologist or a professional engineer registered in the State of North Carolina and employed by an NCDOT Highway Design Branch pre-qualified Geotechnical

Engineering Firm shall seal each boring log. Use only an NCDOT Highway Design Branch pre-qualified Geotechnical Engineering Firm to conduct the subsurface investigation. Perform the investigation only after rough grade (within 3 feet of final grade) is achieved. Locate each boring within 3 feet of the center of the overhead sign foundation. Drill the boring to a minimum depth of 10 feet below the required spread footing bearing or drilled pier tip elevation, whichever is deeper. Conduct Standard Penetrating Tests at 1 foot, 2.5 feet, 5 feet, 7.5 feet, 10 feet and every 5 feet after 10 feet below the rough grade in accordance with ASTM D-1586. A boring may be terminated above the minimum depth required (10 feet below the foundation elevation) if one of the following conditions occur: (a) a total of 100 blows have been applied in any 2 consecutive 6-inch intervals; (b) a total of 50 blows have been applied with less than 3 inches of penetration.

C) Foundation Construction

Excavate footings for overhead sign structures in accordance with the applicable provisions of Section 410 of the 2006 *Standard Specifications for Roads and Structures*. Construct footings for overhead sign structures in accordance with Section 825 of the 2006 *Standard Specifications for Roads and Structures*. Construct all footings with Class A concrete. Where rectangular forms are used, use forms that have a chamfer strip at all corners for at least that distance protruding above finished ground. Use chamfers, which measure one-inch along the diagonal face.

Securely brace anchor bolts positioned in the form and hold in proper position and alignment. Provide a rubbed finish on concrete surfaces to be exposed above finished ground in accordance with Section 825-6 (D) of the 2006 *Standard Specifications for Roads and Structures*. Do not erect overhead sign structures on foundations until the concrete has reached a minimum compressive strength of 3000 psi. Determine concrete compressive strength by nondestructive test methods or compressive strength tests made in accordance with AASHTO T22 and T23. Furnish equipment used for nondestructive tests and obtain Engineer's approval prior to performing the tests.

D) Drilled Pier Construction

Excavation

Perform excavations for drilled piers to the required dimensions and lengths including all miscellaneous grading and excavation necessary to install the drilled pier. Depending on the subsurface conditions encountered excavation in hard rock, weathered rock or removal of boulders and debris may be required.

Dispose of drilling spoils as directed by the Engineer and in accordance with Section 802 of the 2006 *Standard Specifications for Roads and Structures*. Drilling spoils consist of all material excavated including water or slurry removed from the excavation either by pumping or with augers.

Construct drilled piers within the tolerances specified herein. If tolerances are exceeded, provide additional construction as approved by the Engineer to bring the piers within the tolerances specified. Construct drilled piers such that the axis at the top of the piers is no more than 3 inches in any direction from the specified position. Build drilled piers within 1% of the plumb deviation for the total length of the piers. When a grade beam is not required at the top of a pier, locate the top of pier elevation between 18 inches above and 6 inches above the finished grade elevation. Form the top of the pier such that the concrete is smooth and level.

If unstable, caving or sloughing soils are anticipated or encountered, stabilize drilled pier excavations with steel casing and / or polymer slurry. Steel casing may be either the sectional type or one continuous corrugated or non-corrugated piece. All steel casings shall 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 specified pier size and a minimum wall thickness of 1/4 inch. Extract all temporary casings during concrete placement in accordance with this project special provision unless the Design-Build Team chooses to leave the casing in place in accordance with the requirements below.

Any steel casing left in place will be considered permanent casing. When installing permanent casing do not drill or excavate below the tip of the permanent casing at any time such that the permanent casing is against undisturbed soil. The Design-Build Team may excavate a hole with a minimum diameter of 12 inches smaller than the specified size of the pier in order to facilitate permanent casing installation provided the sides of the excavation do not slough during drilling such that the hole diameter becomes larger than the inside diameter of the casing. Permanent steel casings shall only be allowed for full span overhead signs as approved by the Engineer and prohibited for cantilever overhead signs. No additional compensation will be paid for permanent casing.

If the Design-Build Team elects to use polymer slurry to stabilize the excavation, use one of the polymers listed in the table below:

PRODUCT	MANUFACTURER
SlurryPro EXL	KB Technologies Ltd 3648 FM 1960 West Suite 107 Houston, TX 77068 (800) 525-5237
Super Mud	PDS Company 105 West Sharp Street El Dorado, AR 71730 (800) 243-7455
Shore Pac GCV	CETCO Drilling Products Group 1500 West Shure Drive Arlington Heights, IL 60004 (800) 527-9948

Use slurry in accordance with the manufacturer's guidelines and recommendations unless approved otherwise by the Engineer. The Design-Build Team should be aware that polymer slurry might not be appropriate for a given site. Polymer slurry shall not be used for excavations in very soft or loose soils. If the excavation can not be stabilized with polymer slurry, the Engineer may require a site-specific subsurface investigation (if not done during design) and the use of steel casing. No additional time or compensation will be provided if steel casing and / or polymer slurry are required to stabilize the excavation.

Construct all drilled piers such that the piers are cast against undisturbed soil. If a larger casing and drilled pier are required as a result of unstable or caving material during drilling, backfill the excavation before removing the casing to be replaced. No additional time or compensation will be provided for substituting a larger diameter drilled pier in order to construct a drilled pier cast against undisturbed soil.

Any temporary steel casing that becomes bound or fouled during pier construction and cannot be practically removed may constitute a defect in the drilled pier. Improve such defective piers to the satisfaction of the Engineer by removing the concrete and enlarging the drilled pier, providing a replacement pier or other approved means. All corrective measures including redesign as a result of defective piers shall not be cause for any claims or requests for additional time or compensation.

Bottom Cleanliness

If the plans indicate end bearing was used in the design, after a drilled pier excavation is complete, and immediately before concrete placement, demonstrate acceptable bottom cleanliness of the drilled pier excavation to the Engineer for approval. Provide any equipment, personnel and assistance required for the

Engineer to inspect the drilled pier excavation. The pier excavation bottom shall be considered clean if no portion of the bottom area has more than 3 inches of sediment as determined by the Engineer.

Reinforcing Steel

Completely assemble a cage of reinforcing steel consisting of longitudinal and spiral bars and place cage in the drilled pier excavation as a unit immediately upon completion of drilling unless the excavation is entirely cased. If the drilled pier excavation is entirely cased down to the tip, immediate placement of the reinforcing steel and the concrete is not required.

Lift the cage so racking and cage distortion does not occur. Keep the cage plumb during concrete placement operations and casing extraction. Check the position of the cage before and after placing the concrete.

Securely crosstie the vertical and spiral reinforcement at each intersection with double wire. Support or hold down the cage so that the vertical displacement during concrete placement and casing extraction does not exceed 2 inches.

Do not set the cage on the bottom of the drilled pier excavation. Place plastic bolsters under each vertical reinforcing bar that are tall enough to raise the rebar cage off the bottom of the drilled pier excavation a minimum of 3 inches.

In order to ensure a minimum of 3 inches of concrete cover and achieve concentric spacing of the cage within the pier, tie plastic spacer wheels at five points around the cage perimeter. Use spacer wheels that provide a minimum of 3 inches "blocking" from the outside face of the spiral bars to the outermost surface of the drilled pier. Tie spacer wheels that snap together with wire and allow them to rotate. Use spacer wheels that span at least two adjacent vertical bars. Start placing spacer wheels at the bottom of the cage and continue up along its length at maximum 10-foot intervals. Supply additional peripheral spacer wheels at closer intervals as necessary or as directed by the Engineer.

Concrete

Begin concrete placement immediately after inserting reinforcing steel into the drilled pier excavation.

1) Concrete Mix

Provide the mix design for drilled pier concrete for approval and, except as modified herein, meeting the requirements of Section 1000 of the 2006 *Standard Specifications for Roads and Structures*.

Designate the concrete as Drilled Pier Concrete with a minimum compressive strength of 4500 psi at 28 days. The Design-Build Team may use a high early strength mix design as approved by the Engineer. Make certain the cementitious material content complies with one of the following options:

- Provide a minimum cement content of 640 lbs / yd^3 and a maximum cement content of 800 lbs / yd^3; however, if the alkali content of the cement exceeds 0.4%, reduce the cement content by 20% and replace it with fly ash at the rate of 1.2 LB of fly ash per LB of cement removed.

- If Type IP blended cement is used, use a minimum of 665 lbs / yd^3 Type IP blended cement and a maximum of 833 lbs / yd^3 Type IP blended cement in the mix.

Limit the water-cementitious material ratio to a maximum of 0.45. Do not air-entrain drilled pier concrete.

Produce a workable mix so that vibrating or prodding is not required to consolidate the concrete. When placing the concrete, make certain the slump is between 5 and 7 inches for dry placement of concrete or 7 and 9 inches for wet placement of concrete.

Use Type I or Type II cement or Type IP blended cement and either No. 67 or No. 78M coarse aggregate in the mix. Use an NCDOT approved water-reducer, water-reducing retarder, high-range water-reducer or high-range water-reducing retarder to facilitate placement of the concrete, if necessary. Do not use a stabilizing admixture as a retarder in Drilled Pier Concrete without prior approval of the Engineer. Use admixtures that satisfy AASHTO M194 and add admixtures at the concrete plant when the mixing water is introduced into the concrete. Redosing of admixtures shall not be permitted.

Place the concrete within 2 hours after introducing the mixing water. Ensure that the concrete temperature at the time of placement is 90°F or less.

2) Concrete Placement

Place concrete such that the drilled pier is a monolithic structure. Temporary casing may be completely removed and concrete placement may be temporarily suspended when the concrete level is within 42 to 48 inches of the ground elevation to allow for placement of anchor bolts and construction of grade beam or wings. Do not pause concrete placement if unstable caving soils are present at the ground surface. Remove any water or slurry above the concrete and clean the concrete surface of all scum and sediment to expose clean, uncontaminated concrete before inserting the anchor bolts and conduit. Resume concrete pouring within 2 hours.

Do not dewater any drilled pier excavations unless the Engineer approves the dewatering and the excavation is entirely cased down to tip. Do not begin to remove the temporary casing until the level of concrete within the casing is in excess of 10 feet above the bottom of the casing being removed. Maintain the concrete level at least 10 feet above the bottom of casing throughout the entire casing extraction operation except when concrete is near the top of the drilled pier elevation. Maintain a sufficient head of concrete above the bottom of casing to overcome outside soil and water pressure. As the temporary casing is withdrawn, exercise care in maintaining an adequate level of concrete within the casing so that fluid trapped behind the casing is displaced upward and discharged at the ground surface without contaminating or displacing the drilled pier concrete. Exerting downward pressure, hammering or vibrating the temporary casing is permitted to facilitate extraction.

Keep a record of the volume of concrete placed in each drilled pier excavation and make it available to the Engineer.

After all the pumps have been removed from the excavation, the water inflow rate determines the concrete placement procedure. If the inflow rate is less than 6 inches per half-hour, the concrete placement shall be considered dry. If the water inflow rate is greater than 6 inches per half-hour, the concrete placement shall be considered wet.

- Dry Placement: Before placing concrete, make certain the drilled pier excavation is dry so the flow of concrete completely around the reinforcing steel can be certified by visual inspection. Place the concrete by free fall with a central drop method where the concrete is chuted directly down the center of the excavation.

- Wet Placement: Maintain a static water or slurry level in the excavation before placing concrete. Place concrete with a tremie or a pump in accordance with the applicable parts of Sections 420-4 and 420-5 of the 2006 *Standard Specifications for Roads and Structures*. Use a tremie tube or pump pipe made of steel with watertight joints. Passing concrete through a hopper at the tube end or through side openings as the tremie is retrieved during concrete placement is permitted. Use a discharge control to prevent concrete contamination when the tremie tube or pump pipe is initially placed in the excavation. Extend the tremie tube or pump pipe into the concrete a minimum of 5 feet at all times except when the concrete is initially introduced into the pier excavation. If the tremie tube or pump pipe pulls out of the concrete for any reason after the initial concrete is placed, restart concrete placement with a steel capped tremie tube or pump pipe.

Once the concrete in the excavation reaches the same elevation as the static water level, placing concrete with the dry method is permitted. Before

changing to the dry method of concrete placement, remove any water or slurry above the concrete and clean the concrete surface of all scum and sediment to expose clean, uncontaminated concrete.

Vibration shall only be permitted, if needed, in the top 10 feet of the drilled pier or as approved by the Engineer. Remove any contaminated concrete from the top of the drilled pier and wasted concrete from the area surrounding the drilled pier upon completion.

3) Concrete Placement Time

Place concrete within the time frames specified in Table 1000-2 of the 2006 *Standard Specifications for Roads and Structures* for Class AA concrete except as noted herein. Do not place concrete so fast as to trap air, water, fluids, soil or any other deleterious materials in the vicinity of the reinforcing steel and the annular zone between the rebar cage and the excavation walls. Should a delay occur because of concrete delivery or other factors reduce the placement rate to maintain some movement of the concrete. No more than 45 minutes shall be allowed between placements.

E) Scheduling and Restrictions

If caving or sloughing occurs, no additional compensation will be provided for additional concrete to fill the resulting voids.

During the first 16 hours after a drilled pier has achieved its initial concrete set as determined by the Engineer, do not drill adjacent piers, do not install adjacent piles and do not allow any heavy construction equipment loads or "excessive" vibrations to occur at any point within a 20 foot radius of the drilled pier.

In the event that the procedures described herein are performed unsatisfactorily, the Engineer reserves the right to shut down the construction operations or reject the drilled piers. If the integrity of a drilled pier is in question, use core drilling, sonic or other NCDOT approved methods at no additional cost to the Department and under the direction of the Engineer. Dewater and backfill core drill holes with an approved high strength grout with a minimum compressive strength of 4500 psi. Propose remedial measures for any defective drilled piers and obtain approval of all proposals from the Engineer before implementation. No additional time or compensation will be provided for losses or damage due to remedial work or any investigation of drilled piers found defective or not in accordance with this project special provision or the plans.

DYNAMIC MESSAGE SIGN

DB 08-04

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 10-272, Article 1098-6 Wood Poles, Delete Article and refer to Subarticles 1082–3(F) and 1082-4(G)

Page 17-10, Subarticle 1715-3(B) Trenching Section (1) General, Revise 1st paragraph, 2nd sentence to:

Install rigid metallic conduit for all underground runs located inside railroad right-of-way.

I. General Requirements

Conform to these Project Special Provisions, Project Plans developed by the Design-Build Team, and the 2006 *Standard Specifications for Roads and Structures*. The current edition of these specifications and publications in effect on the date of advertisement shall apply.

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® V3 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 DMS support structures 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^{o} 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° F to +185° 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° F, and to automatically restart the LED display whenever the suspect temperature falls below +130° 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° F and to turn the cooling system off whenever LED board temperature falls below +85° 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° F and to deactivate the system whenever LED board temperature falls to +85° 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, methacrylate, GE Lexan Type SG300 or equivalent 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 manufactured by Toshiba or Hewlett-Packard. No substitutions will be allowed. Provide T1 ¾, 0.2 inch size LEDs that emit a true amber color at a wavelength of 590 ± 5 nm.

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° F to +14° 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° 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° F to 140° F. Power supply output at 140° F must not deteriorate to less than 65% of its specified output at 70° 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 a Plexiglas 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 (±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^{o} F and 160^{o} F with a differential of not more than 10^{o}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 Hz $\pm$ 3 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^{o} F to $+158^{o}$ 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 ¼" 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 $\pm$ 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^{o} F to 150^{o} 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^{o} F to $+165^{o}$ 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^{o} F to 185^{o} 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 Engineer will establish the actual location of each Dynamic Message Sign assembly. 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

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

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

Permanent Message Number	Description
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

Code	Feature
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

Object	Reference	Project Requirement
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

Object	Reference	Project Requirement
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 as shown on the plans developed by the Design-Build Team.

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. **The DMS assembly must allow for field adjustment**

(horizontal & vertical tilting) of the DMS enclosure to ensure optimum legibility from all travel lanes.

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 Provisions – Section C, Design and Fabrication found elsewhere in this RFP.

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.

Connect the platform sections rigidly where sections join to avoid an uneven walking surface.

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.

3. DMS Access Ladder

Provide a fixed ladder, of the same material as the assembly, leading to the access platform. The ladder shall be equipped with a security cover to prohibit access by unauthorized persons. It shall start from three feet above finished ground and end at the access platform. Design the ladder as a permanent part of the DMS assembly and include complete design details in the DMS assembly shop drawings. The fixed ladder shall meet OSHA requirements as well as state and local codes.

4. Anchor Rod Nut Tightening Requirements

For nut tightening requirements, reference the Anchor Rod Nut Tightening Requirements for Metal Poles (Special Revision 3/3/09) located in the Project Special Provision for Overhead Sign Supports found elsewhere in this RFP.

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 Project Special Provision for Overhead Sign Foundations found elsewhere in this RFP. Design and construct either spread footing type foundations and / or drilled pier type foundations for each DMS unless otherwise directed by the Engineer.

VII. DMS Direct Tension Indicators

Use direct tension indicators on all ASTM A325 high strength bolt connections in DMS structures.

Provide and install direct tension indicators in accordance with Section 440 and Section 1072 of the Standard Specifications.

VIII. 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.

REQUIREMENTS FOR CABLES CROSSING RAILROADS

Railroad Crossings

It shall be the responsibility of the Design-Build Team to make application with CSX Transportation, Inc., herein called the Railroad Company for the encroachment agreements necessary under this Contract. Do not commence cable routings over or under railroad-owned facilities until notification and coordination with Engineer and the appropriate Railroad Company has occurred. All work associated with the crossing is to conform to the Railroad Company's specifications.

The CSX crossing number is 630 6575. The crossing is located at CSX Milepost S 163.43.

CSX application forms, specifications and contact information is available from the CSX website located at

http://www.csx.com/?fuseaction=about.property_lease

Insurance Requirements

Provide any required railroad liability insurance in the amount specified prior to commencing any work. If required by the railroad, pay for railroad personnel to be present when work is performed.

In addition to any other forms of insurance or bonds required under the terms of the Contract and the Standard Specifications, take out and keep in force from the commencement of all construction on railroad right of way until the final inspection and acceptance of the project by the Engineer insurance of the following kinds and amount. It is understood that the amounts specified are minimum amounts and that larger amounts may be carried if so desired. Any insurance taken out due to these requirements shall be subject to the approval of the Engineer, and the Railroad Companies as to form and amount. Furnish satisfactory policies prior to beginning of the work on railroad right of way.

A. Public Liability and Property Damage Liability Insurance

Furnish evidence to the Engineer that with respect to the operations performed on the railroad right of way, regular Contractor's Public Liability and Property Damage Liability Insurance is carried providing for bodily injury, death, and property damage in the amount of $3,000,000 combined single limit per occurrence. If any part of the work is sublet, similar insurance in the same amounts and evidence thereof as required of the Prime Contractor shall be provided by or on behalf of the Subcontractor to cover his operations on the railroad right of way.

Endorse the Prime Contractor's and Subcontractor's Public Liability and Property Damage Liability Insurance policies to provide Contractual Liability Coverage only in respect to obligations assumed for Prime Contractor / Subcontractor's construction machinery left unattended at the project site, such insurance being without an exclusion denying coverage for operations conducted within 50 feet of any railroad hazard. Type the following information on the Contractual Liability Coverage endorsement:

NCDOT Project No. I-4744 Wake County

Construction on the right of way of the CSX Transportation, Inc. in Raleigh, Wake County, North Carolina

Keep such insurance in force until final inspection of the project, or that portion or portions within the railroad right of way, by the Engineer or, in the case of Subcontractors, until a letter is furnished to the Engineer stating that the Subcontractor has completed his subcontracted work within the railroad right-of-way to the Prime Contractor's satisfaction, and that any additional work necessary on the railroad right of way will be accomplished with the Prime Contractor's forces.

B. Protective Public Liability and Property Damage Liability Insurance

If any part of the work is sublet, furnish evidence satisfactory to the Engineer that, with respect to the operations performed for the Prime Contractor by Subcontractors on railroad right of way, that the Prime Contractor also carries, in the Prime Contractor's behalf, regular Contractor's Protective Public Liability and Property Damage Liability Insurance providing for bodily injury, death, and property damage in the amount of $3,000,000 combined single limit per occurrence.

C. Bodily Injury Liability, Property Damage and Physical Damage to Property Liability Insurance

In addition to the above insurance, furnish evidence to the Engineer that, with respect to the operations the Prime Contractor or any of the Prime Contractor's Subcontractors performs, the Prime Contractor has provided for, and on behalf of the Railroad Company as their respective interest may occur, the limits of liability for the Railroad Protective Liability Policy, Coverage A. Protective Bodily Injury Liability, B. Protective Property Damage Liability, C. Physical Damage to Property Liability Insurance, shall provide for a combined single limit of $5,000,000 for all damages arising out of bodily injury, death, property damage liability, and physical damage to property liability per occurrence with an aggregate limit of $10,000,000 for the term of the policy. The Railroad Protective Liability Policy is to be prepared in accordance with the requirement of the U.S. Department of Transportation on Federal Highway Administration Federal Aid Highway Program Manual, Volume 6, Chapter 6, Section 2, Subsection 2, and any subsequent supplement thereto or revisions thereof.

D. Termination of Insurance and Policies to be Submitted

Any insurance policies given hereunder shall cover all work performed by the Prime Contractor in connection with the work in the introductory paragraph within railroad right of way, but shall not be liable for accidents occurring after acceptance of the completed project by the City. Such policies shall contain a clause requiring thirty (30) days written notice be given to the Engineer and to the appropriate Railroad Company, prior to cancellation or change.

Submit to the Engineer the original and one copy of the Railroad Company's Railroad Protective Liability Policy, one certified duplicate copy of all other policies, and certificates of insurance in an original and two copies as required by these Project Special Provisions.

No extra allowance will be made for the insurance required hereunder.

The named insured under the Railroad Protective Liability Policy is the respective Railroad Company, and the designation of the job site description of work is as follows: All construction on the CSX Transportation, Inc. right-of-way on NCDOT Project No. I-4744 in Raleigh, Wake County, North Carolina.

Flagging Protection or Watchman Service

Provide 72 hours advance notice to the Railroad Company in order that flagging service can be arranged and provided. Do not undertake any work within the Railroad Company right of way until the flagman is at the job site.

Delays Caused by Operations of Others

Neither the Department nor the Railroad Company assumes any responsibility for any work performed by others in connection with the construction of the project, and the Design-Build

Team shall have no claim whatsoever against the Department or the Railroad Company for any inconvenience, delay, or additional cost incurred by him on account of such operations by others.

Cooperation with Others

Cooperate with others participating in the construction of the project to the end that all work may be carried on to the best advantage.

Authority of Railroad Engineer

The authorized representative of the Railroad Company, hereinafter referred to as the Railroad Engineer, will have the final authority in all matters affecting the safe maintenance of railroad traffic of his company.

Interference with Railroad Operations

Arrange and conduct work so that there will be no interference with railroad operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad Company or to the poles, wire, and other facilities of tenants on the rights of way of the Railroad Company. Wherever work is liable to affect the operations or safety of trains, first submit the method of doing such work to the Railroad Engineer for approval. However, such approval will not relieve the Design-Build Team from liability.

Should conditions arising from or in connection with the work, require that immediate and unusual provisions be made to protect train operations and property of the Railroad Company, it shall be a part of the required services by the Design-Build Team to make such provisions and if, in the judgment of the Railroad Engineer such provisions is insufficient, the Railroad Engineer or the Department may, at the expense of the Design-Build Team, require or provide such provisions as may be deemed necessary.

Storage of Materials

Do not store materials and equipment where they will interfere with railroad operations, nor on the rights of way of the Railroad Company without first having obtained permission from the Railroad Engineer. Such permission will be with the understanding that the Railroad Company will not be liable or damage to such material and equipment from any cause, and that the Railroad Engineer may move or require the Design-Build Team to move, at the Design-Build Team's expense, such material and equipment.

Completion and Acceptance of Work

Upon completion of the work, remove from within the limits of the railroad right of way all machinery, equipment, surplus materials, or rubbish and leave such rights of way in a neat and orderly condition. After the final inspection has been made and work found to be completed in a satisfactory manner acceptable to the Department and the Railroad Company, the Department will be notified of the Railroad Company's acceptance in writing by the Railroad Company.

REQUIREMENTS FOR WORK UNDER RAILROAD BRIDGES

An agreement to perform work under the railroad bridge is not required provided that (1) the work does not adversely affect railroad operations in any way; (2) the excavation for the roadway does not extend below the bottom of the existing footing/pile cap elevation; and (3) the existing bridge foundation is not exposed by the excavation.

In the event that the above conditions cannot be met, the Design-Build Team shall be fully responsible for obtaining an agreement from the Railroad prior to beginning work in the Railroad right-of-way.

Regardless of the need for an agreement, the Design-Build Team shall adhere to all the requirements contained in the Construction Requirements, Insurance Requirements, and CSXT Special Provisions provided by the Department, which documents are by reference incorporated and made a part of this Contract.

SEALING EXISTING PAVEMENT CRACKS - Polymer Patch

(5-4-07)(5-19-09) SPI 7-5A

Description

The Contractor 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 Contractor will not be required to seal the existing edge 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 Contractors 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 Contractor 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)	350º F to 392º F
Application Thickness	400 mils plus
Curing Time	10 – 40 minutes
Shelf Life	unlimited
Flash Point	446º F

Construction Requirements

The Contractor 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 3000º 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 Contractor 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.

AGGREGATE SUBGRADE WITH GEOGRID

Description

Construct geogrid reinforced aggregate subgrades in accordance with the NCDOT Standard Specifications and this special provision at all locations under new permanent pavement structure and to extend 12 inches outside the toe of the bottom lift of asphalt pavement.

Construction

Use stiff geogrid as the reinforcement with a nonwoven separation fabric to be located at the bottom of the aggregate subgrade. A geogrid/nonwoven fabric composite product meeting the individual geogrid and nonwoven fabric requirements is acceptable in place of separate products.

Undercut in accordance with Section 225 of the *Standard Specifications* as needed to install separation fabric, geogrid and a minimum compacted thickness of 12 inches of Select Material, Class IV meeting the requirements of Section 1016 of the *Standard Specifications*. Install nonwoven separation fabric and geogrid in accordance with Article 270-3 of the *Standard Specifications* directly below the Select Material Class IV. Place the geogrid directly above the separation fabric. Roll direction (machine direction) for both separation fabric and geogrid shall be parallel with the project alignment. Overlap sides of rolls with adjacent panels a minimum of 1 foot. Overlap ends of rolls with next roll a minimum of 5 feet. Remove all slack from separation fabric and geogrid prior to placing Class IV, Select Material.

Place Class IV Select Material in one lift by end dumping or spreading aggregate on the geogrid and nonwoven separation fabric. Do not operate any equipment on the geogrid until it is covered with 12 inches of Select Material, Class IV. Compact Select Material, Class IV to a minimum of 92% of AASHTO T180 as modified by the Department. A copy of this modified test procedure is available upon request from the Materials and Tests Unit.

No more than 3000 linear feet of Aggregate Subgrade with Geogrid may be constructed at any given time prior to placement of initial lift of asphalt concrete base course, unless otherwise approved by the Engineer. Do not leave the earth material at the bottom of the aggregate subgrade exposed for more than 3 days prior to placement of Aggregate Subgrade with Geogrid.

Maintain Select Material, Class IV in an acceptable condition and minimize the use of heavy equipment on Select Material Class IV in order to avoid damaging aggregate subgrades. Provide and maintain drainage ditches and drains as required to prevent entrapment of water in aggregate subgrades.

DCP Testing

The Engineer will conduct DCP testing at the bottom of the aggregate subgrade when the Contractor has notified the Department that the aggregate subgrade location has been prepared for fabric placement. If the DCP tests indicate extremely poor subgrade such that the above aggregate subgrade thickness may be insufficient, the Engineer may provide direction to increase the aggregate compacted thickness.

If a compacted thickness of greater than 12 inches is so directed, place the nonwoven separation fabric at the bottom of the aggregate layer and place the geogrid at the mid-point depth of the aggregate layer. Place sufficient aggregate thickness above the geogrid to reach the subgrade elevation prior to operating any equipment on the aggregate. Compaction requirements apply only to the top lift of aggregate for thicknesses greater than 12 inches.

If the Design-Build Team is required by the Engineer to increase the compacted thickness to more than 12 inches, the Department will compensate the Design-Build Team for the additional thickness at a rate of $50 per cubic yard (in place volume) of additional Select Material, Class IV beyond that needed for the 12 inch compacted thickness, and for which payment will be considered full compensation for the Select Material, Class IV, any additional undercut needed

to achieve the total Aggregate Subgrade with Geogrid thickness per the Engineer's direction, and placement of geogrid at the aggregate mid-point depth.

Submittals

Submit proposed geogrid and nonwoven fabric products for review and approval a minimum of 30 days prior to beginning Aggregate Subgrade with Geogrid construction.

Materials

Geogrid

The geogrid shall be biaxial geogrid composed of polypropylene. The biaxial geogrid shall be a regular network of integrally connected elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil. The geogrid shall have high flexural rigidity and high tensile modulus in relation to the soil being reinforced and shall also have a high continuity of tensile strength through all of its elements. The geogrid shall be dimensionally stable and able to retain its geometry under construction stresses. The material shall have high resistance to ultraviolet degradation and to all forms of chemical and biological degradation encountered in the soil being reinforced.

Geogrids used must meet the following properties:

MINIMUM GEOGRID PROPERTY VALUES

Geogrid Properties	Test Method	Machine Direction MD	Perpendicular to Machine Direction (Cross-Machine Direction)
Mass per Unit Area (oz./yd.^{2})	ASTM D 5261-92	7.5	7.5
Aperture Size –(in.)	Direct Measure	1.0 to 1.5	1.0 to 1.5
Wide Width Strip Tensile Strength at 5% Strain (lb/ft)	ASTM D 6637-01	700	1200
Wide Width Strip Tensile Strength – Ultimate Strength (lb/ft)	ASTM D 6637-01	1200	1950
Ultimate Junction Strength (lbs/ft)	GRI-GG2-05	1000	1000
Flexural Rigidity (mg-cm)	ASTM D 1388-08	750,000	750,000
Aperture Stability (m-N/deg)	U.S. Army C.O.E.*	0.65	0.65

*The Aperture Stability is based on resistance to in-plane rotational movement measured by applying a 20 kg-cm (2 m-N) moment to the central junction of a 9 inch by 9 inch specimen at its perimeter in accordance with the U.S. Army Corps of Engineers Methodology for measurement of Torsional Rigidity.

mg = milligram
cm = centimeter
m = meter
N = Newton

Unless indicated otherwise, values shown are minimum average roll values (MARV) determined in accordance with ASTM D-4759-02. Multiple layers of geogrid used to meet the requirements set forth in the preceding table will not be accepted.

Acceptance Requirements - The actual minimum average roll values furnished by the manufacturer must be based on representative test results from the manufacturing plant which produced the geogrid, and must meet or exceed each of the specified minimum values. Label all geogrids clearly as being part of the same production run certified as meeting all applicable requirements.

Furnish a Type 2 Typical Certified Mill Test Report for the geogrid in accordance with Section 106-3 of the NCDOT Standard Specifications; however, the material shall be subject to inspection, test, or rejection by the Engineer at any time.

Nonwoven Separation Fabric

The nonwoven separation fabric must meet the following properties:

MINIMUM NONWOVEN SEPARATION FABRIC PROPERTY VALUES

Nonwoven Separation Fabric Properties	**Test Method**	**Minimum Requirements are for both Machine and Cross-Machine Directions**
Grab Strength (lb)	ASTM D 4632-08	160
Puncture Strength (lb)	ASTM D 6241-04	310
Trapezoidal Tear (lb)	ASTM D 4533-04	60
Max. Apparent Opening Size (US Sieve #)	ASTM D 4751-04	60
Permittivity (sec-1)	ASTM D 4491-99a	0.05
Ultraviolet Degradation (% Retained Strength at 500 hr)	ASTM D 4355-04	50
Polymer Type		Polyester (PET) or Polypropylene (PP)

Furnish a Type 2 Typical Certified Mill Test Report for the nonwoven separation fabric in accordance with Section 106-3 of the NCDOT Standard Specifications; however, the material shall be subject to inspection, test, or rejection by the Engineer at any time.

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, 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 and acceptance of the design submittals.

OVERVIEW

The proposed improvements consist of widening I-40 from west of Wade Avenue to east of Jones Franklin Road, a distance of approximately 6.2 miles and improving signing on I-40 / I-440 / US 64 from Wade Avenue eastward to Sunnybrook Road. Improvements include the addition of one 12-foot lane and one 12-foot shoulder in each direction within the existing variable width median. The proposed improvements require widening two sets of dual interstate structures.

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

The I-4744 Categorical Exclusion (CE) was approved on January 29, 2009.

Construction Engineering Inspection will be provided by the NCDOT Division personnel.

GENERAL SCOPE

The scope of work for this project includes design, construction and management of the project. The design work includes all aspects to widen I-40 from west of Wade Avenue to east of Jones Franklin Road, a distance of approximately 6.2 miles and improve signing on I-40 / I-440 / US 64 from Wade Avenue eastward to Sunnybrook Road. 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 six-lane facility. Construction engineering and management shall be the responsibility of the Design-Build Team. Construction shall comply with 2006 *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
Foundation Design for Structures and Roadway
Erosion and Sediment Control Design and Implementation
R/W Utilities, Conflicts and / or Construction
Traffic Control and Pavement Marking Design
Sign Design
ITS Design
Construction
Project Management
Design and Construction Management
Construction Surveying
Location and Surveys
Lighting (Construction Only)
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 to widen I-40 from west of Wade Avenue to east of Jones Franklin Road, a distance of approximately 6.2 miles and improve signing on I-40 / I-440 / US 64 from Wade Avenue eastward to Sunnybrook Road as outlined in the Scope of Work section of this RFP. The Design-Build Team shall prepare final designs, construction drawings and special provisions.

With the exception of the I-4902 Signing and Roadway Plans, 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 acceptance, 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.

The Department shall prequalify all firms for the work they are identified to perform. Design firms and Natural Systems firms are prequalified by the particular office performing the work. If the work shall be performed by an office other than the one that is prequalified, that office shall be prequalified prior to any design submittals.

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.

The Design-Build Team or any subcontractor for the Design-Build Team which are employed to provide services for this project shall not discuss employment opportunities or engage the services of any person or persons, now in the employment of the State during the time of this contract, without written consent of the State.

In the event of engagement, 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
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 Friday, June 12, 2009**, 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)
Contract Number C 202238
TIP Number I-4744
Wake County
Widen I-40 from west of Wade Avenue to east of Jones Franklin Road
Improve signing on I-40 / I-440 / US 64 from Wade Avenue eastward to Sunnybrook Road

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
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

Key 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)
Contract Number C 202238
TIP Number I-4744
Wake County
Widen I-40 from west of Wade Avenue to east of Jones Franklin Road
Improve signing on I-40 / I-440 / US 64 from Wade Avenue eastward to Sunnybrook Road

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.

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:

	EVALUATION FACTORS	POINTS
1.	Management	18
2.	Responsiveness to Request for Proposal	15
3.	Long Term Maintenance	5
4.	Schedule and Milestones	25
5.	Innovation	4
6.	Maintenance of Traffic and Safety Plan	29
7.	Oral Interview	4

TECHNICAL PROPOSAL EVALUATION CRITERIA

1. Management – 18 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 Team's designer(s) have developed Signing Plans, Traffic Control Plans and Pavement Marking Plans.
- Identify a Traffic Control Supervisor and detail the Supervisor's qualifications.

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 – 15 points

Natural Environmental Responsibility

- Describe the Design-Build Team's approach to addressing environmental concerns within the project boundaries.
- Describe any Notice of Violations (NOV's) or Immediate Corrective Actions (ICA's) the Design-Build Team members have received and the disposition of any NOV's or ICA's.
- Describe the Design-Build Teams approach to Sedimentation and Erosion Control for the project.

Design Features

- Show plan view of design concepts with key elements noted.
- Identify preliminary horizontal and vertical alignments of all roadway elements.
- Show typical sections for the mainline of the project.
- Identify areas where sliver fills can not be avoided.
- Identify drainage modifications and designs to be implemented.
- Identify anticipated drainage structures requiring repair or replacement.
- Identify the appropriate design criteria for each feature if not provided.
- Identify all bridge types to be constructed, including any special design features or construction techniques needed.
- Identify any deviations, including proposed design exceptions, from the established design criteria and / or preliminary plans provided by the Department that will be utilized. Explain why the deviation is necessary.
- Identify types of any retaining walls and / or sound barrier walls if applicable.
- Indicate the Team's intention to provide pedestal overhead sign assemblies for advance guide signs.
- Indicate the type of positive median cross-over protection proposed and replacement / resetting requirements.
- Indicate if a project web site will be provided.

3. Long Term Maintenance – 5 points

- Describe any special materials, not referenced elsewhere in the contract, 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 – 25 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. **This date shall be clearly indicated on the Project Schedule and labeled "Final Completion Date"**.

5. Innovation – 4 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 – 29 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.
- Describe how the bridge design and / or construction methods impact traffic control.
- Address how hauling will be conducted.
- 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.
- Include all proposed offsite detours; reason for need and duration.
- Address the continuous weekend lane closure, providing a traffic control concept that details how traffic will be maintained.
- Indicate the Team's intent to use the Department-Furnished Movable Concrete Barrier and Transfer Transport Vehicles, including but not limited to the amount and duration of use.

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 – 4 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	18
Responsiveness to Request for Proposal	15
Long Term Maintenance	5
Schedule and Milestones	25
Innovation	4
Maintenance of Traffic and Safety Plan	29
Oral Interview	4
Maximum Score	**100**

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 **20**%.

Quality Credit Percentage for Technical Proposals

Technical Score	Quality Credit (%)	Technical Score	Quality Credit (%)
100	20.00	84	9.33
99	19.33	83	8.67
98	18.67	82	8.00
97	18.00	81	7.33
96	17.33	80	6.67
95	16.67	79	6.00
94	16.00	78	5.33
93	15.33	77	4.67
92	14.67	76	4.00
91	14.00	75	3.33
90	13.33	74	2.67
89	12.67	73	2.00
88	12.00	72	1.33
87	11.33	71	0.67
86	10.67	70	0.00
85	10.00		

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

Proposal	Technical Score	Quality Credit (%)	Price Proposal ($)	Quality Value ($)	Adjusted Price ($)
A	95	16.67	3,000,000	500,100	2,499,900
B	90	13.33	2,900,000	386,570	2,513,430
C *	90	13.33	2,800,000	373,240	2,426,760
D	80	6.67	2,700,000	180,090	2,519,910
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.

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 **$20,000** 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 will be notified of the opportunity to apply for the stipulated fee. 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 Proposal 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 Team 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 (4-29-09)

NOTE: In accordance with Project Special Provisions found elsewhere in this RFP, the Design-Build Team shall provide and construct all elements defined in the I-4902 Roadway Plans signed and sealed on April 1, 2009 (Internal Plan Sheets signed and sealed March 29, 2007, July 25, 2008 and April 1, 2009), including but not limited to guardrail installation / removal. All references to quantities in the aforementioned I-4902 Roadway Plans are for informational purposes only. The Design-Build Team shall be solely responsible for verifying the quantities required for the I-4902 Roadway Plans signed and sealed as noted above. The requirements defined in this Roadway Scope of Work do not apply to the aforementioned I-4902 Roadway Plans.

Project Details

- The Design-Build Team shall widen I-40 to a minimum six-lane divided facility from west of Wade Avenue to east of Jones Franklin Road. The existing divided facility shall be widened by providing one lane in the median in both directions with a minimum 14-foot median shoulder, 12 feet of which shall be full depth paved shoulder. The median full-depth paved shoulders shall be designed and constructed as future lanes with appropriate cross slope. Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct the -L- Line providing access, widening and improvements as indicated on the I-4744 Preliminary Plans. The limits of -L- Line construction shall be of sufficient length to tie to existing based upon the current NCDOT guidelines and standards.

- The proposed widened facility shall be designed and constructed to meet a 70-mph design speed for a rolling urban freeway. The Design-Build Team shall submit all other design criteria to the Department for review and acceptance. Resurfacing grades, and the associated geometric vertical alignments, will not be required. The Design-Build Team shall resurface the existing lanes and shoulders, providing a uniform overlay, as defined in the Pavement Management Scope of Work found elsewhere in this RFP. If necessary, the Design-Build Team shall extend the I-40 resurfacing limits beyond that shown on the Preliminary Plans provided by the Department to the limits of pavement marking obliterations / revisions.

- Between Harrison Avenue and Wade Avenue, the Design-Build Team shall provide eastbound travel and auxiliary lanes as shown on the 2007 Build Auxiliary Lane Concept – I-40 eastbound from Harrison Avenue to Wade Avenue - Figure 4, dated January 2009, provided by the Department.

- Within the I-40 westbound exit loop onto Cary Towne Boulevard, the Design-Build Team shall provide 30-mph Decision Sight Distance, including but not limited to, clearing and grubbing within the loop.

- At the I-40 widening eastern terminus, the three eastbound through lanes shall be continuous through the US 1 / US 64 interchange, as well as beyond the US 1 / US 64

interchange. The US 1 / US 64 on-ramp shall merge into the I-40 eastbound travel lanes, beyond the required acceleration length. (Reference the 2007 Build Auxiliary Lane Concept – I-40 eastbound at US 1 / US 64 / I-440 – Figure 5, dated January 2009, provided by the Department)

- Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall incorporate into the design and construction, comments made during the I-4744 Final Design Inspection. (Reference the Final Design Inspection Action Items)

- The Design-Build Team shall design and construct outside ten-foot paved shoulders and shoulder berm gutter along the US 1 / US 64 southbound to I-40 westbound ramp at the following locations:
  - West of the I-40 westbound to US 1 / US 64 southbound loop, from the existing shoulder berm gutter westward to the end of the existing guardrail.
  - From the US 1 / US 64 southbound exit ramp gore (12-foot width) westward to the beginning of the existing shoulder berm gutter.

- The Design-Build Team shall coordinate with the I-5112 design and construction to ensure accurate hydrologic, horizontal and vertical ties that adhere to the design criteria. The Design-Build Team shall not make any design or construction changes that affect the design or construction of Project I-5112 without prior written approval from the Transportation Program Management Director. (Reference the Cooperation Between Contractors Project Special Provision found elsewhere in this RFP)

- Milled rumble strips shall be provided on all outside and inside paved shoulders along I-40 travel lanes, including acceleration, deceleration and auxiliary lanes / ramps to the back of the gore (12-foot width).

- NOTE: Deleted bullet on sliver fills.

- With the exception of resurfacing, ramp construction is not anticipated. Should The Design-Build Team's design and / or construction method impact existing ramps or loops, the Design-Build Team shall restore the ramp and / or loop horizontal and vertical alignments to pre-construction conditions or better.

- It is anticipated that all construction will be performed within the existing right of way. The Design-Build Team shall provide all services and costs required for acquiring all additional right of way and / or easements, including but not limited to direct payments to property owners for negotiated settlements, recording fees, relocation benefits, and deposits and fees involved in the filing of condemnation, resulting from design revisions and / or construction methods. If required, parcel names and deed research and descriptions shall be the responsibility of the Design-Build Team to acquire and process. If impacted by design and / or construction, the Design-Build Team shall be responsible for the installation / replacement of all right of way monuments and woven wire fence

according to the NCDOT Standard Drawings and 2006 *Standard Specifications for Roads and Structures*.

- Unless noted otherwise elsewhere in this RFP, all guardrail and cable guiderail placement shall be in accordance with the July 2006 NCDOT *Standard Drawings* and / or approved details in lieu of standards. The Design-Build Team shall remove and replace all existing guardrail along the I-40 outside shoulders. The Design-Build Team shall repair and / or replace all slope and drainage features required for the installation and proper function of the new guardrail along the I-40 outside shoulders. The guardrail / guiderail design shall be submitted for review with the Preliminary Plans submittal. (Reference the W-5130 Final Plans provided by the Department for guardrail and cable guiderail recently constructed within the project limits, but not shown on the I-4744 Preliminary Plans. Reference the Hydraulics Scope of Work found elsewhere in this RFP.)

- Within 60 days from Date of Availability, positive median cross-over protection shall be installed within the I-40 widening project limits. (Reference the Intermediate Contract Time Number 1 Project Special Provision and Traffic Control and Pavement Management Scope of Work found elsewhere in this RFP)

- The Design-Build Team shall widen the existing I-40 dual structures over Wade Avenue and US 1 / US 64 to accommodate a future eight-lane divided facility. The Design-Build Team shall provide a minimum 16-foot vertical clearance for all bridges over I-40. A minimum 17-foot vertical clearance shall be provided for the structures on I-40 over Wade Avenue and US 1 / US 64.

- The Design-Build Team shall design and construct minimum 12-foot median bridge rail offsets. If impacted by design and / or construction, the Design-Build Team shall design and construct minimum 12-foot outside bridge rail offsets for the I-40 dual structures over Wade Avenue and / or US 1 / US 64. (Reference the Structures Scope of Work found elsewhere in this RFP)

- The Department has followed a modified Merger 01 Process used by the environmental agencies and the Department to obtain environmental permits for this highway project. Based on the Department's design, the NCDOT has obtained the required permits. However, 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 shall not allow any contract time extensions or additional compensation associated with any coordination or approval process resulting from design and / or construction modifications.

- The Design-Build Team shall be responsible for all sound barrier wall design and construction listed in the January 2009 Final Noise Technical Report and March 11, 2009

Noise Technical Report Addendum, including any geotechnical investigations necessary to design the foundations. The Design-Build Team shall be responsible for the wall envelope details. As shown in Section 2-8 of the NCDOT Design Manual, Figure F-1, the Design-Build Team shall provide 40-foot overlaps between walls spaced 10 feet apart at all cut and fill transitions. The area accessing these breaks, as well as through the breaks shall be constructed at 4:1 or flatter slopes. The sound barrier walls shall be offset from the edge of travel lane a minimum of 15.5' and not exceed a 25-foot maximum height. The Design-Build Team shall provide appropriate positive protection for the sound barrier walls. If the Design-Build Team revises the horizontal and / or vertical alignments such that greater noise impacts are possible on surrounding receptors, the Design-Build Team shall re-analyze and complete a revised noise report, if necessary, for NCDOT and FHWA review and acceptance. A revised noise report will not be required if the Design-Build Team adjusts the sound barrier wall laterally within the required station range, provided that the top of wall elevation and height noted in the January 2009 Final Noise Technical Report and March 11, 2009 Noise Technical Report Addendum are not reduced; and the length is not reduced by more than 20 feet, measured parallel to the mainline alignment. The January 2009 Final Noise Technical Report and March 11, 2009 Noise Technical Report Addendum 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.

- The maximum allowable cut slope shall be 3:1 and fill slope shall be 2:1, unless noted otherwise 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. Excluding the I-40 westbound exit loop onto Cary Towne Boulevard, the maximum allowable slope inside the interchange quadrants shall be 4:1 for areas impacted by design and / or construction.

- 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 written approval prior to incorporation. The Design-Build Team shall note in the Technical Proposal any proposed deviations to the preliminary design shown on the I-4744 Preliminary Plans 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.

- Design exceptions shall not be allowed for the proposed six lane divided facility. Design exceptions will not be required for existing substandard ramps and / or loops, unless the Design-Build Team revises the horizontal and / or vertical alignment of the ramps or loops, exclusive of the required resurfacing.

- 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.

- 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.

- Within the vehicle recovery area, the Design-Build Team shall design and construct single face 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.

General

- The design shall be in accordance with the 2004 AASHTO *A Policy on Geometric Design of Highways and Streets*, July 2006 NCDOT *Roadway Standard Drawings,* 2002 NCDOT *Roadway Design Manual, Roadway Design Policy and Procedure Manual, Roadway Design Guidelines for Design-Build Projects,* 2006 *North Carolina Standard Specifications for Roads and Structures* and the AASHTO *Roadside Design Guide, 3rd Edition and 2006 Chapter 6 Update.*

- If the NCDOT *Roadway Design Manual*, the 2004 AASHTO *A Policy on Geometric Design of Highways and Streets*, the 2006 *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 otherwise noted 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.

- The project shall follow the NCDOT-FHWA Oversight Agreement. This agreement shall be provided. Any changes that affect previous approvals shall be re-submitted by the Design-Build 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 Project Services Unit may have special details available that can be provided to the Design-Build Team upon request. The Design-Build Team shall refer to the list of details to be used in lieu of standards located at **www.ncdot.org/business/**

NCDOT Information Supplied

- The NCDOT will provide copies of the Categorical Exclusion (CE) and the latest list of environmental commitments, municipal agreements 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 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 SUE work shall be the responsibility of the Design-Build Team.

- The NCDOT will provide the I-5112 and W-5130 Final Plans.

- The NCDOT will provide the I-4744 Preliminary Plans. The Design-Build Team is cautioned that the preliminary design shown on the plans provided by the Department is 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 I-4744. The Design-Build Team shall be responsible for all temporary pavement designs. (Reference the Pavement Management Scope of Work).

- The NCDOT will provide a Geotechnical Subsurface Investigation for I-4744. 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)

PAVEMENT MANAGEMENT SCOPE OF WORK (4/29/09)

NOTE: Unless noted otherwise elsewhere in this RFP, the Pavement Management Scope of Work pertains only to the I-40 widening project limits.

The pavement design for the mainline widening and median mainline paved shoulder shall consist of the following:

3.0” S9.5D
3.0” I19.0D
16.5” B25.0C
12” Shallow Undercut with Stone and Geogrid

The Design-Build Team shall design and construct paved shoulders along the US 1 / US 64 southbound to I-40 westbound ramp that consist of 3.0” S9.5B and 9.5” B25.0C. (Reference Roadway Scope of Work)

Unless noted otherwise elsewhere in this RFP, the Design-Build shall be responsible for the following west of the Wade Avenue bridges:

- From the end of the five-lane section at approximately Station 56+00 –LREVEX- to the bridge over Wade Avenue, the Design-Build Team shall completely resurface all existing I-40 westbound travel lanes, including all acceleration, deceleration and auxiliary lanes / ramps to the back of the gore (12-foot width), with a uniform 1.5-inch S9.5D surface course overlay.
- From the back of the Harrison Avenue eastbound entrance ramp gore (12-foot width) to the bridge over Wade Avenue, the Design-Build Team shall uniformly mill 2.5 inches of pavement on all existing I-40 eastbound travel lanes, including all acceleration, deceleration and auxiliary lanes / ramps / loops to the back of the gore (12-foot width). The Design-Build Team shall fill the milled areas with 2.5 inches of I19.0D and completely resurface the milled areas with a uniform 1.5-inch S9.5D surface course overlay.
- The Design-Build Team shall completely resurface all existing paved shoulders, including those for all I-40 acceleration, deceleration and auxiliary lanes / ramps / loops to the back of the gore (12-foot width), with a uniform 1.5-inch S9.5C or S9.5D surface course overlay.

Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall be responsible for the following east of the Wade Avenue bridges:

- The Design-Build Team shall completely and uniformly resurface all existing and proposed I-40 travel lanes, including all acceleration, deceleration and auxiliary lanes / ramps / loops to the back of the gore (12-foot width), with an Ultra-thin Bonded Wearing Course.

- The Design-Build Team shall completely and uniformly resurface all I-40 paved shoulders, including all acceleration, deceleration and auxiliary lanes / ramps / loops to the back of gore (12-foot width), from the edge of travel lane to the beginning of the rumble strip with an Ultra-thin Bonded Wearing Course.
- On all concrete ramps and loops, with the exception of the Wade Avenue and US 1 / US 64 interchange ramps and loops, the Design-Build Team shall extend the Ultra-thin Bonded Wearing Course from the back of gore (12-foot width) to the –Y- Line radius points or the subsequent –Y- Line back of gore (12-foot width), excluding the US 1 / US 64 collector – distributor gore. The Ultra-thin Bonded Wearing Course shall completely and uniformly resurface all ramp and loop travel lanes and all paved shoulders from the edge of travel lane to the beginning of the rumble strip or 12 inches from the edge of travel lane in the absence of rumble strips.
- On all asphalt ramps and loops, with the exception of the Wade Avenue and US 1 / US 64 interchange ramps and loops, the Design-Build Team shall uniformly mill 1.5 inches of all travel lanes and paved shoulders from the back of gore (12-foot width) to the –Y- Line radius points or the subsequent –Y- line back of gore (12-foot width) excluding the US 1 / US 64 collector – distributor gore. The Design-Build Team shall fill the milled areas with 1.5 inches of S9.5C surface course.
- At the US 1 / US 64 interchange, the Design-Build Team shall completely and uniformly resurface all ramp, loop and I-40 collector-distributor lanes and shoulders with an Ultra-thin bonded Wearing Course. Along all ramps and loops, the Ultra-thin Bonded Wearing Course shall extend to the US 1 / US 64 back of gore (12-foot width).

Ultra-thin Bonded Wearing Course shall be Type B. Milling will not be required for flush longitudinal Ultra-thin Bonded Wearing Course tie-ins at gutters.

The eastbound median lane that starts at approximately Station 50+00 –L- and extends westward was built under Project I-3800. This median lane is currently signed and marked to prohibit truck traffic. The Design-Build Team shall completely remove the median lane pavement (12-foot width) and shoulder through the entire existing lane shift located from approximately Station 34+00 –L- to Station 50+00 –L-, and construct the mainline pavement design noted above. (Reference No Truck Median Lane Sketch provided by the Department for approximate pavement removal limits.)

Before placing Ultra-thin Bonded Wearing Course on concrete pavement, seal all cracks greater than ¼-inch wide or cracks that have associated spalling, and on all spalls at joints greater than two inches wide and repair pot holes in accordance with Sealing Existing Pavement Cracks – Polymer Patch Project Special Provision located elsewhere in this RFP.

Along the NC 54 to I-40 eastbound loop, the Design-Build Team shall repair the gap between the existing concrete slabs and curb and gutter in accordance with the Sealing

Existing Pavement Cracks - Polymer Patch Project Special Provision found elsewhere in this RRP.

Within all impact attenuator limits, the Design-Build Team shall pave the entire median width with 4" of B25.0C, a split seal and at least one lift of surface course. NOTE: Deleted Reference to Guardrail Placement at Median Sign Support Detail

The Design-Build Team shall completely remove and dispose of the I-40 median paved shoulders.

At approximately Station 76+00 –L- westbound, the Department has made asphalt repairs to five adjacent concrete slabs. At this location only, the Design-Build Team shall completely remove, dispose of and replace, in their entirety, these slabs and the associated asphalt repair work in accordance with the Repair of Jointed Concrete Pavement Slabs Project Special Provision found elsewhere in this RFP.

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. Prior to placing traffic on existing shoulders, the Design-Build Team shall remove the existing rumble strips. Upon removal of temporary traffic on existing shoulders, the Design-Build Team shall be responsible for repairing the damaged shoulders and restoring the rumble strips. The Design-Build Team shall repair all damaged shoulders by milling 4" of pavement, compacting the existing ABC, and constructing 2.5" I19.0B and 1.5" S9.5B. The Design-Build Team shall not be responsible for the repair of existing damaged shoulders unless they are exposed to temporary traffic during construction. Using the 2007 / 2035 Build AADT, temporary pavements shall be designed in accordance with the most recent version of the North Carolina DOT Pavement Design Procedure. Temporary pavement designs shall be submitted for review and acceptance using the contract submittal process prior to incorporation. The expected duration for traffic on temporary pavement must be included as part of the submittal.

In areas where the existing paved shoulder is proposed to be incorporated into a permanent travel lane, including but not limited to use of the existing eastbound shoulder between Harrison Avenue and Wade Avenue, 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 removing, and disposing of, 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. As a minimum, all paved shoulders incorporated into a permanent travel lane shall be resurfaced and / or milled

and filled in accordance with the adjacent travel lane requirements noted elsewhere in this RFP.

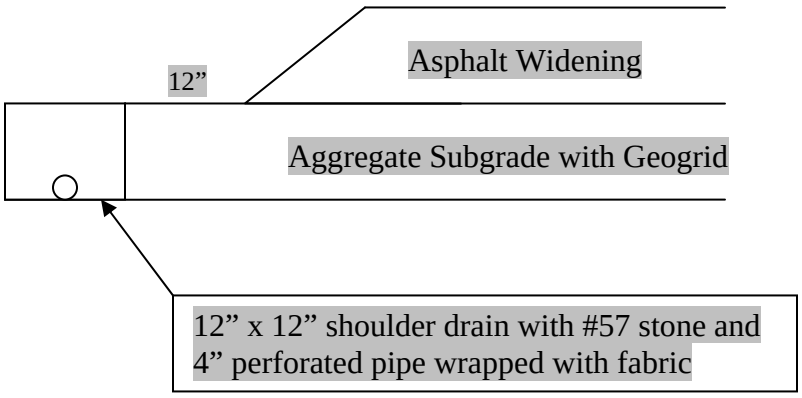
The Design-Build Team shall construct all longitudinal joints on a lane line.

The asphalt rate of application and the maximum and minimum thickness per application and layer shall be in accordance with the NCDOT Roadway Design Manual.

The Design-Build Team shall pave from the edge of all paved shoulders to the face of sound barrier walls located on the outside shoulder in fill sections and all guardrail with 4" B25.0C, a split seal and at least one lift of surface course. As an alternative to the aforementioned pavement design for paving the shoulders to the face of the sound barrier walls and guardrail, the Design-Build Team may use the mainline pavement design.

The Design-Build Team shall be responsible for the design and construction of shoulder drains and outlets for the mainline median widening in accordance with NCDOT Standard Drawing 816.02 of the 2006 Roadway Standard Drawings. The Design-Build Team shall locate the shoulder drains as shown in Figure 1 below. Shoulder drains shall be provided on the low side of cross slope and / or superelevation throughout all vertical curves, and / or where the grade is less than 1%. Where installed on the median shoulder, outlets shall be provided at every drainage structure. The Design-Build Team shall be responsible for replacing existing outside shoulder drains and outlets impacted by design and / or construction. Where installed on the outside shoulder, outlets shall be provided approximately every 300 feet. The shoulder drain design and outlet locations shall be submitted to the Transportation Program Management Director for review and acceptance.

Figure 1. Shoulder drain location in typical section.



NOTE: Relocated underdrain requirements to the Geotechnical Scope of Work found elsewhere in this RFP.

STRUCTURES SCOPE OF WORK (4-29-09)

Project details

The Design-Build Team shall be responsible for all structures necessary to complete the project. The Design-Build Team shall rehabilitate, as noted herein, and widen the structures noted below to accommodate an eight-lane divided interstate facility with a 12 foot median rail offset:

- Bridge No. 553 (I-40 EBL over Wade Avenue)
- Bridge No. 554 (I-40 WBL over Wade Avenue)
- Bridge No. 584 (I-40 EBL over US 1 / US 64)
- Bridge No. 585 (I-40 WBL over US 1 / US 64)

Closure pours with cross-joint reinforcement/dowels are required. Intermediate diaphragms are not required in the closure bay. Bent diaphragms are required in the closure bay and the plans shall reflect that these diaphragms be connected and bolts tensioned prior to the deck pour. Diaphragms for all other bays shall be included as per the Structure Design Manual and memos.

Plate girders may be used and may be constant depth, provided end bent continuity is achieved.

The Design-Build Team shall construct new full width reinforced bridge approach fills and approach slabs at each end of Bridge Nos. 553 and 554. The Design-Build Team shall use flowable fill to fill any remaining voids outside the limits of the reinforced bridge approach fills.

The Design-Build Team shall widen the approach slabs on Bridge Nos. 584 and 585 to accommodate an eight-lane divided interstate facility. (Reference the Roadway Scope of Work found elsewhere in this RFP) The Design-Build Team shall provide drainage details that are similar to those contained in Standard BAS13 under the widened approach slabs.

For Bridge Nos. 553, 554, 584 and 585, deck drain requirements shall be determined and provided by the Design-Build Team.

The Design-Build Team shall replace all joints on Bridge Nos. 553, 554, 584 and 585 with unarmored, sawed evazote joints and elastomeric concrete.

Using System 4 of Article 442-7 of the July 2006 *Standard Specifications for Roads and Structures*, the Design-Build Team shall paint the free ends of proposed and existing girders.

The Design-Build Team shall mill the existing decks for Bridge Nos. 553, 554, 584 and 585, and the existing approach slabs for Bridge Nos. 584 and 585. The Design-Build Team shall overlay the existing and widened decks and approach slabs of these bridges with latex modified concrete. The existing decks for all four bridges shall require Class I surface treatment. To allow the Department to complete a drag chain investigation immediately following the milling operation, the Design-Build Team shall provide written notification a minimum of 21 days prior to completing the milling. The Design-Build Team shall provide Class II surface treatment for areas which are found to be unsound or delaminated as determined by the drag chain investigation. In

such case, the Class II repairs will be paid for in accordance with Article 104-8(A) of the Standard Specifications at the price of $45 per square foot.

The Design-Build Team shall repair and extend the existing slope protection completely across the median area, forming continuous slope protection at all bridge ends. The slope protection shall extend up the slope to the end of end bent wings in the median.

All bridge barrier rails shall be jersey shaped barriers per Standard Drawing CBR1.

The empirical method for deck design shall not be allowed.

A live load rating chart for both existing and proposed girders shall be required on the bridge plans. Regardless of the rating of existing girders, these girders do not need to be replaced. Ratings shall be performed in accordance with the AASHTO Manual for Bridge Evaluation, 1st Edition.

The Design-Build Team shall design and construct pile panel type sound barrier walls with concrete piles. Culverts shall not carry sound barrier wall loads.

General

The 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 AASHTO LRFD Bridge Design Specifications, 4th Edition with 2008 Interims, NCDOT Structure Design Manual (including policy memos), and NCDOT Bridge Policy Manual unless noted otherwise elsewhere in this RFP.

Construction and Materials shall be in accordance with 2006 NCDOT *Standard Specifications for Roads and Structures*, NCDOT Structure Design Unit Project Special Provisions, and NCDOT Structure Design Unit Standard Drawings unless otherwise noted.

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.

All bridges shall adhere to accepted roadway typical sections and grades. Bridge geometry (width, length, skew, span arrangement, etc.) shall be in accordance with the Structure Recommendations prepared by the Design-Build Team and accepted by the Department.

Monotube or cantilever DMS (if required on project) support structures shall not be allowed.

Attachment of signs to bridges shall not be allowed.

Any required bridge attachments (e.g. ITS conduit, water lines) shall not be allowed in the overhang of grade separations. Casting of conduit in the bridge deck or outside railing shall not be allowed.

GEOTECHNICAL ENGINEERING SCOPE OF WORK (4-29-09)

I. GENERAL

Obtain the services of a firm prequalified for geotechnical work by the Highway Design Branch List. 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 foundations, overhead sign structures 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 Specifications*. Prior to the first geotechnical design submittal, the Design-Build Team shall provide a letter to the NCDOT Design-Build Office that documents the Engineer of Record's LRFD experience for review and acceptance. If the Engineer of Record cannot demonstrate the aforementioned LRFD experience, then the design shall undergo a peer review by an individual with such experience. In such case, the reviewer shall be a registered Professional Engineer, but not necessarily in the State of North Carolina. 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, shall be 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 NCDOT Geotechnical Engineering Unit for review and acceptance. The Design-Build Team shall provide the final Subsurface Investigation Report in electronic and hardcopy format to the NCDOT Geotechnical Engineering Unit.

All borings shall be located within 50 feet of the center of each driven pile foundation element and 30 feet of each foundation element for all other foundation types, including drilled piers. All borings shall extend to a depth below the foundation element that is twice the diameter of the foundation element to show a complete subsurface profile. If the subsurface information for bridges provided by the Department does not meet the above requirements, the Design-Build Team shall conduct all the necessary work to satisfy the above requirements.

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 to twice the maximum height of the wall. Boring depths for sound barrier walls shall be equal to the maximum height of the wall or to SPT refusal.

II. DESCRIPTION OF WORK

The Design-Build Team shall design foundations, embankments, slopes, retaining walls, sound barrier foundations and temporary structures 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 *Structure Design Manual*, NCDOT *Roadway Design Manual* and the NCDOT Geotechnical Engineering Unit *Roadway and Structure Foundation Guidelines*, unless noted otherwise in this RFP. The NCDOT *LRFD Driven Pile Foundation Design Policy* is located on the NCDOT Geotechnical Engineering Unit's website at:

www.ncdot.org/doh/preconstruct/highway/geotech/LRFD_Driven_Pile_Foundation_Design_Policy.pdf

A. Structure Foundations

The foundation type for the interior bents of all bridges shall be drilled piers. Footing on piles will be considered by the Department as an alternative foundation type at the interior bents if the Design-Build Team can demonstrate that their construction methods and sequence will minimize disruptions to the travelling public and will not be detrimental to the integrity of the existing pavement.

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. 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 LPile or FB-Pier computer program. Default soil lateral strength parameters in LPile and FB-Pier shall be utilized unless the use of alternative strength parameters is supported by laboratory or field test data that is accepted by the Department. 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 for overturning analysis shall be required for shaft embedment depths.

B. Roadway Foundations

Design all unreinforced fill slopes for a slope of 2:1 (H:V) or flatter except bridge end bent slopes (see Section A – Structure Foundations).

All soil cut slopes shall be 3:1 (H:V) or flatter, unless the slopes are designed with adequate reinforcement to provide the required stability. Submit detailed design calculations and slope stability analysis for any reinforced cut slopes steeper than 3:1 (H:V) and fill slopes steeper than 2:1 (H:V) to the NCDOT Geotechnical Engineering Unit, via the Design-Build Office, for review and acceptance prior to construction.

Design and construct bridge approach embankments such that no more than 2 inches of settlement shall occur after the waiting periods end. 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. 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 Design-Build Office, 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.

C. Permanent Retaining Wall Structures

Extensible reinforcement shall not be allowed for any permanent critical retaining walls. Modular block walls shall not be allowed for critical wall structures. Critical wall structures shall include walls supporting or adjacent to interstate highways, bridge abutments, wing walls and walls over 25 feet in height.

Design and construct permanent retaining walls in accordance with the applicable NCDOT Geotechnical Engineering Unit *Standard Provisions* and Notes which 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 2006 *Standard Specifications for Roads and Structures*. 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 2006 *Standard Specifications for Roads and Structures.*

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 shall not be allowed. 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 cannot 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 minimum 54-inch high 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.

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 strapped to the back of the end bent cap, (3) a multiple row of plumb piles or (4) drilled piers. If fill is required around piles or drilled piers, install foundations before placing any fill. Wing walls shall be independent of abutment retaining walls unless accepted otherwise by the NCDOT. When analyzing end bent stability, lateral support from any fill placed around deep foundations behind abutment retaining walls shall not be considered. All pile foundations for end bents with abutment retaining walls

shall penetrate a minimum of 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 demonstrates 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.

The existing tieback retaining wall at approximate Sta. 85+00 -L- was designed with a traffic surcharge load of 240 psf.

D. Temporary Structures

Design temporary retaining structures, which include earth retaining structures and cofferdams, in accordance with the current AASHTO *Guide Design Specifications for Bridge Temporary Works* and the NCDOT Geotechnical Engineering Unit *Temporary Shoring* Special Provision. The only submittal required to use the standard sheeting design will be 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 the barrier shall be anchored in accordance with NCDOT 2006 *Roadway Standard Drawing* Detail No. 1170.01.

III. CONSTRUCTION REQUIREMENTS

All construction and materials shall be in accordance with the latest AASHTO *LRFD Bridge Construction Specifications*, NCDOT *Driven Pile Foundation Design Policy*, NCDOT 2006 *Standard Specifications for Roads and Structures* and current NCDOT *Project Special Provisions* unless noted otherwise elsewhere in this RFP. The Design-Build Team shall be responsible for investigating, proposing and incorporating remedial measures for all construction problems related to foundations, retaining walls, subgrades, settlement, slopes and construction vibrations. Submit the proposed remedial measures to the Geotechnical Engineering Unit for review and acceptance prior to incorporation.

The prequalified geotechnical firm that prepared the foundation designs shall review the embankment settlement monitoring data a minimum of once a month and issue a letter prior to releasing the embankment from the waiting period. Waiting periods shall not end until less than 0.10 inches of settlement is measured over a period of four weeks. Submit the settlement monitoring data to the NCDOT 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 sequences, the Design-Build Team shall submit to the NCDOT Geotechnical Engineering Unit for review and acceptance prior to beginning construction.

Perform hammer approvals with GRLWEAP Version 2002 or later and in accordance with the NCDOT 2006 *Standard Specifications for Roads and Structures*. The required pile bearing capacity shall be verified with a pile driving system capable of providing a driving resistance of between 30 and 180 blows per feet. 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 feet.

The minimum required driving resistance shall be equal to the factored resistance noted on the plans developed by the Design-Build Team divided by a resistance factor plus any additional resistance for downdrag and scour, if applicable.

Perform Pile Driving Analyzer (PDA) testing to develop pile driving inspection charts or tables. Provide PDA testing, and pile driving inspection charts or tables by a NCDOT pre-approved company. Analyze data with the Case Pile Wave Analysis Program (CAPWAP), version 2006 or later. At a minimum, CAPWAP analysis shall be required for a hammer blow near the end of initial drive. 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 919-250-4088. PDA testing may be performed by a technician, but PDA testing shall 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 each permanent bridge that includes driven pile foundation, 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. Provide additional PDA testing for any revisions to pile type, size or hammer previously approved. The locations of specific piles to be tested shall 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.

Do not dewater any drilled pier excavation. Clean the bottom of excavations with a submersible pump or an airlift. Wet placement of concrete shall be required for all drilled piers. Use current NCDOT inspection forms for drilled piers available on the NCDOT Geotechnical Engineering Unit's webpage. The Department will use the Shaft Inspection Device (SID) in accordance with the current NCDOT *Drilled Piers* Special Provision to inspect all drilled pier excavations. The Design-Build Team shall provide all necessary assistance to the Department personnel in the execution of the SID inspections.

Install Crosshole Sonic Logging (CSL) tubes in all drilled piers. CSL testing shall be required for up to 25% of the drilled piers for each bridge in accordance with the NCDOT Drilled Pier Special Provision. If a CSL test identifies a drilled pier with a Concrete Condition Rating Criteria (CCRC) other than Good (G), then CSL testing of more than 25% of the drilled piers may be required at the discretion of the Department. The Department will determine which piers will be CSL tested. Submit CSL test information and results to NCDOT Geotechnical Engineering Unit to determine if the results are acceptable.

Perform a Standard Penetration Test (SPT) in each drilled pier excavation in accordance with the current NCDOT *Drilled Piers* Special Provision unless the drilled pier tip is in rock as defined in the special provision. The SPT results shall be used to verify the design tip bearing capacity of the drilled piers.

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, a boring shall not be drilled 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 proposed 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 and acceptance.

The Design-Build Team shall construct the roadway subgrade in accordance with the *Aggregate Subgrade with Geogrid* Project Special Provision found elsewhere in this RFP.

The Design-Build Team is responsible for ensuring a dry, stable subgrade on which to place the geogrid, aggregate subgrade and asphalt. To this aim, the Design-Build Team shall design and construct at least one median drain along the entire length of the widening limits for the purpose of preventing groundwater or surface water infiltration into the subgrade excavation. At least two weeks prior to installation of underdrains, the Design-Build Team shall submit to the Design-Build Office, for review and acceptance, their proposed number of drains, locations within the typical section, construction details, and the required waiting period between drain installation and adjacent widening excavation.

IV. ROADWAY AND STRUCTURE FOUNDATION GUIDELINES

The Design-Build Team shall be responsible for, but not limited to, addressing, and incorporating, if necessary, the following items for the roadway and structure foundation design of the project. Include all design calculations and supporting documentation in the geotechnical design submittals for the NCDOT Geotechnical Engineering Unit's review and acceptance.

1. Analyze the stability of embankments and utilize recognized geotechnical engineering designs and construction methods accepted by the NCDOT to ensure embankment stability.
2. Analyze embankment settlement and if necessary, recommend and incorporate mitigation through the use of undercut or soil improvement methods such as surcharges, waiting periods, wick drains, column supported embankments, etc.
3. Address, and incorporate if needed, the following regarding embankment problems:

    a. The feasibility of using geo-textiles to achieve stability, reduce excavation of soft soils and reduce the effect of settlement on the roadway.
    b. The need for settlement gauges, slope inclinometers and other embankment monitoring devices and their placement and location.

4. Determine the feasibility, recommend and incorporate types of retaining walls and / or shoring for permanent and / or temporary situations. Design all retaining walls in accordance with the most recent edition of the AASHTO *LRFD Bridge Design Specifications* and applicable FHWA manuals. If the AASHTO *LRFD Bridge Design Specifications* do not provide applicable load and / or resistance factors for certain retaining wall types, then design these walls in accordance with the latest AASHTO *Standard Specification for Highway Bridges* allowable strength design methods.
5. Determine amount of, recommend and incorporate methods to mitigate any differential settlement problems at locations of culverts and utilities.
6. Analyze the stability of cut sections. Utilize recognized geotechnical engineering designs and construction methods to ensure cut slope stability.
7. Analyze the stability of roadway approaches (to the distance from the bridge that affects the stability and design of the bridge foundations) and particularly the end slopes under the bridge, utilizing recognized geotechnical engineering designs and construction methods to ensure stability.
8. Recommend pile, drilled pier or spread footing foundations for structures with regard to bearing capacity, lateral stability, buckling analysis for piles, scour, settlement and constructability.
9. Recommend maximum bearing pressure for spread footings considering both strength limit and service limit states, and effects of adjacent foundations, water table, scour, etc. The scour critical elevation for a spread footing shall be at the bottom of footing elevation.

10. Address the following regarding pile and / or drilled pier foundations:

    a. Method of support – skin friction, tip bearing or combination of both
    b. Tip elevations and estimated pile lengths
    c. Ultimate axial load
    d. Settlement
    e. Number and location of test piles or piers and dynamic and / or static load testing
    f. Wave equation analyses using an appropriately chosen pile hammer and cushion material
    g. Necessity of using steel pile tips for concrete piles or pile points for steel piles
    h. Effects of vibration on adjacent construction or existing structures
    i. Corrosion effects of various soils and water (Reference NCDOT *Structure Design Unit's Policy Manual*)
    j. Downdrag on piles or piers
    k. Lateral stability and horizontal deflections
    l. Design scour and scour critical elevations. The scour critical elevation for drilled piers and pile foundations shall be the 500-year design scour elevation.
    m. Point of fixity
    n. Lateral squeeze for piles

11. Include in the geotechnical recommendations report a summary table of the bridge foundation recommendations including the following:

    a. WBS project number, TIP number, county, description and bridge station
    b. Bent (work point) stations, types of foundations, allowable loads, bottom of cap or footing elevations, estimated pile lengths and tip elevations

12. Address the following items, when applicable, as notes on plans or comments and attach to the summary table:

    a. All appropriate notes on plans (Reference NCDOT Structure Design Unit's Standard Foundation Notes on Plans)
    b. End slope and extent of slope protection
    c. Waiting periods for approach slab construction or end bent construction
    d. Battered piles
    e. Point of fixity elevations
    f. Design and scour critical elevations
    g. Tip elevations
    h. Steel pile points for steel piles or steel pile tips for concrete piles
    i. Number and location of test piles or piers, load tests, dynamic and / or static testing
    j. Required rock socket for drilled piers
    k. Need for permanent steel casing including casing tip elevations, SPT, SID Inspection, CSL and slurry use in accordance with the current NCDOT *Drilled Piers Special Provision*
    l. Range of estimated hammer energies for concrete and pipe piles

    Address any other items affecting the foundation design on the summary sheets and include all final recommendations on the summary sheets.

HYDRAULICS SCOPE OF WORK (4-29-09)

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 and highway stormwater program work under the Department's normal prequalification procedures prior to submittal of the Design-Build Proposal.

- For permanent water quality and in accordance with the Department's "Stormwater Best Management Practices Tool Box – 2008", design and construct the following adjacent to the US 1 / US 64 southbound to I-40 westbound ramp (For information on recently constructed drainage systems in proximity to the aformentioned ramp, reference the Dry Detention Basin Information Sheet dated April 1, 2009 provided by the Department.):

    1. Site 2 Dry Detention Basin located at approximately Station 265+00 -L-, LT which shall discharge to existing concrete discharge structure and drainage system. Site 2 shall require treatment of the first inch of runoff from all new impervious areas draining to the Dry Detention Basin. The Design-Build Team shall not begin construction of Site 2 prior to completion of the I-40 widening in proximity to the Site.
    2. Site 3 Dry Detention Basin located at approximately Station 270+00 -L-, LT which shall connect to existing drainage system identified in item "4" below. Site 3 shall require treatment of the first inch of runoff from all impervious areas draining to the Dry Dentention Basin.
    3. Fill the existing 36-inch CMP cross pipe located beneath the US 1 / US 64 southbound to I-40 westbound ramp with flowable fill.
    4. Extend the existing 48-inch CSP located on the US 1 / US 64 southbound to I-40 westbound ramp to the toe of the existing fill slope and terminate with an NCDOT approved energy dissipater. Provide 2 grated inlets at the existing buried concrete drainage structure located between the existing 48-inch RCP and the existing 48-inch CSP.

- Attend a pre-design meeting with the Transportation Program Management Director, Division Environmental Officer and Hydraulic Review Engineer, upon acceptance of the Preliminary Roadway Plans.

- Design the project using the 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/

- Construction shall not exceed the stream buffer impacts permitted in the Nationwide Permit No. 3 provided by the Department.

- Replace the failed pipe sections as defined in the Nationwide Permit No. 3 provided by the Department.

- Repair or replace all damaged median aprons and boxes and / or as required by design or construction. Repair or replace all damaged drainage features located along the outside of I-40 as required for installation of guardrail and / or impacted by construction. (Reference Roadway Scope of Work found elsewhere in this RFP)

- Fill with flowable fill all pipes and culverts under roadways not retained for drainage purposes. Remove or fill with flowable fill all other pipes and culverts not retained for drainage purposes.

- Provide a minimum ditch grade of 0.3% and minimum ditch depth of one foot below shoulder point.

- Use Geopak Drainage in the storm drainage design.

TRAFFIC CONTROL AND PAVEMENT MARKINGS SCOPE OF WORK (4/29/09)

I. Traffic Control Plans and Pavement Marking Plans

A. Design Parameters

The Design-Build Team shall prepare the Traffic Control and Pavement Marking Plans for this project following the parameters listed below:

1. Within 75 days from Date of Availability of this contract, the Design-Build Team shall provide positive median cross-over protection for the entire I-40 widening project limits. The Design-Build Team shall consider deflection of the positive median cross-over protection in determining the location of this protection. The Design-Build Team shall indicate in the Technical Proposal the type of positive protection proposed and replacement / resetting requirements. All positive median cross-over protection shall be installed on a stable level surface. (Reference the Intermediate Contract Time Number 1 and Liquidated Damages Project Special Provision found elsewhere in this RFP) The purpose of this median protection is to minimize the potential for cross-median crashes and is not for traffic control purposes.
2. Maintain a minimum of two 11-foot wide lanes in each direction on I-40, as well as all auxiliary lanes. Maintain 4-foot wide inside and outside shoulders in each direction of I-40 unless temporary barrier is placed on the paved shoulder. Maintain a minimum of 11 foot wide lanes and existing shoulder widths on US 1 / US 64, NC 54 and Wade Avenue. Maintain existing lane and shoulder widths on all two-lane roadways.
3. All traffic control devices shall be placed a minimum 2-foot offset (shy distance) from the edge of travel lane.
4. Show temporary barrier system on the Traffic Control Staging Concept. Temporary barrier systems shall be designed in accordance with the following requirements:
   - Perform an Engineering Study to determine the need for temporary barrier that considers clear zone distances, roadway geometry, anticipated construction year traffic volumes, traffic speeds, roadside geometry, workers safety, pedestrian safety, etc. in accordance with 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

   - West of NC 54, when temporary barrier is used continuously on both sides of a direction of I-40 travel for a distance greater than one mile, provide a motorist breakdown area on the right side of the mainline (I-40) travel way every mile, unless the outside useable shoulder width is eight feet or greater. All breakdown areas shall be 1000 feet long and 14 feet wide.

- The Design-Build Team shall determine, and adhere to, the length of need, flare rate, clear zone and possible deflection of the proposed temporary barrier system in accordance with NCHRP-350 deflections from crash testing.
- The Design-Build Team shall not place temporary barrier systems utilized for traffic control on soil surfaces.

5. The design speed for temporary alignments of NC, US and interstate routes shall not be lower than the current posted speed limit.
6. Roadway Standard Drawing 1101.11 shall be used for calculating the length of temporary merge and shift tapers on existing roadways only. All other temporary alignments shall adhere to the *NCDOT Roadway Design Manual*, 2004 AASHTO *A Policy on Geometric Design of Highways and Streets* and the most current *Highway Capacity Manual*.
7. Changes in superelevation rates shall only occur on a lane line and shall not exceed 0.04 between adjacent travel lanes.
8. Maintain access to all residences, schools, emergency services and businesses at all times.
9. Traffic traveling in the same direction shall not be split, including splitting I-40 traffic on the collector-distributor from I-40 to US 1 / US 64 (i.e. separation by any type of barrier, bridge piers, existing median, etc.).
10. Prior to incorporation, Department written approval shall be obtained for all road closures.
11. The Design-Build Team shall not place I-40 traffic on an offsite detour. Offsite detours shall only be allowed on US 1 / US 64 and Wade Avenue for girder placement. Prior to incorporation, all offsite detour routes shall receive Department written approval and adhere to the following requirements:
    - All detour routes shall be investigated, including but not limited to, analyzing traffic capacity, investigating impacts to emergency services and schools and investigating pavement structural adequacy
    - 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
    - The Design-Build Team shall include all proposed offsite detours in the Technical Proposal, providing justification for using such detours along with duration. Possible detour warrants could include, but are not limited to, road closures due to substandard horizontal or vertical clearance limits, grade changes at tie-in locations and oversize and / or overweight limits.
    - Submit the detour route and all associated sign designs for review and acceptance prior to incorporation.
12. On all roadways within the project limits, 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 zone widths as follows:

Roadway	Minimum Clear Width
I-40 and US 1 / US 64	20 feet
All other roadways	18 feet

13. The Design-Build Team shall utilize Changeable Message Signs (CMS) as follows (Reference the Changeable Message Signs Project Special Provision found elsewhere in this RFP):
    - As part of the I-40 widening project, the Design-Build Team shall provide and operate a minimum of two (2) CMSs per direction to display alternate route information ahead of the detour points on I-40. These CMSs shall be in addition to any other devices provided by the Department and operated by the Traffic Management Center (TMC). The Design-Build Team shall coordinate with the TMC when alternate route information needs to be displayed.
        - All CMSs shall be controlled remotely by the TMC and operated in the field by the Design-Build Team
        - Alternate route information shall be displayed when queue length reaches 3 miles
        - Alternate routes, CMS locations and CMS messages shall be reviewed and approved by the Department prior to incorporation
    - Within the I-40 widening project limits, the Design-Build Team shall provide and operate a minimum of one CMS per direction that provides general construction activity information about the construction activities. These CMSs shall be in addition to any other CMSs required by the Roadway Standard Drawings. The proposed Dynamic Message Sign (DMS) located east of Avent Ferry Road will be available for use by the Design-Build Team once it has been installed and operational. (Reference the Signing and ITS Scopes of Work found elsewhere in this RFP)
    - Two weeks prior to placing traffic in the final traffic pattern within or adjacent to the I-40 interchange at US 1 / US 64, the Design-Build Team shall provide and operate a CMS on the US 1 / US 64 northbound on-ramp to I-40 eastbound.
    - The Design-Build Team shall show approximate CMS locations, along with the respective messages that have been coordinated with the TMC, in the Traffic Control Plans.
14. The Design-Build Team shall provide a smooth pavement surface for traffic at all times. The Design-Build Team shall not place traffic on lanes containing rumble strips. (Reference the Pavement Management Scope of Work found elsewhere in this RFP)

B. Traffic Control and Final Pavement Marking Plan requirements:

The Design-Build Team shall select a Private Engineering Firm (PEF) that has experience designing and sealing Traffic Control and Pavement Marking Plans for the North Carolina Department of Transportation (NCDOT) on comparable projects. The

Design-Build Team shall list projects in the Technical Proposal, including description and similarity to the subject project that the PEF developed.

The Design-Build Team shall develop Traffic Control and 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 (MUTCD).*

The Traffic Control and Pavement Marking 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 web site contains useful information that may be needed for the design of the Traffic Control Plans and Pavement Marking Plans.

http://www.ncdot.org/doh/preconstruct/wztc/

The Final Pavement Marking Plans shall address any required modifications to existing pavement markings located outside the project limits to ensure appropriate tie-ins. The Design-Build Team shall be responsible for installing all pavement markings and markers located within and outside the project limits, resulting from the project construction.

II. Project Operations Requirements

The following are Time Restrictions and notes that shall be included with the Traffic Control Plans General Notes, unless noted otherwise elsewhere in this RFP:

A. Time Restrictions

1. Intermediate Contract Time #2 and #3 for Lane Narrowing, Closure, Holiday and Special Event Restrictions.

As a minimum, the Design-Build Team shall maintain existing traffic patterns and shall not close or narrow a lane during the times below. When traffic is placed into the final pattern for any roadway, that will become the minimal traffic pattern and the following time restrictions shall still apply.

Road Name	Time Restrictions
I-40, I-40 ramps, US 1 / US 64, US 1 / US 64 ramps, Wade Avenue, Cary Towne Boulevard and NC 54	Monday to Sunday 6:00 a.m. to 9:00 p.m.

The Design-Build Team shall not install, reset, and / or remove any traffic control device during the times listed above.

In addition to the lane narrowing and closure restrictions stated above for all roads, during holidays, holiday weekends, special events, or any other time when traffic is unusually heavy on the roadways listed herein as directed by the Engineer, the Design-Build Team shall not close or narrow a lane of traffic, detain the traffic flow or alter the traffic flow on the aforementioned facilities. As a minimum, these requirements / restrictions apply to the following schedules:

(a) For New Year's between the hours of 9:00 p.m. December 31st to 6:00 a.m. January 3rd. If New Year's Day is on a Friday, Saturday, Sunday or Monday then until 6:00 a.m. the following Tuesday.

(b) For Easter, between the hours of 9:00 p.m. the Friday before Easter and 6:00 a.m. the Tuesday after Easter.

(c) For Memorial Day, between the hours of 9:00 p.m. the Friday before Memorial Day to 6:00 a.m. the Wednesday after Memorial Day.

(d) For Independence Day, between the hours of 9:00 p.m. July 3rd and 6:00 a.m. July 6th. If Independence Day is on a Friday, Saturday or Sunday, between the hours of 9:00 p.m. the Thursday before Independence Day and 6:00 a.m. the Tuesday after Independence Day.

(e) For Labor Day, between the hours of 9:00 p.m. the Friday before Labor Day to 6:00 a.m. the Wednesday after Labor Day.

(f) For Thanksgiving, between the hours of 9:00 p.m. the Tuesday before Thanksgiving to 6:00 a.m. the Tuesday of the following week.

(g) For Christmas, between the hours of 9:00 p.m. the Friday before the week of Christmas Day and 6:00 a.m. the following Tuesday after the week of Christmas Day.

(h) During the North Carolina State Fair, every day from 9 p.m. to 12 a.m.

(i) For football games at Carter-Finley Stadium, on I-40 eastbound and Wade Avenue westbound from three (3) hours before the beginning of a game to the beginning of a game and on I-40 westbound from the end of a game to two (2) hours after the end of a game.

(j) For any event at the RBC Center, Carter-Finley Stadium and / or the State Fair Grounds, on I-40 eastbound and Wade Avenue eastbound and westbound from one (1) hour before an event to the start of an event and on I-40 westbound from

the end of an event to one (1) hour after the end of an event, as directed by the Engineer.

Liquidated Damages for Intermediate Contract Time #2 for the above lane narrowing, lane closure, holiday and special event time restrictions for I-40, I-40 ramps, US 1 / US 64, US 1 / US 64 ramps and Wade Avenue is $2,500 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 Cary Towne Boulevard and NC 54 is $1,500 per 15-minute period or any portion thereof.

2. Intermediate Contract Time #4 and #5 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 or any ramps shall only be allowed for the operations listed in this intermediate contract time restriction. Using a median cross-over, exclusively for the operations listed below, shall be defined as a closure of a direction of travel.

Road Name	Time Restrictions
I-40, I-40 ramps, US 1 / US 64, US 1 / US 64 ramps, Wade Avenue, Cary Towne Boulevard and NC 54	Sunday to Saturday - 5:00 a.m. to 12:00 a.m. (midnight)

Maximum road closure duration of **30 minutes** shall be allowed for the roadways listed in this ICT for the following operations:

- Traffic shifts to complete tie-in work and placement of pavement markings and markers
- Removal of existing girders
- Installation of overhead sign assemblies and / or work on existing overhead sign assemblies over travel lanes

Maximum road closure duration of **four hours,** accompanied with an off-site detour, shall be allowed for US 1 / US 64 and Wade Avenue for girder installation only.

Maximum road closure duration of **five hours**, accompanied with an off-site detour, shall be allowed for placement of the Ultra-thin Bonded Wearing Course on ramps and loops, provided only one ramp or loop at an interchange is closed at any time.

Proposed road closures for any road within the project limits shall be approved by the Engineer prior to incorporation in the Traffic Control Plans.

Liquidated Damages for Intermediate Contract Time #4 for the above road closure time restrictions for I-40, I-40 ramps, US 1 / US 64, US 1 / US 64 ramps and Wade Avenue are $5,000.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #5 for the above road closure time restrictions for Cary Towne Boulevard and NC 54 are $2,500.00 per 15-minute period or any portion thereof.

3. **Intermediate Contract #6 for Continuous Weekend Lane Closure Time Restriction on I-40 for Construction Operations.**

To replace the lane currently prohibiting truck traffic and adjacent median shoulder, the Design-Build Team may continuously close two lanes on westbound I-40 between Wade Avenue and Harrison Avenue for no more than **fifty-seven (57) consecutive hours** beginning on Friday at 9 p.m. and ending on Monday at 6 a.m. (Reference the Pavement Management Scope of Work found elsewhere in this RFP)

A minimum of one month prior to incorporating the continuous weekend lane closure, the Design-Build Team shall provide a closure plan to the Transportation Program Management Director, for review and approval. In addition to the closure plan, the Design-Build Team shall provide the Transportation Program Management Director the following:

- Documentation that the Design-Build Team has coordinated with contractors on other projects that will be used as an alternate or detour route to ensure that the continuous weekend lane closure does not occur at the same time as any other lane closures within the network. (Reference the Cooperation Between Contractors Project Special Provisions found elsewhere in this RFP.)
- Public Information Plan detailing how the motoring public will be notified of the continuous weekend lane closure. (Reference the Public Information Scope of Work found elsewhere in this RFP)

The Technical Proposal shall address the continuous weekend lane closure, providing a traffic control concept that details how traffic will be maintained.

Liquidated Damages for Intermediate Contract Time #6 for the above continuous lane closure time restrictions for I-40 are $2,500.00 per 15-minute period per lane or any portion thereof.

4. Hauling Restrictions

The Design-Build Team shall adhere to the hauling restrictions noted in the NCDOT 2006 *Standard Specifications for Roads and Structures*.

The Design-Build Team shall conduct all hauling operations as follows:

- The Design-Build Team shall not haul against the flow of traffic of an open travelway unless an approved temporary traffic barrier or guardrail protects the work area.
- The Design-Build Team shall not haul during the holiday and special events time restrictions listed in Intermediate Contract Time #2 and #3.
- Haul vehicles shall not enter and / or exit an open travel lane at speeds more than 10 mph below the posted speed limit.
- Hauling access to the I-40 median will be allowed at the beginning and end of the project. Additional hauling access points to the I-40 median shall be limited to one per direction, at a location chosen by the Design-Build Team and approved by the Department.
- Hauling operations for bridge construction at the I-40 and US 1 / US 64 interchange shall be limited to I-40.
- Single vehicle hauling and multi-vehicle hauling shall not be allowed ingress and egress from any open travel lane during the following time restrictions. The following hauling time restrictions apply only where egress and / or ingress occur between the work areas and any travel lane of the roads noted below. Hauling operations that are conducted entirely behind a temporary traffic barrier or guardrail are allowed at all times and are excluded from the following time restrictions:

For Single Vehicle Hauling

Road Name	Day and Time Restrictions	
I-40, I-40 ramps, US 1 / US 64, US 1 / US 64 ramps, Wade Avenue and NC 54	6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 8:00 p.m.	Monday – Friday

For Multi-Vehicle Hauling

Road Name	Day and Time Restrictions	
I-40, I-40 ramps, US 1 / US 64, US 1 / US 64 ramps, Wade Avenue and NC 54	6:00 a.m. to 9:00 p.m.	Monday – Sunday

The Design-Build Team shall address how hauling will be conducted in the Technical Proposal, including but not limited to, hauling of materials to and from the site and hauling of materials within NCDOT right of way.

B. Lane and Shoulder Closure Requirements

The Design-Build Team shall not install more than four (4) miles of lane closures on any roadway within the project limits or in conjunction with this project, measured from the beginning of the merge taper to the end of the lane closure.

On all roads, the Design-Build Team shall not install more than two (2) simultaneous lane closures, in any one direction. The Design-Build Team shall provide a minimum of five (5) miles between lane closures, measured from the terminus of the end taper of one closure to the first warning sign of the next lane closure.

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 *2006 Roadway Standard Drawing* No. 1101.04, 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 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 *2006 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 *2006 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 *2006 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 involving heavy equipment within 15 feet of the edge of travelway when work is being performed behind a lane closure on the opposite side of the travelway.

C. 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 and / or use proper traffic control setup to protect traffic from the 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 2002 *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.

D. 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 for public information requirements.)

E. Signing

The Design-Build Team shall install advance work zone warning signs when work is within 100 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 signs 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. 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) are in place at all times during construction, as required by the *MUTCD*.

F. Traffic Barrier

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.

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 a hazard.

Protect the approach end of 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 temporary traffic barrier system from oncoming traffic at all times by a temporary crash cushion unless the approach end of temporary traffic barrier system is offset from oncoming traffic as follows:

Posted speed limit (MPH)	Minimum offset (feet)
40 or less	15
45 - 50	20
55	25
60 mph or higher	30

Install temporary traffic barrier system with the traffic flow, beginning with the upstream side of traffic. Remove the temporary traffic barrier system against the traffic flow, beginning with the downstream side of traffic.

Install drums to close or keep closed tangent sections of the roadway until the temporary traffic barrier system can be placed or after the temporary barrier system has been removed. The distance, in feet, between drums shall be no greater than twice the posted speed limit (MPH).

At acceleration ramps / loops, install temporary traffic barrier system in a manner that provides a minimum of 200 feet from the end of the pavement marking taper to the beginning of the barrier taper.

The Design-Build Team shall be responsible for providing proper connection between the existing bridge rail and the temporary barrier system and include this information in the appropriate plans.

G. Traffic Control Devices

The Design-Build Team shall use traffic control devices that conform to all NCDOT requirements and are listed on the NCDOT's Approved Products List. The Approved Products List is shown on NCDOT's Work Zone Traffic Control website. The use of any devices that are not shown on the Approved Product List shall require written approval from the Transportation Management Director.

In tangent sections, channelizing device spacing shall not exceed a distance in feet equal to twice the posted speed limit. At intersections and driveway radii, channelization devices shall be spaced 10 feet on-center and 3 feet off the edge of an open travelway, when lane closures are not in effect. Skinny drums shall only be allowed as defined in Section 1180 of the 2006 *NCDOT 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.

When a CMS is placed within the clear zone, provide proper delineation and protection for the traveling public.

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.

H. Pavement Markings, Markers and Delineation

The Design-Build Team shall provide a Final Pavement Marking Plan that meets 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 not place any final pavement markings or markers until the Final Pavement Marking Plans are accepted.

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 Approved Products List is located on NCDOT's Work Zone Traffic Control website. The use of any devices that are not on the Approved Product List shall require written approval from the Transportation Program Management Director.

The Design-Build Team shall install pavement markings and markers in accordance with the NCDOT 2006 *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:

Road	Marking	Marker
-L- Line and Ramps	Thermoplastic	Snowplowable
-Y- Lines	Thermoplastic	Permanent Raised
Concrete surfaces and bridge deck surfaces	Cold Applied Plastic (Type III)	Permanent Raised

To supplement the guide signs at the Wade Avenue / I-40 interchange, the Design-Build Team shall install individual horizontal signing on all eastbound I-40 lanes (I-40 interstate shields marked on pavement with heated-in-place thermoplastic), as shown on the NCDOT I-4744 Signing Schematic dated March 11, 2009.

The Design-Build Team shall install temporary and permanent pavement markings on all Full Control of Access interstate facilities and US routes with widths shown.

Marking	Permanent	Temporary
Lane line, edge line, skips and mini-skips	6”	4”
Gore	12”	8”

The Design-Build Team shall install temporary pavement markings and temporary pavement markers on the interim surface or temporary pattern as follows:

Road	Marking	Marker
All roads and existing structures	Minimum of Paint	Raised Temporary
Proposed structures	Cold Applied Plastic (Type IV)	Raised Temporary

The Design-Build Team may use any type of pavement markings on the NCDOT Approved Products List for temporary pattern. However, the Design-Build Team shall maintain a minimum retroreflectivity for temporary marking at all times during construction, as follows:

White: 125 mcd / lux / m2
Yellow: 100 mcd / lux / m2

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 2006 *Roadway Standard Drawing* 1250.01, Sheet 1 of 3.

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.

Tie proposed pavement marking lines to existing pavement marking lines.

Replace any pavement markings that have been damaged by the end of each day's operation.

The Design-Build Team shall not place temporary markings on final pavement surface unless the temporary markings are placed in the exact location of the final pavement marking.

The Design-Build Team shall remove all conflicting markings or markers prior to shifting traffic to a new pattern.

Removal of the temporary pavement markings shall be accomplished by using water blasting, sand blasting, shot blasting systems or other NCDOT approved systems to minimize damage to the road surface. All systems shall be required to remove 100% of the pavement marking without removing more than 1/32 inch of the pavement surface.

I. Miscellaneous

Provide portable temporary lighting to conduct night work in accordance with the NCDOT 2006 *Standard Specifications for Roads and Structures*.

Provide proper drainage for all temporary alignments and / or traffic shifts.

Law enforcement officers may be used to help protect workers and road users, and to maintain safe and efficient travel through the work zones. The Design-Build Team shall be responsible for coordinating with the law enforcement agency for the use of law enforcement officers. The Design-Build Team shall address where and why law enforcement officers will be used. The Design-Build Team shall 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.

No Parking / Tow Away Zone signs shall be installed 1000 feet in advance of the *Begin Road Work* sign on all on-ramps within the project limits, and a minimum of every 3000 feet in each direction of I-40 within the I-40 widening project limits.

The Department will consider a speed reduction ordinance when workers and / or lane closures are present on I-40. A speed reduction ordinance will be granted after an engineering study is performed by the NCDOT Regional Traffic Engineer that supports the need for the speed reduction and the Ordinance approved and signed by the NCCDOT State Traffic Engineer. The Design-Build Team shall submit a request for an engineering study, that includes but is not limited to the limits of the Ordinance and the Team’s

Traffic Control Plans, to the Transportation Program Management Director and allow six weeks for the study to be completed and the Ordnance provided, if approved.

The Department will not grant a $250 speeding penalty ordinance.

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 a detail available from the Work Zone Traffic Control Unit that provides design information on the temporary traffic barrier location in relation to the temporary shoring and traffic location. The NCDOT Geotechnical Engineering Unit and Work Zone Traffic Control Section websites have more information on temporary shoring. (Notes related to Temporary Shoring are not required in the General Notes sheet for the Traffic Control Plan)

http://www.ncdot.org/doh/preconstruct/highway/geotech/formdet/standards.html

http://www.ncdot.org/doh/preconstruct/wztc/DesRes/English/TemporaryShoring/TempShoring.pdf

The Design-Build Team shall adhere to the additional shoring requirements located on the Work Zone Traffic Control Unit and Geotechnical Engineering Unit websites.

The Design-Build Team shall identify on the appropriate traffic control detail where temporary shoring will be used by providing station limits, offsets, the type of shoring and where temporary traffic barrier will be located if needed.

J. Towing of Disabled Vehicles

The work covered by this section consists of furnishing towing services for all disabled vehicles displaying a lime green sticker within the I-40 widening limits and ½-mile beyond the I-40 widening 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 **20 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.

K. Traffic Control Supervisor

The Design-Build Team shall furnish a Traffic Control Supervisor for the project who is 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:

(A) A minimum 24 months of On-the-Job Training in supervision and work zone set up and implementation.

(B) Be certified by responsible party (contractor or NCDOT) to have the required experience and training and is qualified to perform the duties of this position. If certified by the Contractor, a notarized certification letter shall be furnished to the Engineer at the preconstruction meeting. The letter shall state the Traffic Control Supervisor is qualified, and state that the Traffic Control Supervisor has the authority to ensure traffic is maintained in accordance with the contract documents.

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.
(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 Traffic Management Center personnel in Wake County to ensure proper messages are displayed on the CMSs and DMSs.
(4) Provide traffic control setup that ensures safe traffic operations and workers' safety throughout the construction area.
(6) Attend all scheduled traffic control coordination meetings, as required by the Engineer.
(7) Monitor traffic delays and backups within the work zone. Coordinate with the TMC as required by this Scope of Work. (Reference Design Parameter #13)

L. Department-Furnished Moveable Concrete Barrier and Transfer / Transport Vehicle

The Department will have available for use by the Design-Build Team 9.8 miles of moveable concrete barrier (MCB) and two (2) Transfer / Transport Vehicles for Movable Concrete Barrier. The Transfer / Transport Vehicles will be able to pick up continuous lengths of movable concrete barrier and move them laterally The Design-Build Team shall obtain and return Department-Furnished Movable Concrete Barrier and Department-Furnished Transfer / Transport Vehicles from the following location:

- 6.8 miles MCB and one (1) vehicle located at the Capital Boulevard / I-540 intersection
- 2.5 miles of MCB and one (1) vehicle located at the Halifax County Maintenance Yard
- 0.5 miles of MCB located at the Nash County Maintenance Yard

The Design-Build Team shall be responsible for determining how much of the available MCB is functional. The Design-Build Team shall be responsible for determining the functionality of the Transfer / Transport Vehicles.

The Engineer will inspect Department-Furnished Movable Concrete Barrier and Transfer / Transport Vehicles prior to the Design-Build Team accepting responsibility of the barrier and vehicles.

The Design-Build Team shall transport the Department-Furnished Moveable Concrete Barrier and Transfer / Transport Vehicles to the project and provide necessary storage area at no cost to the Department. The Design-Build Team shall be fully responsible for any and all damage or theft upon obtaining the Department-Furnished Movable Concrete Barrier and Transfer / Transport Vehicles.

The Design-Build Team shall maintain the Department-Furnished Movable Concrete Barrier and Transfer / Transport Vehicles in good operational and mechanical condition in accordance with the NCDOT 2006 *Standard Specifications for Roads and Structures*.

The Design-Build Team shall return the Department-Furnished Movable Concrete Barrier and Transfer / Transport Vehicles to the original location in good operational and mechanical condition including all manuals, maintenance records, special tools, hardware, parts, etc. The Design-Build Team shall properly pack and label all spare parts and hardware.

The Design-Build Team shall provide a trained, responsible operator to operate the Department-Furnished Transfer / Transport Vehicles at all times.

Resetting the Department-Furnished Movable Concrete Barrier shall entail pin disconnection and longitudinal transfer of the movable concrete barrier.

The Design-Build Team shall stockpile the Department-Furnished Movable Concrete Barrier in accordance with the 2006 *Standard Specifications for Roads and Structures*.

The Design-Build Team shall furnish and install delineators for the Department-Furnished Movable Concrete Barrier which meet the requirements of the 2006 S*tandard Specifications for Roads and Structures*.

The Design-Build Team shall indicate in the Technical Proposal their intent to use the Department-Furnished Movable Concrete Barrier and Transfer Transport Vehicles, including but not limited to the amount and duration of use.

SIGNING SCOPE OF WORK (4-29-09)

NOTES:

In accordance with Project Special Provisions found elsewhere in this RFP, the Design-Build Team shall provide and construct all elements defined in the I-4902 Signing Plans signed and sealed on March 31, 2009, (internal Plan Sheets signed and sealed March 31, 2009 and April 20, 2009) including but not limited to sign fabrication and installation. All references to quantities in the aforementioned I-4902 Signing Plans are for informational purposes only. The Design-Build Team shall be solely responsible for verifying the quantities required for the I-4902 Signing Plans signed and sealed on March 31, 2009. The requirements defined in this Signing Scope of Work do not apply to the aforementioned I-4902 Signing Plans.

The Design-Build Team shall not be responsible for the repair / replacement of existing damaged / inoperable sign lighting on I-4902 or I-4744, unless impacted by design and / or construction. No new sign lighting is required as part of this contract.

The Design-Build Team shall be responsible for verifying the S-Dimension for all ground mounted signs and overhead sign supports on I-4902 and I-4744. For I-4902 only, the Department will develop Construction Revisions required by the S-Dimension verifications.

General

The Design-Build Team shall prepare Signing Plans in accordance with the latest edition of the 2003 *Manual on Uniform Traffic Control Devices (MUTCD),* the 2004 *NC Supplement to the MUTCD, NCDOT Standard Specifications for Roads and Structures* (July 2006), the NCDOT Roadway Standard Drawings (July 2006) 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, NCDOT Division of Highways Transportation Mobility and Safety Division's Standard Practice for Reflective Sign Sheeting dated March 4, 2009, "*Guidelines for Preparation of Signing Plans for Design-Build Projects*", the "*Design-Build Submittal Guidelines*" and the contract requirements contained herein. Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall develop Signing Plans that incorporate Advance Guide Sign messages and structures at locations as defined on the NCDOT I-4744 Signing Schematic dated March 11, 2009.

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, including description and similarity to the subject project, that the PEF developed Signing Plans.

Signs Furnished by Design-Build Team

The Design-Build Team shall furnish all 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 I-40 widening construction limits, providing Advance Guide Signs as defined on the NCDOT I-4744 Signing Schematic dated March 11, 2009, as well as those required for NC 54 and Cary Towne Boulevard -Y- Lines. The Design-Build Team shall also be responsible for the design, fabrication and installation of all signs required beyond the I-40 widening construction limits and NC 54 and Cary Towne Boulevard -Y- Lines to ensure adequate advance signage and spacing is provided.

The posted speed limit for I-40 shall be 65 mph.

Sign Design

The Design-Build Team shall be responsible for the design, fabrication and installation of all signs required for the I-40 widening project limits, as well as all -Y- Lines. The Design-Build Team shall be responsible for all Type A, B, and D sign designs, fabrication and installation 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. All milemarker designs shall be in accordance with the Intermediate Enhanced Reference Location Signs (D10-4) referenced in the *Standard Highway Signs* (2004 Edition).

The Design-Build Team shall provide warning signs in accordance with Figure 2C-7 and Sign E13-1 of the 2003 *Manual on Uniform Traffic Control Devices (MUTCD)* at the I-40 westbound exit loop to Cary Towne Boulevard.

The Design-Build Team shall design, fabricate and install Thru Bolts for Type A Signs in accordance with the NCDOT Roadway Standard Drawing No. 901.10 dated January 2008.

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

Logo Signs

The Design-Build Team shall not be responsible for designing, locating or installing new Logo Signs (blue service signs with specific business panels). The Design-Build Team shall be responsible for relocating existing Logo signs upon completion of the widening, realignment or other construction procedures.

Sign Maintenance

To ensure signs are properly maintained and visible during project construction, the Design-Build Team shall maintain all existing signs during construction, including temporary installations of Guide and Logo Signs on supports and any other element of the sign system, in accordance with Section 908-3(C) of the 2006 *Standard Specifications for Roads and Structures.*

The Design-Build Team shall notify the Division Logo Coordinator within 48 hrs of damage to the Logo Sign(s) or the business panel(s) during construction or installation. If damaged, the Design-Build Team shall be responsible for replacement of Logo Sign(s) and / or Logo business panel(s). The Design-Build Team shall only be allowed to remove the Logo Signs if minimum spacing requirements cannot be adhered to. If the Logo Signs are removed and disposed of per the RFC Signing Plans, the Design-Build Team shall remove the business panels and return them undamaged to the Division Logo Coordinator. The order of preference for Logo Sign(s) shall be maintained during project construction. (Reference MUTCD Section 2F.02)

Temporary Signs

The Design-Build Team shall be responsible for designing, fabricating and installing temporary signs and sign supports. (Reference the Signing Section of the Traffic Control and Pavement Markings 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 all projects listed in the Cooperation Between Contractors Project Special Provision located elsewhere in this RFP.

Ground Mounted Support Designs

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.

Overhead Sign Assemblies

The Design-Build Team shall design, fabricate and install overhead sign assemblies that meet all Department requirements. The windspeed for the overhead sign assembly designs shall be 90 mph. The Design-Build Team shall be responsible for calculating the windload area for the overhead sign assembly. The windload area shall be flush with the sign height and width. When calculating the windload area, the Design-Build Team shall include exit panels as part of the sign height.

The minimum vertical clearance beneath all overhead sign assemblies shall be 17 feet.

Prior to modifying existing overhead sign assemblies within the I-40 widening project limits to accommodate proposed signs, the Design-Build Team shall perform a structural analysis on the overhead sign structure in accordance with the latest version of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*. The Design-Build Team shall obtain Department acceptance of the structural analysis prior to construction. The Design-Build Team shall replace all existing overhead sign assemblies determined to be structurally inadequate for the proposed modifications.

The Design-Build Team shall prepare shop drawings for all modified overhead sign structures for NCDOT review and acceptance. Reference *Guidelines for Preparation of Signing Plans for Design-Build Projects* and 2006 *Standard Specifications for Roads and Structures* for additional requirements, including but not limited to shop drawing design and submittal requirements.

The Design-Build Team shall design, fabricate and install overhead and pedestal sign supports and foundations in accordance with the Standard Special Provisions for Overhead Sign Supports and Overhead Sign Foundations Project Special Provisions found elsewhere in this RFP.

The Design-Build Team shall be responsible for designing, fabricating and installing median barrier footing and median transitional barrier in accordance with the *2006 Roadway Standard Drawing No 854.05* for any new overhead sign assembly that will replace an existing assembly mounted on median barrier.

When applicable, the Design-Build Team has the option to mount signs vertically centered on the horizontal member of the overhead structure or to locate the bottom edge of all signs on each assembly in a horizontal plane.

Pedestal Overhead Sign Assemblies Option

For multi-lane facilities, the Design-Build Team has the option to design pedestal overhead sign assemblies or cantilever overhead sign assemblies for advance guide signs only. Pedestal overhead sign assemblies shall not be allowed for signs with “EXIT ONLY” designations. Exit directional signing shall be mounted on cantilever overhead sign assemblies over the appropriate lane(s). The Design-Build Team shall clearly indicate in the Technical Proposal their intention to provide pedestal overhead sign assemblies for advance guide signs.

All pedestal overhead sign assemblies shall have a 20-foot maximum offset from the edge of pavement to the centerline of the support. The Design-Build Team shall install guardrail or other approved positive protection for pedestal overhead sign supports.

Overhead Sign Supports for Freeway Facilities

Overhead sign supports shall be located 40 feet from the edge of the outside travel lane to the center of the sign support. If the 40-foot distance cannot be obtained, the overhead sign support

shall be located 20 feet from the edge of the outside travel lane and protected by guardrail or other NCDOT approved positive protection barrier.

The Design-Build Team shall provide the appropriate positive protection and drainage for all overhead sign median supports.

Overhead Sign Sheeting

Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and fabricate overhead signs using Type VIII or Type IX reflective sheeting for the legends (text) and background. The Type of sheeting selected by the Design-Build Team shall be consistent throughout the project.

The Design-Build Team shall use Type III sheeting for the legend (text) and background of all proposed signs erected on existing overhead sign assemblies with operational sign lighting.

Guardrail or Other Protection for Signs and Overhead Assemblies

The Design-Build Team shall be responsible for determining, designing and installing all protection for proposed and existing sign 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, including but not limited to 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.

Speed Sensor Equipment

The Design-Build Team shall notify the Transportation Program Management Director in writing a minimum of two weeks prior to removing and / or replacing any portion, including but not limited to signs and supports, of overhead sign assemblies that have speed sensor equipment attached. The Design-Build Team shall allow the Department to remove the speed sensor equipment unimpeded. The Department will provide descriptions of known overhead sign assemblies with speed sensor

equipment attached. The Design-Build Team shall be solely responsible for confirming the location of all speed sensor equipment attached to overhead sign assemblies and / or ground mounted signs.

Construction Revisions

After submittal of RFC Signing Plans, all construction revisions shall be submitted to the Department for review and acceptance prior to incorporation.

UTILITIES COORDINATION SCOPE OF WORK (4-29-09)

- **Overview**

The Design-Build Team shall coordinate the relocation and / or adjustment of all utilities in accordance with this scope of work. 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. Coordination shall include any necessary utility agreements when applicable. Ordinarily, the NCDOT is responsible for non-betterment utility relocation costs, including engineering, when the utility company has prior rights of way / compensable interest. However, under the Design-Build process, the Design-Build Team shall be responsible for all NCDOT cost responsibilities. The utility company will be responsible for the relocation cost if they cannot furnish evidence of prior rights of way or a compensable interest in their facilities. Typically, affidavits, recorded easements or NCDOT agreements can serve as evidence of prior rights. 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 method of operation or sequence of work. The Design-Build Team shall be responsible for determining the cost responsibility for the utility relocations. NCDOT will be the approving authority for all utility agreements and approval of plans.

- **Preparation for relocating utilities within the existing or proposed highway Rights of Way**

I. 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

II. The Design-Build Team shall be responsible for confirming the utility locations, confirming the type of facilities, identifying the utility owners and determining the cost responsibilities in order to coordinate the relocation of any utilities in conflict with the project.

- **Arrangements for Protection or Adjustments to Existing Utilities**

I. The Design-Build Team shall make the necessary arrangements with the utility owners for adjustments, relocations or removals 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 construction.

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.

II. 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 under line items V and VI). 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.

III. The cost of utility relocations due to the highway construction shall be the Design-Build Team's responsibility except when the utility company does not have compensable interest. 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.

The cost in relocating CATV due to the highway construction shall be the responsibility of the CATV Company; however, under the following conditions the Design-Build Team shall 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.

IV. If the Design-Build Team elects to make arrangements with a utility company to incorporate a new utility installation or relocation as part of the highway construction, the utility work done by the Design-Build Team and the associated costs for the work shall be negotiated and agreed upon between the Design-Build Team and the utility company.

If the Design-Build Team's design and / or construction requires the relocation of existing water or sewer facilities, designs shall be coordinated with the NCDOT Utility Coordination Unit. The costs for all engineering charges associated with the design for relocation of these existing water and / or sewer facilities shall be the responsibility of the Design-Build Team. 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.

The Design-Build Team shall make arrangements to relocate water or sewer line facilities in which the entities are covered under *General Statute 136-27.1* or occupying a compensable interest. The non-betterment costs associated with this work shall be borne by the Design-Build Team.

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.

If the Design-Build Team is requested, in writing, by an entity to relocate facilities not impacted by the project's construction, and / or upgrade or incorporate new water and sewer 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.

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.

V. 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.*

VI. 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 cost with the utility company and develop the Utility Agreement. The Design-Build Team shall be required to utilize the NCDOT Three-Party Utility Relocation Agreement as required to relocate utilities.

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.

- **Requirements for attachments to existing and / or proposed structures**

I. 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.

II. 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.

III. Documentation of adverse conditions or cost estimates of all feasible alternatives shall be submitted to the NCDOT State Utility Agent, via the Transportation Program Management Director, 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.

- **Preparation for Communication Cables / Electrical Services for Lighting and ITS Devices:**

I. Prior to establishing the location for new meter poles / boxes, 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.

II. Prior to installation, the Design-Build Team shall provide plans for review and approval for all service taps that require a parallel installation within the C/A.

Parallel service installation within a C/A shall be buried and located as close to the R/W line as practical. Only due to unusual circumstances will parallel aerial service installations within C/A be allowed. The Design-Build Team shall justify the allowance of parallel aerial service installation and obtain NCDOT approval prior to installation

III. The Design-Build Team shall be responsible for all coordination activities required for the utility company to provide service taps. Prior to the Design-Build Team developing the associated design and / or instructing the utility company to proceed with providing the service taps, the Design-Build Team shall obtain written approval of the service tap locations from the Resident Engineer. The Design-Build Team shall be responsible for construction costs associated with the utility company providing service taps.

- **Preparation for Adjusting Existing Utilities due to Proposed Traffic Management systems fiber Optic Communication Cables:**

I. Reference ITS Scope of Work

II. The Design-Build Team shall be responsible for coordination activities required for the utility company to adjust or relocate existing facilities to accommodate the proposed ITS Communication Cable. The Resident Engineer shall approve adjustments and relocations of existing facilities prior to the Design-Build Team developing the associated designs. The NCDOT will be responsible for utility adjustment or relocation costs associated with the proposed ITS Communication Cable installation.

ITS SCOPE OF WORK (4-29-09)

NOTE: An existing Traffic.com traffic detector, located between exits 290 and 291 in the median, is not shown on the I-4744 Preliminary Plans. The Design-Build Team shall be responsible for relocation of this device and all other existing ITS devices if impacted by the project. (Reference the Utilities Coordination Scope of Work found elsewhere in this RFP)

I. GENERAL REQUIREMENTS

The Design-Build Team shall design, furnish and install the following ITS devices along I-40 from the Triangle Regional Transportation Management Center (TRTMC), located at 101 Roscoe Trail, Raleigh, NC (near the Wade Avenue Split), to the I-40 interchange at US 1 / US 64:

- Multi-duct conduit system (two - 1.25 inch conduits)
- 144 fiber single-mode fiber optic cable
- Junction boxes
- New CCTV camera at I-40 near Wade Avenue - The new CCTV camera shall be installed east of the I-40 / Wade Avenue interchange at a location that views both I-40 and Wade Avenue.
- New CCTV camera at I-40 and Cary Towne Boulevard – The new CCTV camera shall be installed at a location that views both I-40 and Cary Towne Boulevard.
- Integrate two (2) existing CCTV cameras at the I-40 interchange with US 1 / US 64 with the new fiber optic communication system
- New Dynamic Message Sign (DMS) and structure on I-40 west bound approximately 1000 feet east of the Avent Ferry Road Overpass.

The conduit system, fiber optic cable, new CCTVs, existing CCTVs, and DMS shall be integrated and fully functional at the TRTMC. The CCTV operating software is Protronix VideoPro and the DMS operating software is Daktronics Vanguard.

No construction on the underground conduit system, junction boxes, and / or fiber optic communications system on this project shall begin prior to the Department's written acceptance of the 100% plans and specifications. The Design-Build Team shall allow NCDOT a minimum 20 working-day review period for all submittals.

As part of the plan submittal, the Design-Build Team shall provide product information sheets that contain manufacturer and model numbers for all components. The Design-Build Team shall depict proposed device locations in the plan package and provide detailed drawings for each component, indicating types of materials proposed, installation details, layout of components, and fiber optic splicing details.

Unless otherwise stated in this Scope of Work, the Design-Build Team shall furnish new equipment, materials and hardware that meet the requirements of the 2006 *Standard Specifications for Roads and Structures*.

The Department has a signal equipment Qualified Products List (QPL) available for the contractor's use. The QPL web site is:

http://www.ncdot.org/doh/preconstruct/traffic/ITSS/SMS/qpl/

The Design-Build Team shall only install items defined on the Department's Qualified Products List.

The Design-Build Team shall provide written certification to the Department that all equipment is in accordance with the QPL. When requested by the Department, the Design-Build Team shall provide additional certifications from independent testing laboratories and sufficient data to verify that the item meets applicable specifications. The Design-Build Team shall ensure that the additional certification states that the testing laboratory is independent of the equipment manufacturer and that neither the laboratory nor the manufacturer has a vested interest in the other.

The Design-Build Team shall furnish three copies of the equipment list, including three copies of catalog cuts. The Design-Build Team shall identify the proposed equipment on the catalog cuts by a reproducible means. Equipment lists shall contain the material description, brand name, manufacturer's address and telephone number, stock number, size, identifying trademark or symbol, and other appropriate ratings.

The Design-Build Team shall provide manufacturer's warranties on all equipment for material and workmanship that are customarily issued by the equipment manufacturer and that are at least one year in length from successful completion of the project. The Design-Build Team shall include unconditional coverage for all parts and labor necessary or incidental to the repair of defective equipment or workmanship that arise during the warranty period. Upon successful completion of the project, the Design-Build Team shall transfer all manufacturers' warranties with proper validation by the manufacturer to the Department.

Prior to final acceptance, the Design-Build Team shall furnish plans of record for all fieldwork. Plans of record documentation shall be subject to Department approval prior to final acceptance.

Except for standard bound manuals, the Design-Build Team shall bond all 8½ x 11 inch documentation; including 11 x 17 inch drawings folded to 8½ x 11 inch, in logical groupings in loose-leaf binders of either the 3-ring or plastic slide-ring type. The Design-Build Team shall permanently label each such bound grouping of documentation.

For documentation that exceeds 8½ x 11 inch, the Design-Build Team shall furnish good quality, highly legible, reproducible drawings. The use of 11 x 17 inch drawings folded and bound into manuals will be permitted.

For the fiber optic communication system, the Design-Build Team shall provide detailed splice details. These details shall provide accurate and detailed information for each individual fiber throughout the entire system.

The Design-Build Team shall furnish material and workmanship conforming to the National Electric Code (NEC), the National Electric Safety Code (NESC), Underwriter's Laboratories (UL), and all local safety codes in effect on the date of advertisement. Comply with Article 4, Chapter 87 of the North Carolina General Statutes (Licensing of Electrical Contractors). The Design-Build Team shall comply with all regulations and codes imposed by the owner of affected utility poles. In the event of a conflict between these documents and the requirements contained herein, the cited documents shall govern.

II. PROJECT OPERATION REQUIREMENTS

Intermediate Contract Time #7 for Failure to Repair NCDOT Fiber Optic Communication Cable and / or Conduit Systems, and Restore Communication

In the event that the NCDOT fiber optic communication cable and / or conduit systems are damaged, the Design-Build Team shall repair and restore communication within 24 hours of damage. The Design-Build Team shall repair damaged and / or cut fiber optic cable by replacing the entire section of fiber optic cable and / or conduit. Mid-section splices of existing fiber optic cable and / or conduit shall not be allowed. If damage occurs, the Design-Build Team shall entirely replace the fiber optic cable and / or conduit between the two adjacent existing junction boxes.

Liquidated Damages for Intermediate Contract Time #7 for failure to repair NCDOT fiber optic communication cable and / or conduit systems, and restore communication within 48 hours are $1,500.00 per 24-hour period or any portion thereof.

III. REQUIREMENT FOR CABLES CROSSING RAILROADS

Prior to crossing railroads, the Design-Build Team shall contact the railroad company, obtain all necessary permits, pay all associated fees and provide necessary insurance coverage. Reference the Requirements for Cables Crossing Railroads Project Special Provision found elsewhere in this RFP.

IV. MULTI-DUCT CONDUIT

The Design-Build Team shall furnish and install two (2) - 1¼-inch inside diameter multi-duct conduit systems and all necessary hardware by the plowing method or trenching method in accordance with the 2006 *Standard Specifications for Roads and Structures* along I-40 from the Triangle Regional Transportation Management Center (TRTMC), located at 101 Roscoe Trail, Raleigh, NC (near the Wade Avenue Split), to the I-40 interchange at US 1 / US 64.

The Design-Build Team shall provide and install underground marker tape at a depth of 1 to 1.5 feet directly over all conduit installations.

The Design-Build Team shall furnish and install duct plugs that provide a watertight barrier when installed in an unused conduit. The Design-Build Team shall furnish and install duct

plugs sized in accordance with the conduit furnished. The Design-Build Team shall provide and install duct plugs that are removable and reusable.

The Design-Build Team shall furnish and install mechanical sealing devices that provide a watertight barrier between the conduit and communications cable. The Design-Build Team shall furnish and install mechanical sealing devices sized in accordance with the conduit furnished and with appropriately sized holes for the communications cable. The Design-Build Team shall provide and install mechanical sealing devices that are removable and reusable.

Upon completion of the conduit installation, the Design-Build Team shall perform a mandrel test on the conduit system to ensure that no conduit(s) has been damaged. The Design-Build Team shall furnish and install a non-metallic mandrel having a diameter of approximately 50% of the inside conduit diameter in which it is to be pulled through. If damage has occurred, the Design-Build Team shall replace the entire length of conduit.

The Design-Build Team shall not splice or join sections of conduit(s). Upon obtaining prior written Department approval, a junction box may be installed at locations where splicing or coupling of the conduit is necessary due to problems encountered with the installation.

Immediately following the installation of the conduit(s), the Design-Build Team shall use duct plugs to seal the ends of the conduit. The Design-Build Team shall secure the pull lines to the duct plugs in such a manner that it shall not interfere with the installation of the duct plug and provide a watertight seal. In conduits containing communications cable, the Design-Build Team shall seal the conduits with a Department approved mechanical sealing device. The Design-Build Team shall ensure the installation provides a watertight seal.

Upon completion of the conduit installation, the Design-Build Team shall furnish the Engineer with a plan of record drawings showing the horizontal and vertical locations of all installed conduits.

V. TRACER WIRE

The Design-Build Team shall furnish and install "green" insulated Number 14 AWG, THWN, stranded, copper wire to serve as a tracer wire in all conduits containing fiber optic communications cable in accordance with the 2006 *Standard Specifications for Roads and Structures*. The Design-Build Team shall pull the tracer wire simultaneously with the fiber optic communications cable in a continuous length. When multiple pulls of fiber optic cable is required, only one tracer wire is required. Where tracer wire is spliced, the Design-Build Team shall provide and install waterproof butt splices. Splicing shall be allowed only in junction boxes. The Design-Build Team shall label and connect the tracer wire(s) to the equipment ground bus bar in all cabinets.

In conduits containing communications cable seal the conduit with an approved mechanical sealing device. Ensure the installation provides a watertight seal.

VI. DIRECTIONAL DRILLING

The Design-Build Team shall furnish and install two (2) - 1¼-inch inside diameter multi-duct conduit systems and all necessary hardware by using the horizontal directional drilling method in accordance with the 2006 *Standard Specifications for Roads and Structures*. Where conduits cannot be installed using the plowing method or trenching method (e.g. under roadways, under bridge structures, steep slopes, behind guardrail, etc.), the Design-Build Team shall directional drill conduits to facilitate the installation of a continuous conduit system along I-40 from the Triangle Regional Transportation Management Center, located at 101 Roscoe Trail, Raleigh, NC (near the Wade Avenue split), to the I-40 interchange at US 1 / US 64.

VII. JUNCTION BOXES

The Design-Build Team shall furnish and install junction boxes (pull boxes) with all necessary hardware in accordance the 2006 *Standard Specifications for Roads and Structures*.

The Design-Build Team shall provide and install junction boxes with minimum inside dimensions of 30(l) x 15(w) x 24(d) inches that can withstand H-20 loading in accordance with AASHTO *Standard Specifications for Highways and Bridges*, H520-44.

The Design-Build Team shall provide and install junction box covers with standard "NCDOT Fiber Optic" logos, pull slots, and stainless steel bolts.

The Design-Build Team shall not provide a sealant compound between junction boxes and covers.

The Design-Build Team shall provide and install junction boxes at maximum intervals of fifteen hundred (1500) feet, or at locations where underground splicing is necessary.

VIII. FIBER-OPTIC CABLE

The Design-Build Team shall furnish and install single mode fiber-optic (SMFO) communications cable, and all necessary hardware in accordance with the 2006 *Standard Specifications for Roads and Structures*. The fiber cable shall be installed in one of the 1 ¼-inch conduits referenced in Section III and Section IV of this Scope of Work. The installation of this fiber-optic cable shall form a complete and continuous fiber-optic communications system along I-40 from the Triangle Regional Transportation Management Center (TRTMC), located at 101 Roscoe Trail, Raleigh, NC (near the Wade Avenue Split), to the I-40 interchange at US 1 / US 64.

The Design-Build Team shall furnish and install one hundred and forty-four (144) fiber SMFO communications cable, communications cable identification markers, and all necessary hardware. The Design-Build Team shall test each fiber in the cable and record the OTDR results electronically and on hard copy. The Design-Build Team shall deliver electronic and hard copy of the fiber optic cable test results to the Engineer.

The Design-Build Team shall furnish and install twelve (12) fiber SMFO drop cables at each device location. These drop cables shall be spliced with 144 fiber cable to establish a complete and operational fiber optic communications system. The Design-Build Team shall perform attenuation tests on each fiber in the drop cables and record the results. The Design-Build Team shall deliver these results to the Engineer.

The Design-Build Team shall furnish and install loose tube fiber-optic cable that complies with RUS CFR 1755.900, single mode with a dielectric central member. The Design-Build Team shall provide and install single mode fiber in the cable that does not exceed 0.25 dB / km at 1550 nm and 0.35 dB / km at 1310 nm. The Design-Build Team shall provide cable with all fibers that are useable and with a surface sufficiently free of imperfections and inclusions to meet optical, mechanical, and environmental requirements. The Design-Build Team shall provide and install cable with a minimum of one ripcord under the sheath for easy sheath removal and with shipping, storage, installation, and operating temperature of at least - 40 to 160 degrees F.

The Design-Build Team shall provide and install fibers inside a loose buffer tube. The fiber optic cable shall contain twelve (12) fibers in each buffer tube. The Design-Build Team shall provide and install a doped silica core surrounded by concentric silica cladding for each fiber. The Design-Build Team shall distinguish each fiber and buffer tube from others by means of color coding meeting the requirements of EIA/TIA-598, “Color Coding of Fiber-Optic Cables.” In buffer tubes containing multiple fibers, the Design-Build Team shall ensure that the colors are stable during temperature cycling and not subject to fading, sticking, or smearing into each other or into the gel filling material. The Design-Build Team shall construct buffer tubes with an inner layer made of polycarbonate and an outer layer made of polyester. The Design-Build Team shall provide and install fillers in cable core if necessary to provide a symmetrical cross-section of cable. The Design-Build Team shall fill buffer tubes with non-hygroscopic, non-nutritive to fungus, electrically non-conductive, homogenous gel. The Design-Build Team shall ensure all gel is free from dirt and foreign matter, and is removable with conventional nontoxic solvents.

The Design-Build Team shall provide and install a central member consisting of a dielectric glass reinforced plastic rod. The Design-Build Team shall apply binders with sufficient tension to secure buffer tubes and binders to the central member without crushing buffer tubes. The Design-Build Team shall ensure binders are non-hygroscopic, non-wicking (or rendered so by the flooding compound), and dielectric with low shrinkage.

The Design-Build Team shall provide and install cable that has cable core interstices filled with super-absorbent, water-blocking compound that is non-conductive and homogenous. The Design-Build Team shall ensure all compound is free from dirt and foreign matter, and is removable with conventional nontoxic solvents.

The Design-Build Team shall provide and install cable with high tensile strength aramid yarns or fiberglass yarns that are helically stranded evenly around the cable core.

The Design-Build Team shall provide and install cable jacket of consistent thickness that is free of holes, splits, and blisters, and containing no metal elements. The Design-Build Team

shall provide and install outer jacket of medium density polyethylene with minimum nominal sheath thickness of 0.050 inch. The Design-Build Team shall ensure all polyethylene contains carbon black for ultraviolet light protection and does not promote the growth of fungus.

The Design-Build Team shall provide and install length markings in sequential feet and within one percent of actual cable length. The Design-Build Team shall ensure character height of all markings is approximately 0.10 inch.

IX. FIBER OPTIC TERMINATION

The Design-Build Team shall terminate the one hundred and forty-four (144) fiber SMFO communications cable in the TRTMC equipment room. All fibers (144) shall be terminated and connected to a patch panel that is housed in a 19 inch rack. Since the existing fiber optic termination rack in the TRTMC is at maximum capacity, the Design-Build Team shall replace or expand the existing rack to accommodate terminating the new 144 fiber optic cable, including patch panels.

X. FIBER-OPTIC SPLICE ENCLOSURES

The Design-Build Team shall furnish and install underground fiber-optic splice enclosures, and all necessary hardware where required to join fiber optic cables in compliance with the 2006 *Standard Specifications for Roads and Structures*.

The Design-Build Team shall furnish and install underground splice enclosures that are re-enterable using a mechanical dome-to-base seal with a flash test valve, and that are impervious to the entry of foreign material (water, dust, etc.). The Design-Build Team shall ensure enclosures are manufactured in such a manner to be suitable for buried, junction box, and manhole installation. The Design-Build Team shall provide and install heat shrink cable shields with the enclosure to ensure a weather tight seal where each cable enters the enclosure.

Within enclosures, the Design-Build Team shall provide and install the necessary number of hinged mountable splice trays to store the number of splices required, plus the capacity to house twelve (12) additional splices. The Design-Build Team shall provide and install a fiber containment basket for storage of loose buffer tubes that are expressed through the enclosure. The Design-Build Team shall ensure enclosures allow sufficient space to prevent damage of the buffer tubes when coiled.

XI. COMMUNICATIONS CABLE IDENTIFICATION MARKERS

The Design-Build Team shall furnish and install yellow communications cable identification markers that are resistant to fading when exposed to UV sources and changes in weather inside all junction boxes. The Design-Build Team shall provide and install markers designed to coil around fiber-optic cable, and that do not slide or move along the surface of the cable once installed. The Design-Build Team shall ensure exposure to UV light and weather does not affect the markers natural coiling effect or deteriorate performance. The Design-Build

Team shall provide and install communications cable wraps that permit writing with an indelible marking pen and that contain the following text in black:

WARNING
NCDOT FIBER OPTIC CABLE
CONTACT TELEPHONE NUMBER: (919) 233-9331

Overall Marker Dimensions.....7(l) x 4(w) inches
Lettering Height.....3/8 inch for "WARNING"
Other Lettering.....1/4 inch

The Design-Build Team shall submit a sample of the proposed communications cable identification markers to the Engineer for approval prior to installation.

XII. DELINEATOR MARKERS

The Design-Build Team shall furnish and install delineator markers with all necessary hardware in compliance with the 2006 *Standard Specifications for Roads and Structures*.

The Design-Build Team shall provide text, including but not limited to the Division contact number, that is hot stamped in black on a yellow background material that will not fade or deteriorate over time. The Design-Build Team shall provide and install 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: (919) 233-9331

The Design-Build Team shall submit a sample of the proposed delineator markers and obtain Department approval prior to installation.

The Design-Build Team shall provide and install delineator markers at fifteen hundred (1500) foot intervals. The Design-Build Team shall install delineator markers using a method that firmly and securely anchors the delineator marker in the ground to prohibit twisting and easy removal.

XIII. CCTV CAMERAS

1. New CCTV Cameras

The Design-Build Team shall provide and install the new CCTV cameras on wood 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

2. Integrate Existing CCTV Cameras

    The Design-Build Team shall integrate two existing CCTV cameras located at I-40 and US 1 / US 64 interchange into TRTMC using the new fiber optic communications cable. The Design-Build Team shall furnish and install at the field and TRTMC all necessary equipment and cables required for this integration. The Design-Build Team shall ensure all newly installed equipment is fully compatible with existing equipment in the TRTMC.

    The existing CCTVs at I-40 and US 1 / US 64 interchange currently communicate using Spread Spectrum radios. The Design-Build Team shall remove the Spread Spectrum Radios, mounting hardware, and cables and deliver undamaged to the Engineer.

The Design-Build Team shall perform System Test on the newly integrated CCTV Cameras. (Reference Item XVIII – TESTING located elsewhere in this Scope of Work)

XIV. CCTV Camera Pole (60' class 3)

The Design-Build Team shall furnish and install wood poles that meet or exceed the requirements outlined in Sections 1082, 1098-6 and 1720 of the 2006 *Standard Specifications for Roads and Structures*. The Design-Build Team shall determine CCTV pole locations and obtain written approval from the Department prior to installation. The Design-Build Team shall furnish and install Class 3 (60') wood poles or longer at Department approved sites.

The Design-Build Team shall set the 60-foot wood poles at a depth of 10 feet. 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. Reference the following ITS Details for additional requirements:

- CCTV Camera Installation for Wood Poles with Aerial Electrical Service – Option with separate service pole
- CCTV Camera Installation for Wood Poles with Aerial Electrical Service – Option without separate service pole
- CCTV Camera Installation for Wood Poles with Underground Electrical Service
- Dynamic Message Sign Electrical Service and Grounding

XV. FIBER OPTIC VIDEO TRANSCEIVERS

The Design-Build Team shall furnish and install fiber optic transceivers in accordance with this Scope of Work. The Design-Build Team shall furnish and install fiber optic transceivers that are compatible, interoperable and completely interchangeable with the existing fiber optic transceivers currently in use by NCDOT. The existing transceivers are IFS VT14130 WDM and IFS VR 14130 WDM.

The Design-Build Team shall provide and install a 19-inch card rack with power supply and fiber optic video receivers in the TRTMC. The fiber optic video receivers shall receive CCTV video and transmit PTZ data over a single fiber.

The Design-Build Team shall provide and install fiber optic video transmitters (w/data) at CCTV camera site. The fiber optic video transmitters shall transmit CCTV video and receive PTZ data over a single fiber.

XVI. DYNAMIC MESSAGE SIGN

The Design-Build Team shall furnish and install a Full Matrix Dynamic Message Sign (DMS) on I-40 westbound as shown on the I-4744 Signing Schematic dated March 11, 2009. The Design-Build Team shall install the DMS in the roadway median. The Design-Build Team shall furnish and install a pole mounted cabinet for housing the DMS field control equipment. The Design-Build Team shall obtain written approval prior to modifying the DMS and DMS field control equipment locations shown on the aforementioned Signing Schematic.

The existing DMS equipment and central software in the Region is Daktronics Vanguard. All new DMS equipment and local software furnished and installed by the Design-Build Team shall be fully compatible with the existing central equipment and central software. If the proposed DMS equipment and / or software have not been previously deployed successfully in the Region, a fully functional prototype shall be submitted for evaluation and approval. The Design-Build Team shall ensure the DMS hardware, software, features, tests, and functionalities completely comply with the Dynamic Message Sign Project Special Provision found elsewhere in this RFP.

The Design-Build Team shall integrate the new DMS into the TRTMC DMS system and conduct approved unit and system tests.

XVII. ELECTRICAL SERVICE

The Design-Build Team shall provide and install new electrical service as required at the CCTVs and DMS locations in compliance with the National Electrical Code (NEC), the National Electrical Safety Code (NESC), Sections 1098-1(H) and 1700-3(C) of the NCDOT 2006 *Standard Specifications for Roads and Structures*, and all local ordinances. All work involving electrical service shall be coordinated with the appropriate utility company and the Engineer or his designated representative prior to installation. (Reference Utilities Coordination Scope of Work found elsewhere in this RFP)

The Design-Build Team shall apply and pay for all fees associated with all electrical permits and inspections required by the local utility companies. The Design-Build Team shall not be granted contract time extensions for delays associated with installing new electrical service.

XVIII. TESTING

The Design-Build Team shall submit a detailed **Unit** and **System Test Plan** to the Engineer for review and approval at least 45 working days prior to initiation of any testing. The Design-Build Team shall identify all required testing levels for the specific equipment provided. The Design-Build Team shall identify the test organization, including the roles and responsibilities of the quality assurance organization.

The Design-Build Team shall notify the Engineer of the proposed date, time and location of all testing 45 working days in advance of the test being performed. All testing shall be

performed by the Design-Build Team and observed by the Engineer. The Engineer may perform additional testing at any time during the project.

LIGHTING SCOPE OF WORK (4-1-09)

GENERAL

Provide and install roadway lighting equipment and materials, in accordance with Division 1400 of the 2006 NCDOT *Standard Specifications for Roads and Structures* and the *Roadway Standard Drawings*, except as amended below. NCDOT will provide the lighting design.

Allow the Department 10 days to update and finalize lighting design after Release for Construction (RFC) Roadway plans are complete and accepted by the Transportation Program Management Director. Provide electronic CADD files in MicroStation format, using Geopak Software (current version used by the Department) showing design changes.

Allow 10 days for Department review of each submittal for all materials including poles and foundation designs. An additional 10 days shall be required for pole submittals from vendors that do not commonly do business with the Department.

Maintain the lighting system until the project is accepted.

Reference the Traffic Control and Pavement Markings Scope of Work found elsewhere in this RFP for time restrictions and lane closure requirements.

MATERIALS

- **High Mount Standard**

  Amend paragraph five (5) of Section 1401-2 of the 2006 *Standard Specifications for Roads and Structures* as follows:

  Have the design of the support including base plate and anchorage conform to 2004 *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*, and the Interim Specifications valid at the time of letting. Fatigue Category II shall be used in design. The welding design and fabrication shall be in accordance with Article 1072-20 of the 2006 *Standard Specifications for Roads and Sturctures*.

  The support shall be designed for the wind velocity shown on the plans.

- **Light Control System**

  Amend Section 1408-2 of the 2006 *Standard Specifications for Roads and Structures* as follows:

  The completed light control system shall be marked “Suitable for Use as Service Equipment”, in a prominent location in the enclosure, in accordance with NEC article 409.110.

  Provide a polymer concrete (PC) junction box measuring 36"L x 24"W x 18"H (PC36) and meeting the requirements of Section 1411 of the Standard Specifications.

CONSTRUCTION

- **Wiring Methods**

  Amend Section 1400-4(F) of the 2006 *Standard Specifications for Roads and Structures* to include the following:

  Pull conductors by hand, or use motorized cable-pulling equipment designed for pulling multiple cables into conduit. Use sheaves or rollers, as required to prevent damage to conductor insulation. Do not use an automobile to generate cable pulling forces. Use equipment similar to the Greenlee model UT2 cable pulling system, or Engineer approved equal.

- **Inspections**

  Amend Section 1400-5 of the 2006 *Standard Specifications for Roads and Structures* to include the following:

  Provide the personnel and equipment necessary for removing and replacing fuseholders and / or operating circuit breakers, to facilitate the insulation resistance test described elsewhere in this Scope of Work.

  To minimize the potential for delays preparing the final inspection punch list, the Design-Build Team shall coordinate inspection of the items defined in the NCDOT LIGHTING SYSTEM INSPECTION CHECKLIST with the project inspector as work progresses and at the end of the project. Upon request, a copy of the NCDOT LIGHTING SYSTEM INSPECTION CHECKLIST will be provided.

- **Performance Tests**

  Amend Section 1400-6 of the 2006 *Standard Specifications for Roads and Structures* to include the following:

  Provide a calibrated MegOhmMeter, with certification that calibration was done recently (within one year of use). Provide a meter manufactured by Fluke, Amprobe, Biddle, or Engineer approved equal. Present the meter for inspection at the pre-lighting-work meeting described elsewhere in this Scope of Work.

  Removing water from the conduit of a faulty circuit is not considered a repair. Water in the conduit allows current to flow between skinned places in the conductors insulation. If a circuit fails the insulation resistance test, and removing water allows the circuit to pass, replace the conductors and re-test the new circuit.

- **Construction Phasing**

  Amend Section 1400-11 of the 2006 *Standard Specifications for Roads and Structures* to include the following:

  Schedule a pre-lighting-work meeting before beginning work on the lighting system. Include staff members from the prime contractor, electrical sub-contractor, Resident Engineer's office, and the Lighting / Electrical squad in the Roadway Design Unit in Raleigh.

- **High Mount Standard**

  Same as Section 1401-3 of the 2006 *Standard Specifications for Roads and Structures* except as amended below:

  Anchor Rod Nut Tightening Requirements for Metal Poles

  Tighten anchor rod nuts in accordance with the Anchor Rod Nut Tightening Requirements section of the Project Special Provision for Overhead Sign Supports.

- **Light Control System**

  Amend Section 1408-3 of the 2006 *Standard Specifications for Roads and Structures* to add the following:

  Install PC36 junction box within 2' of edge of pad in front of Control System. Stub all feeder circuit conduits and spare conduits from Control System in this junction box. See plans developed by the Department for conduit sizes. Place pull cord in any unused conduits and cap unused conduit in junction box.

FINAL INSPECTION

Contact Lighting / Electrical engineers from NCDOT to inspect the completed lighting system and perform insulation resistance testing for all conductors prior to contract acceptance.

ELECTRICAL SERVICE

Coordinate with the local utility company, make application and pay all deposit fees to provide necessary electrical service. Refer to Utilities Coordination Scope of Work for additional coordination / approval requirements, payments and other costs.

MAINTENANCE

Assume responsibility for routine maintenance of the lighting system(s) for the duration of the contract in accordance with Section 1400 of the 2006 *NCDOT Standard Specifications for Roads and Structures*, except as amended below.

NCDOT will pay the monthly power bills. NCDOT will assume maintenance responsibility for the completed lighting systems after the project is accepted, and there is no chance of construction-related damage.

EROSION AND SEDIMENTATION CONTROL SCOPE OF WORK (4-29-09)

The NCDOT 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 *NCDENR - Erosion and Sediment Control Planning and Design Manual* for erosion control design guidelines not addressed in this Scope of Work.

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. Show 50-foot Environmentally Sensitive Area (ESA) around all streams with Neuse River buffer zones on Clearing & Grubbing EC Plans only
7. 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-B's in proposed TSD's and temporary diversions (TD)
8. Protect existing streams; do not place erosion control devices in live streams
9. 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, Q25, using 25-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 for partial duration (ARI) time series type). A Sediment Basin Designer Spreadsheet will be provided by the NCDOT Roadside Environmental Unit (REU) upon request.
10. Design Riser Basins to the following standards:
    a. Surface Area shall be determined by Equation A(sq. feet) = Q25(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. Perforations in the riser pipe shall be reduced to increase dewatering time to twenty-four (24) hours
e. See *NCDENR- Erosion and Sediment Control Planning and Design Manual* for additional design criteria

11. 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, Q25, using the 25-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 for partial duration (ARI) time series type). A Skimmer Basin Designer Spreadsheet will be provided by the NCDOT Roadside Environmental Unit (REU) upon request.
12. The minimum and maximum length to width ratio of all Sediment Basins shall be 2:1 and 6:1, respectively.
13. 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.
14. Include any culvert and / or pipe construction sequence plan sheets in the Clearing & Grubbing Erosion Control Plans; all pipes 48" or larger, or any combination of pipes that total 48" 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.
15. Incorporate temporary sediment basins into permanent stormwater devices.
16. Utilize Wattles with Polyacrylamide (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 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-B's to reduce velocity in existing and proposed ditches with spacing of 250 feet divided by percentage of ditch grade. Also utilize TRSC-B's in proposed TSD's and TD's
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 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, Q25, using 25-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 for partial duration (ARI) time series type). A Sediment Basin Designer Spreadsheet will be provided by NCDOT REU upon request
9. Provide matting for erosion control in all ditch lines 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) = Q25(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. Perforations in the riser pipe shall be reduced to increase dewatering time to twenty-four (24) hours
    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, Q25, using the 25-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 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 Wattles with Polyacrylamide (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 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 temporary rock silt check type B, coir fiber baffle, skimmer basin, 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/

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 & Sediment 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 REU will provide a sample set of Erosion and Sedimentation Control Plans (including any special details or special provisions used by the NCDOT REU) 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 REU.
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 Erosion and Sedimentation Control 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 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.
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 15th 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. Erosion Control / Stormwater Certification shall be required according to the Project Special Provision found elsewhere in this RFP.
O. 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.

EROSION CONTROL LIQUIDATED DAMAGES:

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.

OPEN BURNING

Open burning shall not be 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 Wake 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.

PUBLIC INFORMATION SCOPE OF WORK (4-1-09)

NCDOT will take the lead role on this project and be responsible for a portion of the public information efforts through the Department's IMPACT Team. Unless noted otherwise elsewhere in this RFP, the NCDOT responsibilities include:

- Organizing public meetings
- Providing media announcements
- Developing and producing informational print materials
- Soliciting and administering advertisements, as deemed necessary
- Mailings to the identified target audiences, including information development and 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:

- 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
- Hand delivery of time sensitive informational materials.

Prior to distribution, the IMPACT Team shall review and approve all public information materials created by the Design-Build Team.

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 3 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 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 impacted 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 Plan and construction details. As a minimum, the Design-Build Team shall be responsible for the following involvement:

- 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 / ramp 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. Distribution responsibilities shall include all resources necessary to hand deliver the informational materials to the affected target audiences.

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.

A web site is not required for this project. However, if the Design-Build Team proposes a project web site maintained on a NCDOT server, all web site development must use the current NCDOT Traffic Systems Operations Unit project web design template and must adhere to current software development, security and technical infrastructure standards. All web site design and implementation shall be coordinated with Mr. Ryan Nolan, Internet Web Content Manager, NCDOT Emerging Technologies. The Design-Build Team shall indicate in their Technical Proposal their intent to utilize a web site for this project. All costs associated with setting up and maintaining this website shall be included in the lump sum bid for this project.

***** PROJECT SPECIAL PROVISION *****

(10-18-95) Z-1

PERMITS

The Design-Build Team's attention is directed to the following permits that have been issued to the Department of Transportation by the authority granting the permit.

Permit	Authority Granting Permit
Section 404 Nationwide Permits 3 and 13	United States Army Corps of Engineers
Section 401 Water Quality Certification and Neuse Buffer Authorization	NC Department of Natural Resources (DENR), Division of Water Quality

The Design-Build Team shall comply with all applicable permit conditions during construction of this project. Those conditions marked by ***** are the responsibility of the department and the Design-Build Team has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Design-Build Team's attention is also directed to Articles 107-10 and 107-14 of the 2006 *Standard Specifications for Roads and Structures* and the following:

Should the Design-Build Team propose to utilize construction methods (such as temporary structures or fill in waters and / or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Design- Build Team's responsibility to coordinate with the Engineer to determine what, if any, additional permit action is required. The Design-Build Team shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Design-Build Team shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Design-Build Team's request for approval of construction methods not specifically identified in the permit.

NATIONWIDE PERMIT 3
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
FINAL NOTICE OF ISSUANCE AND MODIFICATION OF NATIONWIDE PERMITS
FEDERAL REGISTER
AUTHORIZED MARCH 19, 2007

Maintenance. (a) The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure, or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. This NWP authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the district engineer, provided the permittee can demonstrate funding, contract, or other similar delays.

(b) This NWP also authorizes the removal of accumulated sediments and debris in the vicinity of and within existing structures (e.g., bridges, culverted road crossings, water intake structures, etc.) and the placement of new or additional riprap to protect the structure. The removal of sediment is limited to the minimum necessary to restore the waterway in the immediate vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend further than 200 feet in any direction from the structure. This 200 foot limit does not apply to maintenance dredging to remove accumulated sediments blocking or restricting outfall and intake structures or to maintenance dredging to remove accumulated sediments from canals associated with outfall and intake structures. All dredged or excavated materials must be deposited and retained in an upland area unless otherwise specifically approved by the district engineer under separate authorization. The placement of riprap must be the minimum necessary to protect the structure or to ensure the safety of the structure. Any bank stabilization measures not directly associated with the structure will require a separate authorization from the district engineer.

(c) This NWP also authorizes temporary structures, fills, and work necessary to conduct the maintenance activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

(d) This NWP does not authorize maintenance dredging for the primary purpose of navigation or beach restoration. This NWP does not authorize new stream channelization or stream relocation projects.

Notification: For activities authorized by paragraph (b) of this NWP, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). Where maintenance dredging is proposed, the pre-construction notification must include information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals. (Sections 10 and 404)

Note: This NWP authorizes the repair, rehabilitation, or replacement of any previously authorized structure or fill that does not qualify for the Clean Water Act Section 404(f) exemption for maintenance.

NATIONWIDE PERMIT 13
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
FINAL NOTICE OF ISSUANCE AND MODIFICATION OF NATIONWIDE PERMITS
FEDERAL REGISTER
AUTHORIZED MARCH 19, 2007

Bank Stabilization. Bank stabilization activities necessary for erosion prevention, provided the activity meets all of the following criteria:

(a) No material is placed in excess of the minimum needed for erosion protection;

(b) The activity is no more than 500 feet in length along the bank, unless this criterion is waived in writing by the district engineer;

(c) The activity will not exceed an average of one cubic yard per running foot placed along the bank below the plane of the ordinary high water mark or the high tide line, unless this criterion is waived in writing by the district engineer;

(d) The activity does not involve discharges of dredged or fill material into special aquatic sites, unless this criterion is waived in writing by the district engineer;

(e) No material is of the type, or is placed in any location, or in any manner, to impair surface water flow into or out of any water of the United States;

(f) No material is placed in a manner that will be eroded by normal or expected high flows (properly anchored trees and treetops may be used in low energy areas); and,

(g) The activity is not a stream channelization activity.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if the bank stabilization activity: (1) involves discharges into special aquatic sites; (2) is in excess of 500 feet in length; or (3) will involve the discharge of greater than an average of one cubic yard per running foot along the bank below the plane of the ordinary high water mark or the high tide line. (See general condition 27.) (Sections 10 and 404)

NATIONWIDE PERMIT CONDITIONS

The following General Conditions must be followed in order for any authorization by a NWP to be valid:

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.

15. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

16. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

17. Endangered Species. (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. No activity is authorized

under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees shall notify the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

(e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, both lethal and non-lethal "takes" of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide Web pages at http://www.fws.gov/ and http://www.noaa.gov/fisheries.html respectively.

18. Historic Properties. (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State

Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, explaining the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

19. Designated Critical Resource Waters. Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, state natural heritage sites, and outstanding national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the district engineer after notice and opportunity for public comment. The district engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 27, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

20. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10 acre and require pre-construction notification, unless the district engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. For wetland losses of 1/10 acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream restoration, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2 acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2 acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

21. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

22. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

23. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

24. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

25. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:
"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate

the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

(Transferee)

(Date)

26. Compliance Certification. Each permittee who received an NWP verification from the Corps must submit a signed certification regarding the completed work and any required mitigation. The certification form must be forwarded by the Corps with the NWP verification letter and will include:

(a) A statement that the authorized work was done in accordance with the NWP authorization, including any general or specific conditions;

(b) A statement that any required mitigation was completed in accordance with the permit conditions; and

(c) The signature of the permittee certifying the completion of the work and mitigation.

27. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, as a general rule, will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) Forty-five calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 17 that listed species or critical habitat might affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 18 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) is completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee cannot begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained.

Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided result in a quicker decision.);

(4) The PCN must include a delineation of special aquatic sites and other waters of the United States on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters of the United States, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, where appropriate;

(5) If the proposed activity will result in the loss of greater than 1/10 acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(2) For all NWP 48 activities requiring pre-construction notification and for other NWP activities requiring pre-construction notification to the district engineer that result in the loss of greater than 1/2-acre of waters of the United States, the district engineer will immediately provide (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy of the PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps multiple copies of pre-construction notifications to expedite agency coordination.

(5) For NWP 48 activities that require reporting, the district engineer will provide a copy of each report within 10 calendar days of receipt to the appropriate regional office of the NMFS.

(e) District Engineer's Decision: In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If the proposed activity requires a PCN and will result in a loss of greater than 1/10 acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any conditions the district engineer deems necessary. The district engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment

(after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan.

28. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

FURTHER INFORMATION

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project.

DEFINITIONS

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration, establishment (creation), enhancement, or preservation of aquatic resources for the purpose of compensating for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Discharge: The term "discharge" means any discharge of dredged or fill material.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a

decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Intermittent stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities eligible for exemptions under Section 404(f) of the Clean Water Act are not considered when calculating the loss of waters of the United States.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of standing or

flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas (see 33 CFR 328.3(e)).

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands adjacent to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through

which surface and subsurface hydrology connects waterbodies with their adjacent uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 20.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete project: The term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete project must have independent utility (see definition). For linear projects, a "single and complete project" is all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single waterbody several times at separate and distant locations, each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a wetland (i.e., water of the United States) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line, which is defined at 33 CFR 328.3(d).

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a jurisdictional water of the United States that, during a year with normal patterns of precipitation, has water flowing or standing above ground to the extent that an ordinary high water mark (OHWM) or other indicators of jurisdiction can be determined, as well as any wetland area (see 33 CFR 328.3(b)). If a jurisdictional wetland is adjacent--meaning bordering, contiguous, or neighboring--to a jurisdictional waterbody displaying an OHWM or other indicators of jurisdiction, that waterbody and its adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of "waterbodies" include streams, rivers, lakes, ponds, and wetlands.

REGIONAL CONDITIONS FOR NATIONWIDE PERMITS IN THE WILMINGTON DISTRICT

1. Excluded Waters

The Corps has identified waters that will be excluded from the use of all NWP's during certain timeframes. These waters are:

1.1. Anadromous Fish Spawning Areas

Waters of the United States identified by either the North Carolina Division of Marine Fisheries (NCDMF) or the North Carolina Wildlife Resources Commission (NCWRC) as anadromous fish spawning areas are excluded during the period between February 15 and June 30, without prior written approval from NCDMF or NCWRC and the Corps.

1.2. Trout Waters Moratorium

Waters of the United States in the twenty-five designated trout counties of North Carolina are excluded during the period between October 15 and April 15 without prior written approval from the NCWRC. (see Section I. b. 7. for a list of the twenty-five trout counties).

1.3. Sturgeon Spawning Areas

Waters of the United States designated as sturgeon spawning areas are excluded during the period between February 1 and June 30, without prior written approval from the National Marine Fisheries Service (NMFS).

2. Waters Requiring Additional Notification

The Corps has identified waters that will be subject to additional notification requirements for activities authorized by all NWP's. These waters are:

2.1. Western NC Counties that Drain to Designated Critical Habitat

Waters of the U.S. that requires a Pre-Construction Notification pursuant to General Condition 27 (PCN) and located in the sixteen counties listed below, applicants must provide a copy of the PCN to the US Fish and Wildlife Service, 160 Zillicoa Street, Asheville, North Carolina 28805. This PCN must be sent concurrently to the US Fish and Wildlife Service and the Corps Asheville Regulatory Field Office. Please see General Condition 17 for specific notification requirements related to Federally Endangered Species and the following website for information on the location of designated critical habitat.

Counties with tributaries that drain to designated critical habitat that require notification to the Asheville US Fish and Wildlife Service: Avery, Cherokee, Forsyth, Graham, Haywood,

Henderson, Jackson, Macon Mecklenburg, Mitchell, Stokes, Surry, Swain, Transylvania, Union and Yancey.

Website and office addresses for Endangered Species Act Information:

The Wilmington District has developed the following website for applicants which provide guidelines on how to review linked websites and maps in order to fulfill NWP general condition 17 requirements.

http://www.saw.usace.army.mil/wetlands/ESA

Applicants who do not have internet access may contact the appropriate US Fish and Wildlife Service offices or the US Army Corps of Engineers office listed below.

US Fish and Wildlife Service
Asheville Field Office
160 Zillicoa Street
Asheville, NC 28801
Telephone: (828) 258-3939

Asheville US Fish and Wildlife Service Office counties: All counties west of and including Anson, Stanly, Davidson, Forsyth and Stokes Counties

US Fish and Wildlife Service
Raleigh Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
Telephone: (919) 856-4520

Raleigh US Fish and Wildlife Service Office counties: all counties east of and including Richmond, Montgomery, Randolph, Guilford, and Rockingham Counties.

2.2. Special Designation Waters

Prior to the use of any NWP in any of the following North Carolina identified waters and contiguous wetlands, applicants must comply with Nationwide Permit General Condition 27 (PCN). The North Carolina waters and contiguous wetlands that require additional notification requirements are:

"Outstanding Resource Waters" (ORW) and "High Quality Waters" (HQW) (as designated by the North Carolina Environmental Management Commission), or
"Inland Primary Nursery Areas" (IPNA) (as designated by the North Carolina Wildlife Resources Commission), or "Contiguous Wetlands" (as defined by the North Carolina Environmental Management Commission), or "Primary Nursery Areas" (PNA) (as designated by the North Carolina Marine Fisheries Commission).

2.3. Coastal Area Management Act (CAMA) Areas of Environmental Concern

Non-Federal applicants for any NWP in a designated "Area of Environmental Concern" (AEC) in the twenty (20) counties of Eastern North Carolina covered by the North Carolina Coastal Area Management Act (CAMA), must also obtain the required CAMA permit. Construction activities for non-Federal projects may not commence until a copy of the approved CAMA permit is furnished to the appropriate Wilmington District Regulatory Field Office (Wilmington Field Office – P.O. Box 1890, Wilmington, NC 28402 or Washington Field Office – P.O. Box 1000, Washington, NC 27889).

2. 4. Barrier Islands

Prior to the use of any NWP on a barrier island of North Carolina, applicants must comply with Nationwide Permit General Condition 27 (PCN).

2.5. Mountain or Piedmont Bogs

Prior to the use of any NWP in a "Mountain or Piedmont Bog" of North Carolina, applicants shall comply with Nationwide Permit General Condition 27 (PCN).

Note: The following wetland community types identified in the N.C. Natural Heritage Program document, "Classification of Natural communities of North Carolina (Michael P. Schafale and Alan S. Weakley, 1990), are subject to this regional condition.

Mountain Bogs	Piedmont Bogs
Swamp Forest-Bog Complex	Upland depression Swamp Forest
Swamp Forest-Bog Complex (Spruce Subtype)	
Southern Appalachian Bog (Northern Subtype)	
Southern Appalachian Bog (Southern Subtype)	
Southern Appalachian Fen	

2.6. Animal Waste Facilities

Prior to use of any NWP for construction of animal waste facilities in waters of the US, including wetlands, applicants shall comply with Nationwide Permit General Condition 27 (PCN).

2.7. Trout Waters

Prior to any discharge of dredge or fill material into streams or waterbodies within the twenty-five (25) designated trout counties of North Carolina, the applicant shall comply with

Nationwide Permit General Condition 27 (PCN). The applicant shall also provide a copy of the notification to the appropriate NCWRC office to facilitate the determination of any potential impacts to designated Trout Waters. Notification to the Corps of Engineers will include a statement with the name of the NCWRC biologist contacted, the date of the notification, the location of work, a delineation of wetlands, a discussion of alternatives to working in the mountain trout waters, why alternatives were not selected, and a plan to provide compensatory mitigation for all unavoidable adverse impacts to mountain trout waters.

NCWRC and NC Trout Counties

Mr. Ron Linville			
Western Piedmont Region Coordinator	Alleghany	Caldwell	Watauga
3855 Idlewild Road	Ashe	Mitchell	Wilkes
Kernersville, NC 27284-9180	Avery	Stokes	
Telephone: (336) 769-9453	Burke	Surry	

Mr. Dave McHenry			
Mountain Region Coordinator	Buncombe	Henderson	Polk
20830 Great Smoky Mtn. Expressway	Cherokee	Jackson	Rutherford
Waynesville, NC 28786	Clay	Macon	Swain
Telephone: (828) 452-2546	Graham	Madison	Transylvania
Fax: (828) 452-7772	Haywood	McDowell	Yancey

3. List of Corps Regional Conditions for All Nationwide Permits

The following conditions apply to all Nationwide Permits in the Wilmington District:

3.1. Limitation of Loss of Perennial Stream Bed

NWPs may not be used for activities that may result in the loss or degradation of greater than 300 total linear feet of perennial streams. The NWPs may not be used for activities that may result in the loss or degradation of greater than 300 total linear feet of ephemeral and intermittent streams that exhibit important aquatic function(s)* Loss of stream includes the linear feet of stream bed that is filled, excavated, or flooded by the proposed activity. The District Commander can waive the 300 linear foot limit for ephemeral and intermittent streams on a case-by-case basis if he determines that the proposed activity will result in minimal individual and cumulative adverse impacts to the aquatic environment. Waivers for the loss of ephemeral and intermittent streams must be in writing. This waiver only applies to the 300 linear feet threshold for NWPs. Mitigation may still be required for impacts to ephemeral and intermittent streams, on a case-by-case basis, depending on the impacts to the aquatic environment of the proposed project. [*Note: The Corps uses the Stream Quality Assessment Worksheet, located with Permit Information on the Regulatory Program Web Site, to aid in the determination of aquatic function within the intermittent stream channel.]

3.2. Mitigation for Loss of Stream Bed Exceeding 150 Feet.

For any NWP that results in a loss of more than 150 linear feet of perennial and/or ephemeral/intermittent stream, the applicant shall provide a mitigation proposal to compensate for the loss of aquatic function associated with the proposed activity. For stream losses less than 150 linear feet, that require a PCN, the District Commander may determine, on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effect on the aquatic environment.

3.3. Pre-construction Notification for Loss of Streambed Exceeding 150 Feet.

Prior to use of any NWP for any activity which impacts more than 150 total linear feet of perennial stream or ephemeral/ intermittent stream, the applicant must comply with Nationwide Permit General Condition 27 (PCN). This applies to NWPs that do not have specific notification requirements. If a NWP has specific notification requirements, the requirements of the NWP should be followed.

3.4. Restriction on Use of Live Concrete

For all NWPs which allow the use of concrete as a building material, measures will be taken to prevent live or fresh concrete, including bags of uncured concrete, from coming into contact with waters of the state until the concrete has hardened.

3.5. Requirements for Using Riprap for Bank Stabilization

For all NWPs that allow for the use of riprap material for bank stabilization, the following measures shall be applied:

3.5.1. Filter cloth must be placed underneath the riprap as an additional requirement of its use in North Carolina waters.

3.5.2. The placement of riprap shall be limited to the areas depicted on submitted work plan drawings.

3.5.3. The riprap material shall be clean and free from loose dirt or any pollutant except in trace quantities that would not have an adverse environmental effect.

3.5.4. It shall be of a size sufficient to prevent its movement from the authorized alignment by natural forces under normal conditions.

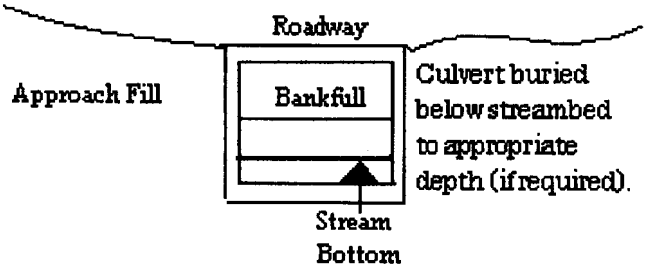
3.5.5. The riprap material shall consist of clean rock or masonry material such as, but not limited to, granite, marl, or broken concrete.

3.5.6. A waiver from the specifications in this Regional Condition may be requested in writing. The waiver will only be issued if it can be demonstrated that the impacts of complying with this Regional condition would result in greater adverse impacts to the aquatic environment.

3.6. Safe Passage Requirements for Culvert Placement

For all NWPs that involve the construction/installation of culverts, measures will be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a pipe or culvert should not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed opening should be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gage data, if available. In the absence of such data, bankfull flow can be used as a comparable level.

In the twenty (20) counties of North Carolina designated as coastal counties by the Coastal Area Management Act (CAMA): All pipe and culvert bottoms shall be buried at least one foot below normal bed elevation when they are placed within the Public Trust Area of Environmental Concern (AEC) and/or the Estuarine Waters AEC as designated by CAMA, and/or all streams appearing as blue lines on United States Geological Survey (USGS) quad sheets.



In all other counties: Culverts greater than 48 inches in diameter will be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter or less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain the existing channel slope. The bottom of the culvert must be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions.

Destabilizing the channel and head cutting upstream should be considered in the placement of the culvert.

A waiver from the depth specifications in this condition may be requested in writing. The waiver will be issued if it can be demonstrated that the proposal would result in the least impacts to the aquatic environment.

All counties: Culverts placed in wetlands do not have to be buried.

3.7. Notification to NCDENR Shellfish Sanitation Section

Applicants shall notify the NCDENR Shellfish Sanitation Section prior to dredging in or removing sediment from an area closed to shell fishing where the effluent may be released to an area open for shell fishing or swimming in order to avoid contamination from the disposal area and cause a temporary shellfish closure to be made. Such notification shall also be provided to the appropriate Corps of Engineers Regulatory Field Office. Any disposal of sand to the ocean beach should occur between November 1 and April 30 when recreational usage is low. Only clean sand should be used and no dredged sand from closed shell fishing areas may be used. If beach disposal were to occur at times other than stated above or if sand from a closed shell fishing area is to be used, a swimming advisory shall be posted, and a press release shall be issued.

3.8. Preservation of Submerged Aquatic Vegetation

Adverse impacts to Submerged Aquatic Vegetation (SAV) are not authorized by any NWP within any of the twenty coastal counties defined by North Carolina's Coastal Area Management Act of 1974 (CAMA).

NC DIVISION OF WATER QUALITY - GENERAL CERTIFICATION CONDITIONS

For the most recent General Certification conditions, call the NC Division of Water Quality, Wetlands/401 Certification Unit at (919) 733-1786 or access the following website: http://h2o.enr.state.nc.us/ncwetlands/certs.html

NC DIVISION OF COASTAL MANAGEMENT - STATE CONSISTENCY

In a letter dated May 7, 2007, the North Carolina Division of Coastal Management found this NWP consistent with the North Carolina Coastal Zone Management Program. Updates on CAMA Consistency for NC can be found on the NC DCM web site at: http://dcm2.enr.state.nc.us/Permits/consist.htm

EASTERN BAND OF THE CHEROKEE INDIANS TRIBAL WATER QUALITY CERTIFICATIONS

In a letter dated May 8, 2007, US EPA, on behalf of the Eastern Band of Cherokee Indians, provided Tribal General Conditions for Nationwide Permits on Cherokee Indian Reservation. These Tribal General Conditions are located on the Corps website at: http://www.saw.usace.army.mil/WETLANDS/NWP2007/EBCI-certs.html

Citations:

2007 Nationwide Permits Public Notice for Final Issue Date: March 15, 2007

Correction Notice for Nationwide Permits, Federal Register / Vol. 72, No. 88 / Tuesday, May 8, 2007 / Notices p.26082

2007 SAW Regional Conditions – Authorized June 1, 2007

This and other information can be found on the Corps web site at: http://www.saw.usace.army.mil/WETLANDS/NWP2007/nationwide-permits.html

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality
Coleen H. Sullins
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

March 13, 2009
Wake County
NCDWQ Project No. 20090242 v.1
I-40 Maintenance Activities
TIP No. I-4744

APPROVAL of 401 WATER QUALITY CERTIFICATION and NEUSE BUFFER AUTHORIZATION, with ADDITIONAL CONDITIONS

Mr. J.W. Bowman, P.E., Division Engineer
NCDOT, Division 5
2612 North Duke Street
Durham, NC 27704

Dear Mr. Bowman:

You have our approval, in accordance with the conditions listed below, for the following impacts for the purpose of repairing pipes on I-40 in Wake County:

Stream Impacts in the Neuse River Basin

Site	Permanent Fill in Perennial Stream (linear ft)	Riprap Impact to Perennial Stream (linear ft)	Total Stream Impact (linear ft)
1	16	37	53
2	12	13	25
3	10	54	64
Total	**38**	**104**	**142**

Total Stream Impact for Project: 142 linear feet.

Neuse Riparian Buffer Impacts

Site	Zone 1 Impact (sq ft)	*minus* Wetlands in Zone 1 (sq ft)	= Zone 1 Buffers (not wetlands) (sq ft)	Zone 1 Buffer Mitigation Required (using 3:1 ratio)	Zone 2 Impact (sq ft)	*minus* Wetlands in Zone 2 (sq ft)	= Zone 2 Buffers (not wetlands) (sq ft)	Zone 2 Buffer Mitigation Required (using 1.5:1 ratio)
1	3874	0	3874	N/A	1902	0	1902	N/A
2	1554	0	1554	N/A	986	0	986	N/A
3	6466	0	6466	N/A	545	0	545	N/A
Totals	**11894**	**0**	**11894**	**0**	**3433**	**0**	**3433**	**0**

* n/a = Total for Site is less than 1/3 acre and 150 linear feet of impact, no mitigation required
Total Buffer Impact for Project: 15,327 square feet.

Transportation Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1650
Location: 2321 Crabtree Blvd., Raleigh, North Carolina 27604
Phone: 919-733-1786 \ FAX: 919-733-6893
Internet: http://h2o.enr.state.nc.us/ncwetlands/

The project shall be constructed in accordance with your application dated received March 11, 2009. After reviewing your application, we have decided that these impacts are covered by General Water Quality Certification Number 3687 and 3689. This certification corresponds to the Nationwide Permit 3 and Nationwide Permit 13 issued by the Corps of Engineers. This approval is also valid for the Neuse Riparian Buffer Rules (15A NCAC 2B.0233). In addition, you should acquire any other federal, state or local permits before you proceed with your project including (but not limited to) Sediment and Erosion Control, Non-Discharge and Water Supply Watershed regulations. This approval will expire with the accompanying 404 permit.

This approval is valid solely for the purpose and design described in your application (unless modified below). Should your project change, you must notify the NCDWQ and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If total wetland fills for this project (now or in the future) exceed one acre, or of total impacts to streams (now or in the future) exceed 150 linear feet, compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). Additional buffer impacts may require compensatory mitigation as described in For this approval to remain valid, you must adhere to the conditions listed in the attached certification as well as those listed below.

Conditions of Certification:

1. For all streams being impacted due to site dewatering activties, the site shall be graded to its preconstruction contours and revegetated with appropriate native species.

2. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed.

3. All riparian buffers impacted by the placement of temporary fill or clearing activities shall be restored to the preconstruction contours and revegetated. Maintained buffers shall be permanently revegetated with non-woody species by the end of the growing season following completion of construction. For the purpose of this condition, maintained buffer areas are defined as areas within the transportation corridor that will be subject to regular NCDOT maintenance activities including mowing. The area with non-maintained buffers shall be permanently revegetated with native woody species before the next growing season following completion of construction.

4. Pursuant to NCAC15A 2B.0233(6), sediment and erosion control devices shall not be placed in Zone 1 of any Neuse Buffer without prior approval by NCDWQ. At this time, NCDWQ has approved no sediment and erosion control devices in Zone 1, outside of the approved project impacts, anywhere on this project. Moreover, sediment and erosion control devices shall be allowed in Zone 2 of the buffers provided that Zone 1 is not compromised and that discharge is released as diffuse flow.

5. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.

6. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers.

7. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions.

8. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage.

9. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval.

10. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water.

11. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream.

12. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials.

13. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification.

14. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited.

15. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If NCDWQ determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, NCDWQ may reevaluate and modify this certification.

16. A copy of this Water Quality Certification shall be maintained on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager.

17. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification.

18. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.

19. The Permittee shall report any violations of this certification to the Division of Water Quality within 24 hours of discovery.

20. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify NCDWQ when all work included in the 401 Certification has been completed.

21. Native riparian vegetation (i.e., trees and shrubs native to your geographic region) must be reestablished within the construction limits of the project by the end of the growing season following completion of construction.

22. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities.

23. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards:

a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual.*
b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual.* The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual.*

d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.

24. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification.

If you do not accept any of the conditions of this certification, you may ask for an adjudicatory hearing. You must act within 60 days of the date that you receive this letter. To ask for a hearing, send a written petition that conforms to Chapter 150B of the North Carolina General Statutes to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699. This certification and its conditions are final and binding unless you ask for a hearing. This letter completes the review of the Division of Water Quality under Section 401 of the Clean Water Act. If you have any questions, please contact Rob Ridings at (919) 733-9817.

Sincerely,

Coleen H. Sullins
Director

Cc: Chris Murray, Division 5 Environmental Officer
Eric Alsmeyer, US Army Corps of Engineers, Raleigh Field Office
File Copy

Water Quality Certification N°. 3687

GENERAL CERTIFICATION FOR PROJECTS ELIGIBLE FOR U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT NUMBERS: 3 (MAINTENANCE), 4 (FISH AND WILDLIFE HARVESTING, ENHANCEMENT, AND ATTRACTION DEVICES AND ACTIVITIES), 5 (SCIENTIFIC MEASUREMENT DEVICES—25 CUBIC YARDS FOR WEIRS AND FLUMES), 6 (SURVEY ACTIVITIES—25 CUBIC YARDS FOR TEMPORARY PADS), 7 (OUTFALL STRUCTURES AND ASSOCIATED INTAKE STRUCTURES), 19 (MINOR DREDGING), 20 (OIL SPILL CLEANUP), 22 (REMOVAL OF VESSELS), 25 (STRUCTURAL DISCHARGE), 30(MOIST SOIL MANAGEMENT FOR WILDLIFE), 32 (COMPLETED ENFORCEMENT ACTIONS), 36 (BOAT RAMPS [IN NONWETLAND SITES]), AND REGIONAL PERMIT 197800056 (PIERS, DOCKS AND BOATHOUSES), AND REGIONAL PERMIT 197800125 (BOAT RAMPS) AND RIPARIAN AREA PROTECTION RULES (BUFFER RULES)

Water Quality Certification Number 3687 is issued in conformity with the requirements of Section 401, Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (DWQ) Regulations in 15 NCAC 2H, Section .0500 and 15 NCAC 2B .0200 for the discharge of fill material to waters and wetland areas which are waters of the United States as described in 33 CFR 330 Appendix A (B) (3, 4, 5, 6, 7, 19, 20, 22, 25, 30, 32, and 36) of the Corps of Engineers regulations and Regional Permits 197800056 and 19780125 and for the Riparian Area Protection Rules (Buffer Rules) in 15A NCAC 2B .0200.

The State of North Carolina certifies that the specified category of activity will not violate applicable portions of Sections 301, 302, 303, 306 and 307 of the Public Laws 92-500 and 95-217 if conducted in accordance with the conditions hereinafter set forth.

Activities meeting any one (1) of the following thresholds or circumstances require *written approval* for a 401 Water Quality Certification from the Division of Water Quality (the "Division"):

a. Impacts equal or greater than 40 linear feet of additional permanent stream impact at an existing stream crossing location, or
b. Temporary or permanent impacts equal to or exceeding: one-third (1/3) acre of wetlands East of Interstate-95, or one-tenth (1/10) of acre of wetlands West of Interstate-95; or
c. Any impact associated with a Notice of Violation or an enforcement action initiated by the Division and/or the Division of Land Resources; or
d. Projects with any impacts to streams, wetlands, and/or waters that have received a Notice of Violation from the Division and/or Division of Land Resources; or
e. Any impacts to streams and/or buffers in the Neuse, Tar-Pamlico, Randleman and Catawba River Basins (or any other basins with Riparian Area Protection Rules [Buffer Rules] in effect at the time of application) *unless* the activities are listed as "EXEMPT" from these Rules.

In accordance with North Carolina General Statute Section 143-215.3D(e), written approval for a 401 Water Quality General Certification must include the appropriate fee. If a project also requires a CAMA Permit, then one payment to both agencies shall be submitted and will be the higher of the two fees.

Activities included in this General Certification and below the thresholds listed above *do not* require written approval from the Division of Water Quality as long as they comply with the Conditions of Certification listed below. If any of these Conditions cannot be met, written approval from the Division is required.

Water Quality Certification N°. 3687

Conditions of Certification:

1. No Impacts Beyond Those Authorized for this General Certification

   No waste, spoil, solids, or fill of any kind shall occur in wetlands, waters, or riparian areas beyond the thresholds established for use of this General Certification, or beyond the footprint of the impacts authorized in the written approval, including incidental impacts. All construction activities, including the design, installation, operation, and maintenance of sediment and erosion control Best Management Practices, shall be performed so that no violations of state water quality standards, statutes, or rules occur.

2. Standard Erosion and Sediment Control Practices

   Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices:

   a. Design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual.* The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
   b. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual.*
   c. Reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.
   d. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times. ,except for publicly funded linear transportation projects when materials can be accessed offsite in a timely manner.
   e. If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNAs), Trout (Tr), SA, WS-I, WS-II, High Quality (HQW), or Outstanding Resource (ORW) waters, then the sediment and erosion control requirements contained within *Design Standards in Sensitive Watersheds* (15A NCAC 04B .0124) supercede all other sediment and erosion control requirements.

3. No Sediment and Erosion Control Measures in Wetlands or Waters

   Sediment and erosion control measures should not be placed in wetlands or waters outside of the permitted impact areas without prior approval from the Division. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, then the design and placement of temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or stream beds or banks, adjacent to or upstream and down stream of the above structures. All sediment and erosion control devices shall be removed and the natural grade restored within two (2) months of the date that the Division of Land Resources or locally delegated program has released the project.

4. Construction Stormwater Permit NCG010000

   Upon the approval of an Erosion and Sedimentation Control Plan issued by the Division of Land Resources (DLR) or a DLR delegated local erosion and sedimentation control program, an NPDES General stormwater permit (NCG010000) administered by the Division is automatically issued to the project. This General Permit allows stormwater to be discharged during land disturbing construction activities as stipulated by conditions in the permit. If the

activity is covered by this permit [applicable to construction projects that disturb one (1) or more acres], full compliance with permit conditions including the sedimentation control plan, self-monitoring, record keeping and reporting requirements are required. A copy of this permit and monitoring report forms may be found at *http://h2o.enr.state.nc.us/su/Forms_Documents.htm*.

NCDOT shall be required to be in full compliance with the conditions related to construction activities within the most recent version of their individual NPDES (NCS000250) stormwater permit.

5. Work in the Dry

All work in or adjacent to stream waters shall be conducted in a dry work area. Approved best management practices from the most current version of the NC Sediment and Erosion Control Manual, or the NC DOT Construction and Maintenance Activities Manual, such as sandbags, rock berms, cofferdams, and other diversion structures shall be used to minimize excavation in flowing water. Exceptions to this condition require submittal to, and approval by, the Division.

6. Construction Moratoriums and Coordination

If activities must occur during periods of high biological activity (i.e. sea turtle or bird nesting), then biological monitoring may be required at the request of other state or federal agencies and coordinated with these activities. This condition can be waived through written concurrence on a case by case basis upon reasonable justification.

All moratoriums on construction activities established by the NC Wildlife Resources Commission (WRC), US Fish and Wildlife Service (USFWS), NC Division of Marine Fisheries (DMF), or National Marine Fisheries Service (NMFS) to protect trout, anadromous fish, larval/post-larval fishes and crustaceans, or other aquatic species of concern shall be obeyed. This condition can be waived through written concurrence on a case by case basis upon reasonable justification.

Work within the twenty-five (25) designated trout counties or identified state or federal endangered or threatened species habitat shall be coordinated with the appropriate WRC, USFWS, NMFS personnel.

7. Riparian Area Protection Rules (Buffer Rules)

Activities located in the protected 50-foot wide riparian areas (whether jurisdictional wetlands or not) within the Neuse, Tar-Pamlico, Randleman, Catawba (or any other basin with buffer rules), shall be limited to "uses" identified within and constructed in accordance with 15A NCAC 2B .0233, .0259, .0250, and .0243, and shall be located, designed, constructed, and maintained to have minimal disturbance to protect water quality to the maximum extent practicable through the use of best management practices. All riparian area protection rule requirements, including diffuse flow requirements, must be met.

8. Water Supply Watershed Buffers

The 100-foot wide (high-density development) or the 30-foot wide vegetative buffer (all other development) must be maintained adjacent to all perennial waters except for allowances as provided in the Water Supply Watershed Protection Rules [15A NCAC 2B .0212 through .0215].

9. Placement of Culverts and Other Structures in Waters and Wetlands

   The application must include construction plans with cross-sectional details in order to indicate that the current stability of the stream will be maintained or enhanced (i.e., not result in head cuts).

   Culverts required for this project shall be designed and installed in such a manner that the original stream profiles are not altered and allow for aquatic life movement during low flows. Existing stream dimensions (including the cross section dimensions, pattern, and longitudinal profile) must be maintained above and below locations of each culvert. Placement of culverts and other structures in waters, streams, and wetlands must be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life, unless otherwise justified and approved by the Division.

   Installation of culverts in wetlands must ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions. Additionally, when roadways, causeways or other fill projects are constructed across FEMA-designated floodways or wetlands, openings such as culverts or bridges must be provided to maintain the natural hydrology of the system as well as prevent constriction of the floodway that may result in destabilization of streams or wetlands.

   Any rip rap required for normal pipe burial and stabilization shall be buried such that the original stream elevation is restored and maintained.

   The establishment of native, woody vegetation and other soft stream bank stabilization techniques must be used where practicable instead of rip-rap or other bank hardening methods.

10. If concrete is used during the construction, then a dry work area should be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete should not be discharged to surface waters due to the potential for elevated pH and possible aquatic life/fish kills.

11. Applications for riprap groins proposed in accordance with 15A NCAC 07H .1401 (NC Division of Coastal Management General Permit for construction of Wooden and Riprap Groins in Estuarine and Public Trust Waters) must meet all the specific conditions for design and construction specified in 15A NCAC 07H .1405.

12. Temporary Fills and/or Access Roads

    All temporary fill and culverts shall be removed and the impacted area returned to the original grade, including each stream's original cross sectional dimensions, plan form pattern, and longitudinal bed and bed profile after construction is complete or within two (2) months of the establishment of the crossing, which ever is sooner, and the various sites shall be stabilized with natural woody vegetation (except for the maintenance areas of permanent utility crossings) and restored to prevent erosion. If the crossings are not completely removed and restored as described above within the specified time above, then written approval from the Division must be obtained to modify this condition.

13. For activities requiring written approval, additional site-specific conditions may be added to the approval letter in order to ensure compliance with all applicable water quality and effluent standards.

14. Certificate of Completion

When written authorization is required for use of this certification, upon completion of all permitted impacts included within the approval and any subsequent modifications, the applicant shall be required to return the certificate of completion attached to the approval. One copy of the certificate shall be sent to the DWQ Central Office in Raleigh at 1650 Mail Service Center, Raleigh, NC, 27699-1650.

15. If an environmental document is required under NEPA or SEPA, then this General Certification is not valid until a Finding of No Significant Impact (FONSI) or Record of Decision (ROD) is issued by the State Clearinghouse.

16. This General Certification shall expire three (3) years from the date of issuance of the written approval or on the same day as the expiration date of these corresponding Nationwide and Regional General Permits. In accordance with General Statute 136-44.7B, certifications issued to the NCDOT shall expire only upon expiration of the federal 404 Permit. The conditions in effect on the date of issuance of Certification for a specific project shall remain in effect for the life of the project, regardless of the expiration date of this Certification. If the construction process for approved activities will overlap the expiration and renewal date of the corresponding 404 Permit and the Corps allows for continued use of the 404 Permit, then the General Certification shall also remain in effect without requiring re-application and re-approval to use this Certification for the specific impacts already approved.

17. The applicant/permittee and their authorized agents shall conduct all activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act), and any other appropriate requirements of State and Federal Law. If the Division determines that such standards or laws are not being met, including failure to sustain a designated or achieved use, or that State or Federal law is being violated, or that further conditions are necessary to assure compliance, then the Division may reevaluate and modify this General Water Quality Certification.

Non-compliance with or violation of the conditions herein set forth by a specific fill project shall result in revocation of this General Certification for the project and may result in criminal and/or civil penalties.

The Director of the North Carolina Division of Water Quality may require submission of a formal application for Individual Certification for any project in this category of activity if it is determined that the project is likely to have a significant adverse effect upon water quality, including state or federally listed endangered or threatened aquatic species, or degrade the waters so that existing uses of the wetland or downstream waters are precluded.

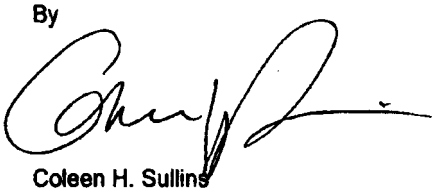
Public hearings may be held for specific applications or group of applications prior to a Certification decision if deemed in the public's best interest by the Director of the North Carolina Division of Water Quality.

Water Quality Certification N°. 3687

Effective date: November 1, 2007

DIVISION OF WATER QUALITY

By



Coleen H. Sullins

Director

History Note: Water Quality Certification Number 3687 replaces Water Quality Certification Number 3376 issued on March 18, 2002, Water Quality Certification Number 3494 issued December 31, 2004, and Water Quality Certification Number 3624 issued March 2007. This General Certification is rescinded when the Corps of Engineers re-authorizes any of these Nationwide or Regional Permits or when deemed appropriate by the Director of the Division of Water Quality.

Water Quality Certification N°. 3689

GENERAL CERTIFICATION FOR STREAM RESTORATION, ENHANCEMENT AND STABILIZATION PROJECTS AND WETLAND AND RIPARIAN RESTORATION AND CREATION ACTIVITIES INCLUDING THOSE ELIGIBLE FOR U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT NUMBERS 13 (BANK STABILIZATION) AND 27 (WETLAND AND RIPARIAN RESTORATION AND CREATION), AND REGIONAL PERMIT 197800080 (BULKHEADS AND RIPRAP) AND RIPARIAN AREA PROTECTION RULES (BUFFER RULES)

Water Quality Certification Number 3689 is issued in conformity with the requirements of Section 401, Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality Regulations in 15A NCAC 2H .0500 and 15A NCAC 2B .0200 for the discharge of fill material to waters as described in 33 CFR 330 Appendix A (B) (13) and (27) of the Corps of Engineers regulations (i.e., Nationwide Permit Numbers 13 and 27) and Regional Permit 197800080. The category of activities shall include stream bank stabilization or stream restoration activity as long as impacts to waters or significant wetlands are minimized; wetland and riparian restoration or creation; and the construction and maintenance of bulkheads on non-Federal Energy Regulatory Commission (FERC) lakes.

The State of North Carolina certifies that the specified category of activity will not violate applicable portions of Sections 301, 302, 303, 306 and 307 of the Public Laws 92-500 and 95-217 if conducted in accordance with the conditions set forth.

All proposed fill or modification of wetlands and/or waters, including streams and streambanks, under this General Certification requires application to, and written approval from the Division of Water Quality (the "Division"), regardless of the purpose of the restoration, enhancement, stabilization, or creation activity.

Bank Stabilization projects qualifying for Nationwide Permit 13 for erosion protection of up to 500 feet of stream banks to protect property are exempt from the requirement for written approval.

Any impacts to riparian buffers associated with this work in the Neuse, Tar-Pamlico, Randleman and Catawba River Basins (or any other basins with Riparian Area Protection Rules [Buffer Rules] in effect at the time of application [in accordance with 15A NCAC 2B .0200]) will require written approval, *unless* the activities are listed as "EXEMPT" from these Rules.

In accordance with North Carolina General Statute Section 143-215.3D(e), written approval for a 401 Water Quality General Certification must include the appropriate fee. If a project also requires a CAMA Permit, then one payment to both agencies shall be submitted and will be the higher of the two fees.

Conditions of Certification:

1. Activities shall meet the definitions, design, and monitoring protocols specified within the US Army Corps of Engineers Wilmington District *Regulatory Guidance Letter* (RGL02-02) and the *Stream Mitigation Guidelines* (April 2003) or any subsequent updates to these documents.

2. No waste, spoil, solids, or fill of any kind shall occur in wetlands, waters, or riparian areas beyond the footprint of the impacts depicted in the Pre-construction Notification and/or those authorized by this Certification, including incidental impacts. All construction activities, including the design, installation, operation, and maintenance of sediment and erosion control

Best Management Practices, shall be performed so that no violations of state water quality standards, statutes, or rules occur.

3. Standard Erosion and Sediment Control Practices

Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices:

a. Design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
b. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
c. Reclamation measures and implementation must comply with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.
d. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times, except for publicly funded linear transportation projects when materials can be accessed offsite in a timely manner..
e. If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNA's), Trout (Tr), SA, WS-I, WS-II, High Quality (HQW), or Outstanding Resource (ORW) waters, then the sediment and erosion control requirements contained within *Design Standards in Sensitive Watersheds* (15A NCAC 04B .0124) supercede all other sediment and erosion control requirements.

4. No Sediment and Erosion Control Measures in Wetlands or Waters

Sediment and erosion control measures should not be placed in wetlands or waters outside of the permitted impact areas without prior approval by the Division. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, design and placement of temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or stream beds or banks, adjacent to or upstream and down stream of the above structures. All sediment and erosion control devices shall be removed and the natural grade restored within two (2) months of the date that the Division of Land Resources or locally delegated program has released the project.

5. Construction Stormwater Permit NCG010000

Upon the approval of an Erosion and Sedimentation Control Plan issued by the Division of Land Resources (DLR) or a DLR delegated local erosion and sedimentation control program, an NPDES General stormwater permit (NCG010000) administered by the Division is automatically issued to the project. This General Permit allows stormwater to be discharged during land disturbing construction activities as stipulated by conditions in the permit. If your project is covered by this permit [applicable to construction projects that disturb one (1) or more acres], full compliance with permit conditions including the sedimentation control plan, self-monitoring, record keeping and reporting requirements are required. A copy of this permit and monitoring report forms may be found at http://h2o.enr.state.nc.us/su/Forms_Documents.htm.

The North Carolina Department of Transportation (NCDOT) shall be required to be in full compliance with the conditions related to construction activities within the most recent version of their individual NPDES (NCS000250) stormwater permit.

6. Construction Moratoriums and Coordination

If activities must occur during periods of high biological activity (i.e. sea turtle or bird nesting), then biological monitoring may be required at the request of other state or federal agencies and coordinated with these activities. This condition can be waived through written concurrence on a case by case basis upon reasonable justification.

All moratoriums on construction activities established by the NC Wildlife Resources Commission (WRC), US Fish and Wildlife Service (USFWS), NC Division of Marine Fisheries (DMF), or National Marine Fisheries Service (NMFS) to lessen impacts on trout, anadromous fish, larval/post-larval fishes and crustaceans, or other aquatic species of concern shall be implemented. This condition can be waived through written concurrence on a case by case basis upon reasonable justification.

Work within the twenty-five (25) designated trout counties or identified state or federal endangered or threatened species habitat shall be coordinated with the appropriate WRC, USFWS, NMFS, and/or DMF personnel.

NC Wildlife Resources Commission will not object to construction of Natural Resources Conservation Service (NRCS) 'urgent and compelling' sites during the spawning period provided these projects are, to the extent appropriate and practical, constructed by:
a. Using flow diversion structures such as sandbags;
b. Placing large-size rock toes and filter cloth backing for stabilization sites before backfilling; and
c. Excavating new channel alignments in dry areas.

Construction at non-'urgent and compelling' sites shall not occur during the spawning period to minimize the potential adverse effects of multiple construction activities on trout or anadromous fish resources in this stream.

7. Work in the Dry

All work in or adjacent to stream waters shall be conducted in a dry work area. Approved best management practices from the most current version of the NC Sediment and Erosion Control Manual, or the NC DOT Construction and Maintenance Activities Manual, such as sandbags, rock berms, cofferdams, and other diversion structures shall be used to minimize excavation in flowing water. Exceptions to this condition require submittal to, and approval by, the Division.

8. Riparian Area Protection (Buffer) Rules

Activities located in the protected 50-foot wide riparian areas (whether jurisdictional wetlands or not) within the Neuse, Tar-Pamlico, Randleman, Catawba (or any other basin with buffer rules), shall be limited to "uses" identified within and constructed in accordance with 15A NCAC 2B .0233, .0259, .0250 and .0243, and shall be located, designed, constructed, and maintained to have minimal disturbance to protect water quality to the maximum extent practicable through the use of best management practices. All buffer rule requirements, including diffuse flow requirements, must be met.

9. Water Supply Watershed Buffers

The 100-foot wide (high-density development) or the 30-foot wide vegetative buffer (all other development) must be maintained adjacent to all perennial waters except for allowances as

provided in the Water Supply Watershed Protection Rules [15A NCAC 2B .0212 through .0215].

10. If concrete is used during the construction, then a dry work area should be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete should not be discharged to surface waters due to the potential for elevated pH and possible aquatic life/fish kills.

11. Any rip-rap shall be of such a size and density so as not to be able to be carried off by wave or current action and consist of clean rock or masonry material free of debris or toxic pollutants. Rip-rap shall not be installed in the streambed except in specific areas required for velocity control and to ensure structural integrity of bank stabilization measures. If rip-rap is to be installed within the streambed, the amount and location must be approved in writing by the Division of Land Resources and Division of Water Quality. However, rock vanes, wing deflectors, and similar structures for grade control and bank protection are acceptable.

12. If an environmental document is required under NEPA or SEPA, then this General Certification is not valid until a Finding of No Significant Impact or Record of Decision is issued by the State Clearinghouse.

13. Additional site-specific conditions may be added to the written approval attached to this Certification in order to ensure compliance with all applicable water quality and effluent standards.

14. This Certification shall expire three (3) years from the date of the approval letter from DWQ or on the same day as the corresponding Nationwide Permit. In accordance with General Statute 136-44.7B, certifications issued to the NCDOT shall expire only upon expiration of the federal 404 Permit. The conditions in effect on the date of issuance of Certification for a specific project shall remain in effect for the life of the project, regardless of the expiration date of this Certification. If the construction process for approved activities will overlap the expiration and renewal date of the corresponding 404 Permit and the Corps allows for continued use of the 404 Permit, then the General Certification shall also remain in effect without requiring re-application and re-approval to use this Certification for the specific impacts already approved.

15. The applicant/permittee and their authorized agents shall conduct all activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act), and any other appropriate requirements of State and Federal Law. If the Division determines that such standards or laws are not being met, including failure to sustain a designated or achieved use, or that State or Federal law is being violated, or that further conditions are necessary to assure compliance, then the Division may reevaluate and modify this General Water Quality Certification.

16. Certificate of Completion

    When written authorization is required for use of this certification, upon completion of all permitted impacts included within the approval and any subsequent modifications, the applicant shall be required to return the certificate of completion attached to the approval. One copy of the certificate shall be sent to the DWQ Central Office in Raleigh at 1650 Mail Service Center, Raleigh, NC, 27699-1650.

Non-compliance with or violation of the conditions herein set forth by a specific project shall result in revocation of this Certification for the project and may also result in criminal and/or civil penalties.

Water Quality Certification N°. 3689

The Director of the North Carolina Division of Water Quality may require submission of a formal application for Individual Certification for any project in this category of activity if it is determined that the project is likely to have a significant adverse effect upon water quality including state or federally listed endangered or threatened aquatic species or degrade the waters so that existing uses of the wetland or downstream waters are precluded.

Public hearings may be held for specific applications or group of applications prior to a Certification decision if deemed in the public's best interest by the Director of the North Carolina Division of Water Quality.

Effective date: November 1, 2007

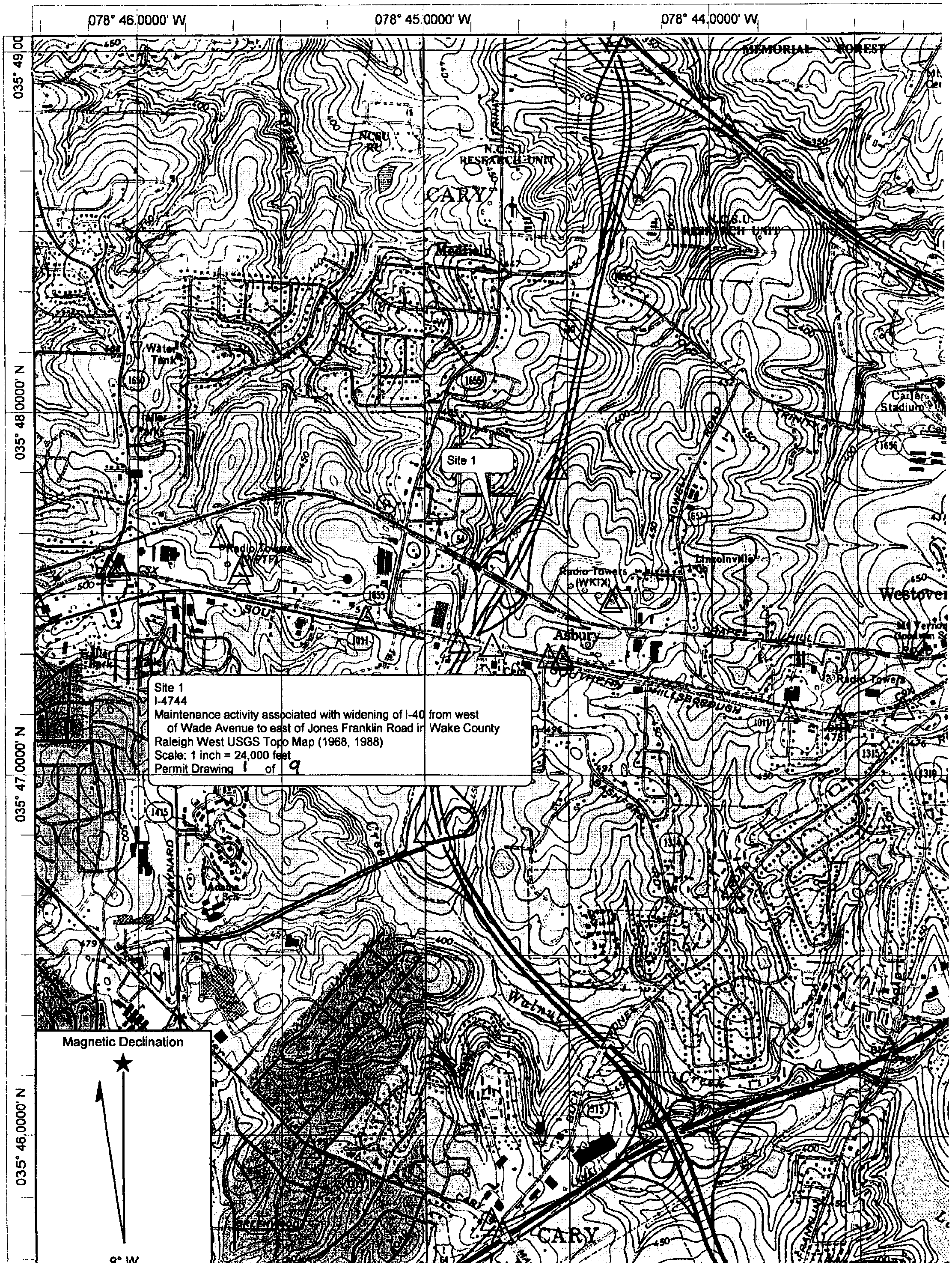
DIVISION OF WATER QUALITY

By

Coleen H. Sullins

Director

History Note: Water Quality Certification Number 3689 replaces Water Quality Certification (WQC) Number 3399 issued March 2003, Water Quality Certification (WQC) Number 3495 issued December 31, 2004, and Water Quality Certification (WQC) Number 3626 issued March 2007. This WQC is rescinded when the Corps of Engineers reauthorizes Nationwide Permits 13 or 27 or Regional Permit 197800080 or when deemed appropriate by the Director of the Division of Water Quality.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078° 45.0000' W
078° 44.0000' W
035° 49.0000' N
035° 48.0000' N
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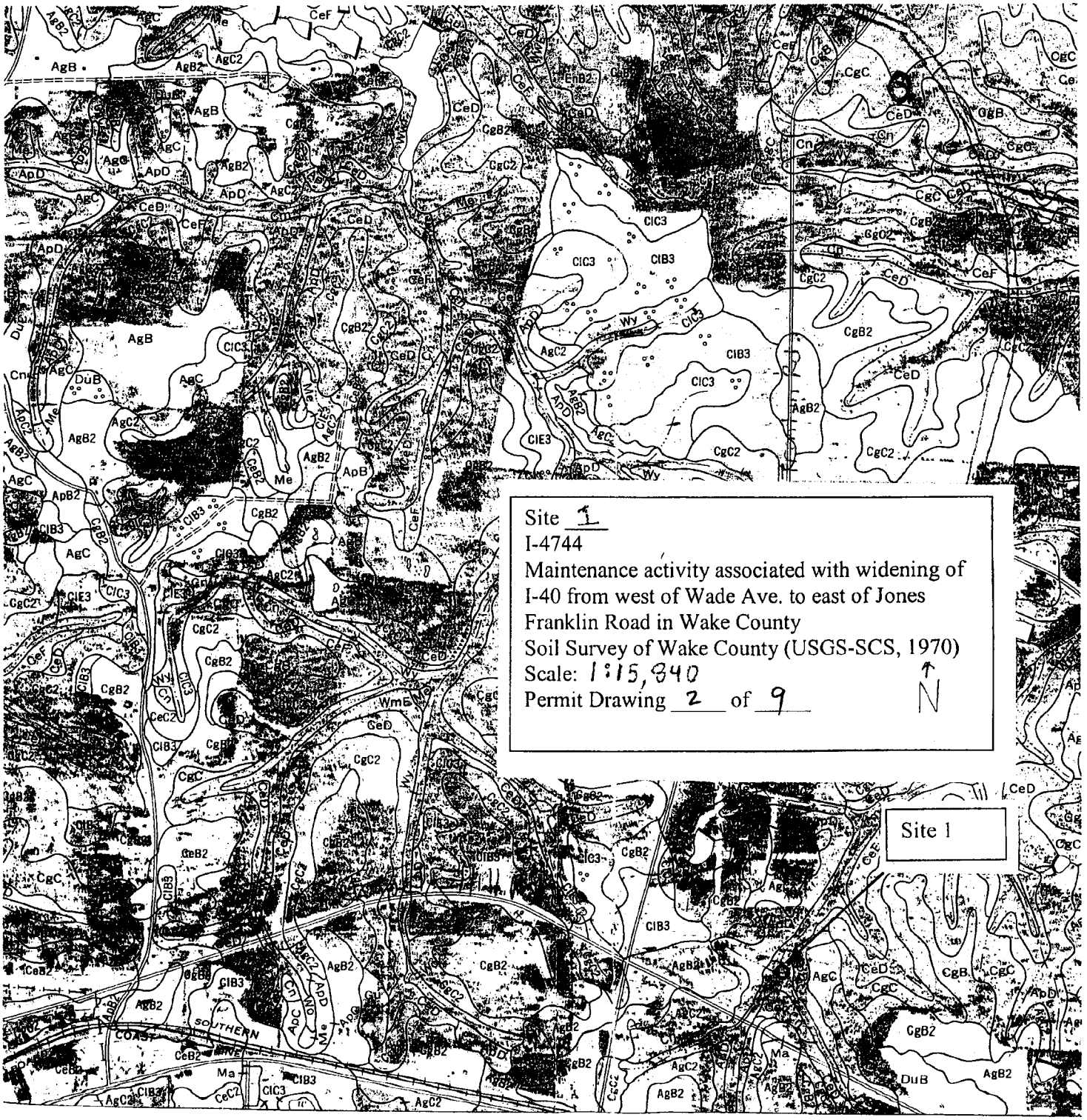
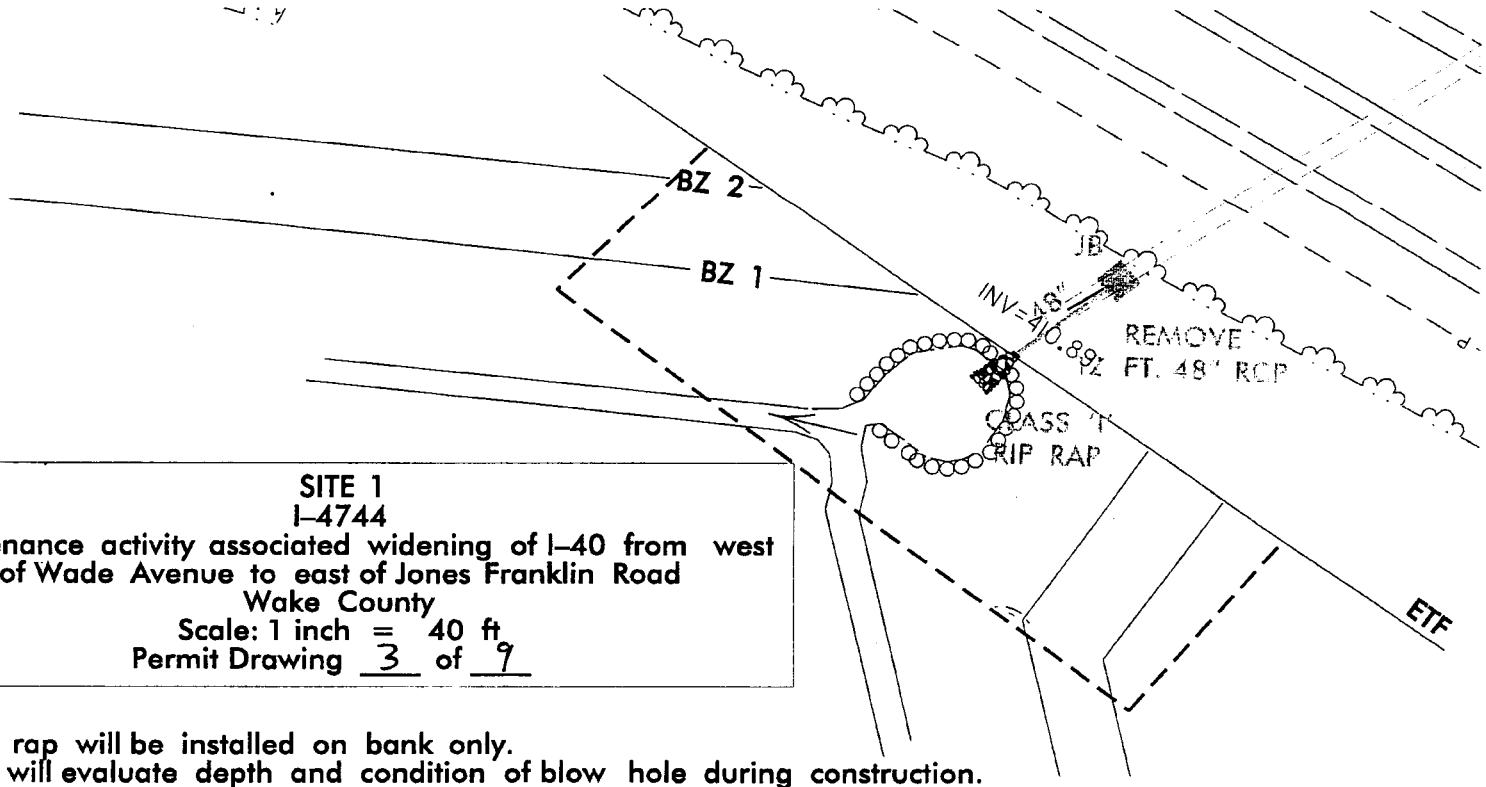
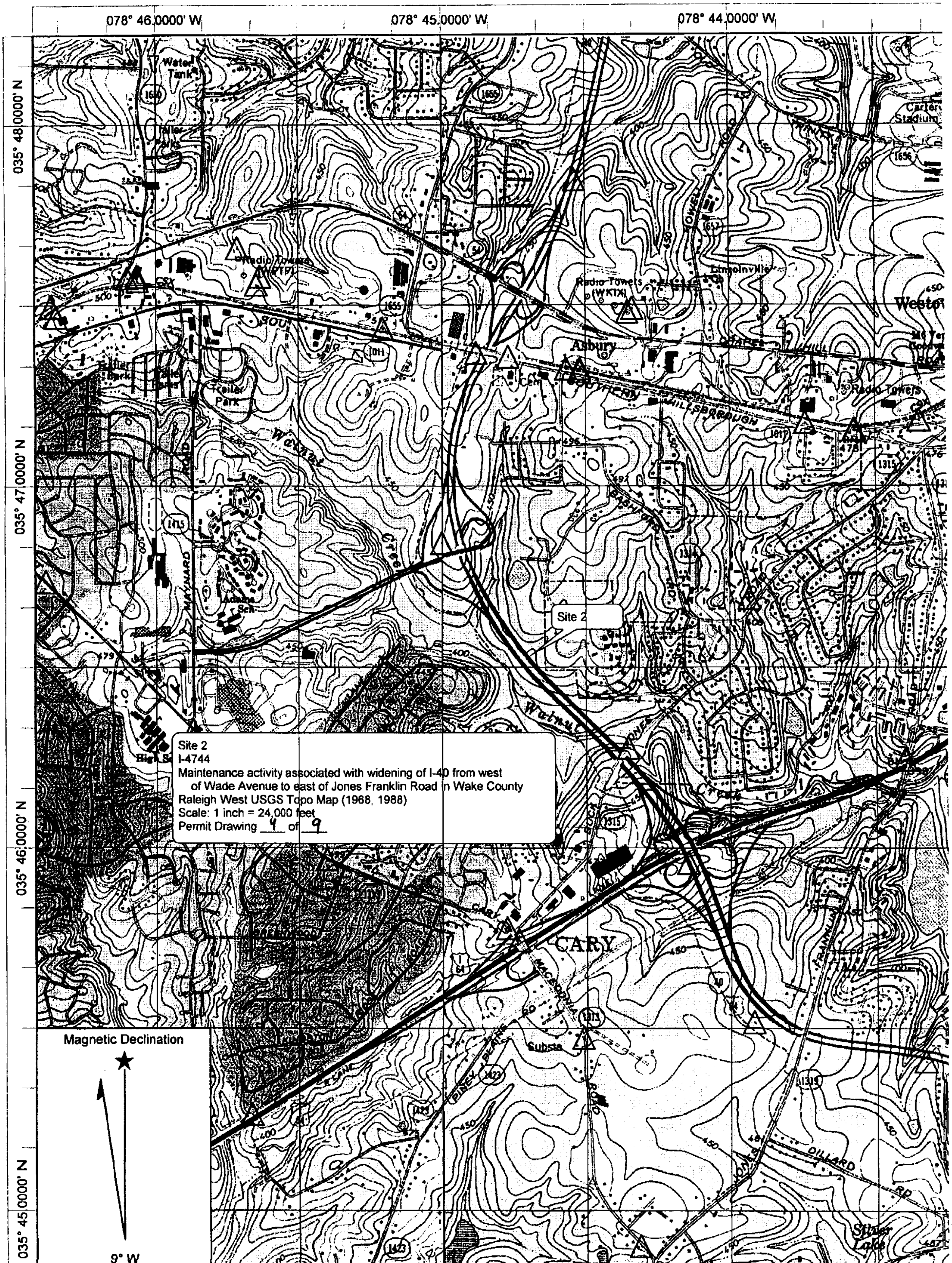
035° 46.0000' N
MEMORIAL FOREST
N.C.S.U. RESEARCH UNIT
CARY
Water Tank
Site 1
Radio Towers (WKIX)
Lincolnville
Westover
Asbury
SOUTHERN
HILLSBOROUGH
Radio Towers
Carter Stadium
Adams Sch
MAYNARD
Walnut
Creek
Site 1
I-4744
Maintenance activity associated with widening of I-40 from west
of Wade Avenue to east of Jones Franklin Road in Wake County
Raleigh West USGS Topo Map (1968, 1988)
Scale: 1 inch = 24,000 feet
Permit Drawing 1 of 9
Magnetic Declination
9° W


Site 1
I-4744
Maintenance activity associated with widening of I-40 from west of Wade Ave. to east of Jones Franklin Road in Wake County
Soil Survey of Wake County (USGS-SCS, 1970)
Scale: 1:15,840
Permit Drawing 2 of 9
N
Site 1
SOUTHERN
COAST



SITE 1
I–4744
Maintenance activity associated widening of I–40 from west of Wade Avenue to east of Jones Franklin Road
Wake County
Scale: 1 inch = 40 ft
Permit Drawing 3 of 9

Note:
1. Rip rap will be installed on bank only.
2. RE will evaluate depth and condition of blow hole during construction.
3. Buffer impacts are calculated to full construction limits.
4. — — — = buffer construction limits.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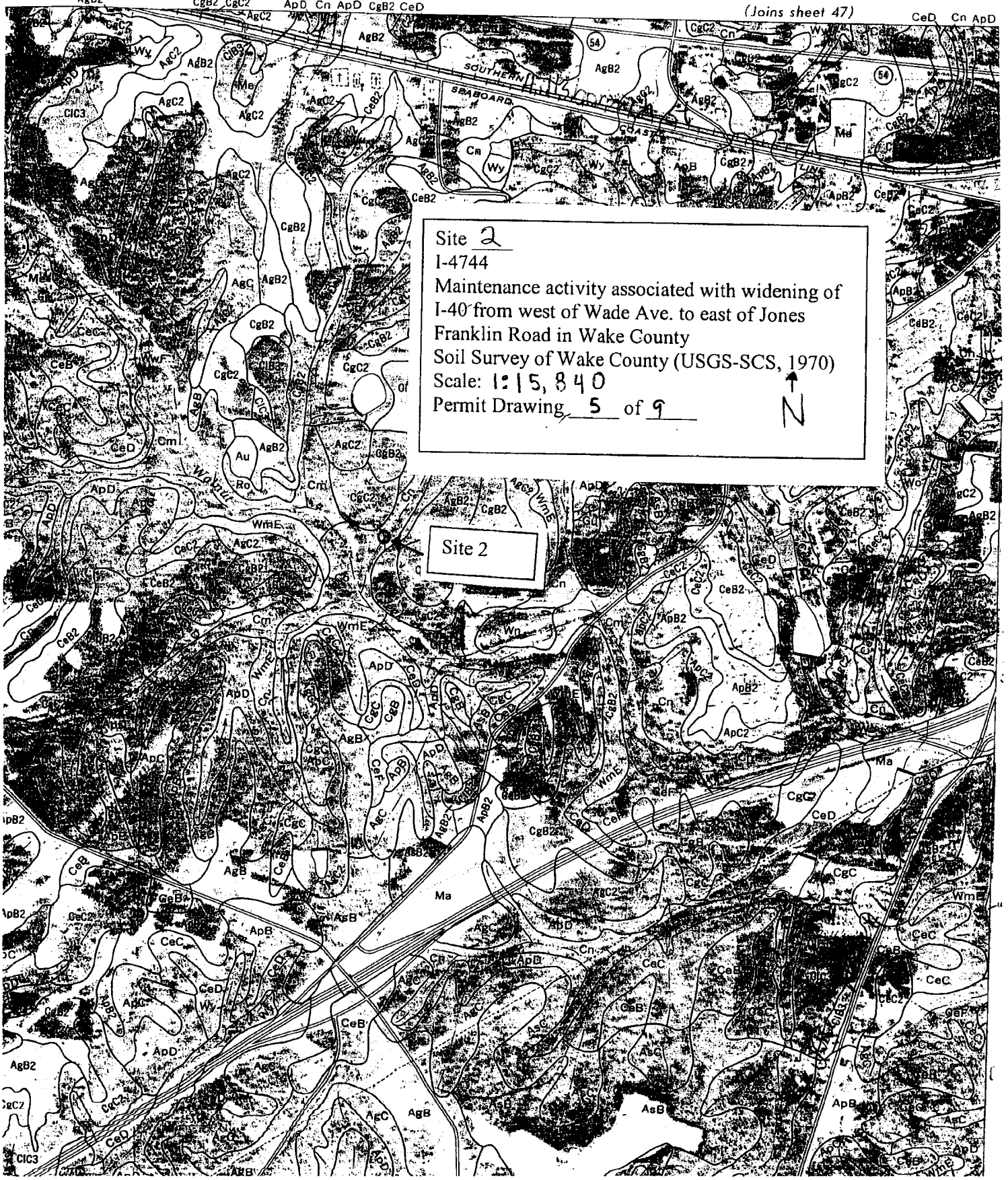
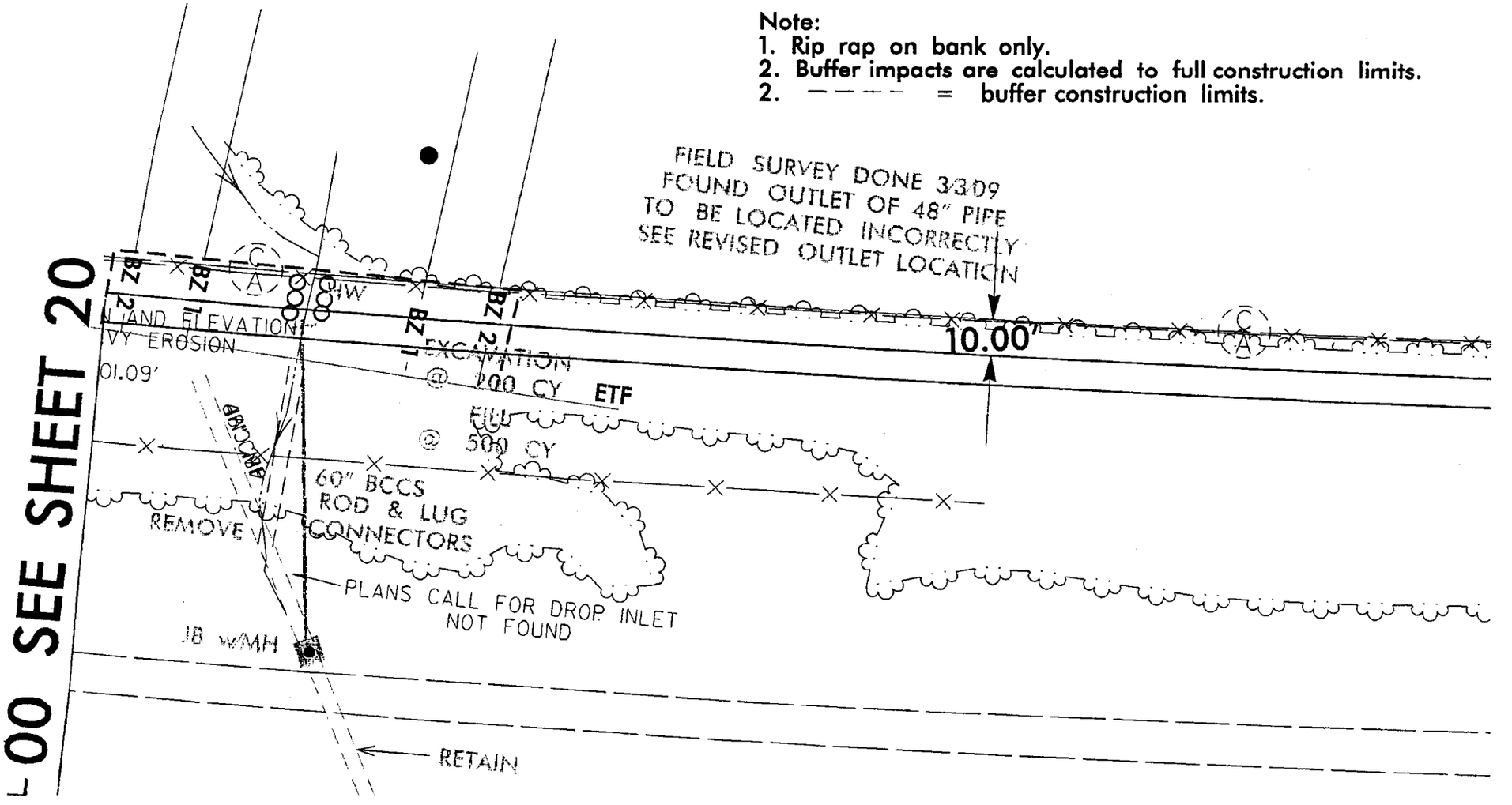
078° 45.0000' W
078° 44.0000' W
035° 48.0000' N
035° 47.0000' N
035° 46.0000' N
035° 45.0000' N
Water Tank
Carter Stadium
Radio Towers (WKIX)
Radio Towers
Asbury
Trailer Park
Adams Sch
CARY
Substa
Silver Lake
DILLARD RD
Site 2
Site 2
I-4744
Maintenance activity associated with widening of I-40 from west of Wade Avenue to east of Jones Franklin Road in Wake County
Raleigh West USGS Topo Map (1968, 1988)
Scale: 1 inch = 24,000 feet
Permit Drawing 4 of 9
Magnetic Declination
9° W

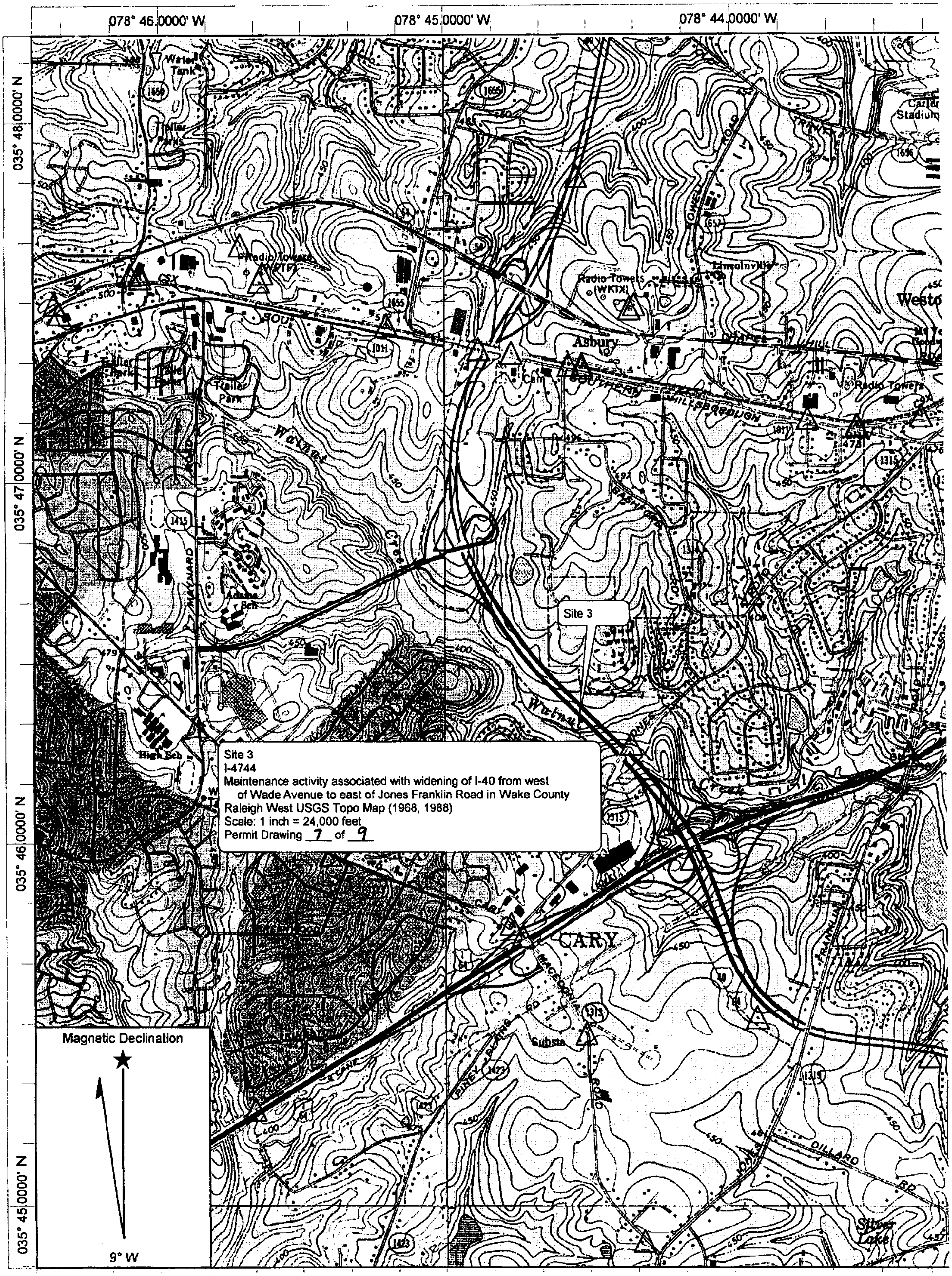
H CAROLINA — SHEET NUMBER 57

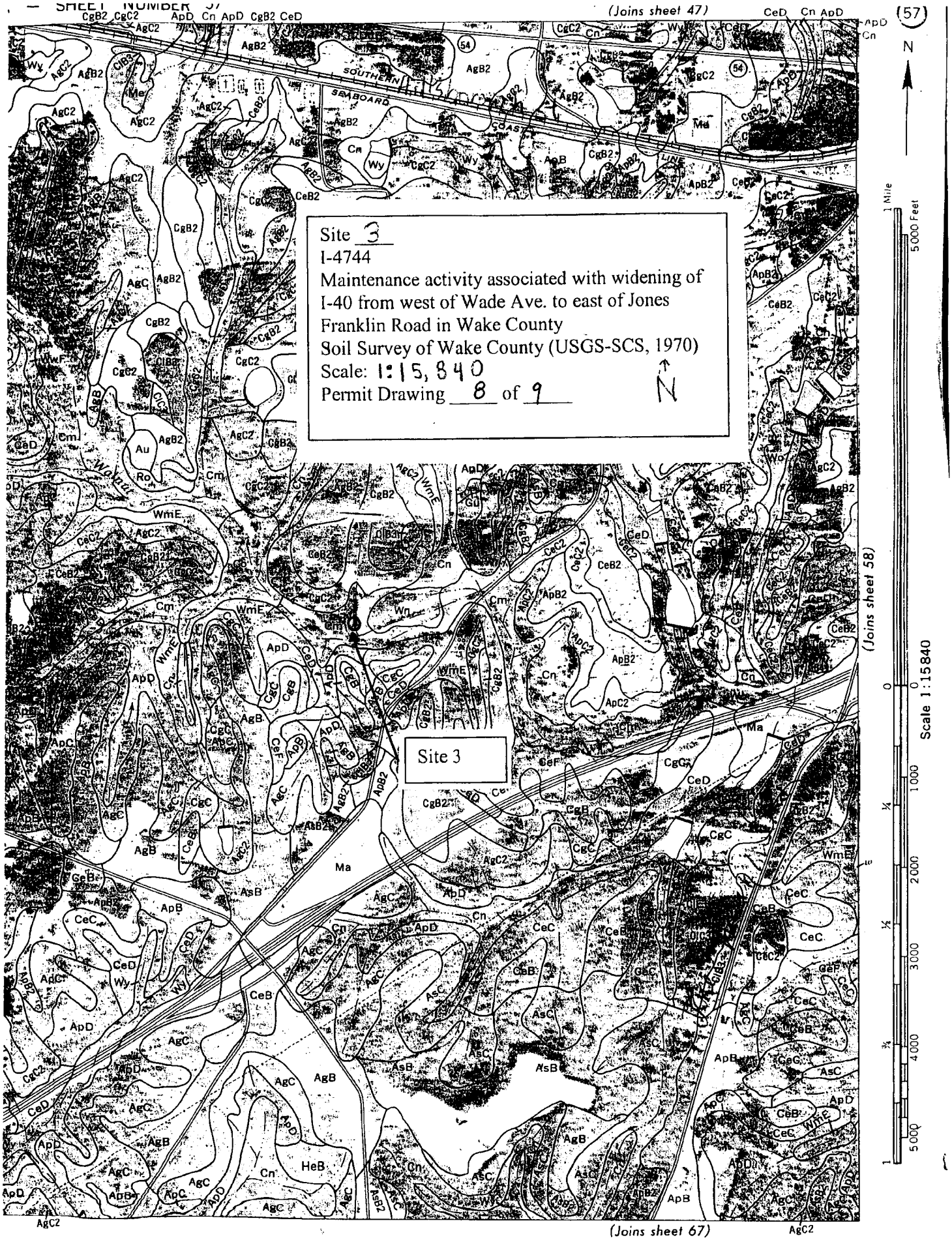


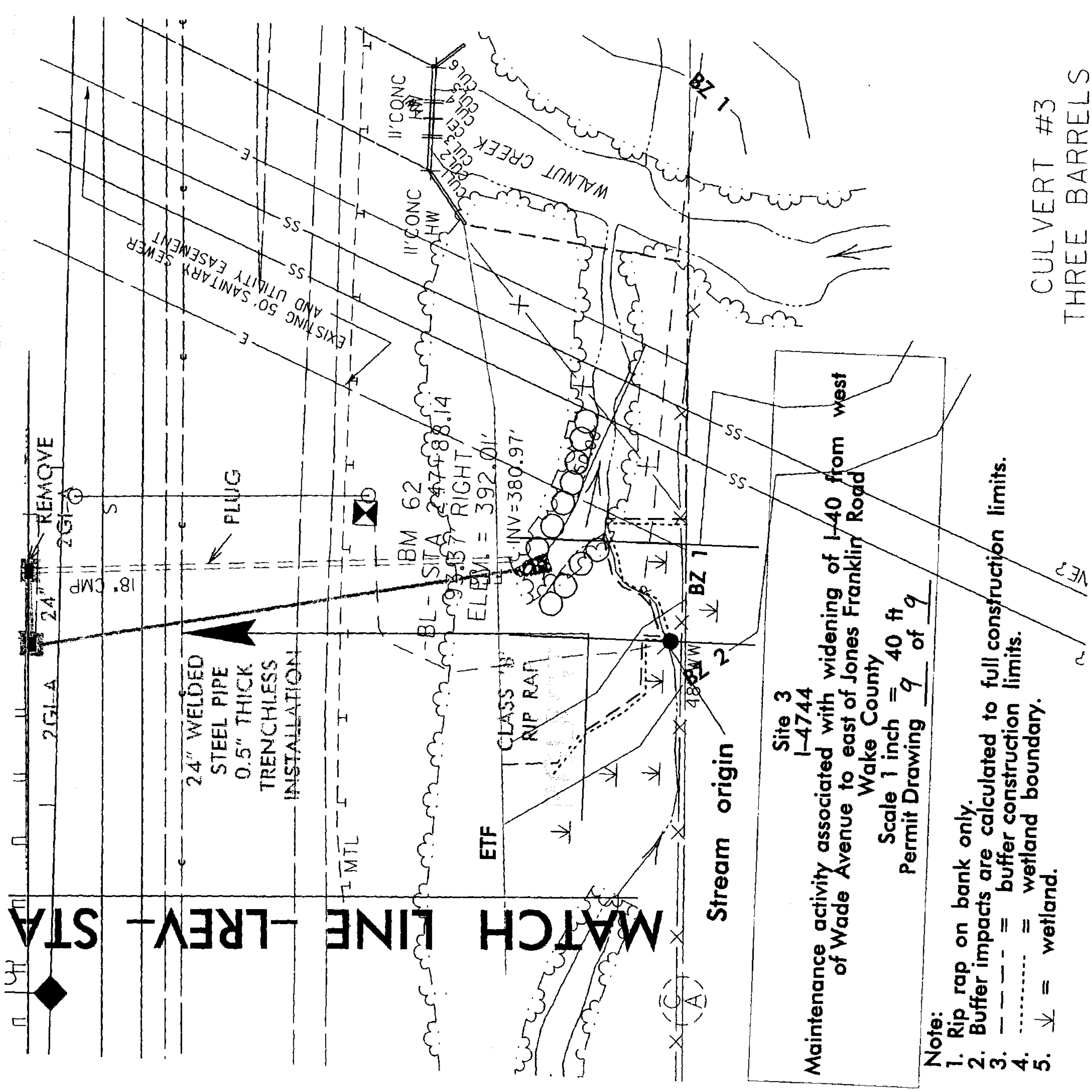
SITE 2
I–4744
Maintenance activity associated with widening of I–40 from west of Wade Avenue to east of Jones Franklin Road
Wake County
Scale: 1 inch = 40 ft
Permit Drawing 6 of 9

Note:
1. Rip rap on bank only.
2. Buffer impacts are calculated to full construction limits.
2. – – – – = buffer construction limits.




078° 46.0000' W
078° 45.0000' W
078° 44.0000' W
035° 48.0000' N
035° 47.0000' N
035° 46.0000' N
035° 45.0000' N
Site 3
Site 3
I-4744
Maintenance activity associated with widening of I-40 from west of Wade Avenue to east of Jones Franklin Road in Wake County
Raleigh West USGS Topo Map (1968, 1988)
Scale: 1 inch = 24,000 feet
Permit Drawing 7 of 9
Magnetic Declination
9° W
CARY
Asbury
Radio Towers
Trailer Park
Walnut
Maynard
Hillsborough
Dillard Rd
Substa
Silver Lake
Carter Stadium


Site 3
I-4744
Maintenance activity associated with widening of I-40 from west of Wade Ave. to east of Jones Franklin Road in Wake County
Soil Survey of Wake County (USGS-SCS, 1970)
Scale: 1:15,840
Permit Drawing 8 of 9
N
Site 3
(Joins sheet 47)
(Joins sheet 58)
(Joins sheet 67)
(57)
SOUTHERN RAILROAD
COAST LINE
Scale 1:15840
1 Mile
5000 Feet


CULVERT #3
THREE BARRELS
WALNUT CREEK
EXISTING 50' SANITARY SEWER AND UTILITY EASEMENT
11' CONC HW
BZ 1
BM 62
BL- STA 247+88.14
93.37' RIGHT
ELEV. = 392.01'
INV=380.97'
REMOVE
2GI-A
PLUG
18" CMP
24"
24" WELDED STEEL PIPE 0.5" THICK TRENCHLESS INSTALLATION
CLASS 'B' RIP RAP
ETF
MTL
Stream origin
MATCH LINE -LREV- STA
Site 3
I-4744
Maintenance activity associated with widening of I-40 from west of Wade Avenue to east of Jones Franklin Road
Wake County
Scale 1 inch = 40 ft
Permit Drawing 9 of 9
Note:
1. Rip rap on bank only.
2. Buffer impacts are calculated to full construction limits.
3. — — - - = buffer construction limits.
4. -------- = wetland boundary.
5. ↓ = wetland.

***** STANDARD SPECIAL PROVISIONS *****

LIABILITY INSURANCE

(11-18-08) DB1 G80

Page 1-68, Article 107-16 is amended to include the following as the first, second, third and fourth paragraphs:

The Design-Build Team shall be liable for any losses resulting from a breach of the terms of this contract. The Design-Build Team shall be liable for any losses due to the negligence or willful misconduct of its agents, assigns and employees including any sub-contractors which causes damage to others for which the Department is found liable under the Torts Claims Act, or in the General Courts of Justice, provided the Department provides prompt notice to the Design-Build Team and that the Design-Build Team has an opportunity to defend against such claims. The Design-Build Team shall not be responsible for punitive damages.

The Design-Build Team shall at its sole cost and expense obtain and furnish to the Department an original standard ACORD form certificate of insurance evidencing commercial general liability with a limit for bodily injury and property damage in the amount of $5,000,000.00 per occurrence and general aggregate, covering the Design-Build Team from claims or damages for bodily injury, personal injury, or for property damages which may arise from operating under the contract by the employees and agents of the Design-Build Team. The required limit of insurance may be obtained by a single general liability policy or the combination of a general liability and excess liability or umbrella policy. The State of North Carolina shall be named as an additional insured on this commercial general liability policy. The policy may contain the following language as relates to the State as an additional insured: "This insurance with respect to the additional insured applies only to the extent that the additional insured is held liable for your or your agent's acts or omissions arising out of and in the course of operations performed for the additional insured."

The Design-Build Team shall maintain all legally required insurance coverage, including without limitation, worker's compensation and vehicle liability, in the amounts required by law. Providing and maintaining adequate insurance coverage is a material obligation of the Design-Build Team and is of the essence of this contract. All such insurance shall meet all laws of the State of North Carolina. Such insurance coverage shall be obtained from companies that are authorized to provide such coverage and that are authorized by the Commissioner of Insurance to do business in North Carolina. The Design-Build Team shall at all times comply with the terms of such insurance policies.

Upon execution of the contract, provide evidence of the above insurance requirements to the Engineer.

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.

CONTRACTOR CLAIM SUBMITTAL FORM

(9-16-08) DB1 G140

If the Design-Build Team elects to file a written claim or requests an extension of contract time, it shall be submitted on the *Contractor Claim Submittal Form (CCSF)* available through the Construction Unit or

http://ncdot.org/doh/operations/dp_chief_eng/constructionunit/formsmanuals/.

SHALLOW UNDERCUT

(9-18-07) DB2 R35

Description

Perform undercut excavation and place a combination of fabric for soil stabilization and Class IV Subgrade Stabilization at locations as directed. Work includes performing undercut excavation, disposing of unsuitable material, furnishing and placing fabric for soil stabilization; and furnishing, placing and compacting Class IV Subgrade Stabilization.

Materials

Refer to Division 10 of the 2006 *Standard Specifications for Roads and Structures*:

Item	Section
Select Material, Class IV	1016
Fabric for Soil Stabilization, Type 4	1056

Use Class IV Select Material for Class IV Subgrade Stabilization. If Class IV Subgrade Stabilization does not meet the requirements of Article 1010-2 of the 2006 *Standard Specifications for Roads and Structures*, the Engineer, at his discretion, may consider the material reasonably acceptable in accordance with Article 105-3 of the 2006 *Standard Specifications for Roads and Structures*.

Construction Methods

Perform undercut excavation in accordance with Section 225 of the 2006 *Standard Specifications for Roads and Structures*. Place fabric for soil stabilization in accordance with Article 270-3 of the 2006 *Standard Specifications for Roads and Structures* before backfilling. Backfill with Class IV Subgrade Stabilization by end dumping subgrade stabilization material on the fabric. Do not operate heavy equipment on the fabric until it is covered with Class IV Subgrade Stabilization. Compact subgrade stabilization material to 92% of AASHTO T180 as modified by the Department or to the highest density that can be reasonably obtained.

Maintain Class IV Subgrade Stabilization in an acceptable condition and minimize the use of heavy equipment on subgrade stabilization material in order to avoid damaging the backfill. Provide and maintain drainage ditches and drains as required to prevent entrapment of water in backfill.

NOTE: Deleted Shoulder and Fill Slope Material Standard Special Provision

FLOWABLE FILL

(8-21-07) DB3 R30

Description

This work consists of all work necessary to place flowable fill in accordance with these provisions, the plans developed by the Design-Build Team and as directed.

Materials

Provide flowable fill material in accordance with Article 340-2 of the 2006 *Standard Specifications for Roads and Structures.*

Construction Methods

Discharge flowable fill material directly from the truck into the space to be filled, or by other approved methods. The mix may be placed full depth or in lifts as site conditions dictate. The Design-Build Team shall provide a method to plug the ends of the existing pipe in order to contain the flowable fill.

REINFORCED BRIDGE APPROACH FILL

7-18-06 DB4 R 01

Description

This work consists of all work necessary to construct reinforced bridge approach fills in accordance with these provisions and the plans, and as directed by the Engineer.

Materials

(A) Geomembrane

Provide geomembrane that is impermeable, composed of polyethylene polymers or polyvinyl chloride, and meets the following physical requirements:

Property	Requirements	Test Method
Thickness	25 mils Minimum	ASTM D1593
Tensile Strength at Break	100 lb /inch Minimum	ASTM D638
Puncture Strength	40 lbs Minimum	ASTM D4833
Moisture Vapor Transmission Rate	0.018 ounce / yard^2 per Day Maximum	ASTM E96

(B) Fabric

Refer to Section 1056 for Type 2 Engineering Fabric and the following:

Use a woven fabric consisting of strong rot-proof synthetic fibers such as polypropylene, polyethylene, or polyester formed into a stable network such that the filaments or yarns retain their relative positions to each other.

Fabric Property	Requirements	Test Method
Minimum Flow Rate	2 gallons / min / square foot	ASTM D 4491

Lamination of fabric sheets to produce the physical requirements of a fabric layer will not be accepted. Furnish letters of certification from the manufacturer with each shipment of the fabric and geomembrane attesting that the material meets the requirements of this provision; however, the material is subject to inspection, test, or rejection by the Engineer at any time.

During all periods of shipment and storage, wrap the geomembrane and fabric in a heavy-duty protective covering to protect the material from ultraviolet rays. After the protective wrapping has been removed, do not leave the material uncovered under any circumstances for longer than 4 days.

(C) Select Material

Provide select material meeting the requirements of Class III, Type 1 or Type 2, or Class V select material of Section 1016 of the 2006 *Standard Specifications for Roads and Structures*. When select material is required under water, use select material class V only, up to one foot above the existing water elevation.

(D) 4-inch Diameter Corrugated Drainage Pipe and Fittings

Provide pipe and fittings that meet all the applicable requirements of Section 815 or 816 of the 2006 *Standard Specifications for Roads and Structures*.

Construction Methods

Place the geomembrane and fabric as shown on the plans or as directed by the Engineer. Perform the excavation for the fabric reinforced fill to the limits shown on the plans. Provide an excavated surface free of obstructions, debris, pockets, stumps, and cleared of all vegetation. The geomembrane or fabric will be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation, handling or storage. Lay all layers smooth, and free from tension, stress, folds, wrinkles or creases. Place all the fabric layers with the machine direction (roll direction) parallel to the centerline of the roadway. A minimum roll width of 10.0 feet for the fabric is required. Overlap geomembrane or fabric splices parallel to the centerline of the roadway a minimum of 18 inches. Geomembrane or fabric splices parallel to the backwall face will not be allowed.

Deposit and spread select material in successive, uniform, approximately horizontal layers of not more than 10 inches in depth, loose measurement, for the full width of the cross section, and keep each layer approximately level. Place and compact each layer of select material fill no more than 10 inches thick with low ground pressure equipment. Use hand operated equipment to compact the fill material within three feet of the backwall and wingwalls as directed by the Engineer. Compact select material to a density equal to at least 95% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the Department. Compact the top eight inches of select material to a density to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the Department. Density requirements are not applicable to select material, class V; however compact the fill with at least four passes of low ground pressure equipment on the entire surface as directed by the Engineer. The compaction of each layer of select material shall be inspected and approved by the Department prior to the placement of the next fill layer. No equipment will be allowed to operate on the drainage pipe or any geomembrane / fabric layer until it is covered with at least six inches of fill material. Compaction shall not damage the drainage pipe, geomembrane, or fabric under the fill. Cover the geomembrane / fabric with a layer of fill material within four days after placement of the geomembrane / fabric. Geomembrane and fabric that are damaged as a result of installation will be replaced as directed by the Department at no additional cost.

Place the geomembrane on the ground, and attach and secure it tightly to the vertical face of the backwall and wingwalls with adhesives, duct-tape, nails or any other method approved by the Engineer. Place the first fabric layer on the surface of the geomembrane with the same dimensions of the geomembrane. No material or void is allowed between the geomembrane and the first fabric layer. Place and fold the remaining fabric layers on the edges as shown on the plans or as directed by the Engineer. Provide vertical separation between fabric layers as specified on the plans. The number of fabric layers will be shown in the plans.

Place four inch diameter perforated drainage pipe along the base of the backwall and sloped to drain as shown on the plans. Completely wrap perforated drainage pipe and #78M stone with Type 2 Engineering Fabric as shown on the plan detail. Install a pipe sleeve through the bottom of or under the wing wall prior to placing concrete for the wing wall. The pipe sleeve shall be of adequate strength to withstand the wingwall load. Place the pipe sleeve in position to allow the drainage pipe to go through the wing wall with a proper slope. Connect four-inch diameter nonperforated (plain) drainage pipe with a coupling to the perforated pipe near the inside face of the wingwall. Place the nonperforated drainage pipe through the pipe sleeve, extend down to the toe of the slope and connect, to a ditch or other drainage systems as directed by the Engineer. For bridge approaches in cut sections where no side slope is available, direct the drainage pipe outlet to the end slope down to the toe using elbows as directed by the Engineer.

AGGREGATE BASE COURSE

12-19-06 DB5 R03

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 5-11, Article 520-5 Hauling and Placing Aggregate Base Material, 6th paragraph, replace the first sentence with the following:

Base course that is in place on November 15 shall have been covered with a subsequent layer of pavement structure or with a sand seal. Base course that has been placed between November 16 and March 15 inclusive shall be covered within 7 calendar days with a subsequent layer of pavement structure or with a sand seal.

PREPARATION OF SUBGRADE AND BASE

(1-16-96) 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 Standard Specifications 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 PAVEMENTS - SUPERPAVE:

(7-18-06)(Rev 5-19-09) DB6 R01

Revise the *2006 Standard Specifications* as follows:

Page 6-2, Article 600-9 Measurement and Payment, delete the second paragraph.

Page 6-12, Subarticle 609-5(C)2, Required Sampling and Testing Frequencies, first partial paragraph at the top of the page, delete last sentence and add the following:

If the Engineer allows the mix to remain in place, payment will be made in accordance with Article 105-3.

Page 6-12, Subarticle 609-5(C)2, QUALITY CONTROL MINIMUM SAMPLING AND TESTING SCHEDULE

First paragraph, delete 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:

Second paragraph, delete the fourth sentence, and replace with the following

When daily production of each mix design exceeds 100 tons and a regularly scheduled full test series random sample location for that mix design does not occur during that

day's production, perform at least one partial test series consisting of Items A and B in the schedule below.

Page 6-12, Subarticle 609-5(C)2(c) Maximum Specific Gravity, add after (AASHTO T 209):

or ASTM D 2041

Page 6-13, last line and on page and Page 6-14, Subarticle 609-5(C)(2)(e) Retained Tensile Strength, add a heading before the first paragraph as follows:

(i) Option 1

Insert the following immediately after the first paragraph:

(ii) Option 2

Mix sampled from truck at plant with one set of specimens prepared by the Contractor and then tested jointly by QA and QC at a mutually agreed upon lab site within the first 7 calendar days after beginning production of each new mix design.

Second paragraph, delete and replace with the following:

Test all TSR specimens required by either option noted above on either a recording test press or a test press that maintains the peak load reading after the specimen has broken.

Subarticle 609-5(C)(3) Control Charts, delete the second sentence of the first paragraph and replace with the following:

For mix incorporated into the project, record full test series data from all regularly scheduled random samples or directed samples that replace regularly scheduled random samples, on control charts the same day the test results are obtained.

Page 6-15, Subarticle 609-5(C)(3) Control Charts, first paragraph on this page, delete the last sentence and substitute the following:

Denote the moving average control limits with a dash green line and the individual test limits with a dash red line.

Subarticle 609-5(C)(3)(a), (b) and (c), replace (a) (b) and (c) with the following:

(a) A change in the binder percentage, aggregate blend, or G_{mm} is made on the JMF, or,

(b) When the Contractor elects to stop or is required to stop production after one or two moving average values, respectively, fall outside the moving average limits as outlined in subarticle 609-5(C)6 or,

(c) If failure to stop production after two consecutive moving averages exceed the moving average limits occurs, but production does stop at a subsequent time, re-establish a new moving average beginning at the actual production stop point.

Subarticle 609-5(C)(4) Control Limits, replace the first paragraph and the CONTROL LIMITS Table on page 6-16 with the following.

The following are established as control limits for mix production. Apply the individual limits to the individual test results. Control limits for the moving average limits are based on a moving average of the last 4 data points. Apply all control limits to the applicable target source.

CONTROL LIMITS

Mix Control Criteria	Target Source	Moving Average Limit	Individual Limit
2.36 mm Sieve	JMF	±4.0 %	±8.0 %
0.075mm Sieve	JMF	±1.5 %	±2.5 %
Binder Content	JMF	±0.3 %	±0.7 %
VTM @ N_{des}	JMF	±1.0 %	±2.0 %
VMA @ N_{des}	Min. Spec. Limit	-0.5%	-1.0%
$P_{0.075}$/ P_{be} Ratio	1.0	±0.4	±0.8
$\%G_{mm}$ @ N_{ini}	Max. Spec. Limit	N/A	+2.0%
TSR	Min. Spec. Limit	N/A	- 15%

Page 6-16, Subarticle 609-5(C)(5) Warning Bands, delete this subarticle in its entirety.

Pages 6-16 through 6-19, Subarticle 609-5(C)(6), delete the word "warning" and substitute the words "moving average".

Page 6-16, Subarticle 609-5(C)(6) Corrective Actions, first paragraph, first sentence, delete and replace with the following:

Immediately notify the Engineer when moving averages exceed the moving average limits.

Page 6-17, third full paragraph, delete and replace with the following:

Failure to stop production when required due to an individual mix test not meeting the specified requirements will subject all mix from the stop point tonnage to the point when the next individual test is back on or within the moving average limits, or to the tonnage

point when production is actually stopped, whichever occurs first, to being considered unacceptable.

Sixth full paragraph, delete the first, second, and third sentence and replace with the following:

Immediately notify the Engineer when any moving average value exceeds the moving average limit. If two consecutive moving average values for any one of the mix control criteria fall outside the moving average limits, cease production of that mix, immediately notify the Engineer of the stoppage, and make adjustments. The Contractor may elect to stop production after only one moving average value falls outside the moving average limits.

Page 6-18, Subarticle 609-5(C)(6) Corrective Actions second full paragraph, delete and replace with the following:

If the process adjustment improves the property in question such that the moving average after four additional tests is on or within the moving average limits, the Contractor may continue production with no reduction in payment

Page 6-18, delete the third and fourth full paragraphs, including the Table for Payment for Mix Produced in the Warning Bands and substitute the following:

If the adjustment does not improve the property in question such that the moving average after four additional individual tests is outside the moving average limits, the mix will be evaluated for acceptance in accordance with Article 105-3. Reduced payment for or removal of the mix in question will be applied starting from the plant sample tonnage at the stop point to the sample tonnage when the moving average is on or within the moving average limits. In addition, any mix that is obviously unacceptable will be rejected for use in the work.

Page 6-19, First paragraph, delete and replace with the following:

Failure to stop production and make adjustments when required due to two consecutive moving average values falling outside the moving average limits will subject all mix produced from the stop point tonnage to the tonnage point when the moving average is back on or within the moving average limits or to the tonnage point when production is actually stopped, whichever occurs first, to being considered unacceptable. Remove this material and replaced with materials that comply with the Specifications at no additional costs to the Department, unless otherwise approved. Payment will be made for the actual quantities of materials required to replace the removed quantities, not to exceed the original amounts.

Page 6-20, Subarticle 609-5(D)(1) General, delete the third full paragraph, and replace with the following:

Perform the sampling and testing at the minimum test frequencies as specified above. Should the density testing frequency fail to meet the minimum frequency as specified above, all mix without the required density test representation will be considered unsatisfactory. If the Engineer allows the mix to remain in place, payment will be made in accordance with Article 105-3.

Page 6-22, Subarticle 609-5(D)(4) Nuclear Gauge Density Procedures, third paragraph, insert the following as the second sentence:

Determine the Daily Standard Count in the presence of the QA Roadway Technician or QA Nuclear Gauge Technician on days when a control strip is being placed.

Page 6-23, Subarticle 609-5(D)(5) Limited Production Procedure, delete the first paragraph including (a), (b), (c) and substitute the following:

Proceed on limited production when, for the same mix type and on the same contract, one of the following conditions occur (except as noted in the first paragraph below).

(a) Two consecutive failing lots, except on resurfacing*
(b) Three consecutive failing lots on resurfacing*
(c) Two consecutive failing nuclear control strips.

* Resurfacing is defined as the first new uniform layer placed on an existing pavement.

Page 6-25, Article 609-6 Quality Assurance, Density Quality Assurance, insert the following items after item (E):

(F) By retesting Quality Control core samples from control strips (either core or nuclear) at a frequency of 100% of the frequency required of the Contractor;

(G) By observing the Contractor perform all standard counts of the Quality Control nuclear gauge prior to usage each nuclear density testing day; or

(H) By any combination of the above

Page 6-28, Subarticle 610-3(A) Mix Design-General, delete the fourth and fifth paragraphs and replace with the following:

Reclaimed Asphalt Pavement (RAP) or Reclaimed Asphalt Shingles (RAS) may be incorporated into asphalt plant mixes in accordance with Article 1012-1 and the following applicable requirements.

Reclaimed asphalt pavement (RAP) may constitute up to 50% of the total material used in recycled mixtures, except for mix Type S 12.5D, Type S 9.5D, and mixtures containing reclaimed asphalt shingle material (RAS). Reclaimed asphalt shingle (RAS) material may constitute up to 6% by weight of total mixture for any mix. When both RAP and RAS are used, do not use a combined percentage of RAS and RAP greater than 20% by weight of total mixture, unless otherwise approved. When the percent of binder contributed from RAS or a combination of RAS and RAP exceeds 20% but not more than 30% of the total binder in the completed mix, the virgin binder PG grade shall be one grade below (both high and low temperature grade) the binder grade specified in Table 610-2 for the mix type. When the percent of binder contributed from RAS or a combination of RAS and RAP exceeds 30% of the total binder in the completed mix, the Engineer will establish and approve the virgin binder PG grade. Use approved methods to determine if any binder grade adjustments are necessary to achieve the performance grade for the specified mix type.

For Type S 12.5D and Type S 9.5D mixes, the maximum percentage of reclaimed asphalt material is limited to 20% and shall be produced using virgin asphalt binder grade PG 76-22. For all other recycled mix types, the virgin binder PG grade shall be as specified in Table 610-2B for the specified mix type.

When the percentage of RAP is greater than 20% but not more than 30% of the total mixture, use RAP meeting the requirements for processed or fractionated RAP in accordance with the requirements of Section 1012-1.

When the percentage of RAP is greater than 30% of the total mixture, use an approved stockpile of RAP in accordance with Section 1012-1(C). Use approved test methods to determine if any binder grade adjustments are necessary to achieve the performance grade for the specified mix type. The Engineer will establish and approve the virgin asphalt binder grade to be used.

Page 6-34, Insert the following immediately after Table 610-2:

TABLE 610-2A

SUPERPAVE MIX DESIGN CRITERIA

	Percentage of RAP in Mix		
	Category 1	Category 2	Category 3
Mix Type	% RAP ≤20%	20.1% ≤ %RAP ≤ 30.0%	%RAP > 30.0%
All A and B Level Mixes, I19.0C, B25.0C	PG 64 -22	PG 64 -22	TBD
S9.5C, S12.5C, I19.0D	PG 70 -22	PG 64-22	TBD
S 9.5D and S12.5D	PG 76-22	N/A	N/A

Note: (1) Category 1 RAP has been processed to a maximum size of 2 inches.

(2) Category 2 RAP has been processed to a maximum size of 1 inch by either crushing and or screening to reduce variability in the gradations.

(3) Category 3 RAP has been processed to a maximum size of 1 inch, fractionating the RAP into 2 or more sized stockpiles

(4) In addition, mixes using more than 30% RAP shall be tested and evaluated using the AASHTO TP62. Dynamic Modulus testing will be used to evaluate the degree of mixing of the Recycled Binder.

Page 6-35, Table 610-3 delete and replace with the following:

TABLE 610-3
ASPHALT PLACEMENT- MINIMUM TEMPERATURE REQUIREMENTS

Asphalt Concrete Mix Type	Minimum Air Temperature	Minimum Surface Temperature
ACBC, Type B 25.0B, C, B 37.5C	35°F	35°F
ACIC, Type I 19.0B, C, D	35°F	35°F
ACSC, Type S 4.75A, SF 9.5A, S 9.5B	40°F	50°F*
ACSC, Type S 9.5C, S 12.5C	45°F	50°F
ACSC, Type S 9.5D, S 12.5D	50°F	50°F

* 35°F if surface is soil or aggregate base for secondary road construction.

Page 6-44, Article 610-8 Spreading and Finishing, third full paragraph, replace the first sentence with the following:

Use the 30 foot minimum length mobile grade reference system or the non-contacting laser or sonar type ski *with at least four referencing stations mounted on the paver at a minimum length of 24 feet* to control the longitudinal profile when placing the initial lanes and all adjacent lanes of all layers, including resurfacing and asphalt in-lays, unless otherwise specified or approved.

Page 6-50, Article 610-13 Density Acceptance, delete the second paragraph and replace with the following:

As an exception, when the first layer of mix is a surface course and is being placed directly on an unprimed aggregate or soil base, the layer will be included in the "Other" construction category.

Page 6-53, Article 620-4 Measurement and Payment, sixth paragraph, delete the last sentence.

Page 6-54, Article 620-4 Measurement and Payment, add the following pay item:

Pay Item	Pay Unit
Asphalt Binder for Plant Mix, Grade PG 70-28	Ton

Page 6-69, Table 660-1 Material Application Rates and Temperatures, add the following:

Type of Coat	Grade of Asphalt	Asphalt Rate gal/yd^2	Application Temperature ^oF	Aggregate Size	Aggregate Rate lb./sq. yd. Total
Sand Seal	CRS-2 or CRS-2P	0.22-0.30	150-175	Blotting Sand	12-15

Page 6-75, Subarticle 660-9(B), add the following as sub-item (5)

(5) Sand Seal

Place the fully required amount of asphalt material in one application and immediately cover with the seal coat aggregate. Uniformly spread the fully required amount of aggregate in one application and correct all non-uniform areas prior to rolling.

Immediately after the aggregate has been uniformly spread, perform rolling.

When directed, broom excess aggregate material from the surface of the seal coat.

When the sand seal is to be constructed for temporary sealing purposes only and will not be used by traffic, other grades of asphalt material meeting the requirements of Articles 1020-6 and 1020-7 may be used in lieu of the grade of asphalt required by Table 660-1 when approved.

Page 6-76, Article 661-1 Description, add the following as the 2nd paragraph:

Provide and conduct the quality control and required testing for acceptance of the UBWC in accordance with "Quality Management System for Asphalt Pavements (OGAFC, PADL, and Ultra-Thin HMA Version)", included in the contract.

Page 6-80, Subarticle 661-3(A) Equipment, add the following as the first paragraph:

Use asphalt mixing plants in accordance with Article 610-5.

Page 10-41, Table 1012-1, delete the last row of entries for OGAFC and add the following:

Mix Type	Course Aggregate Angularity [(b)] ASTM D5821	Fine Aggregate Angularity % Minimum AASHTO T304 Method A	Sand Equivalent % Minimum AASHTO T176	Flat & Elongated 5:1 Ratio % Maximum ASTM D4791 Section 8.4
S 9.5 D	100/100	45	50	10
OGAFC	100/100	N/A	N/A	10
UBWC	100/85	40	45	10

Delete Note (c) under the Table 1012-1 and replace with the following:

(c) Does not apply to Mix Types SF 9.5A and S 9.5B.

Page 10-43, Subarticle 1012-1(F): Reclaimed Asphalt Shingle Material (RAS), insert the following immediately following the first paragraph:

(1) Mix Design RAS

Incorporate RAS from stockpiles that have been tested for uniformity of gradation and binder content prior to use in an asphalt mix design.

(2) Mix Production RAS

New Source RAS is defined as acceptable material which was not included in the stockpile when samples were taken for mix design purposes. Process new source RAS so that all materials will pass a ½" inch sieve prior to introduction into the plant mixer unit.

After a stockpile of processed RAS has been sampled and mix designs made from these samples, do not add new source RAS to the original stockpile without prior field testing to insure gradation and binder uniformity. Sample and test new source RAS before blending with the existing stockpile.

Store new source RAS in a separate stockpile until the material can be sampled and tested for comparison with the original recycled mix design data. New source RAS may also be placed against the existing stockpile in a linear manner provided it is sampled for mix design conformity prior to its use in the recycled mix.

RAS contamination including but not limited to excessive dirt, debris, clean stone, concrete. will not be allowed.

Field approval of new source RAS will be based on Table 1012-3 below and volumetric mix properties on the mix with the new source RAS included. Provided the Table 1012-3 tolerances are met, volumetric properties of the new mix will then be performed. If all volumetric mix properties meet the mix design criteria for that mix type, the new source RAS may continue to be used.

If the gradation, binder content, or any of the volumetric mix properties are not within the allowable tolerances of Table 1012-3, do not use the new source RAS unless approved by the Engineer. The Contractor may elect to either not use the stockpile, to request an adjustment to the JMF, or to redesign the mix.

TABLE 1012-3
NEW SOURCE RAS GRADATION and BINDER TOLERANCES
(Apply Tolerances to Mix Design Data)

0-6% RAS	
P_b %	±1.6%
Sieve Size (mm)	Tolerance
9.5	±1
4.75	±5
2.36	±4
1.18	±4
0.300	±4
0.150	±4
0.075	±2.0

Page 10-43 through 10-45, Subarticle 1012-1(G), delete this in its entirety and replace with the following:

(G) Reclaimed Asphalt Pavement (RAP)

(1) Mix Design RAP

Incorporate RAP from stockpiles or other sources that have been tested for uniformity of gradation and binder content prior to use in an asphalt mix design. Use reclaimed asphalt pavement that meets all requirements specified for *one of* the following *two* classifications.

(a) Millings

Existing reclaimed asphalt pavement (RAP) that is removed from its original location by a milling process as specified in Section 607. Millings should be such that it has a uniform gradation and binder content and all materials will pass a 2" sieve prior to introduction into the plant mixer unit.

(b) Processed RAP

RAP that is processed in some manner (possibly by crushing and/or use of a blending method) to produce a uniform gradation and binder content in the RAP prior to use in a recycled mix. Process RAP so that all materials have a uniform gradation and binder content and will pass a 1" sieve prior to introduction into the plant mixer unit.

(c) Fractionated RAP

Fractionated RAP is defined as having two or more RAP stockpiles, where the RAP is divided into coarse and fine fractions. Grade RAP so that all materials will pass a 1" sieve. The coarse RAP stockpile shall only contain material retained on a 3/8 inch screen, unless otherwise approved. The fine RAP stockpile shall only contain material passing the 3/8" screen, unless otherwise approved. The Engineer may allow the Contractor to use an alternate to the 3/8 inch screen to fractionate the RAP. The maximum percentages of fractionated RAP may be comprised of coarse, fine, or the combination of both. Utilize a separate cold feed bin for each stockpile of fractionated RAP used.

(d) Approved Stockpiled RAP

Approved Stockpiled RAP is defined as fractionated RAP which has been isolated and tested for asphalt content, gradation, and asphalt binder characteristics with the intent to be used in mix designs with greater than 30% RAP materials. Fractionate the RAP in accordance with Section 1012-1(G)(c). Utilize a separate cold feed bin for each approved stockpile of RAP used.

Perform extraction tests at a rate of 1 per 1000 tons of RAP, with a minimum of 5 tests per stockpile to determine the asphalt content and gradation. Separate stockpiles of RAP material by fine and coarse fractions. Erect and maintain a sign satisfactory to the Engineer on each stockpile to identify the material. Assure that no deleterious material is allowed in any stockpile. The Engineer may reject by visual inspection any stockpiles that are not kept clean, separated, and free of foreign materials.

Submit requests for RAP stockpile approval to the Engineer with the following information at the time of the request:

(1) Approximate tons of materials in stockpile
(2) Name or Identification number for the stockpile
(3) Asphalt binder content and gradation test results
(4) Asphalt characteristics of the Stockpile.

For the Stockpiled RAP to be considered for approval, the gradation and asphalt content shall be uniform. Individual test results, when compared to the averages, will be accepted if within the tolerances listed below:

P_b %	±0.3%
Sieve Size (mm)	Percent Passing
25.0	±5%
19.0	±5%
12.5	±2%
9.5	±2%
4.75	±5%
2.36	±4%
1.18	±4%
0.300	±4%
0.150	±4%
0.075	±1.5%

Note: If more than 20% of the individual sieves are out of the gradation tolerances, or if more than 20 % of the asphalt binder content test results fall outside the appropriate tolerances, the RAP shall not be used in HMA unless the RAP representing the failing tests is removed from the stockpile.

Do not add additional material to any approved RAP stockpile, unless otherwise approved by the Engineer.

Maintain at the plant site a record system for all approved RAP stockpiles. Include at a minimum the following: Stockpile identification and a sketch of all stockpile areas at the plant site; all RAP test results (including asphalt content, gradation, and asphalt binder characteristics).

(2) Mix Production RAP

During mix production, use RAP that meets the criteria for one of the following categories:

(a) Mix Design RAP

RAP contained in the mix design stockpiles as described above may be used in all applicable JMFs. These stockpiles have been pretested: however, they are subject to required QC/QA testing in accordance with Subarticle 609-5(C)(2).

(b) New Source RAP

New Source RAP is defined as any acceptable material that was not included in the stockpile or other source when samples were taken for mix design purposes. Process new source RAP so that all materials have a uniform gradation and binder content and will pass a 2" sieve prior to introduction into the plant mixer unit.

After a stockpile of millings, processed RAP, or fractionated RAP has been sampled and mix designs made from these samples, do not add new source RAP to the original stockpile without prior field testing to insure gradation and binder uniformity. Sample and test new source RAP before blending with the existing stockpile.

Store new source RAP in a separate stockpile until the material can be sampled and tested for comparison with the original recycled mix design data. New source RAP may also be placed against the existing stockpile in a linear manner provided it is sampled for mix design conformity prior to its use in the recycled mix.

Unprocessed RAP is asphalt material that was not milled and/or has not been processed to obtain a uniform gradation and binder content and is not representative of the RAP used during the applicable mix design. Unprocessed RAP shall not be incorporated into any JMFs prior to processing. Different sources of unprocessed RAP may be stockpiled together provided it is generally free of contamination and will be processed prior to use in a recycled mix. RAP contamination in the form of excessive dirt, debris, clean stone, concrete, etc. will not be allowed. Incidental amounts of dirt, concrete, and clean stone may be acceptable. Unprocessed RAP may be processed and then classified as a new source RAP as described above.

Field approval of new source RAP will be based on Table 1012-2 below and volumetric mix properties on the mix with the new source RAP included. Provided the Table 1012-2 tolerances are met, volumetric properties of the new mix will then be performed. If all volumetric mix properties meet the mix design criteria for that mix type, the new source RAP may continue to be used.

If the gradation, binder content, or any of the volumetric mix properties are not within the allowable tolerances of Table 1012-2, do not use the new source RAP unless approved by the Engineer. The Contractor may elect to either not use the stockpile, to request an adjustment to the JMF, or to redesign the mix.

TABLE 1012-2 NEW SOURCE RAP GRADATION and BINDER TOLERANCES (Apply Tolerances to Mix Design Data)									
Mix Type	0-20% RAP			20^{+}-30 % RAP			30^{+} % RAP		
Sieve (mm)	Base	Inter.	Surf.	Base	Inter.	Surf.	Base	Inter.	Surf.
P_b %	± 0.7%			± 0.4%			± 0.3%		
25.0	±10	-	-	±7	-	-	±5	-	-
19.0	±10	±10	-	±7	±7	-	±5	±5	-
12.5	-	±6	±6	-	±3	±3	-	±2	±2
9.5	-	-	±8	-	-	±5	-	-	±4
4.75	±10	-	±10	±7	-	±7	±5	-	±5
2.36	±8	±8	±8	±5	±5	±5	±4	±4	±4
1.18	±8	±8	±8	±5	±5	±5	±4	±4	±4
0.300	±8	±8	±8	±5	±5	±5	±4	±4	±4
0.150	-	-	±8	-	-	±5	-	-	±4
0.075	±4	±4	±4	±2	±2	±2	±1.5	±1.5	±1.5

ASPHALT BINDER CONTENT OF ASPHALT PLANT MIXES

(10-6-05) 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_	4.3%
Asphalt Concrete Intermediate Course	Type I 19.0_	4.7%
Asphalt Concrete Surface Course	Type S 4.75_	7.0%
Asphalt Concrete Surface Course	Type SF 9.5_	6.5%
Asphalt Concrete Surface Course	Type S 9.5_	6.0%
Asphalt Concrete Surface Course	Type S 12.5_	5.5%

The actual asphalt binder content will be established during construction by the Engineer within the limits established in the 2006 *Standard Specifications for Roads and Structures* or Project Special Provisions.

ASPHALT PLANT MIXTURES

(7-1-95) 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

(07/15/08) DB6 R45

On portions of this project where the typical section requires two or more layers of new pavement, perform acceptance testing of the longitudinal profile of the finished pavement surface in accordance with these provisions using a North Carolina Hearne Straightedge (Model No. 1). Furnish and operate the straightedge to determine and record the longitudinal profile of the pavement on a continuous graph. Final surface testing is an integral part of the paving operation and is subject to observation and inspection by the Engineer as deemed necessary.

Push the straightedge manually over the pavement at a speed not exceeding 2 miles per hour (3 kilometers per hour). For all lanes, take profiles in the right wheel path approximately 3 feet (1 m) from the right edge of pavement in the same direction as the paving operation, unless otherwise approved due to traffic control or safety considerations. As an exception, lanes adjacent to curb and gutter, expressway gutter, shoulder berm gutter or concrete pavement may be tested in the left wheel path. Make one pass of the straightedge in each full width travel lane. The full lane width should be comparable in ride quality to the area evaluated with the Hearne Straightedge. If deviations exist at other locations across the lane width, utilize a 10-foot (3 meters) non-mobile straightedge or the Hearne Straightedge to evaluate which areas may require corrective action. Take profiles as soon as practical after the pavement has been rolled and compacted but in no event later than 24 hours following placement of the pavement, unless otherwise authorized by the Engineer. Take profiles over the entire length of final surface travel lane pavement exclusive of -Y- line travel lanes less than or equal to 1000 feet (300 meters) in length, ramps less than or equal to 1000 feet (300 meters) in length, turn lanes less than or equal to 1000 feet (300 meters) in length, structures, approach slabs, paved shoulders, loops, and tapers or other irregular shaped areas of pavement, unless otherwise approved by the Engineer. Test in accordance with this provision all mainline travel lanes, full width acceleration or deceleration lanes, -Y- line travel lanes greater than 1000 feet (300 meters) in length, ramps, full width turn lanes greater than 1000 feet (300 meters) in length, and collector lanes.

At the beginning and end of each day's testing operations, and at such other times as determined necessary by the Engineer, operate the straightedge over a calibration strip so that the Engineer can verify correct operation of the straightedge. The calibration strip must be a 100-foot (30 m) section of pavement that is reasonably level and smooth. Submit each day’s calibration graphs with that day’s test section graphs to the Engineer. Calibrate the straightedge in accordance with the current NCDOT procedure titled "North Carolina Hearne Straightedge - Calibration and Determination of Cumulative Straightedge Index". Copies of this procedure may be obtained from the Department's Pavement Construction Section.

Plot the straightedge graph at a horizontal scale of approximately 25 feet per inch (3 m per cm) with the vertical scale plotted at a true scale. Record station numbers and references (bridges, approach slabs, culverts, etc.) on the graphs, and distances between references / stations must not exceed 100 feet (30 m). Have the operator record the Date, Project No., Lane Location, Wheel Path Location, Type Mix, and Operator’s Name on the graph.

Upon completion of each day's testing, evaluate the graph, calculate the Cumulative Straightedge Index (CSI), and determine which lots, if any, require corrective action. Document the

evaluation of each lot on a QA / QC-7 form. Submit the graphs along with the completed QA / QC-7 forms to the Engineer, within 24 hours after profiles are completed, for verification of the results. The Engineer will furnish results of their acceptance evaluation to the Design-Build Team within 48 hours of receiving the graphs. In the event of discrepancies, the Engineer's evaluation of the graphs will prevail for acceptance purposes. The Engineer will retain all graphs and forms.

Use blanking bands of 0.2 inches, 0.3 inches, and 0.4 inches (5 mm, 7.5 mm, and 10 mm) to evaluate the graph for acceptance. The 0.2 inch and 0.3 inch (5 mm and 7.5 mm) blanking bands are used to determine the Straightedge Index (SEI), which is a number that indicates the deviations that exceed each of the 0.2 inch and 0.3 inch (5 mm and 7.5 mm) bands within a 100-foot (30 m) test section. The Cumulative Straightedge Index (CSI) is a number representing the total of the SEIs for one lot, which consist of not more than 25 consecutive test sections. In addition, the 0.4 inch (10 mm) blanking band is used to further evaluate deviations on an individual basis. The Cumulative Straightedge Index (CSI) will be determined by the Engineer in accordance with the current procedure titled "North Carolina Hearne Straightedge - Calibration and Determination of Cumulative Straightedge Index".

The pavement will be accepted for surface smoothness on a lot by lot basis. A test section represents pavement one travel lane wide not more than 100 feet (30 m) in length. A lot will consist of 25 consecutive test sections, except that separate lots will be established for each travel lane, unless otherwise approved by the Engineer. In addition, full width acceleration or deceleration lanes, ramps, turn lanes, and collector lanes, will be evaluated as separate lots.

If during the evaluation of the graphs, 5 lots (mainline travel lanes and full width -Y- line travel lanes greater than 300 feet in length only) require corrective action, then proceed on limited production for unsatisfactory laydown in accordance with Article 610-12. Proceeding on limited production is based upon the Design-Build Team's initial evaluation of the straightedge test results and must begin immediately upon obtaining those results. Additionally, the Engineer may direct the Design-Build Team to proceed on limited production in accordance with Article 610-12 due to unsatisfactory laydown or workmanship.

Limited production for unsatisfactory laydown is defined as being restricted to the production, placement, compaction, and final surface testing of a sufficient quantity of mix necessary to construct only 2500 feet (750 meter) of pavement at the laydown width. Once this lot is complete, the final surface testing graphs will be evaluated jointly by the Design-Build Team and the Engineer. Remain on limited production until such time as acceptable laydown results are obtained or until three consecutive 2500 foot (750 meter) sections have been attempted without achieving acceptable laydown results. The Engineer will determine if normal production may resume based upon the CSI for the limited production lot and any adjustments to the equipment, placement methods, and / or personnel performing the work. Once on limited production, the Engineer may require the Design-Build Team to evaluate the smoothness of the previous asphalt layer and take appropriate action to reduce and / or eliminate corrective measures on the final surface course. Additionally, the Design-Build Team may be required to demonstrate acceptable laydown techniques off the project limits prior to proceeding on the project.

If the Design-Build Team fails to achieve acceptable laydown results after three consecutive 2500 foot (750 meter) sections have been attempted, cease production of that mix type until such time as the cause of the unsatisfactory laydown results can be determined.

As an exception, the Engineer may grant approval to produce a different mix design of the same mix type if the cause is related to mix problem(s) rather than laydown procedures. If production of a new mix design is allowed, proceed under the limited production procedures detailed above.

After initially proceeding under limited production, the Design-Build Team shall immediately notify the Engineer if any additional lot on the project requires corrective action. The Engineer will determine if limited production procedures are warranted for continued production.

If the Design-Build Team does not operate by the limited production procedures as specified above, the 5 lots, which require corrective action, will be considered unacceptable and may be subject to removal and replacement.

The adjustment schedule for the Cumulative Straightedge Index (CSI) test results per lot is as follows:

Adjustment Schedule for Cumulative Straightedge Index (CSI) (Obtained by adding SE Index of up to 25 consecutive 100 ft. (30m) sections)		
***CSI**	**ACCEPTANCE CATEGORY**	**CORRECTIVE ACTION**
0-0	Acceptable	None
1-0 or 2-0	Acceptable	None
3-0 or 4-0	Acceptable	None
Any other Number	Unacceptable	Required

***Either Before or After Corrective Actions**

Correct any deviation that exceeds a 0.3 inch (7.5 mm) blanking band such that the deviation is reduced to 0.2 inches (5 mm) or less.

Corrective actions shall be performed at the Design-Build Team's expense and shall be presented for evaluation and approval by the Engineer prior to proceeding. Any corrective action performed shall not reduce the integrity or durability of the pavement which is to remain in place. Corrective action for deviation repair may consist of overlaying or removing and replacing. Scraping of the pavement with any blade type device shall not be allowed as a corrective action. Provide overlays of the same type mix, full roadway width, and to the length and depth established by the Engineer. Tapering of the longitudinal edges of the overlay will not be allowed.

Take corrective actions as specified if the CSI indicates “Required” corrective action. The CSI after corrective action should meet or exceed “Acceptable” requirements.

Where corrective action is required, the test section(s) requiring corrective action shall be retested, unless the Engineer directs the retesting of the entire lot.

Test sections and / or lots that are initially tested by the Design-Build Team which indicate excessive deviations such that corrective action is required, may be re-rolled with asphalt rollers while the mix is still warm and in a workable condition, to possibly correct the problem. In this instance, reevaluation of the test section(s) must be completed within 24 hours of pavement placement and these test results will serve as the initial test results.

Areas excluded from testing by the N.C. Hearne Straightedge shall be tested by using a non-mobile 10-foot (3 m) straightedge. Assure that the variation of the surface from the testing edge of the straightedge between any two contact points with the surface is not more than 1/8 inch (3 mm). Correct deviations exceeding the allowable tolerance in accordance with the corrective actions specified above, unless the Engineer permits other corrective actions.

Furnish the North Carolina Hearne Straightedge(s) necessary to perform this work. Maintain responsibility for all costs relating to the procurement, handling, and maintenance of these devices. The Department has entered into a license agreement with a manufacturer to fabricate, sell, and distribute the N.C. Hearne Straightedge. The Department's Pavement Construction Section may be contacted for the name of the current manufacturer and the approximate price of the straightedge.

REMOVE AND STOCKPILE EXISTING GUARDRAIL

(7-1-95) (Rev. 7-18-06) DB8 R55

Carefully dismantle and remove existing guardrail and all components, concrete anchors included, at locations indicated in the plans and neatly stockpile it on the right of way, with the small parts stored in sturdy containers, for removal by State Forces. Dispose of the concrete anchors.

GUARDRAIL ANCHOR UNITS, TYPE M-350

(4/20/04) DB8 R60

Description

Furnish and install guardrail anchor units in accordance with the details in the plans, the applicable requirements of Section 862 of the 2006 *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 following guardrail anchor units.

The guardrail anchor unit (SRT-350) as manufactured by:

TRINITY INDUSTRIES, INC.
2525 N. STEMMONS FREEWAY
DALLAS, TEXAS 75207
TELEPHONE: 800 644-7976

The guardrail anchor unit (FLEAT) as manufactured by:

ROAD SYSTEMS, INC.
3616 OLD HOWARD COUNTY AIRPORT
BIG SPRINGS, TEXAS 79720
TELEPHONE: 915-263-2435

The guardrail anchor unit (REGENT) as manufactured by:

ENERGY ABSORPTION SYSTEMS, INC.
ONE EAST WACKER DRIVE
CHICAGO, ILLINOIS 60601-2076
TELEPHONE: 888-32-ENERGY

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 the 2006 *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 2006 *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 2006 *Standard Specifications for Roads and Structures* and is incidental to the cost of the guardrail anchor unit.

GUARDRAIL ANCHOR UNITS, TYPE 350

(4/20/04) DB8 R65

Description

Furnish and install guardrail anchor units in accordance with the details in the plans, the applicable requirements of Section 862 of the 2006 *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.

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 2006 *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 2006 *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 2006

Standard Specifications for Roads and Structures and is incidental to the cost of the guardrail anchor unit.

CABLE GUIDERAIL

(12-19-06) (Revised 11-29-07) DB8 R69

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 8-51, Article 865-1 Description, add the following as the second sentence of the first paragraph:

Install additional double faced cable guiderail posts without cable at median hazards as shown in Roadway Standard Drawing No. 865.01 (Sheet 1 of 12)

Page 8-52, Article 865-2 Materials, add the following as the last paragraph:

Additional guiderail posts shall be double faced guiderail intermediate posts.

IMPACT ATTENUATOR UNITS, TYPE 350

(4/20/04) (Rev. 7-18-06) 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

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 2006 *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 2006 *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.

STREET SIGNS AND MARKERS AND ROUTE MARKERS

(7-1-95) 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.

STEEL U-CHANNEL POSTS

(7-18-06) DB9 R02

Amend the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 9-15 Subarticle 903-3(D) first paragraph, last sentence, delete the last sentence and add the following:

Use posts of sufficient length to permit the appropriate sign mounting height. Spliced posts are not permitted on new construction.

SHIPPING SIGNS

(5-15-07) DB9 R03

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 9-2, Section 901-3(A), General, add the following as the 7th paragraph:

Ship all multi-panel signs to the project intact, completely assembled and ready to be hung. Fabricate signs taller than 12 ft as 2 separate signs with a horizontal splice, ready to be spliced and hung. No assembly other than a horizontal splice will be permitted.

AGGREGATE PRODUCTION

(11-20-01) DB10 R05

Provide aggregate from a producer who utilizes the new Aggregate Quality Control / Quality Assurance Program that is in effect at the time of shipment.

No price adjustment is allowed to Design-Build Team or producers who utilize the new program. Participation in the new program does not relieve the producer of the responsibility of complying with all requirements of the 2006 *Standard Specifications for Roads and Structures*. Copies of this procedure are available upon request from the Materials and Test Unit.

CONCRETE BRICK AND BLOCK PRODUCTION

(11-20-01) DB10 R10

Provide concrete brick and block from a producer who utilizes the new Solid Concrete Masonry Brick / Unit Quality Control / Quality Assurance Program that is in effect on the date that material is received on the project.

No price adjustment is allowed to Design-Build Team or producers who utilize the new program. Participation in the new program does not relieve the producer of the responsibility of complying with all requirements of the 2006 *Standard Specifications for Roads and Structures*. Copies of this procedure are available upon request from the Materials and Test Unit.

AGGREGATES FOR ASPHALT PAVEMENTS AND SURFACE TREATMENTS (Ultra-Thin)

(7-18-06) DB10 R15

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 10-40, Subarticle 1012-1(A), add the following at the end of the last paragraph, last sentence:

or ultra-thin bonded wearing course.

Page 10-41, Table 1012-1, add the following as the last row of the Table:

UBWC	*100/85*	*40*	*45*	*10*

Page 10-42, Subarticle 1012-1(B)(6), add as the last sentence:

The percentage loss for aggregate used in UBWC shall be no more than 35%.

QUALITY MANAGEMENT SYSTEM FOR ASPHALT PAVEMENTS (OGAFC, PADC, and ULTRATHIN HMA Version)

(3-22-07) DBI 6-1

Description

Produce and construct Open Graded Asphalt Friction Course, Permeable Asphalt Drainage Course and Ultrathin Hot Mix Asphalt Concrete Wearing Surface asphalt mixtures and pavements. All materials and work shall conform to Division 6 of the 2006 *Standard Specifications for Roads and Structures* except as modified herein. Perform all applicable quality control activities in accordance with the Department's *Hot Mix Asphalt Quality Management System (HMA/QMS) Manual* unless otherwise approved.

Description of Responsibilities

(A) Quality Control (QC)

Provide and conduct a quality control program. A quality control program shall be defined as all activities, including mix design, process control inspection, plant and equipment calibration, sampling and testing, and necessary adjustments in the process that are related to production of a pavement which meets all requirements of the Specifications.

(B) Quality Assurance (QA)

The Department will conduct a quality assurance programs. A quality assurance program shall be defined as all activities, including inspection, sampling, and testing related to determining that the quality of the completed pavement conforms to all specification requirements.

Mix Design / Job Mix Formula Requirements

All mix design and job mix formula requirements of Article 661-2 of the 2006 *Standard Specifications for Roads and Structures* and the contract documents shall apply. In addition, submit Superpave gyratory compactor printouts for all specimens required to be compacted during the mix design process.

Field Verification Of Mixture And Job Mix Formula Adjustments

Conduct field verification of the mix at each plant within 30 calendar days prior to initial production of each mix design, when required by the Allowable Mix Adjustment Policy, and when directed by the Engineer as deemed necessary.

Field verification testing shall consist of performing a minimum of one test series on mix sampled and tested in accordance *Required Sampling and Testing Frequencies*. Obtain the mix verification sample and split in accordance with the Department's *HMA/QMS Manual*. Do not begin normal plant production until all field verification test results have been completed and the mix has been satisfactorily verified by the Contractor's Level II Technician. Verification shall be considered satisfactory when the mix meets all applicable individual test control limits as specified elsewhere in these provisions, except that the drain down test shall meet the requirements as specified in Section 661 of the 2006 *Standard Specifications for Roads and Structures* for the applicable mix type.

In addition to the required sampling and testing for field verification, perform all preliminary inspections and plant calibrations as shown in the Department's *HMA/QMS Manual*.

Retain records of these calibrations and mix verification tests, including Superpave Gyratory Compactor (SGC) printouts, at the QC laboratory. In addition, furnish copies, including SGC

printouts, to the Engineer for review and approval within one working day after beginning production of the mix.

Conduct the initial mix verification of all new mix designs with the plant set up to produce the aggregate blend and binder content in accordance with the initially approved job mix formula (JMF). If the Contractor and / or the Engineer determine from results of quality control tests conducted during mix verification that adjustments to the job mix formula are necessary to achieve specified mix properties, adjustments to the JMF shall be made within tolerances permitted by specifications for the mix type being produced, subject to prior approval by the Engineer. All JMF adjustments shall be approved and documented in writing by the Engineer prior to incorporation.

Failure by the Contractor to fully comply with the above mix verification requirements shall result in immediate production stoppage by the Engineer. Do not resume normal production until all mix verification sampling, testing, calibrations, and plant inspections have been performed and approved by the Engineer. At the Engineer's discretion, any mix produced that is not verified may result in a deduction of monies due to the Contractor, in addition to a deduction of monies due to the Contractor due to mix and / or surface deficiencies.

Contractor's Quality Control System

(A) Personnel Requirements

Obtain all certifications in accordance with the Department's QMS Asphalt Technician Certification Program as shown in the Department's *HMA/QMS M*anual. Perform all sampling, testing, data analysis and data posting by or under the direct supervision of a certified QMS Asphalt Plant Technician.

Provide a certified Asphalt Plant Technician Level I to perform quality control operations and activities at each plant site at all times during production of material for the project. A plant operator who is a certified Asphalt Plant Technician Level I may be utilized to meet this requirement when daily production for each mix design is less than 100 tons provided the randomly scheduled increment sample is not within that tonnage. When performing in this capacity, the plant operator shall be responsible for all quality control activities that are necessary and required. Absences of the Level I Technician, other than those for normal breaks and emergencies, shall be pre-approved by the appropriate QA Supervisor or his designated representative. Any extended absence of the Technician that has not been approved will result in immediate suspension of production by the Engineer. All mix produced during this absence shall be accepted in accordance with Article 105-3 of the 2006 *Standard Specifications for Roads and Structures*.

Provide and have readily available a certified Asphalt Plant Technician Level II to supervise, coordinate, and make any necessary adjustments in the mix quality control process in a timely manner. The Level II Technician may serve in a dual capacity and fulfill the Level I Technician requirements specified.

Provide a certified QMS Roadway Technician with each paving operation at all times during placement of asphalt. This person shall be responsible for monitoring all roadway paving operations and all quality control processes and activities, to include stopping production or implementing corrective measures when warranted.

Post in the quality control laboratory an organizational chart, including names, telephone numbers and current certification numbers of all personnel responsible for the quality control program while asphalt paving work is in progress.

(B) Field Laboratory Requirements

Furnish and maintain a Department certified laboratory at the plant site. A minimum of 320 square feet of floor space (exclusive of toilet facilities), equipment, and supplies necessary for performing Contractor quality control testing is required. Provide convenient telephone and fax machine access for QMS personnel at the plant site.

Provide testing equipment meeting the requirements of the test methods herein identified. Provide equipment that is properly calibrated and maintained. Allow all measuring and testing devices to be inspected to confirm both calibration and condition. If at any time the Engineer determines that the equipment is not operating properly or is not within the limits of dimensions or calibration described in the applicable test method, the Engineer may stop production until corrective action is taken. Maintain and have available a record of all calibration results at the laboratory.

(C) Plant Mix Quality Control

(1) General

Include in the quality control process the preliminary inspections, plant calibrations and field verification of the mix and JMF. In addition, conduct at a minimum, but not limited to, the sampling, testing, and determination of all parameters outlined in these provisions using test methods and minimum frequencies as specified herein. Perform additional sampling and testing when conditions dictate. Obtain, split, and retain all scheduled samples at randomly selected locations in accordance with the Department's *HMA/QMS Manual*, except as modified below. Log all samples taken on forms provided by the Department. Provide documentation. Identify any additional quality control samples taken and tested at times other than the regularly scheduled random samples or directed samples that take the place of regularly scheduled as process control (PC) samples on the appropriate forms. Process Control test results shall not be plotted on control charts nor reported to Quality Assurance Laboratory.

Obtain minimum 25 lb. samples for PADC and Ultrathin HMA. Split and retain in accordance with procedures in the Department's *HMA/QMS Manual*. For OGAFC Types FC-1, FC-1 Modified and FC-2 Modified, obtain minimum 1500-2000 gram samples each for QC, QA, and for retained samples. OGAFC QC samples

shall be tested immediately. Place QA samples and retained samples of OGAFC in lubricated gill cans and store for possible testing in accordance with the procedures established below.

Retain the untested split portion of quality control aggregate and mix samples and the tested TSR specimens for five calendar days at the plant site, commencing the day the samples are tested. Permission for disposal may be given by Quality Assurance personnel prior to these minimum storage periods. Retain the split portion of the Contractor's mix verification and referee mix samples until either procured by or permission for disposal is given by QA. Store all retained samples in a dry and protected location.

(2) Required Sampling and Testing Frequencies

All mix sampling, testing, data analysis and data posting shall be performed or directly supervised by a certified QMS Asphalt Plant Technician.

Maintain minimum test frequencies as established in the schedule below. Complete all tests within 24 hours of the time the sample is taken, unless specified otherwise within these provisions. Should the specified tests not be completed within the required time frame, cease production at that point until such time the tests are completed.

Should the Contractor's testing frequency fail to meet the minimum frequency requirements as specified, all mix without the specified test representation shall be considered unsatisfactory. If the Engineer allows the mix to remain in place, payment will be made at 50 percent of the contract unit bid price for the mixture.

If desired, innovative equipment or techniques not addressed by these specifications to produce or monitor the production of mix may be utilized, subject to prior approval from the Engineer.

Quality Control Minimum Sampling and Testing Schedule

Sample and test the completed mixture from each mix design (OGAFC and Ultrathin HMA) or job mix formula (PADC) at the following minimum frequency during mix production:

Accumulative Production Increment	Number of Samples per Increment
500 tons	1

If production is discontinued or interrupted before the accumulative production increment tonnage is completed, continue the increment on the next production day(s) until the increment tonnage is completed. Obtain a random sample within the specified increment at the location determined in accordance with the Department's *HMA/QMS Manual*. Conduct quality control sampling and testing

on each random sample as scheduled below. When daily production of each mix design exceeds 100 tons and a regularly scheduled test series random sample location for that mix design is not reached during that day's production, perform a test series as scheduled below. This test series shall not be a substitute for the regularly scheduled random sample for that increment.

Perform the following test series on all regularly scheduled random samples:

Asphalt Mixture - Sampled From Truck at Plant (AASHTO T-168 Modified) (Split Sample Required)

(a) Asphalt Binder Content, % (Contractor may select either option below)
   1. Ignition Furnace (AASHTO T 308 Modified)
   2. Other (Contractor may request and use other means of determining percent asphalt binder subject to prior approval by the Engineer)

(b) Gradation on Recovered Blended Aggregate from Mix Sample (AASHTO T-30 Modified) (Graded on all sieves specified on the job mix formula.)

In addition to the above schedule, conduct the following sampling and testing as indicated:

(a) Aggregate Stockpile Gradations (AASHTO T 27 and T 11) (Sampled from stockpiles or cold feed system as follows; split samples not required)

   1. Coarse Aggregates (Approved Standard Sizes)
      a. At beginning of production*****
      b. Weekly thereafter*****
   2. Fine Aggregates (Stone Screenings, Natural Sands, Etc.)
      a. At or within one week prior to mix verification (Gradations valid for multiple mix designs).
      b. Weekly after mix verification *****
      c. Anytime production is stopped due to plant mix gradation related problems.
   3. Reclaimed Asphalt Shingle Material (RAS) Binder Content and Gradation (AASHTO T 308 Modified or T 164 and AASHTO T 30 Modified) (sample from stockpiles or cold feed system at beginning of production and weekly thereafter). Have RAS approved for use in accordance with Article 1012-1 (F). (Split Sample Required)

*****In lieu of the aggregate stockpile gradations performed by QC personnel, gradation quality control data conducted by the aggregate producer, which is representative of the Contractor's current stockpiles, may be furnished.

(b) Combined Aggregate Moisture Content (AASHTO T 255) Drum Plant Only (sampled from stockpiles or cold feed system a minimum of once daily).

(c) Asphalt Drain Down Test Procedure, AASHTO T 305; Copy of procedure may be obtained from the Engineer upon request. Mix sampled from truck at plant within the first day's production and weekly thereafter.
Note: Drain Down Test not required for Permeable Asphalt Drainage Course.

(d) Retained Tensile Strength (TSR) - (AASHTO T 283 Modified)
Note: TSR only required for Ultrathin HMA.

1. Option 1
Mix sampled from truck at plant, tested, and results furnished to the Engineer within seven calendar days after beginning production of each new mix design. From the split sample, QC shall prepare and submit within five calendar days of the sample date, an additional set of specimens to the QA Lab for TSR testing (Split Sample Required).

2. Option 2
Mix sampled from truck at plant with one set of specimens prepared by the Contractor and then tested jointly by QA and QC at a mutually agreed upon lab site within the first seven (7) calendar days after beginning production of each new mix design. Specimens shall be tested on either a recording test press or a test press that maintains the peak load reading after the specimen has broken.

Additional TSR testing required prior to mix production in accordance with above procedures shall be required when a change is made in anti-strip additive dosage or when a new anti-strip additive source or grade is utilized, unless otherwise approved. Other TSR test(s) may be directed as deemed necessary. TSR testing not required for mix verification, but may be performed at that time.

(3) Control Charts

Maintain standardized control charts furnished by the Department at the field laboratory. For mix incorporated into the project, record test data from all regularly scheduled random samples or directed samples which replace regularly scheduled random samples, on control charts the same day the tests results are obtained. Process Control (PC) test results shall not be plotted on control charts nor reported to Quality Assurance Laboratory.

Results of quality assurance tests performed by the Engineer will be posted on the Contractor's control charts as data becomes available.

Record the following data on the standardized control charts:

(a) Aggregate Gradation Test Results:
1. 1/2" (Types P57 & FC-2 Mod. Only)
2. 3/8" (Excluding Type P57)
3. No. 4
4. No. 8
5. No. 200 Sieves

(b) Binder Content, %, P_b

Both the individual test values and the moving average of the last four data points shall be plotted on each chart. The Contractor's test data shall be shown in black and the moving average in red. The Engineer's assurance data shall be plotted in blue. Denote the warning control limits with a dash green line, the moving average control limits with a dashed blue line, and individual test limits with a dash red line.

Maintain a continuous moving average with the following exceptions. Re-establish a new moving average only when:

1. A change in the binder percentage or aggregate blend is made in the JMF, or,
2. When the Contractor elects to stop or is required to stop production after one or two moving average values, respectively, fall outside the warning limits or,
3. If failure to stop production after two consecutive moving averages exceed the warning limits occurs, but production does stop at a subsequent time, re-establish a new moving average beginning at the actual production stop point.

In addition, re-establish the moving averages for all mix properties. Moving averages will not be re-established when production stoppage occurs due to an individual test result exceeding the individual test limits and / or specifications.

All individual test results for regularly scheduled samples or directed samples which replace regularly scheduled samples are part of the plant quality control record and shall be included in moving average calculations with the following exception. When the Contractor’s testing data has been proven incorrect, use the correct data as determined by the Engineer in lieu of the Contractor’s data to determine the appropriate pay factor. In this case, replace the data in question and any related data proven incorrect.

(4) Control Limits

The following are established as control limits for mix production. Control limits for the warning and moving average limits are based on a moving average of the last four data points. Apply all control limits to data given on the job mix formula.

Mix Control Criteria	Warning	Control Limits, % Moving Average	Individual Test
Asphalt Binder Content	+/- 0.3	+/- 0.5	+/- 0.7
1/2" Sieve (Types P57 & FC-2 Mod)	+/- 4.0	+/- 5.0	+/- 8.0
3/8" Sieve (Excluding Type P57)	+/- 4.0	+/- 5.0	+/- 8.0
No. 4 Sieve	+/- 4.0	+/- 5.0	+/- 8.0
No. 8 Sieve	+/- 4.0	+/- 5.0	+/- 8.0
No. 200 Sieve	+/- 1.5	+/- 2.0	+/- 2.5
TSR (Ultrathin Only)	N/A	N/A	15%

(5) Warning Bands

Warning bands shall be defined as the area between the warning limits and moving average limits

(6) Corrective Actions

All required corrective actions shall be based upon initial test results and shall be taken immediately upon obtaining those results. In the event situations occur that warrant more than one corrective action and / or adjustment, give precedence to the more severe of these actions. Stopping production when required takes precedence over all other corrective actions. Document all corrective actions.

Immediately cease production and immediately notify the Engineer when any of the following occur:

(a) When an individual test result for a mix control criteria exceeds both the individual test control limits and the applicable specification design criteria, or,
(b) When two consecutive field TSR values fail to meet the minimum specification requirement, or,
(c) When two consecutive binder content test results exceed the individual limits.

Do not resume normal plant production until one of the following has occurred:

(a) Option 1 - Approval has been granted by the appropriate QA Supervisor.
(b) Option 2 - The mix in question has been satisfactorily verified. Normal production may resume based on the approval of the contractor’s Level II technician, provided notification and the verification test results have been furnished to the QA Laboratory.

Failure to fully comply with one of the above provisions will result in immediate production stoppage by the Engineer. Normal production shall not then resume until a complete reverification process has been performed and approved by the Engineer.

Acceptance of all mix failing to meet the individual test control or minimum TSR requirements as described above shall be determined in accordance with Article 105-3. In addition, any mix, which is deemed unacceptable, shall be rejected for use in the work.

Failure to stop production when required due to an individual mix test not meeting the specified requirements shall subject all mix from the stop point tonnage to the point when the next individual test is back on or within the warning limits, or to the tonnage point when production is actually stopped, whichever occurs first, to being considered unacceptable.

Failure to stop production when required due to two consecutive TSR tests failing to meet the specification requirements shall subject all mix from the stop point tonnage to the point when the next TSR test meets or exceeds the specification requirement, or to the tonnage point when production is actually stopped, whichever occurs first, to being considered unacceptable.

In either case, remove and replace this mix with materials that comply with the specifications at no additional costs to the Department unless otherwise approved. Payment will be made for the actual quantities of materials required to replace the removed quantities, not to exceed the original amounts.

Immediately notify the Engineer when any moving average value exceeds the warning limit. If two consecutive moving average values for any one of the mix control criteria fall outside the warning limits, cease production of that mix and make adjustments. The Contractor may elect to stop production after only one moving average value falls outside the warning limits. In either case, do not determine a new moving average until the fourth test after the elective or mandatory stop in production.

Do not resume normal plant production until one of the following has occurred:

(a) Option 1 - Approval has been granted by the appropriate QA Supervisor.
(b) Option 2 - The mix in question has been satisfactorily verified. Normal production may resume based on the approval of the contractor’s Level II technician, provided notification and the verification test results have been furnished to the QA Laboratory.

Failure to fully comply with one of the above provisions shall result in immediate production stoppage by the Engineer. Normal production shall not resume until a complete reverification process has been performed and approved by the Engineer.

If the process adjustment improves the property in question such that the moving average after four additional tests is on or within the warning limits, the Contractor may continue production with no reduction in payment.

If the adjustment does not improve the property in question such that the moving average after four additional individual tests stays in the warning bands, the mix shall be considered not to be within reasonably close conformity, but reasonably acceptable. Reduced payment for the mix in question will be applied starting from the plant sample tonnage at the stop point to the sample tonnage when the moving average is on or within the warning limits in accordance with the following table.

Payment for Mix Produced in the Warning Bands	
Mix Property	**Pay Factor Percent Bid Price for Mix****
1/2" Sieve (Types P57 &FC-2 Mod. Only)	90
3/8" (Excluding Type P57)	90
No. 4	90
No. 8	90
No. 200	90
Asphalt Binder Content	85

** When two or more properties are in question, only the lower pay factor will be applied to the mix unit bid price.

If the adjustment does not improve the property in question such that the moving average after four additional tests exceeds the moving average control limits, the mix shall be considered not to be within reasonably close conformity with specifications. If the Engineer determines the mix is reasonably acceptable based on test data and an inspection of the completed pavement and allows it to remain in place, the mix will be accepted in accordance with Article 105-3. If the mix is determined to be unacceptable, the mix shall be removed and replaced with materials that comply with the specifications. In either case, the adjustment or removal, respectively, for the mix in question shall be applied starting from the plant sample tonnage at the stop point to the sample tonnage when the moving average is on or within the warning limits. In addition, any mix that is deemed unacceptable shall be rejected for use in the work.

Failure to stop production and make adjustments when required due to two consecutive moving average values falling outside the warning limits shall subject all mix produced from the stop point tonnage to the tonnage point when the moving average is back on or within the warning limits or to the tonnage point when production is actually stopped, whichever occurs first, to being considered unacceptable. Remove this material and replace with materials which comply with the specifications at no additional costs to the Department, unless otherwise approved. Payment will be made for the actual quantities of materials required to replace the removed quantities, not to exceed the original amounts.

(7) Allowable Retesting for Mix Deficiencies

The Contractor may elect to resample and retest for plant mix deficiencies when individual QC test(s) exceed one or more mix property target(s) by more than the tolerances indicated below. Perform the retesting within ten days after initial test results are determined. Retesting shall be approved prior to being performed and in accordance with the Department's Guidelines for Retests of Plant Mix Deficiencies as shown in the Department's *HMA/QMS Manual*. The Contractor, under the supervision of the Department's QA personnel shall perform these retests. Retests for any mix deficiency other than as listed below shall not be allowed unless otherwise permitted by the Engineer. Acceptance of the mix in question shall be based on the retest data in accordance with Article 105-3.

The Department reserves the right to require the Contractor to resample and retest at any time or location as directed.

(a)	% Binder Content	--	by more than +/- 1.0%
(b)	1/2" Sieve (Types P 57 & FC-2 Mod)	--	by more than +/- 9.0%
(c)	3/8" Sieve (Excluding Type P 57)	--	by more than +/- 9.0%
(d)	No. 4 sieve	--	by more than +/- 9.0%
(e)	No. 8 sieve	--	by more than +/- 9.0%
(f)	No. 200 sieve	--	by more than +/- 3.0%
(g)	TSR (Ultrathin only)	--	by more by more than -15% from Specification limit

(8) Documentation (Records)

Document all quality control observations, records of inspection, samples taken, adjustments to the mix, and test results on a daily basis. Note the results of observations and records of inspection as they occur in a permanent field record. Record adjustment to mix production and test results on forms provided.

Identify any additional quality control samples taken and tested at times other than the regularly scheduled random samples or directed samples which take the place of regularly scheduled as process control (PC) samples on the appropriate forms. Process Control test results shall not be plotted on control charts nor reported to Quality Assurance Laboratory. Process control sample test results are for the Contractor's informational purposes only.

Make all such records available to the Engineer, upon request, at any time during project construction. Complete all QC records and forms and distribute in accordance with the most current edition of the Department's *HMA/QMS Manual*. Maintain all QC records, forms and equipment calibrations for a minimum of three years from their completion date. Failure to maintain QC records and forms as required, or to provide these records and forms to the Engineer upon request,

may result in production and / or placement stoppage until the problem is resolved.

Falsification of test results, documentation of observations, records of inspection, adjustments to the process, discarding of samples and/or test results, or any other deliberate misrepresentation of the facts will result in the revocation of the applicable person's QMS certification. The Engineer will determine acceptability of the mix and/or pavement represented by the falsified results or documentation. If the mix and/or pavement in question is determined to be acceptable, the Engineer may allow the mix to remain in place at no pay for the mix, asphalt binder and other mix components. If the mix and/or pavement represented by the falsified results are determined not to be acceptable, remove and replace with mix that complies with the Specifications. Payment will be made for the actual quantities of materials required to replace the falsified quantities, not to exceed the original amounts.

Quality Assurance

The Department's quality assurance program will be conducted by a certified QMS technician(s) and will be accomplished in the following ways:

Plant Mix Quality Assurance

(A) By conducting assurance testing of split samples obtained by the Contractor at a frequency equal to or greater than 5% of the frequency required of the Contractor;

(B) By periodically observing sampling and testing procedures performed by the Contractor;

(C) By monitoring required control charts exhibiting test results of control parameters;

(D) By directing the Contractor to take additional samples at any time and any location during production (in lieu of the next scheduled random sample for that increment);

(E) By conducting verification sampling and testing on samples taken independently of the Contractor's quality control samples at a frequency equal to or greater than 10% of the QC sample frequency; or

(F) By any combination of the above

The Engineer will periodically obtain quality assurance and verification samples for testing independently of the Contractor's quality control process. The Engineer will conduct assurance tests on both split QC samples taken by the Contractor and verification samples taken by the Department. These samples may be the regular quality control samples or a sample selected by the Engineer from any location in the process, or verification samples taken at random by the Department. The Engineer may select any or all split samples for assurance testing.

Results of quality assurance tests will be provided to the Contractor within three working days after the sample has been obtained, except for verification TSR test results which will be provided within seven calendar days.

Limits of Precision

Differences between the Contractor's and the Department's split sample test results shall be considered acceptable if within the following limits of precision:

Mix Property	**Acceptable Limits of Precision**
Asphalt Binder Content	± 0.5 %
1/2" Sieve (Types P 57 & FC-2 Mod. Only)	± 6.0 %
3/8" Sieve (Excluding Type P 57)	± 5.0 %
No. 4 Sieve	± 5.0 %
No. 8 Sieve	± 5.0 %
No. 200 Sieve	± 2.0 %
TSR (Ultrathin HMA Only)	± 15.0 %

The Engineer will immediately investigate the reason for differences if any of the following occur:

(A) QA test results of QC split sample does not meet above limits of precision, or

(B) QA test results of QC split sample does not meet the individual test control limits or the specification requirements, or

(C) QA verification sample test results exceed the allowable retesting tolerances.

If the potential for a pavement failure exist, the Engineer may suspend production, wholly or in part, in accordance with Article 108-7 while the investigation is in progress. The Engineer's investigation may include, but not be limited to the following:

(A) Joint testing of any remaining split samples,

(B) Review and observation of the QC technician's sampling and testing procedures,

(C) Evaluation and calibration of QC testing equipment, and / or

(D) Comparison testing of other retained quality control samples

If additional mix samples or core samples are necessary to resolve the difference, these samples shall be taken as directed and tested jointly by the Contractor's quality control and Department's quality assurance personnel. If reasons for the difference cannot be determined, payment for the mix in question will be determined in accordance with Article 105-3. If the reason for the difference is determined to be an error or other discrepancy in the quality control test results, the

applicable quality assurance test results or verification test results will be used to determine compliance with the applicable mix specification requirements.

The Engineer will periodically witness the sampling and testing being performed by the Contractor. If the Engineer observes that the sampling and quality control tests are not being performed in accordance with the applicable test procedures, the Engineer may stop production until corrective action is taken. The Engineer will promptly notify the Contractor of observed deficiencies, both verbally and in writing. The Engineer will document all witnessed samples and tests.

Acceptance

The Engineer will base final acceptance of the mix on the results of random testing made on split samples during the assurance process and validation of the Contractor's quality control process.

Measurement and Payment

All reductions in payment that are based on Unit Cost / Unit Bid Price shall be based on $45 per ton of material placement.

PORTLAND CEMENT CONCRETE (Alkali-Silica Reaction)
(2-20-07) DB10 R16

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Article 1024-1(A), replace the 2nd paragraph with the following:

Certain combinations of cement and aggregate exhibit an adverse alkali-silica reaction. The alkalinity of any cement, expressed as sodium-oxide equivalent, shall not exceed 1.0 percent. For mix designs that contain non-reactive aggregates and cement with an alkali content less than 0.6%, straight cement or a combination of cement and fly ash, cement and ground granulated blast furnace slag or cement and microsilica may be used. The pozzolan quantity shall not exceed the amount shown in Table 1024-1. For mixes that contain cement with an alkali content between 0.6% and 1.0%, and for mixes that contain a reactive aggregate documented by the Department, regardless of the alkali content of the cement, use a pozzolan in the amount shown in Table 1024-1.

Obtain the list of reactive aggregates documented by the Department at:

http://www.ncdot.org/doh/operations/materials/pdf/quarryasrprob.pdf

Table 1024-1 Pozzolans for Use in Portland Cement Concrete	
Pozzolan	***Rate***
Class F Fly Ash	20% by weight of required cement content, with 1.2 lbs Class F fly ash per lb of cement replaced
Ground Granulated Blast Furnace Slag	35% - 50% by weight of required cement content with 1 lb slag per lb of cement replaced
Microsilica	4% - 8% by weight of required cement content, with 1 lb microsilica per lb of cement replaced

GLASS BEADS

(7-18-06) DB10 R35

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 10-223, 1087-4(C) Gradation & Roundness

Replace the second sentence of the first paragraph with the following:

All Drop-On and Intermixed Glass Beads shall be tested in accordance with ASTM D1155.

Delete the last paragraph.

ENGINEERING FABRICS TABLE 1056-1

(7-18-06) DB10 R40

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 10-100, Table 1056-1, replace the values for Trapezoidal Tear Strength with the following:

Physical Property	**ASTM Test Method**	**Type 1**	**Type 2**	**Type 3**		**Type 4**
				Class A	**Class B**	
Typical Applications		**Shoulder Drain**	**Under Riprap**	**Temporary Silt Fence**		**Soil Stabilization**
Trapezoidal Tear Strength	D4533	*45* lb	*75* lb	--	--	*75* lb

PAINT SAMPLING AND TESTING

(8-15-06) DB10 R 45

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 10-190, Article 1080-4, Delete the first paragraph and replace with the following:

All paint will be sampled, either at the point of manufacture or at the point of destination. Inspection and sampling will be performed at the point of manufacture wherever possible. The Design-Build Team shall not begin painting until the analysis of the paint has been performed, and the paint has been accepted.

PORTABLE CONCRETE BARRIER

(2-20-07) DB10 R50

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 10-245, Article 1090-1(A) General, add the following after the first sentence:

The requirement for approved galvanized connectors will be waived if the barrier remains the property of the Design-Build Team.

TEMPORARY SHORING

(09/25/07) DB11 R02

Description

Design and construct temporary shoring in accordance with the contract. Temporary shoring includes standard shoring, temporary mechanically stabilized earth (MSE) walls and non-anchored temporary shoring. Trench boxes are not considered temporary shoring. "Standard shoring" refers to *standard temporary shoring* and *standard temporary MSE walls*. Notes on plans may restrict the use of one or both types of standard shoring. Notes on plans may also require or prohibit temporary MSE walls.

Unless noted otherwise on the plans, temporary shoring is required as shown on the plans and to maintain traffic. Temporary shoring to maintain 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 ft from the edge of pavement of the open travelway.

This provision is not applicable to anchored temporary shoring or the installation of pipes, drop inlets and utilities unless noted otherwise on the plans. Provide all shoring submittals before beginning work.

Materials

(A) Certifications, Storage and Handling

Provide Type 7 Contractor's Certifications in accordance with Article 106-3 of the 2006 *Standard Specifications for Roads and Structures* for all shoring materials used with the exception of reinforcing fabrics and geogrids. Furnish Type 2 Typical Certified Mill Test Reports in accordance with Article 106-3 of the 2006 *Standard Specifications for Roads and Structures* for all seam strengths and reinforcing fabric and geogrid properties. Provide minimum average roll values (MARV) in accordance with ASTM D4759 for test reports. For testing reinforcing fabric and geogrids, a lot is defined as a single day's production.

Load, transport, unload and store shoring materials such that they are kept clean and free of damage. Identify, store and handle all geogrids and geotextile fabrics in accordance with ASTM D4873. Geogrids and fabrics with defects, flaws, deterioration or damage will be rejected. Do not leave fabrics or geogrids uncovered for more than 7 days.

(B) Shoring Backfill

Use shoring backfill for the construction of all temporary shoring including backfilling behind non-anchored temporary shoring and in the reinforced zone for temporary MSE walls. Unless backfilling around culverts, use shoring backfill that meets the requirements of Class II Type I, Class III, Class V or Class VI select material in accordance with Section 1016 of the 2006 *Standard Specifications for Roads and Structures* or AASHTO M145 for soil classification A-2-4 with a maximum plasticity index (PI) of 6. For backfilling around culverts, use shoring backfill as defined herein except for A-2-4 soil.

(C) Non-anchored Temporary Shoring

Use steel shapes, plates and piles that meet the requirements of ASTM A36 and steel sheet piles that meet the requirements of Article 1084-2 of the *Standard Specifications*. Use timber lagging with a minimum allowable bending stress of 1000 psi that meets the requirements of Article 1082-1 of the 2006 *Standard Specifications for Roads and Structures*. For standard temporary shoring, use pile sections and lengths and lagging sizes as shown on the plans.

(D) Temporary MSE Walls

Use welded wire reinforcement forms, facings, mesh and mats that meet the requirements of AASHTO M55 or M221. Use connector bars and wires for welded wire wall components and support struts that meet the requirements of AASHTO M32. For standard temporary MSE walls, use wire gauges, strut sizes and welded wire components as shown on the plans.

(1) Geotextile Fabrics

Use geotextile fabrics that meet the requirements of Article 1056-1 of the 2006 *Standard Specifications for Roads and Structures*.

(a) Reinforcing Fabric

The reinforcement direction (RD) is defined as the direction perpendicular to the wall face and the cross-reinforcement direction (CRD) is defined as the direction parallel to the wall face.

Use woven polyester or polypropylene fabric that meets the following properties:

Property	Test Method	Requirement (MARV)
Wide Width Tensile Strength @ Ultimate (RD)	ASTM D4595	Varies – 200 lb / in min
Wide Width Tensile Strength @ Ultimate (CRD)	ASTM D4595	100 lb/in min
Trapezoidal Tear Strength	ASTM D4533	100 lb min
CBR Puncture Strength	ASTM D6241	600 lb min
UV Resistance after 500 hrs	ASTM D4355	70 %
Apparent Opening Size (AOS), US Sieve	ASTM D4751	20 min – 70 max
Permittivity	ASTM D4491	0.20 sec^{-1}

For standard temporary MSE walls (temporary fabric wall) use reinforcing fabric wide width tensile strengths and lengths in the RD as shown on the plans.

(b) Retention Fabric

Retain shoring backfill at the face of temporary MSE walls with retention fabric. Use fabric that meets the requirements of Class 3 and the UV resistance, AOS and permittivity for separation geotextile in accordance with AASHTO M288.

(2) SierraScape Temporary Wall

Use uniaxial (UX) geogrids composed of high-density polyethylene (HDPE) manufactured by Tensar Earth Technologies. Test geogrids in accordance with ASTM D6637. Use connection rods manufactured by Tensar Earth Technologies to transfer the load between the facings and geogrids.

For standard temporary MSE walls (SierraScape temporary wall) use geogrid types and lengths as shown on the plans.

(3) Terratrel Temporary Wall

Use ribbed reinforcing steel strips manufactured by The Reinforced Earth Company that meet the requirements of ASTM A572, Grade 65. Use connector rods that meet the requirements of AASHTO M31, Grade 60 and hair pin connectors that meet the requirements of ASTM A1011, Grade 50. Use bolts, nuts and washers that meet the requirements of AASHTO M164.

For standard temporary MSE walls (Terratrel temporary wall) use ribbed steel strip size and lengths, rod lengths and diameters, hairpin connectors, bolts, nuts and washers as shown on the plans.

Embedment

"Embedment" is defined as the depth of shoring below the bottom of the excavation or the grade in front of the shoring. For cantilever shoring, embedment is the depth of the piling below the grade in front of the shoring. For temporary MSE walls, embedment is the difference between the grade elevation in front of the wall and the elevation of the bottom of the reinforced zone.

Portable Concrete Barriers

Provide portable concrete barriers in accordance with the plans and if shoring is located within the clear zone as defined in the *AASHTO Roadside Design Guide*. Use NCDOT portable concrete barriers (PCBs) in accordance with Roadway Standard Drawing No. 1170.01 and Section 1170 of the 2006 *Standard Specifications for Roads and Structures*. Use Oregon Tall F-Shape Concrete Barriers in accordance with detail drawing and special provision obtained from:

http://www.ncdot.org/doh/preconstruct/wztc/DesRes/English/DesResEng.html

The clear distance is defined as the horizontal distance from the back face of the barrier to the edge of pavement and the minimum required clear distance is shown on the traffic control plans. At the Contractor's option or if the minimum required clear distance is not available, set an unanchored PCB against the traffic side of the shoring and design shoring for traffic impact or use the "surcharge case with traffic impact" for the standard temporary shoring. An anchored PCB or Oregon barrier is required for barriers above and behind temporary MSE walls.

Contractor Designed Shoring

"Contractor designed shoring" is defined as non-anchored temporary shoring or temporary MSE walls designed by the Contractor. Unless prohibited or required, Contractor designed shoring is optional. Contractor designed shoring is required when notes on plans prohibit the use of standard shoring. Non-anchored Contractor designed shoring is prohibited when notes on plans require the use of temporary MSE walls and Contractor designed temporary MSE walls are prohibited when notes on plans prohibit the use of temporary MSE walls.

Before beginning design, survey the shoring location to determine existing elevations and actual design heights. Submit design calculations and drawings including typical sections for review and acceptance showing details of the proposed design and construction sequence in accordance with Article 105-2 of the 2006 *Standard Specifications for Roads and Structures*. Have shoring designed, detailed and sealed by a Professional Engineer registered in the State of North Carolina. Submit 3 hard copies of design calculations and 10 hard copies of drawings and an electronic copy (pdf or jpeg format on CD or DVD) of both the calculations and drawings.

Design non-anchored temporary shoring in accordance with the *AASHTO Guide Design Specifications for Bridge Temporary Works* and temporary MSE walls in accordance with the *AASHTO Allowable Stress Design Standard Specifications for Highway Bridges*. Use the following soil parameters for shoring backfill in the reinforced zone.

Total Unit Weight = 120 pcf
Friction Angle = 30 degrees
Cohesion = 0 psf

Design temporary shoring in accordance with the in-situ assumed soil parameters shown on the plans. Design shoring for a 3-year design service life and a traffic surcharge equal to 240 psf. This surcharge is not applicable for construction traffic. If a construction surcharge will be present within a horizontal distance equal to the height of the shoring, design the shoring for the required construction surcharge. If the edge of pavement or a structure to be protected is within a horizontal distance equal to the height of the shoring, design shoring for a maximum deflection of 3". Otherwise, design shoring for a maximum deflection of 6".

For non-anchored temporary shoring, the top of shoring elevation is defined as the elevation where the grade intersects the back face of the shoring. For traffic impact, apply 2 kips/ft to the shoring 1.5 ft above the top of shoring elevation. When designing for traffic impact, extend shoring at least 32" above the top of shoring elevation. Otherwise, extend shoring at least 6" above the top of shoring elevation.

Standard Shoring

Unless notes on plans prohibit the use of one or both types of standard shoring, standard shoring is optional. Submit a "Standard Temporary MSE Wall Selection Form" for each standard temporary MSE wall location and a "Standard Temporary Shoring Selection Form" for up to three standard temporary shoring locations. Submit selection forms at least 14 days before beginning shoring construction. Obtain standard shoring selection forms from:

http://www.ncdot.org/doh/preconstruct/highway/geotech/formdet/standards.html

(A) Standard Temporary Shoring

Determine the shoring height, traffic impact, groundwater condition and slope or surcharge case for each standard temporary shoring location. Determine the minimum

required extension, embedment and sheet pile section modulus or H pile section from the plans for each location.

(B) Standard Temporary MSE Walls

Choose a standard temporary MSE wall from the multiple temporary MSE wall options shown in the plans. Do not use more than one option per wall location.

Step bottom of reinforced zone in increments equal to vertical reinforcement spacing for the wall option chosen. Determine the wall height and slope or surcharge case for each section of standard temporary MSE wall. With the exception of either the first or last section of wall, use horizontal section lengths in increments equal to the following for the wall option chosen.

Standard Temporary MSE Wall Option	Increment
Temporary Fabric Wall	9 ft min (varies)
Hilfiker Temporary Wall	10 ft min (varies)
SierraScape Temporary Wall	18 ft – 7 ¼ in
Retained Earth Temporary Wall	24 ft
Terratrel Temporary Wall	19 ft – 8 in

Determine the appropriate facings and/or forms and reinforcement length, spacing, strength, type, density and/or size from the plans for each wall section.

Construction Methods

When using an anchored PCB, anchor the barrier in accordance with Roadway Standard Drawing 1170.01 and Section 1170 of the 2006 *Standard Specifications for Roads and Structures*. Control drainage during construction in the vicinity of temporary shoring. Collect and direct run off away from temporary MSE walls, shoring and shoring backfill.

(A) Non-anchored Temporary Shoring

Install and interlock sheet piling or install piles as shown on the plans or accepted submittals with a tolerance of 1/2 inch per foot from vertical. Contact the Engineer if the design embedment is not achieved. If piles are placed in drilled holes, perform pile excavation to the required elevations and backfill excavations with concrete and lean sand grout.

Remove grout as necessary to install timber lagging. Install timber lagging with a minimum bearing distance of 3” on each pile flange. Backfill voids behind lagging with shoring backfill.

Perform welding in accordance with the accepted submittals and Article 1072-20 of the 2006 *Standard Specifications for Roads and Structures*.

(1) Pile Excavation

Excavate a hole with a diameter that will result in at least 3" of clearance around the entire pile. 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 excavations. Blasting for core removal is permitted only when approved by the Engineer. Dispose of drilling spoils in accordance with Section 802 of the 2006 *Standard Specifications for Roads and Structures*. Drilling spoils consist of all excavated material including water removed from excavations by either pumping or drilling tools.

If unstable, caving or sloughing soils are encountered, stabilize excavations with clean watertight steel casing. Steel casings may be either sectional type or one continuous corrugated or non-corrugated piece. Provide casings 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.

Before placing concrete, check the water inflow rate in the excavation after any pumps have been removed. If the inflow rate is less than 6" 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" per half hour, propose and obtain approval of the concrete placement procedure before placing concrete.

Center the pile in the excavation and fill the excavation with Class A concrete in accordance with Section 1000 of the 2006 *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. Place concrete in a continuous manner to the bottom of shoring or the elevations shown on the accepted submittals. Fill the remainder of the excavation with a lean sand grout and remove all casings.

(B) Temporary MSE Walls

The Engineer may require a wall preconstruction meeting to discuss the construction and inspection of the temporary MSE walls. If required, conduct the meeting with the Site Superintendent, the Resident or Bridge Maintenance Engineer, the Bridge Construction Engineer and the Geotechnical Operations Engineer before beginning wall construction.

Perform all necessary clearing and grubbing in accordance with Section 200 of the 2006 *Standard Specifications for Roads and Structures*. Excavate as necessary as shown on the plans or accepted submittals. Notify the Engineer when foundation excavation is

complete. Do not place shoring backfill or first reinforcement layer until obtaining approval of the excavation depth and foundation material.

If applicable, install foundations located within the reinforced zone in accordance with the plans or accepted submittals.

Erect and maintain facings and forms as shown on the plans or accepted submittals. Stagger vertical joints of facings and forms to create a running bond when possible unless shown otherwise on the plans or accepted submittals.

Place facings and forms as near to vertical as possible with no negative batter. Construct temporary MSE walls with a vertical and horizontal tolerance of 3" when measured with a 10 ft straight edge and an overall vertical plumbness (batter) and horizontal alignment of less than 6".

Place reinforcement at locations and elevations shown on the plans or accepted submittals and in slight tension free of kinks, folds, wrinkles or creases. Repair or replace any damaged reinforcement. Contact the Engineer when existing or future structures such as foundations, pavements, pipes, inlets or utilities will interfere with reinforcement. To avoid structures, deflect, skew and modify reinforcement.

Do not splice reinforcement in the reinforcement direction (RD), i.e., parallel to the wall face. Seams are allowed in the cross-reinforcement direction (CRD). Bond or sew adjacent reinforcing fabric together or overlap fabric a minimum of 18" with seams oriented perpendicular to the wall face.

Place shoring backfill in 8 to 10 inch thick lifts and compact in accordance with Subarticle 235-4(C) of the 2006 *Standard Specifications for Roads and Structures*. Use only hand operated compaction equipment within 3 ft of the wall face. Do not damage reinforcement when placing and compacting shoring backfill. End dumping directly on the reinforcement is not permitted. Do not operate heavy equipment on reinforcement until it is covered with at least 10" of shoring backfill. Do not use sheepsfoot, grid rollers or other types of compaction equipment with feet.

Cover reinforcing and retention fabric with at least 3" of shoring backfill. Place top reinforcement layer between 4 and 24 inches below top of wall as shown on the plans or accepted submittals.

Bench temporary MSE walls into the sides of excavations where applicable. If the top of wall is within 5 ft of finished grade, remove top form or facing and incorporate the top reinforcement layer into the fill when placing fill in front of the wall. Temporary MSE walls remain in place permanently unless required otherwise.

PAVEMENT MARKING LINES

(11-21-06) (Rev. 9-18-07) DB 12 R001

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 12-2, 1205-3(D) Time Limitations for Replacement, add the following at the beginning of the chart:

Facility Type	Marking Type	Replacement Deadline
Full-control-of-access multi-lane roadway (4 or more total lanes) and ramps, including Interstates	All markings including symbols	By the end of each workday's operation if the lane is opened to traffic

GALVANIZED HIGH STRENGTH BOLTS, NUTS AND WASHERS

(02-17-09) DB10 R02

Revise the 2006 *Standard Specifications for Roads and Structures* as follows:

Page 10-126, Subarticle 1072-7(F)(3) Change the AASHTO reference to B 695 Class 55

Page 10-247, Table 1092-2, Steel Sign Materials, Change High Strength Bolts, Nuts & Washers ASTM Specifications for Galvanizing to B695 Class 55.

Page 10-259, Subarticle 1094-1(A) Breakaway or Simple Steel Beam Sign Supports, replace the third paragraph with the following:

> Fabricate high strength bolts, nuts, and washers required for breakaway supports from steel in accordance with ASTM A325 and galvanize in accordance with AASHTO B 695 Class 55.

Page 10-261, Article 1096-2 Steel Overhead Sign Structures, replace the last sentence with the following:

The galvanizing shall meet the requirement of AASHTO B 695 Class 55 for fasteners and of ASTM A123 for other structural steel.

ON-THE-JOB TRAINING

(10-16-07) 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.

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 Federal funded projects.

Minorities and Women

Training and upgrading of minorities and women toward journeymen status is a primary objective of this provision. Accordingly, the Contractor shall make every effort to enroll minority trainees and women 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 or not members of a minority group.

Assessing Training Goals

The Department through the On-The-Job Training (OJT) Program Manager of the Contractor Support Services Section within the UCP, Training and HBCU/MIHE Services Unit will assign training goals for a calendar year based on past three years' activity and anticipated upcoming year's activity with the Department. At the beginning of each year, all contractors will be contacted by the Department to determine the number of trainees that will be assigned to the Contractor for that 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 slots agreed to by both parties. The number of training slots may range from 1 to 15 per contractor per calendar year. The Contractor shall sign an agreement to fulfill their goal for the year. A sample agreement is available at www.ncdot.org/business/ocs/ojt/.

Training Classifications

The Contractor shall provide on-the-job training aimed at developing full journey workers in the construction crafts. 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, estimators and

timekeepers. 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 status or in which they have been employed as a journeyman.

Records and Reports

The Contractor shall furnish the trainee a copy of the training program to be followed. Additionally, the Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The Contractor will maintain and furnish monthly reports documenting company compliance under these contract documents. This information shall be provided to the On-The-Job Training (OJT) Program Manager of the Contractor Support Services Section within the UCP, Training and HBCU/MIHE Services Unit.

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. It is the Contractor's responsibility to adhere to the minimum 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 workload scheduling.

If a contractor fails to attain their training assignments for the calendar year, they may be taken off the Bidders List.

Measurement and Payment

No compensation will be provided for providing training required by the contract documents.

***** STANDARD SPECIAL PROVISIONS *****

AVAILABILITY OF FUNDS – TERMINATION OF CONTRACTS

(05-20-08) Z-2

General Statute 143C-6-11. (h) Highway Appropriation is hereby incorporated verbatim in this contract as follows:

"(h) Amounts Encumbered – Transportation project appropriations may be encumbered in the amount of allotments made to the Department of Transportation by the Director for the estimated payments for transportation project contract work to be performed in the appropriation fiscal year. The allotments shall be multiyear allotments and shall be based on estimated revenues and shall be subject to the maximum contract authority contained in *General Statute 143C-6-11(c).* Payment for transportation project work performed pursuant to contract in any fiscal year other than the current fiscal year is subject to appropriations by the General Assembly. Transportation project contracts shall contain a schedule of estimated completion progress, and any acceleration of this progress shall be subject to the approval of the Department of Transportation provided funds are available. The State reserves the right to terminate or suspend any transportation project contract, and any transportation project contract shall be so terminated or suspended if funds will not be available for payment of the work to be performed during that fiscal year pursuant to the contract. In the event of termination of any contract, the contractor shall be given a written notice of termination at least 60 days before completion of scheduled work for which funds are available. In the event of termination, the contractor shall be paid for the work already performed in accordance with the contract specifications."

Payment will be made on any contract terminated pursuant to the special provision in accordance with Article 108-13(E), of the *North Carolina Department of Transportation Standard Specifications for Roads and Structures*, dated July 1, 2006.

***** STANDARD SPECIAL PROVISIONS *****

NCDOT GENERAL SEED SPECIFICATIONS FOR SEED QUALITY

(11-18-08) 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:

Restricted Noxious Weed	Limitations per Lb. Of Seed	Restricted Noxious Weed	Limitations per Lb. of Seed
Blessed Thistle	4 seeds	Cornflower (Ragged Robin)	27 seeds
Cocklebur	4 seeds	Texas Panicum	27 seeds
Spurred Anoda	4 seeds	Bracted Plantain	54 seeds
Velvetleaf	4 seeds	Buckhorn Plantain	54 seeds
Morning-glory	8 seeds	Broadleaf Dock	54 seeds
Corn Cockle	10 seeds	Curly Dock	54 seeds
Wild Radish	12 seeds	Dodder	54 seeds
Purple Nutsedge	27 seeds	Giant Foxtail	54 seeds
Yellow Nutsedge	27 seeds	Horsenettle	54 seeds
Canada Thistle	27 seeds	Quackgrass	54 seeds
Field Bindweed	27 seeds	Wild Mustard	54 seeds
Hedge Bindweed	27 seeds		

Seed of Pensacola Bahiagrass shall not contain more than 7% inert matter, Kentucky Bluegrass, Centipede and Fine or Hard Fescue shall not contain more than 5% inert matter whereas a

maximum of 2% inert matter will be allowed on all other kinds of seed. In addition, all seed shall not contain more than 2% other crop seed nor more than 1% total weed seed. The germination rate as tested by the North Carolina Department of Agriculture shall not fall below 70%, which includes both dormant and hard seed. Seed shall be labeled with not more than 7%, 5% or 2% inert matter (according to above specifications), 2% other crop seed and 1% total weed seed.

Exceptions may be made for minimum pure live seed allowances when cases of seed variety shortages are verified. Pure live seed percentages will be applied in a verified shortage situation. Those purchase orders of deficient seed lots will be credited with the percentage that the seed is deficient.

FURTHER SPECIFICATIONS FOR EACH SEED GROUP ARE GIVEN BELOW:

Minimum 85% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 83% pure live seed will not be approved.

Sericea Lespedeza
Oats (seeds)

Minimum 80% pure live seed; maximum 1% total weed seed; maximum 2% total other crop; maximum 144 restricted noxious weed seed per pound. Seed less than 78% pure live seed will not be approved.

Tall Fescue (all approved varieties)
Kobe Lespedeza
Korean Lespedeza
Weeping Lovegrass
Carpetgrass
Bermudagrass
Browntop Millet
German Millet - Strain R
Clover – Red / White / Crimson

Minimum 78% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 76% pure live seed will not be approved.

Common or Sweet Sundangrass

Minimum 76% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 74% pure live seed will not be approved.

Rye (grain; all varieties)
Kentucky Bluegrass (all approved varieties)
Hard Fescue (all approved varieties)
Shrub (bicolor) Lespedeza

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 70% pure live seed will not be approved.

Centipedegrass	Japanese Millet
Crownvetch	Reed Canary Grass
Pensacola Bahiagrass	Zoysia

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 PROVISIONS *****

ERRATA

(11-16-08) Z-4

Revise the *Standard Specifications for Roads and Structures July 2006* on all projects as follows:

Division 1

- Page 1-1, replace AREA - American Railway Engineering Association with ***American Railway Engineering and Maintenance of Way Association*.**
- Page 1-7, remove **–L-** in middle of page after INVITATION TO BID and before LABORATORY.
- Page 1-25, 102-16(R), move 2nd paragraph to left margin. It is not a part of this subarticle, but part of the entire article.

Division 2

- Page 2-9, Subarticle 225-1(C), 1st paragraph, 2nd line, last word, add a "d" to make the word grade become **graded**
- Page 2-15, Subarticle 226-3, 5th paragraph, first line, replace the word *in* with the word ***is***.
- Page 2-23, Subarticle 235-4(B)(9), at the end of the sentence, replace finished greater with finished ***grade***.
- Page 2-28, Article 260-3, First paragraph, second line, remove the word *foot*.

Division 3

- Page 3-13, Article 340-4, Second paragraph, change Flowable Backfill to Flowable ***Fill***

Division 4

- Page 4-29, Article 420-13(A) Description, change reference from Section 1082 to ***Article 1081-6***.
- Page 4-70, 442-13(B) Second sentence, change SSPC Guide 6I to SSPC Guide ***6.***
- Pages 4-72, 4-74, 4-76, at the top of the page, substitute the heading Section 452 with Section ***450*.**
- Page 4-79, at the top of the page, substitute the heading Section 450 with Section ***452***
- Page 4-80, change 452-7 to 452-***6*** at the top of the page.
- Page 4-80, change Pay Item ___Steel Pile Retaining Walls, to ***Sheet*** Pile Retaining Walls.
- Page 4-88, 462-4, Title, Replace last word Measurement with the word ***PAYMENT***

Division 5

- Page 5-8, Article 501-15 Measurement and Payment, delete the 4th paragraph that begins The quantity of lime, measured as provided …

Division 6

- Page 6-3, Article 600-9, 2nd Paragraph on this page, replace 818-5 with 818-***4***.
- Pages 6-30 and 31, Subarticle 610-3(A)(13) Move 2 paragraphs from the margin to the right under the number (13).
- Page 6-43, Article 610-8, 4th paragraph, remove the first ***the***
- Page 6-44, 2nd full paragraph, 1st sentence, delete the first ***and*** and add ***transverse*** just before cross-slope control.
- Page 6-51, at the top of the page, add ***610-14*** on the same line, and just before the heading MAINTENANCE.
- Page 6-53, Article 620-4 sixth paragraph, second line; the word that should be ***which***.
- Page 6-66, title, Replace EXISTNG with **EXISTING**
- Page 6-66, Article 657-1, Description, first sentence, replace PS/AR (hot-poured rubber asphalt with ***hot applied joint sealer***.
- Page 6-66, Article 657-2, replace PS/AR (Hot-Poured Rubber Asphalt with the following:

Item	Section
Hot Applied Joint Sealer	***1028-2***

- Page 6-67, at the top of the page, substitute the heading Section 654 with Section ***657.***
- Page 6-67, Article 657-3 Construction Methods, 2nd paragraph, replace PS/AR sealant with ***hot applied joint sealer***.
- Page 6-67, at the top of the page, substitute the heading Section 654 with Section ***657.***
- Page 6-71, 660-9(B)(1), Replace the first sentence of the first paragraph with the following:

  Using the quantities shown in *Table 660-1*, apply asphalt material to the existing surface followed by an application of No. 78 M or lightweight aggregate.

- Page 6-89, Add a period at the end of the last sentence at the bottom of the page.
- Page 6-90, Article 663-5, first paragraph, first sentence, change 50oF to ***50^oF;*** third paragraph, fourth sentence change 325oF to ***325^oF.***

Division 7

- Page 7-12, at the top of the page, substitute the heading Section 710 with Section ***700***.
- Page 7-15, Article 710-9, 4th paragraph, last line, change 710-11(B) to 710-1***0***(B).

Division 8

- Page 8-13, Article 808-3, 4th Paragraph, third line, replace the word Eexcavation with the word ***Excavation***

- Page 8-35, Article 848-2, Item: Replace Cncrete with ***Concrete***

Division 9

- Page 9-2, add ***901-3*** just before CONSTRUCTION METHODS

Division 10

- Page 10-12, near bottom of page add ***(C)*** before Proportioning and Mixing of Modified Compositions, which should be bold type.
- Page 10-28, at the top of the page, substitute Section 100***6*** for 1005.
- Page 10-54, Subarticle 1018-2A), First line, substitute ***(B)*** for II, third line, substitute ***(B)(2)*** for II-b.
- Pages 10-56, 10-58, 10-60 at the top of the page, substitute Section 1018 with Section ***1020.***
- Page 10-84, Table 1042-1, Class 2, Maximum, change from 23r to ***23***.
- Page 10-84, Article 1042-2 Testing, last sentence, replace the word alterations with the word ***cycles***.
- Page 10-100, Table 1056-1, replace on the line for Trapezoidal Tear Strength:

Type 1	Type 2	Type 3		Type 4
		Class A	Class B	Soil Stabilization
45 lb	***75*** lb	--	--	***75*** lb

- Page 10-116, Subarticle 1070-10, first paragraph, second sentence, add ***or*** just before cold-forged sleeve.
- Pages 10-136 through 10-147, at the top of the page, substitute Section 1074 with Section ***1072***.
- Page 10-157, Article 1077-11, first paragraph, change the reference from Subarticle 420-18(B) to Subarticle 420-***17***(B).
- Page 10-200, Subarticle 1080-14(B), change reference to ASTM D335***9***
- Page 10-211, at the top of the page, substitute Section 1081 with Section ***1082.***
- Page 10-229, add ***1088-6 BLANK*** on the line above 1088-7 TUBULAR MARKERS.
- Page 10-244, add **1089-10** ***BLANK*** and **1089-11** ***BLANK*** on the lines just above 1089-12 FLAGGER.
- Page 10-272, delete Article 1098-6 in its entirety. Renumber Articles 1098-7 through 1098-17 as Articles 1098-6 through 1098-16 consecutively.

Division 12

- Page 12-21 Add ***1266-2*** just before the heading MATERIALS.

Division 14

- Page 14-33, Article 1413-6, first paragraph, first sentence, first line, replace the word made with the words ***paid for***.

Division 15

- Page 15-2 add ***1500-4*** just before the heading WEEKEND, NIGHT AND HOLIDAY WORK.
- Page 15-4, Subarticle 1505-3(A)(2), replace the 2nd line with the following: ***Provide shielding or shoring as required under Section 150 or as required elsewhere in the contract.***
- Page 15-5, add ***1505-6*** on the same line and just before the heading MEASUREMENT AND PAYMENT. (Remove the period after PAYMENT.)
- Page 15-6, Article 1505-6(3), delete *in Section 1175* and replace it with *elsewhere in the contract*.
- Page 15-8, add **1510-4** on the same line and just before the heading MEASUREMENT AND PAYMENT.
- Page 15-10, substitute **BLANK** for CONSTRUCTION REQUIREMENTS on the same line and just before 1515-4.
- Page 15-10, substitute **CONSTRUCTION REQUIREMENTS** for General Requirements
- Page 15-10, Article 1515-4, add ***(D)*** just before the bolded Fire Hydrants.
- Page 15-13, Article 1520-3, 8th paragraph, add ***pipe*** after diameter.
- Page 15-22, add ***1540-3*** on the same line and just before the heading CONSTRUCTION REQUIREMENTS
- Page 15-28, Replace 1550-6 METHOD OF MEASUREMENT with ***MEASUREMENT AND PAYMENT.***

Division 16

- Page 16-12, Subarticle 1632-1(C) ¼ Inch hardware cloth, change the minimum width from 24 inches to ***48*** inches.

Division 17

- Page 17-19, Subarticle 1725-2 Material, Second paragraph, change Article 1098-7 to 1098-***8***
- Page 17-20, Subarticle 1726-2 Material, Second paragraph, change Article 1098-8 to 1098-**9**

END

***** 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 PROVISIONS ***

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS (FHWA-1273)

I. GENERAL

1. 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.
2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.
3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.
4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

   Section I, paragraph 2;

   Section IV, paragraphs 1, 2, 3, 4, and 7;

   Section V, paragraphs 1 and 2a through 2g.
5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 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 DOL, or the contractor's employees or their representatives.
6. **Selection of Labor:** During the performance of this contract, the contractor shall not:
   a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
   b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

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 and 41 CFR 60) 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 Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American 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 State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.

b. The contractor will accept as his 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, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO 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 minority group employees.

   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 minority groups 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 minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group 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, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

   c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group 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 his 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 his avenues of appeal.

6. **Training and Promotion:**

   a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

   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. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

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 minority group and women employees 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 his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. 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 best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

   b. The contractor will use best 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 SHA 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 minority and women 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 minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) 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 SHA.

8. **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.

   a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

   b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.

   c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. **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 completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

   a. The records kept by the contractor shall document the following:

      1. The number 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;

      3. The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

      4. The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

   b. The contractors will submit an annual report to the SHA 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. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. **NONSEGREGATED FACILITIES**

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of $10,000 or more and that it will retain such certifications in its files.

IV. **PAYMENT OF PREDETERMINED MINIMUM WAGE**

(Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. **General:**

a. All mechanics and laborers 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 (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) 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. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, 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 paragraphs 4 and 5 of this Section IV.

b. 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.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. **Classification:**

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

1. the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

2. the additional classification is utilized in the area by the construction industry;

3. the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

4. with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification 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 DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour 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.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional 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. Said 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

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. **Payment of Fringe Benefits:**

a. 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 or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a 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.

4. **Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:**

a. Apprentices:

1. 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 DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/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 Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

2. The allowable ratio of apprentices to journeyman-level employees 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 employee 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 listed in 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 or subcontractor 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-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

3. 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 journeyman-level 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 for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

4. In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

1. 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 DOL, Employment and Training Administration.

2. The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. 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.

3. Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level 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-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

4. In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor 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. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under a approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. **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.

6. **Withholding:**

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor 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, as 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 SHA contracting officer 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.

7. **Overtime Requirements:**

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. **Violation:**

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her 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, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. **Withholding for Unpaid Wages and Liquidated Damages:**

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies 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 8 above.

V. **STATEMENTS AND PAYROLLS**

(Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. **Compliance with Copeland Regulations (29 CFR 3):**

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. **Payrolls and Payroll Records:**

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof 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. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found 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 and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing

Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

1. that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

2. that such 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 the Regulations, 29 CFR 3;

3. that each laborer or mechanic has been paid not less that the applicable wage rate and fringe benefits or cash equivalent for the classification of worked performed, as specified in the applicable wage determination incorporated into the contract.

e. 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 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, 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 SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions 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.

VI. **RECORD OF MATERIALS, SUPPLIES, AND LABOR THIS SECTION DELETED JUNE 4, 2007.**

VII. **SUBLETTING OR ASSIGNING THE CONTRACT**

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 State. 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).

a. "Its own organization" shall be construed to include only workers employed and paid directly 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, assignee, or agent of the prime contractor.

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 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 VII 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 SHA 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 SHA 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 SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. **SAFETY: ACCIDENT PREVENTION**

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 SHA 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. 333).

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. 333).

IX. **FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

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, the following notice 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:

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

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 not more that $10,000 or imprisoned not more than 5 years or both."

X. **IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.
2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.
3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. **CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

1. **Instructions for Certification - Primary Covered Transactions:**

(Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary 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 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 primary 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 department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary 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," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary 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 primary 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 Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

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 may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. 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.

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.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its 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 3-year period preceding this proposal been convicted of or had a civil judgement 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 1b of this certification; and

   d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary 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 Covered Transactions:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions of $25,000 or more - 49 CFR 29)

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," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

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.

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 may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

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 Covered Transactions:

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 participation in this transaction 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.

* * * * *

XII. **CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

(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 his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

GENERAL DECISION NC20080011 NC11

Z-12

Date: July 25, 2008

General Decision Number NC20080011 07/25/2008

Superseded General Decision No. NC20070011

State: North Carolina

Construction Type: HIGHWAY

COUNTIES:

Alamance	Durham	Orange
Alexander	Forsyth	Randolph
Buncombe	Franklin	Rowan
Burke	Gaston	Stokes
Cabarrus	Guilford	Union
Catawba	Lincoln	Wake
Cumberland	Mecklenburg	Yadkin
Davidson	New Hanover	
Davie	Onslow	

HIGHWAY CONSTRUCTION PROJECTS (does not include tunnels, building structures in rest area projects, railroad construction, and, bascule, suspension and spandrel arch bridges, bridges designed for commercial navigation, and bridges involving marine construction, and other major bridges).

Modification Number	Publication Date
0	02/08/2008
1	07/25/2008

SUNC1990-014 02/12/1990

	Rates	Fringes
CARPENTER	7.63	
CONCRETE FINISHER	7.52	
ELECTRICIAN	10.26	
IRONWORKERS (reinforcing)	9.76	
LABORER		
Common	6.55	
Asphalt Lay Down Man	6.55	
Asphalt Raker	6.55	
Form Setter (road)	8.57	
Mason (brick, block, stone)	7.44	
Pipe Layer	6.55	
Power Tool Operator	8.28	
POWER EQUIPMENT OPERATORS		
Asphalt Distributor	6.78	
Asphalt Paver	7.47	
Bulldozer	7.33	
Bulldozer (utility)	6.72	
Concrete Curb Machine	7.09	
Concrete Finishing Machine	7.85	
Concrete Paver	6.90	
Crane, Backhoe, Shovel & Dragline (over 1 yd)	8.16	
Crane, Backhoe, Shovel & Dragline (1 yd and under)	6.95	
Drill Operator	7.34	
Grade Checker	6.55	
Gradeall	8.38	
Greaseman	6.55	
Loader	7.09	
Mechanic	8.47	
Motor Grader (Fine Grade)	8.04	
Motor Grader (Rough Grade)	7.68	
Oiler	6.55	
Roller (Finisher)	6.70	
Roller (Rough)	6.55	
Scraper	6.63	
Screed Asphalt	7.09	
Stone Spreader	6.55	
Stripping Machine Operator	6.55	
Subgrade Machine	7.13	
Sweeper	6.55	
Tractor (Utility)	6.55	
TRUCK DRIVERS		
Trucks – Single Rear Axle	6.55	
Trucks – Multi Rear Axle	6.55	
Trucks – Heavy Duty	9.47	
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)).

In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

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 *****

(12-18-07)

DIVISION ONE OF STANDARD SPECIFICATIONS

Division One of the *2006 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, 102-10(C)(2), 102-11(A), 103-2(B), 103-4(B), 104-13, and 108-2 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 1-2, Article 101-3, replace and add certain definitions as follows:

ADDITIONAL WORK

Additional work is that which results from a change or alteration in 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 Qualification for the design and construction of specific projects.

AWARD

The decision of the Board 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 of Transportation and the successful proposer, covering the performance of the work and the compensation therefor.

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 specifically

include, but not be limited to, the Request for Proposals, the Technical Proposal, the Price Proposal, the printed contract form and all attachments thereto, the contract bonds, the plans and associated special provisions prepared by the Design-Build Team, the standard specifications and all supplemental specifications thereto, the standard special provisions and the project special provisions contained in the Request for Proposals, and all executed supplemental agreements, all of which 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 included along 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 Trns*port 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.

SECTION 102
PROPOSAL REQUIREMENTS AND CONDITIONS

Page 1-11, 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 mailed 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 bids 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 items 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 prior to the bid opening.

Page 1-15, 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 will be opened. The Request for Proposals will also include any 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.

Up to three copies of the Request for Proposals will be furnished to each prospective Proposer. Additional copies may be purchased for the sum of $25 each. The copy marked with the Proposer's name and prequalification number shall be returned to the Department.

Page 1-16, Article 102-6, replace the first paragraph with the following:

The Proposer shall examine carefully the site of the work contemplated, the preliminary plans and specifications, and the Request for Proposals. The submission of a Technical Proposal and a Price Proposal shall be conclusive evidence that the Proposer has investigated and is satisfied as to the conditions to be encountered; as to the character, quality, and scope of work to be performed; the quantities of materials to be furnished; and as to the conditions and requirements of the proposed contract.

Page 1-17, delete Article 102-7 and replace with following:

102-7 SUBSURFACE INVESTIGATION REPORT

The Subsurface Investigation and report was made for the purpose of information only.

If a subsurface investigation report is available on this project, a copy may be obtained by the prospective proposers upon request.

The subsurface investigation on which the report is based was made for the purpose of information only. The various field boring logs, rock cores, and soil test data available may be reviewed or inspected in Raleigh at the office of the Geotechnical Unit. Neither the subsurface investigation report nor the field boring logs, rock cores, or soil test data is part of the contract.

General soil and rock strata descriptions and indicated boundaries are based on a geotechnical interpretation of all available subsurface data and may not necessarily reflect the actual subsurface conditions between borings or between sampled strata within the borehole. The laboratory sample data and the in situ (in-place) test data can be relied on only to the degree of reliability inherent in the standard test method. The observed water levels or soil moisture conditions indicated in the subsurface investigations are as recorded at the time of the investigation. These water levels or soil moisture conditions may vary considerably with time according to climatic conditions including temperature, precipitation, and wind, as well as other nonclimatic factors.

The Proposer is cautioned that details shown in the subsurface investigation report are preliminary only. The Department does not warrant or guarantee the sufficiency or accuracy of the investigation made, nor the interpretations made or opinions of the Department as to the type of materials and conditions that may be encountered. The proposer is cautioned to make such independent subsurface investigations, as he deems necessary to satisfy himself 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 time for any reason resulting from the actual conditions encountered at the site differing from those indicated in the subsurface investigation.

Pages 1-17, 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. 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.

6. Changes in any entry shall be made by marking through the entry in ink and making the correct entry adjacent thereto in ink. A representative of the Proposer shall initial the change in ink.

7. The Price Proposal shall be properly executed. In order 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 (LLC), it shall be signed by the manager 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 which is part of the signature sheets.

8. The Price Proposal shall not contain any unauthorized additions, deletions, or conditional bids.

9. 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.
10. 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 102-11. The bid deposit shall be a certified check or cashier check in accordance with Article 102-11.
11. 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 1-22, delete Article 102-12 and replace with the following:

102-12 DELIVERY OF BIDS

All Price Proposals shall be placed in a sealed envelope having the name and address of the Proposer, and the statement " Price Proposal for the Design/Build of State Highway Project No. _____ in _____County(ies)" on the outside of the envelope. 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 Project No. _____". All Technical Proposals shall be placed in a sealed envelope having the name and address of the Proposer, and the statement "Technical Proposal for the Design/Build of State Highway Project No. _____ in _____County(ies)" on the outside of the envelope. 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 Proposal. The outer envelope shall also bear the statement "Technical Proposal for the Design/Build of State Highway Project No. _____". If delivered in person on or before the due date, the sealed envelope shall be delivered to the office of the Contract Officer as indicated in the Request for Proposals. Price Proposals and Technical Proposals shall be submitted in accordance with the project special provision “Submittal of Proposals” contained elsewhere in this Request for Proposals.

All Price Proposals and Technical Proposals shall be delivered prior to the time specified in the Request for Proposals. Price proposals and Technical Proposals received after such time will not be accepted and will be returned to the Proposer unopened.

Pages 1-22, delete Article 102-13 and replace with the following:

102-13 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 State Highway Administrator.

Page 1-23, delete Article 102-14 and replace with the following:

102-14 RECEIPT AND OPENING OF BIDS

Price Proposals will be opened and read publicly at the time and place 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 1-23, Article 102-15, Replace the 1st paragraph with the following:

102-15 REJECTION OF BIDS

Any Price Proposal submitted which fails to comply with any of the requirements of Articles 102-8, 102-10 or 102-11, or with the requirements of the project scope and functional 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.

SECTION 103
AWARD AND EXECUTION OF CONTRACT

Page 1-25, 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 costs, corrections to the Price Proposal will be made in accordance with the provisions of Article 103-2. Such corrected costs 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 "Selection Procedure" section of 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 Board, the best interests of the State will be promoted thereby.

Page 1-26, Subarticle 103-2(A), add items (7) and (8) as follows:

(7) **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 for the entire project.

(8) **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 1-29, delete Article 103-6 and replace with the following:

103-6 RETURN OF BID BOND OR BID DEPOSIT

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 Department of Transportation warrants in the equivalent amount of checks that were furnished as a bid deposit will be issued.

Paper bid bonds will be retained by the Department until the contract bonds are furnished by the successful proposer, after which all such bid bonds will be destroyed unless the individual bid bond form contains a note requesting that it be returned to the proposer or the Surety.

Page 1-30, delete Article 103-9 and replace with the following:

103-9 FAILURE TO FURNISH CONTRACT BONDS

The successful proposer's failure to file acceptable bonds within 14 calendar days after the notice of award is received by him shall be just cause for the forfeiture of the bid bond or bid deposit and rescinding the award of the contract. Award may then be made to the responsible proposer with the next lowest adjusted price or the work may be readvertised and constructed under contract or otherwise, as the Board of Transportation may decide.

SECTION 104
SCOPE OF WORK

Page 1-30, 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. In case the method 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 1-31, Article 104-3, replace “plans or details of construction” with “contract” in all instances within this Article.

Page 1-40, 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. 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 1-41, 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 1-46, 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 1-47, Article 105-3, add the following after the 3rd 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 1-47, 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 Plans, the Standard Specifications, 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 intended to be complementary and to describe and provide for a complete work.

In case of discrepancy or conflict, the order in which they govern shall be as follows:

(A) Request for Proposals

(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 1-50, delete Article 105-9 and replace with the following:

105-9 CONTRUCTION STAKES, LINES, AND GRADES

The Design-Build Team shall be responsible for any 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. Unless otherwise specified in the Request for Proposals, no measurement or direct payment will be made for this work. The cost shall be considered as included in other contract items.

SECTION 106
CONTROL OF MATERIAL

Page 1-56, 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 1-58, Article 106-6, replace "specifications" with "contract" as the last word of the 1st paragraph.

Page 1-58, Article 106-6(C), replace the 2nd paragraph with the following:

Where the Department agrees to inspect or test materials during their production or at the source of supply, the Design-Build Team shall bear the cost of testing performed on materials ordered by him but not incorporated into the project. 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 1-69, Article 107-18, in the last sentence of the first paragraph, replace the word "legally" with the word "contractually".

Page 1-69, delete Article 107-19 and replace with the following:

107-19 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 1-71, Article 108-1, add the following sentence to the end of the 1st paragraph:

The Design-Build Team shall not commence work prior to execution of the contract by both the Department and the Design-Build Team.

Page 1-72, 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 1-72, 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 1-74, Article 108-6, replace "40 percent" with "30 percent" in the 1st paragraph.

Page 1-74, Article 108-6, delete the second paragraph and replace with the following:

In any event, the Contractor shall perform with his own organization work amounting to not less than 25% of the difference between the total amount bid and the value of specialty items that have been sublet.

Pages 1-75, 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).

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 1-79, 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 1-79, delete Subarticle 108-10(B)(1) in its entirety.

Page 1-83, Article 108-13, delete bullet (E)(2) in its entirety.

SECTION 109
MEASUREMENT AND PAYMENT

Page 1-85, Article 109-2, delete the last sentence of the 1st 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 1-90, 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 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 represent 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 1-92, 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 1-94, Article 109-10, add the following as bullets (E) and (F) under the 1st paragraph.

(E) As-constructed plans or other submittals as required by the Contract.

(G) Documents or guarantees to support any warranty provided by the Design Build Team.

ITEMIZED PROPOSAL FOR CONTRACT No. C 202238 (I-4744)

Mar 26, 2009 2:31 pm

County: WAKE

Line #	Item Number #	Sec #	Description	Quantity	Unit Cost	Amount
			ROADWAY ITEMS			
0001	0000900000-N	SP	GENERIC MISCELLANEOUS ITEM DESIGN AND CONSTRUCTION	Lump Sum	L.S.	

1431/Mar26/Q1.0/D 900000 /E1

Total Amount Of Bid For Entire Project:_____

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
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 Structural Concrete (cast-in-place only) Concrete Shoulders Adjacent to Pavement	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.)

12/19/89

AWARD LIMITS ON MULTIPLE PROJECTS

It is the desire of the Proposer to be awarded contracts, the value of which will not exceed a total of $_____, for those projects indicated below on which bids are being opened on the same date as shown in the Proposal Form. Individual projects shall be indicated by placing the project number and county in the appropriate place below. Projects not selected will not be subject to an award limit.

_____	_____
(Project Number)	(County)
_____	_____
(Project Number)	(County)
_____	_____
(Project Number)	(County)
_____	_____
(Project Number)	(County)

*If a Proposer desires to limit the total amount of work awarded to him in this letting, he shall state such limit in the space provided above in the second line of this form.

It is agreed that in the event that I am (we are) the successful Design Build Team on indicated projects, the total value of which is more that the above stipulated award limits, the Board of Transportation will award me (us) projects from among those indicated which have a total value not exceeding the award limit and which will result in the best advantage to the Department of Transportation.

_____
**Signature of Authorized Person

**Only those persons authorized to sign bids under the provisions of Article 102-8, Item 7, shall be authorized to sign this form.

LISTING OF DBE SUBCONTRACTORS

Sheet ____ of ____

FIRM NAME AND ADDRESS	ITEM NO.	ITEM DESCRIPTION	(*) AGREED UPON UNIT PRICE	DOLLAR VOLUME OF SUBLET ITEM

CONTRACT NO._____ **COUNTY**_____ **FIRM**_____

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.

LISTING OF DBE SUBCONTRACTORS

Sheet ____ of ____

FIRM NAME AND ADDRESS	ITEM NO.	ITEM DESCRIPTION	(*) AGREED UPON UNIT PRICE	DOLLAR VOLUME OF SUBLET ITEM

CONTRACT NO._____ **COUNTY**_____ **FIRM**_____

LISTING OF DBE SUBCONTRACTORS

Sheet ____ of ____

FIRM NAME AND ADDRESS	ITEM NO.	ITEM DESCRIPTION	(*) AGREED UPON UNIT PRICE	DOLLAR VOLUME OF SUBLET ITEM

CONTRACT NO._____ **COUNTY**_____ **FIRM**_____

LISTING OF DBE SUBCONTRACTORS

Sheet ____ of ____

FIRM NAME AND ADDRESS	ITEM NO.	ITEM DESCRIPTION	(*) AGREED UPON UNIT PRICE	DOLLAR VOLUME OF SUBLET ITEM

CONTRACT NO._____ **COUNTY**_____ **FIRM**_____

COST OF CONSTRUCTION WORK ONLY **$** _____

(*) The Dollar Volume Shown In This Column Shall be 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 this Contract.

Dollar Volume of DBE Subcontractor **$ _____

Percentage of Total Construction Cost _____**%**

**MUST HAVE ENTRY EVEN IF FIGURE TO BE ENTERED IS ZERO.

08/08/08

EXECUTION OF BID, NONCOLLUSION AFFIDAVIT, AND DEBARMENT 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, 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.

SIGNATURE OF CONTRACTOR (Principal)

_____
Full name of Corporation

_____
Address as prequalified

Attest _____ By _____

Secretary/Assistant Secretary
Select appropriate title

President/Vice President/Assistant Vice President
Select appropriate title

_____ _____
Print or type Signer's name Print or type Signer's name

CORPORATE SEAL

AFFIDAVIT MUST BE NOTARIZED

Subscribed and sworn to before me this the

_____ day of _____, 20_____

NOTARY SEAL

_____
Signature of Notary Public

Of _____County

State of _____

My Commission Expires _____

EXECUTION OF BID, NONCOLLUSION AFFIDAVIT, AND DEBARMENT CERTIFICATION

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, 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.

LIMITED LIABILITY COMPANY

SIGNATURE OF CONTRACTOR (Principal)

_____
Full Name of Firm

_____
Address as Prequalified

_____ Signature of Manager _____
Witness's Signature Individually

_____ _____
Print or type Witness's name Print or type Signer's Name

AFFIDAVIT MUST BE NOTARIZED

Subscribed and sworn to before me this the

_____ day of _____ 20__.

_____ **NOTARY SEAL**
Signature of Notary Public

of _____County

State of _____

My Commission Expires:_____

08/08/08

EXECUTION OF BID, NONCOLLUSION AFFIDAVIT, AND DEBARMENT 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, 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.

SIGNATURE OF CONTRACTOR (Principal)

Instructions to Prequalified Bidders: **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 venturers 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	*NOTARY SEAL*	*NOTARY SEAL*
Affidavit must be notarized for Line (2)	*Affidavit must be notarized for Line (3)*	*Affidavit must be notarized for Line (4)*
Subscribed and sworn to before me this	Subscribed and sworn to before me this	Subscribed and sworn to before me this
_____day of_____ 20___	_____day of _____ 20___	____day of _____ 20_____
_____	_____	_____
Signature of Notary Public	Signature of Notary Public	Signature of Notary Public
of _____County	of _____County	of _____County
State of _____	State of _____	State of _____
My Commission Expires:_____	My Commission Expires:_____	My Commission Expires:_____

EXECUTION OF BID, NONCOLLUSION AFFIDAVIT, AND DEBARMENT CERTIFICATION

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, 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.

INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME

SIGNATURE OF CONTRACTOR (Principal)

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 Witness's name Print or type Signer's name

AFFIDAVIT MUST BE NOTARIZED

Subscribed and sworn to before me this the

_____ day of _____ 20__.

NOTARY SEAL

_____
Signature of Notary Public

of _____County

State of _____

My Commission Expires:_____

EXECUTION OF BID, NONCOLLUSION AFFIDAVIT, AND DEBARMENT CERTIFICATION

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, 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.

INDIVIDUAL DOING BUSINESS IN HIS OWN NAME

SIGNATURE OF CONTRACTOR (Principal)

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 Witness's name

AFFIDAVIT MUST BE NOTARIZED

Subscribed and sworn to before me this the

_____ day of _____ 20__.

_____

Signature of Notary Public

NOTARY SEAL

of _____County

State of _____

My Commission Expires:_____

EXECUTION OF BID, NONCOLLUSION AFFIDAVIT, AND DEBARMENT CERTIFICATION

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, 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.

PARTNERSHIP

SIGNATURE OF CONTRACTOR (Principal)

_____
Full Name of Partnership

_____
Address as Prequalified

_____ By _____
Signature of Witness Signature of Partner

_____ _____
Print or type Witness'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

NOTARY SEAL

of _____County

State of _____

My Commission Expires:_____

DEBARMENT CERTIFICATION

Conditions for certification:

1. The prequalified bidder shall provide immediate written notice to the Department if at any time the bidder learns that his certification was erroneous when he submitted his debarment certification or explanation 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 202238 (I-4744)**

County (ies): **Wake**

ACCEPTED BY THE
DEPARTMENT OF TRANSPORTATION

Contract Officer

Date

Execution of Contract and Bonds
Approved as to Form:

Attorney General