

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

PROPOSAL

DATE AND TIME OF BID OPENING: **AUGUST 17, 2004 AT 2:00 PM**

CONTRACT ID C200809
WBS 34517.3.5

FEDERAL-AID NO. STP-70(75)

COUNTY IREDELL

T.I.P. NO. R-2911A

KILOMETERS 7.444

ROUTE NO. US 70

LOCATION US-70 FROM SR-2318 (SHILOH CHURCH RD) TO ROWAN COUNTY
LINE.

TYPE OF WORK WIDENING, GRADING, DRAINAGE, PAVING & STRUCTURES.

NOTICE:

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

BIDS WILL BE RECEIVED AS SHOWN BELOW: \$ _____

THIS IS A ROADWAY & STRUCTURE PROPOSAL _____

5% BID BOND OR BID DEPOSIT REQUIRED

PROPOSAL FORM FOR THE CONSTRUCTION OF CONTRACT NO. C200809

IN IREDELL COUNTY NORTH CAROLINA

Date _____ 20__

DEPARTMENT OF TRANSPORTATION,

RALEIGH, NORTH CAROLINA

The Bidder has carefully examined the location of the proposed work to be known as Contract No. C200809; has carefully examined the plans and specifications, which are acknowledged to be part of the proposal, the special provisions, the proposal, the form of contract, and the forms of contract payment bond and contract performance bond; and thoroughly understands the stipulations, requirements and provisions. The undersigned bidder agrees to bound upon his execution of the bid and subsequent award to him by the Board of Transportation in accordance with this proposal to provide the necessary contract payment bond and contract performance bond within fourteen days after the written notice of award is received by him. The undersigned Bidder further agrees to provide all necessary machinery, tools, labor, and other means of construction; and to do all the work and to furnish all materials, except as otherwise noted, necessary to perform and complete the said contract in accordance with the 2002 Standard Specifications for Roads and Structures by the dates(s) specified in the Project Special Provisions and in accordance with the requirements of the Engineer, and at the unit or lump sum prices, as the case may be, for the various items given on the sheets contained herein.

The Bidder shall provide and furnish all the materials, machinery, implements, appliances and tools, and perform the work and required labor to construct and complete State Highway Contract No. C200809

In Iredell County, for the unit or lump sum prices, as the case may be, bid by the Bidder in his bid and according to the proposal, plans, and specifications prepared by said Department, which proposal, plans, and specifications show the details covering this project, and hereby become a part of this contract.

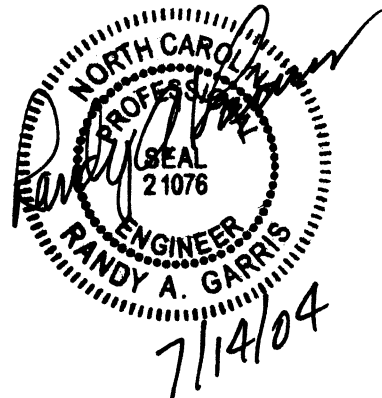
The published volume entitled "North Carolina Department of Transportation, Raleigh, Standard Specifications for Roads and Structures, January 2002 with all amendments and supplements thereto, is by reference incorporated into and made a part of this contract; that, except as herein modified, all the Construction and work included in this contract is to be done in accordance with the specifications contained in said volume, and amendments and supplements thereto, under the direction of the Engineer.

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

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

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

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



CONTRACT: C200809 (R-2911A)
IREDELL COUNTY

TABLE OF CONTENTS

COVER SHEET

PROPOSAL SHEETS

PROJECT SPECIAL PROVISIONS (GREEN SHEETS)

PAGE NO.

Contract Time and Liquidated Damages.....	1
Substantial Completion.....	1 - 2
Intermediate Contract Time (s).....	2 - 4
Safety Index Rating.....	4
Delay in Right of Entry.....	4
Major Contract Items.....	4
Specialty Items.....	5
Fuel Price Adjustment.....	5
Schedule of Estimated Completion Progress.....	6
Electronic Bidding.....	6 - 8
Disadvantaged Business Enterprise.....	9 - 17
Retainage and Prompt Payment.....	18
Certification for Federal-Aid Contracts.....	19
Contractor's License Requirements.....	19
Domestic Steel and Iron Products.....	20
U.S. Department of Transportation Hotline.....	20 - 21
Submission of Records - Federal-Aid Projects.....	21
Compensation and Record Keeping.....	21
Contractor Borrow Source.....	21 - 22
Subsurface Information.....	22
Payments For Materials – Removal Pavement Marking Material.....	22
Plant Pest Quarantines.....	22 - 23
Training Requirements.....	23
Safety Vests.....	23
Director of Construction in Lieu of Chief Engineer.....	24
Twelve Month Guarantee.....	24 - 25
Roadway.....	26 - 66
Utility Construction	67 - 69
Utility Conflicts.....	70 - 71
Erosion Control.....	72 - 87
Signals and Traffic Management Systems.....	88 - 122
Project Special Provisions Structure and Culverts.....	123 - 182
Railroad Special Provisions	183 - 197
Permits (WHITE SHEETS).....	198 - 224

STANDARD SPECIAL PROVISIONS (YELLOW SHEETS)

Availability of Funds.....	1
Seed Quality Requirements.....	2 - 4

Errata.....	5 - 6
Award of Contract.....	7
Minority and Female Employment Requirements.....	8 - 10
Required Contract Provs.-Federal-Aid Construction Contracts Exclusive of Appalachian Contracts (FHWA-1273).....	11 - 21
Training Special Provisions.....	22 - 25
Wage Rates	26 - 28

PROPOSAL FORM ITEM SHEETS, ETC.

Item Sheets

Signature Sheet (Bid-Acceptance by Department)

PROJECT SPECIAL PROVISIONS

General

7-1-95

SP1G01

CONTRACT TIME AND LIQUIDATED DAMAGES:

07-20-99

The date of availability for this contract is September 27, 2004, except that work in jurisdictional waters and wetlands shall not begin until a meeting between the DOT, Regulatory Agencies, and the Contractor is held as stipulated in the permits contained elsewhere in this proposal. This delay in availability has been considered in determining the contract time for this project.

The completion date for this contract is July 1, 2007.

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 stated in the contract. Should an observation period extend beyond the final completion date, the acceptable completion of the observation period shall be a part of the work covered by the performance and payment bonds.

The liquidated damages for this contract are Four Thousand Dollars (\$4,000.00) per calendar day. As an exception to this amount, where the contract has been determined to be substantially complete, as defined elsewhere in this proposal, the liquidated damages will be reduced to One Thousand Dollars (\$1,000.00) per calendar day.

SP1G04

SUBSTANTIAL COMPLETION:

09-17-03

The January 2002 Standard Specifications, Page 1-42, Article 105-17, Insert the following after the last paragraph:

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

1. Through traffic has been placed along the project or along the work required by an intermediate contract time and the work is complete to the extent specified below, and all lanes and shoulders are open such that traffic can move unimpeded at the posted speed. Intersecting roads and service roads are complete to the extent that they provide the safe and convenient use of the facility by the public.
2. The final layers of pavement for all lanes and shoulders along the project or along the work required by an intermediate contract time are complete.
3. All signs are complete and accepted except for the signs on intersecting roadways.

4. All guardrails, drainage devices, ditches, excavation and embankment are complete.
5. Remaining work along the project consists of permanent pavement markings, permanent pavement markers or incidental construction that is away from the paved portion of the roadway.

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

INTERMEDIATE CONTRACT TIME NUMBER #1 AND LIQUIDATED DAMAGES:

The Contractor shall complete the required work of installing, maintaining, and removing the traffic control devices for lane closures and restoring traffic to a 2-lane, 2-way traffic pattern. The Contractor shall not close or narrow a lane of traffic on –L- (US 70) during the following time restrictions:

DAY AND TIME RESTRICTIONS
6:00 a.m. to 7:00 p.m. Monday through Friday

In addition, the Contractor shall not close or narrow a lane of traffic on –L- (US 70), detain and/or alter the traffic flow on or during holidays, holiday weekends, special events, or any other time when traffic is unusually heavy, including the following schedules:

HOLIDAY AND HOLIDAY WEEKEND LANE CLOSURE RESTRICTIONS:

1. For any event that creates unusually high traffic volumes, as directed by the Engineer.
2. For **New Year's Day**, between the hours of **6:00 a.m.** December 31st and **7:00 p.m.** January 2nd. If New Year's Day is on Saturday or Sunday, then until **7:00 p.m.** the following Tuesday.
3. For **Easter**, between the hours of **6:00 a.m.** Thursday and **7:00 p.m.** Monday.
4. For **Memorial Day**, between the hours of **6:00 a.m.** Friday and **7:00 p.m.** Tuesday.
5. For **Independence Day**, between the hours of **6:00 a.m.** the day before Independence Day and **7:00 p.m.** the day after Independence Day.

If **Independence Day** is on a Saturday or Sunday, then between the hours of **6:00 a.m.** the Thursday before Independence Day and **7:00 p.m.** the Tuesday after Independence Day.

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

Holidays and holiday weekends shall include New Years, Easter, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas. The Contractor shall schedule his work so that lane closures are not required during these periods, unless otherwise directed by the Engineer.

The time of availability for this intermediate contract work shall be the time the Contractor begins to install all traffic control devices for lane closures according to the time restrictions listed above.

The intermediate completion time for this intermediate contract work shall be the time the Contractor is required to complete the removal of all traffic control devices for lane closures according to the time restrictions stated above and place traffic in a 2-lane, 2-way pattern on.

The liquidated damages are **One Thousand Dollars (\$1,000.00)** per hour.

INTERMEDIATE CONTRACT TIME NUMBER #2 AND LIQUIDATED DAMAGES:

The Contractor shall complete the work required of Phase I, Steps 6 thru 8 as shown on Sheets TCP-12 through TCP-14 and shall place and maintain traffic on same.

The date of availability for this intermediate contract time will be the date the Contractor elects to begin the work.

The completion date for this intermediate contract time will be the date which is 45 consecutive calendar days after and including the date the Contractor begins this work.

The liquidated damages for this intermediate contract time are Five Hundred Dollars (\$500.00) per calendar day.

INTERMEDIATE CONTRACT TIME NUMBER #3 AND LIQUIDATED DAMAGES:

The Contractor shall complete the work required of Phase I, Steps 6 thru 10 as shown on Sheets TCP-12 through TCP-14 and shall place and maintain traffic on same.

The date of availability for this intermediate contract time will be the date the Contractor elects to begin the work.

The completion date for this intermediate contract time will be the date which is 60 consecutive calendar days after and including the date the Contractor begins this work.

The liquidated damages for this intermediate contract time are Five Hundred Dollars (\$500.00) per calendar day.

SAFETY INDEX RATING:

6-18-02

Revise the 2002 Standard Specifications as follows:

Page 1-10, Article 102-2

Before the last paragraph on this page, add the following paragraph:

"All subcontractors performing work for the Department shall have received a passing grade on the Safety Index Rating form, in accordance with Article 102-2, prior to beginning work. Subcontractors can request the Safety Index Rating form from the State Contractual Services Engineer."

SP1G14

DELAY IN RIGHT OF ENTRY:

07-01-95

The Contractor will not be allowed right of entry to the parcels listed below before December 31, 2004 unless otherwise permitted by the Engineer.

Parcel No.

Property Owner

071
064

Gordon Brothers
Purina Mills, Inc.

SP1G22

MAJOR CONTRACT ITEMS:

2-19-02_c

The following listed items are the major contract items for this contract (See Articles 101-54 and 104-5 of the Standard Specifications):

SP1G28

Line #

Description

- 6 Unclassified Excavation
- 13 Borrow Excavation
- 62 Aggregate Base Course
- 69 Asphalt Concrete Base Course, Type B25.0C
- 70 Asphalt Concrete Intermediate Course, Type I19.0C
- 71 Asphalt Concrete Surface Course, Type S9.5C

SPECIALTY ITEMS:

7-1-95

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

Line #	Description	
108 thru 116, 121	Guardrail Items	
117 thru 120	Fencing Items	
126 thru 132	Signing Items	
147 thru 154	Long-Life Pavement Markings	
165	Pavement Markers	
169	Lighting Items	
170 thru 188	Utility Construction Items	
189 thru 215	Erosion Control Items	
216 thru 217	Reforestation Items	
218 thru 251	Signal Items	
257 thru 262	Drilled Piers	
		SP1G37

FUEL PRICE ADJUSTMENT:

2-19-02_{cc}

Fuel Price Adjustment for items of work listed below will be made in accordance with Section 109-8 of the Standard Specifications.

The base index price for DIESEL #2 FUEL is \$0.2744 per liter.

The selected item(s) of work and the fuel factor used in calculating adjustments to be made are as follows:

<u>Line #</u>	<u>Description</u>	<u>Units</u>	<u>Fuel Usage Factor</u> <u>Diesel</u>
6	Unclassified Excavation	L/C.M.	1.44
13	Borrow Excavation	L/C.M.	1.44
62	Aggregate Base Course	L/Metric Ton	2.30
69	Asphalt Concrete Base Course, Type B25.0 C	L/Metric Ton	12.10
70	Asphalt Concrete Intermediate Course, Type I19.0C	L/Metric Ton	12.10
71	Asphalt Concrete Surface Course, Type S9.5 C	L/Metric Ton	12.10

SP1G46

SCHEDULE OF ESTIMATED COMPLETION PROGRESS:

07-20-04

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

<u>Fiscal Year</u>	<u>Progress (Dollar Value)</u>
2005 (07/01/04 – 06/30/05)	38% of Total Amount Bid
2006 (07/01/05 – 06/30/06)	39% of Total Amount Bid
2007 (07/01/06 – 06/30/07)	23% of Total Amount Bid

The Contractor shall also furnish his own progress schedule in accordance with Article 108-2 of the Standard Specifications. Any acceleration of the progress as shown by the Contractor's progress schedule over the progress as shown above shall be subject to the approval of the Engineer.

SP1G58

ELECTRONIC BIDDING:

03-16-04_R

Page 1-2, Article 101-11

Delete this article and replace with the following:

Bid (Or Proposal): The electronic offer of a Bidder via Bid Express™ to the Department to perform the work and to furnish the labor and materials at the prices quoted.

Page 1-3, Article 101-20, **Contract**

Add after the second paragraph of this article.

All references to contracts shall include electronic agreements and printed paper agreements. These may include but not be limited to the electronic bid bond, non-collusion statement, debarment certification, and award limits.

Page 1-6, Article 101-64 **Proposal Form**

Delete this article and replace with the following:

Proposal or Proposal Form: The electronic or paper form provided by the Department that the Bidder uses to develop his electronic offer to perform the work at designated bid prices.

Page 1-14, **Article 102-9**

Delete Article 102-9 in its entirety and replace with the following:

102-9 ELECTRONIC BIDDING.

The Bidder shall submit bids electronically using the following guidelines:

1. The prequalified Bidder shall have a fully executed *Non-Collusion Affidavit and Debarment Certification* on file in the Contract Office prior to submitting his bid. If the Bidder cannot provide the debarment certification required, he shall provide an explanation as shown in the certification. The explanation will not necessarily result in denial of participation in a contract. Non-collusion and debarment certification forms shall be downloaded at <http://www.NCDOT.org/business>. Forms shall be executed in accordance with Section 102-8. The affidavit and certification shall be received in the Contract Office by 5 p.m. the last business day before the bid letting. The Contract Office address is shown at the end of this provision.

If the prequalified Bidder's *status* changes, he shall immediately submit a new fully executed non-collusion affidavit and debarment certification with an explanation of the change.

Failure to have a fully executed non-collusion affidavit and debarment certification on file in the Contract Office prior to placing bids will cause those bids to be non-responsive.

2. Obtain on-line bidding information from Bid Express™ at www.bidx.com (Note: Obtain an account and valid Digital Signature from Bid Express™ in order to bid electronically).
3. An electronic corporate surety bid bond for at least 5% of the total amount bid shall accompany each electronic bid, or the Contractor may submit a certified check or cashier's check in lieu of an electronic bid bond. The certified check or cashier's check shall be for at least 5% of the total amount bid and shall be received by 5 p.m. the last business day before the bid letting and shall be delivered to the address shown at the end of this provision.

Contact either or both of the following bond management companies in order to acquire the necessary service to submit an electronic bid bond.

- a. Surety 2000 (www.surety2000.com)
 - b. Surepath (www.insurevision.com)
4. Debarment Certification – The Bidder shall provide a debarment certification in the electronic bid submittal. If a Bidder cannot provide the debarment certification required, he shall provide an explanation in the Bid Express™ miscellaneous folder within the .ebs file. The explanation will not necessarily result in denial of participation in a contract. Failure to furnish a certification or an explanation will be grounds for rejection of a bid.
 5. Zero (0) is considered a valid bid. Do Not enter zero (0) in any unit price field unless zero (0) is the intended bid for that item.

6. Include all addenda in the submitted electronic bid. Bid Express™ will not accept a bid which does not contain all addenda. Section 103-2 (Correction of Bid Errors) will not apply to On-Line Electronic Bidding. All addenda and attachments will be considered part of the bid.
7. The electronic bid may be changed and resubmitted as many times as desired prior to the advertised bid opening time specified in the Invitation to Bid. The latest time stamped electronically submitted bid prior to the advertised bid opening time will constitute the Bid.
8. The provisions of Section 102-8 will apply to the preparation of bids except that the bid shall be submitted via Bid Express™ On-Line Bid Submission.
9. All bids shall be submitted with an electronically affixed digital signature. For the purpose of this provision, affixing a digital ID to the bid shall be the equivalent of signing before a notary public and placing in force the non-collusion affidavit and debarment certification on file with the Department.
10. By submitting an electronic bid, the Bidder certifies that he has read, understands, accepts, acknowledges and agrees to comply with all statements, conditions and Specifications in the electronic bid submittal.
11. Bids will be decrypted, opened, printed to paper and read publicly at the time and place specified in the invitation to bid.
12. The successful Bidder if award be made shall submit a fully executed *Execution of Contract, Non-Collusion Affidavit and Debarment Certification* signature sheet, and payment and performance bonds within 14 calendar days of receipt of award letter.
13. The Department will not be responsible if a Bidder cannot submit his bid to Bid Express™ and claims will not be accepted for this. In the event of technical difficulties, the Department reserves the right to postpone the reading of bids for up to 4 hours past the advertised bid opening time.
14. The pre-bid *Non-Collusion Affidavit, Debarment Certification signature sheet, Execution of Contract, Non-Collusion Affidavit, Debarment Certification signature sheet*, certified check or cashier's check in lieu of electronic bid bond, payment and performance bonds shall be delivered to the Contract Office at the address shown herein:

Physical Address

State Contract Officer
Project Services Unit
Century Center Bldg. B
1020 Birch Ridge Drive
Raleigh, NC 27610

Mailing Address:

State Contract Officer
NC Department of Transportation
Contracts and Proposals
1591 Mail Service Center
Raleigh, NC 27699-1591

SP1G60

DISADVANTAGED BUSINESS ENTERPRISE07-17-01_RPOLICY

It is the policy of the North Carolina Department of Transportation that Disadvantaged Business Enterprises shall have the opportunity to participate in the performance of contracts financed in whole or in part by Federal Funds in order to create a level playing field.

The Contractor is also encouraged to give every opportunity to allow DBE participation in Supplemental Agreements.

OBLIGATION

The Contractor, subcontractor, and sub-recipient shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of federally assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the Department deems necessary.

GOALS

The following goal for participation by Disadvantaged Business Enterprise (DBE) is established for this contract:

Disadvantaged Business Enterprises 13%

The Contractor 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 goals for this contract.

LISTING OF DBE SUBCONTRACTORS

All bidders, at the time the bid proposal is submitted, must also submit a listing of DBE participation on the appropriate form (or facsimile thereof) contained elsewhere in this proposal in order for the bid to be considered responsive. Bidders must indicate the total dollar value of DBE participation for the contract. In the event the bidder has no DBE participation, he is still required to indicate this on the forms by entering the word or number zero. Blank forms will not be deemed to represent zero participation. **BIDS SUBMITTED WHICH DO NOT HAVE DBE PARTICIPATION INDICATED ON THE APPROPRIATE FORM WILL NOT BE READ PUBLICLY DURING THE OPENING OF BIDS.** The Department will not consider these bids for award and they will be returned to the bidder. Bidders have the option of submitting their DBE participation in an abbreviated format as required in Paragraph A below, or the bidder may submit their DBE participation in the additional detail required by Paragraph B below. In the event the bidder elects to submit DBE participation in accordance with Paragraph A and is determined to be the apparent lowest responsive bidder, that bidder must deliver to the Department no later than 12:00 noon of the sixth day following the opening of bids, a detailed DBE submittal as required by Paragraph B below.

Only those DBE firms with current certification by the Department will be considered acceptable for listing in the bidder submittal of DBE participation.

- A. The Contractor shall indicate on the form for listing of DBE subcontractors contained elsewhere in this proposal the following required information:

REQUIRED INFORMATION

- (1) The names and addresses of DBE firms committed to participate in the contract
- (2) The Contract Item Numbers of work to be performed by each DBE firm; and
- (3) The total dollar amount to be paid to each DBE based on agreed upon unit prices.

Failure to indicate the required information on the specified form will cause the bid to be considered nonresponsive and it may be rejected.

- B. In lieu of submitting the information required by (A) above, the bidder may submit the detailed information that required below along with the bid proposal.

REQUIRED INFORMATION

- (1) The names and addresses of DBE firms committed to participate in the contract
- (2) The Contract Item Numbers and Contract Item Descriptions and agreed upon unit prices of work to be performed by each DBE firm; and
- (3) The total dollar amount to be paid to each DBE based on agreed upon unit prices.

Failure to indicate the required information on the specified form will cause the bid to be considered nonresponsive and it may be rejected.

The bidder is required to submit written documentation of the bidder/offeror'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.

The Department will not allow any substitutions, deletions, or other alterations to the listing of firms committed for DBE participation and/or the respective listed contract item numbers after opening of bids. The Department will not allow adjustments to total dollar amount of DBE participation after the opening of bids that would result in the DBE participation being less than the contract goal. The only exceptions to the requirements of this paragraph will be: (1) to allow for replacement of a DBE firm that had been decertified after opening of bids, and (2) to allow alteration of the listed contract item numbers subject to the Bidder submitting sufficient documentation to verify an obvious error in the initial submittal.

- C. If the DBE participation submitted in the bid by the apparent lowest responsive bidder in response to Paragraph A/B does not meet or exceed the DBE contract goal, the apparent lowest responsive bidder must submit information to satisfy the North Carolina Department of Transportation that sufficient Good Faith efforts have been made to meet the contract goals. One complete set and nine (9) copies of this information must be received in the office of the State Contractual Services Engineer no later than 12:00 noon of the sixth day following opening of bids. Where the information submitted includes repetitious solicitation letters it will be acceptable to submit a sample representative letter along with a distribution list of the firms being 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.

Where the bidder fails to provide this information by the deadline, the Department may impose one or more of the following sanctions: (1) disqualify the contractor and any affiliated companies from further bidding for a period of time of no more than 90 days from the date of disqualification as established in notification by certified mail, (2) disqualify the Contractor and any affiliated companies for award of all contracts for which bids have been received and opened, (3) disqualify the Contractor from the contract in question.

The following factors are what the Department will consider in judging whether or not the bidder has made adequate good faith effort:

- (1) Whether the bidder attended any pre-bid meetings that were scheduled by the Department to inform DBEs of subcontracting opportunities.
- (2) Whether the bidder provided solicitations through all reasonable and available means (e.g. advertising in newspapers owned and targeted to the Disadvantaged) at least 10 days prior to bid opening. Whether the bidder provided written notice to all DBEs listed in the NCDOT DBE directory, 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 bidder will be subcontracting.
- (3) Whether the bidder 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 bidder must notify DBEs outside of the targeted Divisions that specialize in the subcontracted areas, as well as call the project Compliance Officer in the Office of Civil Rights to give notification of the bidder inability to get DBE quotes.
- (4) Whether the bidder 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 prime contractor might otherwise perform these work items with its own forces.

- (5) Whether the bidder provided interested DBEs with adequate and timely information about the plans, specifications and requirements of the contract
- (6) Whether the bidder negotiated in good faith with interested DBEs not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.
- (7) 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 bidder 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 Contractor to accept unreasonable quotes in order to satisfy contract goals.
- (8) Whether the bidder 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.
- (9) Whether the bidder 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 bid proposal.
- (10) Any other evidence that the bidder submits which show that the bidder has made reasonable Good Faith efforts to include DBE participation.

In the event one bidder is the apparent low 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 bidder to combine the DBE participation as long as the overall goal value of all projects is achieved.

Where the apparent lowest responsive bidder fails to submit sufficient participation by DBE firms to meet the contract goal and upon a determination by the Goal Compliance Committee based upon the information submitted that the apparent lowest responsive bidder failed to make sufficient reasonable efforts to meet the contract goal, the bidder will be offered the opportunity to meet in person for administrative reconsideration. A committee appointed by the Department will hear administrative reconsideration. Members of this committee will be officials who did not take part in the original determination by the Goal Compliance Committee. The bidder will have the opportunity to present written documentation or argument concerning the issue of whether it met the goal or made an adequate good faith effort. The bidder will receive a written decision on the reconsideration. Explaining the basis for finding that the bidder did or did not meet the goal or made adequate Good Faith efforts to do so. The result of the reconsideration process is not administratively appealable to the Department.

In the event that the Department does not award the contract to the apparent lowest responsive bidder, the Department reserves the right to award the contract to the next lowest responsive bidder that can satisfy the Department that the contract goal can be met or that adequate good faith efforts have been made to meet the goal.

DBE DIRECTORY

Included with this Proposal is a list of Disadvantaged Business Enterprises (DBE) which have been certified as such by the North Carolina Department of Transportation. Only those DBE firms with current certification may be listed in the proposal.

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

REPLACEMENT OF DBEs

(A) Performance Related

If any DBE Subcontractor submitted on the form for listing of DBE Subcontractors, contained elsewhere in this proposal, is terminated or fails to complete its work on the contract for any reason, the Contractor shall take all necessary, reasonable steps to replace the DBE Subcontractor with another DBE Subcontractor to perform at least the same amount of work of the contract as the DBE that was terminated.

To demonstrate necessary, reasonable Good Faith efforts, the Contractor shall document the steps he has 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:

- (a) 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.
- (b) Efforts to negotiate with DBEs for specific subbids including, at a minimum:
 - (1) The names, addresses, and telephone numbers of DBEs who were contacted;
 - (2) A description of the information provided to DBEs regarding the plans and specifications for portions of the work to be performed; and
- (c) For each DBE contacted but rejected as unqualified, the reasons for the Contractor's conclusion.
- (d) Efforts made to assist the DBEs contacted, if needed, in obtaining bonding or insurance required by the Contractor.

The contractor will not terminate a DBE subcontractor listed in the proposal for convenience or perform the work with its own forces or those of an affiliate without the written approval of the Engineer. If the Contractor fails to demonstrate reasonable efforts to replace a DBE firm that does not perform as intended or completes the work with its own forces without the Engineer's approval, the Contractor will be disqualified from further bidding for a period of up to 6 months after notification by certified mail.

(B) Decertification

1. If a Prime Contractor has listed a DBE firm in his low bid submitted and that DBE Subcontractor is subsequently decertified by the Department after a Request for Subcontract has been approved, then the Department will not require the Prime Contractor to solicit replacement DBE participation equal to the remaining work to be performed by the decertified firm. The participation equal to the remaining work performed by the decertified firm will count toward the contract goal but may not be counted toward the overall program goal.
2. If a Prime Contractor has listed a DBE firm in his low bid submittal and the DBE firm is decertified prior to the Department approving a Request for Subcontract for the named DBE firm, the Prime Contractor shall take all necessary and reasonable steps to replace the DBE subcontractor with another DBE subcontractor to perform at least the same amount of work to meet the contract goal or demonstrate that it has made a Good Faith effort to do so.

DEFINITIONS

For purposes of this provision the following definitions will apply:

- (1) Socially and economically disadvantaged individuals means a person who has a net worth of \$750,000.00 or less and is a citizen or lawful permanent resident of the United States and who is:
 - (a) A Black American
 - (b) A Hispanic American
 - (c) A Subcontinent Asian American
 - (d) A Native American
 - (e) An Asian-Pacific American
 - (f) A Woman
 - (g) Members of other groups, or other individuals found to be economically and socially disadvantaged by the Small Business Administration under Section 8(d) of the Small Business Act, as amended (15 U.S.C. 637(d)).

- (h) Members of other groups, or other individuals found to be economically and socially disadvantaged by the N. C. Department of Transportation under the Criteria for Disadvantaged Business Enterprises as published by the Department.
- (2) Disadvantaged Business Enterprise (DBE) means a for-profit small business concern.
 - (a) That is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation in which 51 percent of the stock is owned by one or more such individuals; and
 - (b) Whose management and daily business operation are controlled by one or more of the socially and economically disadvantaged individuals who own it,

COUNTING DBE PARTICIPATION TOWARD MEETING THE DBE GOAL

- (1) If a firm is determined to be an eligible DBE firm and certified by the Department, the total dollar value of the participation by the DBE will be counted toward the goal. 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 contractor.
- (2) When a DBE performs as a participant in a joint venture, the contractor 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.
- (3)
 - (a) The Contractor may count toward its DBE goal only expenditures to DBEs that perform a commercially useful function in the work of a contract. A DBE is considered to perform a commercially useful function when it is responsible for execution of a distinct element of the work of a contract and carrying out its responsibilities by actually performing, managing, and supervising the work involved. 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.
 - (b) Consistent with normal industry practices, a DBE may enter into subcontracts. Work that a DBE subcontracts to another DBE firm may be counted toward the contract goal. Work that a DBE subcontracts to a non-DBE firm does not count toward the contract goal. 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 normal industry practices, the DBE shall be presumed not to be performing a commercially useful function. 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.

- (c) The following factors will be used to determine if a DBE trucking firm is performing a commercially useful function.
- (1) The DBE firm must be responsible for the management and supervision of entire trucking operation
 - (2) The DBE must itself own and operate at least one fully licensed, insured and operational truck
 - (3) The DBE will receive full credit for all trucks it owns, insures, operates, and employs drivers
 - (4) The DBE will receive full credit for all trucks leased from a certified DBE firm
 - (5) The DBE will only receive credit for the fees or commission for trucks leased from a non-DBE firm
 - (6) Others may use trucks during the term of the lease so long as the lease gives priority to the DBE for the use of the truck(s).

The DBE may present evidence to rebut this presumption to the Department for commercially useful functions.

- (4) A Contractor may count toward its DBE goal 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.
- (a) For purposes of this provision, a manufacturer is a firm that operates or maintains a factory or establishment that produces on the premises the materials or supplies obtained by the Contractor.
 - (b) For purposes of this provision, a regular dealer is 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. To be a regular dealer, the firm must engage in, as its principal business and in its own name, the purchase and sale 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 shall not be regarded as manufacturers or regular dealers within the meaning of this section.
- (5) A contractor may count toward its DBE goal the following expenditures to DBE firms that are not manufacturers or regular dealers:
- (a) 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, toward DBE goal, provided the fees or commissions are determined to be reasonable and not excessive as compared with fees and commissions customarily allowed for similar services.

- (b) 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), toward DBE goals, 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.

REPORTS

All requests for subcontracts involving DBE subcontractors shall be accompanied by a certification executed by both the Prime Contractor and the DBE subcontractor attesting to the agreed upon unit prices and extensions for the affected contract items. This document shall be on the Department's Form RS-1-D, or in lieu of using the Department's Form, copies of the actual executed agreement between the Prime Contractor and the DBE subcontractor may be submitted. In any event, the Department reserves the right to require copies of actual subcontract agreements involving DBE Subcontractors.

The RS-1-D certification forms may be obtained from the Department's Resident Engineer.

These certifications shall 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

When payments are made to Disadvantaged Business Enterprise firms, including material suppliers, contractors at all levels (prime, subcontractor, or second tier subcontractor) shall provide the Engineer with an accounting of said payments. This accounting shall be furnished the Engineer for any given month by the end of the following month. Failure to submit this information accordingly may result in (1) withholding of money due in the next partial pay estimate; or (2) removal of an approved Contractor from the prequalified bidders list or the removal of other entities from the approved subcontractors list. The accounting shall list for each payment made to a Disadvantaged Business Enterprise firm the following:

DOT Project Number
 Payee Contractor Name
 Receiving Contractor or Material Supplier
 DBE Certification Basis, e.g., Woman Owned, Native American, African American, etc.
 Amount of Payment
 Date of Payment

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. A copy of an acceptable report may be obtained from the Engineer.

SP1G61

RETAINAGE AND PROMPT PAYMENT:

1-01-02

Retainage:

The Department will not deduct and hold any retainage from the Prime Contractor on this project.

The 2002 Standard Specifications shall be revised as follows:

Sub-Article 109-4(A), pages 1-69 and 1-70

Delete the second, third, fourth, and fifth paragraphs of this subarticle.

Insert the following:

"The Department will withhold an amount sufficient to cover anticipated liquidated damages, as determined by the Engineer."

Prompt Payment of Monies Due Subcontractors, Second Tier Subcontractors and Material Suppliers and Release of Retainage

Contractors at all levels; prime, subcontractor, or second tier contractor, shall within seven calendar days of receipt of monies, resulting from work performed on the project or services rendered, pay subcontractors, second tier subcontractors, or material suppliers, as appropriate. This seven-day period begins upon knowledgeable receipt by the contracting firm obligated to make a subsequent periodic or final payment. These prompt payment requirements will be met if each firm mails the payment to the next level firm by evidence of postmark within the seven-day period.

This provision for prompt payment shall be incorporated into each subcontract or second tier subcontract issued for work performed on the project or for services provided.

The Contractor may withhold up to 3% retainage if any subcontractor does not obtain a payment and performance bond for their portion of the work. If any retainage is held on subcontractors, all retainage shall be released within seven calendar days of satisfactory completion of all work. For the purpose of release of retainage, satisfactory completion is defined as completion of all physical elements and corresponding documentation as defined in the contract, as well as agreement between the parties as to the final quantities for all work performed in the subcontract. The Department will provide internal controls to expedite the determination and processing of the final quantities for the satisfactorily completed subcontract portions of the project.

Failure of any entity to make prompt payment as defined herein may result in (1) withholding of money due to that entity in the next partial payment until such assurances are made satisfactory to this provision; or (2) removal of an approved contractor from the prequalified bidders list or the removal of other entities from the approved subcontractors list.

SP1G73

CERTIFICATION FOR FEDERAL-AID CONTRACTS:

03-21-90

The prospective participant certifies, by signing and submitting this bid or 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 prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such subrecipients shall certify and disclose accordingly.

SP1G85

CONTRACTOR'S LICENSE REQUIREMENTS:

7-1-95

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

SP1G88

DOMESTIC STEEL AND IRON PRODUCTS:

7-1-95

All steel and iron products which are permanently incorporated into this project shall be produced in the United States except minimal amounts of foreign steel and iron products may be used provided the combined project cost of the bid items involved does not exceed one-tenth of one percent (0.1 percent) of the total amount bid for the entire project or \$2,500.00, whichever is greater. This minimal amount of foreign produced steel and iron products permitted for use by this Special Provision is not applicable to fasteners. Domestically produced fasteners are required for this project.

All steel and iron products furnished as "domestic products" shall be melted, cast, formed, shaped, drawn, extruded, forged, fabricated, produced, or otherwise processed and manufactured in the United States. Raw materials including pig iron and processed pelletized and reduced iron ore used in manufacturing "domestic" steel products may be imported; however, all manufacturing processes to produce the products, including coatings, must occur in the United States.

Before each steel or iron product is incorporated into this project or included for partial payment on a monthly estimate, the Contractor shall furnish the Resident Engineer a notarized certification certifying that the product conforms to the above requirements of this Special Provision. The Resident Engineer will forward a copy of each certification to the Materials and Tests Unit.

Each purchase order issued by the Contractor or a subcontractor for steel and iron products to be permanently incorporated into this project shall contain in bold print a statement advising the supplier that all manufacturing processes to produce the steel or iron shall have occurred in the United States. The Contractor and all affected subcontractors shall maintain a separate file for steel products permanently incorporated into this project so that verification of the Contractor's efforts to purchase "domestic" steel and iron products can readily be verified by an authorized representative of the Department or the Federal Highway Administration.

SP1G97

U.S. DEPARTMENT OF TRANSPORTATION HOTLINE:

11-22-94

To report bid rigging activities call:

1-800-424-9071

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

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

SP1G100

SUBMISSION OF RECORDS - FEDERAL-AID PROJECTS: 12-15-98

The Contractor's attention is directed to the Standard Special Provisions entitled "Required Contract provisions - Federal-Aid Construction Contracts" contained elsewhere in this proposal.

This project is NOT located on the National Highway System, therefore, federal form FHWA-47 IS NOT required.

SP1G109

COMPENSATION AND RECORD KEEPING 03-16-04

Revise the *2002 Standard Specifications* as follows:

104-8 Compensation and Record Keeping

Change Article (A), subarticle 1. with the following:

In line 3 and line 6, change \$15,000.00 to \$25, 000.00.

SP1G110

CONTRACTOR BORROW SOURCE 07-20-04

Revise the *2002 Standard Specifications* as follows:

Page 2-17, Article 230-4(C) Contractor Furnished Sources, add the following;

If the Contractor proposes a borrow source, the environmental assessment shall include wetland and stream delineation extending 400 feet beyond the proposed borrow source limits.

1. If wetlands or streams are present within 400 feet of the borrow source and the contractor proposes to dewater:
 - a. Submit a hydrologic analysis (DRAINMOD or equivalent) to determine if excavation, pump frequency/duration/volume will permanently impact or cause degradation to wetlands or streams. The analysis shall consist of, but not be limited to:

Required buffer width to avoid long term impacts to wetlands or stream

Return interval to pre-existing hydrologic conditions after pit excavation and dewatering is completed.

- b. Attach a conservation easement specifying that the completed pit impoundment, upon returning to mean water table elevation, shall not be drained, ditched, used for irrigation, or any other manner that would degrade wetlands and streams.
 - c. Provide copy of recorded conservation easement to Engineer prior to commencement of any work on proposed pit.
2. If wetlands or streams are not present within 400 feet, no additional documentation will be required.

During Department review of the proposed borrow area, the hydrologic analysis will be submitted to the U. S. Army Corps of Engineers for evaluation.

SP1G111

SUBSURFACE INFORMATION:

7-1-95

Subsurface information is available on the roadway and structure portions of this project.

SP1G119

PAYMENTS FOR MATERIALS - REMOVABLE PAVEMENT

07-01-95

MARKING MATERIAL:

When so authorized by the Engineer, partial materials payments will be made up to 90 percent of the delivered cost of pavement marking tape, provided that these materials have been delivered on or in the vicinity of the project, stored in an acceptable manner, not to exceed the shelf life recommended by the manufacturer, and further provided the documents listed in Subarticle 109-5(C) of the Standard Specifications have been furnished to the Engineer.

The Contractor shall be responsible for the material and the satisfactory performance of the material when used in the work.

The provisions of Article 109-6 of the Standard Specifications will not apply to removable pavement marking materials.

SP1G124

**PLANT AND PEST QUARANTINES:
(IMPORTED FIRE ANT, GYPSY MOTH,
WITCHWEED, AND OTHER NOXIOUS WEEDS)**

03-18-03

Within quarantined area:

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

Originating in a quarantined county:

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

Contact:

Contact the N.C. Department of Agriculture/United States Department of Agriculture at 1-800-206-9333, 919-733-6932, or <http://www.ncagr.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.

SP1G130

TRAINING REQUIREMENTS:**7-1-95**

The Contractor's attention is directed to the Standard Special Provision "Training Special Provision" included elsewhere in this proposal.

The number of trainees to be trained on this project shall be 7.

SP1G136

SAFETY VESTS:**6-19-01**

All Contractors' personnel, all subcontractors and their personnel, and any material suppliers and their personnel must wear an OSHA approved reflective vest or outer garment at all times while on the project.

SP1G139

DIRECTOR OF CONSTRUCTION IN LIEU OF CHIEF ENGINEER

03-16-04

Revise the 2002 Standard Specifications as follows:

Wherever the term *Chief Engineer* or *Chief Engineer of Operations* occurs in the Specifications, the actions and responsibilities referred to will be performed by the Director of Construction, Division of Highways, North Carolina Department of Transportation, acting directly or through his duly authorized representative.

Revision to Definitions of Terms

Page 1-4, Article 101-35

101-35 ENGINEER

The Chief Engineer of Operations, and/or Director of Construction, Division of Highways, North Carolina, Department of Transportation, acting directly or through their duly authorized representative.

SP1G143

TWELVE MONTH GUARANTEE:

07-15-03

- A. The Contractor shall guarantee materials and workmanship against latent and patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve months following the date of final acceptance of the work for maintenance and shall replace such defective materials and workmanship without cost to the Department. The Contractor will not be responsible for damage due to faulty design, normal wear and tear, for negligence on the part of the Department, and/or for use in excess of the design.
- B. Where items of equipment or material carry a manufacturer’s guarantee for any period in excess of twelve months, then the manufacturer’s guarantee shall apply for that particular piece of equipment or material. The Department’s first remedy shall be through the manufacturer although the Contractor is responsible for invoking the warranted repair work with the manufacturer. The Contractor’s responsibility shall be limited to the term of the manufacturer’s guarantee. NCDOT would be afforded the same warranty as provided by the Manufacturer.

This guarantee provision shall be invoked only for major components of work in which the Contractor would be wholly responsible for under the terms of the contract. Examples would include pavement structures, bridge components, and sign structures. This provision shall not be used as a mechanism to force the Contractor to return to the project to make repairs or perform additional work that the Department would normally compensate the Contractor for. In addition, routine maintenance activities (i.e. mowing grass, debris removal, ruts in earth shoulders,) are not parts of this guarantee.

Appropriate provisions of the payment and/or performance bonds shall cover this guarantee for the project.

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

SP1G145

PROJECT SPECIAL PROVISIONS

Roadway

7-1-95

SP1R01

CLEARING AND GRUBBING:

9-17-02

Perform clearing on this project to the limits established by Method "III" shown on Standard No. 200.03 of the Roadway Standards.

The 2002 Standard Specifications shall be revised as follows:

Page 2-3, Article 200-5

Delete the first sentence of this article and insert the following:

The property owner will have no right to use or reserve for his use any timber on the project. All timber cut during the clearing operations is to become the property of the Contractor, and shall be either removed from the project by him, or else shall be satisfactorily disposed of as hereinafter provided.

SP2R01

BURNING RESTRICTIONS:

7-1-95

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

SP2R05

TEMPORARY DETOURS:

7-1-95

Construct temporary detours required on this project in accordance with the typical sections in the plans or as directed.

Payment for the construction of the detours will be made at the contract unit prices for the various items involved. After the detours have served their purpose, remove the portions deemed unsuitable for use as a permanent part of the project as directed by the Engineer. Salvage within the right of way, as directed by the Engineer, for removal by State Forces. Pipe culverts and stockpile the aggregate base course removed from the detours at locations removed from the detours remain the property of the Contractor. Remove pipe culverts from the project when they are no longer needed. Place pavement and earth material removed from the detour in embankments or dispose of in waste areas furnished by the Contractor. Aggregate base course and earth material that is removed will be measured and will be paid for at the contract unit price per cubic yard (cubic meter) for "Unclassified Excavation". Pavement that is removed will be measured and will be paid for at the contract unit price per square yard (square meter) for

"Removal of Existing Pavement". Pipe culverts that are removed will be measured and will be paid for at the contract unit price per linear foot (meter) for "Pipe Removal". Such prices and payments will be full compensation for the work of removing, salvaging, and stockpiling aggregate base course; placing and removing pipe culverts; and for placing earth material and pavement in embankments or disposing of earth material and pavement in waste areas.

SP2R30

SHALLOW UNDERCUT:

2-19-02

Perform undercut excavation and place a combination of fabric for soil stabilization and Class IV Subgrade Stabilization at locations as directed by the Engineer. 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

Fabric for Soil Stabilization.....	Section 270
Class IV Subgrade Stabilization.....	Section 1016-3, Class IV; or Material meeting gradation requirements of Table 520-1, Column C

CONSTRUCTION METHODS

Perform undercut excavation in accordance with Section 225.
Place fabric for soil stabilization in accordance with Section 270.
Place Class IV Subgrade Stabilization by back dumping material on previously placed fabric.
Compact material to 95% of AASHTO T-99, Method "D" density or compact material to the highest density that can be reasonably obtained.

METHOD OF MEASUREMENT

Undercut Excavation will be measured in accordance with Section 225.
Fabric for Soil Stabilization will be measured in accordance with Article 270-4.
Class IV Subgrade Stabilization, as accepted in place, will be measured by the ton (metric ton), in accordance with Section 106-7.

BASIS OF PAYMENT

Payment will be made for quantities as measured above for the pay items listed below:
Undercut Excavation.....Cubic Yard (Cubic Meter)
Fabric for Soil Stabilization.....Square Yard (Square Meter)
Class IV Subgrade Stabilization.....Ton (Metric Ton)

SP2R35

BORROW MATERIAL:

“Borrow material consisting of A-2-5 and A-5 soils with a plasticity index less than 8 shall not be used in the top 0.3 meter of embankments nor as backfill in undercut areas unless waived in writing by the Engineer.”

BORROW EXCAVATION:**2-19-02**

Revise the 2002 Standard Specifications as follows:

Page 2-20, Article 230-6

After the first paragraph, insert the following paragraph:

"No direct payment will be made for the work of Evaluation of Potential Wetlands and Endangered Species as outlined above. Payment at the contract unit price for the pay item 'Borrow Excavation' or 'Grading - Lump Sum' will be considered full compensation for this work."

SP2R37

FALSE SUMPS:**7-1-95_c**

Construct false sumps in accordance with the details in the plans and at locations shown in the plans or at other locations as directed by the Engineer.

Payment for the work of construction of the false sumps will be made at the contract unit price per cubic yard (cubic meter) for "Unclassified Excavation or "Borrow Excavation" depending on the source of material, or included in "Grading-Lump Sum"

SP2R40

SHOULDER AND FILL SLOPE MATERIAL:**5-21-02****General:**

Perform the required shoulder and slope construction for this project in accordance with the applicable requirements of Section 560 and Section 235 of the Standard Specifications except as follows:

Construct the top 6 inches (150-mm) of shoulder and fill slopes with soils capable of supporting vegetation.

Provide soil with a P.I. greater than 6 and less than 25 and with a pH ranging from 5.5 to 6.8. Remove stones and other foreign material 2 inches (50 mm) or larger in diameter. All soil is subject to test and acceptance or rejection by the Engineer.

Obtain material from within the project limits or approved borrow source.

Compensation:

When the Contractor elects to obtain material from an area located beneath a proposed fill sections which does not require excavation for any reason other than to generate acceptable shoulder and fill slope material, the work of performing the excavation will be considered incidental to the item of "Borrow Excavation" or "Shoulder Borrow". If there is no pay item for "Borrow" or "Shoulder Excavation" in the contract, this work will be considered incidental to "Unclassified Excavation". Stockpile the excavated material in a manner to facilitate measurement by the Engineer. Fill the void created by the excavation of the shoulder and fill slope material with suitable material. Payment for material used from the stockpile will be made at the contract unit price for "Borrow Excavation" or "Shoulder Borrow". If there is no pay item for "Borrow Excavation" or "Shoulder Borrow", then the material will be paid for at the contract unit price for "Unclassified Excavation". The material used to fill the void created by the excavation of the shoulder and fill slope material will be made at the contract unit price for "Unclassified Excavation", "Borrow Excavation", or "Shoulder Borrow", depending on the source of the material.

Material generated from undercut excavation, unclassified excavation or clearing and grubbing operations that is placed directly on shoulders or slope areas, will not be measured separately for payment, as payment for the work requiring the excavation will be considered adequate compensation for depositing and grading the material on the shoulders or slopes.

When undercut excavation is performed at the direction of the Engineer and the material excavated is found to be suitable for use as shoulder and fill slope material, and there is no area on the project currently prepared to receive the material generated by the undercut operation, the Contractor may construct a stockpile for use as borrow at a later date. Payment for the material used from the stockpile will be made at the contract unit price for "Borrow Excavation" or "Shoulder Borrow".

When shoulder material is obtained from borrow sources or from stockpiled material, payment for the work of shoulder construction will be made at the contract unit price per cubic yard (cubic meter) for "Borrow Excavation" or "Shoulder Borrow" in accordance with the applicable provisions of Section 230 or Section 560 of the Standard Specifications.

SP2R50

RESTRICTIONS ON CONSTRUCTION OF EMBANKMENT:

02-17-04

The Contractor shall construct the embankments to the finished graded roadway section for a minimum distance of 100 feet (30.48 meters) from the listed end bents, and shall not begin any work on the bridge end bents as listed below until the prescribed waiting periods have elapsed, or until notified by the Engineer that the settlement rate has stabilized and work on the end bents may proceed.

Bridge Description and Affected Bent	Waiting Period
Station 39+62.402 -L- LT/RT Lanes	One (1) Month all end bents
Station 41+59.472 -L-, 12+40.935 -Y6- LT/RT Lanes	Two (2) Month all end bents

The Contractor will be required to maintain the embankments at finished graded roadway section during the waiting period. Additional earth material required to maintain embankment of finished graded roadway section will be paid for at the contract unit price per cubic yard (cubic meter) for "Borrow Excavation" or "Unclassified Excavation" depending on the source of the material. Where there is no pay item for Unclassified or Borrow Excavation, the furnishing of additional material will be paid for as extra work.

SP2R65

REINFORCED BRIDGE APPROACH FILLS:

03-18-03

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:

Geomembrane

Provide geomembrane that is impermeable, composed of polyethylene polymers or polyvinyl chloride, and meets the following physical requirements:

<u>Property</u>	<u>Requirements</u>	<u>Test Method</u>
Thickness	25 mils (0.6 mm) Minimum	ASTM D1593
Tensile Strength at Break	100 lb/inch (18 KN/M) Minimum	ASTM D638
Puncture Strength	40 lbs (0.2KN) Minimum	FTMS 101 C 2065
Moisture Vapor Transmission Rate	0.018 ounce/yard ² (0.615 gm/ m ²) per Day Maximum	ASTM E96

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.

<u>Fabric Property</u>	<u>Requirements</u>	<u>Test Method</u>
Minimum Flow Rate	2 gallons/min/square foot (1358 cm ³ /sec/square meter)	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.

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 Standard Specifications. When select material is required under water, use select material class V only, up to one foot (300mm) above the existing water elevation.

4" (100mm) Diameter Corrugated Drainage Pipe and Fittings

Provide pipe and fittings that meet all the applicable requirements of Section 815 or 816 of the Standard Specifications.

Construction:

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) perpendicular to the backwall face. Overlap geomembrane or fabric splices perpendicular to the backwall face a minimum of 18 inches (450 mm). 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 (250 mm) 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 (250 mm) thick with low ground pressure equipment. Use hand operated equipment to compact the fill material within three feet (0.9 m) 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 (200 mm) 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 must 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 (150 mm) of fill material. Compaction must 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 is 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 (100 mm) 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 must 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 (100-mm) 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.

Measurement and Payment:

Compensation:

All work covered by this provision will be paid for at the contract lump sum price for "Reinforced Bridge Approach Fills, Station _____". Such price and payment will be full compensation for both approach fills at each bridge installation, including but not limited to furnishing, placing and compacting select material, furnishing and placing geomembrane and woven fabric, furnishing and placing pipe sleeve, drainage pipe, and stone, furnishing and installing concrete pads at the end of outlet pipes, excavation and any other items necessary to complete the work.

Payment will be made under:
 Reinforced Bridge Approach Fills, Station _____ Lump Sum SP4R01

PREPARATION OF SUBGRADE AND BASE: 1-16-96

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.

No direct payment will be made for the work required by this provision as it will be considered incidental to other work being paid for by the various items in the contract.

SP5R05

AGGREGATE FOR SOIL-CEMENT BASE:

1-01-02_R

Revise the 2002 Standard Specifications as follows:

Page 5-27, Article 542-1. Delete the first sentence and substitute the following:

"The work covered by this section consists of constructing and curing a soil-cement base by treating the subgrade, existing subbase, or existing base, or any combination of these materials, by pulverizing, adding portland cement, adding aggregate when required, mixing, wetting, and compacting the mixture to the required density."

Page 5-27, Article 542-2. Add the following after line 3:

"Aggregate, Std. Size ABC.....Section 1005"

Page 5-28, Article 542-7. Add the following paragraph after the first paragraph:

"Prior to spreading cement, aggregate shall be spread at the rate shown in the plans.

Page 5-30, Article 542-16. Add the following paragraph after the first paragraph:

"The quantity of aggregate to be paid for will be the number of tons (metric tons) of aggregate that have been incorporated into the completed and accepted work. The aggregate will be measured by weighing in trucks on certified platform scales or other certified weighing devices. No deductions will be made for any moisture contained in the aggregate at the time of weighing."

Page 5-31, Article 542-17. Add the following paragraph after the first paragraph:

"The quantity of aggregate, measured as provided in Article 542-16, will be paid for at the contract unit price per ton (metric ton) for "Aggregate for Soil-Cement Base"."

Add the following at the end of the last paragraph:

"Aggregate for Soil-Cement Base.....Ton (Metric Ton)"

SP5R15

LIME AND CEMENT TREATED SOIL

11-18-03

Revise the 2002 Standard Specifications as follows:

Page 5-4, Article 501-8. In the second sentence of the first paragraph, **change 40 days to 24 days.**

Page 5-28, Article 542-7. In the second sentence of the first paragraph, **change 45 days to 24 days.**

SP5R20

ASPHALT PAVEMENTS - SUPERPAVE

02-17-04

Revise the 2002 Standard Specifications as follows:

PRIME COAT

Page 6-2, Article 600-9

Delete the first paragraph under this Article and substitute the following:

The quantity of prime coat to be paid will be the number of gallons (liters) of prime coat material that has been satisfactorily placed on the roadway. Each distributor load of prime coat material delivered and utilized on the project will be measured.

ASPHALT TACK COAT

Page 6-4, Article 605-8

Insert the following after paragraph one in this Article:

Take necessary precautions to limit the tracking and/or accumulation of tack coat material on either existing or newly constructed pavements. Excessive accumulation of tack may require corrective measures.

FIELD VERIFICATION AND JOB MIX FORMULA ADJUSTMENTS

Page 6-7, Article 609-4

Delete the first paragraph under this Article and substitute the following:

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 as deemed necessary.

Page 6-8, Article 609-4

Delete the first paragraph on this page and substitute the following:

Retain records of these calibrations and mix verification tests, including Superpave Gyrotory 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.

Page 6-8, Article 609-4

Add the following sentence to the end of the last paragraph in this Article:

Any mix produced that is not verified may be assessed a price reduction at the Engineer's discretion in addition to any reduction in pay due to mix and/or density deficiencies.

Quality control minimum sampling and testing schedule:

Page 6-9, Subarticle 609-5(C)1

Delete the second sentence in the second paragraph of this Article and substitute the following:

Retain the QC compacted volumetric test specimens for 5 calendar days, commencing the day the specimens are prepared.

Page 6-9, Subarticle 609-5(C)2

At the bottom of this page, delete the sentence directly above the Accumulative Production Increment and substitute the following:

Sample and test the completed mixture from each mix design at the following minimum frequency during mix production:

Page 6-10, Subarticle 609-5(C)2

Revise Items B, C, D and E on this page as follows:

- B. Gradation on Recovered Blended Aggregate from Mix Sample (AASHTO T 30 Modified) Grade on all sieves specified on JMF
- C. Maximum Specific Gravity (AASHTO T 209 or ASTM D 2041), optional (ASTM D 6857)
- D. Bulk Specific Gravity of Compacted Specimens (AASHTO T166), optional (ASTM D 6752), Average of 3 specimens at N_{des} gyrations (AASHTO T 312)
- E. Air Voids (VTM) (AASHTO T 269), Average of 3 specimens at N_{des} gyrations

Page 6-11, Subarticle 609-5(C)2

At the top of this page, delete Item B.,” Reclaimed Asphalt Pavement...” and substitute the following:

- B. Reclaimed Asphalt Pavement (RAP) Binder Content and Gradation (AASHTO T 308 Modified or T 164 and AASHTO T 30 Modified) (sampled from stockpiles or cold feed system at beginning of production and weekly thereafter). Have RAP approved for use in accordance with Article 1012-1(G). (Split Sample Required)

Page 6-11, Subarticle 609-5(C)2

Insert the following sampling and testing at the end of this Subarticle

- F. Uncompacted Void Content of Fine Aggregate, AASHTO T 304, Method A (natural sand only). Performed at Mix Design and when directed as deemed necessary. (Split Sample Required)
- G. Reclaimed Asphalt Shingle Material (RAS) Binder Content and Gradation (AASHTO T 308 Modified or T 164 and AASHTO T 30 Modified) (sampled 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)

CONTROL CHARTS

Page 6-11, Subarticle 609-5(C)3

Delete the second sentence of the first paragraph in this Subarticle and substitute the following:

Record all regularly scheduled random sample or directed sample full test series results for mix incorporated into the project on control charts the same day the test results are obtained.

Page 6-12, Subarticle 609-5(C)3

Delete item 3 in the list below the second full paragraph on this page.

CONTROL LIMITS

Page 6-12, Subarticle 609-5(C) 4

At the bottom of this page, delete the table and substitute the following:

CONTROL LIMITS

Mix Control Criteria	Target Source	Warning Limit	Moving Average Limit	Individual Limit
2.36mm Sieve	JMF	±4.0 %	±5.0 %	±8.0 %
0.075mm Sieve	JMF	±1.5 %	±2.0 %	±2.5 %
Binder Content	JMF	±0.3 %	±0.5 %	±0.7 %
VTM @ N _{des}	JMF	±1.0 %	±1.5 %	±2.0 %
VMA @ N _{des}	Min. Spec. Limit	-0.5%	-0.8%	-1.0%
P _{0.075} / P _{be} Ratio	Max. Spec. Limit	0.0	N/A	+0.4%
%G _{mm} @ N _{ini}	Max. Spec. Limit	N/A	N/A	+2.0%
TSR	Min. Spec. Limit	N/A	N/A	-15.0%

FIELD COMPACTION QUALITY CONTROL

Page 6-15, Subarticle 609-5(D)1

Delete the first and second sentences in the fourth paragraph on this page and substitute the following:

Base and intermediate mix types (surface mixes not included) utilized for pavement widening of less than 4.0 feet and all mix types used in tapers, irregular areas and intersections (excluding full width travel lanes of uniform thickness), will not be subject to the sampling and testing frequency specified above provided the pavement is compacted using approved equipment and procedures. However, the Engineer may require occasional density sampling and testing to evaluate the compaction process.

Page 6-16, Subarticle 609-5(D)1

Delete item number 2 at the top of this page. Item number 3 should be re-numbered as 2 after the specified deletion.

LIMITED PRODUCTION PROCEDURE

Page 6-17, Subarticle 609-5(D) 5

Delete the first paragraph in this Subarticle and substitute the following:

Proceed on limited production when, for the same mix type, one of the following items occur:

- (1) Two consecutive failing lots, excluding lots representing an individual resurfacing map or portion thereof.
- (2) Three consecutive failing lots, with each lot representing an individual resurfacing map or portion thereof.
- (3) Two consecutive failing nuclear control strips.

Pavement within each construction category (New and Other), as defined in Article 610-13, and pavement placed simultaneously by multiple paving crews will be evaluated independently for limited production purposes.

Delete the first sentence in the last paragraph in this Subarticle and substitute the following:

If the Contractor does not operate by the limited production procedures as specified above, the two consecutive failing density lots, three consecutive failing lots with each lot representing an individual resurfacing map or portion thereof, or two consecutive failing nuclear control strips, whichever is applicable, and all mix produced thereafter will be considered unacceptable.

DOCUMENTATION (RECORDS)

Page 6-18, Subarticle 609-5(E)

Delete the third and fourth sentence in the first full paragraph on this page and substitute the following:

Maintain all QC records, forms and equipment calibrations for a minimum of 3 years from their completion date.

Delete the second full paragraph on this page and substitute the following:

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 is determined not to be acceptable, remove and replace with mix, which 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

Page 6-18, Article 609-6

In Item 5 under Plant Mix Quality Assurance, add "at a frequency equal to or greater than 5% of the QC sample frequency".

In the first sentence within the paragraph below Plant Mix Quality Assurance, delete the words “of mix”.

In Item 1 under Density Quality Assurance, delete the wording at the end of the sentence “at a frequency equal to or greater than 10% of the frequency required of the Contractor”.

Page 6-19, Article 609-6

In Item 4 under Density Quality Assurance, add “at a frequency equal to or greater than 5% of the QC sample frequency.”

Insert the following after Item 4 under Density Quality Assurance:

6. By periodically directing the recalculation of random numbers for the Quality Control core or nuclear density test locations. The original QC test locations may be tested by QA and evaluated as verification tests.

LIMITS OF PRECISION

Page 6-19, Article 609-6

In the limits of precision table, delete the last three rows and substitute the following:

QA retest of prepared QC Gyratory Compacted	
Volumetric Specimens	± 0.015
Retest of QC Core Sample	± 1.2% (% Compaction)
Comparison of QA Core Sample	± 2.0% (% Compaction)
QA Verification Core Sample	± 2.0% (% Compaction)
Nuclear Comparison of QC Test	± 2.0% (% Compaction)
QA Nuclear Verification Test	± 2.0% (% Compaction)

ASPHALT CONCRETE PLANT MIX PAVEMENTS – DESCRIPTION

Page 6-21, Article 610-1

Insert the following after the last paragraph in this Article:

A high frequency of asphalt plant mix, density, or mix and density deficiencies occurring over an extended duration of time may result in future asphalt, which is represented by mix and/or density test results not in compliance with minimum specification requirements, being excluded from acceptance at an adjusted contract unit price in accordance with Article 105-3. This acceptance process may apply to all asphalt produced and /or placed and may continue until the Engineer determines a history of quality asphalt production and placement is reestablished.

MATERIALS

Page 6-21, Article 610-2

Delete reference of Anti-strip additive (chemical) to Article 1020-2 and substitute Article 1020-8.

COMPOSITION OF MIXTURES (MIX DESIGN AND JOB MIX FORMULA)

Page 6-21, Subarticle 610-3(A)

At the end of the second paragraph under this Subarticle, add the following sentence:

In addition, submit Superpave gyratory compactor printouts for all specimens compacted at N_{des} and N_{max} during the mix design process.

Insert the following paragraph after the second paragraph under this Subarticle:

For the final surface layer of the specified mix type, use a mix design with an aggregate blend gradation above the maximum density line on the 2.36 mm and larger sieves.

Insert the following at the end of the third paragraph under this Article:

When the percent of binder contributed from RAS or a combination of RAS and RAP exceeds 20 percent of the total binder in the completed mix, the virgin binder PG grade must be one grade below (both high and low temperature grade) the binder grade specified in Table 610-2 for the mix type.

Delete the fourth paragraph in this Subarticle and substitute the following:

For Type S 12.5D mixes, the maximum percentage of reclaimed asphalt material is limited to 15% and must be produced using virgin asphalt binder grade PG 76-22. For all other recycled mix types, when the percentage of RAP is 15 percent or less of the total mixture, the virgin binder PG grade must be as specified in Table 610-2 for the specified mix type. When the percentage of RAP is greater than 15 but not more than 25 percent of the total mixture, the virgin binder PG grade must be one grade below (both high and low temperature grade) the specified grade for the mix type. When the percentage of RAP is greater than 25 percent of the total mixture, the Engineer will establish and approve the asphalt binder grade.

Page 6-22, Subarticle 610-3(A)

Insert the following sentence at the end of the Item 4:

If natural sand is utilized in the proposed mix design, determine and report the Uncompacted Void Content of the natural sand in accordance with AASHTO T-304, Method A.

Page 6-23, Subarticle 610-3(A)

Under the quantities of mix components insert the following sentence:

When requested by the Engineer, submit to the Department’s Materials and Tests Unit, in Raleigh, six (6) Superpave Gyratory Compactor specimens compacted to a height of 75 mm and to a void content (VTM) of 4.0% +/- 0.5% for performance rut testing with the Asphalt Pavement Analyzer.

JOB MIX FORMULA

Page 6-24, Subarticle 610-3(C)

Delete Table 610-1 and associated notes. Substitute the following:

**TABLE 610-1
SUPERPAVE AGGREGATE GRADATION DESIGN CRITERIA**

Standard Sieves (mm)	Percent Passing Criteria (Control Points)											
	Mix Type (Nominal Maximum Aggregate Size)											
	4.75 mm (a)		9.5 mm (c)		12.5 mm (c)		19.0 mm		25.0 mm		37.5 mm	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
50.0												100.0
37.5										100.0	90.0	100.0
25.0								100.0	90.0	100.0		90.0
19.0						100.0	90.0	100.0		90.0		
12.5				100.0	90.0	100.0		90.0				
9.5		100.0	90.0	100.0		90.0						
4.75	90.0	100.0		90.0								
2.36	65.0	90.0	32.0(b)	67.0(b)	28.0	58.0	23.0	49.0	19.0	45.0	15.0	41.0
1.18												
0.600												
0.300												
0.150												
0.075	4.0	8.0	4.0	8.0	4.0	8.0	3.0	8.0	3.0	7.0	3.0	6.0

- (a) For Type S 4.75A, a minimum of 50% of the aggregate components shall be manufactured material from the crushing of stone.
- (b) For Type SF 9.5A, the percent passing the 2.36mm sieve shall be a minimum of 60% and a maximum of 70%.
- (c) For the final surface layer of the specified mix type, use a mix design with an aggregate blend gradation above the maximum density line on the 2.36 mm and larger sieves.

Page 6-25, Subarticle 610-3(C),

Delete Table 610-2 and associated notes. Substitute the following:

**TABLE 610-2
SUPERPAVE MIX DESIGN CRITERIA**

Mix Type (f)	Design ESALs millions (a)	Binder PG Grade (b)	Compaction Levels			Volumetric Properties (c)			
			No. Gyration @ N _{ini}	N _{des}	N _{max}	VMA % Min.	VTM %	VFA Min. - Max.	%G _{mm} @ N _{ini}
S-4.75A	<0.3	64 -22	6	50	75	20.0	7.0-15.0		
SF-9.5A	<0.3	64 -22	6	50	75	16.0	3.0 - 5.0	70 - 80	≤ 91.5
S-9.5B	0.3 - 3	64 -22	7	75	115	15.0	3.0 - 5.0	65 - 80	≤ 90.5
S-9.5C	3 - 30	70 -22	8	100	160	15.0	3.0 - 5.0	65 - 76	≤ 90.0
S-12.5C	3 - 30	70 -22	8	100	160	14.0	3.0 - 5.0	65 - 75	≤ 90.0
S-12.5D	> 30	76 -22	9	125	205	14.0	3.0 - 5.0	65 - 75	≤ 90.0
I-19.0B	< 3	64 -22	7	75	115	13.0	3.0 - 5.0	65 - 78	≤90.5
I-19.0C	3 - 30	64 -22	8	100	160	13.0	3.0 - 5.0	65 - 75	≤ 90.0
I-19.0D	> 30	70 -22	9	125	205	13.0	3.0 - 5.0	65 - 75	≤ 90.0
B-25.0B	< 3	64 -22	7	75	115	12.0	3.0 - 5.0	65 - 78	≤ 90.5
B-25.0C	> 3	64 -22	8	100	160	12.0	3.0 - 5.0	65 - 75	≤ 90.0
B-37.5C	> 3	64 -22	8	100	160	11.0	3.0 - 5.0	63 - 75	≤ 90.0
	Design Parameter					Design Criteria			
All	1. %G _{mm} @ N _{max}					≤ 98.0% (d)			
Mix	2. Dust to Binder Ratio (P _{0.075} / P _{be})					0.6 - 1.4			
Types	3. Retained Tensile Strength (TSR) (AASHTO T 283 Modified)					85 % Min. (e)			

- Notes:**
- (a) Based on 20 year design traffic.
 - (b) When Recycled Mixes are used, select the binder grade to be added in accordance with Subarticle 610-3(A).
 - (c) Volumetric Properties based on specimens compacted to N_{des} as modified by the Department.
 - (d) Based on specimens compacted to N_{max} at selected optimum asphalt content.
 - (e) AASHTO T 283 Modified (No Freeze-Thaw cycle required). TSR for Type S 4.75A, Type B 25.0 and Type B 37.5 mixes is 80% minimum.
 - (f) Mix Design Criteria for Type S 4.75A may be modified subject to the approval of the Engineer

WEATHER, TEMPERATURE, AND SEASONAL LIMITATIONS FOR PRODUCING AND PLACING ASPHALT MIXTURES

Page 6-26, Article 610-4, Table 610-3

Delete the title of Table 610-3 and substitute the following title:

ASPHALT PLACEMENT- MINIMUM TEMPERATURE REQUIREMENTS

In the first column, third row; delete reference to the ACSC Types S 9.5A and S 12.5B mix.

Add the following minimum placing temperatures for mix types S 4.75A and SF 9.5A.

Asphalt Concrete Mix Type	Minimum Air Temperature	Minimum Road Surface Temperature
ACSC, Type S 4.75A, SF 9.5A	40°F (5°C)	50°F (10°C)

SPREADING AND FINISHING

Page 6-32, Article 610-8

Insert the following after the second sentence within the sixth paragraph in this Article,

Take necessary precautions during production, loading of trucks, transportation, truck exchanges with paver, folding of the paver hopper wings, and conveying material in front of the screed to prevent segregation of the asphalt mixtures.

Page 6-33, Article 610-8

At the end of the third full paragraph on this page, add the following sentence:

Waiver of the use of automatic screed controls does not relieve the Contractor of achieving plan grades and cross-slopes.

DENSITY REQUIREMENTS

Page 6-34, Article 610-10,

Delete Table 610-4 and substitute the following table and associated notes:

**Table 610-4
MINIMUM DENSITY REQUIREMENTS**

MIX TYPE	MINIMUM % of G_{mm}
SUPERPAVE MIXES	(Maximum Specific Gravity)
S 4.75A	85.0 ^(a,b)
SF 9.5A	90.0
S 9.5X, S 12.5X, I 19.0X, B 25.0X, B 37.5X	92.0

- (a) All S 4.75A pavement will be accepted for density in accordance with Article 105-3
- (b) Compaction to the above specified density will be required when the S 4.75 A mix is applied at a rate of 100 lbs/sy (55 kg/m²)

Page 6-34, Article 610-10

Delete the second paragraph in this Article and substitute the following:

Compact base and intermediate mix types (surface mixes not included) utilized for pavement widening of less than 4.0 feet (1.2 meters) and all mix types used in tapers, irregular areas and intersections (excluding full width travel lanes of uniform thickness), using equipment and procedures appropriate for the pavement area width and/or shape. Compaction with equipment other than conventional steel drum rollers may be necessary to achieve adequate compaction. Occasional density sampling and testing to evaluate the compaction process may be required. Densities lower than that specified in Table 610-4 will be accepted, in accordance with Article 105-3, for the specific mix types and areas listed directly above.

SURFACE REQUIREMENTS AND ACCEPTANCE

Page 6-35, Article 610-12

Delete the first paragraph in this Article and substitute the following:

Construct pavements using quality paving practices as detailed herein. Construct the pavement surface smooth and true to the plan grade and cross slope. Immediately correct any defective areas with satisfactory material compacted to conform with the surrounding area. Pavement imperfections resulting from unsatisfactory workmanship such as segregation, improper longitudinal joint placement or alignment, non-uniform edge alignment and excessive pavement repairs will be considered unsatisfactory and if allowed to remain in place will be accepted in accordance with Article 105-3.

When directed due to unsatisfactory laydown or workmanship, operate under the limited production procedures. Limited production for unsatisfactory laydown is defined as being restricted to the production, placement, compaction, and final surface testing (if applicable) of a sufficient quantity of mix necessary to construct only 2500 feet (750 meter) of pavement at the laydown width.

Remain on limited production until such time as satisfactory laydown results are obtained or until three consecutive 2500 foot (750 meter) sections have been attempted without achieving satisfactory laydown results. If the Contractor fails to achieve satisfactory 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.

Mix placed under the limited production procedures for unsatisfactory laydown or workmanship will be evaluated for acceptance in accordance with Article 105-3.

DENSITY ACCEPTANCE

Page 6-36, Article 610-13

Delete the second paragraph on this page and substitute the following:

The pavement will be accepted for density on a lot by lot basis. A lot will consist of one day's production of a given job mix formula on a contract. As an exception, separate lots will be established when the one of the following occurs:

- (6) Portions of pavement are placed in both "New" and "Other" construction categories as defined below. A lot will be established for the portion of the pavement in the "New" construction category and a separate lot for the portion of pavement in the "Other" construction category.
- (7) Pavement is placed on multiple resurfacing maps, unless otherwise approved prior to paving. A lot will be established for each individual resurfacing map or portion thereof.
- (8) Pavement is placed simultaneously by multiple paving crews. A lot will be established for the pavement placed by each paving crew.
- (9) Pavement is placed in different layers. A lot will be established for each layer.
- (10) Control strips are placed during limited production.

The Engineer will determine the final category and quantity of each lot for acceptance purposes.

Page 6-36, Article 610-13

Delete the first sentence in the third paragraph on this page and insert the following:

The “New” construction category will be defined as pavements of uniform thickness, exclusive of irregular areas, meeting all three of the following criteria:

Delete the sixth paragraph in this Article and substitute the following:

A failing lot for density acceptance purposes is defined as a lot for which the average of all test sections, and portions thereof, fails to meet the minimum specification requirement. If additional density sampling and testing, beyond the minimum requirement, is performed and additional test sections are thereby created, then all test results shall be included in the lot average. In addition, any lot or portion of a lot that is obviously unacceptable will be rejected for use in the work.

Page 6-36, Article 610-13

Delete the last paragraph on this page and substitute the following:

Any density lot not meeting minimum density requirements detailed in Table 610-4 will be evaluated for acceptance by the Engineer. If the lot is determined to be reasonably acceptable, the mix will be paid at an adjusted contract price in accordance with Article 105-3. If the lot is determined not to be acceptable, the mix will be removed and replaced with mix meeting and compacted to the requirement of these specifications.

BASIS OF PAYMENT, ASPHALT PAVEMENTS

Page 6-37, Article 610-16

Add the following to the second paragraph:

The quantity of hot mix asphalt pavement, measured as provided in Article 610-15, will be paid for at the contract unit prices per ton (metric ton) for “Asphalt Concrete Surface Course, Type S 4.75A, and SF 9.5A”.

Add the following to the payment item description:

Asphalt Concrete Surface Course, Type S 4.75A	Ton (Metric Ton)
Asphalt Concrete Surface Course, Type SF 9.5A.....	Ton (Metric Ton)

Delete reference to the Asphalt Concrete Surface Course, Types S 9.5A and S 12.5B in both the second paragraph and in the payment description.

ASPHALT BINDER FOR PLANT MIX - METHOD OF MEASUREMENT

Page 6-39, Article 620-4

Delete the first sentence of the second paragraph on this page and substitute the following:

Where recycled plant mix is being produced, the grade of asphalt binder to be paid for will be the grade for the specified mix type as required in Table 610-2 unless otherwise approved.

CONSTRUCTION REQUIREMENTS

Page 6-43, Article 650-5

Add the following paragraph after the first paragraph under this Article:

Do not place open-graded asphalt friction course between October 31 and April 1 of the next year, unless otherwise approved. Place friction course, Type FC-1 mixes, only when the road surface temperature is 50°F (10°C) or higher and the air temperature is 50°F (10°C) or higher. The minimum air temperature for Type FC-1 Modified and FC-2 Modified mixes will be 60°F (15°C).

AGGREGATES FOR ASPHALT PLANT MIXES

Page 10-34, Subarticle 1012-1(B)4

Delete this Subarticle and substitute the following:

(4) Flat and Elongated Pieces:

Use coarse aggregate meeting the requirements of Table 1012-1 for flat and elongated pieces when tested in accordance with ASTM D 4791 (Section 8.4) on the No. 4 (4.75 mm) sieve and larger with a 5:1 aspect ratio (maximum to minimum) for all pavement types, except there is no requirement for Types S 4.75A, SF 9.5A, and S 9.5B.

Page 10-35, Table 1012-1

Delete Table 1012-1 and substitute the following:

**Table 1012-1
AGGREGATE CONSENSUS PROPERTIES^(a)**

Mix Type	Course Aggregate Angularity ^(b)	Fine Aggregate Angularity % Minimum	Sand Equivalent % Minimum	Flat & Elongated 5 : 1 Ratio % Maximum
	ASTM D 5821	AASHTO T 304 Method A	AASHTO T 176	ASTM D 4791 Section 8.4
S 4.75 A		40	40	
SF 9.5 A S 9.5 B I 19.0 B B 25.0 B	75 / -	40	40	10 ^(c)
S 9.5 C S 12.5 C I 19.0 C B 25.0 C B 37.5 C	95 / 90	45	45	10
S 12.5 D I 19.0 D	100 / 100	45	50	10
OGAFC	100 / 100	N/A	N/A	10

- (a) Requirements apply to the course aggregate blend and/or fine aggregate blend
- (b) 95/90 denotes that 95% of the course aggregate (+No.4 or + 4.75mm sieve) has one fractured face and 90% has two or more fractured faces.
- (c) Does not apply to Mix Types SF 9.5 A or S 9.5 B

Page 10-36, Subarticle 1012-1(C)1

Insert the following after the fourth paragraph on this page:

When natural sand is utilized in “C” or “D” level asphalt mixes, do not exceed the maximum natural sand percentage in the mix design and/or production aggregate blend detailed in Table 1012-1A.

Table 1012-1A

Uncompacted Void Content of Fine Aggregate AASHTO T 304 Method A	Maximum Percent Natural Sand Included in Mix Design and/or Production*
Less than 42.0	10
Equal to 42.0 to 44.9	15
Equal to 45.0 and greater	20

*Maximum percent natural sand may be exceeded with approval from Pavement Construction Engineer upon satisfactory evaluation of pavement performance testing

FINE AGGREGATE ANGULARITY

Page 10-36, Subarticle 1012-1(C)6

Delete reference to AASHTO TP 33 Method A and substitute AASHTO T 304, Method A.

Page 10-37, Subarticle 1012-1(H)

Delete this Subarticle. It is a duplicate of Subarticle 1012-1(F) located on Page 10-36.

ASPHALT BINDER

Page 10-46, Article 1020-2

Delete the first paragraph under this Article and substitute the following:

Use Performance Graded Asphalt Binder meeting the requirements of AASHTO M 320. See Article 610-3 for the specified grades. Submit a Quality Control Plan for asphalt binder production in conformance with the requirements of AASHTO R 26 to the Materials and Tests Unit.

SP6R01

ASPHALT BINDER CONTENT OF ASPHALT PLANT MIXES:

11-21-00R

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 4.75A	7.0%

Asphalt Concrete Surface Course, Type SF 9.5A	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 Standard Specifications or Project Special Provisions.

SP6R15

PRICE ADJUSTMENT - ASPHALT BINDER FOR PLANT MIX:

11-21-00

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

The base price index for asphalt binder for plant mix is \$231.79 per ton (metric ton).

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on June 1, 2004.

SP6R25

FINAL SURFACE TESTING - ASPHALT PAVEMENTS (RIDEABILITY) 05-18-04

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 ft (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. 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 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 300 feet (90 meters) in length, turn lanes less than or equal to 300 feet (90 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 300 feet (90 meters) in length, ramps, full width turn lanes greater than 300 feet (90 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 ft (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 ft 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 ft (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 Contractor 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 ft (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 ft (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. For any lot which is less than 2500 feet (750 m) in length, the applicable pay adjustment incentive will be prorated on the basis of the actual lot length. For any lot which is less than 2500 feet (750 m) in length, the applicable pay adjustment disincentive will be the full amount for a lot, regardless of the lot length.

If during the evaluation of the graphs, more than 5 lots within the contract limits (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 Contractor's initial evaluation of the straightedge test results and must begin immediately upon obtaining those results. Additionally, the Engineer may direct the Contractor 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 Contractor and the Engineer. Remain on limited production until such time as satisfactory laydown results are obtained or until three consecutive 2500 foot (750 meter) sections have been attempted without achieving satisfactory 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 Contractor 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 Contractor may be required to demonstrate acceptable laydown techniques off the project limits prior to proceeding on the project.

If the Contractor fails to achieve satisfactory 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.

If the Contractor 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. Mix placed under the limited production procedures for unsatisfactory laydown will be evaluated for acceptance in accordance with Article 105-3.

After initially proceeding under limited production, the Contractor 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.

The pay adjustment schedule for the Cumulative Straightedge Index (CSI) test results per lot is as follows:

Pay Adjustment Schedule for Cumulative Straightedge Index (CSI) (Obtained by adding SE Index of up to 25 consecutive 100 ft. (30m) sections)				
*CSI	<u>ACCEPTANCE</u> <u>CATEGORY</u>	<u>CORRECTIVE</u> <u>ACTION</u>	<u>PAY ADJUSTMENT</u>	
			Before Corrective Action	After Corrective Action
0-0	Acceptable	None	\$300 incentive	None
1-0 or 2-0	Acceptable	None	\$100 incentive	None
3-0 or 4-0	Acceptable	None	No Adjustment	No Adjustment
1-1, 2-1, 5-0 or 6-0	Acceptable	Allowed	\$300 disincentive	\$300 disincentive
3-1, 4-1, 5-1 or 6-1	Acceptable	Allowed	\$600 disincentive	\$600 disincentive
Any other Number	Unacceptable	Required	Per CSI after Correction(s) (not to exceed 100% Pay)	

***Either Before or After Corrective Actions**

Correct any deviation that exceeds a 0.4 inch (10 mm) blanking band such that the deviation is reduced to 0.3 inches (7.5 mm) or less.

Corrective actions shall be performed at the Contractor'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, removing and replacing, indirect heating and rerolling. Scraping of the pavement with any blade type device will 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.

Corrective actions will not be allowed for lots having a CSI of 40 or better. If the CSI indicates "Allowed" corrective action, the Contractor may elect to take necessary measures to reduce the CSI in lieu of accepting the disincentive. 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 allowed or required, the test section(s) requiring corrective action will be retested, unless the Engineer directs the retesting of the of the entire lot. No disincentive will apply after corrective action if the CSI is 40 or better. If the retested lot after corrective action has a CSI indicating a disincentive, the appropriate disincentive will be applied.

Incentive pay adjustments will be based only on the initially measured CSI, as determined by the Engineer, prior to any corrective work. Where corrective actions have been taken, payment will be based on the CSI determined after correction, not to exceed 100 percent payment.

Areas excluded from testing by the N.C. Hearne Straightedge will 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.

No direct payment will be made for the work covered by this section. Payment at the contract unit prices for the various items covered by those sections of the specifications directly applicable to the work constructed will be full compensation for all work covered by this section including, but not limited to, performing testing in accordance with this specification, any corrective work required as a result of this testing and any additional traffic control as may be necessary.

SP6R45

SEALING EXISTING PAVEMENT CRACKS:

7-1-95

Description of Work:

The work covered by this provision consists of sealing existing longitudinal and transverse pavement cracks with Sealant Type 2, PS/AR (hot-poured rubber asphalt) at locations as directed by the Engineer. The Contractor will not be required to seal the existing edge joints.

Materials:

Use Sealant Type 2, PS/AR (hot-poured rubber asphalt) meeting the requirements of Article 1028-2 of the Standard Specifications.

Construction Methods:

Install the sealant so that it forms a complete watertight bond with a high degree of elasticity, with maximum flexibility and longevity under extreme temperature ranges.

Use a HCA (hot compressed air) lance at all times to blast out any vegetation, dirt, dampness and loose materials from the cracks.

Use a concentrated hot air jet that is a minimum of 3000°F (1649°C) in temperature and that has a minimum air jet force of 3000 feet per second (914.4 meters per second) of blasting.

Force open asphalt cracks, clean warm and dry, and have ready for the application of the preheated sealant for maximum crack sealability.

Preheat the sealant to correct temperature, using the air jacketed flow method to prevent the burning of the modified rubber in the sealant. Perform this by means of a trailer mounted 190 gallon (719.2 liter) safety tested crack sealant preheater melter kettle, with a horizontally mounted full sweep double paddle agitator.

Apply sealant in the prepared cracks at a temperature range of 370°F (188°C) minimum and 420°F (216°C) maximum, using the pressure screed shoe to completely fill the crack, leaving a sealed 2" (50.8 mm) overband. Excessive overbanding or waste of sealant materials will not be tolerated.

Do not apply the PS/AR sealant when the surface temperature of the pavement is below 32°F (0°C).

All cracks sealed must have a minimum of 1/8" (3.2 mm) depth of sealant installed.

After the crack has been sealed, promptly remove any surplus sealer on the pavement. Do not permit traffic over the sealed cracks without approval by the Engineer.

The sealant is to be packaged in polyethylene bags and placed in boxes that weigh approximately 60 pounds (27.2 kg). The sealant may be packed in 60 pound (27.2 kg) boxes containing two polyethylene bags of sealant which weigh approximately 30 pounds (13.6 kg) each. Boxes of sealant are to be palletized for shipment. The pallets are to be protected with a weatherproof covering. The Contractor is responsible for storage.

Method of Measurement:

The amount of the sealant material to be paid for will be the actual number of pounds (kg) of material that has satisfactorily been used to seal pavement cracks in the designated highway. Any material that has been spilled, used in excessive overbanding, wasted, misapplied, or unsatisfactorily used in any way will be deducted in determining quantities for payment. The Engineer will determine the quantity, if any, to be deducted. The Engineer's decision on the quantity to be deducted will be final and binding.

Basis of Payment:

The quantity of sealant material, measured as provided above, will be paid for at the contract unit price per pound (kg) for "Sealing Existing Pavement Cracks". The above price and payment will be full compensation for all work required to seal the pavement cracks including but not limited to furnishing, hauling, loading and unloading, and storage of all sealant materials; cleaning and preparation of cracks to be sealed; application of sealant material in the prepared cracks; any clean-up; and any incidentals necessary to satisfactorily complete the work.

SP6R50

Payment will be made under:

Sealing Existing Pavement Cracks..... Pound (kg)

4 inch (100 mm) ELECTRICAL UNDERGROUND CONDUIT:

DESCRIPTION

Furnish and install conduit for underground installation in accordance with the plans and specifications.

Furnish conduit for underground installation with backfill, graded stone, paved materials, miscellaneous fittings, seeding and mulching, and all necessary hardware.

MATERIAL

Material, equipment, and hardware furnished under this section must be pre-approved on the Department's QPL by the date of advertisement.

Refer to Division 10 except as noted herein:

- Metallic Conduit Article 1097-5
- Backfill Article 1018-2
- Graded Stone Articles 545-2 and 545-3

CONSTRUCTION METHODS

Install 4 inch (100 mm) metallic conduit under roadway before paving. See Roadway plans for locations.

Comply with the following except as noted herein:

- Conduit Article 1409-3

Install conduit at a minimum depth of 30 inches (760 mm) below finished grade or 6 inches (150 mm) below roadway subgrade, whichever is deeper. See NCDOT Standard Drawing 1715.01. Provide 3 feet (1 m) of conduit from back of curb or from edge of pavement. Terminate ends of conduit into junction boxes.

METHOD OF MEASUREMENT

Measured horizontal linear feet (linear meters) of 4 inch (100 mm) electrical underground conduit furnished, installed and accepted. Measurement will be along the approximate centerline of the conduit from junction box to junction box. Vertical segments will not be paid for, as these will be considered incidental to installation of underground conduit.

No measurement will be made of trenching, backfill, graded stone, miscellaneous fittings, and seeding and mulching as these will be considered incidental to the installation of the conduit.

BASIS OF PAYMENT

The quantity of 4 inch (100 mm) electrical underground conduit, measured as provided above, will be paid for at the contract unit price per linear foot (linear meter) as "Electrical Underground Conduit (_____)."

Payment will be made under:

Electrical Underground Conduit (_____). Linear Foot (Meter)

CONSTRUCTION SURVEYING:

01-20-04

Add the following after the first sentence of Section 801-1 of the January 2002 Standard Specifications:

Provide a stakeout of areas where an environmental permit is required prior to performing any construction in or adjacent to these areas. Stake out limits of the permitted work areas according to the approved permit drawings. Provide clear delineation by use of pink or other highly visible flagging. Insure construction limits do not exceed approved permitted work areas. Immediately notify the Resident Engineer of any variations of the stakeout limits when compared to the approved permit drawings.

Replace the fifth paragraph of Section 801-4 of the January 2002 Standard Specifications with the following:

Partial payments for the item of "Construction Surveying" will be made on each particular payment estimate based upon the percentage complete of the item of "Construction Surveying" as determined by the Engineer. The Contractor is required to submit a certified statement each month indicating the percentage of "Construction Surveying" work completed. The Resident Engineer will determine if the amount indicated is reasonably correct and the Resident Engineer will pay accordingly on the next partial pay estimate.

SP8R02

DISPOSAL OF WASTE AND DEBRIS:

2-19-02

Revise the 2002 Standard Specifications as follows:

Page 8-9, Subarticle 802-2(7. Buffer Zones:)

At the end of the last sentence in this subarticle, add the words "unless superseded by an environmental permit."

SP8R03

ENDWALLS:**6-18-02**

Revise the 2002 Standard Specifications as follows:

Page 8-24, Article 838-2

Delete the last two paragraphs of this article and insert the following:

"Use either portland concrete, brick masonry, or precast concrete for the endwall unless otherwise specified on the Drainage Summary Sheet of the Plans."

SP8R27

GUARDRAIL POSTS AND OFFSET BLOCKS:**06-22-04**

Revise the 2002 *Standard Specifications* as follows:

Page 10-69, Subarticle 1046-3

Delete this sub-article in its entirety and replace with the following:

1046-3 POSTS AND OFFSET BLOCKS.**(A) General:**

The Contractor may at his option furnish either of the following types of steel guardrail posts. Only one type of post will be permitted at any one continuous installation. Use structural steel posts throughout the project, unless otherwise directed or detailed in the plans.

1. Steel W6 x 8.5 or W6 x 9.0 posts
2. Steel 4.5" x 6.0" "C" shape posts (C150 x 12.2 kg/m)

The Contractor may at his option furnish either of the following types of treated timber posts if specifically directed or detailed in the plans. Only one type of post will be permitted at any one continuous installation.

1. Timber 6" x 8" (152 mm x 203 mm) posts.
2. Timber 8" x 8" (203 mm x 203 mm) posts.

(B) Structural Steel Posts:

Fabricate steel posts for guardrail of the size and weight shown on the plans from structural steel complying with the requirements of Section 1072. Metal from which C shape posts are fabricated shall meet the requirements of ASTM A570 for any grade of steel, except that mechanical requirements shall meet the requirements of ASTM A36. Punch or drill the holes for connecting bolts. Burning will not be permitted. After fabrication, the posts shall be galvanized in accordance with Section 1076.

(C) Treated Timber Posts:

Timber guardrail posts shall be of treated southern pine meeting the requirements of Article 1082-2 and 1082-3.

Bore bolt holes to a driving fit for the bolts. A minus tolerance of 1 percent will be allowed in the length of the post. Perform all framing and boring before the posts receive preservative treatment.

(D) Offset Blocks:

Provide 8-inch deep recycled plastic or composite offset blocks that have been approved for use with the guardrail shown in the standard drawings and/or plans. Only one type of offset block will be permitted at any one continuous installation. Prior to beginning the installation of recycled offset block, submit the FHWA acceptance letter for each type of block to the Engineer for approval.

Treated timber offset blocks with steel beam guardrail will not be allowed unless required by Specifications, directed by the Engineer or detailed in the plans. Steel offset blocks with steel beam guardrail will not be allowed.

Recycled plastic or composite offset blocks shall be made from no less than 50% recycled plastic or composite, and shall meet the following minimum requirements:

- Specific Gravity: 0.950
- Compressive Strength in Lateral Direction:..... 1600 psi (11 MPa)
- Maximum Water Absorption: 10% by weight
- Maximum Termite and Ant Infestation:..... 10%
- Testing..... Shall pass NCHRP Report 350,
Test Level 3 by CRASH TESTING

Revise the *2002 Standard Roadway Drawings* as follows:

Sheet 4 of 6, Standard 862.03, delete the note and substitute the following:

Note: The midpost and offset block of the WTR section will require special bolt hole drilling in the thrie beam offset block and line post.

SP8R57

GUARDRAIL ANCHOR UNITS, TYPE M-350:

04-20-04

DESCRIPTION

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

MATERIALS

The Contractor 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: 1-800-644-7976

The guardrail anchor unit (FLEAT) as manufactured by:

ROAD SYSTEMS, INC.
1507 EAST 4TH STREET
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: 312-467-6750

Prior to installation the Contractor 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 Standard Specifications.
2. Certified working drawings and assembling instructions from the manufacturer for each guardrail anchor unit in accordance with Section 105-2 of the Specifications.

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 Standard Specifications and is incidental to the cost of the guardrail anchor unit.

MEASUREMENT AND PAYMENT

Measurement and payment will be made in accordance with Articles 862-5 and 862-6 of the Standard Specifications.

Payment will be made under:

Guardrail Anchor Units, Type M-350..... Each SP8R60

GUARDRAIL ANCHOR UNITS, TYPE 350: **04-20-04**

DESCRIPTION

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

MATERIALS

The Contractor 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: 1-800-644-7976

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 Contractor 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 Standard Specifications.
2. Certified working drawings and assembling instructions from the manufacturer for each guardrail anchor unit in accordance with Section 105-2 of the Specifications.

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 Standard Specifications and is incidental to the cost of the guardrail anchor unit.

MEASUREMENT AND PAYMENT

Measurement and payment will be made in accordance with Articles 862.5 and 862-6 of the Standard Specifications.

Payment will be made under:

Guardrail Anchor Units, Type 350..... Each

SP8R65

STREET SIGNS AND MARKERS AND ROUTE MARKERS:

7-1-95

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 Contractor will be responsible to the owners for any damage to any street signs and markers or route markers during the above described operations.

No direct payment will be made for relocating, reinstalling, and/or stockpiling the street signs and markers and route markers as such work will be considered incidental to other work being paid for by the various items in the contract.

SP9R01

AGGREGATE PRODUCTION:

11-20-01

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 contractors 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 Standard Specifications. Copies of this procedure are available upon request from the Materials and Test Unit.

SP10R05

CONCRETE BRICK AND BLOCK PRODUCTION:**11-20-01**

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 contractors 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 Standard Specifications. Copies of this procedure are available upon request from the Materials and Test Unit.

SP10R10

FINE AGGREGATE:**11-19-02**

Revise the 2002 Standard Specifications as follows:

Page 10-17, Table 1005-2

Make the following change to the table:

For Standard Size 2MS the following gradation change applies.

The minimum percent shown for material passing the No. 8 (2.36mm) sieve has been changed from 84 to **80**.

SP10R15

BORROW MATERIAL**02-17-04**

Revise the 2002 Standard Specifications as follows:

Page 10-44

Section 1018-2 II (b) Delete the last sentence in its entirety.

SP10R17

METAL POSTS AND RAILS:01-21-03_R

Revise the 2002 Standard Specifications as follows:

1050-3 METAL POSTS AND RAILS.

Page 10-72, (A) Chain Link Fence: Delete paragraphs 2 and 3, and replace with the following:

Steel H posts must have a minimum yield strength of 45,000 pi (310 MPa) and weigh 3.26 pounds per foot (4.85 kg/m). Galvanize steel H posts in accordance with ASTM F 1043 with a Type A coating. Aluminum H posts must weigh 1.25 pounds per foot (1.86 kg/m).

Roll formed steel line posts must be a 1.625" x 1.875" (41.3 mm x 47.6 mm) section weighing 2.40 lb/lf (3.57 kg/m) after galvanizing and be formed from 0.121" (3.1 mm) thick sheet having a minimum yield strength of 45,000 psi (310 MPa). Roll formed steel brace rails and top rails must be a 1.250" x 1.625" (31.8 mm x 41.3 mm) section weighing 1.35 lb/lf (2.01 kg/m) after galvanizing and be formed from 0.080" (2.0 mm) thick sheet steel having a minimum yield strength of 45,000 pi (310 Map). Galvanize all roll formed members after fabrication in accordance with ASTM F 1043 with a Type A coating.

Page 10-73, (A) Chain Link Fence: Delete sentence one of paragraph four and replace with the following:

Vinyl coated posts must be pipe posts meeting the requirements of AASHTO M 181, and have a fusion bonded vinyl coating of at least 6 mils (0.15 mm) thick.

Add the following as the penultimate paragraph:

For pipe 1.90" OD and under, the outside diameter at any point shall not vary more than 1/64" (0.4 mm) over nor more than 1/32" (0.8 mm) under the standard specified. For pipe 2.375" OD and over, the outside diameter shall not vary more than $\pm 1\%$ from the standard specified nor shall the minimum wall thickness at any point be more than 12.5% under the nominal wall thickness specified.

Page 10-73 (B) Woven Wire Fence: Add the following as the penultimate paragraph:

For pipe 1.90" OD and under, the outside diameter at any point shall not vary more than 1/64" (0.4 mm) over nor more than 1/32" (0.8 mm) under the standard specified. For pipe 2.375" OD and over, the outside diameter shall not vary more than $\pm 1\%$ from the standard specified nor shall the minimum wall thickness at any point be more than 12.5% under the nominal wall thickness specified.

1050-7 FITTINGS AND ACCESSORIES

Page 10-75, delete the last sentence of the last paragraph and replace with the following:
The vinyl coating must be at least 6 mils (0.15 mm) thick, except that the coating on tension wire, hog rings, and tie wires must be at least 20 mils (0.50 mm) thick.

SP10R20

COATED, PAVED AND LINED CORRUGATED STEEL CULVERT PIPE: 10-21-03

Revise the 2002 Standard Specifications as follows:

Section 1032-4(E) Optional Coatings for Bituminous Coated Pipe and Pipe Arch:

Page 10-58. Delete Numbers 2. and 3., and substitute the following;

- 2. Type B: In lieu of Type B, Half Bituminous Coated and Partially Paved galvanized pipe, aluminized pipe or polymeric coated pipe without bituminous coating and paving may be used.
- 3. Type C: In lieu of Type C, Fully Bituminous Coated and Partially Paved galvanized pipe, aluminized pipe or polymeric coated pipe without a bituminous coating and paving may be used.

SP10R25

DRUMS:

07-16-02

Revise the 2002 Standard Specifications as follows:

Page 10-195, Subarticle 1089-5(C)

Delete the first (1st) sentence of the first (1st) paragraph and insert the following:

“Provide a minimum of three orange and two white alternating horizontal circumferential stripes covering the entire outside with each drum.”

SP11R05

PAVEMENT MARKING GENERAL REQUIREMENTS:

07-16-02

Revise the 2002 Standard Specifications as follows:

Page 12-10, Subarticle 1205-3(J)

Delete the first (1st) sentence of the first (1st) paragraph and insert the following:

“Have at least one member of every pavement marking crew working on a project certified through the NCDOT Pavement Marking Technician Certification Process. For more information contact the Traffic Control, Marking and Delineation Section of the North Carolina Department of Transportation at 919-250-4151 or <http://www.doh.dot.state.nc.us/preconstruct/traffic/congestion/TC/>”

SP12R01

PERMANENT SEEDING AND MULCHING:

07-01-95

The Department desires that permanent seeding and mulching be established on this project as soon as practical after slopes or portions of slopes have been graded. As an incentive to obtain an early stand of vegetation on this project, the Contractor's attention is called to the following:

For all permanent seeding and mulching that is satisfactorily completed in accordance with the requirements of Section 1660, "Seeding and Mulching", and within the following percentages of elapsed contract times, an additional payment will be made to the Contractor as an incentive additive. The incentive additive will be determined by multiplying the number of acres of seeding and mulching satisfactorily completed times the contract unit bid price per acre for "Seeding and Mulching" times the appropriate percentage additive.

<u>Percentage of Elapsed Contract Time</u>	<u>Percentage Additive</u>
0% - 30%	30%
30.01% - 50%	15%

Percentage of elapsed contract time is defined as the number of calendar days from the date of availability of the contract to the date the permanent seeding and mulching is acceptably completed divided by the total original contract time.

SP16R01

Project: R- 2911A
County: Iredell

PROJECT SPECIAL PROVISIONS
Utility Construction

GENERAL CONSTRUCTION REQUIREMENTS:

Specifications:

The proposed utility construction shall meet the applicable requirements of the NC Department of Transportation's "Standard Specifications for Roads and Structures" dated January 2002, and the following provisions.

The depth of pipeline installation may vary to achieve minimum clearance of existing or proposed utilities or storm drainage while maintaining the minimum cover specified (whether existing or proposed pipelines, conduits, cables, mains, and storm drainage are shown on the plans or not).

On new sewer force mains and tie-in sections of sewer force mains, the method of anchoring pipe bends, plugs, caps, tees, reducing sections, valves, and related appurtenances will be the responsibility of the Contractor. Tying into existing sewer force mains may alter such lines to the extent that these pipelines with fittings, valves, and appurtenances may also require reaction backing or restraint; this work shall also be the responsibility of the Contractor.

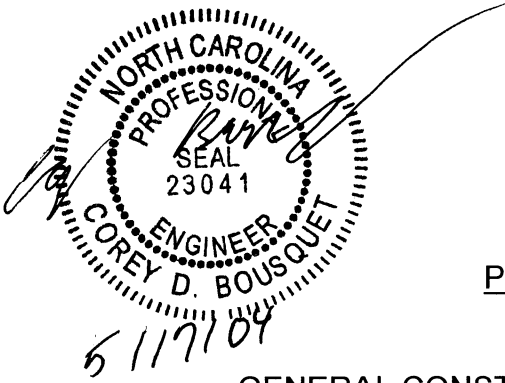
The Contractor shall submit his proposed method of anchoring to the Engineer for review and approval before any applicable sewer force mains construction. Such approval will not relieve the Contractor of his responsibility of properly anchoring the sewer force mains system.

Owner and Owner's Requirements:

The existing utilities belong to The City of Statesville. The Contractor shall provide access for the owner's representatives to all phases of construction. Notify the owner two weeks before commencement of any work and one week before service interruption.

Utility Locations Shown on the Plans:

The location, size, and type material of the existing utilities shown on the plans are from the best available information. The Contractor will be responsible for determining the exact location, size, and type material of the existing facilities necessary for the construction of the proposed utilities and to avoid damage to existing facilities.



To replace the existing sewer line crossing Line –L- at Sta. 48+68, the contractor will be required to temporarily bypass pump. The cost for bypass pumping will be considered incidental to the cost of the proposed sewer pipe. The removal of the existing sewer line will also be considered incidental to the proposed sewer pipe.

No direct payment will be made for utility construction work required by the preceding provisions, which are general requirements applying to utility construction, and all of the requirements stated will be considered incidental work, paid for at the contract unit prices of the various utility items included in the contract.

1. BEDDING MATERIAL:

Bedding material for utility lines shall be installed in accordance with the applicable utility provisions herein, as shown on the utility construction plans, and/or as directed by the Engineer.

Bedding material shall meet the requirements of Article 1016-3 of the Standard Specifications. Bedding material shall be installed in accordance with Articles 300-6 and 300-7 of the Standard Specifications.

Bedding material installed in accordance with the plans and provisions herein and accepted, will be measured and paid for at the contract unit price per ton for "Bedding Material, Utilities Class IV". Such prices and payments shall be full compensation for all materials, labor, equipment, compaction and shaping the bedding material in accordance with Article 300-4 of the Standard Specifications, and incidentals necessary to complete the work as required.

RELOCATE EXISTING 50mm WATER METER:

The existing 50mm water meters and meter boxes that are to be relocated shall be installed at the locations shown on the utility plans, or as directed by the Engineer.

The relocation of 50mm water meters shall consist of the removal and installation at the appropriate location of the water meter, meter yoke, meter valve, and meter box. Any fittings necessary to reconnect the relocated meter to the water line will be considered incidental. Any pipe necessary to complete the relocation will be paid for as provided elsewhere in these provisions.

All work shall be in accordance with the applicable plumbing codes, as shown on the plans, and as directed by the Engineer.

Relocated meter boxes shall be placed with the top of the meter box flush with finish grade of the project.

The quantity of 50mm water meters and meter boxes relocated and accepted will be measured and paid for at the contract unit price each for "Relocate Existing 50mm Water Meter". Such price and payment will be full compensation for all labor, excavation, removing, installing and reconnecting the meter and box, backfilling, and incidentals necessary to complete the work as required.

PROJECT: R-2911A
COUNTY: IREDELL

PROJECT SPECIAL PROVISIONS

Utility

UTILITY CONFLICTS:

General:

The following utility companies have facilities that will be in conflict with the construction of this project:

- A. STATESVILLE POWER CPMPANY
- B. DUKE POWER COMPANY
- C. BELLSOUTH TELECOMUNICATION COMPANY
- D. PUBLIC SERVICE OF N.C. (GAS)
- E. TIME WARNER CABLE

The conflicting facilities of these concerns will be adjusted prior to the date of availability, unless otherwise noted and are therefore listed in these special provisions for the benefit of the Contractor. The utility owners will do all utility work listed herein. All utilities are shown on the plans from the best available information.

The Contractor's attention is directed to Article 105.8 of the Standard Specifications.

Utilities Requiring Adjustment:

- A. STATESVILLE POWER CPMPANY
These facilities will be relocated and finished by August 30, 2004.
See Utility Conflict Plan for details.
- B. DUKE POWER COMPANY
These facilities will be relocated and finished by August 30, 2004.
See Utility Conflict Plan for details.
- C. BELLSOUTH TELECOMUNICATION COMPANY
These facilities (underground cable) will be abandoned and relocated in joint use with power poles by August 30, 2004.
See Utility Conflict Plan for details.
- D. PUBLIC SERVICE OF N.C. (GAS)
Existing Facilities will remove in place and be adjusted as necessary.

- E. TIME WARNER CABLE
Time Warner Cable will relocate in joint use with power and telephone.

R-2911A**Project Special Provisions
Erosion Control****Iredell County****Seeding And Mulching****(6)**

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined by the Engineer. All rates are in pounds per acre (kilograms per hectare).

August 1 - June 1

May 1 - September 1

100# (110kg) Tall Fescue	100# (110kg) Tall Fescue
15# (17kg) Kentucky Bluegrass	15# (17kg) Kentucky Bluegrass
15# (17kg) Hard Fescue	15# (17kg) Hard Fescue
500# (560kg) Fertilizer	25# (28kg) Kobe or Korean Lespedeza
4000# (4500kg) Limestone	500# (560kg) Fertilizer
	4000# (4500kg) Limestone

Approved Tall Fescue Cultivars:

Adventure	Adventure II	Amigo	Anthem
Apache	Apache II	Arid	Austin
Brookstone	Bonanza	Bonanza II	Chapel Hill
Chesapeake	Chieftain	Coronado	Crossfire II
Debutante	Duster	Falcon	Falcon II
Finelawn Petite	Finelawn	Finelawn I	Genesis
Grande	Guardian	Houndog	Jaguar
Jaguar III	Kentucky 31	Kitty Hawk	Monarch
Montauk	Mustang	Olympic	Pacer
Phoenix	Pixie	Pyramid	Rebel
Rebel Jr.	Rebel II	Renegade	Safari
Shenandoah	Tempo	Titan	Tomahawk
Trailblazer	Tribute	Vegas	Wolfpack
Wrangler			

Approved Kentucky Bluegrass Cultivars:

Adelphi	Baron	Bristol	Challenger
Columbia	Fylking	Glade	Kenblue
Merit	Plush	Ram I	Rugby
Sydsport	Touchdown	Vantage	

Approved Hard Fescue Cultivars:

Aurora	Bardur	Crystal	Reliant	Scaldis
--------	--------	---------	---------	---------

Spartan

Valda

Waldina

Warwick

On cut and fill slopes 2:1 or steeper add 25# (28kg) Rye Grain November 1 - March 1.

On cut and fill slopes 2:1 or steeper add 30# (35 kg) Sericea Lespedeza January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

Temporary Seeding:

Fertilizer shall be the same analysis as specified for "Seeding and Mulching" and applied at the rate of 400 pounds (450kg) and seeded at the rate of 50 pounds per acre (55kg per hectare). Kobe or Korean Lespedeza, German Millet, or Browntop Millet shall be used in summer months and rye grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

Fertilizer Topdressing:

Fertilizer used for topdressing shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre (560 kg per hectare). Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

Supplemental Seeding:

The kinds of seed and proportions shall be the same as specified for "Seeding and Mulching", and the rate of application may vary from 25# to 75# per acre (28kg to 85kg per hectare). The actual rate per acre (hectare) will be determined by the Engineer prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre (hectare), total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

Mowing:

The minimum mowing height on this project shall be six inches (150 mm).

Lawn Type Appearance

All areas adjacent to lawns must be hand finished as directed by the Engineer to give a "lawn type appearance". Remove all trash, debris, and stones $\frac{3}{4}$ inch (19 mm) and larger in diameter or other obstructions that could interfere with providing a smooth "lawn type appearance".

Specialized Seeding Under Guiderail and Guardrail (Hard Fescue/Bluegrass):**General:**

Areas under guiderail and guardrail sections shall be seeded in accordance with these provisions and as directed by the Engineer. Perform the work covered by this provision including but not limited to litter and debris removal, mowing, disposal of weeds and other unacceptable growth, grading, soil preparation and amendment, surface smoothing, seed applications, and matting installation.

Materials:

Only approved Hard Fescue and Kentucky Bluegrass seed that complies with Section 1060 of the Standard Specifications shall be used.

Soil Preparation:

Remove litter and other debris. Mow and satisfactorily dispose of weeds or other unacceptable growth on the areas to be seeded.

Prior to seeding, all eroded, uneven and rough areas shall be contour graded and/or filled with soil as directed by the Engineer. The soil shall be scarified or otherwise loosened to a depth of not less than 5 inches (130 mm) with a minimum width of 48 inches (1145 mm) and a maximum width of 52 inches (1320 mm). Clods shall be broken and the top 2 to 3 inches (52 to 78 mm) of soil shall be worked into an acceptable soil bed by the use of soil pulverizers, drags, or harrows.

Soil amendments shall be as follows:

Limestone: Limestone shall be applied at a rate of 4000 pounds (4500 Kg/Hectare) per acre.

Fertilizer: Fertilizer shall be 10-20-20 analysis and applied at a rate of 500 pounds (560kg/Hectare) per acre.

After soil preparation, lime and fertilizer shall be uniformly distributed by mechanical means using a 48 inch (1065 mm) drop type spreader and thoroughly mixed with the top five inches (130 mm) of the soil by discing, harrowing, or other approved methods.

The area shall then be harrowed, dragged, raked, or prepared by other approved methods which will give a lawn type finish. All trash, debris and stones larger than 1-1/2 inch (38 mm) in diameter or other obstructions shall also be removed.

Application:

(Hard Fescue/Bluegrass) seed shall be uniformly distributed at a rate of 75 pounds per acre (85 kilograms per hectare) of Hard Fescue and 20 pounds per acre (28 kilograms per hectare) of Kentucky bluegrass by mechanical means.

Immediately following the placement of seed, the area shall be rolled or tamped carefully and firmly by means acceptable to the Engineer to ensure a smooth surface. Use of rubber tired equipment to roll shall not be allowed.

Matting:

Immediately upon completion of seeding work and herbicidal application, 48 inch wide matting shall be installed over the seeded area in accordance with Section 1631 of the Standard Specifications.

Basis of Payment:

The quantity of "Specialized Seeding Under Guiderail and Guardrail (Hard Fescue/Bluegrass)" to be paid for will be the actual number of acres (hectares) of guiderail and guardrail sections, measured along the surface of the ground, over which acceptable seeding has been performed. The quantity of seeding will be paid for at the contract unit price per acre (hectare) for "Specialized Seeding Under Guiderail and Guardrail (Fescue/Bluegrass)".

No payment shall be made for "Specialized Seeding Under Guiderail and Guardrail (Fescue/Bluegrass)" in which the work has not been satisfactorily completed. Complete work includes but is not limited to soil preparation, surface smoothing, seeding, and matting.

Specialized Hand Mowing:

The work covered by this section consists of specialized hand mowing around or under fixed objects, including but not limited to guardrails, signs, barriers and slopes in a method acceptable to the Engineer.

The work of specialized hand mowing shall be completed with mechanically powered trimmers, string trimmers, hand operated rotary mowers, or self-propelled mowers of sufficient size and quality to perform the work timely and efficiently.

The quantity of mowing to be performed will be affected by the actual conditions which occur during the construction of the project. The quantity of mowing may be increased, decreased or eliminated entirely at the direction of the Engineer. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

The quantity of specialized hand mowing to be paid for will be the actual number of man hours worked while hand mowing along the surface of the ground, at the direction of the Engineer. Where an area has been mowed more than once, at the direction of the Engineer, separate measurement will be made each time the area is mowed.

Payment will be made under:

Specialized Hand Mowing..... HR

Environmentally Sensitive Areas:

This project is located in an “Environmentally Sensitive Area”. This designation requires special procedures to be used for clearing and grubbing, temporary stream crossings, and grading operations within the area identified on the plans. This also requires special procedures to be used for seeding and mulching and staged seeding within the project.

Clearing and Grubbing:

In areas identified on the erosion control plans as “Environmentally Sensitive Areas”, the Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations as described in Section 200, Article 200-1, in the Standard Specifications. The “Environmentally Sensitive Area” shall be defined as a 50 foot (16 meter) buffer zone on both sides of the stream (or depression), measured from top of streambank, (or center of depression). Only clearing operations (not grubbing) shall be allowed in this buffer zone until immediately prior to beginning grading operations. Erosion control devices shall be installed immediately following the clearing operation.

Grading:

Once grading operations begin in identified “Environmentally Sensitive Areas”, work will progress in a continuous manner until complete. All construction within these areas must progress in a continuous manner such that each phase is complete and areas permanently stabilized prior to beginning of next phase. Failure on the part of the Contractor to complete any phase of construction in a continuous manner in “Environmentally Sensitive Areas” as specified will be just cause for the Engineer to direct the suspension of work in accordance with Section 108-7 of the Standard Specifications.

Temporary Stream Crossings:

Any crossing of streams within the limits of this project must be accomplished in accordance with Section 107-13(b) of the Standard Specifications.

Seeding and Mulching:

Seeding and mulching shall be performed in accordance with Section 1660 of the Standard Specifications and vegetative cover sufficient to restrain erosion shall be installed immediately following grade establishment.

Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. No appreciable time shall lapse into the contract time without stabilization of slopes, ditches and other areas within the "Environmentally Sensitive Areas" as indicated on the E.C. Plans.

Stage Seeding:

The work covered by this section shall consist of the establishment of a vegetative cover on cut and fill slopes as grading progresses. Seeding and mulching shall be done in stages on cut and fill slopes which are greater than 20 feet (6 meters) in height or greater than 2 acres (0.8 hectares) in area. Each stage shall not exceed the limits stated above.

All work described above will be paid for at the contract unit prices established in the contract for the work involved. Additional payments will not be made for the requirements of this section as the cost for this work should be included in the contract unit prices for the work involved.

Minimize Removal Of Vegetation

The Contractor shall minimize removal of vegetation at stream banks and disturbed areas within the project limits as directed by the Engineer.

Stockpile Areas

The Contractor shall install and maintain erosion control devices sufficient to contain sediment around any erodible material stockpile areas as directed by the Engineer.

Reforestation:

Reforestation will be planted within areas of pavement removal, interchanges and along the outside borders of the road, in areas designated by the Engineer. Reforestation is not shown on the plan sheets. See the reforestation detail sheet.

Seasonal limitations: Seedlings shall be planted from November 15 through March 15.

Seedlings shall be planted as soon as practical following permanent Seeding and Mulching. Seedlings shall be planted in a 16 ft. (5 meters) wide swath adjacent to mowing pattern line.

Root dip: The roots of reforestation seedlings shall be coated with a slurry of water, and either a fine clay ("kaolin") or a superabsorbent that is made to be used as a bare root dip.

The type, mixture ratio, method of application, and the time of application shall be submitted to the Engineer for approval. With the approval of the Engineer, seedlings may be coated before delivery to the job or at the time of planting, but at no time shall the roots of the seedlings be allowed to dry out. The roots shall be moistened immediately prior to planting.

Streambank Reforestation:

Streambank reforestation will be planted in areas designated on the plans and as directed by the Engineer. See the streambank reforestation detail sheet.

Seedlings shall be planted as soon as practical following permanent seeding and mulching. Type I seedlings shall be planted along both streambanks. Type II seedlings shall be planted in a 26 ft. (8 meters) wide swath from top of bank along both sides of stream.

Seasonal limitations: Seedlings shall be planted from November 15 through March 15.

Root dip: the roots of reforestation seedlings shall be coated with a slurry of water, and either a fine clay ("kaolin") or a superabsorbent that is made to be used as a bare root dip. The type, mixture ratio, method of application, and the time of application shall be submitted to the Engineer for approval.

With the approval of the Engineer, seedlings may be coated before delivery to the job or at the time of planting, but at no time shall the roots of the seedlings be allowed to dry out. The roots shall be moistened immediately prior to planting.

Measurement:

The quantity of streambank reforestation to be paid for will be the actual number of acres (hectares) of land, measured along of the surface of ground, which has been acceptably planted with seedlings in accordance with these specifications.

Payment:

The quantity of streambank reforestation will be paid for at the contract unit price per acre (hectare) for "Streambank Reforestation".

Payment will be made under:

Streambank Reforestation.....ACR (HA)

Waste Areas And Borrow Sources:

Payment for temporary erosion control measures, except those made necessary by the Contractor's own negligence or for his own convenience, will be paid for at the

appropriate contract unit price for the devices or measures utilized in borrow sources and waste areas.

No additional payment will be made for erosion control devices or permanent seeding and mulching in any commercial borrow or waste pit. All erosion and sediment control practices which may be required on a commercial borrow or waste site will be done at the Contractor's expense.

Temporary Diversion:

The work by this section for installation, maintenance, and cleanout of temporary diversions shall be in accordance with Section 1630. The quantity of excavation for installation and cleanout measured as provided in Article 1630-4 will be paid for at the contract unit price per cubic yard (cubic meter) as provided in Article 1630-5 for "Silt Excavation".

Gravel Construction Entrance:

Description:

The work covered by this section consists of furnishing, installing, and maintaining and removing any and all material required for the construction of a Gravel Construction Entrance.

Materials:

The filter fabric shall meet the requirements of Section 1056 for Type 2 Fabric.

Stone shall be Class A Stone and shall meet the requirements of Section 1042 for Stone for Erosion Control, Class A.

Construction:

The Contractor shall install a Gravel Construction Entrance in accordance with the details in the plans and at locations as directed by the Engineer.

Method Of Measurement:

Gravel Construction Entrance will not be measured for payment under this section.

Basis Of Payment:

Payment for installation of Filter Fabric shall be paid for at the contract unit price per square yard (square meter) "Filter Fabric for Drainage".

Payment for installation of Class A Stone shall be paid for at the contract unit price per ton (metric ton) "Stone for Erosion Control, Class A".

Such price and payment shall be considered full compensation for all work covered by this provision including all materials, construction, maintenance, and removal of Gravel Construction Entrance as directed by the Engineer.

Culvert Diversion Channel:

Description:

Provide a culvert diversion channel to detour existing stream around the culvert construction site at locations shown on the plans. Work includes constructing diversion channel, disposing of excess materials, providing and placing filter fabric liner, maintaining diversion area in an acceptable condition, removing filter fabric liner, backfilling diversion channel area with suitable material and providing proper drainage when diversion channel area is abandoned.

Material:

Use local material or material specified on plans.

Provide filter fabric to meet requirements of Section 1056 for Type 2 fabric.

Construction requirements:

Grade channel according to plan with channel surface free of obstructions, debris, and pockets of low density material.

Utilize suitable material and provide disposal area for unsuitable material.

Line channel with fabric unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury top of slope fabric edge in a trench at least five inches (125mm) deep and tamp.

Make vertical overlaps a minimum of eighteen inches (450mm) with upstream fabric overlapping the downstream fabric.

Secure fabric with eleven gauge (3.05mm) wire staples shaped into a "u" shape with a length of not less than six inches (150mm) and a throat not less than one inch (25mm) in width. Place staples along outer edges and throughout the fabric a maximum of three feet (one meter) horizontally and vertically.

Method of Measurement:

Measurement of excavation will be made by the cubic yard (cubic meter) of excavation as calculated from the typical section throughout the length of the diversion channel as shown on the final approved plans.

Measurement of filter fabric will be made by the number of square yards (square meters) as measured over the surface of the ground over which filter fabric has been acceptably placed.

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

Basis of Payment:

Payment will be made for the quantities as measured above under the items listed below:

Culvert Diversion ChannelCY (M3)

Filter Fabric for Drainage SY (M2)

Impervious Dike:

The work covered by this section consists of furnishing, installing, maintaining, and removing an impervious dike for the purpose of diverting normal stream flow around the construction site. The Contractor shall construct an impervious dike in such a manner approved by the Engineer. The impervious dike shall not permit seepage of water into the construction site or contribute to siltation of the stream. The impervious dike shall be constructed of an acceptable material in the locations noted on the plans or as directed by the Engineer.

Acceptable materials shall include but not be limited to sheet piles, sandbags, and/or the placement of an acceptable size stone lined with polypropylene or other impervious fabric.

Earth material shall not be used to construct an impervious dike when it is in direct contact with the stream unless vegetation can be established before contact with the stream takes place.

The quantity of impervious dike to be paid for will be the actual number of linear feet (meters) of impervious dike(s) constructed, measured in place from end to end of each separate installation which has been completed and accepted.

The quantity of impervious dikes measured as provided above will be paid for at the contract unit price per linear foot (meter) for "Impervious Dike".

The above prices and payments will be full compensation for all work covered by this section including but not limited to furnishing all of the materials in the impervious dike, construction, maintenance, and removal of the impervious dike.

Special Sediment Control Fence:**Description:**

The work covered by this section consists of the construction, maintenance, and removal of special sediment control fence. Place special sediment control fence as shown on the plans or as directed by the Engineer.

Materials:**(A) Posts:**

Either wood or steel posts may be used. Wood posts shall be a minimum of 6 feet long (1.8 m), at least 3 inches (75 mm) in diameter, and straight enough to provide a fence without noticeable misalignment. Steel posts shall be at least 5 feet (1.5 m) in length, approximately 1 3/8 inches (35 mm) wide measured parallel to the fence, and have a minimum weight of 1.25 lb/ft (1.86 kg/m) of length. The post shall be equipped with an anchor plate having a minimum area of 14.0 square inches (9000 square millimeters), and shall have a means of retaining wire in the desired position without displacement.

(B) 1/4 inch (6.4mm) Hardware Cloth:

Hardware cloth shall have 1/4 inch (6.4mm) openings constructed from #24 gauge wire. Install hardware cloth according to the detail shown on the plans.

(C) Sediment Control Stone:

Sediment control stone shall meet the requirements of Section 1005. Install stone according to the detail shown on the plans.

Maintenance and Removal:

The Contractor shall maintain the special sediment control fence until the project is accepted or until the fence is removed, and shall remove and dispose of silt accumulations at the fence when so directed by the Engineer in accordance with Section 1630.

Method of Measurement:

The quantity of 1/4 inch (6.4mm) hardware cloth to be paid for will be the actual number of linear feet (meters) measured along the ground, which has been completed and accepted.

The quantity of sediment control stone will be measured according to Article 1610-4.

Basis of Payment:

Payment for special sediment control fence will be as follows:

1/4 inch (6.4mm) Hardware Cloth.....LF (M)
Sediment Control Stone.....TON (MT)

Permanent Soil Reinforcement Mat:**General:**

This work shall consist of furnishing and placing "Permanent Soil Reinforcement Mat", of the type specified, over previously prepared areas as directed by the Engineer.

Materials:

The product shall be permanent erosion control reinforcement mat and shall be constructed of 100% coconut fiber stitch bonded between a heavy duty UV stabilized cusped (crimped) netting overlaid with a heavy duty UV stabilized top net. The three nettings shall be stitched together on 1.5 inch (38 mm) centers UV stabilized polyester thread to form a permanent three dimensional structure. The mat shall have the following physical properties:

Property	Test Method	Value	Unit
Ground Cover	Image Analysis	93	%
Thickness	ASTM D1777	0.63 (16)	in (mm)
Mass Per Unit Area	ASTM D3776	0.92 (0.50)	lb/sy (kg/m ²)
Tensile Strength	ASTM D5035	480 (714.2)	lb/ft (kg/m)
Elongation	ASTM D5035	49	%
Tensile Strength	ASTM D5035	960 (1428.5)	lb/ft (kg/m)
Elongation	ASTM D5035	31	%
Tensile Strength	ASTM D1682	177 (80.3)	lbs (kg)
Elongation	ASTM D1682	22	%
Resiliency	ASTM D1777	>80	%
UV Stability *	ASTM D4355	151 (68.5)	lbs (kg)
Color(Permanent Net)		UV Black	
Porosity (Permanent Net)	Calculated	>95	%
Minimum Filament Diameter (permanent net)	Measured	0.03 (0.8)	in (mm)

*ASTM D1682 Tensile Strength and % strength retention of material after 1000 hours of exposure in a Xenon-arc weatherometer.

A certification (Type 1, 2, or 3) from the manufacturer showing:

- 1) the chemical and physical properties of the mat used, and
- 2) conformance of the mat with this specification will be required.

Matting shall be installed according to section 1060-8 of the Standard Specifications.

Soil Preparation:

All areas to be protected with the mat shall be brought to final grade and seeded in accordance with Section 1660. The surface of the soil shall be smooth, firm, stable and free of rocks, clods, roots or other obstructions which would prevent the mat from lying in direct contact with the soil surface. Areas where the mat is to be placed will not need to be mulched.

Measurement:

The quantity of "Permanent Soil Reinforcement Mat" to be paid for shall be the actual number of square yards (square meters), surface measure, completed, and accepted. Overlaps will not be included in the measurement, and will be considered as incidental to the work.

Basis of Payment:

This work will be paid for at the contract unit price per square yard (square meter) for "Permanent Soil Reinforcement Mat" of the type specified, complete in place and accepted. Such payment shall be full compensation for furnishing and installing the mat in accordance with this specification, and for all required maintenance.

Payment will be made under:

Permanent Soil Reinforcement Mat..... SY (M2)

Stream Channel Relocation Limitations:

The following sequence of construction must be followed in the areas designated on the plans as stream relocation. Failure on the part of the Contractor to follow this sequence, and complete each step prior to proceeding in this area as specified, will be just cause for the Engineer to direct the suspension of work in accordance with Section 108-7 of the Standard Specifications.

1. Clear, but do not grub area within the Environmentally Sensitive Area on the existing stream to be relocated.
2. Construct and stabilize, with vegetation or erosion control materials sufficient to restrain erosion, the proposed stream channel relocation as shown on the plans.
3. Divert water into newly constructed channel only after it has been stabilized and approved.
4. Begin grubbing and/or grading within Environmentally Sensitive Area of existing stream.

The contractor shall perform seeding and mulching and install erosion control matting to all cut/fill slopes adjacent to stream relocations in accordance with the provision contained in this contract and in accordance with Section 1631 of the Standards and Specification Manual.

The above requirements apply to the stream channels being constructed at the following stations:

- Sta 32+06
- Sta 32+45

Rootwads:

The Contractor shall identify and stockpile rootwads encountered during Clearing and Grubbing. These shall be used to stabilize the streambank after its construction.

Rootwads to be used for streambank stabilization should have a trunk diameter of 0.3 to 0.45 meters and should have 3 meters of the trunk length remaining. The Contractor, upon removal of the trunk and root, shall remove soil to the extent acceptable to the Engineer. Care shall be taken to preserve the root structure and shown on the detail in the plans.

Method of Measurement:

The quantity of rootwads measured will be paid for according to the actual number of rootwads each, as installed and accepted by the Engineer.

Basis of Payment:

The quantity of rootwads, measured as provided above, will be paid for at the contract unit price per each for "Rootwads". The above prices and payments will be full compensation for all work covered by this section, including but not limited to excavation, furnishing and installing all rootwads, footer logs, cut-off logs, anchor rocks, and fill material.

Payment will be made under:

Rootwads.....EACH

Coir Fiber Mat:

Description:

Furnish material, install and maintain coir fiber mat in locations shown on the plans or in locations as directed by the engineer. Work includes providing all materials, excavating and backfilling, and placing and securing Coir Fiber Matting.

Materials:**(A) Matting:**

Provide matting to meet the following requirements:

100 % coconut fiber (coir) twine woven into a high strength matrix.
Thickness - 0.30 in. minimum. (7.6 mm)
Tensile Strength - 1348 x 626 lb/ft minimum (1650.5 x 766.5 kg/m)
Elongation - 34% x 38% maximum
Flexibility (mg-cm)- 65030 x 29590
Flow Velocity- Observed 11 ft/sec (3.35 m/s)
Weight - 20 oz/SY (678 g/SM)
Size - 6.6 x 164 ft (120 SY) or (100 SM)
"C" Factor - 0.002
Open Area (measured) - 50%

(B) Stakes:

Provide wooden stakes 12 in. (300 mm) in length with a notch cut 1 in. (25 mm) from top.

Construction Methods:

Place the matting immediately upon final grading. Provide a smooth soil surface free from stones, clods, or debris which will prevent the contact of the matting with the soil. Take care to preserve the required line, grade, and cross section of the area covered.

Unroll the matting and apply without stretching such that it will lie smoothly but loosely on the soil surface. Bury the top slope end of each piece of matting in a narrow trench at least 6 in. (150 mm) deep and tamp firmly. Where one roll of matting ends and a second roll begins, overlap the end of the upper roll over the buried end of the second roll so there is a 6 in. (150 mm) overlap. Construct check trenches at least 12 in. (0.3 m) deep every 50 ft. (16 m) longitudinally along the edges of the matting or as directed by the Engineer. Fold over and bury matting to the full depth of the trench, close and tamp firmly. Overlap matting at least 6 in. (150 mm) where 2 or more widths of matting are installed side by side.

Place stakes across the matting at ends, junctions, and check trenches approximately 1 ft. (0.3 m) apart with notch facing upslope.

Place stakes along the outer edges and down the center of each strip of matting 3 feet (1 meter) apart. Place stakes along all lapped edges 1 ft. (0.3 m) apart. Refer to details in the plan sheets.

The Engineer may require adjustments in the trenching or staking requirements to fit individual site conditions.

Method of Measurement:

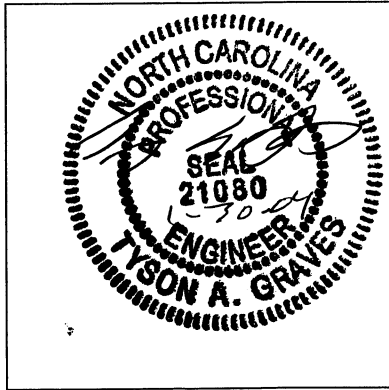
The quantity of coir fiber matting measured will be paid for according to the actual number of square yards (square meters) measured along the surface of the ground over which coir fiber matting is installed and accepted.

Basis of Payment:

The quantity of Coir Fiber Matting, measured as provided above, will be paid for at the contract unit price per square yards (square meters) for "Coir Fiber Matting."

Payment will be made under:

Coir Fiber Mat..... Square Yards (Square Meters)



Project Special Provisions (Version 02.12) Signals and Traffic Management Systems

Prepared By: *XEM*
 30-Jan-04

Contents

1.	2002 STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES – SECTION 1098 REVISIONS	3
1.1.	GENERAL REQUIREMENTS (1098-1)	3
1.2.	SIGNAL HEADS (1098-2)	3
1.3.	WOOD POLES (1098-6)	12
1.4.	LOOP LEAD-IN CABLE (1098-9)	12
1.5.	FIBER-OPTIC CABLE (1098-11)	12
1.6.	METAL POLES (1098-15)	12
1.7.	NEMA TS-2 TYPE 1 CABINETS (1098-22)	13
1.8.	CLOSED LOOP SYSTEM (1098-23)	13
2.	2002 STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES – SECTION 1700 REVISIONS	13
2.1.	GENERAL REQUIREMENTS (1700)	13
2.2.	UNDERGROUND CONDUIT (1715)	13
2.3.	WOOD POLES (1720)	14
2.4.	LOOP LEAD-IN CABLE (1726)	14
2.5.	STRUCTURE DESIGN OF SIGNAL SUPPORTS (1744)	14
2.6.	CONTROLLERS WITH CABINETS (1751)	17
2.7.	CLOSED LOOP SYSTEM MASTER CONTROLLERS (1752)	17
3.	ELECTRICAL REQUIREMENTS	18
4.	DIRECTIONAL DRILLING	18
4.1.	DESCRIPTION	18
4.2.	MATERIALS	18
A.	General:	18
B.	Polyethylene Conduit:	18
4.3.	CONSTRUCTION METHODS	19
A.	Pre-Approvals and Minimum Depth Requirements:	19
B.	Directional Drill Operations:	20
C.	Drilling Fluids:	20
D.	Splicing of the Conduit:	21
E.	Duct Plugs and Mechanical Sealing Devices:	21
F.	Plan of Record Drawings:	21
4.4.	METHOD OF MEASUREMENT	21
4.5.	BASIS OF PAYMENT	21
5.	FIBER-OPTIC SYSTEM SUPPORT EQUIPMENT	22
5.1.	DESCRIPTION	22
5.2.	MATERIALS	22
A.	General:	22
B.	Fiber-optic Restoration Kit:	22

Signals & Traffic Management Systems

C. SMFO Transceiver (For Emergency Restoration):22

5.3. METHOD OF MEASUREMENT22

5.4. BASIS OF PAYMENT23

6. DRILLED PIER FOUNDATIONS FOR METAL TRAFFIC SIGNAL POLES23

6.1. DESCRIPTION23

6.2. SOIL TEST AND FOUNDATION DETERMINATION23

 A. General:23

 B. Soil Test:23

 C. Foundation Design:24

6.3. DRILLED PIER CONSTRUCTION25

 A. Excavation:25

 B. Reinforcing Steel:26

 C. Concrete:26

 D. Concrete Placement Time:28

 E. Scheduling and Restrictions:28

6.4. DRILLED PIER FOUNDATIONS WITH WING WALLS29

 A. General:29

 B. Excavation:29

 C. Reinforcing Steel:29

 D. Concrete Placement29

6.5. METHOD OF MEASUREMENT30

6.6. BASIS OF PAYMENT30

7. LED BLANKOUT SIGNS30

7.1. DESCRIPTION30

7.2. MATERIALS30

7.3. CONSTRUCTION METHODS33

7.4. METHOD OF MEASUREMENT33

7.5. BASIS OF PAYMENT33

8. REMOVAL OF EXISTING TRAFFIC SIGNAL INSTALLATIONS33

8.1. DESCRIPTION33

8.2. CONSTRUCTION METHODS33

 A. General:33

 B. Removal:34

 C. Disposal:34

8.3. METHOD OF MEASUREMENT34

8.4. BASIS OF PAYMENT34

1. 2002 STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES – SECTION 1098 REVISIONS

The 2002 Standard Specifications are revised as follows:

1.1. General Requirements (1098-1)

Page 10-220, Subarticle 1098-1(A)

In the last paragraph, sentence 1, revise “by the date of advertisement of the project” to “by the date of equipment installation.”

Pages 10-222,3 Subarticle 1098-1(H)

Replace paragraphs 2, 3, and 4 with the following paragraphs:

Except for grounding conductors, provide signal cable conductors of size Number 16 AWG that are fabricated from stranded copper. **Number 16 AWG cable can only be used with an all LED traffic signal intersection.** Repairs to a non-LED traffic signal intersection must use Number 14 AWG cable.

Provide either 0.05 x 0.30 inch (1.3 x 7.6 mm) aluminum wrapping tape or 0.06 inch (1.5 mm) stainless steel lashing wire for the purpose of lashing cables, except fiber-optic communications cables, to a messenger cable. Use 0.045-inch (1.14-mm) stainless steel lashing wire for the aerial installation of fiber-optic communications cable to messenger cable.

1.2. Signal Heads (1098-2)

Page 10-223, Subarticle 1098-2(A)

In paragraph 5, sentence 4, revise “1 3/8 inch (32 mm) vertical conduit entrance hubs” to “1 1/4 inch (32 mm) vertical conduit entrance hubs” and revise “1 5/8 inch (40 mm) horizontal hubs” to “1 1/2 inch (40 mm) horizontal hubs.”

In the last paragraph, sentence 3, revise “2/5 x 3/4 inch (9.5 mm x 19.1 mm) square head bolts” to “3/8 x 3/4 inch (9.5 mm x 19.1 mm) square head bolts.”

Page 10-225, Subarticle 1098-2(C)

Replace paragraphs 2 and 3 with the following paragraphs:

Unless otherwise required by the plans, provide single-section pedestrian heads with black grid-type visors 1/5 inches (40 mm) deep that prevent the sun phantom illumination of the indication.

Where required by the plans, provide two-section pedestrian signal heads with traditional three-sided, rectangular visors 12 inches (300 mm) long.

Replace the last paragraph with the following:

Provide lead-in cable that complies with the loop lead-in cable section of these project special provisions.

Pages 10-225-227, Subarticle 1098-2(E) [**Light Emitting Diode (LED) Sections**]

Replace the entire subarticle with the following two subarticles:

(1) Vehicular

Provide light emitting diode (LED) traffic signal modules (hereafter referred to as modules) that consist of an assembly that utilizes LEDs as the light source in lieu of an incandescent lamp for use in traffic signal sections. Use LEDs that are aluminum indium gallium phosphorus (AlInGaP) technology for red and yellow indications and indium gallium nitride (InGaN) for green indications. Install the ultra bright type LEDs that are rated for 100,000 hours of continuous operation from -40°C to +74°C (-40°F to +165°F). Design modules to have a minimum useful life of 60 months, and to meet all parameters of this specification during this period of useful life.

Ensure, unless otherwise stated in these specifications, that each module meets or exceeds the requirements of the Interim Purchase Specification of the ITE VTCSH part 2 (Light Emitting Diode (LED) Vehicular Traffic Signal Modules (hereafter referred to as VTCSH-2). Arrow displays shall meet or exceed the electrical and environmental operating requirements of VTCSH-2 sections 3 and 5, chromaticity requirements of section 4.2, and the requirements of sections 6.3 (except 6.3.2) and 6.4 (except 6.4.2).

Provide modules that meet the requirements of Table 1098-1. Design the modules to operate from a 60 ±3 HZ AC line voltage ranging from 80 volts to 135 volts. Ensure that fluctuations of line voltage have no visible effect on the luminous intensity of the indications. Design the module to have a normal operating voltage of 120 VAC, and measure all parameters at this voltage.

Table 1098-1
Maximum Power Consumption (in Watts) at 25°C (77°F)

	Red	Yellow	Green
300 mm circular	17	34	24
200 mm circular	10	16	12
300 mm arrow	9	10	11

Certify that the module has a power factor of 0.90 or greater, and that total harmonic distortion (THD) (current and voltage) induced into an AC power line by the module does not exceed 20 percent for modules with power ratings above 15W, and 40 percent for modules with power ratings of 15W or less. Design the module's onboard circuitry to include voltage surge protection to withstand high repetition noise transients as stated in Section 2.1.6 of NEMA Standard TS-2, 1992. Ensure all wiring meets the requirements of Section 13.02 of the ITE Publication: Equipment and Material Standards, VTCSH-2. Provide spade terminals appropriate to the lead wires and sized for a #10 screw connection to the existing terminal block in a standard signal head.

Ensure that the module is compatible with signal load switches and conflict monitors. Design the module to provide sufficient current draw to ensure proper load switch operation while the voltage is varied from a regulated 80 Vrms to 135 Vrms. Design off-state for green and yellow modules to be 30Vrms or greater, and on-state to be 40 Vrms or greater. Design the voltage decay to 10 Vrms or less to be 100 milliseconds or less for green and yellow modules. Ensure that the control circuitry prevents current flow through the LEDs in the off state to avoid a false indication.

Design all modules to meet existing NCDOT monitor specifications for each of the following types of signal monitors: NEMA TS-1 conflict monitors (including so-called NEMA plus features such as dual indication detection and short yellow time detection); NEMA TS-2

Malfunction Management Units (MMU); and 170 cabinet Type 210ECL and 2010ECL conflict monitors (including red monitoring and so-called plus features such as dual indication detection and short yellow time detection).

Ensure that the modules and associated onboard circuitry meet Class A emission limits referred to in Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 regulations concerning the emission of electronic noise.

Provide modules that meet the requirements of Tables 1098-2, 3, and 4. Test all ball modules for luminous intensity at 25°C (77°F) to meet 115% of values in tables 1098-2 and 4. Design and certify the modules to meet or exceed the maintained minimum luminous intensity values throughout the warranty period based on normal use in a traffic signal operation over the operating temperature range. Test the Red and Green modules for maintained luminous intensity (Tables 1098-2, 3, and 4) at 74°C (165°F) (ITE 6.4.2.2). Use LEDs that conform to the chromaticity requirements of VTCSH-2, Section 8.04 throughout the warranty period over the operating temperature range. Make chromaticity coordinate compliance measurements at 25°C (77°F).

Table 1098-2
Specification for 12 inch (300 mm) Extended View Signals

Minimum Luminous Intensity Values (In Candelas)				
Expanded View Vertical Angle	Horizontal Angle (Left/Right)	RED	YELLOW	GREEN
+/-2.5	2.5	339	678	678
	7.5	251	501	501
	12.5	141	283	283
	17.5	77	154	154
+/-7.5	2.5	226	452	452
	7.5	202	404	404
	12.5	145	291	291
	17.5	89	178	178
	22.5	38	77	77
	27.5	16	32	32
+/-12.5	2.5	50	101	101
	7.5	48	97	97
	12.5	44	89	89
	17.5	34	69	69
	22.5	22	44	44
	27.5	16	32	32
+/-17.5	2.5	22	44	44
	7.5	22	44	44
	12.5	22	44	44
	17.5	22	44	44
	(Not Extended View) 22.5	20	41	41
	(Not Extended View) 27.5	16	32	32
+/-22.5	2.5	20	40	40
	17.5	20	40	40

Notes

1. Design signal modules to meet these requirements as a minimum throughout the warranty period.
2. Design signal modules to have a minimum initial intensity equal to 115% of Table 2 at 25°C.
3. Independent laboratory test reports are required to validate the initial intensity.

Table 1098-3
Minimum Initial and maintained Intensities for Arrow Indications (in cd/m²)

	Red	Yellow	Green
Arrow Indication	5,500	11,000	11,000

Table 1098-4
Specification for 8 inch (200 mm) Extended View Signals

Minimum Luminous Intensity Values (In Candelas) for circular indications				
Expanded View Vertical Angle	Horizontal Angle (Left/Right)	RED	YELLOW	GREEN
+/-2.5	2.5	133	267	267
	7.5	97	194	194
	12.5	57	113	113
	17.5	25	48	48
+/-7.5	2.5	101	202	202
	7.5	89	178	178
	12.5	65	129	129
	17.5	41	81	81
	22.5	18	37	37
	27.5	10	20	20
+/-12.5	2.5	37	73	73
	7.5	32	65	65
	12.5	28	57	57
	17.5	20	41	41
	22.5	12	25	25
	27.5	9	16	16
+/-17.5	2.5	16	32	32
	7.5	14	28	28
	12.5	10	20	20
	17.5	9	16	16
	(Not Extended View) 22.5	6	12	12
	(Not Extended View) 27.5	4	9	9

Notes

4. Design signal modules to meet these requirements as a minimum throughout the warranty period.
5. Design signal modules to have a minimum initial intensity equal to 115% of Table 4 at 25°C.
6. Independent laboratory test reports are required to validate the initial intensity.

Table 1098-5
Chromaticity Standards (CIE Chart)

Red	Y: not greater than 0.308, or less than 0.998 - x
Yellow	Y: not less than 0.411, nor less than 0.995 - x, nor less than 0.452
Green	Y: Not less than 0.506 - .519x, nor less than 0.150 + 1.068x, nor more than 0.730 - x

Design the modules as retrofit replacements for installation into standard incandescent traffic sections that do not contain the incandescent lens, reflector assembly, lamp socket and lens gasket. Ensure that installation does not require special tools or physical modification for the

existing fixture other than the removal of the incandescent lens, reflector assembly, lamp socket, and lens gasket.

Provide modules that are rated for use in the operating temperature range of -40°C (-40°F) to $+74^{\circ}\text{C}$ ($+165^{\circ}\text{F}$). Ensure that the modules (except yellow) meet all specifications throughout this range. Fabricate the module to protect the onboard circuitry against dust and moisture intrusion per the requirements of NEMA Standard 250-1991 for Type 4 enclosures to protect all internal components.

Design the module to be a single, self-contained device with the circuit board and power supply for the module inside and integral to the unit.

Design the assembly and manufacturing process for the module to ensure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources. Wire the individual LEDs such that a catastrophic loss or the failure of one LED will result in the loss of not more than 20 percent of the signal module light output. Solder the LEDs to the circuit board.

Fabricate the lens and signal module from material that conforms to ASTM specifications. Ensure enclosures containing either the power supply or electronic components of the module are made of UL94VO flame retardant materials. The lens of the signal module is excluded from this requirement.

Permanently mark the manufacturer's name, trademark, model number, serial number, date of manufacture (month & year), and lot number as identification on the back of the module.

Permanently mark the following operating characteristics on the back of the module: rated voltage and rated power in watts and volt-amperes.

If a specific mounting orientation is required, provide permanent markings consisting of an up arrow, or the word "UP" or "TOP" for correct indexing and orientation within the signal housing.

Provide a lens that is integral to the unit with a smooth outer surface and UV stabilized to withstand ultraviolet exposure for a minimum period of 60 months without exhibiting evidence of deterioration. Coat the front of a polycarbonate lens to make it more abrasion resistant. Seal the lens to the module to prevent moisture and dust from entering the module.

Tint the red and yellow lens to match the wavelength (chromaticity) of the LED. Provide a green lens that is either colorless or tinted to match the wavelength (chromaticity) of the LED.

For 12-inch (300-mm) arrow modules, ensure that the module meets specifications stated in Section 9.01 of the ITE VTCSH for arrow indications. Design arrow displays to be solid LEDs (spread evenly across the illuminated portion of the arrow or other designs), not outlines.

Determine the luminous intensity using the CALTRANS 606 method or similar procedure.

Provide test results for ball modules from an independent testing laboratory showing wattage and compliance with ITE VTCSH-2 specifications 6.4.2, 6.4.4.1, 6.4.4.2, 6.4.4.3, 6.4.5, and 6.4.6.1 as a minimum. Ensure the 6.4.2.1 test meets the requirements of Tables 1098-2 and 4 of this specification. The 6.4.2.2 test is for Red and Green only. Ensure that the LED signal modules tested are typical, average production units.

Burn In - Energize the sample module(s) (a sample of one module minimum) for a minimum of 24 hours, at 100 percent on-time duty cycle, at a temperature of $+74^{\circ}\text{C}$ ($+165^{\circ}\text{F}$) before

performing any qualification testing. Any failure of the module, which renders the unit non-compliant with the specification after burn-in, shall be cause for rejection. All specifications will be measured including, but not limited to:

- (a) **Photometric (Rated Initial Luminous Intensity)** - Measure at +25°C (+77°F). Measure luminous intensity for red and green modules upon the completion of a 30 minute 100 percent on-time duty cycle at the rated voltage. **Measure luminous intensity for yellow modules immediately upon energizing at the rated voltage.**
- (b) **Chromaticity (Color)** - Measure at +25°C (+77°F). Measure chromaticity for red and green modules upon the completion of a 30 minute 100 percent on-time duty cycle at the rated voltage. Measure chromaticity for yellow modules immediately upon energizing at the rated voltage.
- (c) **Electrical** - Measure all specified parameters for quality comparison of production quality assurance on production modules. (rated power, etc)

Equipment Compatibility - In addition to the 6.4.4.5 test of modules for compatibility with controllers, conflict monitors, and load switches, perform the following test, and certify the results. Connect each signal module to the output of a standard load switch connected to a variable AC voltage supply (95 to 135 VAC). With the load switch “off,” vary the AC voltage from 95 Vrms to 135 Vrms, and measure the drop across the module. Readings greater than 15 Vrms are unacceptable.

NCDOT evaluates and approves all LED Traffic Signal modules for the QPL by a standard visual inspection and blind operational survey, a compatibility test, current flow, and other random tests, in addition to reviewing the lab reports and documentation from the manufacturer. The tests are conducted at the Traffic Electronics Center in Raleigh. Each 12-inch (300-mm) ball module shall be visible at 450 feet (135 meters) during sway conditions (extended view) until obscured by the visor. Each 8-inch ball (200-mm) and 12-inch (300-mm) arrow module shall be visible at 300 feet (90 meters) during sway conditions (extended view) until obscured by the visor. Sufficient luminance during the extended views will be determined during this blind survey evaluation.

In addition to meeting the performance requirements for the minimum period of 60 months, provide a written warranty against defects in materials and workmanship for the modules for a period of 60 months after shipment acceptance of the modules. Replacement modules shall be provided within 30 days of receipt of modules that have failed at no cost to the State. Provide warranty documentation to the Department prior to QPL acceptance. Provide luminous intensity testing at an independent lab, to determine degradation, for two modules of each color provided by NCDOT at the end of two and four years of operation.

Provide testing at an independent laboratory for a designated module to be tested for maintained luminous intensity at 25°C (77°F) once each year during the five year warranty period.

(2) Pedestrian

Design the LED pedestrian traffic signal modules for installation into standard pedestrian traffic signal sections that do not contain the incandescent signal section reflector, lens, eggcrate visor, gasket, or socket. Provide a clear 0.25-inch (6.4-mm), non-glare, mat finish lens with a smooth outer surface and UV stabilized to withstand ultraviolet exposure for a minimum period

of 60 months without exhibiting evidence of deterioration. Coat the front surface of a polycarbonate lens to make it more abrasion resistant. Ensure that the lens has light transmission properties equal to or greater than 80%.

Ensure installation of all modules requires no physical modification of the existing fixture other than the removal of the incandescent signal section reflector, lens, eggcrate visor and socket where applicable.

Design the countdown display as a double row of LEDs, and ensure the countdown display blanks-out during the initial cycle while it records the countdown time. Ensure that the countdown display is operational only during the flashing don't walk, clearance interval. Blank-out the countdown indication after it reaches zero until the beginning of the next don't walk indication, and design the controlling circuitry to prevent the timer from being triggered during the solid hand indication.

Design the man and hand to be a solid display, which meets the minimum requirements of "The Equipment and Materials Standards" of the Institute of Transportation Engineers (ITE) Chapter 3, Table 1 *Symbol Message*. Wire the LEDs such that a catastrophic loss or failure of one or more LEDs will result in the loss of not more than five percent of the signal module light output.

Ensure that the power consumption for the modules is equal to or less than the following in watts, and that the modules have EPA Energy Star compliance ratings, if applicable to that shape, size and color.

TEMPERATURE	77°F (25°C)	165°F (74°C)
HAND	10	12
MAN	9	12
COUNTDOWN	9	12

Provide 16-inch (400-mm) displays, where required by plan or bid document, that have the hand/man overlay on the left and the countdown on the right. Ensure the hand/man meets the dimension requirements cited in Chapter 3, Table 1 *Symbol Message* for Class 3 displays. Ensure that the countdown number display is at least 7 inches high by 6 inches wide. Configure the signal head with a sufficient number of LEDs to provide an average luminous intensity of at least 342 candela per square feet (3750 candela per square meter) of lighting surface for the "RAISED HAND" and "COUNTDOWN", and 483 candela per square feet (5300 candela per square meter) of lighting surface for the "WALKING PERSON". Ensure they meet this average luminous intensity throughout the warranty period over the operating temperature range.

Provide 12 inch (300 mm) displays, where required by plan or bid document, that meet the dimension requirements cited in Chapter 3, Table 1 *Symbol Message* for Class 2 displays. Furnish three types of modules, the solid hand/man module as an overlay, the solid hand module, and the solid man module. Configure the signal head with a sufficient number of LEDs to provide an average luminous intensity of at least 342 candela per square feet (3750 candela per square meter) of lighting surface for the "RAISED HAND" and "COUNTDOWN", and 483 candela per square feet (5300 candela per square meter) of lighting surface for the "WALKING PERSON". Ensure they meet this average luminous intensity throughout the warranty period over the operating temperature range.

Design all modules to operate using a standard 3 - wire field installation. Provide lead wires that are eighteen gauge (18AWG) minimum copper conductors with 221 degree F (105 degree C) insulation. Ensure that lead wires are a minimum of 30 inches (760 mm) long with NEMA "spade" terminals that are appropriate to the lead wires and sized for a #10 screw connection to the existing terminal block in the signal head. Solder the LEDs to the circuit board.

Ensure that modules are compatible with signal load switches and conflict monitors. Design the module to provide sufficient current draw to ensure proper load switch operation while the voltage is varied from a regulated 80Vrms to 135Vrms. Provide control circuitry to prevent current flow through the LEDs in the off state to avoid a false indication. Design all modules to meet existing NCDOT monitor specifications for each of the following types of signal monitors: NEMA TS-1 conflict monitors (including so-called NEMA plus features such as dual indication detection and short yellow time detection); NEMA TS-2 Malfunction Management Units; and 170 cabinet 210ECL and 2010ECL conflict monitors (including red monitoring and so-called plus features such as dual indication detection and short yellow time detection).

Comply with the following sections: 3.3, 3.5, 3.6, 5.2, 5.3, 5.7, 6.1, 6.3.1, 6.3.3, 6.3.4, 6.3.5, 6.4.4, 6.4.5, and 6.4.6 of "The Equipment and Material Standards" of the Institute of Transportation Engineers "Vehicular Traffic Control Signal Heads" (VTC SH) Part 2, Chapter 2A.

Furnish Portland Orange LEDs for the hand and countdown that are the latest AlInGaP technology or higher, and Lunar White LEDs for the man that are the latest InGaN technology or higher.

Provide certification with the signal modules when offered for evaluation that your product complies with the sections of the ITE specification identified in paragraph 1.12 above and this specification. Provide test results showing that the signal modules meet or exceed the luminous intensity requirements of sections 1.8 and 1.9 of this specification.

Ship each module as a complete kit designed for retrofitting existing pedestrian signal sections with an LED display module. Provide modules that include, but are not limited to the following items: lens, LED display mounted on a circuit board, wire leads with strain relief, rigid housing, electronics including a power supply integral to the LED module which is protected by the housing, and a neoprene one piece gasket. Ensure that the module is compatible with standard, existing, pedestrian head mounting hardware.

Warrant performance for a period of 60 months from the date of installation and include repair or replacement of an LED signal module that exhibits light output degradation, which in the judgment of the Department, cannot be easily seen at 150 feet (45 meters) in bright sunlight with a visor on the housing or which drops below the luminous intensity output requirements. Warrant failure due to workmanship, materials, and manufacturing defects during the first 60 months after the date of installation. Repair or replace any failed modules within 30 calendar days of notification at no cost to the Department.

Page 10-227, Subarticle 1098-2(F)

Replace the first sentence in the paragraph with the following:

Furnish 16-4 and 16-7 signal cable that complies with IMSA specification 20-1 except provide the following conductor insulation colors:

- For 16-4 cable: white, yellow, red, and green

- For 16-7 cable: white, yellow, red, green, yellow with black stripe tracer, red with black stripe tracer, and green with black stripe tracer. Apply continuous stripe tracer on conductor insulation with a longitudinal or spiral pattern.

Provide a ripcord to allow the cable jacket to be opened without using a cutter. IMSA specification 19-1 will not be acceptable.

1.3. Wood Poles (1098-6)

Page 10-228, Article 1098-6

Replace the entire article with the following:

Provide poles of treated southern pine or treated Douglas fir that meet the requirements of ANSI 05.1. Provide Class 3 or better wood poles that are a minimum length of 40 feet (12.2 meters) unless otherwise shown on the plans and are of a sufficient length to maintain minimum required distances above the roadway, obstructions and affected railroad tracks. Mark each pole in accordance with ANSI 05.01. First roof and bore poles and then give them a full-length preservative treatment.

Provide poles with pentachlorophenol or chromated copper arsenate (CCA) preservative, in accordance with AWPA Standard C4-99. Ensure the retention of preservative is a minimum of 0.45 lb. per cubic foot (7.2 kg per cubic meter) for pentachlorophenol and 0.6 lb. per cubic foot (9.6 kg per cubic meter) for CCA.

1.4. Loop Lead-In Cable (1098-9)

Page 10-230, Article 1098-9

Replace the entire article with the following:

Furnish lead-in cable with conductors of size 18 AWG that are fabricated from stranded copper, and that complies with IMSA Specification 50-2 except as follows:

- Provide the following two pair (4 conductor) conductor insulation pair colors: clear-yellow and red-green.
- Provide the following four pair (8 conductor) conductor insulation pair colors: clear-yellow, red-green, clear with black stripe tracer-yellow with black stripe tracer, and red with black stripe tracer-green with black stripe tracer. Apply continuous stripe tracer on conductor insulation with a longitudinal or spiral pattern.
- Provide cable jacket formed from black polyethylene. Ensure the finished jacket provides environmental stress resistance, outdoor weatherability, toughness, low temperature performance, and ultraviolet resistance.
- Provide a ripcord to allow the cable jacket to be opened without using a cutter.
- Install all underground lead-in cable in non-metallic conduit.

1.5. Fiber-optic Cable (1098-11)

Page 10-233, Subarticle 1098-11(A)

In paragraph 3, sentence 5, delete “Construct buffer tubes with an inner layer made of polycarbonate and an outer layer made of polyester.”

1.6. Metal Poles (1098-15)

Page 10-236, Subarticle 1098-15(A)

R-2911A**Signals & Traffic Management Systems**

In paragraph 1, sentence 2, delete the phrase “(AASHTO Specifications) in effect on the date of advertisement” and insert the words “Fourth Edition, 2001, including the latest interim specifications.”

Page 10-238, Subarticle 1098-15(B)

In paragraph 1 (partial), sentence 2, delete the phrase “6 x 6 x 3/4 inches (150 x 150 x 18 mm)” and insert the words “circular anchor bolt lock.”

In the first full paragraph, add the following sentence:

Where splicing is necessary, use butt splice and heat shrink tubing.

1.7. NEMA TS-2 Type 1 Cabinets (1098-22)

Page 10-251, Subarticle 1098-22(B)

In paragraph 1, sentence 3, revise “latching plate at least 1/8 inch (4.5 mm) thick” to “latching plate at least 3/16 inch (4.5 mm) thick.”

1.8. Closed Loop System (1098-23)

Page 10-257, Article 1098-23

Change the title to “**CLOSED LOOP SYSTEM NEMA TS-2.**”

2. 2002 STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES – SECTION 1700 REVISIONS

The 2002 Standard Specifications are revised as follows:

2.1. General Requirements (1700)

Page 17-2, Subarticle 1700-3 (D), add the following paragraph

In the event the contractor fails to perform in accordance with the plans and specifications within the time frame specified, the Department reserves the right to perform the maintenance and emergency service necessary to assure continuous traffic signal operation. Further, all expenses incurred by the Department in implementing this option shall be deducted from the payment due the contractor, plus a \$250 liquidated damage per occasion, per day, or any portion thereof, until corrected. The liquidated damages are due to increased public hazard resulting from the malfunction.

Page 17-2, Subarticle 1700-3 (F)

In paragraph 2, sentence 2, delete “type 1.”

Page 17-3, Subarticle 1700-3 (J)

In paragraph 2, sentence 2, revise “detectable metallic burial tape” to “marker tape.”

2.2. Underground Conduit (1715)

Page 17-8, Subarticle 1715-3(A)

Add the following paragraph:

Install metallic conduit at all locations where conduits traverse railroad tracks or as shown on the plans. For all other locations, install nonmetallic conduit unless otherwise shown on the

plans. Backfill with excavated material and compact to 95% of its original density. Remove any rock and debris from backfill material.

Page 17-8, Subarticle 1715-3(C)

Delete the first paragraph.

Page 17-8, Subarticle 1715-3(D)

Replace reference to Article 342-3 with reference to Article 1540-3 (A&B).

2.3. Wood Poles (1720)

Page 17-10, Article 1720-3

Replace the fourth paragraph with the following paragraph:

On joint use poles and NCDOT owned poles, at signal and traffic management systems equipment installations (i.e. controller cabinets, CCTV cabinets, DMS cabinets, etc.), bond the messenger cable(s) to the existing pole ground using burndy clamps at each end and at 1300-foot intervals. On multiple messenger cable arrangements, connect all messenger cable ends with #6 solid bare copper wire and bond with split bolt connectors or burndy clamps (UCG25RS) or equivalent. On joint use and NCDOT owned poles, if an existing pole ground does not exist, install a grounding system consisting of a #6 AWG bare copper wire that is exothermically welded to a ground rod.

In the last paragraph, last sentence, revise “5/8 inch x 8 foot (16 mm x 2.4 m) ground rod” to “5/8 inch x 10 foot (16 mm x 3.0 m) ground rod.”

2.4. Loop Lead-In Cable (1726)

Page 17-14, Article 1726-3

Replace paragraph 1 with the following:

Install lead-in cable.

Delete paragraph 3.

In paragraph 4, delete “type 1.”

In paragraph 6, revise “less than 0.0036 ohms per foot (0.012 ohms per meter)” to “less than 0.00885 ohms per foot (0.0295 ohms per meter).”

Page 17-15, Article 1726-4

Delete the last sentence.

2.5. Structure Design of Signal Supports (1744)

Page 17-26-28, Subarticle 1744-2(A)

In paragraph 2, sentence 2, delete the phrase “(AASHTO specifications) in effect on the date of advertisement” and insert the words “Fourth Edition, 2001, including the latest interim specifications.” Revise “with a 1.3 gust factor” to “with a minimum 1.14 gust factor.”

Add the following paragraph after paragraph 2:

“Use the following in design, which is taken from The Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 4th Edition, 2001:

- The wind pressure map that is developed from the 3-second gust speeds, as provided in Article 3.8, shall be used.
- Signal support structures shall include natural wind gust loading and truck-induced gust loading in the fatigue design, as provided for in Article 11.7.3 and 11.7.4, respectively. Designs need not consider periodic galloping forces.
- The natural wind gust speed in North Carolina is assumed to be 11.2 mph.
- 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.
- Deflection induced by truck gust, as provided in Article 11.8, at the free end of single-arm sign supports and all traffic signal arms, shall be limited to 8 inches (200 mm) vertically, when the equivalent static design wind effect from truck-induced gusts are applied to the structure.
- Conform to article 10.4.2 of the 2001 AASHTO Specification

The maximum allowable vertical deflection at the tip of the mast arm due to the combined deflection of the pole and the arm shall not exceed 3.0% of the total mast arm length under maximum dead loading conditions.

For span wire mounted signal support structures, wind loads shall be applied as shown in Figure 3-5 of the AASHTO Specification. For Group III loading, where ice is present, half wind shall also be applied to the span wire cable bundle diameter shown above as well as to the increased diameter of the cable bundle due to the presence of ice around the full perimeter of the cable bundle.”

“Use the following in design, which modifies The Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 4th Edition, 2001”:

Revise Article 11.7.4, Truck-Induced Gust, Equation 11-6 to read as follows:

$$P_{TG} = 900C_dI_F \text{ (Pa)}$$

$$P_{TG} = 18.8C_dI_F \text{ (psf)}$$

Revise the third sentence of Article 11.7.4, Truck-Induced Gust, to read as follows:

“The pressure range shall be applied along any 3.7 m (12 ft) length to create the maximum stress range, excluding any portion of the structure not located directly above a traffic lane.”

In Article 11.7.4, Truck-Induced Gust, after the first paragraph, add a paragraph to read as follows:

“The magnitude of applied pressure range may be varied depending on the height of the horizontal support and the attachments above the traffic lane. Full pressure shall be applied for heights up to and including 6 m (19.7 ft), and then the pressure may be linearly reduced for heights above 6 m (19.7 ft) to a value of zero at 10 m (32.8 ft).”

Revise the third paragraph of the Commentary to Article 11.7.4, Truck-Induced Gust, to remove the following two sentences in their entirety:

“To improve fuel economy ... created by the trailer. It has been proposed ... (Desantis and Haig, 1996).”

Revise the fourth paragraph of the Commentary to Article 11.7.4, Truck-Induced Gust, to read as follows:

“The design pressure calculated from Equation 11-6 is based on a truck speed of 30 m/s (65 mph). For structures installed at locations where the posted speed limit is much less than 30 m/s (65 mph), the design pressure may be recalculated based on this lower truck speed. The following may be used:

$$P_{TG} = 900C_d(V/30 \text{ m/s})^2 I_F \text{ (Pa)} \quad \text{Eq. C 11-6}$$
$$P_{TG} = 18.8C_d(V/65 \text{ mph})^2 I_F \text{ (psf)}$$

Where V is the truck speed in m/s (mph), V may be taken as either the posted speed limit or the design speed (if known), whichever is higher.”

Revise the Commentary to Article 11.7.4, Truck-Induced Gust, to remove in their entirety, the fifth and seventh paragraphs, which deal with the application length, and variability of truck gust pressure range.

In the last paragraph, add the following after the last sentence:

“The computed surface area for ice load on signal heads shall be:

- 3-section, 12-inch (300-mm)
Surface area: 26.0 ft² (2.4 m²)
- 4-section, 12-inch (300-mm)
Surface area: 32.0 ft² (3.0 m²)
- 5-section, 12-inch (300-mm)
Surface area: 42.0 ft² (3.9 m²)”

Page 17-29, Subarticle 1744-2(B)

In the third paragraph, second sentence, revise the phrase “3 percent” to “2.5 percent.”

In the fourth paragraph, following the first sentence, add the following:

“The base plate thickness for all uprights and poles shall be no less than that determined by the following criteria and design:

Case 1 Circular or rectangular solid base plate 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 1/3 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 $M = (P \times D_1) / 2$,

where M = bending moment at the critical section of the base plate induced by one anchor bolt
P = anchoring force of each anchor bolt

D₁ = 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

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.

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 1/3 of the upright diameter

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

where P = anchoring force of each anchor bolt

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 top nut 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 2 shall not be less than that calculated based on formula for Case 1.”

Page 17-30, Subarticle 1744-2(C)

Delete paragraphs 1 and 2.

2.6. Controllers with Cabinets (1751)

Page 17-34, Subarticle 1751-3(A)

In paragraph 3, replace sentence 2 with the following:

For all other installations, do not program the controller for late night flashing operation unless otherwise directed.

Page 17-34, Subarticle 1751-3(B)

Add the following paragraph after the first paragraph:

Program telemetry command sequences and enable devices necessary for testing of communication between local controllers and field master controllers, and between field master controllers and the central computer.

Page 17-34, Article 1751-4

Replace paragraph 2 with the following:

Actual number of each type of detector cards (2-channels) furnished, installed, and accepted. If 4-channel detector cards are used in order to fulfill the requirements of the plans, payment will be allowed for two detector cards for each 4-channel detector card.

In paragraph 3, revise “No measurement will be made...” to include “modems.”

Page 17-35, Article 1751-5

Replace paragraph 2 with the following:

The quantity of detector cards, measured as provided above, will be paid for at the contract unit price each for “Detector Card (____).”

In paragraph 3, revise “Detector Channel” to “Detector Card.”

2.7. Closed Loop System Master Controllers (1752)

Page 17-35, Section 1752

Change the title to “CLOSED LOOP SYSTEM MASTER CONTROLLER NEMA TS-2”.

3. ELECTRICAL REQUIREMENTS

Ensure that an IMSA certified, or equivalent, Level II traffic qualified signal technician is standing by to provide emergency maintenance services whenever work is being performed on traffic signal controller cabinets and traffic signal controller cabinet foundations. Stand by status is defined as being able to arrive, fully equipped, at the work site within 30 minutes ready to provide maintenance services.

4. DIRECTIONAL DRILLING

4.1. DESCRIPTION

Furnish and install conduit(s) and all necessary hardware by using the horizontal directional drilling method in accordance with the plans and specifications. Comply with the provisions of Section 1700 of the 2002 Standard Specifications for Roads and Structures.

4.2. MATERIALS

A. General:

Provide conduit that is suitable for underground use in an ambient temperature range of -30 to 130 degrees F (-35 to 55 degrees C) without degradation of material properties.

Provide conduit that is resistant to benzene, calcium chloride, ethyl alcohol, fuel oil, gasoline, lubricating oil, potassium chloride, sodium chloride, sodium nitrate, and transformer oil, and is protected against degradation due to oxidation and general corrosion.

Provide conduit(s) with an outer diameter to minimum wall thickness ratio that complies with ASTM-D3035, Standard Dimension Ratio (SDR) 13.5.

Provide conduit(s) that meets or exceeds the following:

ASTM-D638	Tensile Strength - 3,000 psi (20 Mpa), minimum Elongation - 400 percent, minimum
ASTM-D1238	Melt Index - 0.4 maximum
ASTM-D1505	Density - (0941-0955 g/cc)
ASTM-D1693	Condition B - 20 percent failure, maximum
ASTM-D2444	Impact - NEMA Standards Publication Number TC7
ASTM-D3350	Cell classification - 334420 or 344420

Furnish conduits with a coefficient of friction of 0.09 or less in accordance with Belcore GR-356.

Dependent upon the number of conduits required, furnish conduits in black, orange, blue and white colors. Provide conduits that are factory extruded with the appropriate colors.

Furnish ½-inch (12.7-mm), prelubricated, woven polyester tape, pull line with a minimum rated tensile strength of 2,500 lb (11 kN).

B. Polyethylene Conduit:

Furnish factory lubricated, low friction, coilable, conduit constructed of virgin high-density polyethylene (HDPE). Furnish conduits with inside diameter as required by the plans. Provide conduit with a smooth outer wall and ribbed inner wall and ensure the conduit is capable of being

coiled on reels in continuous lengths, transported, stored outdoors, and subsequently uncoiled for installation without affecting its properties or performance.

Furnish duct plugs that provide a watertight barrier when installed in an unused conduit. Furnish duct plugs sized in accordance with the conduit furnished. Provide duct plugs that are removable.

Furnish mechanical sealing devices that provide a watertight barrier between the conduit and communications cable. Furnish mechanical sealing devices sized in accordance with the conduit furnished and with appropriately sized holes for the communications cable. Provide mechanical sealing devices that are removable.

4.3. CONSTRUCTION METHODS

A. Pre-Approvals and Minimum Depth Requirements:

Obtain the Engineer's approval prior to beginning drilling operations.

At all points where the proposed conduit will traverse under city streets, state roads, driveways, sidewalks, and/or "Controlled Access Areas" including entrance/exit ramps, ensure the conduit(s) maintains a minimum depth of 4 feet (1.2 meters) or 8 times the back reamer's diameter, whichever is deeper. For an installation that runs parallel to a controlled access area or entrance and exit ramps ensure the conduit maintains a minimum depth of 30 inches (760 mm) below grade. Maintain a minimum clearance of 30 inches (760 mm) below grade when crossing ditch lines. For the following man-made structures, the minimum clearance requirements are shown in the table below:

Man-made Structure	Minimum Clearance Requirement
Bridge foundation	5' (1.5 m) horizontal & 4' (1.2 m) vertical (clearances greater than minimum horizontal should continue to use the 4V:5H ratio, i.e., 10' horizontal should be no deeper than 8')
Drainage pipes less than 60"	1' (0.3 m) above or below [while maintaining a minimum depth of 30" (760 mm) below grade]
Drainage pipes greater than 60"	1' (0.3 m) above or 4' (1.2 m) below [while maintaining a minimum depth of 30" (760 mm) below grade]
Box Culverts	1' (0.3 m) above or 4' (1.2 m) below [while maintaining a minimum depth of 30" (760 mm) below grade]
Slope protection	2' (0.6 m) below
Slope protection foundation footing	5' (1.5 m) below

Guarantee the drill rig operator and digital walkover locating system operator are factory-trained to operate the make and model of the equipment provided and has a minimum of one year's experience operating the make and model of drill rig. Submit written documentation of the operators' training and experience at least two weeks prior to commencing directional drilling operations for review by the Engineer.

Provide a means of collecting and containing drilling fluid/slurry that returns to the surface such as a slurry pit. Provide measures to prevent drilling fluids from entering drainage ditches and storm sewer systems. Prevent drilling fluid/slurry from accumulating on or flowing onto sidewalks, other

pedestrian walkways, driveways or streets. Immediately remove any drilling fluids/slurry that is accidentally spilled.

B. Directional Drill Operations:

Provide grounding for the drill rig in accordance with the manufacturer's recommendations.

Place excavated material near the top of the working pit and dispose of as required. Backfill pits or trenches excavated to facilitate drilling operations immediately after the drilling has been completed.

Utilize a drill head suitable for the type of material being drilled and sized no more than 2 inches (50 mm) larger than the outer diameter of the conduit to be installed. Direct the drill head as needed to obtain the proper depth and desired destination. Pressure grout with an approved bentonite/polymer slurry mixture to fill any voids. Do not jet alone or wet bore with water.

During each drilling operation, locate the drill head every 10 feet (3 meters) along the drill path and prior to transversing any underground utility or structure. Use the digital walkover locating system to track the drill head during the directional drilling operation. Ensure the locating system is capable of determining the pitch, roll, heading, depth and horizontal position of the drill head at any point. Unless otherwise approved, do not deviate from the proposed line and grade by more than two percent.

Once the drill head has reached its final location, remove the head, and install a reamer of appropriate size (no more than 2 inches (50 mm) larger than the outer diameter of the ducts) to simultaneously facilitate back drilling of the drill hole and installation of the conduit. The reamer is sized larger than the actual conduits to ensure the conduits are not subjected to extraneous deviations caused by the original drill operation and are as straight as possible in their final position.

The intent of these specifications is to limit the diameter of the actual drill shaft/hole such that it is no more than 2 inches (50 mm) larger than the conduit(s) outer diameter. The 2-inch (50-mm) larger diameter can be accomplished during the original bore or during the back reaming/conduit installation process.

Once the physical installation of the conduit has started, continue performing the installation without interruption to prevent the conduit from becoming firmly set. Ensure the bentonite slurry mixture is applied as the conduit installation process is occurring.

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

Extend the ends of the conduit such that upon completion of the installation the conduit will extend a minimum of 2 inches (50 mm) above concrete surfaces and 4 inches (100 mm) above crushed stone bases.

C. Drilling Fluids:

Furnish and use lubrication for subsequent removal of material and immediate installation of the pipe. The use of water and other fluids in connection with the directional drilling operation will be permitted only to the extent necessary to lubricate cuttings. Jetting alone or wet boring with water shall not be permitted. Use a drilling fluid/slurry consisting of at least 10 percent high-grade bentonite to consolidate excavated material and seal the walls of the drill hole.

Transport waste drilling fluid/slurry from the site and dispose of such slurry in a method that complies with Local, State and Federal laws and regulations.

D. Splicing of the Conduit:

Do not splice or join sections of conduit(s). Upon 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.

E. Duct Plugs and Mechanical Sealing Devices:

Following the installation of the conduit(s) where the communications cable is not immediately installed use a duct plug to seal the ends of the conduit. Secure the pull line to the duct plug in such a manner that it will not interfere with the installation of the duct plug and provide a watertight seal.

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

F. Plan of Record Drawings:

Upon completion of the drilling operation and conduit installation furnish the Engineer with a plan of record profile drawing and a plan drawing for the drilled conduit showing the horizontal and vertical locations of the installed conduit.

4.4. METHOD OF MEASUREMENT

Measured horizontal linear feet (meters) of directionally drilled polyethylene conduit(s) furnished, installed and accepted. Measurement of the drill path will be from point-to-point horizontally along the approximate centerline.

No additional payment will be made for vertical and horizontal sweeps, excavation of drill pits, backfill, site restoration, seeding and mulching, removal of excess material, duct organizers, mechanical sealing devices, duct plugs, pulling lubricants, mandrel test, and plan of record drawings, as these will be considered incidental to the directional drill and/or conduit installation.

4.5. BASIS OF PAYMENT

The quantity of directional drilled polyethylene conduit(s), measured as provided above, will be paid for at the contract unit price per linear foot (meter) as "Directional Drill Polyethylene Conduit(s), (size)(quantity of conduits) and (size)(quantity of conduits)."

As examples, an installation of a single 1.25" HDPE conduit would be paid as:

Directional Drill Polyethylene Conduit(s), (1.25")(1)Linear Foot (Meter)

An installation of two 1.25" and four 2" HDPE conduits would be paid as:

Directional Drill Polyethylene Conduit(s), (1.25")(2)&(2")(4)Linear Foot (Meter)

Payment will be made under:

Directional Drill Polyethylene Conduit(s), (Size)(Qty)&(Size)(Qty)Linear Foot (Meter)

5. FIBER-OPTIC SYSTEM SUPPORT EQUIPMENT

5.1. DESCRIPTION

Furnish fiber-optic system support equipment with all necessary hardware in accordance with the plans and specifications. Comply with the provisions of Section 1700 of the 2002 Standard Specifications for Roads and Structures.

5.2. MATERIALS

A. General:

Furnish equipment with test probes/leads, batteries (for battery-operated units), line cords (for AC-operated units), and carrying cases. Provide operating instructions and maintenance manuals with each item.

Prior to starting any system testing or training, furnish all fiber-optic system support equipment.

B. Fiber-optic Restoration Kit:

Furnish a fully functional fiber-optic restoration kit consisting of the following items (minimum):

- Plier-type strippers
- Non-niks fiber stripper tool with procedures
- Buffer tube stripper tool with procedures
- Fiber-optic Cleaver (average cut less than 0.5 degrees from perpendicular) Diamond Blade
- Screw driver set
- 48 Alcohol wipes
- Tape, 3/4-inch, electrician
- Kim wipes
- Metal ruler
- Tweezers
- Crimping pliers
- CamSplice assembly manual
- CamSplice assembly fixture
- 12, Non-adhesive, mechanical, CamSplice, splices
- 2 Mechanical Splice Trays, 12 CamSplices Capacity, Compatible with the Interconnect Centers being installed in the Traffic Signal Controller Cabinets
- Scissors
- Hard-sided, padded, storage case

C. SMFO Transceiver (For Emergency Restoration):

Furnish SMFO transceivers identical to the type installed in the traffic signal controller cabinets to be used for emergency restoration of the system and the fiber-optic communications system.

5.3. METHOD OF MEASUREMENT

Actual number of fiber-optic restoration kits furnished and accepted.

Actual number of fiber-optic transceivers furnished and accepted.

5.4. BASIS OF PAYMENT

The quantity of fiber-optic restoration kits, measured as provided above, will be paid for at the contract unit price each for “Furnish Fiber-optic Restoration Kit.”

The quantity of fiber-optic transceivers, measured as provided above, will be paid for at the contract unit price each for “Furnish Fiber-optic Transceiver.”

Payment will be made under:

Furnish Fiber-optic Restoration Kit	Each
Furnish Fiber-optic Transceiver	Each

6. DRILLED PIER FOUNDATIONS FOR METAL TRAFFIC SIGNAL POLES

6.1. DESCRIPTION

Perform a soil test at each proposed metal pole location. Furnish and install foundations for NCDOT metal poles with all necessary hardware in accordance with the plans and specifications.

Metal Pole Standards have been developed and implemented by NCDOT for use at signalized intersections in North Carolina. If the plans call for a standard pole, then a standard foundation may be selected from the plans. If the plans call for a non-standard site-specific pole, design the foundation to conform to the applicable provisions in the NCDOT Metal Pole Standards. Comply with the provisions of Section 1700 of the 2002 Standard Specifications for Roads and Structures.

6.2. SOIL TEST AND FOUNDATION DETERMINATION

A. General:

Drilled piers are reinforced concrete sections, cast-in-place against in situ, undisturbed material. Drilled piers are of straight shaft type and vertical.

Some standard drilled piers for supporting poles with mast arms may require wing walls to resist torsional rotation. Based upon this provision and the results of the required soil test, a drilled pier length and wing wall requirement may be determined and constructed in accordance with the plans.

For non-standard site-specific poles, the contractor-selected pole fabricator will determine if the addition of wing walls is necessary for the supporting foundations.

B. Soil Test:

Perform soil tests. Complete all required fill placement and excavation at each signal pole location to finished grade before drilling each boring. Drill one boring to a depth of 26 feet (7.9 meters) at each signal pole location.

Perform standard penetration tests (SPT) in accordance with ASTM D 1586 at depths of 1, 2.5, 5, 7.5, 10, 15, 20 and 26 feet (0.3, 0.8, 1.5, 2.3, 3.0, 4.6, 6.1 and 7.9 meters). Discontinue the boring if one of the following occurs:

- A total of 100 blows have been applied in any 2 consecutive 6-in. (0.15-m) intervals.
- A total of 50 blows have been applied with < 3-in. (.08-m) penetration.

Describe each intersection as the “Intersection of (Route or SR #), (Street Name) and (Route or SR #), (Street Name), _____ County, Signal Inventory No. _____”. Label borings with “B- N, S, E, W, NE, NW, SE or SW” corresponding to the quadrant location within the intersection. For each

boring, submit a legible (hand written or typed) boring log signed and sealed by a licensed geologist or professional engineer registered in North Carolina. Include on each boring the SPT blow counts and N-values at each depth, depth of the boring, and a general description of the soil types encountered.

C. Foundation Design:

Use the following method for determining the Design N-value for each signal pole location:

$$N_{AVG} = \frac{(N@1' + N@2.5' + \dots + N@Deepest\ Boring\ Depth)}{\text{Total Number of N-values}}$$

$$Y = (N@1')^2 + (N@2.5')^2 + \dots + (N@Deepest\ Boring\ Depth)^2$$

$$Z = (N@1' + N@2.5' + \dots + N@Deepest\ Boring\ Depth)$$

$$N_{STD\ DEV} = \left[\frac{(\text{Total Number of N-values} \times Y) - Z^2}{(\text{Total Number of N-values}) \times (\text{Total Number of N-values} - 1)} \right]^{0.5}$$

Design N-value equals lesser of the following two conditions:

$$N_{AVG} - (N_{STD\ DEV} \times 0.45)$$

Or

$$\text{Average of First Four N-Values} = \frac{(N@1' + N@2.5' + N@5' + N@7.5')}{4}$$

Note: If less than 4 N-values are obtained because of criteria listed in Section (B) above, use average of N-values collected for second condition. Do not include the N-value at the deepest boring depth for above calculations if the boring is discontinued at or before the required boring depth because of criteria listed in Section (B) above. Use N-value of zero for weight of hammer or weight of rod. If N-value is greater than 50, reduce N-value to 50 for calculations.

If standard NCDOT poles are shown on the plans, determine a drilled pier length, “L,” for each signal pole from the Foundation Selection Table based on the Design N-value and the predominant soil type. For each standard pole location, submit a completed “Metal Pole Standard Foundation Selection Form” signed by the contractor’s representative. Include the Design N-value calculation and resulting drilled pier length, “L,” on each form.

If non-standard site-specific poles are shown on the plans, submit a completed “Metal Pole Standard Foundation Selection Form” signed by the contractor’s representative for each pole location. Include the design N-value calculation only. These forms along with pole loading diagrams from the plans are to be used by the contractor selected pole fabricator to assist in the pole and foundation design.

If one of the following occurs, the Foundation Selection Table shown on the plans may not be used and a non-standard foundation may be required. In such case, contact the Engineer.

- The Design N-value is less than 4.
- The drilled pier length, “L”, determined from the Foundation Selection Table, is greater than the depth of the corresponding boring.

The Foundation Selection Table is based on level ground around the traffic signal pole. If the distance between the edge of the drilled pier and the top of the slope is less than 10 feet (3 meters) and the grade is steeper than 2:1 (H:V), contact the Engineer.

The “Metal Pole Standard Foundation Selection Form” may be found as follows:

- 1) Go to www.NCDOT.org/business/.
- 2) Click on “Other Industry Links.”
- 3) Scroll down and click on “Soils and Foundation Design Section Forms.”
- 4) Click on “Metal Pole Standard Foundation Selection Form.”

If assistance is needed with the required calculations, contact the Signals and Geometrics Structures Engineer at (919) 733-3915. However, in no case will the failure or inability to contact the Signals and Geometrics Structures Engineer be cause for any claims or requests for additional compensation.

6.3. DRILLED PIER CONSTRUCTION

A. 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 weathered rock or removal of boulders may be required.

Dispose of drilling spoils as directed and in accordance with Section 802 of the 2002 Standard Specifications for Roads and Structures. Drilling spoils consist of all material excavated including water 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 (75 mm) in any direction from the specified position. Build drilled piers within 1% of the plumb deviation for the total length of the piers. Construct the finished top of pier elevation between 5 inches (125 mm) above and 2 inches (50 mm) 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 temporary steel casing during drilling through concrete placement. For each excavation, provide one continuous piece of steel casing that is clean smooth non-corrugated watertight steel of ample strength to withstand handling and driving stresses and the pressures imposed by concrete, earth or backfill. Use temporary steel casings with an outside diameter equal to the specified size of the pier and a minimum wall thickness of 1/4 inches (7 mm). Extract all temporary casings during concrete placement in accordance with this special provision unless the Contractor chooses to leave the casing in place in accordance with the requirements below.

Any steel casing left in place will be considered permanent casing and must be installed before excavating or drilling such that the permanent casing is against undisturbed soil. Permanent steel casings are only allowed for strain poles and prohibited for mast arm poles. No additional compensation will be paid for permanent casing. If the Contractor chooses to use permanent steel casing, include all costs for permanent casing in the cost of the contract unit price bid for the “Drilled Pier Foundation” pay item.

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 prior to removing the casing to be replaced. No additional payment will be made 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 will not be cause for any claims or requests for additional compensation.

B. 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 operations and casing extraction. Check the position of the cage before and after placing the concrete.

Securely cross-tie 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 (50 mm).

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 (75 mm).

In order to ensure a minimum of 3 inches (75 mm) 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 (75 mm) "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 (3-m) intervals. Supply additional peripheral spacer wheels at closer intervals as necessary or as directed by the Engineer.

C. 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 2002 Standard Specifications for Roads and Structures.

Designate the concrete as Drilled Pier Concrete with a minimum compressive strength of 4500 psi (31.0 MPa) at 28 days. Make certain the cementitious material content complies with one of the following options:

- Provide a minimum cement content of 640 lbs/yd³ (380 kg/m³) and a maximum cement content of 800 lbs/yd³ (475 kg/m³); 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 (1.2 kg) of fly ash per lb (kg) of cement removed.
- If Type IP blended cement is used, use a minimum of 665 lbs/yd³ (395 kg/m³) Type IP blended cement and a maximum of 833 lbs/yd³ (494 kg/m³) 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 (125 and 175 mm) for dry placement of concrete or 7 and 9 inches (175 and 225 mm) 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 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 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 is not 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 (32°C) or less.

2) Concrete Placement

Place concrete such that the drilled pier is a monolithic structure. Vibration is only permitted, if needed, in the top 10 feet (3 m) 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.

Do not dewater any drilled pier excavations unless the excavation is entirely cased down to tip. Do not remove the temporary casing until the level of concrete within the casing is in excess of 10 feet (3 m) above the bottom of the casing being removed. Maintain the concrete level at least 10 feet (3 m) above the bottom of casing throughout the entire casing extraction operation except when concrete is at or above the top of 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 (150 mm) per half hour, the concrete placement is considered dry. If the water inflow rate is greater than 6 inches (150 mm) per half hour, the concrete placement is considered wet.

- **Dry Placement:** Prior to 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 level in the excavation prior to placing concrete. Place concrete with a tremie or a pump in accordance with the applicable parts of Sections 420-6 and 420-8 of the 2002 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 (1.5 m) 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 the water above the concrete and clean the concrete surface of all scum and sediment to expose clean, uncontaminated concrete.

D. Concrete Placement Time:

Place concrete within the time frames specified in Table 1000-2 of the 2002 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 is 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 equipment wheel loads or “excessive” vibrations to occur at any point within a 20 foot (6 m) 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 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 (31.0 Mpa). Propose remedial measures for any defective drilled piers and obtain approval of all proposals from the Engineer prior to implementation. No additional compensation will be paid for losses or damage due to remedial work or any investigation of drilled piers found defective or not in accordance with these special provision or the plans.

6.4. DRILLED PIER FOUNDATIONS WITH WING WALLS

A. General:

Wing walls are reinforced concrete sections, rectangular in shape that protrude horizontally out from two sides of a drill pier shaft. They are cast-in-place together with a drilled pier in a monolithic pour. They are used to eliminate torsional rotation of a foundation designed for supporting poles with mast arms.

NCDOT Metal Pole Standards provide design details for two types of wing walls based on their size and concrete volume:

- TYPE 1: 1'-6" long by 1'-0" wide by 3'-0" deep (.4 cubic yards)
- TYPE 2: 3'-0" long by 1'-0" wide by 5'-0" deep (1.2 Cubic yards)

The type of wing wall to be used, if required, is determined when a standard foundation is selected from the Foundation Selection Table shown on the plans. For non-standard site-specific pole designs, the contractor-selected pole fabricator will determine whether wings are needed for the pole foundation.

Contact the Engineer for assistance in resolving constructibility issues if wing walls for a foundation are required, but can not be installed because:

- of unforeseen difficulties such as underground utility obstructions,
- the construction of the wings may compromise a roadway base,
- the soil conditions are so unstable that construction of the wings may compromise the integrity of the drill pier shaft,
- underground rock formations make excavation impractical.

B. Excavation:

Excavate for wing walls after boring of the drill pier shaft is complete. Follow excavation procedure as necessary per subarticle 3A. If unstable, caving or sloughing soils are anticipated or encountered, stabilize excavation for wings using temporary shoring during excavation and through concrete placement. In wet pour conditions, advise and gain approval from the Engineer as to the planned construction method intended for the complete installation of the drilled pier prior to performing any excavation of the drill pier or its wings.

C. Reinforcing Steel

Completely assemble the wing wall cage along with the drill pier cage. Install horizontal bars in cone continuous length so they extend completely through the drill shaft cage, out to each wing tip. Follow details described in subarticle 3B. If a drilled pier casing has been installed to construct the drill shaft to stabilize the shaft walls, installation of the wing wall reinforcing steel may not be possible until the drill shaft casing has been extracted. Constructibility issues must be resolved and construction methods approved to the satisfaction of the Engineer prior to assembly of the reinforcing cage.

D. Concrete Placement

Place concrete such that the drilled pier and wing walls are a monolithic structure. Follow provisions described in subarticle 3C. No construction joints or keys will be allowed.

6.5. METHOD OF MEASUREMENT

Actual number of soil tests with SPT borings drilled furnished and accepted.

Vertical linear feet (meters) of drilled pier length (top of pier elevation minus tip elevation, "L") furnished, installed and accepted.

6.6. BASIS OF PAYMENT

The quantity of soil tests with SPT borings, measured as provided above, will be paid for at the contract unit price each as "Soil Test."

The quantity of drilled pier lengths, measured as provided above, will be paid for at the contract unit price per linear foot (linear meter) as "Drilled Pier Foundation (____-inch (mm) diameter)".

Payment will be made under:

Soil Test	Each
Drilled Pier Foundation (____-inch (mm) diameter).....	Linear Foot (Meter)

7. LED BLANKOUT SIGNS

7.1. DESCRIPTION

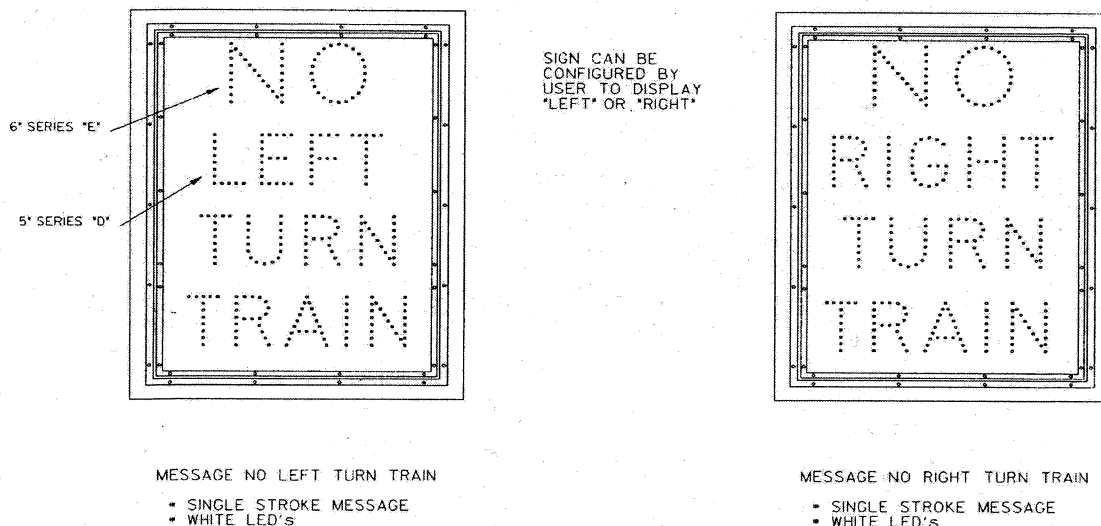
Furnish and install Light Emitting Diode (LED) blank out signs with all necessary hardware as set forth in the plans and specifications. Design the signs with the options to display "NO (LEFT or RIGHT) TURN TRAIN ". Fabricate the sign to be between 27 inches (685 mm) and 29 inches (736 mm) wide, between 37 inches (940 mm) and 39 inches (990 mm) high, and approximately 8 inches (200 mm) deep. Comply with the provisions of Section 1700 of the 2002 Standard Specifications for Roads and Structures.

7.2. MATERIALS

Provide a modular design with the following self-contained modules: message display, rack mounted message drivers, driver rack assembly, and enclosure. Ensure that all internal components are adequately supported to withstand mechanical shock and vibration from ratings meeting AASHTO's requirements of 80 mph (130 km/h) with a 30% gust factor. Design the display to operate without moving parts.

Provide a message display that is a PCB matrix with a mat black solder mask that has a minimum thickness of 0.093 inches (2.36 mm) and a silk screened component identifier. Mount the LEDs on the front of the PCB matrix. Mount all other components on the back of the black matrix. Ensure that a person with 20/20 vision can read a fully intensified, legible message from 500 feet in front of the sign under any light conditions. Ensure the message is not legible when the sign is off, even if in direct sunlight

Use white LEDs that are the latest InGaN technology or better with a minimum luminous intensity of 6,000 mcd at 20 mA. Distribute the LEDs evenly. Ensure that the maximum distance, center to center, between consecutive LEDs is 0.5 inches (12.7 mm), plus or minus 10%. Connect the individual LED light sources so that failure of a single LED will result in a loss of no more than 5 LEDs. Ensure the sign is still legible. Fabricate the message using 6 inch (150 mm) high Series "E" letters for "NO" and 5 inch (125 mm) high Series "D" letters for "LEFT/RIGHT TURN TRAIN."



Protect and seal the rear side of the PCB with a molded polymeric back cover. Mount the display PCB with back cover into the front door, which consist of an aluminum frame and face lens. Provide a clear 0.25-inch (6.0-mm), non-glare, mat finish polycarbonate lens with a UV resistant surface treatment. Ensure that the lens has light transmission properties equal to or greater than 80%

Design the entire display face and door as a one piece, self contained module that can be removed from the sign housing in less than one minute without using tools. Seal the module against dust and moisture intrusion to meet the requirements of NEMA Standard 250-1991 sections 4.7.2.1 and 4.7.3.2 for type 4 enclosures.

Mount the module on the sign housing with three stainless steel "lift-off" hinges, and latch it with a minimum of two stainless steel ¼ turn link locks. Provide a retaining rod to hold the door in the open position. Configure the front door frame assembly to cover a gutter surrounding the full perimeter of the housing body and fit flush to the exterior of the body.

Fabricate the weatherproof housing out of 0.125 inch (3.2 mm) aluminum with all corner seams welded their full length. Weld the full length of all corner seams using tungsten inert gas method. Provide a 1-inch (25-mm) diameter vent plug in four bottom corners of the housing to prevent the collection of water from possible gasket leaks. Ensure each vent plug has a corrosion resistant screen, which allows the passage of water but does not allow insects to enter the housing. Install a terminal block that accommodates a spade lug sized for a number 10 terminal screw. Provide 4 terminals with each having 2 terminal screws that have a shorting bar between them.

Fabricate a mounting fitting and entrance for wires to be compatible with standard traffic signal mounting hardware using Pelco type die cast aluminum mounting hubs with 1.5 inch (40 mm) threaded nipples. Provide stainless steel nuts, bolts, screws, washers, lock washers, etc. Do not use self-tapping fasteners on the exterior of the sign. Ensure that all mechanical fasteners are stainless steel.

Provide a standard 7-inch (178-mm) deep sun visor made of 1/16-inch (1.58 mm) aluminum. Paint the inside of the visor with two (2) coats of dull black paint. Paint the exterior and interior of

R-2911A**Signals & Traffic Management Systems**

the sign case and the outside of the visor Federal Standard 595A yellow by the dry powder method. Apply the yellow finish by electrostatic spray and heat cure. Ensure the thickness of the finish is a minimum of 2.5 mils (64 μm) thick. Apply no paint to the latching hardware.

Provide an aluminum driver rack assembly that is a single part, self-contained module consisting of an interconnect PCB and an anodized aluminum frame. Ensure that it is vented from top to bottom and has latches to lock the modules in place. Design the driver rack assembly to be easily removable in less than one minute without the use of tools.

Design the driver modules to be industry standard 6.5 x 4.5 inches (165 x 114 mm) rack mounted. Provide driver modules that consist of a PCB with aluminum front plate and handle as used for inductive loop detectors. Ensure that the LED current does not exceed the manufacturer's maximum current rating. Ensure that the driver modules are fused. Provide voltage surge protection to withstand high repetition noise transients and low repetition high energy transients as stated in section 2.1.6 of the NEMA Standard TS-2, 1992.

Ensure compatibility and proper triggering and operation with load switches and conflict monitors in signal controllers currently used by the Department. Ensure the on-board circuitry meets FCC title 47, sub-part B, section 15 regulations on the emission of electronic noise. Design the driver modules to maintain a constant LED drive current regardless of the outside temperature.

Design the driver modules to automatically reduce the light intensity of the display by 35% based on the ambient light to reduce long term degradation of the LEDs. Include a 30-second delay to prevent interference caused by extraneous light. Provide an alarm signal that will appear as a high impedance to the power source from the controller cabinet if the display is not operational. Provide a green LED for power status and a red LED for alarm status on the drive module.

Design the interconnect PCB to include terminals for all field wiring, 120VAC controls, external photocell, and alarm signals. Design all interconnections within the sign to be accomplished through the PCB with no internal wiring with the exception of a single cable for the message display and wires from the input terminal block. Provide a multi-conductor cable with an individual 2-pin connector for each word. Identify all connectors and terminals by the silk screen identifier on the surface of the PCB. Mount all PCBs vertically to facilitate air-cooling and to prevent collection of dust and moisture

Design and certify the LED blank out sign to operate over a temperature range of -35°F (-37°C) to 165°F (74°C) with an operating voltage range of 105 to 130 volts (60 Hertz). Ensure that all electronic components are standard industry items that are available from wholesale electronics distributors. Provide components that are "solid state" type. Do not use electro-mechanical components such as relays, transformers or solenoids.

Guarantee the materials and workmanship of all equipment provided under this section for a period of five years. All warranties and guarantees that are customarily issued by the equipment manufacturers that exceed this requirement shall be acceptable to the Department. Begin the warranty period on the date of the final acceptance of all work if contractor supplied, or on the date of installation if supplied to the Department by a manufacturer or manufacturer's representative. Guarantee all parts and labor necessary or incidental to the repair of any defect in equipment or workmanship and malfunctions that arise during the guarantee period. Provide the guarantee to the Department in writing prior to final acceptance of the work and material. Obtain the Engineer's approval of the guarantee's wording.

R-2911A

Signals & Traffic Management Systems

Ensure that the manufacturer’s warranties and guarantees delivered to a contractor includes the provision that they are subject to transfer to the Department or its designated maintaining agency, and provide proper validation from the manufacturer. Transfer warranties and guarantees to the Department at the time of acceptance of the work.

The state shall have the discretion to perform warranty work at the Traffic Electronics Center by NCDOT electronics technicians or to have warranty work performed by the vendor. The vendor shall provide bench repair training on the manufacturer’s equipment as required by the bid document or plans at no additional cost to the State unless otherwise specified. In addition to any formal training requirements, the vendor agrees to provide the following upon request: 1) Prompt technical support to the State repair personnel during the contract and for a period of one year after the end of the warranty period at no cost to the State; 2) Provide parts to the Traffic Electronics Center for all warranty repairs at no cost to the State (defective parts replaced under warranty by the Traffic Electronics Center will be returned to the vendor for examination at the vendor’s request); 3) Provide schematics and other documentation required to perform bench repair to the Traffic Electronics Center within two weeks of request. Upon request from the vendor, the Department agrees not to divulge any proprietary information contained in those documents.

At the request of the State, the vendor shall perform warranty repairs to equipment that fails during the warranty period at no cost to the State including freight costs to ship repaired equipment back to the NCDOT Traffic Electronics Center. The State shall pay freight charges to ship equipment to the vendor or manufacturer. All equipment shall be repaired and returned to the Department Traffic Electronics Center within 21 calendar days of receipt by the vendor.

7.3. CONSTRUCTION METHODS

Install LED blank out signs with wire entrance fittings, span wire cable mounting assemblies, pedestal mounting assemblies, signal cable, lashing wire, and all necessary hardware.

7.4. METHOD OF MEASUREMENT

Actual number of LED blankout signs with mounting hardware furnished, installed, and accepted.

7.5. BASIS OF PAYMENT

The quantity of LED blankout signs, measured as provided above, will be paid for at the contract unit price each for “LED Blankout Sign.”

Payment will be made under:

LED Blankout Sign.....Each

8. REMOVAL OF EXISTING TRAFFIC SIGNAL INSTALLATIONS

8.1. DESCRIPTION

Remove existing traffic signal installations.

8.2. CONSTRUCTION METHODS

A. General:

Remove existing traffic signal installations at the following locations:

Existing US 70 (Y1) and Bethesda Rd. (SR 2359) (12-1405)

Signals & Traffic Management Systems

Maintain and repair traffic signal equipment within the limits of the project until the traffic signal equipment is disconnected and stockpiled.

B. Removal:

Dismantle and remove existing traffic signal equipment and material, excluding joint use poles. Disconnect and remove all Department equipment from joint use poles in a manner that will not damage the poles or existing utilities. Cut electrical conduit and remove to at least 18 inches below finished ground elevation unless otherwise directed by the Engineer.

Install the required regulatory signs in accordance with Sections 900, 901, and 903 of the 2002 Standard Specifications for Roads and Structures before deactivating the traffic signal installation. Cover the signs with burlap bags until the traffic signal is put into flashing operation.

Place the traffic signal installation into flashing operation and immediately uncover the signs. Allow to operate in the flash mode for a minimum of one week.

Deactivate, dismantle, and remove the traffic signal installation after the one-week period unless otherwise required by the Engineer.

Use methods to remove the traffic signal installation that will not result in damage to other portions of the project or facility. Repair damage that results from the Contractor's actions at no additional cost to the Department.

Final acceptance of the project shall be contingent upon the removal of the existing traffic signal installation. Removal of the existing traffic signal is part of the work required by the final completion date.

C. Disposal:

Remove all Department traffic signal equipment, span poles, messenger cable, interconnect cable, and supporting hardware that will not be reused. Assume ownership and promptly transport the removed poles, messenger cable, interconnect cable, and supporting hardware. Return all other traffic signal equipment and material to the Traffic Services Office within the Division responsible for the administration of the project.

Return the removed equipment and material between the hours of 8:00 a.m. and 12:00 p.m. Monday through Thursday, or at a time mutually agreed upon by the Contractor and the Engineer. Replace or repair all material lost or damaged during its removal and transit. Label all returned equipment and material to indicate its original location.

8.3. METHOD OF MEASUREMENT

Actual number of intersections that were completely cleared of all traffic signal equipment. The traffic signal equipment shall have existed along the roadway before the start of construction on the project, shall have had no changes made to the phasing or timing by the Contractor, shall have had no additional equipment installed by the Contractor during the life of the project (excluding equipment for maintenance), and shall have been removed as a part of the project.

8.4. BASIS OF PAYMENT

The quantity of intersections removed of traffic signal installations, measured as provided above, will be paid for at the contract unit price each for "Traffic Signal Removal."

Payment will be made under:

Traffic Signal Removal.....Each

Project R-2911A

Iredell County

**Project Special Provisions
Structures & Culverts**

Table of Contents

	Page #
Maintenance & Protection of Traffic Beneath Proposed Structure at Station 41+59.472 -L- (LT & RT Lanes) (10-12-01)	1
Falsework and Forms Over or Adjacent to Traffic (10-12-01)	1
Drilled Piers (10-03-02)	2
Crosshole Sonic Logging (7-9-02)	20
Mechanical Butt Splicing For Reinforcing Steel (10-12-01)	26
Pot Bearings (10-12-01)	27
Thermal Sprayed Coatings (Metallization) (2-14-04)	31
Minimizing Railroad Flagging Service (10-12-01)	35
Evazote Joint Seals (02-04-03)	36
Epoxy Protective Coating (10-12-01)	40
Elastomeric Concrete (10-12-01)	42
Falsework and Formwork (10-12-01)	43
Submittal of Working Drawings (2-14-04)	48
Metric Structural Steel (10-12-01)	54
Optional Disc Bearings (10-03-02)	55
Elastomeric Bearings (10-03-02)	59
Railroad Provisions (SPECIAL)	



Quang H. Nguyen 6-17-04

PROJECT SPECIAL PROVISIONS
STRUCTURE AND CULVERT

PROJECT R-2911A

IREDELL COUNTY

MAINTENANCE AND PROTECTION OF TRAFFIC (10-12-01)
BENEATH PROPOSED STRUCTURE AT STATION 41+59.472 -L-
(LT & RT. LANES)

Maintain traffic on SR 2527 as shown in Traffic Control Plans and as directed by the Engineer.

Maintain a minimum temporary vertical clearance of 5 m at all times during construction. Construct the proposed bridge using approved methods that cause minimum restriction in clearance.

Submit plans for protecting traffic at the above station before beginning work at this location. Design the protective system for any operation that affords the opportunity for construction materials, equipment, tools, etc. to be dropped into the path of traffic beneath the structure. Design the protective system to include flooring to be installed between beams or girders over any travelway or shoulder area where traffic is maintained. In addition, for these same areas, keep the overhang falsework in place until after the rails have been poured. Install the protective system before beginning any construction operations over traffic.

Payment at the contract unit prices for the various pay items will be full compensation for the above work required for protecting traffic.

FALSEWORK AND FORMS OVER OR ADJACENT TO TRAFFIC (10-12-01)

This Special Provision applies in addition to Article 420-3 of the Standard Specifications.

This Special Provision covers falsework or forms including metal stay-in-place forms and precast concrete deck panels erected over vehicular, pedestrian or railroad traffic, or vessel traffic on navigable waterways. It also covers falsework and forms for those parts of a substructure unit constructed within 20 ft. (6 m) of the edge of a travelway or railroad track and more than 25 ft. (7.6 m) above the ground line at the time of substructure construction.

1.0 SUBMITTALS

Submit detailed drawings as required by the Standard Specifications or other Special Provisions and one set of design calculations for falsework and forms for review and acceptance before beginning construction of the falsework or forms. Have the drawings and design calculations prepared, signed and sealed by a North Carolina Registered Professional Engineer. These submittal requirements apply to all falsework and form systems covered by this Special Provision.

2.0 DESIGN

Design falsework and forms for the combined effects of dead load and live load and with appropriate safety factors in accordance with these Special Provisions and the respective design codes of the materials used. Include the weight of concrete, reinforcing steel, forms and falsework in the dead load. Live load includes the actual weight of any equipment the falsework supports, applied as concentrated loads at the points of contact, and a uniform load of not less than 20 lbs/ft² (1.0 kPa) applied over the supported area. In addition, apply a line load of 75 lbs/ft (1.1 kN/m) along the outside edge of deck overhangs.

3.0 INSPECTION

Before the form or falsework system is loaded, inspect the erected falsework and forms and submit a written statement certifying that the erected falsework system complies with the accepted detailed drawings prepared by the Registered Professional Engineer. Submit a separate certification for each span, unit, or bridge component. Any condition that does not comply with the accepted drawings, or any other condition deemed unsatisfactory by the Engineer, is cause for rejection until corrections are made.

4.0 BASIS OF PAYMENT

Payment at the contract unit prices for the various pay items will be full compensation for the above work required for falsework or forms.

DRILLED PIERS

(10-03-02)

1.0 GENERAL

A. Description

The work in this special provision governs the construction of Drilled Piers, also known as "Drilled Shafts" and "Caissons". Drilled piers are a reinforced concrete section, cast-in-place against in situ, undisturbed material. Drilled piers are a straight shaft type and vertical. Construct drilled piers in accordance with the details and dimensions shown on the plans and the requirements of this special provision.

B. Work Experience

The Contractor/Subcontractor and the Contractor's/Subcontractor's superintendent performing the work described in this special provision is required to have installed drilled piers of both diameter and length similar to those shown on the plans and have a minimum of five years experience with underwater concrete placement prior to the bid date for this project. This work is performed under the supervision of the Contractor's/Subcontractor's superintendent, who is knowledgeable and experienced in the construction of drilled piers using casing and/or slurry. Use equipment that has the capacity to undertake the work and is sufficient to complete the work within the

specified contract time. Furnish evidence of experience and expertise that the Contractor/Subcontractor meets the following requirements.

To verify the ability to construct drilled piers for this project, submit a list containing a description of at least two projects completed in the last five years on which those responsible for the drilled pier construction have installed drilled piers of similar size as shown in the plans and with similar excavation techniques anticipated for this project. Include on the list of projects the names and phone numbers of the project owner's representatives who can verify the Contractor/Subcontractor's participation on the project.

C. Construction Sequence Plan

Develop and submit a drilled pier construction sequence plan for all the drilled piers for review and acceptance 30 days prior to beginning construction of the drilled piers. Provide detailed project specific information in the drilled pier construction sequence plan including:

1. Work experience in accordance with Section 1.0, Item B.
2. List and size of proposed equipment including: cranes, kelly bars, drill rigs, vibratory hammers, augers, core barrels, cleanout buckets, airlifts and/or submersible pumps, tremies and/or concrete pumps, casing (diameters, thicknesses and lengths), desanding equipment (for slurry construction), etc.
3. Details of the sequence of drilled pier construction, including the order of drilled pier construction.
4. Details of pier excavation methods.
5. Details of proposed methods to clean the pier excavation bottom.
6. Details of reinforcement placement including support and method to center in the excavation.
7. Details of concrete placement including proposed operational procedures for the concrete tremie or pump; including initial placement, how the tremie or pump is raised during concrete placement and what type of discharge control is proposed to prevent concrete contamination when the tremie or pump is initially placed in the excavation.
8. Details of casing installation and temporary casing removal including order of telescoped casing removal.
9. Required submittals for concrete mix designs.
10. Details of the slurry to be used (if applicable), including: product information, manufacturers mixing instructions, slurry equipment information and how the

Contractor proposes to use the slurry. Also, submit a written approval from the bentonite supplier that the water to be used is acceptable.

11. Details on the handling of drilling spoils and slurry overflow including environmental control procedures used to prevent the loss of concrete, slurry and spoils.
12. Details of how the level of slurry is maintained above the highest piezometric pressure head (if applicable).
13. Other information shown in the plans or requested by the Engineer.

The Engineer reviews the drilled pier construction sequence plan for conformance with the plans, specifications and special provisions. Within 15 days of receiving the plan, the Engineer notifies the Contractor of any additional information required and/or changes that are necessary to satisfy the plans, specifications and special provisions. Submit changes for re-evaluation of any unsatisfactory part of the construction sequence plan that is rejected. The Engineer responds to the Contractor within 7 days after receiving the proposed changes.

If any changes in procedure are made during the construction of the drilled piers, inform the Engineer in writing and await approval of the proposed modifications prior to the construction of the remaining drilled piers.

D. Preconstruction Conference

After the drilled pier construction sequence plan is accepted but prior to beginning any drilled pier work, schedule a drilled pier preconstruction conference with the drilling superintendent, the Concrete Supplier, the Resident Engineer including the inspector, the Area Bridge Construction Engineer and the Soils and Foundation Design Engineer to discuss construction and inspection of the drilled piers.

E. Definition of Rock

For the purposes of this special provision, "Rock" is defined as a continuous intact natural material in which the penetration rate with a rock auger is less than 2 inches (50 mm) per 5 minutes of drilling at full crowd force. This definition excludes discontinuous loose natural materials such as boulders and man-made materials such as concrete, steel, timber, etc.

F. Rock Socket

When required by a plan note, provide a minimum penetration into rock as directed by the Engineer.

2.0 EXCAVATION

Perform the excavations required for the drilled piers to the dimensions and elevations shown on the plans or otherwise required by the Engineer, including any miscellaneous grading or excavation to install the drilled pier.

Excavate the drilled pier with a drill rig of adequate capacity. Use a rig that is capable of drilling through soil and non-soil including rock, boulders, timbers, man-made objects and any other materials encountered. Blasting is not permitted to advance the excavation. Blasting for core removal is only permitted when approved by the Engineer. Use a drill rig capable of drilling a minimum of 25% deeper than the deepest drilled pier shown in the plans. Use drilling tools equipped with vents designed to stabilize the hydrostatic pressure above and below the tool during extraction from the excavation. For drilled piers constructed with slurry, monitor the rate at which the drilling tools are inserted and extracted so as to minimize sidewall suction action in the excavation. Drilling below the tip elevations shown on the plans is required if necessary to achieve adequate bearing.

Maintain a drilling log during the drilled pier excavation and provide it to the Engineer. Include in the log information such as top and bottom elevation of each stratum encountered, drilling tools used and drilling time in each stratum and material descriptions of each soil and rock layer.

Drilling spoils consist of all material excavated including water removed from the excavation either by pumping or with augers. Dispose of spoils, with the exception of those containing slurry, as directed by the Engineer and in accordance with Section 802 of the Standard Specifications.

Construct drilled piers at the locations shown on the plans and 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 the drilled piers such that the axis at the top of the piers is no more than 3 inches (75 mm) in any direction from the position indicated in the plans. Build drilled piers within 1% of the plumb deviation for the total length of the piers. Measure the plumbness of the drilled piers by an accurate procedure, such as an inclinometer on the kelly bar or other approved techniques. Unless a plan note requires the construction joint to be moved below the ground line, construct the finished top of pier elevation between 1 inch (25 mm) above and 3 inches (75 mm) below the top of pier elevation shown on the plans.

When drilling from a barge, use a fixed template that maintains shaft position and alignment during all excavation and concrete placement operations. Floating templates (attached to a barge) are not allowed unless approved by the Engineer.

Stabilize all drilled pier excavations with steel casing and/or bentonite slurry except, as approved by the Engineer, the portions of the excavations in rock as defined by Section 1.0, Item E. Stabilize excavations at all times from the beginning of drilling through concrete placement. Provide casing or slurry in rock if unstable material is anticipated or encountered during drilling. When slurry is used, a partially excavated pier is subject to the

time requirements in Section 2.0, Item C, Number 1. When slurry is not used, do not leave a partially excavated pier open overnight unless the excavation is cased to rock.

If the tip of the drilled pier excavation is in rock as defined by Section 1.0, Item E, dewater the excavation to the satisfaction of the Engineer. The minimum diameter of the drilled pier excavation in rock is 2 inches (50 mm) less than the design drilled pier diameter shown on the plans.

If electing to remove a casing and substitute a larger diameter or longer casing through unstable or caving material, either backfill the excavation or stabilize it with a bentonite slurry prior to removing the casing to be replaced. Use other methods, as approved by the Engineer, to control the stability of the excavation during casing replacement.

A. Permanent Steel Casing

Use permanent steel casings as directed by the Engineer and/or a note on the plans. Use permanent casings that are clean smooth non-corrugated watertight steel of ample strength to withstand handling and driving stresses and the pressures imposed by concrete, earth or backfill. Provide permanent casing steel conforming to ASTM A252, Grade 2. The minimum wall thickness of the permanent steel casing depends on the casing diameter and the following requirements.

CASING WALL THICKNESS

Casing Diameter	Minimum Wall Thickness
Less than 42 inches (1066 mm)	3/8 inch (9 mm)
42 inches (1066 mm) to 78 inches (1982 mm)	1/2 inch (12 mm)
Greater than 78 inches (1982 mm)	5/8 inch (16 mm)

Provide permanent casings with an outside diameter not less than specified size of the drilled pier. If approved by the Engineer, a permanent casing larger in diameter than the drilled pier design diameter is permitted. No payment will be made for additional construction materials or other costs associated with a request for a larger casing diameter. Extend the permanent casings from the top of pier elevation or top of permanent casing elevation if shown on the plans to a depth not greater than the permanent casing tip elevation shown on the plans. If electing to extend the permanent steel casing below the permanent casing tip elevation, get prior approval from the Engineer and provide additional drilled pier length if required. No payment will be made for the additional drilled pier length and casing unless the previously approved extension is necessary for dewatering purposes. Place all permanent casings in contact with undisturbed material. Install permanent casing in one continuous unit. If splices are necessary for the casing, use an approved method of splicing. Splices are considered incidental and no additional compensation will be allowed if approved.

Remove any portion of the permanent steel casing that extends above the top of the drilled pier after the drilled pier concrete has achieved a compressive strength of 4500

psi (31.0 MPa). The cost of casing removal will be considered incidental to the cost of the permanent steel casing.

B. Temporary Steel Casing

Provide temporary casing to stabilize drilled pier excavations, protect personnel and prevent caving or sloughing, that is clean smooth non-corrugated watertight steel of ample strength to withstand handling and driving stresses and the pressures imposed by concrete, earth or backfill.

Use temporary steel casings with an outside diameter not less than the specified size of the piers, except for casing to protect inspection personnel. Temporary steel casings are subjected to the same minimum wall thickness requirement as permanent steel casings as shown in Section 2.0, Item A.

Temporary steel casings that become bound or fouled during pier construction and cannot be practically removed constitute a defect in the drilled pier. Improve such defective shafts to the satisfaction of the Engineer by removing the shaft concrete and extending the shaft deeper, providing a replacement shaft, or other acceptable means. Complete all corrective measures including redesign as a result of defective shafts to the satisfaction of the Engineer without additional compensation or an extension of the completion date of the project.

C. Slurry

When slurry use is not noted on the plans, slurry construction is an option.

Use slurry composed of bentonite having a mineral grain size that remains in suspension and sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system to minimize or eliminate bottom sedimentation. Provide material used to make the suspension with a percentage and specific gravity sufficient to maintain the stability of the excavation and allow for proper concrete placement.

When slurry is used and permanent steel casing is not required, use temporary casing a minimum of 10 feet (3 m) long at the top of the excavation. Maintain the top of the temporary casing a minimum of 1 foot (300 mm) above the ground surface surrounding the casing. This temporary casing is also subject to the minimum wall thickness as required for permanent steel casing as shown in Section 2.0, Item A.

Maintain the slurry in the pier excavation at a level not less than 5 feet (1.5 m) or the drilled pier diameter (whichever is greater) above the highest piezometric pressure head along the depth of the pier. It is anticipated that the highest piezometric pressure head is the static water elevation or the groundwater elevation. However, the Contractor is responsible for determining the highest piezometric pressure head. The use of steel casing to maintain the required slurry level is permitted; however, in accordance with the basis of payment for permanent steel casing, no payment will be made for casing that is cut off. If the slurry level in the excavation suddenly changes or cannot be

practically maintained, or the slurry construction method does not produce the desired result, stop the pier construction until an alternate construction procedure is approved by the Engineer.

Thoroughly premix the bentonite slurry with clean, fresh water. Have a sample of the water used on the project tested by an independent laboratory, at no additional cost to the Department, to verify that it is suitable for use with the bentonite slurry. Submit written approval from the bentonite supplier that the water to be used is acceptable. Allow 24 hours for hydration of the slurry, prior to introduction into the pier excavation. Slurry tanks of adequate capacity are required for slurry circulation, storage and treatment. Excavated slurry pits are not allowed in lieu of slurry tanks without prior approval from the Engineer. Take all steps necessary to prevent the slurry from "setting up" in the drilled pier. Such methods include, but are not limited to: agitation, circulation and/or adjusting the properties of the slurry. Provide desanding equipment as necessary to achieve a slurry sand content of 2% or less by volume prior to placement of the reinforcement steel.

1. Time

Adjust the excavation operations so that the maximum time the slurry is in contact with the sidewalls of the uncased portions of the drilled pier excavation (from time of drilling to completing concrete placement) does not exceed 24 hours. Also, agitate the slurry in the drilled pier excavations a minimum of every 4 hours. Do not allow an excavated slurry shaft below the steel casing to go unagitated overnight. Do not work on more than two drilled piers per drill rig below the steel casing at any time.

If the 24 hour time limit is exceeded, overream the drilled pier excavation beneath the steel casing a minimum of 1 inch (25 mm) and a maximum of 3 inches (75 mm), or as required by the Engineer, prior to performing other operations in the excavation. Overream with a grooving tool, overreaming bucket or other approved equipment at a minimum spacing of 12 inches (300 mm). The Contractor bears all costs associated with both overreaming and additional shaft concrete placement at no additional cost to the Department.

If concrete placement is not completed within three days of beginning drilling, enlarge the design drilled pier diameter by a minimum of 6 inches (150 mm), or as required by the Engineer, the entire length of the pier at no additional cost to the Department. Enlarging the drilled pier includes replacing the steel casing with steel casing the same size to which the drilled pier is enlarged at no additional cost to the Department.

2. Sampling

Take all slurry samples using an approved sampling tool. Test slurry samples to determine density, viscosity and pH to establish an acceptable working pattern during slurry use. Test a minimum of four samples during each 8 hours of slurry

use for each drilled pier. Take the first sample for the first 8 hours from the slurry tank prior to introduction into the pier excavation. Take the remaining samples from the bottom of the drilled pier excavation. When the test results are acceptable and consistent, a decrease in the testing frequency to one sample per 4 hours of slurry use is permitted.

Prior to placing the reinforcing steel in any drilled pier excavation, extract slurry samples from the bottom of each pier excavation and at intervals not exceeding 10 feet (3 m) up the pier, until two consecutive samples produce acceptable values for density, viscosity, pH and sand content.

3. Testing

Have a qualified Engineer or technician, approved by the Engineer, conduct control tests to determine density, viscosity and pH. Use suitable apparatus for the control tests. The following table shows the acceptable range of values for those physical properties:

BENTONITE SLURRY Sodium Montmorillonite (Commercial Bentonite) Acceptable Range of Values			
Property (units)	At Time of Slurry Introduction	In Hole at Time of Drilling	Test Method
Density, pcf (kg/m ³)	64.3 – 69.1* (1030-1107*)	64.3 – 75.0* (1030-1201*)	Density Balance
Viscosity, sec./quart (sec./0.95 liters)	28 – 45	28 – 45	Marsh Cone
pH	8 – 11	8 – 11	pH paper pH meter
* Increase the density by 2 pcf (32 kg/m ³) in saltwater.			
Notes:			
1. Perform tests when the slurry temperature is above 40°F (4.4°C).			
2. The maximum sand content is 2% by volume at any point in the borehole prior to placement of the reinforcement steel as determined by the American Petroleum Institute sand content base.			
3. When field conditions warrant, an adjustment to the limits and test methods in the above table is permitted only after a successful test hole demonstration. Obtain the Engineer's written approval before use.			

When any slurry samples are found to be unacceptable, take whatever action is necessary to bring the bentonite slurry within specification requirements. Do not place reinforcement steel until resampling and testing produce acceptable results.

Generate reports of all tests required above, have them signed by an authorized representative, and submit them to the Engineer upon completion of each drilled pier. Representatives of the Department reserve the right to perform comparison tests as determined necessary during bentonite slurry operations.

4. Slurry Disposal

Comply with all applicable local, state and federal regulations, as well as with the environmental permits of the project when disposing of excavated materials contaminated with slurry. Keep all excavated materials, spoils from the desanding unit and slurry out of the water and contain them at all times. The cost of the containment, removal and disposal of excavated materials contaminated with slurry, as well as the slurry itself, is incidental to the cost of constructing the drilled piers.

3.0 CLEANING

Excavate the bottom of the drilled pier to a level plane or stepped with a maximum step height of 12 inches (300 mm). Regardless of construction methods used, clean the bottom of the excavation of loose material using a technique approved by the Engineer. When the drilled pier excavation can not be dewatered and is not hand cleaned, clean the bottom of the excavation with a cleanout bucket and an airlift or submersible pump.

4.0 INSPECTION METHODS AND REQUIREMENTS

After the drilled pier excavation is complete and immediately prior to placement of the reinforcing steel and concrete, demonstrate the proper condition of the drilled pier excavation to the Engineer for verification. Provide bosun chairs, gas meters, safety equipment, lights, mirrors, weighted tape measures, steel probes, personnel and all assistance required for the Engineer to inspect the drilled pier excavations.

A. Bearing Capacity

One or more of the following tests are used to verify the conditions and continuity of the bearing material prior to placement of the reinforcing steel. If the required tip bearing capacity is not satisfied, then increase the drilled pier length as determined by the Engineer. Payment for the additional length of the drilled pier to achieve adequate bearing will be made per the drilled pier pay items.

1. Visual Inspection

The tip bearing of the drilled pier excavation is inspected either by entering the excavation or visually from the top of the excavation as directed by the Engineer.

2. Test Hole

If the tip of the drilled pier excavation is in rock as defined by Section 1.0, Item E, drill one or more 1½ inch (38 mm) diameter test holes in each drilled pier to a depth at least 6 feet (1.83 m) below the tip elevation.

3. Standard Penetration Test (SPT)

When noted on the plans that a SPT is required, drive a split barrel sampler a minimum of 18 inches (450 mm) below the drilled pier tip elevation or to refusal in accordance with ASTM D1586. Complete the SPT using NW rods through casing or another stabilizing method as approved by the Engineer. Extend the SPT rods from the top of the drilled pier excavation to the drilled pier tip elevation. Firmly support the SPT casing at the top of the drilled pier excavation and rest it on the bottom of the excavation. Conduct the SPT a minimum of 12 inches (300 mm) away from the sidewalls of the excavation and be sure not to scrape the sidewalls of the excavation while inserting or withdrawing the SPT equipment. Have the SPT device on-site prior to reaching the drilled pier tip elevation. Report the number of blows needed to drive the split barrel sampler and a description of the recovered soil sample to the Engineer. The Engineer determines the number of blows required for bearing.

B. Bottom Cleanliness

One or more of the following inspection procedures are used to check the cleanliness of the pier excavation bottom prior to placement of the reinforcement steel and concrete.

The pier excavation bottom is considered clean if a minimum of 50% of the bottom area has less than ½ inch (13 mm) of sediment and no portion of the bottom area has more than 1½ inches (38 mm) of sediment as determined by the Engineer.

1. Visual Inspection

The cleanliness of the drilled pier excavation bottom is observed either by entering the excavation or from the top of the excavation as directed by the Engineer.

2. Steel Probe

If the excavation is not dewatered or if the Engineer requires it, lower a steel probe to the bottom of the drilled pier excavation to ensure that cleaning has been satisfactorily completed. Supply a steel probe that is 2 feet (0.6 m) long with a flat tip on the sounding end, weighs approximately 9 pounds (#10 rebar) (4 kg, #32 rebar) and is suspended from the opposite end with a non-stretch cable.

3. Shaft Inspection Device (SID)

When noted on the plans, the SID is used to take sediment measurements and observe the bottom conditions of the drilled pier excavation at a minimum of five locations selected by the Engineer. The SID is a remotely operated camera capable of observing bottom conditions and measuring sediment underwater and slurry. Each SID inspection (including all 5 locations) takes approximately 1 hour after the equipment has been set up. The Engineer provides the SID and the personnel to operate the device. Notify the Engineer a minimum of 2 days prior to beginning the drilled pier excavation so the Engineer can arrange for the transportation of the SID

to the site and the personnel to perform the inspections. SID inspections are required until the cleanliness of the drilled pier excavation bottom is acceptable in accordance with Section 4.0, Item B of this special provision. Do not conduct operations that interfere with the SID inspections as directed by the Engineer. Remove all cleaning and drilling equipment from the drilled pier excavation during any SID inspection. Provide a working area large enough for the SID equipment, within the reach of the cabling supplied, and within clear sight distance of the drilled pier excavation, as directed by the Engineer. Assist the Engineer in the transportation and handling of the SID and all the associated equipment and in supporting the electric hoist and/or hoisting tripod for the SID, as directed by the Engineer. Provide a safe and secure storage area for the SID and all the associated equipment while it is located unattended on the project site. If any of the SID equipment is damaged, lost or stolen due to the Contractor's negligence, then replace the equipment at no additional cost to the Department. Provide replacement equipment that exactly matches the damaged, lost or stolen equipment as directed by the Engineer. All costs involved with the initial SID inspection of each drilled pier excavation will be made per the SID pay item. No additional payment will be made for subsequent or repeated SID inspections of the same drilled pier excavation. Claims against the Department for either lost time or actual expense of any SID inspections that do not find the cleanliness of the drilled pier excavation bottom in compliance with this special provision are not permitted.

5.0 REINFORCING STEEL

Completely assemble a cage of reinforcing steel, consisting of longitudinal and spiral bars and place it in the drilled pier excavation as a unit immediately after the proper condition of the excavation is demonstrated to the Engineer. When concrete placement does not follow immediately after cage placement, remove the steel from the pier excavation unless the Engineer directs otherwise. If the cage is removed, recheck pier excavation cleanliness in accordance with this special provision prior to reinstallation of the cage.

If the drilled pier excavation is cased down to rock, immediate placement of the reinforcing steel and the concrete is not required. If electing to delay placement of the reinforcing steel and concrete due to the presence of rock, recheck the excavation for proper cleanliness immediately prior to placement of the reinforcing steel.

A. Construction, Placement, Support and Alignment

If it is determined in the field that the drilled pier must be longer, adequate reinforcement is required in the extended length as directed by the Engineer. Lift the cage so racking and cage distortion does not occur. Keep the cage plumb during concrete operations and casing extraction. Check the position of the cage before and after placing the concrete. Position the splice length of the drilled pier cage so that the column or footing has the minimum concrete cover shown on the plans.

Securely cross-tie 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 6 inches (150 mm).

B. Bolsters, Blocks and Spacers

Do not set the cage on the bottom of the drilled pier excavation. Place plastic bolsters under each vertical reinforcing bar. If required by the Engineer, provide concrete blocks instead of plastic bolsters to limit rebar cage settlement. Place blocks under each vertical rebar that have a 4 inch (100 mm) minimum diameter and that have a depression to receive the vertical reinforcing bar. Ensure that the blocks are tall enough to raise the rebar cage off the bottom of the drilled pier excavation a minimum of 3 inches (75 mm).

In order to ensure a minimum of 4 inches (100 mm) of concrete cover and achieve concentric spacing of the cage within the pier, tie plastic spacer wheels, subject to the Engineer's approval, at five points around the cage perimeter. Use spacer wheels that provide a minimum of 4 inches (100 mm) "blocking" from the outside face of the spiral bars to the outermost surface of the drilled pier except in rock as defined by Section 1.0, Item E. Use spacer wheels in the rock zone that provide a minimum of 2 inches (50 mm) "blocking". 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 (3 m) intervals. At the Engineer's direction, supply additional peripheral spacer wheels and closer intervals if necessary.

6.0 CONCRETE

Begin concrete placement immediately after inserting reinforcing steel into the drilled pier excavation. Prior to placing concrete, assure the Engineer that sufficient quantities of concrete are available and that sufficient transportation is committed to the project to deliver the concrete within the time frame set forth within this special provision.

A. 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 Standard Specifications.

Designate the concrete as Drilled Pier Concrete with a minimum compressive strength of 4500 psi (31.0 MPa) at 28 days. Make certain the cementitious material content complies with one of the following options:

- Provide a minimum cement content of 640 lbs/yd³ (380 kg/m³) and a maximum cement content of 800 lbs/yd³ (475 kg/m³); 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 (1.2 kg) of fly ash per lb (kg) of cement removed.

- If Type IP blended cement is used, use a minimum of 665 lbs/yd³ (395 kg/m³) Type IP blended cement and a maximum of 833 lbs/yd³ (494 kg/m³) 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 (125 and 175 mm) for dry placement of concrete or 7 and 9 inches (175 and 225 mm) 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 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 approval of the Engineer. Use admixtures that satisfy AASHTO M194 and add them at the concrete plant when the mixing water is introduced into the concrete. Redosing of admixtures is not 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 (32°C) or less.

1. Slump Loss Test

If any drilled pier concrete pour is greater than 40 yd³ (31 m³) per pier, provide a slump loss test before beginning the drilled pier operation. The slump loss test verifies that the drilled pier concrete maintains a slump of at least 4 inches (100 mm) a minimum of 4 hours after batching. Perform the test with a Division of Highways representative present. Have the concrete producer notify the Department at least 72 hours prior to the test.

Conduct the slump loss test as follows:

- a. Batch the actual mix design at 9 inches (225 mm) initial slump and at the highest concrete temperature expected on the job, but no less than 60°F (15.5°C).
- b. Batch at least 4 yd³ (3 m³) in a mixer truck. Begin timing the test when the mixing water is introduced into the mix.
- c. After initial mixing, measure and record the slump, ambient temperature, concrete temperature and percent air. Ensure all concrete properties are within specifications.
- d. Mix the concrete intermittently at agitation speed for 30 seconds every 15 minutes.

- e. Measure and record the slump, ambient and concrete temperatures, and percent air after every second 15 minute interval until the slump is 3½ inches (90 mm).

Make certain the concrete maintains a minimum slump of 4 inches (100 mm) 4 hours after batching.

Once a mix design is accepted and the slump loss test is on file with the Materials and Tests Unit, resubmit the design for subsequent projects without the slump loss test.

B. Concrete Placement

Place concrete such that the drilled pier is a monolithic structure. Vibration is only permitted, if needed, in the top 10 feet (3 m) of the drilled pier or as directed by the Engineer. Remove any contaminated concrete from the top of the drilled pier and the wasted concrete from the area surrounding the drilled pier. Contain all concrete that spills over the permanent casing of the drilled pier.

Do not remove temporary casing until the level of concrete within the casing is in excess of 10 feet (3 m) above the bottom of the casing being removed. Maintain the concrete level at least 10 feet (3 m) above the bottom of innermost casing throughout the entire casing extraction operation, except when concrete is at or above the top of drilled pier elevation. Sustain a sufficient head of concrete above the bottom of casing to overcome outside soil and water pressure. As the 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 and/or vibrating the temporary casing is permitted to facilitate extraction.

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 (150 mm) per half hour, the concrete placement is considered dry. If the water inflow rate is greater than 6 inches (150 mm) per half hour, the concrete placement is considered wet.

Keep a record of the volume of concrete placed in each drilled pier excavation and make it available to the Engineer. For drilled piers constructed with slurry or as directed by the Engineer, record a graphical plot of the depth versus theoretical concrete volume and actual measured concrete volume for each drilled pier and provide it to the Engineer when finished placing concrete.

1. Dry Placement

Prior to 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. If the concrete free fall does not exceed 60 feet (18.3 m), placing the concrete by a central drop method where the concrete is chuted directly down the center of the excavation is permitted.

For drilled piers exceeding 60 feet (18.3 m) in length, use a tremie or a pump to place concrete as described in Section 6.0, Item B, Number 3. Support the tremie or pump so that the concrete free fall is less than 60 feet (18.3 m) at all times.

2. Wet Placement

Maintain a static water or slurry level in the excavation prior to placing concrete underwater. When temporary casing is used as the method to stabilize the excavation, place concrete only with a pump (no tremie).

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 the water above the concrete and clean the concrete surface of all scum and sediment to expose clean, uncontaminated concrete.

3. Tremie and Pump

Place concrete with a tremie or a pump in accordance with the applicable parts of Sections 420-6 and 420-8 of the Standard Specifications that concern tremie and/or concrete pumping operations. Use a tremie consisting of a sectional tube a minimum of 10 inches (254 mm) in diameter unless otherwise approved or directed by the Engineer. 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 (1.5 m) 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.

4. Placement Time

Place concrete within the time frames specified in Table 1000-2 of the Standard Specifications for Class AA concrete and this special provision. Never place concrete so fast as to trap air, slurry, 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 is allowed between placements.

7.0 SCHEDULING AND RESTRICTIONS

After the first drilled pier is successfully completed, do not make any significant changes in construction methods, equipment or materials, unless approved by the Engineer.

If caving or sloughing occurs, compensation is not provided for additional concrete to fill the resulting voids.

Within 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 equipment wheel loads or "excessive" vibrations to occur at any point within a 20 foot (6 m) 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 and/or reject the drilled piers. If the integrity of a drilled pier is in question, use core drilling, sonic or other 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 (31.0 MPa) as directed by the Engineer. Remedial measures are directed by and require approval from the Engineer. No compensation will be paid for losses or damage due to remedial work or any investigation of drilled piers found defective or not in accordance with this special provision or the construction plans.

8.0 NON-DESTRUCTIVE TESTING (NDT)

The Engineer furnishes the non-destructive testing (NDT) equipment. NDT requires the attachment of an accelerometer to the top of the drilled pier. Measurements are made while tapping the top of the drilled pier with a hammer. The Engineer furnishes the materials, labor and equipment necessary for the installation of the accelerometer.

If the NDT instruments and supporting equipment are damaged due to the fault or negligence of the Contractor, replace the damaged equipment at no additional cost to the Department.

After installation, notify the Engineer that the drilled piers are ready to be tested. A drilled pier is tested only after the concrete has been in place for 5 days and the concrete has achieved a minimum compressive strength of 3000 psi (20.7 MPa). Grind four flat dry areas on top of the drilled pier down to exposed aggregate with a grinder or some other acceptable device. The Engineer selects the location of the four ground surfaces. Several velocity records as a function of time are averaged at each test location. The NDT field data is recorded with digital data acquisition equipment. Field testing is estimated to take 1 hour per drilled pier. Evaluation and interpretation of the field data requires 3 working days after testing. Further construction above the drilled piers that were tested is not allowed until the analysis of the NDT field data is complete.

The Engineer determines the number of drilled piers to be tested with NDT. It is anticipated that all drilled piers require testing. The cost of this work is included in the contract unit price bid for the drilled pier pay items. No separate payment will be made. Claims are not permitted for any delay incurred, including but not limited to the installation of the instrumentation or the collection and analysis of the NDT data.

9.0 COMPENSATION

A. Method of Measurement

1. Drilled Piers in Soil

The quantity of “Drilled Piers in Soil” to be paid for will be the linear feet (meters) of the drilled piers exclusive of the linear feet (meters) of “Drilled Piers Not in Soil” computed from elevations and dimensions as shown on the plans or from revised dimensions authorized by the Engineer. Drilled piers through air or water will be paid for as “Drilled Piers in Soil”.

2. Drilled Piers Not in Soil

The quantity of “Drilled Piers Not in Soil” to be paid for will be the linear feet (meters) of drilled piers excavated in non-soil as determined by the Engineer. Non-soil is defined as material that can not be cut with a rock auger and requires excavation by coring, air tools, hand removal or other acceptable methods. Top of non-soil elevation is that elevation where the rock auger penetration rate is less than 2 inches (50 mm) per 5 minutes of drilling at full crowd force and coring, air tools, etc. are used to advance the excavation. For pay purposes, after non-soil is encountered, earth seams, rock fragments and voids in the excavation less than 3 feet (0.9 m) in total length will be considered “Drilled Piers Not in Soil”. If the non-soil is discontinuous, payment will revert to “Drilled Piers in Soil” at the elevation where non-soil is no longer encountered.

3. Permanent Steel Casing

The quantity of “Permanent Steel Casing” to be paid for will be the linear feet (meters) of permanent steel casing as directed and authorized to be used. The length to be paid for will be measured along the permanent casing from the top of the casing elevation or top of the pier elevation, whichever is lower, to the casing tip elevation. Casing will be paid for only when permanent casing is authorized or when the Engineer directs the Contractor to leave a casing in place that then becomes a permanent part of the pier. No payment will be made for temporary steel casings that become bound or fouled during pier construction and cannot be practically removed.

4. Shaft Inspection Device (SID)

The quantity of “SID Inspection” to be paid for will be per drilled pier as noted on the plans and/or directed by the Engineer. SID inspections are performed until the bottom cleanliness of the drilled pier excavation is acceptable by this special provision; however, payment will only be made for the initial SID inspection of each drilled pier excavation.

5. Standard Penetration Test (SPT)

The quantity of “SPT Testing” to be paid for will be the actual number of SPT tests performed as noted on the plans and/or directed by the Engineer.

B. Basis of Payment

1. Drilled Piers in Soil

Payment will be made at the contract unit price per linear foot (meter) for “____ Dia. Drilled Piers in Soil”. Such payment will include, but is not limited to, furnishing all labor, tools, equipment, materials including concrete complete and in place and all incidentals necessary to excavate the drilled piers and complete the work as described in this special provision. No additional payment will be made for slurry use. No additional payment will be made for any miscellaneous grading or excavation to install the drilled pier. “Reinforcing Steel” and “Spiral Column Reinforcing Steel” will be paid for separately and will not be part of this pay item.

2. Drilled Piers Not in Soil

Payment will be made at the contract unit price per linear foot (meter) for “____ Dia. Drilled Piers Not in Soil”. Such payment will include, but is not limited to, furnishing all labor, tools, equipment, materials including concrete complete and in place and all incidentals necessary to excavate the drilled piers and complete the work as described in this special provision. No additional payment will be made for slurry use. No additional payment will be made for any miscellaneous grading or excavation to install the drilled pier. “Reinforcing Steel” and “Spiral Column Reinforcing Steel” will be paid for separately and will not be part of this pay item.

3. Permanent Steel Casing

Payment will be made at the contract unit price per linear foot (meter) for “Permanent Steel Casing for ____ Dia. Drilled Pier”. Such payment will include, but is not limited to, furnishing all material, labor, tools, equipment and all incidentals necessary to install the casing in the pier excavation.

4. Shaft Inspection Device (SID)

Payment for SID will be at the contract unit price per each for “SID Inspection”. Such payment will include, but is not limited to, furnishing all materials, labor, tools, equipment and all incidentals necessary to complete the SID inspection as described in this special provision.

5. Standard Penetration Test (SPT)

Payment for SPT will be at the contract unit price per each for “SPT Testing”. Such payment will include, but is not limited to, furnishing all materials, labor, tools, equipment and all incidentals necessary to complete the SPT at each test location.

CROSSHOLE SONIC LOGGING

(07-09-02)

1.0 GENERAL

Use the non-destructive testing method called Crosshole Sonic Logging (CSL) to verify the integrity of the drilled pier and the quality of the concrete. The Engineer will determine the number of CSL tests and which drilled piers will be CSL tested on this project. Drilled piers are referred to as piers in this special provision.

The CSL test measures the time for an ultrasonic pulse to travel from a signal source in one access tube to a receiver in another access tube. In uniform, good quality concrete, the travel time between equidistant tubes should yield relatively consistent arrival times and corresponds to a reasonable pulse velocity, signal amplitude and energy from the bottom to the top of the pier. Longer travel times, decrease in pulse velocity, and lower amplitude/energy signals indicate the presence of irregularities such as poor quality concrete, voids, honeycombing, cracking and soil intrusions. The signal may be completely lost by the receiver and CSL recording system for severe defects such as voids and soil intrusions.

The CSL Consultant must have a minimum 3 years experience of CSL testing and have a Registered North Carolina Professional Engineer supervising the testing and interpretation of results. **Submit** the proposed CSL Consultant to the Engineer for approval 30 days before beginning drilled pier construction. The following evidence of qualification needs to be included, unless previously approved by the Department and no changes have occurred since previous submittal:

- Written evidence of successful completion of CSL tests, brief descriptions and reference's phone numbers for three recent CSL projects.
- Personnel qualifications
- Equipment description
- Example report

Make all necessary arrangements with the CSL Consultant to have the CSL tests satisfactorily performed on the selected drilled piers and in accordance with this special provision. The CSL Consultant must supply to the Contractor technical instruction and guidance in preconstruction activities, and on-site technical assistance and guidance during set up and performance of the CSL tests. Provide suitable access to the site and to the top of piers to be tested. Follow instructions from the CSL Consultant unless the Engineer directs otherwise.

Place CSL tubes in all drilled piers. Perform CSL testing only on drilled piers selected by the Engineer a minimum 7 days after concrete placement and after concrete achieves a minimum compressive strength of 3000 psi (20.7 MPa), but within 30 days after concrete placement. After CSL test results have been reviewed and the Engineer has accepted the drilled pier or approves grouting of the tubes, dewater the tubes and core holes, if any, and

backfill with the approved grout. When the Engineer elects not to CSL test a pier, dewater the tubes and backfill them with an approved 4500 psi (31.0 MPa) compressive strength grout.

2.0 PREPARATION FOR CSL

Install four tubes in each drilled pier with a diameter of 5 feet (1524 mm) or less, and install six tubes in each pier with a diameter of greater than 5 feet (1524 mm). Provide 2 inch (50 mm) inside diameter Schedule 40 steel pipe conforming to ASTM A53, Grade A or B, Type E, F, or S. The tubes must have a round, regular internal diameter free of defects or obstructions, including any at tube joints, in order to permit the free, unobstructed passage of source and receiver probes. The tubes must provide a good bond with the concrete, and be watertight.

Fit the tubes with a watertight threaded cap on the bottom and a removable threaded cap on the top. Securely attach the tubes to the interior of the reinforcement cage. Install the tubes in each drilled pier in a regular, symmetric pattern such that each tube is equally spaced from the others around the perimeter of the cage. Tube placement must be such that large vertical reinforcing bars do not block the direct line between adjacent tubes. The tubes are typically wire-tied to the reinforcing cage every 3 feet (1 m) or otherwise secured such that the tubes remain in position during placement of the rebar cage and the concrete. The tubes must be as near to vertical and as parallel as possible, **as non-vertical tubes can adversely affect data analysis**. Extend the tubes from 6 inches (150 mm) above the pier tip to at least 3 feet (1 m) above the top of the pier. If the pier top elevation is below ground elevation, extend tubes at least 2 feet (610 mm) above ground surface. If the drilled pier tip elevation is excavated more than 1 foot (305 mm) below the tip elevation in the original plans, extend the tubes using proper threaded mechanical couplings to within 6 inches (150 mm) of the revised pier tip elevation.

Before placement of the reinforcement cage into the drilled pier, record the tube lengths and tube positions along the length of the cage. After placement of concrete, measure the stickup of the tubes above the top of the drilled piers and verify tube spacing.

Verify that unobstructed passage of the probes is achievable before the CSL Consultant arrives on site. If testing equipment will not pass through the entire length of the CSL tube, core a 2 inch (50 mm) diameter hole through the concrete the full length of the drilled pier at no cost to the Department. Locate the core hole approximately 9 inches (230 mm) inside the pier reinforcement from obstructed tube or as determined by the Engineer. Fill core hole with clean, potable water and cover to keep out debris.

Immediately after placement of the reinforcement cage and within 2 hours after concrete placement, fill the CSL tubes with clean, potable water, and cap them to keep out debris. The Engineer will reject CSL tubes that are not filled with water or capped. When removing the caps, exercise care not to apply excess torque, force or stress, which could break the bond between the tubes and the concrete.

Submit to the Engineer the CSL tube size, the manufacturer's certificate of compliance, cap details, couplings, any joints details, and the proposed method of attaching the tubes, 30 days before beginning drilled pier construction.

3.0 CSL EQUIPMENT

The minimum requirements of the CSL equipment are as follows:

- A microprocessor based CSL system for display of individual CSL records, analog-digital conversion and recording of CSL data, analysis of receiver responses and printing of report quality CSL logs
- Ultrasonic source and receiver probes which can travel through 2 inch (50 mm) I.D. steel pipe
- An ultrasonic voltage pulser to excite the source with a synchronized triggering system to start the recording system
- A depth measurement device to electronically measure and record the source and receiver depths associated with each CSL signal
- Appropriate filter/amplification and cable systems for CSL testing
- An acquisition system that stores each log in digital format, with drilled pier identification, date, time and test details, including the source and receiver gain. Arrival time data must be displayed graphically during data acquisition.
- 3D tomographic imaging software, or source for completing the work

4.0 CSL TEST PROCEDURE

Provide the Engineer and CSL Consultant with the following:

- Tube lengths and positions
- Record of the drilled pier construction information including the pier bottom and top elevations
- Construction dates before CSL testing

Conduct CSL tests between each perimeter pair and major principal diameter and log, unless otherwise directed by the Engineer.

Perform the CSL testing with the source and receiver probes in the same horizontal plane unless test results indicate defects or poor concrete zones, in which case the defect zones must be further evaluated with angle tests (source and receiver vertically offset at greater than 1.5 feet (460 mm) in the tubes). Report any defects indicated by decreased signal velocity and lower amplitude/energy signals to the Engineer at the time of testing, and conduct angle tests in the zones of the defects as defined by the Concrete Condition Rating Criteria (CCRC) in Section 5.0 of this special provision. Make CSL measurements at depth intervals of 2 ½ inches (65 mm) or less from the bottom of the tubes to the top of each pier. Pull the probes simultaneously, starting from the bottom of the tubes, using a depth-measuring device to electronically measure and record the depths associated with

each CSL signal. Remove any slack from the cables before pulling to provide for accurate depth measurements of the CSL records. In the event defects are detected, conduct additional logs, as needed, at no additional cost to the Department. The Department will not accept any claims for either lost time or the actual expense of further investigation of defects.

If steel tube debonding occurs, then core drill a 2 inch (50 mm) diameter hole to the depth of debonding for each debonded tube in order to perform the CSL logs at no additional cost to the Department.

5.0 CSL RESULTS AND REPORTING

Submit the test results in the form of a report including four original copies of CSL results to the Engineer within 5 working days of completion of CSL testing. The CSL report should include but not limited to the following:

- Project identification
- Dates of testing
- Table and a plan view of each pier tested with accurate identification of tube coordinates and tubes referenced to the site
- Tube collar elevation
- Names of personnel that performed the tests/interpretation and their affiliation
- Equipment used
- Interpretation, analysis, and results.

Include CSL logs for each tube pair tested with analysis of the initial pulse arrival time, velocity, relative pulse energy/amplitude, and stacked waveform plotted versus depth. List all zones defined by the Concrete Condition Rating Criteria (CCRC) in a tabular format including the percent velocity reduction and the velocity values used from the nearby zone of good quality concrete. Discuss each zone defined by the CCRC in the CSL report as appropriate. Base the results on the percent reduction in velocity value from a nearby zone of good quality concrete with good signal amplitude and energy as correlated to the following:

Concrete Condition Rating Criteria (CCRC)			
CCRC	Rating Symbol	Velocity Reduction	Indicative Results
Good	G	$\leq 10\%$	Good quality concrete
Questionable Defect	Q	$>10\% \& < 20\%$	Minor concrete contamination or intrusion. Questionable quality concrete.
Poor	P/D	$\geq 20\%$	Defects exist, possible water/slurry contamination, soil intrusion, and/or poor quality concrete.
No Signal	NS	No Signal received	Soil intrusion or other severe defect absorbed the signal (assumes good bond of the tube-concrete interface).
Water	W	V = 4750 fps (1450 mps) to 5000 fps (1525 mps)	Water intrusion, or water filled gravel intrusion with few or no fines present.

The following are a few examples of types and causes of defects:

- Necking or arching of the concrete on withdrawal of the temporary casing.
- Necking or contamination of the concrete due to collapse of the side walls.
- Soft toe due to incomplete cleaning or collapse of the side walls.
- Horizontal lenses of silt/mud/bentonite due to the tremie pipe rising above the concrete
- Voids due to the use of low-slump concrete.
- Honeycombing due to washout of fines.
- Trapping of contaminants due to pumping concrete to fast.

Provide the original pulse signal data files and ASCII format of the picks with a header (identifying the pier tested, tube coordinates and each data column) in an electronic file to the Engineer. The Engineer will require 7 working days to evaluate the CSL test results and determine whether or not the drilled pier is acceptable. Evaluation of CSL test results,

with ratings other than good (G) per the Concrete Condition Rating Criteria (CCRC) may require further investigation and additional time for review and analysis of the data. Do not grout the CSL tubes or perform any further work on the CSL tested drilled pier until the Engineer determines whether the drilled pier is acceptable. Perform tomography in order to further investigate and delineate the boundaries of any defective/unconsolidated zones with 20% or more reduction in velocity value as correlated to the CCRC. Process CSL data to construct easy to understand 2D/3D (2D cross-sections between tubes and 3D volumetric images for the entire pier) *color-coded* tomographic images indicating velocity variations along the pier. Location and geometry of defective/unconsolidated zones must be identified in 3D color images with detailed discussion in the CSL report. Any further tests deemed necessary by the Engineer in order to determine the acceptability of the drilled pier will be determined after reviewing the CSL report. Additional test or analysis options include 3D tomographic imaging, single-hole sonic testing, gamma-gamma nuclear density logging, sonic echo or impact response tests, and concrete coring, in addition to load testing of the piers.

The Engineer will determine the depth, location, and the number of core holes when concrete coring is required. Drill a minimum of two PQ size core holes to intercept the suspected defect zones. Use a coring method that provides maximum core recovery and minimizes abrasion and erosion. Provide concrete cores properly marked in a wooden crate and labeling the drilled pier depth at each interval of core recovery to the NCDOT Materials and Test Unit for evaluation and testing. Submit to the Engineer a drilling report that includes the NCDOT project number, name of the Drilling Contractor, date drilled, percent core recovery and signed by the Contractor. Allow 7 working days after submitting the core records for the Department's review.

6.0 CORRECTION OF UNACCEPTABLE DRILLED PIER

When the Engineer determines a drilled pier is unacceptable, the Engineer will direct the Contractor to submit remedial measures to the Department for approval. No compensation will be made for remedial work or losses or damage due to remedial work of drilled piers found defective or not in accordance with the drilled pier special provision or the construction plans. Modifications to the drilled pier design or any load transfer mechanisms required by the remedial action must be designed and calculations sealed by a Registered North Carolina Professional Engineer. Include drawings sealed by a Registered North Carolina Professional Engineer for all foundation elements affected. Do not begin remedial action work until the Department has reviewed and accepted the remedial action plan. Allow 10 working days after submitting the remedial work plan for the Department's review and acceptance. Furnish all materials and work necessary to correct defective drilled piers.

7.0 MEASUREMENT AND BASIS OF PAYMENT

The complete and accepted CSL testing will be paid for at the unit bid price for "Crosshole Sonic Logging" per each, which will constitute full compensation for all costs incurred for procurements, conducting the CSL testing, including any other test required to determine acceptability, reporting of results and incidentals necessary to complete the work.

The complete and accepted crosshole sonic logging tubes will be paid for at the unit bid price for "CSL Tubes" per foot (meter) of tube. The unit bid price will constitute full compensation for furnishing, installing, extending tubes, dewatering and grouting of all CSL tubes and 2 inch (50 mm) diameter core holes, if applicable, and for all materials, labor, tools, equipment and incidentals necessary to complete the work.

MECHANICAL BUTT SPLICING FOR REINFORCING STEEL

(10-12-01)

1.0 GENERAL

When mechanically butt splicing reinforcing steel, use a standard metal filled sleeve, cement mortar filled sleeve, threaded steel couplings, forged steel sleeve, cold-forged sleeve or an exothermic process whereby molten filler metal, contained by a high strength steel sleeve of larger inside diameter than the bars, is introduced into the annular space between the bars and the sleeve and also between the ends of the bars. Provide a splice that is capable of transferring at least 125% of the yield strength of the bars from one bar to the other by the mechanical strengths of the splice components.

The following is a list of approved connectors:

Brand Name	Approved Size
Bar-Lock Couplers	#4 - #11 (#13 - #36)
Barsplice Products	
Bar-Grip System	#4 - #18 (#13 - #57)
Grip-Twist System	#4 - #18 (#13 - #57)
Threaded Dowel Bar Coupler	#4 - #8 (#13 - #25)
Erico	
Lenton Interlok Grout-Filled Coupler	#6 - #11 (#19 - #36)
Lenton Position Coupler	#4 - #18 (#13 - #57)
Lenton Standard Coupler	#4 - #18 (#13 - #57)
Quick-Wedge Coupler	#4 - #6 (#13 - #19)
Richmond DB-SAE Dowel Bar Splicer	#4 - #11 (#13 - #36)
Williams Form Engineering Flange Coupler	#4 - #14 (#13 - #43)
Zap Screwlok	#4 - #11 (#13 - #36)

For splices not on the approved list, as a condition of approval, assemble three test splices in the presence of the Engineer for each of the bar materials identical to that which is proposed for use in the structure and forward the test splices to N. C. Department of Transportation Materials and Tests Unit in Raleigh, N.C.

When an exothermic connector is used, do not let the splice depend upon fusion of the filler metal with the bars. Select a temperature for heating the bars that is below the melting point of the bars and is sufficiently low so as not to significantly affect the original hardness nor decrease the structural properties of the bars. Visual inspection of the finished splices is sufficient; the splice is acceptable if sound filler metal is present at both ends of the splice sleeve and at the sleeve entry port.

Splice the bars in accordance with the manufacturer's recommendations using the manufacturer's required accessories as approved by the Engineer. Use mechanical butt splices only where specified on the plans. Any additional splices require approval.

If bars are epoxy coated, strip the epoxy coating within the limits of the sleeve prior to splicing. After making the splice, paint any unprotected areas of the reinforcing bar and the coupling sleeve with epoxy paint as described in the Standard Specifications.

2.0 BASIS OF PAYMENT

No separate measurement or payment will be made for this work. The following pay items will be full compensation for the above work as follows:

- The unit contract price bid for "Reinforced Concrete Deck Slab" will be full compensation for mechanical butt splices in concrete decks.
- The unit contract price bid for "Reinforcing Steel" or "Epoxy Coated Reinforcing Steel" will be full compensation for mechanical butt splices in bridge substructures and cast-in-place culverts.

POT BEARINGS

(10-12-01)

1.0 GENERAL

This item consists of furnishing, fabrication and installation of pot bearings in accordance with AASHTO Standard Specifications, the Standard Specifications, the recommendations of the manufacturer and the details shown on the plans and as specified herein.

Fixed pot bearings consist of a sole plate, a disc of elastomer in a steel cylinder with a snug fitting steel piston, masonry plate, anchor bolts, nuts and washers. Expansion pot bearings consist of a sole plate, a top steel plate with a polished stainless steel sheet facing bearing on a fixed pot bearing with a layer of virgin polytetrafluoroethylene (PTFE) material on its top, masonry plate, anchor bolt assembly which includes anchor bolts, nuts, washers, pipe sleeves, a closure plate, grout and various sizes of standard pipe and any other necessary material as detailed on the plans.

2.0 MATERIALS

Use pot bearings produced by the same manufacturer.

Use AASHTO M270 Grade 50W (345W) for all steel in the pot bearings. Clean, coat, and seal the plates in the pot bearing assemblies except for the areas with special facings and the internal surfaces of pot, in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)". Metallization of the internal surfaces of the pot is permitted provided these surfaces are then polished to a surface smoother than 63 micro inches (0.0016 mm) root mean square. Coat surfaces to a thickness of 6 mils (0.150 mm) minimum on all external parts. Repair surfaces that are abraded or damaged after the application of metallizing in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)".

Galvanize all fill plates specified on the plans. Provide anchor bolts and nuts in accordance with the Standard Specifications.

When the maximum plan dimension of the sheet is 12" (300 mm) or less, provide a stainless steel sheet in expansion pot bearings that is at least 16 gage or 1/16" (1.6 mm). When the maximum plan dimension is greater than 12" (300 mm), provide a stainless steel sheet that is at least 11 gage or 1/8" (3 mm). Ensure that all stainless steel sheets are in conformance with ASTM A240/A167 Type 304 and polished to a minimum #8 mirror surface finish.

Blast clean the surface of the plate that will be attached to the stainless sheet to a near white condition in accordance with the Standard Specifications. Position and clamp the back of the stainless sheet that is to be in contact with the steel plate on the steel plate. Apply the stainless steel to the blast cleaned surface of the steel plate as soon as possible after blasting and before any visible oxidation of the blast cleaned surface occurs. Weld the stainless sheet continuously around its perimeter using a tungsten inert gas, wire-fed welder.

For the PTFE sheet, used as a mating surface for the stainless sheet, provide an unfilled virgin PTFE Sheet (Recessed) or a glass-fiber filled PTFE sheet, resulting from skiving billets formed under hydraulic pressure and heat. Provide resin that conforms to the requirements of ASTM D4894 or D4895.

To bond the PTFE and the piston, use heat cured high temperature epoxy capable of withstanding temperature of -320°F to 500°F (-195°C to 260°C).

Provide a neoprene elastomer with a durometer hardness of 50 that allows for a minimum rotation of 0.02 radians. Place a 1/64" (0.4 mm) thick unfilled PTFE disc on either side of the neoprene inside the bearing. Use other material if the Engineer approves. Use a brass sealing ring with the neoprene elastomer.

3.0 DESIGN

Have the manufacturer design the pot bearings for the loads and movements shown on the contract plans. However, use the anchor bolt size, length, spacing and masonry plate

thickness as shown on the contract plans and provide an overall height of the bearing assembly that is at least the height shown on the contract plans, but no more than 1/2 inch (13 mm) greater than this height. Either combine, cast as a single piece, or weld together the sole plate and top plate/piston and the cylinder with the masonry plate.

When designing the bearings, use the following allowable bearing stresses:

- On confined elastomer: 3500 psi (24.1 MPa)
- On PTFE Sliding Surface, filled or unfilled PTFE (recessed): 3500 psi (24.1 MPa)

Submit eight sets of shop drawings and one set of design calculations for review, comments and acceptance. Have a North Carolina Registered Professional Engineer check and seal the shop drawings and design calculations.

After the Engineer reviews the drawings and, if necessary, corrections are made, submit one 22" x 34" reproducible set of the working drawings.

4.0 SAMPLING AND TESTING

A. Sampling

The manufacturer is responsible for randomly selecting and testing sample bearings from completed lots of bearings. The manufacturer is also responsible for certifying that the completed bearings and their components have been tested and are in compliance with the requirements of this Special Provision. Have the manufacturer furnish the results of the tests to the Materials and Tests Engineer.

B. Testing

1. Proof Load Test

Load a test bearing to 150% of the bearing's rated design capacity and simultaneously subject it to a rotational range of 0.02 radians (1.146°) for a period of 1 hour.

Have the bearing visually examined both during the test and upon disassembly after the test. Any resultant visual defects, such as extruded or deformed elastomer or PTFE, damaged seals or rings, or cracked steel is cause for rejection.

Keep the steel bearing plate and steel piston in continuous and uniform contact for the duration of the test. Any observed lift-off is cause for rejection.

2. Sliding Coefficient of Friction

For all guided and non-guided expansion type bearings, measure the sliding coefficient of friction at the bearing's design capacity in accordance with the test method described below, and on the fifth and fiftieth cycles, at a sliding speed of 1 in/min (25 mm/min).

Calculate the sliding coefficient of friction as the horizontal load required to maintain continuous sliding of one bearing, divided by the bearing's vertical design capacity.

The test results are evaluated as follows:

- A maximum measured sliding coefficients of friction of 3%.
- A visual examination both during and after the test. Any resultant visual defects, such as bond failure, physical destruction, cold flow of PTFE to the point of debonding, or damaged components is cause for rejection of the lot.

Using undamaged test bearings in the work is permitted.

3. Test Method

For the test method and equipment, meet the following requirements:

- a. Arrange the test to determine the coefficient of friction on the first movement of the manufactured bearing.
- b. Clean the bearing surface prior to testing.
- c. Conduct the test at maximum working stress for the PTFE surface with the test load applied continuously for 12 hours prior to measuring friction.
- d. Determine the first movement static and dynamic coefficient of friction of the test bearing at a sliding speed of less than 1 in/min (25 mm/min), not to exceed:

0.04	unfilled PTFE
0.08	filled PTFE
- e. Subject the bearing specimen to 100 movements of at least 1 inch (25 mm) of relative movement and, if the test facility permits, the full design movement at a speed of less than 1 ft/min (300 mm/min). Following this test determine the static and kinetic coefficient of friction again. The specimen is considered a failure if it exceeds the values measured in (d) above or if it shows any signs of bond failure or other defects.

Bearings represented by test specimens passing the above requirements are approved for use in the structure subject to on-site inspection for visible defects.

5.0 INSTALLATION

Prior to shipment, seal the joint between the steel piston and the steel cylinder with a bead of caulk. Store pot bearings delivered to the bridge site under cover on a platform above the ground surface. Protect the bearings from injury at all times and, before placing the bearings, dry and clean all dirt, oil, grease or other foreign substances from the bearing. Do not disassemble the bearings during installation, except at the manufacturer's direction.

Place the bearings in accordance with the recommendations of the manufacturer, Contract Drawings, and as directed by the Engineer. If there is any discrepancy between the recommendations of the manufacturer, Special Provisions, and Contract Drawings, the Engineer is the sole judge in reconciling any such discrepancy.

Provide preformed bearing pads under the masonry plates in accordance with Article 1079-1 of the Standard Specifications.

Do not install any bearing before the Engineer approves it.

6.0 BASIS OF PAYMENT

Payment will be at the lump sum contract price bid for “Pot Bearings” which price will be full compensation for furnishing all labor, materials, tools, equipment and incidentals required to complete the work in accordance with the Standard Specifications, this Special Provision, the manufacturer’s requirements and as directed by the Engineer.

THERMAL SPRAYED COATINGS (METALLIZATION)

(2-14-04)

1.0 DESCRIPTION

Apply a thermal sprayed coating (TSC) and sealer to metal surfaces as specified herein when called for on the plans or by other Special Provisions, or when otherwise approved by the Engineer in accordance with the SSPC-CS 23.00/AWS C2.23/NACE No. 12 Specification. Only Arc Sprayed application methods are used to apply TSC coatings, the Engineer must approve other methods of application.

2.0 QUALIFICATIONS

Only use NCDOT approved TSC Contractors meeting the following requirements:

1. Who have the capability of blast cleaning steel surfaces to SSPC SP-5 and SP-10 Finishes.
2. Who employ a Spray Operator(s) qualified in accordance with AWS C.16/C2.16M2002 and a Quality Control Inspector(s) who have documented training in the applicable test procedures of ASTM D-3276 and SSPC-CS 23.00.

A summary of the contractor’s related work experience and the documents verifying each Spray Operator’s and Quality Control Inspector’s qualifications are submitted to the Engineer before any work is performed.

3.0 MATERIALS

Provide wire in accordance with the metallizing equipment manufacturer's recommendations. Use the wire alloy specified on the plans which meets the requirements in Annex C of the SSPC-CS 23.00 Specification. Have the contractor provide a certified analysis (NCDOT Type 2 Certification) for each lot of wire material.

Apply an approved sealer to all metallized surfaces in accordance with Section 9 of SSPC-CS 23. The sealer must either meet SSPC Paint 27 or is an alternate approved by the Engineer.

4.0 SURFACE PREPARATION AND TSC APPLICATION

Grind flame cut edges to remove the carbonized surface prior to blasting. Bevel all flame cut edges in accordance with Article 442-10(D) regardless of included angle. Blast clean surfaces to be metallized with grit or mineral abrasive in accordance with Steel Structures Painting Council SSPC SP-5/10(as specified) to impart an angular surface profile of 2.5 - 4.0 mils (0.063 – 0.100 mm). Surface preparation hold times are in accordance with Section 7.32 of SSPC-CS 23. If flash rusting occurs prior to metallizing, blast clean the metal surface again. Apply the thermal sprayed coating only when the surface temperature of the steel is at least 5°F (3°C) above the dew point.

At the beginning of each work period or shift, conduct bend tests in accordance with Section 6.5 of SSPC-CS 23.00. Any disbonding or delamination of the coating that exposes the substrate requires corrective action, additional testing, and the Engineer's approval before resuming the metallizing process.

Apply TSCs to thickness specified on the plans. All spot results (the average of 3 to 5 readings) must meet the minimum requirement. No additional tolerance (as allowed by SSPC PA-2) is permitted. The specified thickness requirement has been adjusted for surface roughness so that no correction for base metal is needed. (For Steel Beams: For pieces with less than 200 ft² (18.6m²) measure 2 spots/surface per piece and for pieces greater than 200 ft² (18.6m²) add 1 additional spots/surface for each 500 ft² (46.5m²))

When noted on the plans, apply the sealer to all metallized surfaces in accordance with the manufacturer's recommendations. Only apply the seal coat when the air temperature is above 40°F (4°C) and the surface temperature of the steel is at least 5°F (3°C) above the dew point. If the sealer is not applied within eight hours after the final application of TSC, the applicator verifies acceptable TSC surfaces and obtains approval from the Engineer before applying the sealer.

5.0 INSPECTION FREQUENCY

The TSC Contractor must conduct the following tests at the specified frequency and the results documented in a format approved by the Engineer.

TEST/STANDARD	LOCATION	FREQUENCY	SPECIFICATION
Ambient Conditions	Site	Each Process	5°F (3°C) above the dew point
Abrasive Properties	Site	Each Day	Size, angularity, cleanliness
Surface Cleanliness SSPC Vis 1	All Surfaces	Visual All Surfaces	SSPC-SP-10 Atmospheric Service SSPC-SP - 5 Immersion Service
Surface Profile ASTM D-4417 Method C	Random Surfaces	3 per 500 ft ²	2.5 - 4.0 mils
Bend Test SSPC-CS 23.00	Site	5 per shift	Pass Visual
Thickness SSPC PA-2R SSPC-CS 23.00	Each Surface	Use the method in PA-2 Appendix 3 for Girders and Appendix 4 for frames and miscellaneous steel. See Note 1.	Zn - 8.0 mils minimum Al - 12 mils minimum Areas with more than twice the minimum thickness are inspected for compliance to the adhesion and cut testing requirements of this specification.
Adhesion ASTM 4541	Random Surfaces Splice Areas	1 set of 3 per 500 ft ²	ZN > 500 psi Al > 1000 psi
Cut Test - SSPC-CS 23.00	Random Surfaces	3 sets of 3 per 500 ft ²	No peeling or delamination
Job Reference Std. SSPC-CS 23.00	Site	1 per job	Meets all the above requirements

6.0 REPAIRS

All Repairs are to be performed in accordance with the procedures below, depending on whether the repair surface is hidden or exposed. As an exception to the following, field welded splices on joint angles may be repaired in accordance with the procedures for hidden surfaces.

For hidden surfaces (including but not limited to interior girders, interior faces of exterior girders, and below-grade sections of piles):

1. Welding of metallized surfaces may be performed only if specifically permitted by the Engineer. Remove metallizing at the location of field welds by blast cleaning (SSPC SP-6 finish), or hand (SSPC SP-2 finish) or power tool cleaning (SSPC SP-3

finish) just prior to welding. Clean sufficiently to prevent contamination of the weld. All repairs to welded connections are metallized in accordance with SSPC CS 23.00.

2. Minor areas less than or equal to 0.1 ft^2 (9300mm^2) exposing the substrate are metallized in accordance with SSPC CS 23.00 or painted in accordance with ASTM A780, "Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings."
3. Large areas greater than 0.1 ft^2 (9300mm^2) exposing the substrate are metallized in accordance with SSPC CS 23.00.
4. Damaged (burnished) areas not exposing the substrate with less than the specified coating thickness are metallized in accordance with SSPC CS 23.00 or painted in accordance with ASTM A780, "Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings."
5. Damaged (burnished) areas not exposing the substrate with more than the specified coating thickness are not repaired.
6. Defective coating is repaired by either method 2 or 3 depending on the area of the defect.

For Exposed Surfaces (including but not limited to exterior faces of exterior girders and above-grade sections of piles):

1. Welding of metallized surfaces may be performed only if specifically permitted by the Engineer. Remove metallization at the location of field welds by blast cleaning (SSPC SP-6 finish), or hand (SSPC SP-2 finish) or power tool cleaning (SSPC SP-3 finish) just prior to welding. Clean sufficiently to prevent contamination of the weld. All repairs to welded connections are metallized in accordance with SSPC CS 23.00.
2. All areas exposing the substrate are metallized in accordance with SSPC CS 23.00
3. Defective coating is repaired by either method 2 or 3 depending on the area of the defect.

7.0 TWELVE MONTH OBSERVATION PERIOD

The contractor maintains responsibility for the coating system for a twelve (12) month observation period beginning upon the satisfactory completion of all the work required in the plans or as directed by the engineer. The contractor must guarantee the coating system under the payment and performance bond (refer to article 109-10). To successfully complete the observation period, the coating system must meet the following requirements after twelve(12) months service:

- No visible rust, contamination or application defect is observed in any coated area.
- Painted surfaces have a uniform color and gloss.

- Surfaces have an adhesion of no less than 500 psi (3.45 MPa) when tested in accordance with ASTM D-4541.

8.0 BASIS OF PAYMENT

The contract price bid for the bridge component to which the coating is applied will be full compensation for the thermal sprayed coating.

MINIMIZING RAILROAD FLAGGING SERVICE

(10-12-01)

Notify the Engineer whenever construction activity on, or immediately adjacent to, the railroad right-of-way is expected to be delayed for more than 2 weeks due to:

- Construction activity being confined to an area where the activity, including the possible falling or overturning of proposed construction equipment and/or material, is not reasonably expected to interfere with Railroad operations or cause damage to facilities of the Railroad or its tenants, and where Railroad operations would not affect personnel and/or equipment.
- The Contractor removing his work force from the site to pursue his work at other locations.
- Scheduling of needed construction equipment and/or material
- Coordination with other required construction activity
- Seasonal considerations

In the notification, describe the reason for the delay and provide a schedule of when the delay in the area is expected to begin and when work in the area is expected to resume.

Contact the Railroad's authorized representative to determine if the flagman can be released and reassigned to accommodate the proposed work delay schedule. If the Railroad agrees, the Engineer follows the advance notification procedures for releasing and rescheduling a flagman as stated elsewhere in this Special Provision or as provided by the Railroad.

Prior to the release of the flagman, ensure that drainage facilities and erosion control measures adjacent to the tracks are properly maintained and that the site is left in a condition satisfactory to the Railroad. In addition, remove any material or equipment stored on the Railway right of way that is needed during the absence of the flagman.

If failing to notify the Engineer of a construction activity delay as stated above and a flagman remains assigned to the site for more than 2 weeks after the delay begins, the flagman time exceeding the 2 weeks, until work resumes on a routine schedule, is considered the Contractor's responsibility.

For that portion of the flagman time considered as the Contractor's responsibility, the Department will continue to pay the flagging charges but an amount of \$250 per day will be withheld from partial or final payment due the Contractor.

EVAZOTE JOINT SEALS

(02/04/03)

1.0 SEALS

Use preformed seals compatible with concrete and resistant to abrasion, oxidation, oils, gasoline, salt and other materials that are spilled on or applied to the surface. Use a low-density closed cell, cross-linked ethylene vinyl acetate polyethylene copolymer nitrogen blown material for the seal.

Use seals manufactured with grooves 1/8" (3 mm) ± wide by 1/8" (3 mm) ± deep and spaced between 1/4 (6 mm) and 1/2 inch (13 mm) apart along the bond surface running the length of the joint. Use seals sized so that the depth of the seal meets the manufacturer's recommendation, but is not less than 70% of the uncompressed width. Provide a seal designed so that, when compressed, the center portion of the top does not extend upward above the original height of the seal by more than 1/4 inch (6 mm). Splice the seal using the heat welding method by placing the joint material ends against a teflon heating iron of 350°F (177°C) for 7 - 10 seconds, then pressing the ends together tightly. Do not test the welding until the material has completely cooled. Use material that resists weathering and ultraviolet rays. Provide a seal that has a working range of 30% tension and 60% compression and is watertight along its entire length including the ends.

Provide seals that meet the requirements given below.

TEST	TEST METHOD	REQUIREMENT
Elongation at break	ASTM D3575	210 ± 15%
Tensile strength, psi (kPa)	ASTM D3575	110 ± 15 (755 ± 100)
Compression Recovery (% of original width)	AASHTO T42 50% compr. for 22 hr. @ 73°F (23°C) 1/2 hr. recovery	87 ± 3
Weather/Deterioration	AASHTO T42 Accelerated Weathering	No deterioration for 10 years min.
Compression/Deflection	@ 50% deflection of original width @ 50% deflection of original width	10 psi (69 kPa) min. 60 psi (414 kPa) max.
Tear Strength, psi (kPa)	ASTM D624	16 ± 3 (110 ± 20)
Density	ASTM D545	2.8 to 3.4
Water Absorption (% vol/vol)	ASTM D3575 Total immersion for 3 months	3

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

2.0 ADHESIVES

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

Tensile strength	3500 psi (24.1 MPa) min.
Compressive strength	7000 psi (48.3 MPa) min.
Shore D Hardness	75 psi (0.5 MPa) min.
Water Absorption	0.25% by weight

Use an adhesive that is workable to 40°F (4°C). When installing in temperatures below 40°F (4°C) or for application on moist, difficult to dry concrete surfaces, use an adhesive specified by the manufacturer of the joint material.

3.0 SAWING THE JOINTS

When the plans call for sawing the joints, initially form the joints to the width shown on the plans.

Allow the concrete slab to cure for at least 2 days prior to sawing the concrete joint to its final specified width and depth.

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

Saw cut to the desired width and depth in one or two passes of the saw by placing and spacing two metal blades on the saw shaft to the desired width for compression seals.

The desired depth is the depth of the seal plus 1/4 inch (6 mm) above the top of the seal plus approximately 1 inch (25 mm) below the bottom of the seal. An irregular bottom of sawed joint is permitted as indicated on the plans. Grind exposed corners on saw cut edges to a 1/4" (6 mm) chamfer.

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

Use extreme care to saw the joint straight to the desired width and to prevent any chipping or damage to sawed edges of the joint.

4.0 PREPARATIONS FOR SAWED JOINTS

When the plans call for sawing the joint, the Engineer thoroughly inspects the sawed joint opening for spalls, popouts, cracks, etc. Make all necessary repairs prior to blast cleaning and installing the seal.

Immediately before sealing, clean the joints by sandblasting with clean dry sand. Sandblast to provide a firm, clean joint surface free of curing compound, loose material and any foreign matter. Sandblast without causing pitting or uneven surfaces.

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

If nozzle blasting, use compressed air that does not contain detrimental amounts of water or oil.

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

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

5.0 PREPARATIONS FOR ARMORED JOINTS

When the plans call for armored joints, form the joint and blockout openings in accordance with the plans. If preferred, wrap the temporary form with polyethylene sheets to allow for easier removal. Do not use form release agents.

A. Submittals

Submitting detailed working drawings is not required; however, submitting catalog cuts of the proposed material is required. In addition, direct the joint supplier to provide an angle segment placing plan.

B. Surface Preparation

Prepare the surface within the 48 hours prior to placing the elastomeric concrete. Do not place the elastomeric concrete until the surface preparation is completed and approved.

1. Angle Assembly

Clean and free metallized steel of all foreign contaminants and blast the non-metallized steel surfaces to SSPC SP-10. Blast-cleaning anchor studs is not required.

2. Concrete

Prior to placing the elastomeric concrete, thoroughly clean and dry all concrete surfaces. Sandblast the concrete surface in the blockout and clear the surface of all loose debris.

C. Elastomeric Concrete Placement

Make sure that a manufacturer's representative is present when placing elastomeric concrete. Do not place elastomeric concrete if the ambient air temperature is below 45°F (7°C).

Prepare and apply a primer, as per manufacturer's recommendations, to all vertical concrete faces, all steel components to be in contact with elastomeric concrete, and to areas specified by the manufacturer. Align the angles with the joint opening.

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

D. Joint Preparation

Prior to installing the seal, the Engineer thoroughly inspects the armored joint opening for proper alignment and full consolidation of elastomeric concrete under the angle assemblies. Make all necessary repairs prior to cleaning the joint opening and installing the seal.

Clean the armored joint opening with a pressure washer rated at 3000 psi (20.7 MPa) minimum at least 24 hours after placing the elastomeric concrete. Dry the cleaned surface prior to installing the seal.

Examine the cleaned surface and remove traces of oil, grease or smudge deposited during the cleaning operations.

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

6.0 SEAL INSTALLATION

Install the joint seal according to the manufacturer's procedures and recommendations and as recommended below. Do not install the joint seal if the ambient air temperature is below 45°F (7°C). Have a manufacturer's representative present during the installation of the first seal of the project.

Begin installation at the low end of the joint after applying the mixed epoxy to the sides of both the joint material and both sides of the joint, making certain to completely fill the grooves with epoxy. With gloved hands, compress the material and with the help of a blunt probe, push it down into the joint until it is recessed approximately 1/4 inch (6 mm) below the surface. Do not push the seal at an angle that would stretch the material. Once work on a joint begins, do not stop until it is completed. Clean the excess epoxy off the surface of the joint material *quickly* and *thoroughly*. Do not use solvents to remove excess epoxy. Remove excess epoxy in accordance with the joint manufacturer's recommendations.

Install the seal so that it is watertight. Testing of the joint seal is not required, but it is observed until final inspection.

7.0 BASIS OF PAYMENT

Payment for all evazote joint seals will be at the lump sum contract price bid for “Evazote Joint Seals” which prices and payment will be full compensation for furnishing all material, including elastomeric concrete when required, labor, tools and equipment necessary for installing these units in place and accepted.

EPOXY PROTECTIVE COATING

(10-12-01)

1.0 DESCRIPTION

This work consists of preparing the concrete surface and furnishing and applying an epoxy protective coating to the surfaces described in this Special Provision. When epoxy protective coating is required, cure the top surfaces of the bent or end bent caps in accordance with the Standard Specifications, but do not use the Membrane Curing Compound method.

2.0 MATERIALS

Use an epoxy coating that meets the most recently published NCDOT Specification on the date of advertisement. Use the epoxy coating that meets NCDOT-Type 4A Flexible, epoxy coating, moisture insensitive.

Provide a certification for the proposed epoxy showing that it meets NCDOT-Type 4A.

The following companies have epoxies that meet Type 4A Specifications:

- E-Bond Epoxy, Inc.
Fort Lauderdale, Florida 33307
- Permagile Industries
Plainview, NY 11803
- Poly-Carb
Cleveland, OH 44139
- Tamms, Inc.
Mentor, OH 44060
- Adhesive Engineering
Cleveland, OH 44122-5554
- Kaufman Products
Baltimore, MD 21226-1131
- Prime Resins
Lithonia, GA 30058

- Sika Corporation
Lyndhurst, N. J. 07071

A copy of the specifications for Epoxy Resin Systems is available from the Materials and Tests Unit.

3.0 SURFACES

With the exception of cored slab bridges, apply the epoxy protective coating to the top surface area, including chamfer area, of bent caps under expansion joints and of end bent caps, excluding areas under elastomeric bearings. For cored slab bridges, do not apply the epoxy protective coating to the bent or end bent caps. Also, apply epoxy protective coating to the ends of prestressed concrete members as noted on the plans.

Use extreme care to keep the area under the elastomeric bearings free of the epoxy protective coating. Do not apply the epoxy protective coating in the notch at the ends of the prestressed concrete girders.

Thoroughly clean all dust, dirt, grease, oil, laitance, and other objectionable material from the concrete surfaces to be coated. Air-blast all surfaces immediately prior to applying the protective coating.

Only use cleaning agents pre-approved by the Engineer.

4.0 APPLICATION

Apply epoxy protective coating only when the air temperature is at least 40°F (4°C) and rising, but less than 95°F (35°C) and the surface temperature of the area to be coated is at least 40°F (4°C). Remove any excess or free standing water from the surfaces before applying the coating. Apply one coat of epoxy protective coating at a rate such that it covers between 100 and 200 ft²/gal (2.5 and 5 m²/liter).

Note: Under certain combinations of circumstances, the cured epoxy protective coating may develop “oily” condition on the surface due to amine blush. This condition is not detrimental to the applied system.

Apply the coating so that the entire designated surface of the concrete is covered and all pores filled. To provide a uniform appearance, use the exact same material on all visible surfaces.

5.0 BASIS OF PAYMENT

No separate measurement or payment will be made for preparing, furnishing and applying the epoxy protective coating to the concrete surfaces.

Payment at the contract unit prices for the various pay items will be full compensation for the above work including all materials, equipment, tools, labor, and incidentals necessary to complete the work.

ELASTOMERIC CONCRETE**(10-12-01)****1.0 DESCRIPTION**

Elastomeric concrete is a mixture of a two-part polymer consisting of polyurethane and/or epoxy, and kiln-dried aggregate. Have the manufacturer supply it as a unit. Use the concrete in the blocked out areas on both sides of the bridge deck joints as indicated on the plans.

2.0 MATERIALS

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

CONCRETE PROPERTIES	TEST METHOD	MINIMUM REQUIREMENT
Bond Strength to Concrete, psi (MPa)	(a) STM D638 (D638M)	450 (3.1)
Brittleness by Impact, ft-lb (kg-m)	Ball Drop	7 (0.97)
Compressive Strength, psi (MPa)	ASTM D695 (D695M)	2800 (19.3)

BINDER PROPERTIES (without aggregate)	TEST METHOD	MINIMUM REQUIREMENT
Tensile Strength, psi (MPa)	ASTM D638 (D638M)	800 (5.5)
Ultimate Elongation	ASTM D638 (D638M)	150%
Tear Resistance, lb/in (kN/m)	ASTM D624	90 (15.7)

In addition to the requirements above, use elastomeric concrete that also resists water, chemical, UV, and ozone exposure and withstands extreme temperature (freeze-thaw) changes.

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

Require a manufacturer's representative to be present on site during the installation of the elastomeric concrete.

3.0 BASIS OF PAYMENT

No separate payment will be made for elastomeric concrete. The lump sum contract price bid for “Evazote Joint Seals” will be full compensation for furnishing and placing the Elastomeric Concrete.

FALSEWORK AND FORMWORK

(10-12-01)

1.0 DESCRIPTION

Use this Special Provision as a guide to develop temporary works submittals required by the Standard Specifications or other provisions; no additional submittals are required herein. Such temporary works include, but are not limited to, falsework and formwork.

Falsework is any temporary construction used to support the permanent structure until it becomes self-supporting. Formwork is the temporary structure or mold used to retain plastic or fluid concrete in its designated shape until it hardens. Access scaffolding is a temporary structure that functions as a work platform that supports construction personnel, materials, and tools, but is not intended to support the structure. Scaffolding systems that are used to temporarily support permanent structures (as opposed to functioning as work platforms) are considered to be falsework under the definitions given. Shoring is a component of falsework such as horizontal, vertical, or inclined support members. Where the term “temporary works” is used, it includes all of the temporary facilities used in bridge construction that do not become part of the permanent structure.

Design and construct safe and adequate temporary works that will support all loads imposed and provide the necessary rigidity to achieve the lines and grades shown on the plans in the final structure.

2.0 MATERIALS

Select materials suitable for temporary works; however, select materials that also ensure the safety and quality required by the design assumptions. The Engineer has authority to reject material on the basis of its condition, inappropriate use, safety, or nonconformance with the plans. Clearly identify allowable loads or stresses for all materials or manufactured devices on the plans. Revise the plan and notify the Engineer if any change to materials or material strengths is required.

3.0 DESIGN REQUIREMENTS

A. Working Drawings

Provide working drawings for items as specified in the contract, or as required by the Engineer, with design calculations and supporting data in sufficient detail to permit a structural and safety review of the proposed design of the temporary work.

When concrete placement is involved, include data such as the drawings of proposed sequence, rate of placement, direction of placement, and location of all construction joints. Submit the number of copies as called for by the contract.

When required, have the drawings and calculations prepared under the guidance of, and sealed by, a North Carolina Registered Professional Engineer who is knowledgeable in temporary works design.

Design falsework and formwork requiring submittals in accordance with the 1995 AASHTO *Guide Design Specifications for Bridge Temporary Works* except as noted herein.

1. Wind Loads

Table 2.2 of Article 2.2.5.1 is modified to include wind velocities up to 110 mph (177 km/hr). In addition, Table 2.2A is included to provide the maximum wind speeds by county in North Carolina.

Table 2.2 - Wind Pressure Values

Height Zone feet (m) above ground	Pressure, lb/ft ² (kPa) for Indicated Wind Velocity, mph (km/hr)				
	70 (112.7)	80 (128.7)	90 (144.8)	100 (160.9)	110 (177.0)
0 to 30 (0 to 9.1)	15 (0.72)	20 (0.96)	25 (1.20)	30 (1.44)	35 (1.68)
30 to 50 (9.1 to 15.2)	20 (0.96)	25 (1.20)	30 (1.44)	35 (1.68)	40 (1.92)
50 to 100 (15.2 to 30.5)	25 (1.20)	30 (1.44)	35 (1.68)	40 (1.92)	45 (2.15)
over 100 (30.5)	30 (1.44)	35 (1.68)	40 (1.92)	45 (2.15)	50 (2.39)

2. Time of Removal

The following requirements replace those of Article 3.4.8.2.

Do not remove forms until the concrete has attained strengths required in Article 420-17 of the Standard Specifications and these Special Provisions.

Do not remove forms until the concrete has sufficient strength to prevent damage to the surface.

Table 2.2A - Steady State Maximum Wind Speeds by Counties in North Carolina

COUNTY	25 YR (mph) (km/hr)	COUNTY	25 YR (mph) (km/hr)	COUNTY	25 YR (mph) (km/hr)
Alamance	70 (112.7)	Franklin	70 (112.7)	Pamlico	100 (160.9)
Alexander	70 (112.7)	Gaston	70 (112.7)	Pasquotank	100 (160.9)
Alleghany	70 (112.7)	Gates	90 (144.8)	Pender	100 (160.9)
Anson	70 (112.7)	Graham	80 (128.7)	Perquimans	100 (160.9)
Ashe	70 (112.7)	Granville	70 (112.7)	Person	70 (112.7)
Avery	70 (112.7)	Greene	80 (128.7)	Pitt	90 (144.8)
Beaufort	100 (160.9)	Guilford	70 (112.7)	Polk	80 (128.7)
Bertie	90 (144.8)	Halifax	80 (128.7)	Randolph	70 (112.7)
Bladen	90 (144.8)	Harnett	70 (112.7)	Richmond	70 (112.7)
Brunswick	100 (160.9)	Haywood	80 (128.7)	Robeson	80 (128.7)
Buncombe	80 (128.7)	Henderson	80 (128.7)	Rockingham	70 (112.7)
Burke	70 (112.7)	Hertford	90 (144.8)	Rowan	70 (112.7)
Cabarrus	70 (112.7)	Hoke	70 (112.7)	Rutherford	70 (112.7)
Caldwell	70 (112.7)	Hyde	110 (177.0)	Sampson	90 (144.8)
Camden	100 (160.9)	Iredell	70 (112.7)	Scotland	70 (112.7)
Carteret	110 (177.0)	Jackson	80 (128.7)	Stanley	70 (112.7)
Caswell	70 (112.7)	Johnston	80 (128.7)	Stokes	70 (112.7)
Catawba	70 (112.7)	Jones	100 (160.9)	Surry	70 (112.7)
Cherokee	80 (128.7)	Lee	70 (112.7)	Swain	80 (128.7)
Chatham	70 (112.7)	Lenoir	90 (144.8)	Transylvania	80 (128.7)
Chowan	90 (144.8)	Lincoln	70 (112.7)	Tyrell	100 (160.9)
Clay	80 (128.7)	Macon	80 (128.7)	Union	70 (112.7)
Cleveland	70 (112.7)	Madison	80 (128.7)	Vance	70 (112.7)
Columbus	90 (144.8)	Martin	90 (144.8)	Wake	70 (112.7)
Craven	100 (160.9)	McDowell	70 (112.7)	Warren	70 (112.7)
Cumberland	80 (128.7)	Mecklenburg	70 (112.7)	Washington	100 (160.9)
Currituck	100 (160.9)	Mitchell	70 (112.7)	Watauga	70 (112.7)
Dare	110 (177.0)	Montgomery	70(112.7)	Wayne	80 (128.7)
Davidson	70 (112.7)	Moore	70 (112.7)	Wilkes	70 (112.7)
Davie	70 (112.7)	Nash	80 (128.7)	Wilson	80 (128.7)
Duplin	90 (144.8)	New Hanover	100 (160.9)	Yadkin	70 (112.7)
Durham	70 (112.7)	Northampton	80 (128.7)	Yancey	70 (112.7)
Edgecombe	80 (128.7)	Onslow	100 (160.9)		
Forsyth	70 (112.7)	Orange	70 (112.7)		

Note on the working drawings any anchorages, connectors, inserts, steel sleeves or other such devices used as part of the falsework or formwork that remains in the permanent structure. If the plan notes indicate that the structure contains the necessary corrosion protection required for a Corrosive Site, epoxy coat, galvanize, metallize or otherwise protect these devices as directed by the Engineer. Any coating required by the Engineer will be considered incidental to the various pay items requiring temporary works.

B. Review and Approval

The Engineer is responsible for the review and approval of temporary works' drawings.

Submit the working drawings sufficiently in advance of proposed use to allow for their review, revision (if needed), and approval without delay to the work.

Do not start construction of any temporary work for which working drawings are required until the drawings have been approved. Such approval does not relieve the Contractor of the responsibility for the accuracy and adequacy of the working drawings.

The time period for review of the working drawings does not begin until complete drawings and design calculations, when required, are received by the Engineer.

On the drawings, show all information necessary to allow the design of any component to be checked independently as determined by the Engineer.

If requested by the Engineer, submit with the working drawings manufacturer's catalog data listing the weight of all construction equipment that will be supported on the temporary work. Show anticipated total settlements and/or deflections of falsework and forms on the working drawings. Include falsework footing settlements, joint take-up, and deflection of beams or girders. Design the falsework and forms supporting deck slabs and overhangs on girder bridges so that there will be no differential settlement between the girders and the deck forms during placement of deck concrete.

4.0 CONSTRUCTION REQUIREMENTS

All requirements of Section 420 of the Standard Specifications apply.

Construct temporary works in conformance with the approved working drawings. Ensure that the quality of materials and workmanship employed is consistent with that assumed in the design of the temporary works. Do not weld falsework members to any portion of the permanent structure unless approved. Show any welding to the permanent structure on the approved construction drawings.

Provide tell-tales attached to the forms and extending to the ground, or other means, for accurate measurement of falsework settlement. Make sure that the anticipated compressive settlement and/or deflection of falsework does not exceed 1 inch (25 mm). For cast-in-place concrete structures, make sure that the calculated deflection of falsework

flexural members does not exceed $1/240$ of their span regardless of whether or not the deflection is compensated by camber strips.

A. Maintenance and Inspection

Inspect and maintain the temporary work in an acceptable condition throughout the period of its use. Certify that the manufactured devices have been maintained in a condition to allow them to safely carry their rated loads. Clearly mark each piece so that its capacity can be readily determined at the job site.

Perform an in-depth inspection of an applicable portion(s) of the temporary works, in the presence of the Engineer, not more than 24 hours prior to the beginning of each concrete placement. Inspect other temporary works at least once a month to ensure that they are functioning properly. Have a North Carolina Registered Professional Engineer inspect the cofferdams, shoring, sheathing, support of excavation structures, and support systems for load tests prior to loading.

B. Foundations

Determine the safe bearing capacity of the foundation material on which the supports for temporary works rest. If required by the Engineer, conduct load tests to verify proposed bearing capacity values that are marginal or in other high-risk situations.

The use of the foundation support values shown on the contract plans of the permanent structure is permitted if the foundations are on the same level and on the same soil as those of the permanent structure.

Allow for adequate site drainage or soil protection to prevent soil saturation and washout of the soil supporting the temporary works supports.

If piles are used, the estimation of capacities and later confirmation during construction using standard procedures based on the driving characteristics of the pile is permitted. If preferred, use load tests to confirm the estimated capacities; or, if required by the Engineer conduct load tests to verify bearing capacity values that are marginal or in other high risk situations.

The Engineer reviews and approves the proposed pile and soil bearing capacities.

5.0 REMOVAL

Unless otherwise permitted, remove and keep all temporary works upon completion of the work. Do not disturb or otherwise damage the finished work.

Remove temporary works in conformance with the contract documents. Remove them in such a manner as to permit the structure to uniformly and gradually take the stresses due to its own weight.

6.0 METHOD OF MEASUREMENT

Unless otherwise specified, temporary works will not be directly measured.

7.0 BASIS OF PAYMENT

Payment at the contract unit prices for the various pay items requiring temporary works will be full compensation for the above falsework and formwork.

SUBMITTAL OF WORKING DRAWINGS**(2-14-04)****1.0 GENERAL**

Submit working drawings in accordance with Article 105-2 of the Standard Specifications and the requirements of this Special Provision. The list of submittals contained herein does not represent a list of required submittals for this project. Submittals are only necessary for those items as required by the Standard Specifications, other Special Provisions, or contract plans. Make submittals that are not specifically noted in this Special Provision directly to the Resident Engineer.

If submittals contain variations from plan details or specifications, significantly affect project cost, or significantly affect field construction or operations, discuss them with, and submit them through, the Resident Engineer. State the reason for the proposed variation in the submittals. To minimize overall review time, make sure all working drawing submittals are complete when first submitted. Provide a contact name and phone number with each submittal. Direct any questions regarding working drawing submittal requirements to the Resident Engineer, Structure Design Unit contacts or the Geotechnical Engineering Unit contacts noted below.

2.0 WORKING DRAWINGS SUBMITTAL CONTACTS

All submittals noted herein are reviewed by the Structure Design Unit and/or the Geotechnical Engineering Unit.

For submittals to the Structure Design Unit, use the following addresses:

Via US mail:

Mr. G. R. Perfetti, P. E.
State Bridge Design Engineer
North Carolina Department
of Transportation
Structure Design Unit
1581 Mail Service Center
Raleigh, NC 27699-1581

Attention: Mr. P. D. Lambert, P. E.

Via other delivery service:

Mr. G. R. Perfetti, P. E.
State Bridge Design Engineer
North Carolina Department
of Transportation
Structure Design Unit
1000 Birch Ridge Drive
Raleigh, NC 27610

Attention: Mr. P. D. Lambert, P. E.

For submittals to the Geotechnical Engineering Unit, use the following addresses:

For projects in Divisions 1-7, use the following Eastern Regional Office address:

Via US mail:

Mr. K. J. Kim, Ph. D., P. E.
 Eastern Regional Geotechnical
 Manager
 North Carolina Department
 of Transportation
 Geotechnical Engineering Unit
 Eastern Regional Office
 1570 Mail Service Center
 Raleigh, NC 27699-1570

Via other delivery service:

Mr. K. J. Kim, Ph. D., P. E.
 Eastern Regional Geotechnical
 Manager
 North Carolina Department
 of Transportation
 Geotechnical Engineering Unit
 Eastern Regional Office
 3301 Jones Sausage Road, Suite 100
 Garner, NC 27529

For projects in Divisions 8-14, use the following Western Regional Office address:

Via US mail:

Western Regional Geotechnical
 Manager
 North Carolina Department
 of Transportation
 Geotechnical Engineering Unit
 Western Regional Office
 1589 Mail Service Center
 Raleigh, NC 27699-1589
 Attention: Mr. M. A. Mulla, P. E.

Via other delivery service:

Western Regional Geotechnical
 Manager
 North Carolina Department
 of Transportation
 Geotechnical Engineering Unit
 Western Regional Office
 1020 Birch Ridge Drive
 Raleigh, NC 27610
 Attention: Mr. M. A. Mulla, P. E.

Direct any questions concerning submittal review status, review comments, or drawing markups to the following contacts:

Primary Structures Contact:

Paul Lambert
 (919) 250-4041
 (919) 250-4082 facsimile
plambert@dot.state.nc.us

Secondary Structures Contacts:

James Gaither (919) 250-4042
 Man-Pan Hui (919) 250-4044

Eastern Regional Geotechnical Contact (Divisions 1-7):

K. J. Kim
 (919) 662-4710
 (919) 662-3095 facsimile
kkim@dot.state.nc.us

Western Regional Geotechnical Contact (Divisions 8-14):

Mohammed Mulla
(919) 250-4088
(919) 250-4237 facsimile
mmulla@dot.state.nc.us

3.0 SUBMITTAL COPIES

The quantities provided in this Special Provision act as a guide in the submittal process.

Unless otherwise required by the contract, submit two sets of supporting calculations to the Structure Design Unit.

Furnish one complete copy of the submittal, including all attachments, to the Resident Engineer. If requested, provide additional copies of any submittal. At the same time, submit the following number of copies directly to the Structure Design Unit and/or the Geotechnical Engineering Unit:

Working Drawing Submittal	Copies Required by Structure Design Unit	Copies Required by Geotechnical Engineering Unit	Contract Reference Requiring Submittal ¹
Arch Culvert Falsework	5	0	Plan Note & SN Sheet
Box Culvert Falsework ²	5	0	Plan Note & SN Sheet
Cofferdams ⁴	6	1	Articles 410-5 and 420-8
Expansion Joint Seals (hold down plate type with base angle)	9	0	“Expansion Joint Seals”
Expansion Joint Seals (modular)	2, then 9	0	“Modular Expansion Joint Seals”
Expansion Joint Seals (strip seals)	9	0	“Strip Seals”
Falsework & Forms (superstructure)	8	0	Article 420-3
Falsework & Forms ² (substructure)	8	0	Article 420-3
Mechanically Stabilized Earth Retaining Walls ⁴	7	1	“MSE Retaining Walls”
Metal Bridge Railing	8	0	Plan Note
Metal Stay-in-Place Forms	8	0	Article 420-3
Metalwork for Elastomeric Bearings ^{5,6}	7	0	Article 1072-10
Miscellaneous Metalwork ^{5,6}	7	0	Article 1072-10
Overhead Sign Assemblies	13	0	Article 903-3(C)
Pile Points	7	1	Article 450-8(D) & “Steel Pile Points”
Placement of Equipment on Structures (cranes, etc.)	7	0	Article 420-20

Precast Concrete Box Culverts	2, then 1 reproducible	0	“(Optional) Precast Reinforced Concrete Box Culvert at Station ____”
Precast Retaining Wall Panels	10	0	Article 1077-2
Pot bearings ⁵	8	0	“Pot Bearings”
Prestressed Concrete Deck Panels	6 and 1 reproducible	0	Article 420-3
Proprietary retaining walls ⁴	9	1	Applicable Project Special Provision
Prestressed Concrete Girder (strand elongation and detensioning sequences)	6	0	Articles 1078-8 and 1078-11
Prestressed Concrete Cored Slab (detensioning sequences) ³	6	0	Article 1078-11
Revised Bridge Deck Plans (adaptation to metal stay-in-place forms)	2, then 1 reproducible	0	Article 420-3
Revised Bridge Deck Plans (adaptation to modular expansion joint seals)	2, then 1 reproducible	0	“Modular Expansion Joint Seals”
Soil Nail Retaining Walls ⁴	4	1	Applicable Project Special Provision
Sound Barrier Wall Steel Fabrication Plans ⁶	7	0	Article 1072-10 & “Sound Barrier Wall”
Sound Barrier Wall Casting Plans	10	0	Article 1077-2 & “Sound Barrier Wall”
Structural Steel ⁵	2, then 7	0	Article 1072-10
TFE Expansion Bearings ⁵	8	0	Article 1072-10
Temporary Detour Structures ⁴	10	1	Article 400-3 & “Construction, Maintenance and Removal of Temporary Structure at Station ____”
Temporary Shoring ⁴	6	1	Article 410-4 & “Temporary Shoring for Maintenance of Traffic”

Temporary Fabric or Wire Walls ⁸	0	2	Applicable Project Special Provision
Permanent Anchored Tieback Retaining Walls ⁴	4	1	Applicable Project Special Provision
Evazote Joint Seals ⁷	9	0	Applicable Project Special Provision
Optional Disc Bearings ⁵	8	0	“Optional Disc Bearings”
Removal of Existing Structure over Railroad	5	0	Railroad Special Provisions
Drilled Pier Construction Sequence Plans ⁸	0	2	“Drilled Piers”
Pile Hammers ⁸	0	2	Article 450-6

FOOTNOTES

1. References are provided to help locate the part of the contract where the working drawing submittals are required. References in quotes refer to the Project Special Provision by that name. Articles refer to the Standard Specifications.
2. Submittals for these items are necessary only when plan notes require them.
3. Submittals for these items may not be required. A list of pre-approved sequences is available from the producer or the Materials and Tests Unit.
4. These submittals are reviewed by the Structure Design Unit and the Geotechnical Engineering Unit. If NCDOT Shoring Standards are used, working drawings need not be submitted, but the Shoring Selection Form should be forwarded to the Geotechnical Engineering Unit.
5. The fabricator may submit these items directly to the Structure Design Unit.
6. The two sets of preliminary submittals required by Article 1072-10 of the Standard Specifications are not required for these items.
7. Submittals for Fabrication Drawings are not required. Submission of Catalogue Cuts of Proposed Material is required. See Section 5.A of the Project Special Provision.
8. Submittals for these items are reviewed by the Geotechnical Engineering Unit only and correspondence regarding these items should be directed to and will come from the Geotechnical Engineering Unit.

METRIC STRUCTURAL STEEL**(10-12-01)**

The structural steel for this project is specified in SI (Metric) units with plate thickness designated in millimeters in accordance with AASHTO M160M.

The substitution of structural steel in US Customary nominal thickness is permitted for primary and secondary members defined as follows:

- Primary members - members such as webs and flanges of plate girders, transverse and bearing stiffeners, girder field splice plates, and connector plates for curved girders.
- Secondary members - members such as connector plates for straight girders, bearing plates and miscellaneous hardware.

Such substitution is limited to the values shown in the following table.

Material Specified Metric (mm)	Primary Members US Customary (in)	Secondary Members US Customary (in)
8	3/8	*
9	3/8	*
10	7/16	3/8
11	7/16	*
12	1/2	*
14	9/16	*
16	11/16	5/8
18	3/4	11/16
20	13/16	3/4
22	7/8	*
25	1	*
28	1-1/8	*
30	1-3/16	*
32	1-5/16	1-1/4
35	1-7/16	1-3/8
38	1-1/2	*
40	1-5/8	*
45	1-13/16	*
50	2	*
55	2-1/4	*
60	2-3/8	*
70	2-13/16	2-3/4

* These values are the same as those for Primary members.

There will be no additional payment for any extra weight incurred as a result of any substitution.

OPTIONAL DISC BEARINGS

(10-03-02)

1.0 GENERAL

This item consists of furnishing, fabrication and installation of disc bearings in accordance with AASHTO Standard Specifications, the Standard Specifications, the recommendations of the manufacturer and as specified herein. In addition, all plan notes pertaining to furnishing and installing pot bearing assemblies shall also apply to disc bearing assemblies, except as noted herein.

Disc Bearings consist of a polyether urethane structural element (disc) confined by upper and lower steel bearing plates. Equip disc bearings with a shear restriction mechanism to prevent movement of the disc. Supply disc bearings as fixed bearings and guided expansion bearings as designated by the Contract Documents.

Fixed disc bearings allow rotation but no longitudinal or transverse movement in the bearing plane. Fixed bearings consist of a sole plate, an elastomer disc, upper bearing plate, lower bearing plate, masonry plate, anchor bolts, nuts and washers.

Guided expansion disc bearings allow rotation and only longitudinal movement in the bearing plane. Guided expansion disc bearings consist of a sole plate, a top steel plate with a polished stainless steel sheet facing bearing on a fixed disc bearing with a layer of virgin polytetrafluoroethylene (PTFE) material on its top, masonry plate, anchor bolt assembly which includes anchor bolts, nuts, washers, pipe sleeves, a closure plate, grout and various sizes of standard pipe and any other necessary material as detailed on the plans. To allow longitudinal movement, bond a polytetrafluoroethylene (PTFE) sheet to the upper steel bearing plate. Support a sliding steel top bearing plate with the upper steel bearing plate. Face the mating surface of the sliding steel top bearing plate with polished stainless steel. Use either a guide bar or keyway system to restrict transverse movement. Face the sliding surfaces of the guide bar or keyway systems with either PTFE sheets or stainless steel.

2.0 MATERIALS

Use disc bearings produced by the same manufacturer.

Use AASHTO M270 Grade 50W (345W) for all steel in the disc bearings. Clean, coat, and seal the plates in the disc bearing assemblies except for the areas with special facings and the areas that come in contact with the elastomer disc, in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)". Coat surfaces to a thickness of 6 mils (0.150 mm) minimum on all external parts. Repair surfaces that are abraded or damaged after the application of metallizing in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)".

Provide anchor bolts and nuts in accordance with the Standard Specifications.

When the maximum plan dimension of the sheet is 12" (300 mm) or less, provide a stainless steel sheet in expansion disc bearings that is at least 16 gage or 1/16" (1.6 mm).

When the maximum plan dimension is greater than 12" (300 mm), provide a stainless steel sheet that is at least 11 gage or 1/8" (3 mm). Ensure that all stainless steel sheets are in conformance with ASTM A167/A240 Type 304 and polished to a minimum #8 mirror surface finish.

Blast clean the surface of the plate that will be attached to the stainless sheet to a near white condition in accordance with the Standard Specifications. Position and clamp the back of the stainless sheet that is to be in contact with the steel plate on the steel plate. Apply the stainless steel to the blast cleaned surface of the steel plate as soon as possible after blasting and before any visible oxidation of the blast cleaned surface occurs. Weld the stainless sheet continuously around its perimeter using a tungsten inert gas, wire-fed welder.

For the PTFE sheet, used as a mating surface for the stainless sheet, provide an unfilled virgin PTFE Sheet (Recessed) or a glass-fiber filled PTFE sheet, resulting from skiving billets formed under hydraulic pressure and heat. Provide resin that conforms to the requirements of ASTM D4894 or D4895.

To bond the PTFE and the bearing plate, use heat cured high temperature epoxy capable of withstanding temperature of -320°F to 500°F (-195 °C to 260 °C).

Mold the polyether urethane structural element from a polyether urethane compound. Conform the physical properties of the polyether urethane to the following requirements:

Physical Property	ASTM Test Method	Requirements	
		Min.	Max.
Hardness, Type D Durometer	D2240	60	64
Tensile Stress psi (Mpa) At 100% elongation At 200% elongation	D412	2000 (13.8) 3700 (25.5)	-----
Tensile Strength psi (Mpa)	D412	5000 (34.5)	-----
Ultimate Elongation %	D412	220	-----
Compression Set % 22 hrs. at 158°F (70°C)	D395	-----	40

3.0 DESIGN

Design the disc bearings for the loads and movements shown on the contract plans. However, use the anchor bolt size, length, spacing and masonry plate thickness as shown on the contract plans and provide an overall height of the bearing assembly that is at least the height shown on the contract plans, but no more than 1/2 inch (13 mm) greater than this height. Either combine and cast the sole plate and top plate/upper bearing plate and the lower bearing plate and masonry plate as a single unit or weld together prior to the installation of the disc.

When designing the bearings, use the following allowable bearing stresses:

- On polyether urethane structural element: 5000 psi (34.5 MPa)
- On PTFE Sliding Surface, filled or unfilled PTFE (recessed): 3500 psi (24.1 MPa)

Submit eight sets of shop drawings and one set of design calculations for review, comments and acceptance. Have a North Carolina Registered Professional Engineer check and seal the shop drawings and design calculations.

After the Engineer reviews the drawings and, if necessary, corrections are made, submit one 22" x 34" reproducible set of the working drawings.

4.0 SAMPLING AND TESTING

A. Sampling

The manufacturer is responsible for randomly selecting and testing sample bearings from completed lots of bearings. The manufacturer is also responsible for certifying that the completed bearings and their components have been tested and are in compliance with the requirements of this Special Provision. Have the manufacturer furnish the results of the tests to the Materials and Tests Engineer.

B. Testing

1. Proof Load Test

Load a test bearing to 150% of the bearing's rated design capacity and simultaneously subject it to a rotational range of 0.02 radians (1.146°) for a period of 1 hour.

Have the bearing visually examined both during the test and upon disassembly after the test. Any resultant visual defects, such as extruded or deformed elastomer or PTFE, damaged seals or rings, or cracked steel is cause for rejection.

Keep continuous and uniform contact between the polyether urethane element and the bearing plates and between the sliding steel top plate and the upper bearing plate for the duration of the test. Any observed lift-off is cause for rejection.

2. Sliding Coefficient of Friction

For all guided and non-guided expansion type bearings, measure the sliding coefficient of friction at the bearing's design capacity in accordance with the test method described below, and on the fifth and fiftieth cycles, at a sliding speed of 1 in/min (25 mm/min).

Calculate the sliding coefficient of friction as the horizontal load required to maintain continuous sliding of one bearing, divided by the bearing's vertical design capacity.

The test results are evaluated as follows:

- A maximum measured sliding coefficient of friction of 3%.
- A visual examination both during and after the test. Any resultant visual defects, such as bond failure, physical destruction, cold flow of PTFE to the point of debonding, or damaged components is cause for rejection of the lot.

Using undamaged test bearings in the work is permitted.

3. Test Method

The test method and equipment shall meet the following requirements:

- f. Arrange the test to determine the coefficient of friction on the first movement of the manufactured bearing.
- g. Clean the bearing surface prior to testing.
- h. Conduct the test at maximum working stress for the PTFE surface with the test load applied continuously for 12 hours prior to measuring friction.
- i. Determine the first movement static and dynamic coefficient of friction of the test bearing at a sliding speed of less than 1 in/min (25 mm/min), not to exceed:

0.04	unfilled PTFE
0.08	filled PTFE
- j. Subject the bearing specimen to 100 movements of at least 1 inch (25 mm) of relative movement and, if the test facility permits, the full design movement at a speed of less than 1 ft/min (300 mm/min). Following this test determine the static and kinetic coefficient of friction again. The specimen is considered a failure if it exceeds the values measured in (d) above or if it shows any signs of bond failure or other defects.

Bearings represented by test specimens passing the above requirements are approved for use in the structure subject to on-site inspection for visible defects.

5.0 INSTALLATION

Store disc bearings delivered to the bridge site under cover on a platform above the ground surface. Protect the bearings from injury at all times and, before placing the bearings, dry and clean all dirt, oil, grease or other foreign substances from the bearing. Do not disassemble the bearings during installation, except at the manufacturer’s direction. Place the bearings in accordance with the recommendations of the manufacturer, Contract Drawings, and as directed by the Engineer. If there is any discrepancy between the recommendations of the manufacturer, Special Provisions, and Contract Drawings, the Engineer is the sole judge in reconciling any such discrepancy.

Provide preformed bearing pads under the masonry plates in accordance with Article 1079-1 of the Standard Specifications.

Do not install any bearing before the Engineer approves it.

6.0 BASIS OF PAYMENT

Payment for all optional disc bearings will be at the lump sum contract price bid for “Pot Bearings” which includes full compensation for furnishing all disc bearings, labor, materials, tools, equipment, testing and incidentals required to complete the work in accordance with the Standard Specifications, this Special Provision, the manufacturer’s requirements and as directed by the Engineer.

ELASTOMERIC BEARINGS

(10-03-02)

Use elastomeric bearings in accordance with Article 1079-2 of the Standard Specifications except as follows:

**TABLE 1079-2
NATURAL RUBBER ELASTOMER REQUIREMENTS**

Grade (durometer)	50	60
PHYSICAL PROPERTIES		
Hardness ASTM D2240	50 +5 -5	60 +5 -5

SPECIAL PROVISIONS FOR PROTECTION OF RAILWAY INTEREST

1. FLAGGING SERVICES:A. When Required

Under the terms of the agreement between the N. C. Department of Transportation, herein called Department and the Norfolk Southern Railway Company herein called the Railroad, the Railroad has sole authority to determine the need for flagging required to protect its operations. In general, the requirements of such services will be whenever the Contractor's men or equipment are, or are likely to be, working on the Railroad's right-of-way, or across, over, adjacent to or under a track, or when such work has disturbed or is likely to disturb a railroad structure or the railroad roadbed or surface and alignment of any track to such extent that the movement of trains must be controlled by flagging. Normally, the Railroad will assign one flagman to a project; but in some cases, more than one may be necessary, such as yard limits where three (3) flagmen may be required. However, if the Contractor works within distances that violate instructions given by the Railroad's authorized representative or performs work that has not been scheduled with the Railroad's authorized representative, a flagman or flagmen may be required full time until the project has been completed. Should such violations or unscheduled, unauthorized work by the contractor result in full time flagging being required by Railroad, the additional cost of such flagging above normal flagging cost shall be deducted from the final payment to the Contractor as provided in Article 109-9 of the Standard Specifications. Neither Railroad nor Department will be liable for damages resulting from unscheduled or unauthorized work.

B. Scheduling and Notification

- (1) The Contractor's work requiring railroad flagging should be scheduled to limit the presence of a flagman at the site to a maximum of 50 hours per week. The Contractor shall receive Railroad approval of work schedules requiring a flagman presence in excess of 40 hours per week.
- (2) Not later than the time that approval is initially requested to begin work on Railroad right-of-way, Contractor shall furnish to the Railroad and the Department a schedule for all work required to complete the portion of the project within Railroad right-of-way and arrange for a job site meeting between the Contractor, the Department, and the Railroad's authorized representative. Flagman or flagmen may not be provided until the job site meeting has been conducted and the Contractor's work scheduled.
- (3) The Contractor will be required to give the Railroad representative at least 10 working days of advance written notice of intent to begin work within Railroad right-of-way in accordance with this special provision. Once begun, when such

work is then suspended at any time, or for any reason, the Contractor will be required to give the Railroad representative at least 3 working days of advance notice before resuming work on Railroad right-of-way. Such notices shall include sufficient details of the proposed work to enable the Railroad representative to determine if flagging will be required. If such notice is in writing, the Contractor shall furnish the Highway Engineer a copy; if notice is given verbally it shall be confirmed in writing with copy to the Highway Engineer. If flagging is required, no work shall be undertaken until the flagman, or flagmen, is present at the job site. It may take up to 30 days to obtain flagging initially from the Railroad. When flagging begins, the flagman is usually assigned by the Railroad to work at the project site on a continual basis until no longer needed and cannot be called for on a spot basis. If flagging becomes unnecessary and is suspended, it may take up to 30 days to again obtain from the Railroad. Due to labor agreements, it is necessary to give 5 working days notice before flagging service may be discontinued and responsibility for payment stopped.

- (4) If, after the flagman is assigned to the project site, emergencies arise which require the flagman's presence elsewhere, then the Contractor shall delay work on Railroad right-of-way until such time as the flagman is again available. Any additional costs resulting from such delay shall be borne by the Contractor and not the Department or Railroad.

C. Payment

- (1) The Department will be responsible for paying the Railroad directly for any and all costs of flagging which may be required to accomplish the construction. The Contractor shall reimburse the Railroad for any costs of the flagging which is required for work for the benefit of the Contractor.
- (2) The cost of flagging service is based on an 8-hour work day and 40-hour work week. This cost includes the base pay for each flagman, overhead, and includes an estimated per diem charge for travel expenses, meals and lodging. The charge by the Railroad will be the actual cost based on the rate of pay for the Railroad's employees who are available for flagging service at the time the service is required. Work by a flagman in excess of 8 hours per day or 40 hours per week but not more than 12 hours a day will result in overtime pay at 1½ times the appropriate rate. Work by a flagman in excess of 12 hours per day will result in overtime pay at 2 times the appropriate rate. If work is performed on a holiday, the flagging rate is 2½ times the normal rate. Railroad work involved in preparing and handling bills will also be charged. Charges by the Railroad shall be in accordance with applicable provisions of Federal-Aid Policy Guide 23 CFR 140I and 23 CFR 646B issued by the Federal Highway Administration on December 9, 1991, including all current amendments.

ID. Verification

- (1) The Contractor and Department will review and sign the Railroad flagman's time sheet, (Form 11123) attesting that the flagman was present during the time recorded. Flagmen may be removed by Railroad if form is not signed. If flagman is removed, the Contractor will not be allowed to re-enter the Railroad right-of-way until the issue is resolved. Complaints concerning flagman or flagmen must be resolved in a timely manner. If need for flagman or flagmen is questioned, please write or telephone Railroad's Engineer-Grade Separation Structures. All verbal complaints must be confirmed in writing by the Contractor within 5 working days with copy to the Highway Engineer. All written correspondence should be addressed to:

Chief Engineer-Bridges & Structures
Norfolk Southern Railway Company
99 Spring Street, S.W.
Atlanta, GA 30303
Attention: Engineer-Grade Separation Structures

- (2) The Railroad flagman assigned to the project will be responsible for notifying the Highway Engineer upon arrival at the job site on the first day (or as soon thereafter as possible) that flagging services begin and on the last day that he performs such services for each separate period that services are provided. The Highway Engineer will document such notification in the project records. When requested, the Highway Engineer will also sign the flagman's diary showing daily time spent and activity at the project site.

2. AUTHORITY OF RAILROAD ENGINEER AND STATE ENGINEER:

The authorized representative of the Railroad company, hereinafter referred to as Railroad Engineer, shall have final authority in all matters affecting the safe maintenance of Railroad traffic of his Company including the adequacy of the foundations and structures supporting the Railroad tracks.

The authorized representative of the Department, hereinafter referred to as the Engineer, shall have authority over all other matters as prescribed herein, in the Project Specifications, and Special Provisions, and on the plans.

3. NOTICE OF STARTING WORK:

- A. The Contractor shall not commence any work on Railroad rights of way until he has complied with the following conditions:

- (1) Given the Railroad written notice, with copy to the Engineer who has been designated to be in charge of the work, at least ten days in advance of the date he proposes to begin work on Railroad rights of way to:

Chief Engineer-Bridges & Structures
Norfolk Southern Railway Company
99 Spring Street, SW
Atlanta, Georgia 30303

- (2) Obtain written authorization from the Railroad to begin work on Railroad rights of way, such authorization to include an outline of specific conditions with which he must comply.
 - (3) Obtain written approval from the Railroad for Railroad Protective Insurance coverage as required by paragraph 13 herein.
- B. The Railroad's written authorization to proceed with the work will include the names, addresses, and telephone numbers of the Railroad's representatives who are to be notified as hereinafter required. Where more than one representative is designated, the area of responsibility of each representative will be specified.
4. INTERFERENCE WITH RAILROAD OPERATIONS:
- A. The Contractor shall so arrange and conduct his work 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 poles, wires, and other facilities of tenants on the rights of way of the Railroad Company. Whenever work is liable to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor which requires flagging service or inspection service (watchman) shall be deferred by the Contractor until the flagging protection required by the Railroad is available at the job site.
 - B. Whenever work within Railroad rights-of-way is of such a nature that impediment to Railroad operations such as use of runaround tracks or necessity for reduced speed is unavoidable, the contractor shall schedule and conduct his operations so that such impediment is reduced to the absolute minimum.
 - C. Should conditions arising from, or in connection with the work, require that immediate and unusual provisions be made to protect operations and property of the Railroad, the Contractor shall make such provisions. If in the judgment of the Railroad Engineer, or in his absence, the Engineer, such provision is insufficient, either may require or provide such provisions as he deems necessary. In any event, such unusual provisions shall be at the Contractor's expense and without cost to the Railroad or the Department.

B. Excavation:

The subgrade of an operated track shall be maintained with edge of berm at least 10'0" from centerline of track and not more than 24 inches below top of rail. The Contractor will not be required to make existing section meet this specification if substandard, in which case existing section will be maintained.

C. Excavation for Structures:

The Contractor will be required to take special precaution and care in connection with excavating and shoring pits, and in driving piles, for footings adjacent to tracks to provide adequate lateral support for the tracks and the loads which they carry, without disturbance of track alignment and surface, and to avoid obstructing track clearances with working equipment, tools or other material. The procedure for doing such work, including need of and plans for shoring, shall first be approved by the Railroad Engineer, but such approval shall not relieve the Contractor from liability. Before submission of plans to the Railroad Engineer for approval, such plans shall first be reviewed and certified satisfactory by the Department.

D. Blasting:

- (1) The Contractor shall obtain advance approval of the Railroad Engineer and the Engineer for use of explosive on or adjacent to Railroad property. If permission for use of explosives is granted, the Contractor will be required to comply with the following:
 - (a) Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Contractor.
 - (b) Electric detonating fuses shall not be used because of the Possibility of premature explosions resulting from operation of two-way train radios.
 - (c) No blasting shall be done without the presence of an authorized representative of the Railroad. At least 72 hours advance notice to the person designated in the Railroad's notice of authorization to proceed (see paragraph 3B above) will be required to arrange for the presence of an authorized Railroad representative and such flagging as the Railroad may require.
 - (d) Have at the job site adequate equipment, labor and materials and allow sufficient time to clean up debris resulting from the blasting without delay to trains, as well as correcting at his expense any track misalignment or other damage to Railroad property resulting from the blasting as directed by the Railroad's authorized representative. If his actions result in delay of trains, the Contractor shall bear the entire cost thereof.

- (2) The Railroad representative will:
- (a) Determine the approximate location of trains and advise the Contractor the approximate amount of time available for the blasting operation and clean-up.
 - (b) Have the authority to order discontinuance of blasting if, in his opinion, blasting is too hazardous or is not in accord with these special provisions.

E. Maintenance of Railroad Facilities:

- (1) The Contractor will be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from his operations; to promptly repair eroded areas within Railroad rights of way and to repair any other damage to the property of the Railroad or its tenants.
- (2) All such maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.

F. Storage of Materials and Equipment:

Materials and equipment shall not be stored 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, and such permission will be with the understanding that the Railroad Company will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the contractor's expense, such material and equipment.

All grading or construction machinery that is left parked near the track unattended by a watchman shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save Railroad, and any associated, controlled or affiliated corporation, harmless from and against all loss, costs, expenses, claim or liability for loss of or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.

G. Cleanup:

Upon completion of the work, the Contractor shall remove from within the limits of the Railroad rights of way, all machinery, equipment, surplus materials, falsework, rubbish or temporary buildings of the Contractor, and leave said rights of way in a neat condition satisfactory to the Chief Engineer of the Railroad or his authorized representative.

7. DAMAGES:

- A. The Contractor shall assume all liability for any and all damages to his work, employees, servants, equipment and materials caused by Railroad traffic.
- B. Any cost incurred by the Railroad for repairing damages to its Property or to property of its tenants, caused by or resulting from the operations of the contractor, shall be paid directly to the Railroad by the contractor.

8. HAUL ACROSS RAILROADS:

- A. Where the plans show or imply that materials of any nature must be hauled across a Railroad, unless the plans clearly show that the State has included arrangements for such haul in its agreement with the Railroad, the Contractor will be required to make all necessary arrangements with the Railroad regarding means of transporting such materials across the Railroad. The Contractor will be required to bear all costs incidental, including flagging, to such crossings whether services are performed by his own forces or by Railroad personnel.
- B. No crossing may be established for use of the Contractor for transporting materials or equipment across the tracks of the Railroad Company unless specific authority for its installation, maintenance, necessary watching and flagging thereof and removal, all at the expense of the contractor, is first obtained from the Railroad Engineer.

9. WORK FOR THE BENEFIT OF THE CONTRACTOR:

- A. All temporary or permanent changes in wire lines or other facilities which are considered necessary to the project are shown on the plans; included in the force account agreement between the Department and the Railroad or will be covered by appropriate revisions to same which will be initiated and approved by the State and/or the Railroad.
- B. Should the Contractor desire any changes in addition to the above, then he shall make separate arrangements with the Railroad for same to be accomplished at the Contractor's expense.

10. COOPERATION AND DELAYS:

- A. It shall be the Contractor's responsibility to arrange a schedule with the Railroad for accomplishing stage construction involving work by the Railroad or tenants of the Railroad. In arranging his schedule he shall ascertain, from the Railroad, the lead time required for assembling crews and materials and shall make due allowance therefor. The Contractor shall cooperate with others in the construction of the project to the end that all work may be accomplished to the best advantage.
- B. No charge or claims of the Contractor against either the Department or the Railroad Company will be allowed for hindrance or delay on account of railroad traffic, any work

done by the Railroad company or other delay incident to or necessary for safe maintenance of railroad traffic or for any delays due to compliance with these special provisions.

- C. The Contractor's attention is called to the fact that 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 Contractor 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.

11. TRAINMAN'S WALKWAYS

- A. Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than 10' from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while Railroad's protective service is provided shall be removed before the close of each work day. If there is any excavation near the walkway, a handrail, with 10'-0" minimum clearance from centerline of track, shall be placed.

12. COMPLETION AND ACCEPTANCE:

- A. Upon completion of the work, the Contractor shall remove from within the limits of the railroad right of way all machinery, equipment, surplus materials, rubbish or temporary buildings of the Contractor, and leave said rights of way in a neat and orderly condition. After the final inspection has been made and work found to be completed in a satisfactory manner acceptable to the Department and the Railroad Company, the Department will be notified of the Railroad Company's acceptance in writing by the Railroad Company's Chief Engineer or his authorized representative within ten (10) days or as soon thereafter as practicable.

13. SAFETY:

A. GUIDELINES FOR PERSONNEL ON RAILROAD RIGHT-OF-WAY:

1. All persons shall wear hard hats. Appropriate eye and hearing protection must be used. Working in shorts is prohibited. Shirts must cover shoulders, back and abdomen. Working in tennis or jogging shoes, sandals, boots with high heels, cowboy and other slip-on type boots is prohibited. Hard-sole, lace-up footwear, zippered boots or boots cinched up with straps which fit snugly about the ankle are adequate. Safety boots are strongly recommended.
2. No one is allowed within 25' of the centerline of track without specific authorization from the flagman.

3. All persons working near track while train is passing are to lookout for dragging bands, chains and protruding or shifted cargo.
4. No one is allowed to cross tracks without specific authorization from the flagman.
5. All welders and cutting torches working within 25' of track must stop when train is passing.
6. No steel tape or chain will be allowed to cross or touch rails without permission.

B. GUIDELINES EQUIPMENT ON RAILROAD RIGHT-OF-WAY:

1. No crane or boom equipment will be allowed to set up to work or park within boom distance plus 15 ft. of centerline of track without specific permission from railroad official and flagman.
2. No crane or boom equipment will be allowed to foul track or lift a load over the track without flag protection and track time.
3. All employees will stay with their machines when crane or boom equipment is pointed toward track.
4. All cranes and boom equipment under load will stop work while train is passing (including pile driving).
5. Swinging loads must be secured to prevent movement while train is passing.
6. No loads will be suspended above a moving train.
7. No equipment will be allowed within 25' of centerline of track without specific authorization of the flagman.
8. Trucks, tractors or any equipment will not touch ballast line without specific permission from railroad official and flagman.
9. No equipment or load movement within 25' or above a standing train or railroad equipment without specific authorization of the flagman.
10. All operating equipment within 25' of track must halt operations when a train is passing. All other operating equipment may be halted by the flagman if the flagman views the operation to be dangerous to the passing train.
11. All equipment, loads and cables are prohibited from touching rails.

- 12. While clearing and grubbing, no vegetation will be removed from railroad embankment with heavy equipment without specific permission from the Railroad engineer and flagman.
- 13. No equipment or materials will be parked or stored on Railroad's property unless specific authorization is granted from the Railroad engineer.
- 14. All unattended equipment that is left parked on Railroad property shall be effectively immobilized so that it cannot be moved by unauthorized persons.
- 15. All cranes and boom equipment will be turned away from track after each work day or whenever unattended by an operator.

14. INSURANCE

A. In addition to any other forms of insurance or bonds required elsewhere in the contract documents, the Contractor will be required to provide coverage conforming to the requirements of the Federal-Aid Policy Guide outlined under 23 CFR 646A for all work to be performed on Railroad right(s) of way under the terms of the contract by carrying insurance of the following kinds:

1. CONTRACTOR'S COMMERCIAL GENERAL LIABILITY INSURANCE:

a. The Contractor shall furnish an original and one copy of the certificates of insurance and one certified copy of the policy to the Department as evidence that, with respect to the operations he performs on railroad right of way, he carries regular Contractor's Commercial General Liability Insurance including "XCU" coverage providing for limits of liability as follows:

<u>COVERAGE</u>	<u>MINIMUM COMBINED LIMITS OF LIABILITY</u>
Bodily Injury Liability	\$ 2,000,000 Per Occurrence
Property Damage Liability	\$ 2,000,000 Aggregate

- b. If any part of the work is sublet, similar insurance and evidence thereof in the same amounts as required of the Prime Contractor, shall be provided by the subcontractor to cover his operations on railroad right of way. As an alternative, the Prime Contractor may provide insurance for the subcontractor by means of separate and individual policies.
- c. Certificates of Insurance holders are to be the addressees given below. Certificates shall make reference to the project, milepost and county.

Division of Highways
 Dept. of Transportation
 c/o State Contractual Services Engr.
 P. O. Box 25201
 Raleigh, N.C. 27611

Norfolk Southern Railway Company
 c/o Director of
 Risk Management
 Three Commercial Place
 Norfolk, VA 23510-2191

2. RAILROAD PROTECTIVE LIABILITY INSURANCE:

- a. The Contractor shall furnish to the Department an original and one duplicate of the Railroad Protective Liability Insurance Policy with limits of liability as follows:

<u>COVERAGE</u>	<u>MINIMUM COMBINED LIMITS OF LIABILITY</u>
Bodily Injury Liability	\$2,000,000 Per Occurrence
Property Damage Liability	\$6,000,000 Aggregate Per Annual Policy Period
Physical Damage to Property	

- b. The Railroad Protective Liability Policy is to be written on the ISO/RIMA Form No. CG 00 35 06 90 including Endorsements CG 28 31 11 85 and IL 00 21 or their equivalents.
- c. The named insured, description of the work and designation of the job site to be shown on the Policy are as follows:

Named Insured: Norfolk Southern Railway Company
 Three Commercial Place
 Norfolk, VA 23510-2191

Description and Designation: Construction of new dual overhead structures on proposed relocated US 70 over the tracks of Norfolk Southern Railway Company in Statesville, Iredell County, North Carolina near Railroad Milepost S-20.2 (Industrial Lead Track) identified as State TIP R-2911A and Federal Project STP-70(75).

- B. The Railroad Protective Liability Policy shall contain a clause requiring that sixty (60) days written notice be given the Department and the Railroad Company prior to cancellation or change.

All other policies and certificates shall contain a clause requiring that thirty (30) days written notice be given the Department and the Railroad Company prior to cancellation or change. The notices shall make reference to the project, milepost and county.

NOTICE TO:

Norfolk Southern Railway Company
c/o Director of Risk
Management
Three Commercial Place
Norfolk, VA 23510-2191

COPY NOTICE TO:

Division of Highways
Dept. of Transportation
c/o State Contractual Services Engineer
P. O. Box 25201
Raleigh, NC 27611

- C. All insurance herein before specified shall be carried until the final inspection and acceptance of the project, or that portion of the project within railroad right of way, by the Department or, in the case of subcontractors, until the Contractor furnishes a letter to the Engineer stating that the subcontractor has completed his subcontracted work within railroad right of way to the satisfaction of the Contractor and that the Contractor will accomplish any additional work necessary on railroad right of way with his own forces. It is understood that the amounts specified are minimum amounts and that the Contractor may carry insurance in larger amounts if he so desires. As to "aggregate limits", if the insurer establishes loss reserves equal to or in excess of the aggregate limit specified in any of the required insurance policies, Contractor shall immediately notify the Department of Transportation and shall cease all operations until the aggregate limit is reinstated. If the insurer establishes loss reserves equal to or in excess of one/half of the aggregate limit, Contractor shall arrange to restore the aggregate limit to at least the minimum amount stated in these requirements. Any insurance policies and certificates taken out and furnished due to these requirements shall be approved by the Department and the Railroad Company as to form and amount prior to beginning work on railroad right of way.
- D. Evidence of insurance as required above shall be furnished for review to the Department at the address shown below after which it will be forwarded by the Department to the Railroad.

Send to Department:

Division of Highways
Dept. of Transportation
c/o State Contractual Services Engineer
P. O. Box 25201
Raleigh, NC 27611

15. FAILURE TO COMPLY:

A. In the event the Contractor violates or fails to comply with any of the requirements of these Special Provisions:

- (1) The Railroad Engineer may require that the Contractor vacate Railroad property.
- (2) The Engineer may withhold all monies due the Contractor on monthly statements.

Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Engineer.

16. PAYMENT FOR COST OF COMPLIANCE:

A. No separate payment will be made for any extra cost incurred on account of compliance with these special provisions. All such cost shall be included in prices bid for other items of the work as specified in the payment items.

R-2911A

Railroad Site Data:

The following information was received from the Railroad on **June 21, 2004**, and is provided as a convenience to the Contractor in bidding this project. This information is subject to change and the Contractor may, at his discretion, contact the Railroad directly to verify its current accuracy. Since this information is shown as a convenience to the Contractor, but is subject to change, the Contractor shall have no claims whatsoever against either the Railroad or the Department of Transportation for any delays or additional costs incurred based on changes in this information which occur after the above date of receipt.

Type and number of tracks within 50 ft. of project.

1 – Mainline & 2 - Sidings

Number of trains on affected track per day.

4 per day

Type of trains.

Freight

Maximum authorized operating speed of trains.

15 mph

Type and number of RR employees assigned to job.

1 - Flagman

PROJECT SPECIAL PROVISIONS
PERMITS

The Contractor's attention is directed to the following permits, which have been issued to the Department of Transportation by the authority granting the permit.

PERMIT**AUTHORITY GRANTING THE PERMIT**

Dredge and Fill and/or
Work in Navigable Waters (404)

U. S. Army Corps of Engineers

Water Quality (401)

Division of Environmental Management, DENR,
State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-14 of the Standard Specifications and the following:

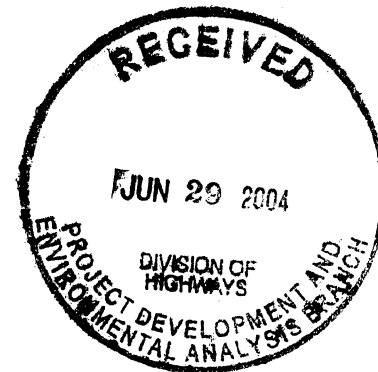
Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the Engineer to determine what, if any, additional permit action is required. The Contractor 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 Contractor 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 Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890



June 29, 2004

Regulatory Division

Action ID. 200430596, TIP No. R-2911 A

Dr. Gregory J. Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

In accordance with your written request of February 25, 2004 and the ensuing administrative record, enclosed are two copies of a permit to discharge dredged or fill material into 0.26 acres of wetland and 1998 linear feet of stream channel on unnamed tributaries to Third Creek to facilitate the widening and relocation of 5.1 miles of US Highway 70 from SR 2318 (Fanjoy Road) to the Iredell-Rowan County Line east of Statesville, Iredell County, North Carolina (TIP No. R-2911 A, State Project No. 8.1631801).

You should acknowledge that you accept the terms and conditions of the enclosed permit by signing and dating each copy in the spaces provided ("Permittee" on page 3). Your signature, as permittee, indicates that, as consideration for the issuance of this permit, you voluntarily accept and agree to comply with all of the terms and conditions of this permit. All pages of both copies of the signed permit with drawings should then be returned to this office for final authorization. A self-addressed envelope is enclosed for your convenience.

In addition, I have enclosed a copy of the Notification of Administrative Appeal Process and Options and Request for Appeal. Please carefully read Section "B" of this form for information regarding the appeal process for proffered permits.

200

After the permit is authorized in this office, the original copy will be returned to you; the duplicate copy will be permanently retained in this office. Should you have questions, contact Mr. Steven Lund, Regulatory Division, Asheville Regulatory Field Office, telephone (828) 271-7980 extension 223.

Sincerely,

A handwritten signature in cursive script that reads "E. David Franklin".

E. David Franklin
Chief, NCDOT Team

Enclosures

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: NC Department of Transportation		File Number: 200430596	Date: 06-29-04
Attached is:			See Section below
XX	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A	
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B	
	PERMIT DENIAL	C	
	APPROVED JURISDICTIONAL DETERMINATION	D	
	PRELIMINARY JURISDICTIONAL DETERMINATION	E	

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

DEPARTMENT OF THE ARMY PERMIT

NC Department of Transportation

Permittee _____

200430596

Permit No. _____

USAED, Wilmington

Issuing Office _____

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

To discharge dredged or fill material into 0.26 acres of wetland and 1998 linear feet of stream channel on unnamed tributaries to Third Creek to facilitate the widening and relocation of 5.1 miles of US Highway 70 from SR 2318 (Fanjoy Road) to the Iredell-Rowan County Line east of Statesville, Iredell County, North Carolina (TIP No. R-2911 A).

Project Location:

From SR 2318 (Fanjoy Road) to the Iredell-Rowan County Line east of Statesville, Iredell County, North Carolina .

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2007. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

See enclosed sheet.

Further Information:

1. **Congressional Authorities:** You have been authorized to undertake the activity described above pursuant to:

() Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(x) Section 404 of the Clean Water Act (33 U.S.C. 1344).

() Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. **Limits of this authorization.**

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. **Limits of Federal Liability.** In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE)

(DATE)

NC DEPARTMENT OF TRANSPORTATION

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

(DISTRICT ENGINEER)

(DATE)

CHARLES R. ALEXANDER, JR. COLONEL

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE)

(DATE)



Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E., Director
Division of Water Quality
Coleen H. Sullins, Deputy Director
Division of Water Quality

May 11, 2004

Mr. Gregory J. Thorpe, Ph.D., Environmental Director
NCDOT Planning and Environmental Branch
1548 Mail Service Center
Raleigh, NC, 27699-1548

RECEIVED

MAY 21 2004

Dear Dr. Thorpe:

CESAW-CO-RA

Re: Water Quality Certification Pursuant to §401 of the Federal Clean Water Act.
US 70 Relocation from SR 2314 (Fanjoy Road) to Iredell-Rowan Co. line.
Iredell County.
F.A. Project No. STP-70(39); State Project No. 8.1631801
TIP No. R-2911A
DWQ Project No. 040289

Attached hereto is a copy of Certification No. 3460 issued to The North Carolina Department of Transportation dated May 11, 2004.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

Alan W. Klimek, P.E.

Attachments

- cc: Wilmington District Corps of Engineers
- Steve Lund, USACE Asheville Field Office
- NCDWQ Mooresville Regional Office
- Christopher Militscher, US Environmental Protection Agency – Region IV
- William D. Gilmore, NC Ecological Enhancement Program
- Central Files
- File Copy



Gregory J. Thorpe, Ph.D.
§401 Water Quality Certification No. 3460
R-2911A

207

NORTH CAROLINA 401 WATER QUALITY CERTIFICATION

THIS CERTIFICATION 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 .0500. This Certification authorizes the NCDOT to incur the following permanent impacts:

- 0.26 acres of riverine wetlands through fill, excavation and mechanized clearing;
- 0.25 acres of surface waters;
- 1998 linear feet of jurisdictional stream loss.

R-2911A shall be constructed pursuant to the application dated February 25, 2004 to relocate US 70 from SR 2318 (Fanjoy Road) east of Statesville to the Iredell-Rowan County line.

The Application provides adequate assurance that the discharge of fill material into the waters of the state with the proposed development will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your Application. All work authorized by this Certification must be done in strict compliance with the plans attached to the Application. If this project changes, incurring additional impacts to streams, wetlands or buffers, you are required to notify the DWQ *in writing*, and you may be required to submit a new application. Additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion Control, Non-discharge and Water Supply watershed regulations.

This Certification shall expire three (3) years from the date of the cover letter from DWQ or on the same day as the expiration date of the corresponding US Army Corps of Engineers Permit, whichever is later.

Condition(s) of Certification:

1. 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. Any reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.

Gregory J. Thorpe, Ph.D.
§401 Water Quality Certification No. 3460
R-2911A

208

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 Application. All construction activities shall be performed so that no violations of state water quality standards, statutes, or rules occur.
3. Sediment and erosion control measures shall not be placed in wetlands or waters to the maximum extent practicable. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, they shall be removed and the natural grade restored within 30 days after the project has been released.
4. Stormwater management shall be constructed in accordance with the hydraulic design plans submitted in the February 25, 2004 application.
5. The outside wetland or water boundary as well as along the construction corridor within these boundaries approved under this authorization shall be clearly marked by orange fabric fencing for the areas that have been approved to infringe within the wetland or water prior to any land disturbing activities.
6. NCDOT and its contractors and/or agents shall not excavate, fill, or perform mechanized land clearing at any time in the construction or maintenance of this project within waters and/or wetlands, except as authorized by this Certification, or any modification to this Certification. There shall be no excavation from or waste disposal into jurisdictional wetlands or waters associated with this Certification without appropriate modification. If this occurs, compensatory mitigation will be required since it is a direct impact from road construction activities.
7. Excavation of stream crossings should be conducted in the dry unless demonstrated by the applicant or its authorized agent to be unfeasible. Sandbags, cofferdams, flexible pipe, or other diversion structures should be used to minimize excavation in flowing water.
8. Live or fresh concrete shall not come into contact with waters of the state until the concrete has hardened.
9. Discharging hydroseeding mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is strictly prohibited.
10. The removal of vegetation in riparian areas should be minimized. NCDOT is encouraged to use existing on-site vegetation and materials for stream bank stabilization and to minimize the use of rip rap. Riprap shall not be placed in the stream bottom. Riparian vegetation, using native trees and shrubs, must be re-established within the construction limits of the project by the end of the growing season following completion of construction to reestablish the riparian zone and to provide long-term erosion control.
11. Culverts that are less than 48-inch in diameter should be buried to a depth equal to or greater than 20% of their size to allow for aquatic life passage. Culverts that are 48-inch diameter or larger should be buried at least 12 inches below the stream bottom to allow natural stream bottom material to become established in the culvert following installation and to provide aquatic life passage during periods of low flow. If any of the existing pipes are perched, they shall be removed and replaced, and re-installed correctly, unless demonstrated that this is topographically unfeasible.
12. Heavy equipment should be operated from the bank rather than in the stream channel unless demonstrated by the applicant or its authorized agent to be unfeasible. All mechanized

Gregory J. Thorpe, Ph.D.
§401 Water Quality Certification No. 3460
R-2911A

209

equipment operated near surface waters should be inspected and maintained regularly to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids or other toxic substances.

13. *Summary of Compensatory Mitigation:* Compensatory mitigation shall be the same as that approved by the US Army Corps of Engineers, as long as the mitigation required equals a ratio of 1:1 restoration or creation of lost wetland acres as described in 15A NCAC 2H.0506 (h)(6), and consists of the following:
- 180 linear feet of relocation of UT to Third Creek using natural channel design
 - 1817 linear feet of stream impacts will be mitigated through NCDENR Ecosystem Enhancement Program (EEP).
 - 0.27 acres of impacts to riverine wetlands will be mitigated through EEP.
- In accordance with 15A NCAC 2R.0500, this contribution will satisfy NC Division of Water Quality's compensatory mitigation requirements under 15A NCAC 2H.0506(h). Until the EEP receives and clears your payments, wetland or stream fill shall not occur. The payments to EEP shall be sent within two (2) months of issuance of the 404 permit.
14. Rock check dams at culvert outlets should be removed at project completion to avoid blocking movement of aquatic life.
- * 15. Two copies of the final construction drawings shall be furnished to NCDWQ prior to the pre-construction meeting. Written verification shall be provided that the final construction drawings comply with the attached permit drawings contained in the Application dated February 20, 2004.
- * 16. Upon completion of the project, the NCDOT shall complete and return the enclosed "Certification of Completion Form" to notify DWQ when all work included in the 401 Certification has been completed. The responsible party shall complete the attached form and return it to the 401/Wetlands Unit of the Division of Water Quality upon completion of the project.
17. NCDOT and its authorized agents shall conduct its activities in a manner consistent with State water quality standards and any other appropriate requirements of State law and Federal law. If DWQ 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, DWQ may reevaluate and modify this Certification to include conditions appropriate to assure compliance with such standards and requirements in accordance with 15A NCAC 2H.0507(d). Before modifying the Certification, DWQ shall notify NCDOT and the US Army Corps of Engineers, provide public notice in accordance with 15A NCAC 2H.0503 and provide opportunity for public hearing in accordance with 15A NCAC 2H.0504. Any new or revised conditions shall be provided to NCDOT in writing, shall be provided to the United States Army Corps of Engineers for reference in any permit issued pursuant to Section 404 of the Clean Water Act, and shall also become conditions of the 404 Permit for the project.

NCDOT shall require its contractors (and/or agents) to comply with all of the terms of this Certification, and shall provide each of its contractors (and/or agents) a copy of this Certification.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal Permit. This Certification shall expire upon the expiration of the 404 Permit.

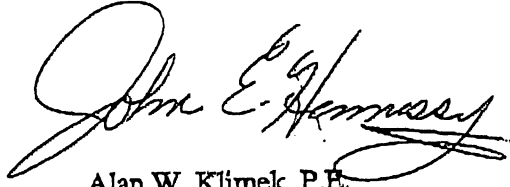
Gregory J. Thorpe, Ph.D.
§401 Water Quality Certification No. 3460
R-2911A

210

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. 27699-6714. This certification and its conditions are final and binding unless you ask for a hearing.

This the 11th day of May 2004

DIVISION OF WATER QUALITY

A handwritten signature in cursive script, appearing to read "Alan W. Klimek". The signature is written in black ink and is positioned above the printed name.

Alan W. Klimek, P.E.

WQC No. 3460

SPECIAL CONDITIONS; ACTION ID: 200430596; TIP NO; R-2911A

1. All work authorized by this permit must be performed in strict compliance with the attached plans, which are a part of this permit.
2. All conditions of Section 401, Clean Water Act, Water Quality Certification No. 3460, issued by the North Carolina Division of Water Quality on May 11, 2004, will be regarded as conditions of this Department of the Army (DA) permit.
- * 3. The permittee shall schedule a preconstruction meeting between their representatives, the contractor and a representative of the Corps of Engineers, Asheville Regulatory Field Office prior to any work in jurisdictional waters and wetlands to ensure that there is a mutual understanding of all terms and conditions contained in this DA permit. The permittee shall notify the Corps of Engineers a minimum of thirty (30) days in advance of the meeting.
- * 4. The permittee and his contractors and/or agents shall not excavate, fill or perform mechanized land clearing at any time in the construction or maintenance of this project within waters and/or wetlands except as authorized by this permit or any modification to this permit. There shall be no excavation from, waste disposal into, or degradation of jurisdictional waters or wetlands associated with this permit without the necessary modification of this permit to include appropriate compensatory mitigation. This prohibition applies to all borrow and fill activities associated with this project.
- * 5. To ensure that all borrow and waste activities occur on uplands and do not result in the degradation of adjacent waters and wetlands, except as authorized by this permit, the permittee shall require its contractors and/or agents to identify all areas to be used to borrow material or to dispose of dredged, fill or waste material. The permittee will coordinate with the Corps of Engineers before approving any borrow or waste sites that are within 400 feet of any stream or wetland by providing appropriate map(s) indicating the location (s) of such borrow or waste sites. The permittee shall ensure that all such areas comply with Special Condition No. 4 of this permit and shall require and maintain documentation of the location and characteristics of all borrow and disposal sites associated with this project. This documentation will include data regarding soils, vegetation and hydrology sufficient to clearly demonstrate compliance with Special Condition No. 4 above. All information will be available to the Corps of Engineers upon request. The permittee shall require its contractors to complete and execute reclamation plans for each waste and borrow site and provide written documentation that the reclamation plans have been implemented and all work is completed. This documentation will be provided to the Corps of Engineers within 30 days of the completion of the reclamation work.

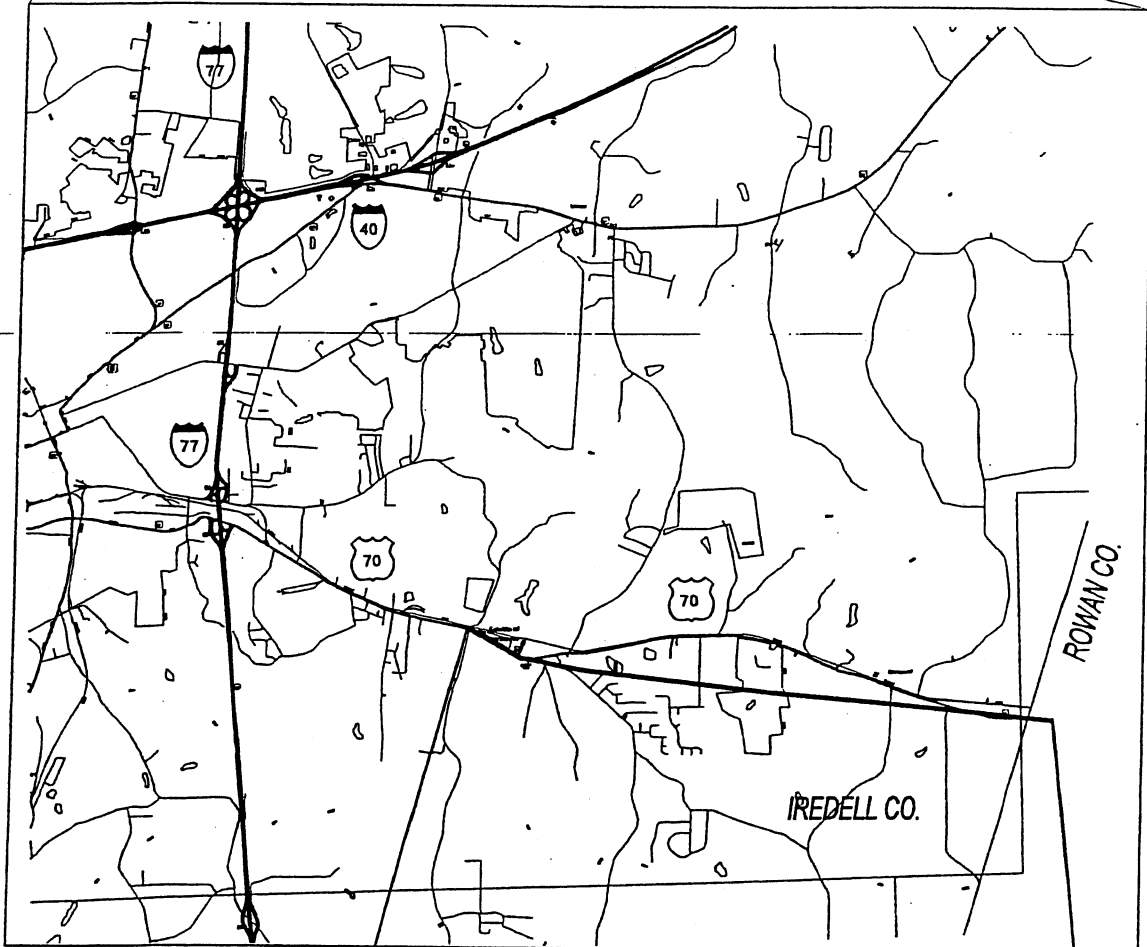
- * 6. The permittee shall require his contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project and shall provide each of his contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit.
- * 7. The permittee will ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any deviations in the construction design plans will be brought to the attention of the Corps of Engineers, Asheville Regulatory Field Office prior to any active construction in waters or wetlands.
- 8. Adequate sedimentation and erosion control measures must be implemented prior to any ground disturbing activities to minimize impacts to downstream aquatic resources. These measures must be inspected and maintained regularly, especially following rainfall events.
- 9. During the clearing phase of the project, heavy equipment must not be operated in surface waters or stream channels. Temporary stream crossings will be used to access the opposite sides of stream channels. Grubbing of riparian vegetation will not occur until immediately before construction begins on a given segment of stream channel.
- 10. All temporary diversion channels and stream crossings will be constructed of non-erodible materials. Any such structures located outside of the authorized construction limits of the project will be reported in writing to the Corps of Engineers, Asheville Regulatory Field Office, together with a location map and restoration plan for any necessary permit modification.
- 11. All authorized culverts will be installed to allow the passage of low stream flows and the continued movement of fish and other aquatic life as well as to prevent headcutting of the streambed. For all box culverts and for pipes greater than 48 inches in diameter, the bottom of the pipe will be buried at least one foot below the bed of the stream. For culverts 48 inches in diameter or smaller, the bottom of the pipe must be buried below the bed of the stream to a depth equal to or greater than 20 percent of the diameter of the culvert. Wet concrete will be isolated from contact with any flowing streams.
- 12. In order to allow for the continued movement of bed load and aquatic organisms, existing stream channel widths and depths will be maintained at the inlet and outlet ends of culverts. Riprap armoring of streams at culvert inlets and outlets shall be minimized above the ordinary high water elevation in favor of bioengineering techniques such as bank sloping, erosion control matting and revegetation with deep-rooted, woody plants.
- 13. All mechanized equipment operating near surface waters shall be regularly inspected to prevent contamination of streams from leakage of fuels, lubricants, hydraulic fluids or other toxic materials. No equipment staging or storage of construction material will occur in wetlands. Hydroseeding equipment will not be discharged or washed out into any surface waters or wetlands.

14. The authorized channel relocation at Permit Site 2 will be constructed in a dry work area and stabilized before stream flow is diverted through it. The Corps of Engineers, Asheville Regulatory Field Office will be notified in advance by facsimile transmission or electronic mail of the intended diversion of water into the new channel. The banks and buffer area of the relocated channel will be planted with appropriate species of deep-rooted, woody vegetation. A final inspection of the channel relocation by a representative of the Corps of Engineers, Asheville Regulatory Field Office will be conducted prior to completion of the road project.

15. Compensatory mitigation for unavoidable impacts to .26 acres of wetland and 1817 linear feet of stream channel shall be provided by the Ecosystem Enhancement Program (EEP) as outlined in the February 20, 2004 letter from William D. Gilmore, EEP Transition Manager. The EEP will provide 2.7 acres of preservation of riverine wetlands at the Swift Creek Site in Wake County, 13172 linear feet of preservation of warm water stream channel at the Little Mountain-Len's Knob Site in Surry County and 4998 linear feet of preservation of warm water stream channel at the Eno River State Park-Wilderness Site in Durham County in the Central Piedmont Eco-Region which have been acquired and protected by the EEP. Pursuant to the EEP Memorandum of Agreement (MOA) between the State of North Carolina and the US Army Corps of Engineers signed on July 22, 2003, the EEP will provide a minimum of .26 acres of restoration of riverine wetlands and 1817 linear feet of restoration of warm water stream channel in the Yadkin River Basin (Hydrologic Cataloging Unit 03040105) by July 22, 2005 and half of the proposed preservation mitigation would be available at that time for mitigation for other project impacts.

* 16. The permittee will report any violations of the above conditions and any violation of Section 404 of the Clean Water Act from unauthorized work in writing to the Wilmington District, US Army Corps of Engineers within 24 hours of the violation.

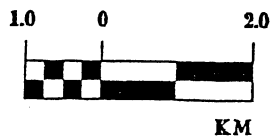
VICINITY MAP



BEGIN
PROJECT

END
PROJECT

ACTION ID 200430596



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

IREDELL COUNTY

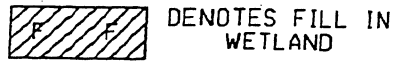
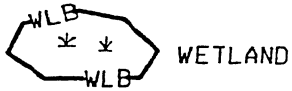
PROJECT: 8.1823401 (R-2911A)

PUBLIC NOTICE SHEET
1 OF 11

SHEET ~~1~~ OF ~~16~~ 7/12/02

LEGEND

—WLB— WETLAND BOUNDARY



←← FLOW DIRECTION

—TB— TOP OF BANK

---WE--- EDGE OF WATER

—C— PROP. LIMIT OF CUT

—F— PROP. LIMIT OF FILL

▲ PROP. RIGHT OF WAY

---NG--- NATURAL GROUND

—PL— PROPERTY LINE

—TDE— TEMP. DRAINAGE EASEMENT

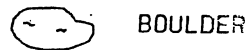
—PDE— PERMANENT DRAINAGE EASEMENT

—EAB— EXIST. ENDANGERED ANIMAL BOUNDARY

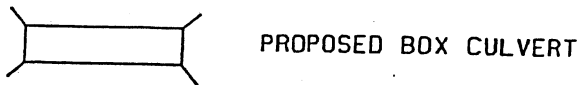
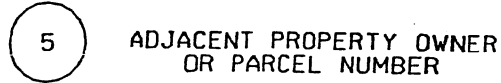
—EPB— EXIST. ENDANGERED PLANT BOUNDARY

---▽--- WATER SURFACE

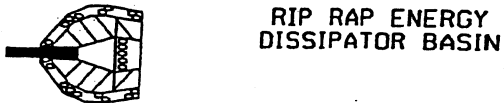
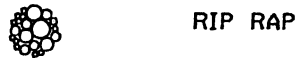
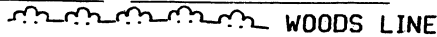
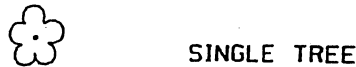
X X X LIVE STAKES



--- COIR FIBER ROLLS



(DASHED LINES DENOTE EXISTING STRUCTURES)



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

IREDELL COUNTY

PROJECT: 8.1823401 (R-2911A)

PUBLIC NOTICE SHEET

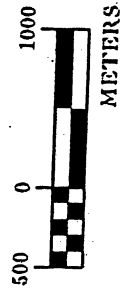
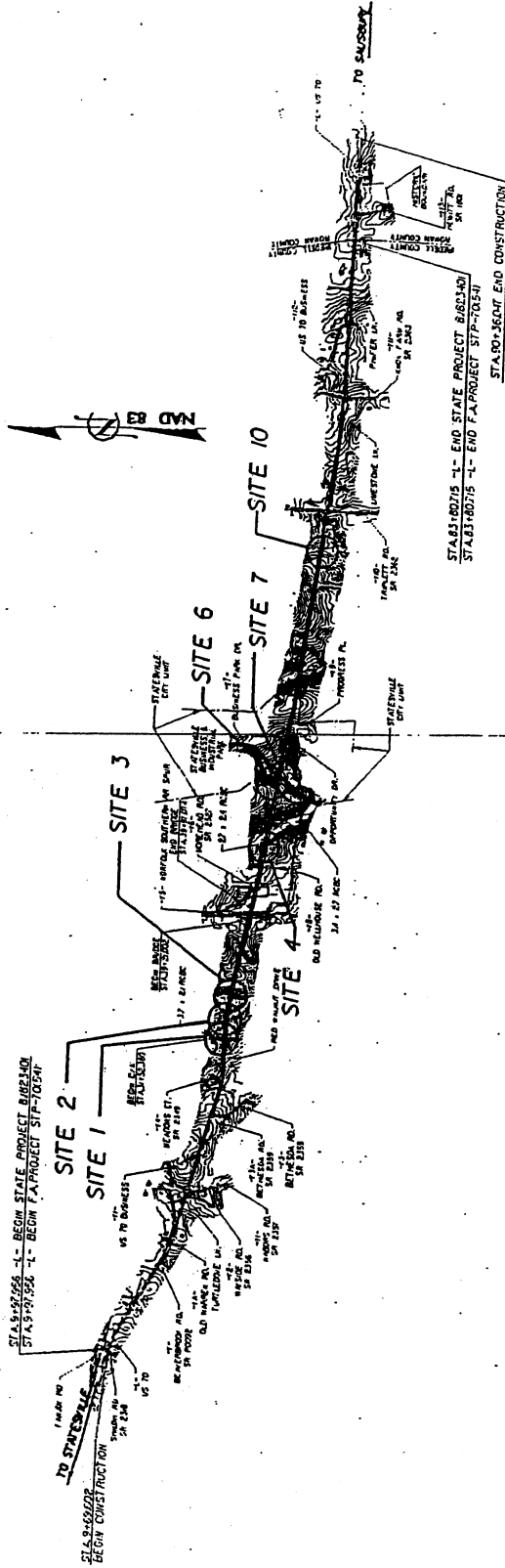
2 OF 11

SHEET 2 OF 16

7/12/02

SITE MAP

216



PUBLIC NOTICE SHEET
3 OF 11

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
IREDELL COUNTY
PROJECT: 8.182371 (R-2911A)
SHEET 3 OF 36
REVISED: 2/06/04
9/18/02

217

60

57

DAVID E. MOORE
AND WIFE, LOUISE M.

48

900 CS

R
W

R
W

31+00

+20

900 RCP

49

CB

600 RCP

600 RCP

HEADWALL

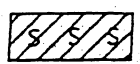
R
W

R
W

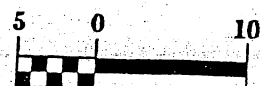
8.00m

+15.000 -L-
37.000m (121.39')

PLAN VIEW SITE 1



DENOTES FILL IN
SURFACE WATERS



SCALE

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

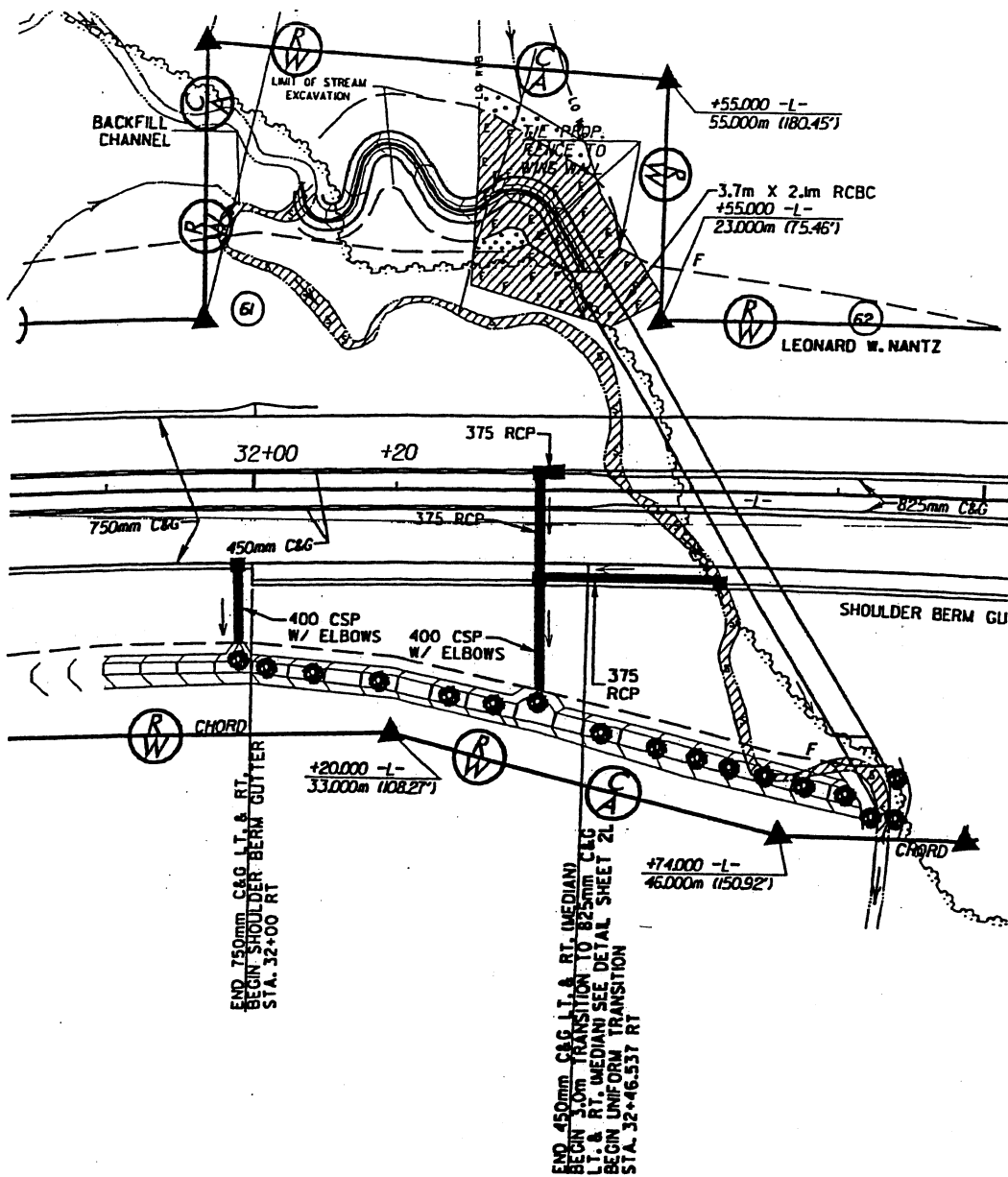
IREDELL COUNTY

PROJECT: 8.1823401 (R-2911A)



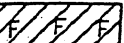

PUBLIC NOTICE SHEET
4 OF 11

SHEET 4 OF 16

7/12/02



PLAN VIEW
SITE 2

-  DENOTES MECHANIZED CLEARING
-  DENOTES EXCAVATION IN WETLANDS
-  DENOTES FILL IN WETLANDS
-  DENOTES FILL IN SURFACE WATERS



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

IREDELL COUNTY

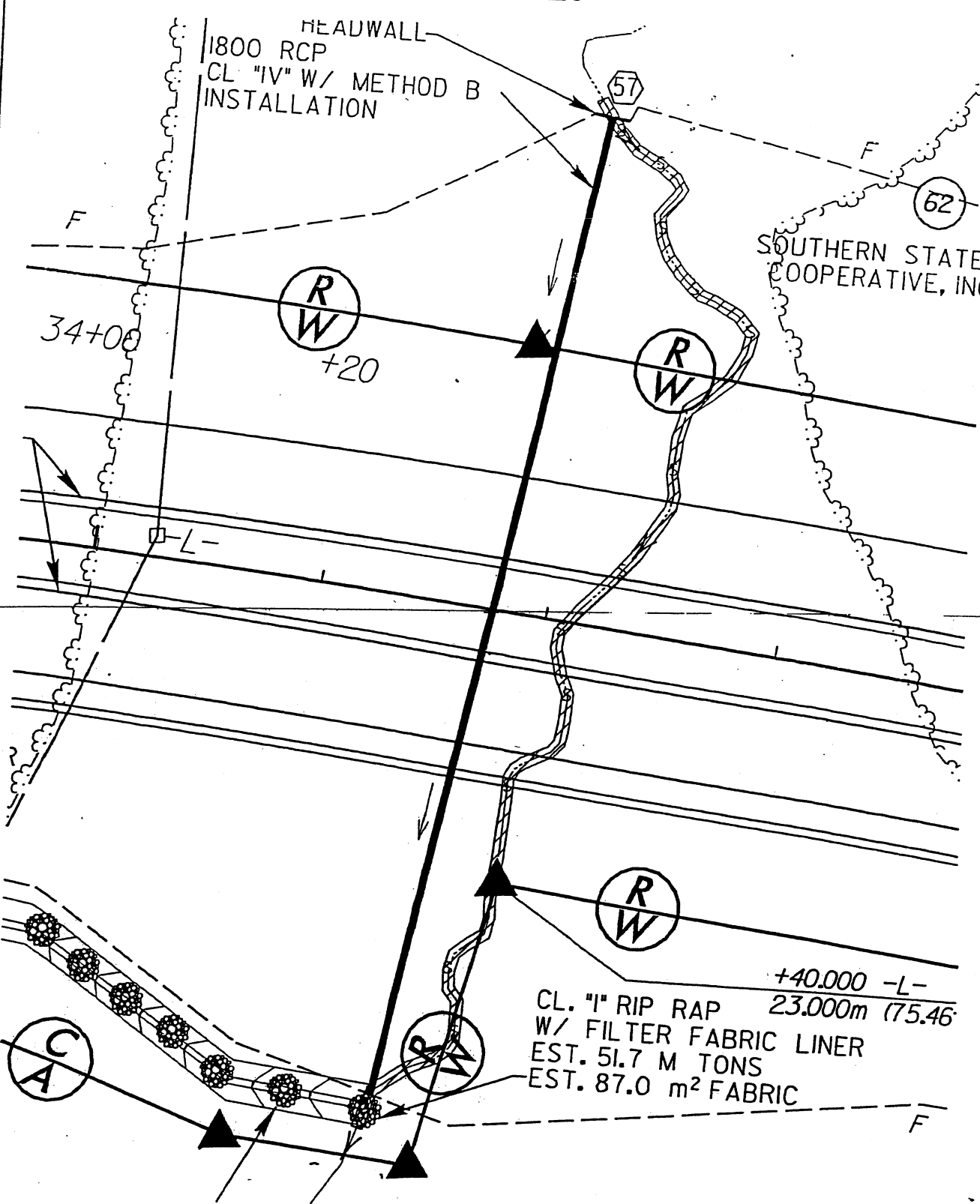
PROJECT: 8.1823401 (R-2911A)

PUBLIC NOTICE SHEET
5 OF 11

SHEET 5 OF 16 7/12/02

HEADWALL
1800 RCP
CL. "IV" W/ METHOD B
INSTALLATION

SOUTHERN STATES
COOPERATIVE, INC.



+40.000 -L-
23.000m (75.46'
CL. "I" RIP RAP
W/ FILTER FABRIC LINER
EST. 51.7 M TONS
EST. 87.0 m² FABRIC

PLAN VIEW
SITE 3

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

IREDELL COUNTY

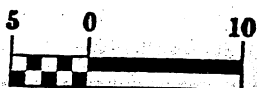
PROJECT: 8.1823401 (R-2911A)

PUBLIC NOTICE SHEET
6 OF 11

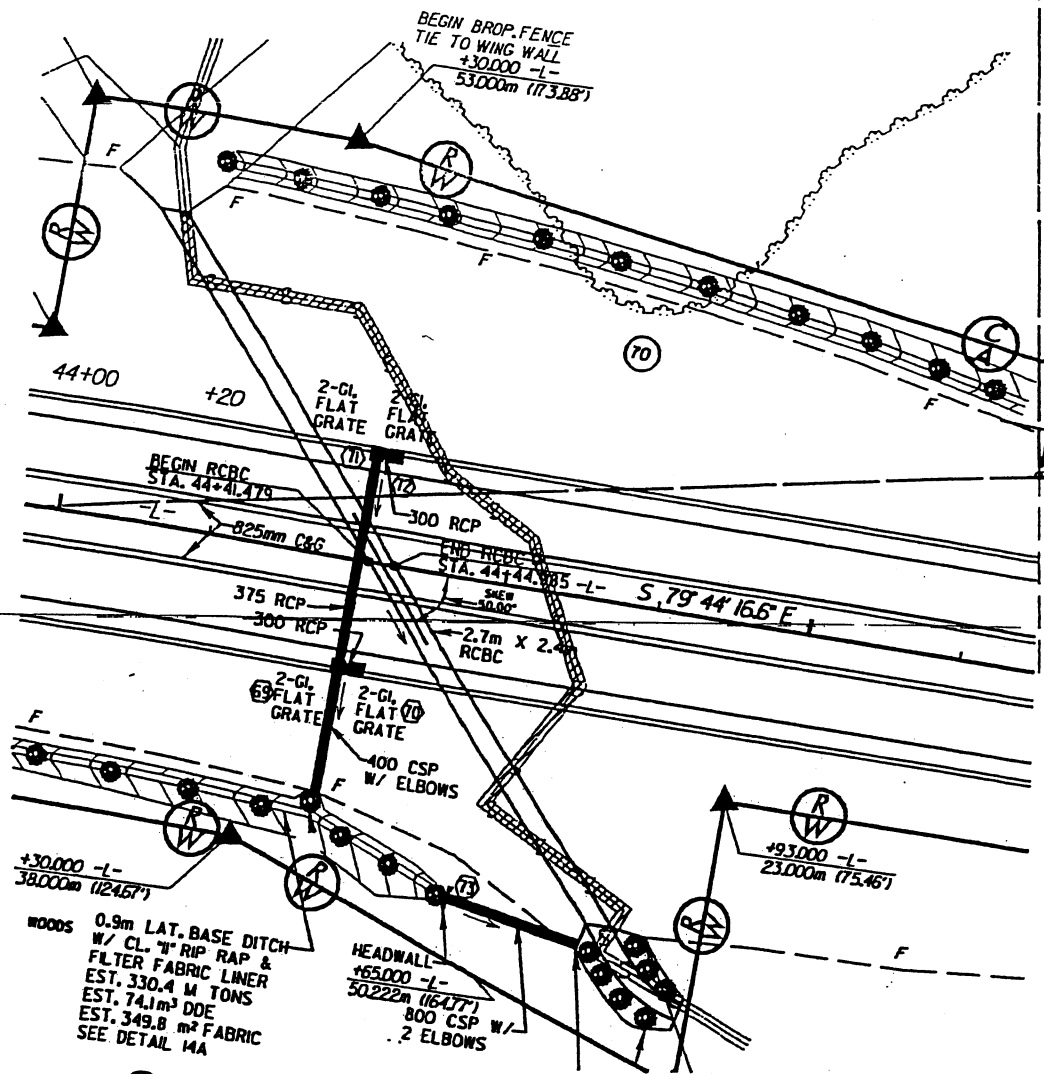
SHEET 6 OF 16 7/12/02



DENOTES FILL IN
SURFACE WATERS



SCALE



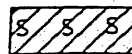
WOODS 0.9m LAT. BASE DITCH
W/ CL. 7" RIP RAP &
FILTER FABRIC LINER
EST. 330.4 M TONS
EST. 74.1m³ DOE
EST. 349.8 m² FABRIC
SEE DETAIL 14A

HEADWALL
+65.000 -L-
30.222m (164.77')
800 CSP W/
. 2 ELBOWS

(71)
GORDON BROTHERS
DB 94 PG 1767
(TRACT 9)



PLAN VIEW
SITE 4

 DENOTES FILL IN SURFACE WATERS



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

IREDELL COUNTY

PROJECT: 81823401 (R-2911A)

PUBLIC NOTICE SHEET
7 OF 11

SHEET 7 OF 16 7/12/02

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

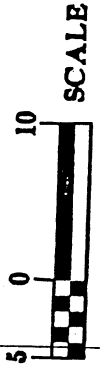
IREDELL COUNTY

PROJECT: 8.1823401 (R-2911A)

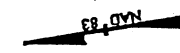
PUBLIC NOTICE SHEET
8 OF 11

SHEET 8 OF 16 7/12/02

PLAN VIEW
SITE 6



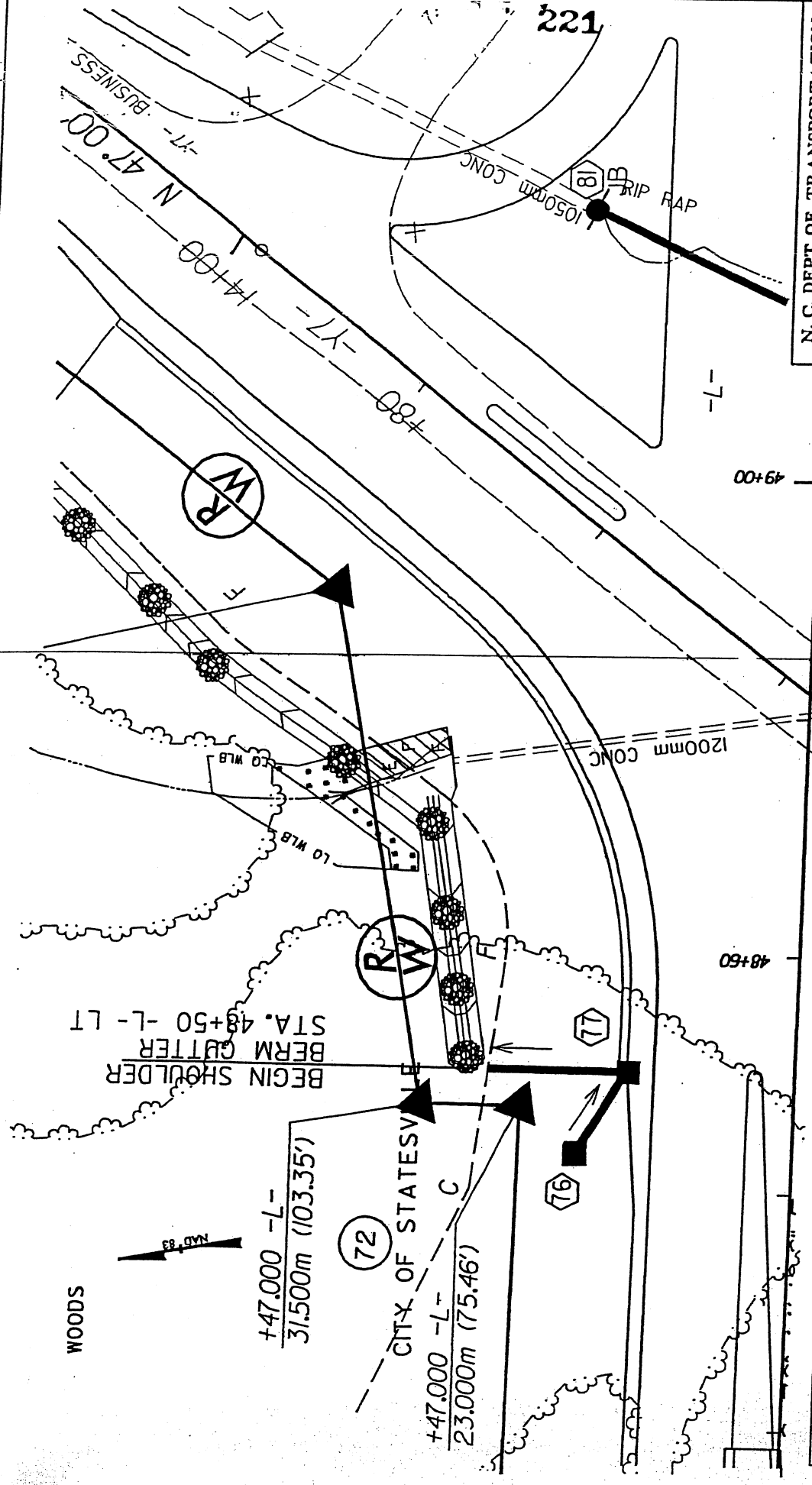
WOODS



+47.000 -L-
31.500m (103.35')

(72)
CITY OF STATESVILLE
+47.000 -L-
23.000m (75.46')

BEGIN SHOULDER
BERM CUTTER
STA. 48+50 -L- LT



- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLANDS
- DENOTES EXCAVATION IN WETLANDS

63

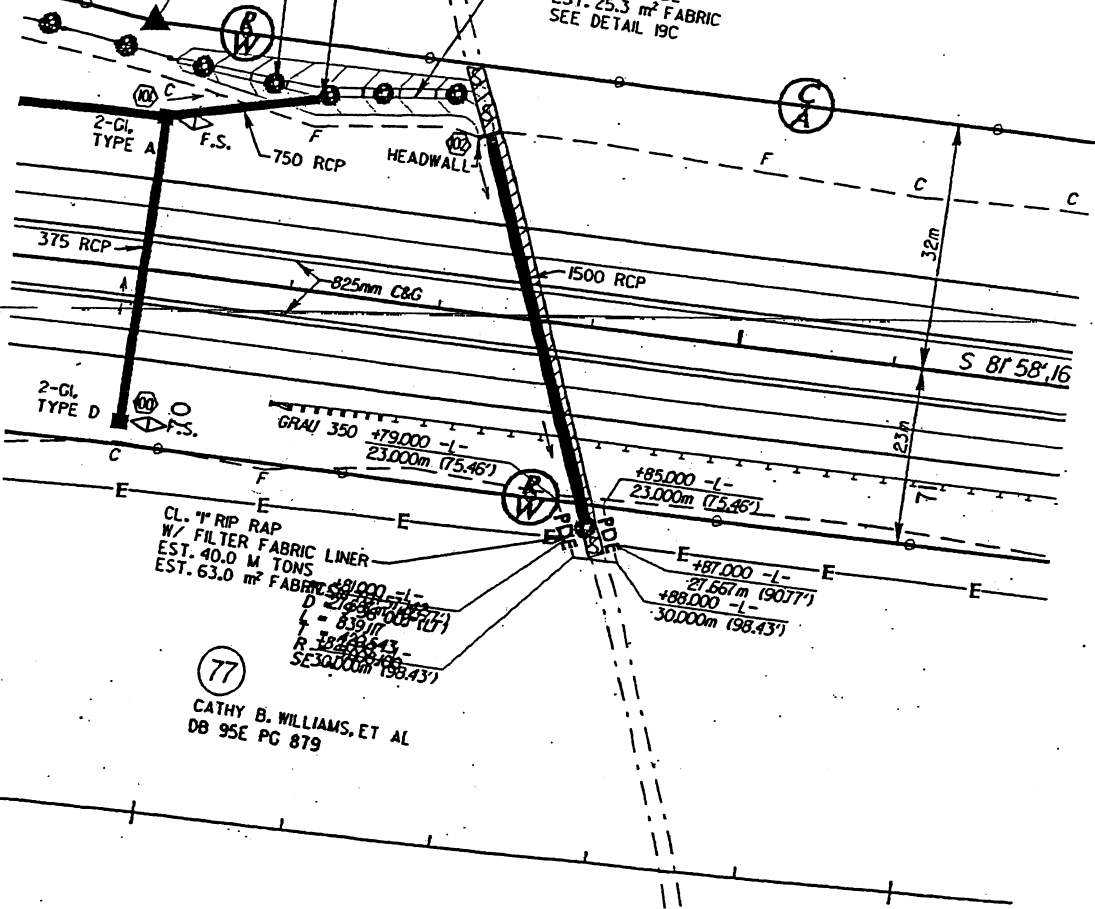
64

0.6m-1.2m LAT. BASE DITCH
 W/ CL. 1/8" RIP RAP &
 FILTER FABRIC LINER
 EST. 30.0 M TONS
 EST. 75.0 m³ DDE
 EST. 75.0 m² FABRIC
 SEE DETAIL 19B
 NOTE: TRANSITION
 BASE WIDTH FROM
 0.6m TO 1.2m

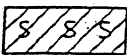
CL. 1/8" RIP RAP
 W/ FILTER FABRIC LINER
 EST. 7.9 M TONS
 EST. 1810 m² FABRIC

SPEC. GRADE LAT. BASE DITCH
 W/ CL. 1/4" RIP RAP &
 FILTER FABRIC LINER
 EST. 65 M TONS
 EST. 110 m³ DDE
 EST. 25.3 m² FABRIC
 SEE DETAIL 19C

+16529 -L-
 32,000m (104,99')

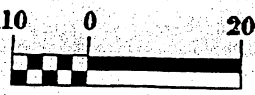


(77)
 CATHY B. WILLIAMS, ET AL
 DB 95E PG 879



DENOTES FILL
 IN SURFACE WATERS

PLAN VIEW
 SITE 10



SCALE

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS

IREDELL COUNTY
 PROJECT: 8.1823401 (R-2911A)

PUBLIC NOTICE
 SHEET 10 OF 11

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS			SURFACE WATER IMPACTS						
			Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation In Wetlands (ha)	Mechanized Clearing (Method III) (ha)	Fill In SW (Natural) (ha)	Fill In SW (Pond) (ha)	Temp. Fill In SW (ha)	Existing Channel Impacted (m)	Natural Stream Design (m)	
1	-L- 30+80 LT	900mm RCP					0.018				130	0
2	-L- 31+45 LT											
3	-L- 32+20 LT	3.7m x 2.1m RCBC	0.017		0.026	0.007	0.026				155	55
4	-L- 34+50 LT	1800mm RCP					0.011				105	0
5	-L- 34+62 RT											
6	-L- 44+12 LT	2.7m x 2.4m RCBC					0.019				153	0
7	-L- 44+90 RT											
8	-Y8- 14+10 LT	9.4m x 2.7m RCBC	SIZE 0	DELETED	0	0	0	0	DELETED	0	0	0
9	-Y8- 15+35 RT											
10	-Y7- 13+55 LT	1200 RCP	0.001		0.001	0.004						
11	-Y7- 13+70 LT											
12	-L- 48+66 RT	1050 RCP	0.033			0.019				0.013		
13	-L- 49+30 RT											
14	-L- 68+35 RT	1350mm RCP										
15	-L- 68+51 RT											
16	-L- 74+16 RT	600 RCP										
17	-L- 74+63 RT											
18	-L- 63+62 LT	1500mm RCP					0.015				66	
19	-L- 63+84 RT											
TOTALS:			0.051	0	0.027	0.03	0.089	0.013	0	609	55	

OMITTED - STREAM DEEMED NON-JURISDICTIONAL

OMITTED - STREAM DEEMED NON-JURISDICTIONAL

NCDOT

DIVISION OF HIGHWAYS
 IREDELL COUNTY
 PROJECT 8.1823401 (R-2911A)
 US 70 FROM SR 2318 TO
 ROWAN COUNTY LINE

PUBLIC NOTICE
 SHEET 11 OF 11

2/16/04

STANDARD SPECIAL PROVISION

AVAILABILITY OF FUNDS - TERMINATION OF CONTRACTS

In accordance with G.S. 143.18.1 (6), Subsection (5) of G.S. 143-28.1 is hereby incorporated verbatim in this contract. G.S. 143-28.1(5) is as follows:

“(5). Amounts Obligated - Payments subject to the Availability of Funds - Termination of Contracts. Highway maintenance and construction appropriations may be obligated in the amount of allotments made to the Department of Transportation by the Office of State Budget and Management for the estimated payments for maintenance and construction contract work to be performed in the appropriation fiscal year. The allotments shall be multi-year allotments and shall be based on estimated revenues and shall be subject to the maximum contract authority contained in subdivision (2) above. Payment for highway maintenance and construction work performed pursuant to contract in any fiscal year other than the current fiscal year will be subject to appropriations by the General Assembly. Highway maintenance and construction 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 highway maintenance or construction contract and any highway maintenance or construction 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 schedule 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, Item 5, of the North Carolina Department of Transportation Standard Specifications for Roads and Structures, dated January 1, 2002.

STANDARD SPECIAL PROVISIONS
(ENGLISH AND METRIC)
NCDOT GENERAL SEED SPECIFICATION FOR SEED QUALITY

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 relabeling required by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory, that would cause the label to reflect as otherwise specified herein shall be rejected by the North Carolina Department of Transportation.

Seed shall be free from seeds of the noxious weeds Johnsongrass, Balloonvine, Jimsonweed, Witchweed, Itchgrass, Serrated Tussock, Showy Crotalaria, Smooth Crotalaria, Sicklepod, Sandbur, Wild Onion, and Wild Garlic. Seed shall not be labeled with the above weed species on the seed analysis label. Tolerances as applied by the Association of Official Seed Analysts will NOT be allowed for the above noxious weeds except for Wild Onion and Wild Garlic.

Tolerances established by the Association of Official Seed Analysts will generally be recognized. However, for the purpose of figuring pure live seed, the found pure seed and found germination percentages as reported by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory will be used. Allowances, as established by the NCDOT, will be recognized for minimum pure live seed as listed on the following pages.

The specifications for restricted noxious weed seed refers to the number per pound as follows:

<u>Restricted Noxious Weed</u>	<u>Limitations per Lb. Of Seed</u>	<u>Restricted Noxious Weed</u>	<u>Limitations per Lb. of Seed</u>
Blessed Thistle	4 seeds	Bermudagrass	27 seeds
Cocklebur	4 seeds	Cornflower (Ragged Robin)	27 seeds
Spurred Anoda	4 seeds	Texas Panicum	27 seeds
Velvetleaf	4 seeds	Bracted Plantain	54 seeds
Morning-glory	8 seeds	Buckhorn Plantain	54 seeds
Corn Cockle	10 seeds	Broadleaf Dock	54 seeds
Wild Radish	12 seeds	Curly Dock	54 seeds
Purple Nutsedge	27 seeds	Dodder	54 seeds
Yellow Nutsedge	27 seeds	Giant Foxtail	54 seeds
Canada Thistle	27 seeds	Horsenettle	54 seeds
Field Bindweed	27 seeds	Quackgrass	54 seeds
Hedge Bindweed	27 seeds	Wild Mustard	54 seeds

Seed of Pensacola Bahiagrass shall not contain more than 7% inert matter, Kentucky Bluegrass 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 give below:

Minimum 85% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 83% pure live seed will not be approved.

Sericea Lespedeza
Oats (seeds)

Minimum 80% pure live seed; maximum 1% total weed seed; maximum 2% total other crop; maximum 144 restricted noxious weed seed per pound. Seed less than 78% pure live seed will not be approved.

Tall Fescue (all approved varieties)	Bermudagrass
Kobe Lespedeza	Browntop Millet
Korean Lespedeza	German Millet - Strain R
Weeping Lovegrass	Centipedegrass
Carpetgrass	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.

Crownvetch
Pensacola Bahiagrass
Japanese Millet
Switchgrass
Reed Canary Grass

STANDARD SPECIAL PROVISIONS
ERRATA

Correct the *2002 Standard Specifications* as follows:

Page 1-61, Subarticle 108-10(A)

In the first sentence, change the Article reference from 101-24 to 101-25.

Page 2-21, Subarticle 235-4(B)

In the third sub-bullet under the eighth bullet in this subarticle, delete the word "subgrade" and insert the words "finished grade".

Page 3-4, Article 300-10

Change all references to 300-8 to 300-9.

Page 5-9, Subarticle 520-3(A)

Delete the words "at your option".

Page 5-10, Subarticle 520-6(A)

In the first sentence, add a period after "(B)" and delete the words "and (C)."

Delete the last sentence of the subarticle.

Page 8-47, Subarticle 862-6

Change the subarticle number from 862-6 to 862-7.

Page 8-49, Subarticle 864-4

In the first paragraph, change the Article reference from 862-3 to 864-3.

Page 8-55, Subarticle 866-5(G)

In the third pay item, insert the words "with Posts" after the word "Fence".

Page 10-1, Subarticle 1000-3(A)

In the second paragraph, change 550 psi to 600 psi (4.1 MPa).

Page 10-2, Subarticle 1000-3(A)

In the last sentence of the second paragraph on this page, change 550 psi to 600 psi (4.1 MPa).

Page 10-5, Table 1000-1

Under the column "Consistency Max. Slump" change the sub-heading 'Non-Vibrated' to 'Vibrated' and change the sub-heading 'Vibrated' to 'Non-Vibrated'. Under the column "Min. Cement Content" change the sub-heading 'Non-Vibrated' to 'Vibrated' and change the sub-heading 'Vibrated' to 'Non-Vibrated'.

Page 10-7, Table 1005-2

For Std. Size # 2S make the following changes:

- #50 (0.300) Sieve change the limits from 8 - 30 to **5 - 30**.
- #100 (0.150) Sieve change the limits from 0.5 - 10 to **0 - 10**.

For Std. Size # 2MS make the following changes:

- #50 (0.300) Sieve change the limits from 8 - 35 to **5 - 35**.
- #100 (0.150) Sieve change the limits from 0.5 - 20 to **0 - 20**.

Page 15-3, Article 1505-3

In the last paragraph of this article, change Article 300-6 to Article 300-7.

Page 15-10, Article 1510-5

In the fourth paragraph, insert a comma after the word "water".

Page 15-18, Article 1530-2

In the third paragraph on the page, change "Section 812" to "Section 340".

Page 16-15, Article 1635-3(A)

Substitute the second paragraph with the following:

Construct the rock pipe inlet sediment trap type-A with a minimum height of 18 inches (457.2 mm) and a minimum of 12 inches (304.8 mm) below the roadway shoulder or diversion point.

STANDARD SPECIAL PROVISION**AWARD OF CONTRACT**

“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”.

MINORITY AND FEMALE EMPLOYMENT REQUIREMENTS

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
Guiford 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%

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Payment of Predetermined Minimum Wage
- V. Statements and Payrolls
- VI. Record of Materials, Supplies, and Labor
- VII. Subletting or Assigning the Contract
- VIII. Safety: Accident Prevention
- IX. False Statements Concerning Highway Projects
- X. Implementation of Clean Air Act and Federal Water Pollution Control Act
- XI. Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion
- XII. Certification Regarding Use of Contract Funds for Lobbying

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 dispute 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 implementations 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 an 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 of the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. 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 than the applicable wage rate and fringe benefits or cash equivalent for the classification of work 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

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:

a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.

b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

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 than \$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.

C200809 (R-2911A)

Training Special Provisions

This project special provision will not be applicable to those Contractors who have elected to participate in the Department's *Alternative On-The-Job Training Program*. In the event the Contractor is participating in the Department's *Alternative On-The-Job Training Program*, the On-The-Job Training program of the Construction Unit, Contractual Services Section will certify that participation to the appropriate Highway Division and Resident Engineers.

This Training Special Provision supersedes subparagraph 7b of the Special Provision entitled "*Specific Equal Employment Opportunity Responsibilities*," (Attachment 1), and is in implementation of 23 USC 140(a). As a part of the Contractor's equal opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training aimed at developing full journey workers in the type of trade or classification involved. 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 number of trainees to be trained under this contract will be as specified in the project special provisions included else where in the proposal form.

In the event that a Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided, however, the Contractor shall maintain the primary responsibility for meeting the training requirements imposed by this special provision and the subcontractor has an approved on-the-job training program. The Contractor shall also insure that this training special provision is made applicable to such subcontract. 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 skilled work classifications on the basis of the Contractor's needs and the availability of journey workers in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the Contractor shall submit to the Department for approval the number of trainees to be trained in each selected classification and the training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications on the form provided by the Department. That form shall be submitted by the Contractor to the Department on or before the date of the pre-construction conference. 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.

Training and upgrading of minorities and women toward journey worker status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private resources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps he has taken in the pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journey worker_status or in which he has been employed as a journey worker. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the Contractor's records should document the finding in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by the Department. The Department shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journey worker status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the US Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the US Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training, shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-Aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the Department prior to commencing work on the classification covered by the program. It is the intention of these provisions that training be provided in the construction crafts rather than clerk-typist or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is provided and approved by the Department and the Federal Highway Administration. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

It is normally expected that a trainee will begin his training on the project as soon as feasible after the start of work utilizing the skill involved and remain on the project as long as training opportunities exist in the work classification or until he has completed his training program. It is not required that all trainees be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this

training special provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the Contractor for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journey worker's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The Contractor shall furnish the trainee a copy of the program he will be following providing the training. The Contractor shall provide each trainee with a with a certificate showing the type and length of training satisfactorily completed.

The Contractor will provide for maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

GENERAL DECISION NC030011 06/13/03 NC11
 General Decision Number NC030011

Superseded General Decision No. NC020011

State: North Carolina

Construction Type:
 HIGHWAY

County(ies):

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	06/13/2003

COUNTY(ies):

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	

SUNC3002A 02/12/1990

	Rates	Fringes
CARPENTER	7.63	
CONCRETE FINISHER	7.52	
ELECTRICIAN	10.26	
IRONWORKERS (Reinforcing)	9.76	
LABORER		
Comman	5.33	
Asphalt Lay Down Man	5.60	
Asphalt Raker	6.14	
Form Setter (Road)	8.57	
Mason (Brick, Block, Stone)	7.44	
Pipe Layer	6.23	
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. & under)	6.95
Drill Operator	7.34
Grade Checker	5.45
Gradeall	8.38
Greaseman	6.49
Loader	7.09
Mechanic	8.47
Motor Grader (Fine Grade)	8.04
Motor Grader (Rough Grade)	7.68
Oiler	5.88
Roller (Finisher)	6.70
Roller (Rough)	5.65
Scraper	6.63
Screed Asphalt	7.09
Stone Spreader	6.02
Stripping Machine Operator	6.00
Subgrade Machine	7.13
Sweeper	5.80
Tractor (Utility)	5.47

TRUCK DRIVERS:

Trucks - Single Rear Axle	5.42
Trucks - Multi Rear Axle	6.08
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

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
ROADWAY ITEMS						
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum	L.S.	
0003	0001000000-M	200	CLEARING & GRUBBING ... HEC-TARE(S)	Lump Sum	L.S.	
0004	0008000000-M	200	SUPPLEMENTARY CLEARING & GRUB-BING	1.2 HA		
0005	0015000000-N	205	SEALING ABANDONED WELLS	7 EA		
0006	0022000000-M	225	UNCLASSIFIED EXCAVATION	465,000 M3		
0007	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ***** (39+60.00-L-EBL)	Lump Sum	L.S.	
0008	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ***** (39+60.00-L-WBL)	Lump Sum	L.S.	
0009	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ***** (41+60.00-L-EBL)	Lump Sum	L.S.	
0010	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ***** (41+60.00-L-WBL)	Lump Sum	L.S.	
0011	0036000000-M	225	UNDERCUT EXCAVATION	1,000 M3		
0012	0080000000-M	SP	CLASS IV SUBGRADE STABILIZA-TION	325 MTN		
0013	0106000000-M	230	BORROW EXCAVATION	767,000 M3		
0014	0134000000-M	240	DRAINAGE DITCH EXCAVATION	4,695 M3		
0015	0141000000-M	240	BERM DITCH CONSTRUCTION	500 M		
0016	0156000000-M	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	7,000 M2		
0017	0177000000-M	250	BREAKING OF EXISTING ASPHALT PAVEMENT	1,300 M2		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0018	0185000000-M	250	BREAKING OF EXISTING CONCRETE PAVEMENT	1,700 M2		
0019	0192000000-N	260	PROOF ROLLING	41 HR		
0020	0195000000-M	265	SELECT GRANULAR MATERIAL	500 M3		
0021	0196000000-M	270	FABRIC FOR SOIL STABILIZATION	500 M2		
0022	0300000000-M	300	SELECT MATERIAL, CLASS II	3,900 MTN		
0023	0306000000-M	300	SELECT MATERIAL, CLASS III	7,800 MTN		
0024	0312000000-M	300	SELECT MATERIAL, CLASS IV	8,400 MTN		
0025	0318000000-M	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	1,660 MTN		
0026	0343000000-M	310	375MM SIDE DRAIN PIPE	62.4 M		
0027	0344000000-M	310	450MM SIDE DRAIN PIPE	34.8 M		
0028	0360000000-M	310	300MM RC PIPE CULVERTS, CLASS III	74.4 M		
0029	0366000000-M	310	375MM RC PIPE CULVERTS, CLASS III	1,141.2 M		
0030	0372000000-M	310	450MM RC PIPE CULVERTS, CLASS III	1,202.4 M		
0031	0378000000-M	310	600MM RC PIPE CULVERTS, CLASS III	1,051.2 M		
0032	0384000000-M	310	750MM RC PIPE CULVERTS, CLASS III	397.2 M		
0033	0390000000-M	310	900MM RC PIPE CULVERTS, CLASS III	242.4 M		
0034	0396000000-M	310	1050MM RC PIPE CULVERTS, CLASS III	126 M		
0035	0402000000-M	310	1200MM RC PIPE CULVERTS, CLASS III	72 M		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0036	0408000000-M	310	1350MM RC PIPE CULVERTS, CLASS III	55.2 M		
0037	0414000000-M	310	1500MM RC PIPE CULVERTS, CLASS III	51.6 M		
0038	0448000000-M	310	****MM RC PIPE CULVERTS, CLASS IV (1200MM)	74.4 M		
0039	0448000000-M	310	****MM RC PIPE CULVERTS, CLASS IV (1650MM)	115.2 M		
0040	0448000000-M	310	****MM RC PIPE CULVERTS, CLASS IV (1800MM)	86 M		
0041	0448000000-M	310	****MM RC PIPE CULVERTS, CLASS IV (750MM)	57.6 M		
0042	0448000000-M	310	****MM RC PIPE CULVERTS, CLASS IV (900MM)	142.8 M		
0043	0706000000-M	310	300MM BIT COAT CS PIPE CULVERTS, TYPE B 1.63MM THICK	49.2 M		
0044	0708000000-M	310	400MM BIT COAT CS PIPE CULVERTS, TYPE B 1.63MM THICK	177.6 M		
0045	0714000000-M	310	450MM BIT COAT CS PIPE CULVERTS, TYPE B 1.63MM THICK	34.8 M		
0046	0720000000-M	310	600MM BIT COAT CS PIPE CULVERTS, TYPE B 1.63MM THICK	34.8 M		
0047	0726000000-M	310	800MM BIT COAT CS PIPE CULVERTS, TYPE B 2.01MM THICK	18 M		
0048	0732000000-M	310	900MM BIT COAT CS PIPE CULVERTS, TYPE B 2.01MM THICK	24 M		
0049	0804000000-M	310	****MM BIT COAT CS PIPE ELBOWS, TYPE B ****MM THICK (900MM, 2.01MM)	2 EA		
0050	0805000000-M	310	300MM BIT COAT CS PIPE ELBOWS, TYPE B 1.63MM THICK	2 EA		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0051	0806000000-M	310	400MM BIT COAT CS PIPE ELBOWS, TYPE B 1.63MM THICK	21 EA		
0052	0807000000-M	310	450MM BIT COAT CS PIPE ELBOWS, TYPE B 1.63MM THICK	2 EA		
0053	0808000000-M	310	600MM BIT COAT CS PIPE ELBOWS, TYPE B 1.63MM THICK	4 EA		
0054	0809000000-M	310	800MM BIT COAT CS PIPE ELBOWS, TYPE B 2.01MM THICK	2 EA		
0055	0995000000-M	340	PIPE REMOVAL	999 M		
0056	1000000000-M	462	150MM SLOPE PROTECTION	200 M2		
0057	1011000000-N	500	FINE GRADING	Lump Sum	L.S.	
0058	1022000000-M	SP	SEALING EXISTING PAVEMENT CRACKS	550 KG		
0059	1044000000-M	501	LIME TREATED SOIL (SLURRY METHOD)	110,300 M2		
0060	1066000000-M	501	LIME FOR LIME TREATED SOIL	1,300 MTN		
0061	1110000000-M	510	STABILIZER AGGREGATE	500 MTN		
0062	1121000000-M	520	AGGREGATE BASE COURSE	85,000 MTN		
0063	1176000000-M	542	***MM SOIL CEMENT BASE (180MM)	36,800 M2		
0064	1187000000-M	542	PORTLAND CEMENT FOR SOIL CE- MENT BASE	1,200 MTN		
0065	1198000000-M	SP	AGGREGATE FOR SOIL CEMENT BASE	500 MTN		
0066	1209000000-M	543	ASPHALT CURING SEAL	100,200 L		
0067	1220000000-M	545	INCIDENTAL STONE BASE	500 MTN		
0068	1297000000-M	607	MILLING ASPHALT PAVEMENT, **MM DEPTH (60MM)	1,500 M2		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0069	1491000000-M	610	ASPHALT CONC BASE COURSE, TYPE B25.0C	38,400 MTN		
0070	1503000000-M	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	41,700 MTN		
0071	1523000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	29,700 MTN		
0072	1560000000-M	620	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22	3,612 MTN		
0073	1565000000-M	620	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22	1,782 MTN		
0074	1693000000-M	654	ASPHALT PLANT MIX PAVEMENT REPAIR	180 MTN		
0075	2022000000-M	815	SUBDRAIN EXCAVATION	248 M3		
0076	2033000000-M	815	SUBDRAIN FINE AGGREGATE	124 M3		
0077	2044000000-M	815	150MM PERFORATED SUBDRAIN PIPE	300 M		
0078	2055000000-M	815	150MM SUBDRAIN PIPE WYES, TEES, & ELBOWS	30 EA		
0079	2066000000-N	815	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET	2 EA		
0080	2077000000-M	815	150MM OUTLET PIPE (SUBDRAINS)	4 M		
0081	2143000000-M	818	BLOTTING SAND	10 MTN		
0082	2209000000-M	838	ENDWALLS	40 M3		
0083	2220000000-M	838	REINFORCED ENDWALLS	20 M3		
0084	2253000000-M	840	PIPE COLLARS	2 M3		
0085	2264000000-M	840	PIPE PLUGS	1 M3		
0086	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	120 EA		
0087	2308000000-M	840	MASONRY DRAINAGE STRUCTURES	12 M		

County: Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0088	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	7 EA		
0089	2364200000-N	840	FRAME WITH TWO GRATES, STD 840.20	21 EA		
0090	2365000000-N	840	FRAME WITH TWO GRATES, STD 840.22	15 EA		
0091	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	13 EA		
0092	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	4 EA		
0093	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	23 EA		
0094	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	28 EA		
0095	2440000000-N	840	CONCRETE APRON FOR CATCH BASIN	7 EA		
0096	2451000000-N	840	CONCRETE APRON FOR DROP INLETS	1 EA		
0097	2538000000-M	846	***MM CONCRETE CURB & GUTTER (825MM)	9,450 M		
0098	2542000000-M	846	450MM CONCRETE CURB & GUTTER	1,570 M		
0099	2549000000-M	846	750MM CONCRETE CURB & GUTTER	4,680 M		
0100	2556000000-M	846	SHOULDER BERM GUTTER	3,010 M		
0101	2598000000-M	848	CONCRETE WHEELCHAIR RAMPS	220 M2		
0102	2612000000-M	848	150MM CONCRETE DRIVEWAY	920 M2		
0103	2619000000-M	850	100MM CONCRETE PAVED DITCH	4 M2		
0104	2655000000-M	852	125MM MONOLITHIC CONCRETE IS- LANDS (KEYED IN)	1,600 M2		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0105	2761000000-M	848	GENERIC PAVING ITEM 200MM CONCRETE DRIVEWAY (REINFORCED NORMAL DRIVE)	130 M2		
0106	2830000000-N	858	ADJUSTMENT OF MANHOLES	20 EA		
0107	2845000000-N	858	ADJUSTMENT OF METER BOXES OR VALVE BOXES	40 EA		
0108	3030000000-M	862	STEEL BM GUARDRAIL	5,006.34 M		
0109	3045000000-M	862	STEEL BM GUARDRAIL, SHOP CURVED	83.82 M		
0110	3105000000-N	862	STEEL BM GUARDRAIL TERMINAL SECTIONS	6 EA		
0111	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	10 EA		
0112	3210000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	5 EA		
0113	3215000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE III	16 EA		
0114	3270000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350	16 EA		
0115	3285000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE M-350	4 EA		
0116	3360000000-M	863	REMOVE EXISTING GUARDRAIL	447 M		
0117	3503000000-M	866	WOVEN WIRE FENCE, 1200MM FAB- RIC	10,500 M		
0118	3509000000-M	866	100MM TIMBER FENCE POSTS, 2.30M LONG	2,120 EA		
0119	3515000000-M	866	125MM TIMBER FENCE POSTS, 2.50M LONG	610 EA		
0120	3557000000-M	866	ADDITIONAL BARBED WIRE	300 M		
0121	3595000000-M	869	RELAPPING GUARDRAIL	198.12 M		
0122	3628000000-M	876	PLAIN RIP RAP, CLASS I	1,540 MTN		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0123	3635000000-M	876	PLAIN RIP RAP, CLASS II	980 MTN		
0124	3649000000-M	876	PLAIN RIP RAP, CLASS B	2,400 MTN		
0125	3656000000-M	876	FILTER FABRIC FOR DRAINAGE	12,045 M2		
0126	4072000000-M	903	SUPPORTS, 4.5KG STEEL U-CHANNEL	929 M		
0127	4096000000-N	904	SIGN ERECTION, TYPE D	4 EA		
0128	4102000000-N	904	SIGN ERECTION, TYPE E	184 EA		
0129	4108000000-N	904	SIGN ERECTION, TYPE F	6 EA		
0130	4129000000-N	906	RELOCATE SIGN, TYPE ***** (D)	10 EA		
0131	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U- CHANNEL	25 EA		
0132	4192000000-N	907	DISPOSAL OF SUPPORT, U-CHANNEL	10 EA		
0133	4400000000-M	1110	WORK ZONE SIGNS (STATIONARY)	158 M2		
0134	4405000000-M	1110	WORK ZONE SIGNS (PORTABLE)	68 M2		
0135	4410000000-M	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	30 M2		
0136	4415000000-N	1115	FLASHING ARROW PANELS, TYPE C	1 EA		
0137	4425000000-N	1125	WARNING FLAG SETS	33 EA		
0138	4430000000-N	1130	DRUMS	500 EA		
0139	4435000000-N	1135	CONES	50 EA		
0140	4445000000-M	1145	BARRICADES (TYPE III)	238 M		
0141	4455000000-N	1150	FLAGGER	500 MD		
0142	4475000000-N	1165	TRUCK MOUNTED IMPACT ATTENUA- TOR (45 MPH)	2 EA		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0143	4615000000-M	1205	REMOVABLE TAPE PAVEMENT MARKING LINES (100MM)	2,241 M		
0144	4635000000-M	1205	REMOVABLE TAPE PAVEMENT MARKING LINES (600MM)	35 M		
0145	4645000000-N	1205	REMOVABLE TAPE PAVEMENT MARKING SYMBOL	4 EA		
0146	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	1,228 EA		
0147	4685000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 2.3MM)	14,406 M		
0148	4686000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 3.1MM)	12,720 M		
0149	4688000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (150MM, 2.3MM)	738 M		
0150	4695000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM)	788 M		
0151	4710000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (600MM, 3.1MM)	346 M		
0152	4721000000-M	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (3.1MM)	18 EA		
0153	4725000000-M	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM)	157 EA		
0154	4770000000-M	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES (100MM)	630 M		
0155	4810000000-M	1205	PAINT PAVEMENT MARKING LINES (100MM)	96,880 M		
0156	4815000000-M	1205	PAINT PAVEMENT MARKING LINES (150MM)	284 M		
0157	4820000000-M	1205	PAINT PAVEMENT MARKING LINES (200MM)	591 M		
0158	4835000000-M	1205	PAINT PAVEMENT MARKING LINES (600MM)	616 M		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0159	4840000000-N	1205	PAINT PAVEMENT MARKING CHARACTER	54	EA	
0160	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	99	EA	
0161	4850000000-M	1205	REMOVAL OF PAVEMENT MARKING LINES (100MM)	3,295	M	
0162	4860000000-M	1205	REMOVAL OF PAVEMENT MARKING LINES (200MM)	42	M	
0163	4870000000-M	1205	REMOVAL OF PAVEMENT MARKING LINES (600MM)	28	M	
0164	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	12	EA	
0165	4905000000-N	1253	SNOWPLOWABLE RAISED PAVEMENT MARKERS	1,103	EA	
0166	4915000000-M	1264	2.1M U-CHANNEL POSTS	15	EA	
0167	4955000000-N	1264	OBJECT MARKERS (END OF ROAD)	15	EA	
0168	5255000000-N	1413	PORTABLE LIGHTING	Lump Sum	L.S.	
0169	5265000000-M	SP	GENERIC LIGHTING ITEM ELECTRICAL UNDERGROUND CONDUIT (100 MM, METALLIC)	20	M	
0170	5300000000-M	1505	FOUNDATION CONDITIONING MATERIAL, UTILITIES CLASS ***** (VI)	110	MTN	
0171	5306000000-M	SP	BEDDING MATERIAL, UTILITIES CLASS ***** (IV)	110	MTN	
0172	5360000000-M	1510	150MM DI WATER PIPE, PC 2.41MPA	32	M	
0173	5378000000-M	1510	300MM DI WATER PIPE, PC 2.41MPA	328	M	
0174	5408000000-M	1510	***MM COPPER WATER PIPE, TYPE K (50MM)	21	M	
0175	5414000000-M	1510	20MM COPPER WATER PIPE, TYPE K	16	M	

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0176	548000000-M	1510	DUCTILE IRON WATER PIPE FITTINGS, 1.72MPA MIN WP	768 KG		
0177	554000000-M	1510	150MM GATE VALVE & VALVE BOX, 1.38MPA WP	1 EA		
0178	555800000-M	1510	300MM GATE VALVE & VALVE BOX, ****MPA WP (1.38MPA)	2 EA		
0179	564800000-N	1510	RELOCATE EXISTING WATER METER (20MM)	13 EA		
0180	567200000-N	1510	RELOCATE EXISTING FIRE HYDRANT	4 EA		
0181	573800000-M	1520	300MM DI SEWER PIPE, PC 2.41MPA	113 M		
0182	577500000-M	1525	1200MM DIA PRECAST CONC SEWER MANHOLE 0-1.8M DEPTH	2 EA		
0183	578000000-M	1525	PRECAST CONC MANHOLE WALL, ****MM DIA, OVER 1.8M HT (1200MM)	6 M		
0184	580400000-M	1530	FILL OR REMOVE ABANDONED 300MM PIPE, ***** (CONC SEWER)	120 M		
0185	580400000-M	1530	FILL OR REMOVE ABANDONED 300MM PIPE, ***** (DI WATER PIPE)	168 M		
0186	581600000-N	1530	BREAK DOWN, PLUG, & FILL ABANDONED UTILITY MANHOLE	1 EA		
0187	582200000-N	1530	BREAK DOWN & REBUILD EXISTING MANHOLE	1 EA		
0188	588200000-N	SP	GENERIC UTILITY ITEM RELOCATE EXISTING 50MM WATER METER	3 EA		
0189	600000000-M	1605	TEMPORARY SILT FENCE	6,130 M		
0190	600600000-M	1610	STONE FOR EROSION CONTROL, CLASS A	920 MTN		
0191	600900000-M	1610	STONE FOR EROSION CONTROL, CLASS B	17,200 MTN		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0192	6012000000-M	1610	SEDIMENT CONTROL STONE	6,680	MTN	
0193	6015000000-M	1615	TEMPORARY MULCHING	38	HA	
0194	6018000000-M	1620	SEED FOR TEMPORARY SEEDING	2,425	KG	
0195	6021000000-M	1620	FERTILIZER FOR TEMPORARY SEEDING	19.5	MTN	
0196	6024000000-M	1622	TEMPORARY SLOPE DRAINS	1,100	M	
0197	6027000000-N	1622	INLET PROTECTION AT TEMPORARY SLOPE DRAINS	55	EA	
0198	6030000000-M	1630	SILT EXCAVATION	69,515	M3	
0199	6036000000-M	1631	MATTING FOR EROSION CONTROL	21,400	M2	
0200	6037000000-M	SP	COIR FIBER MAT	210	M2	
0201	6038000000-M	SP	PERMANENT SOIL REINFORCEMENT MAT	970	M2	
0202	6042000000-M	1632	6.4MM HARDWARE CLOTH	920	M	
0203	6069000000-M	1638	STILLING BASINS	300	M3	
0204	6084000000-M	1660	SEEDING & MULCHING	57.5	HA	
0205	6087000000-M	1660	MOWING	20	HA	
0206	6090000000-M	1661	SEED FOR REPAIR SEEDING	450	KG	
0207	6093000000-M	1661	FERTILIZER FOR REPAIR SEEDING	1.5	MTN	
0208	6096000000-M	1662	SEED FOR SUPPLEMENTAL SEEDING	1,625	KG	
0209	6108000000-M	1665	FERTILIZER TOPDRESSING	96.75	MTN	
0210	6109000000-M	SP	SPECIALIZED SEEDING UNDER GUIDERAIL & GUARDRAIL (HARD FESCUE/BUEGRASS)	0.7	HA	
0211	6111000000-M	SP	IMPERVIOUS DIKE	100	M	

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0212	6114000000-N	SP	SPECIALIZED HAND MOWING	36.5 HR		
0213	6117000000-N	1675	RESPONSE FOR EROSION CONTROL	24 EA		
0214	6118000000-N	SP	ROOTWADS	18 EA		
0215	6120000000-M	SP	CULVERT DIVERSION CHANNEL	630 M3		
0216	6123000000-M	1670	REFORESTATION	5 HA		
0217	6126000000-M	SP	STREAMBANK REFORESTATION	0.12 HA		
0218	7060000000-M	1705	SIGNAL CABLE	1,706 M		
0219	7120000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 3 SECTION)	51 EA		
0220	7132000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 4 SECTION)	1 EA		
0221	7144000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 5 SECTION)	8 EA		
0222	7252000000-M	1710	MESSENGER CABLE (6.35MM)	1,138 M		
0223	7264000000-M	1710	MESSENGER CABLE (9.52MM)	901 M		
0224	7288000000-M	1715	TRENCHING (PAVED)	25 M		
0225	7300000000-M	1715	TRENCHING (UNPAVED)	2,511 M		
0226	7302000000-M	SP	DIRECTIONAL DRILL POLYETHYLENE CONDUIT, 31.75MM (** CONDUIT) (1)	169 M		
0227	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	47 EA		
0228	7336000000-N	1716	JUNCTION BOX (OVER-SIZED)	12 EA		
0229	7360000000-N	1720	WOOD POLE	7 EA		
0230	7372000000-N	1721	GUY ASSEMBLY	18 EA		
0231	7408000000-M	1722	25MM RISER WITH WEATHERHEAD	5 EA		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0232	7420000000-M	1722	50MM RISER WITH WEATHERHEAD	6 EA		
0233	7432000000-M	1722	50MM RISER WITH HEAT SHRINK TUBING	4 EA		
0234	7444000000-M	1725	INDUCTIVE LOOP SAWCUT	3,114 M		
0235	7456000000-M	1726	LEAD-IN CABLE	7,875 M		
0236	7516000000-M	1730	COMMUNICATIONS CABLE (**FIBER) (12)	1,951 M		
0237	7552000000-N	1731	INTERCONNECT CENTER	2 EA		
0238	7564000000-N	1732	FIBER-OPTIC TRANSCEIVER	2 EA		
0239	7566000000-N	1733	DELINEATOR MARKER	9 EA		
0240	7568000000-N	SP	FURNISH FIBER-OPTIC RESTORATION KIT	1 EA		
0241	7574000000-N	SP	FURNISH FIBER-OPTIC TRANSCEIVER	1 EA		
0242	7576000000-N	1740	METAL STRAIN SIGNAL POLE	20 EA		
0243	7613000000-N	SP	SOIL TEST	20 EA		
0244	7614000000-M	SP	DRILLED PIER FOUNDATION (**MM DIA) (1067MM)	92 M		
0245	7636000000-N	1745	SIGN FOR SIGNALS	4 EA		
0246	7675000000-N	SP	LED BLANKOUT SIGN	2 EA		
0247	7684000000-N	1750	SIGNAL CABINET FOUNDATION	4 EA		
0248	7828000000-N	1751	CONTROLLER WITH CABINET (NEMA TS-2, TYPE 2 CONTROLLER, TYPE 1 CABINET, BASE MOUNTED)	4 EA		
0249	7840000000-N	1751	CONTROLLER WITH CABINET (NEMA TS-2, TYPE 2 CONTROLLER, TYPE 1 CABINET, POLE MOUNTED)	1 EA		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0250	7852000000-N	SP	DETECTOR CARD (NEMA TS-2)	29 EA		
0251	7948000000-N	SP	TRAFFIC SIGNAL REMOVAL	1 EA		
CULVERT ITEMS						
0252	8126000000-N	414	CULVERT EXCAVATION, STA ***** (32+55.510 -L-)	Lump Sum	L.S.	
0253	8126000000-N	414	CULVERT EXCAVATION, STA ***** (44+43.180 -L-)	Lump Sum	L.S.	
0254	8133000000-M	414	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	413 MTN		
0255	8196000000-M	420	CLASS A CONCRETE (CULVERT)	750 M3		
0256	8245000000-M	425	REINFORCING STEEL (CULVERT)	73,699 KG		
STRUCTURE ITEMS						
0257	8105500000-M	SP	****MM DIA DRILLED PIERS IN SOIL (1676MM)	81.8 M		
0258	8105600000-M	SP	****MM DIA DRILLED PIERS NOT IN SOIL (1676MM)	20 M		
0259	8113000000-N	SP	SID INSPECTION	2 EA		
0260	8114000000-N	SP	SPT TESTING	4 EA		
0261	8115000000-N	SP	CROSSHOLE SONIC LOGGING	2 EA		
0262	8116000000-M	SP	CSL TUBES	629 M		
0263	8147000000-M	420	REINFORCED CONCRETE DECK SLAB	3,164.7 M2		
0264	8161000000-M	420	GROOVING BRIDGE FLOORS	2,636.1 M2		

County : Iredell

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0265	8182000000-M	420	CLASS A CONCRETE (BRIDGE)	441.2 M3		
0266	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (39+62.402 -L- LEFT LANE)	Lump Sum	L.S.	
0267	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (39+62.402 -L- RIGHT LANE)	Lump Sum	L.S.	
0268	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (41+59.472 -L- LEFT LANE)	Lump Sum	L.S.	
0269	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (41+59.472 -L- RIGHT LANE)	Lump Sum	L.S.	
0270	8217000000-M	425	REINFORCING STEEL (BRIDGE)	53,312 KG		
0271	8238000000-M	425	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	6,909 KG		
0272	8280000000-M	440	APPROX KG STRUCTURAL STEEL	667,050 LS		
0273	8364000000-M	450	HP310X79 STEEL PILES	1,949 M		
0274	8503000000-M	460	CONCRETE BARRIER RAIL	536.839 M		
0275	8531000000-M	462	100MM SLOPE PROTECTION	3,140 M2		
0276	8650000000-N	SP	POT BEARINGS	Lump Sum	L.S.	
0277	8657000000-N	430	ELASTOMERIC BEARINGS	Lump Sum	L.S.	
0278	8692000000-N	SP	EVAZOTE JOINT SEALS	Lump Sum	L.S.	
0710/Jul09/Q2896970.889/D1145834800000/E278			Total Amount Of Bid For Entire Project :			

C200809
IREDELL COUNTY

2/16/99

Contract No: C200809

County: IREDELL

ACCEPTED BY THE
DEPARTMENT OF TRANSPORTATION

Contract Officer

Date

Execution of Contract and Bonds
Approved as to Form:

Attorney General

