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	C201251
WBS	34857.3.2
FEDERAL-AID NO.	NHS-1409(5)
COUNTY	NEW HANOVER
T.I.P. NO.	U-2734
KILOMETERS	3.748
ROUTE NO.	SR 1409
LOCATION	SR-1409 (MILITARY CUTOFF RD) FROM MULTI-LANES NORTH OF US-74 TO US-17.
TYPE OF WORK	WIDENING, GRADING, DRAINAGE, PAVING, SIGNALS & CULVERT.

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 SPECAILITY 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 REFREGIRATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA.

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A ROADWAY & CULVERT

5% BID BOND OR BID DEPOSIT REQUIRED

PROPOSAL FORM FOR THE CONSTRUCTION OF CONTRACT NO. C201251

IN NEW HANOVER 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. C201251; 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. C201251

In New Hanover 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: **C201251 (U-2734)**
New Hanover County

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PROJECT SPECIAL PROVISIONS

General 7-1-95

SP1G01

CONTRACT TIME AND LIQUIDATED DAMAGES: **7-20-99**

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 May 15, 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 Three Thousand Dollars ($3,000.00) per calendar day.

SP1G04

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 the existing traffic pattern. The Contractor shall not close or narrow a lane of traffic on **US 74 (Military Cutoff Road)** and **US 17 (Market Street)** during the following time restrictions:

DAY AND TIME RESTRICTIONS

(Monday thru Sunday from 6:00 AM until 7:00 PM)

In addition, the Contractor shall not close or narrow a lane of traffic on **US 74 (Military Cutoff Road)** and **US 17 (Market Street)**, 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 **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.

2. For **Easter**, between the hours of 6:00 a.m. Thursday and 7:00 p.m. Monday.

3. For **Memorial Day**, between the hours of 6:00 a.m. Friday and 7:00 p.m. Tuesday.

4. 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.

5. For **Labor Day**, between the hours of 6:00 a.m. Friday and 7:00 p.m. Tuesday.

6. For **Thanksgiving Day**, between the hours of 6:00 a.m. Tuesday and 7:00 p.m. Monday.

7. 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 the existing traffic pattern.

The liquidated damages are **Five Thousand Dollars ($5,000.00)** per hour.

INTERMEDIATE CONTRACT TIME NUMBER 2 AND LIQUIDATED DAMAGES:

The Contractor shall complete the required work of installing, maintaining and removing the traffic control devices for road closures and restoring traffic to a five-lane, two-way traffic pattern. The Contractor shall not close **US 17 (Market Street)** during the following time restrictions:

DAY AND TIME RESTRICTIONS

Monday thru Sunday from 6AM TO 12 Midnight

The maximum allowable time for a road closure (s) is 20 minutes for removal / installation of overhead sign assemblies. If a traffic queue develops during the road closure, the Contractor shall reopen the road to traffic until the traffic queue is depleted before closing the road again.

The time of availability for this intermediate contract time will be the time the Contractor begins to install traffic control devices required for the road closures according to the time restrictions stated above.

The completion time for this intermediate contract time will be the time the Contractor is required to complete the removal of traffic control devices required for the road closures according to the time restrictions stated above and restore traffic to a five-lane, two-way traffic pattern.

The liquidated damages are One Thousand Five Hundred Dollars ($1,500.00) per 20 minute time period.

INTERMEDIATE CONTRACT TIME NUMBER 3 AND LIQUIDATED DAMAGES:

The Contractor shall complete the work required of Phase I, Step 3 as shown on Sheet TCP-5 and the Signal Plans. Place and maintain traffic on same.

The date of availability for this intermediate contract time will be the date of availability for the contract.

The completion date for this intermediate contract time will be the date which is Three Hundred Sixty-Five (365) consecutive calendar days after and including the date of availability.

The liquidated damages are Two Thousand Five Hundred Dollars ($2,500.00) per calendar day.

INTERMEDIATE CONTRACT TIME NUMBER 4 AND LIQUIDATED DAMAGES:

The Contractor shall complete the work required of PHASE I, Step 2 as shown on Sheet TCP-5, and the Signals Plans. Place and maintain traffic on same.

The date of availability for this intermediate contract time will be the date of availability for the Contract.

The completion date for this intermediate contract time will be the date which is ninety (90) consecutive calendar days after and including the date of availability.

The liquidated damages are One Thousand Five Hundred Dollars ($1,500.00) 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

MAJOR CONTRACT ITEMS: **2-19-02C**

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
41	Asphalt Concrete Base Course, Type B25.0C
42	Asphalt Concrete Intermediate Course, Type I19.0C
44	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
83 thru 88	Guardrail Items
89 thru 93	Fencing Items
99 thru 112	Signing Items
128 thru 134	Long-Life Pavement Markings
141	Pavement Markers
143 thru 178	Utility Construction Items
179 thru 201 and 203, 204	Erosion Control Items
202	Reforestation Items
205 thru 263	Signal Items

SP1G37

DELAY IN RIGHT OF ENTRY: **07-01-95**

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

Parcel No.	Property Owner
12B	Regios Bank

SP1G22

FUEL PRICE ADJUSTMENT: **2-19-02C**

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:

Line #	Description	Units	Fuel Usage Factor Diesel
41	Asphalt Concrete Base Course, Type B25.0 C	L/Metric Ton	12.10
42	Asphalt Concrete Intermediate Course, Type I19.0C	L/Metric Ton	12.10
44	Asphalt Concrete Surface Course, Type S9.5 C	L/Metric Ton	12.10

SP1G46

SCHEDULE OF ESTIMATED COMPLETION PROGRESS: **07-16-90$_C$**

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

Fiscal Year	Progress (Dollar Value)
2005 (07/01/04 – 06/30/05)	40% of Total Amount Bid
2006 (07/01/05 – 06/30/06)	40% of Total Amount Bid
2007 (07/01/06 – 06/30/07)	20% 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**

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
Design 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 ENTERPRISE **07-17-01$_R$**

POLICY

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 __10%__

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 form.

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 form, 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 that 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 Form 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 form.

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 form, 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' 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 form 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 Departments 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: **3-21-90**

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

SUBMISSION OF BIDS - ALTERNATES: **1-01-02**

The 2002 Standard Specifications are revised as follows:

Page 1-13, Article 102-8

In Item 3, at the end of the second paragraph add the following:

"When Bidders submit prices on more than one alternate the lower cost of the correctly completed alternate is the accepted bid and will be used to determine the total amount bid."

Page 1-19, Article 103-2(D)

Add the following paragraph after the second paragraph:

"When Bidders submit prices on more than one alternate the lower cost of the correctly completed alternate is the accepted bid and will be used to determine the total amount bid."

SP1G91

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 form.

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 portion of this project.

SP1G119

PLANT AND PEST QUARANTINES: **03-18-03**
(IMPORTED FIRE ANT, GYPSY MOTH, WITCHWEED, AND OTHER NOXIOUS WEEDS)

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 2.

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

CONTROL OF NOISE:

Local laws, ordinances, and regulations that limit the periods during which work can be performed or that limit noise resulting from work shall not be applicable to the work required under the contract.

The Contractor shall conduct operations between 10:00 p.m. and 6:00 a.m. to minimize the noise impact on adjoining property. Blasting and driving of piles shall not be performed during this period. The exterior noise level resulting from the work shall not exceed 80 decibels or shall not exceed the background noise by more than 5 decibels, which ever is greater. Background noise shall be defined as the measured ambient noise level associated with all existing environmental, transportation, and community noise sources in the absence of any audible construction activity. Noise levels shall be measured at the right-of-way line adjacent occupied residential property at a height of five feet above the ground.

Work shall be performed in a manner to prevent nuisance conditions such as noise which exhibits a specific audible frequency or tone (e.g. back-up alarms, improperly maintained equipment, brake squeal) or impact noise (e.g. jackhammers, hoe rams, truck tailgates). The Engineer will determine whether or not nuisance noise conditions exist. All equipment shall be operated in accordance with the manufacturer's specifications and be equipped with all noise-reducing equipment in proper condition.

When feasible, the Contractor shall establish haul routes that direct its vehicles away from developed areas and ensure that noise from hauling operations is kept to a minimum. Equipment shall not be altered to result in noise levels that are greater than that produced by the original equipment.

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

BUILDING REMOVAL: **01-01-02**

Remove the buildings and appurtenances listed below in accordance with Section 215 of the Standard Specifications and the following provisions:

Prior to removal of any building, comply with the notification requirements of Title 40 Code of Federal Regulations, Part 61, Subpart M, which are applicable to asbestos. Give notification to the North Carolina Department of Health and Human Services, Division of Epidemiology, Asbestos Hazard Management Branch and/or the appropriate county agency when enforcement of the Federal Regulation is performed by the county. Submit a copy of the notification to the Engineer prior to the building removal.

The Department has performed asbestos assessments for building items identified below. Copies of this report may be obtained through the Division Right-of-Way Agent. When asbestos is discovered after the opening of bids for the project, the cost of asbestos removal and disposal will be paid for in accordance with Article 104-7 of the Standard Specifications. Perform removal and disposal of asbestos in accordance with the requirements of Title 40 Code of Federal Regulations.

When a building has had or will have asbestos removed and the Contractor elects to remove the building such that it becomes a public area, the Contractor is responsible for any additional costs incurred including final air monitoring.

Comply with all Federal, State and local regulations when performing building removal and/or asbestos removal and disposal. Any fines resulting from violations of any regulation are the sole responsibility of the Contractor and the Contractor agrees to indemnify and hold harmless the Department against any assessment of such fines.

Prior to removal of any Underground Storage Tank (UST), comply with the notification requirements of the Title 40 Code of Federal Regulations, Part 280.71(a). Give notification to the appropriate regional office of the North Carolina Department of Environment, and Natural Resources, Division of Environmental Management, Groundwater Section. Submit a copy of the notification to the Engineer prior to the removal of the underground storage tank.

Permanently close UST systems by removal and dispose of in compliance with the regulations set forth in Title 40, Code of Federal Regulations, Part 280.71 and North Carolina Administrative Code Title 15A, Chapter 2, Subchapter 2N and any applicable local regulations. Assess Underground Storage Tank sites at closure for the presence of contamination as required in NCAC Title 15A, Chapter 2, Subchapter 2N, Section .0803 and as directed by the appropriate Regional Office of the Division of Environmental Management. Remove and dispose of UST systems and contents in a safe manner in conformance with requirements of American Petroleum Institute Bulletin 1604, "Removal and Disposal of Used Underground Petroleum Storage Tanks", Chapters 3 through 6. (Note: As an exception to these requirements, the filling of the tank with water as a means of expelling vapors from the tank as described in section 4.2.6.1 of API Bulletin 1604, will not be allowed. Where underground storage tanks are indicated below, there will be no direct payment for the closure or assessment. When the contract does not indicate the presence of storage tanks and storage tanks are discovered after the opening of bids for the project, the cost of closure, assessment and/or removal will be paid for in accordance with Article 104-7 of the Standard Specifications.

Disposition of any contaminated material associated with underground storage tanks will be made as provided in Article 107-26 of the Standard Specifications.

Building Removal (Item #1)
Parcel 019 – Left of Survey Station 34+55, Survey Line L
3–Post Billboard

Building Removal (Item # 2)
Parcel 038 – Left of Survey Station 43+20, Survey Line L
Single-Wide Mobile Home

Building Removal (Item #3)
Parcel 038 – Left of Survey Station 43+40, Survey Line L
Frame Shed

Section 215 – Removal of Existing Buildings/Structures

When the description of the work for an item requires portion of the building to be cut off, that portion of the building and appurtenances located within the right of way and/or construction area shall be cut off by the Contractor and disposed of by him. The Engineer will denote on the building the line where the building is to be cut off. The Contractor will be required to cut the building off on a neat line along the construction line or right of way boundary designated by the Engineer. The Contractor will not be required to do any repairing to that portion of the building located outside of the right of way or construction area or to shore it up in any respect. All of the Contractor's work shall be confined to the right of way and construction area designated by the Engineer. (This paragraph pertains to No items: None.)

When the description of the work for an item indicates a building partially inside and partially outside the right of way and/or construction area, but does not require the building to be cut off, the entire building shall be removed. (This paragraph pertains to Items 2 & 3.)

SP2R15

TEMPORARY DETOURS: **8-15-00**

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

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 and stockpile the aggregate base course removed from the detours at locations within the right of way, as directed by the Engineer, for removal by State Forces. Pipe culverts 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. No direct payment will be made for removing the aggregate base course, earth material and pavement, as the cost of same shall be included in the lump sum price bid for "Grading". 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; removing any pipe culverts; and for placing earth material and pavement in embankments or disposing of earth material and pavement in waste areas.

SP2R31

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 226.
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

COMPREHENSIVE GRADING:

Comprehensive grading shall be performed in accordance with Section 226 of the Standard Specifications with the following exceptions:

Delete any reference to Section 230 "Borrow Excavation" from Section 226.

Borrow material shall be in accordance with Section 230.

The provisions of Article 104-5 will not be applicable to the item of "Borrow Excavation".

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' 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 "Borrow Excavation" or included in "Grading-Lump Sum" depending on the source of material.

SP2R40

BRICK ENTRANCE TO LANDFALL SUBDIVISION:

Description:

The Contractor shall tie the proposed asphalt pavement to the existing brick entrance at Arboretum Drive in accordance with the detail in the plans and as directed by the Engineer. Existing brick shall be reused to the extent possible. Any replacement brick shall match the existing brick as closely as possible. Provide a smooth tie-in with sufficient drainage from the existing brick roadway to the new asphalt pavement.

Basis of Payment:

The work covered by this provision shall be paid for at the contract lump sum price for "Brick Entrance to Landfall Subdivision". Such price and payment will be full compensation for all work covered by this provision including removing and reinstalling existing bricks, furnishing and installing replacement bricks, ABC, asphalt, sand and all other incidentals necessary to satisfactorily complete this work.

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 226 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:

Where the material has been obtained from an authorized stockpile or from a borrow source measurement and payment will be made as provided in Section 230 of the specifications for "Borrow Excavation".

SP2R45

___" (mm) WELDED STEEL PIPE: **1-15-02**

Use ___" (mm) welded steel pipe as shown on the plans that conforms to Section 330 of the Standard Specifications.

Install the pipe by dry boring and jacking. Carefully dry bore the pipe true to the line and grade given. Hold the bore to a minimum to insure that there is no settlement. Remove and replace any pipe that has been damaged due to the Contractor's operation at no cost to the Department. Completely fill all voids around the outside of the pipe to the satisfaction of the Engineer.

Measurement will be made in accordance with Article 330-4 of the Standard Specifications.

The quantity of pipe as measured above will be paid for at the contract unit price per linear foot (meter) for "___" (mm) Welded Steel Pipe, ___" (mm) Thick, Grade B (By Boring and Jacking)". Such price and payment will be full compensation for all work described herein including dry boring, jacking, tools, materials, labor, workmanship, and all other incidentals necessary to complete the work.

SP3R25

Payment will be under:

__" (mm) Welded Steel Pipe, __" (mm) Thick, Grade B
(By Boring and Jacking) .....Linear Foot (Meter)

FLOWABLE FILL: **9-17-02**

Provide and install flowable fill material in accordance with Articles 340-2 of the Standard Specifications.

Discharge flowable fill material directly from the truck into the space to be filled, or by other approved methods. The mix may be placed full depth or in lifts as site conditions dictate. The Contractor shall provide a method to plug the ends of the existing pipe in order to contain the flowable fill.

At locations where flowable fill is called for on the plans and a pay item for flowable fill is included in the contract, the quantity of flowable fill to be paid for will be the actual number of cubic yards (cubic meters) of flowable fill that have been satisfactorily placed and accepted.

The quantity of flowable fill, measured as provided above, will be paid for at the contract unit price per cubic yard (cubic meter) for "Flowable Fill". Such price and payment will be full compensation for all work covered by this provision including but not limited to the mix design, furnishing, hauling, placing and containing the flowable fill.

SP3R30

Payment will be made under:

Flowable Fill .....Cubic Yard (Cubic Meter)

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 Gyratory Compactor (SGC) printouts, at the QC laboratory. In addition, furnish copies, including SGC printouts, to the Engineer for review and approval within one working day after beginning production of the mix.

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	**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**	
(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

	Design	Binder	Compaction Levels			Volumetric Properties (c)			
Mix	ESALs	PG							
Type	millions	Grade	No. Gyrations @			VMA	VTM	VFA	%Gmm
(f)	(a)	(b)	N_{ini}	N_{des}	N_{max}	% Min.	%	Min. - Max.	@ 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/m^2)

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	Sand Equivalent	Flat & Elongated
		% Minimum	% Minimum	% 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: **11-21-00$_R$**

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 25.0B&C	4.3%
Asphalt Concrete Intermediate Course, Type I 19.0C	4.7%
Asphalt Concrete Surface Course, Type S 9.5B&C	6.5%

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

ASPHALT PLANT MIXTURES: **7-1-95$_c$**

Place asphalt concrete base course material in trench sections with asphalt pavement spreaders made for the purpose or with other equipment approved by the Engineer.

SP6R20

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

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)

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

SPECIAL SEALED DRAINAGE SYSTEM:

I. DESCRIPTION

The Contractor's attention is directed to the fact that there is an area containing petroleum contaminated soil (gasoline and diesel) on both sides of Military Cuttoff Road (SR 1489) near its intersection with Market Street (US 17).

The work covered by these provisions consists of constructing a special sealed system of underground storm drainage pipes and structures through this area, in accordance with these special provisions and with the lines, grades, dimensions, locations and details as shown on the plans or established by the Engineer. The sealed drainage system runs from Station 48+84 to Station 50+35 LT and RT on -L- and from 11+99 to 12+49 RT on –Y1- (Structures 170 to 189) or as directed by the Engineer.

No underdrains will be allowed for any reason between the above referenced stations on -L- and –Y1-.

II. MATERIALS

All backfill material shall have been approved by the Engineer.

Select Material for backfill shall meet the requirements of Section 1016 of the Standard Specifications.

Portland Cement Concrete shall meet the requirements of Section 1000 of the Standard Specifications.

Ductile Iron drainage pipe shall be Pressure Class 350 and shall conform to ANSI A21.51 (AWWA C151). Such pipe shall be push-on joint and installed with gaskets in accordance with the applicable sections of ANSI A21.11 (AWWA C111). Gaskets for ductile iron pipe shall be made of Nitrile, Teflon, or other gasoline resistant material and shall be approved for use with Pressure Class 350 Ductile Iron Pipe. Ductile Iron Pipe shall be cement mortar lined with a seal coat in accordance with ANSI A21.4 (AWWA C104).

Drainage Structures shall be precast concrete conforming to ASTM C478 and shall be as shown on the plans. Joints between sections shall conform to ASTM C443. Joints shall be sealed with O-Ring gaskets in accordance with the applicable sections of ASTM C443. O-Ring gaskets shall be made of Nitrile Teflon, or other gasoline resistant material and shall be approved for use with precast drainage structure sections.

Connection of pipe to drainage structure shall be by a flexible, resilient connector conforming to the applicable requirements of ASTM C923. The drainage structure to pipe connector shall be made of Nitrile, Teflon, or other gasoline resistant material.

Grout used in precast drainage structure shall meet the requirements of Article 1040-9 of the Standard Specifications except that the mixture shall consist of 1 part portland cement to 2 part mortar sand.

The Contractor shall submit to the Engineer catalog cuts and/or shop drawings for materials he proposes to use on the project. These shall be submitted by the Engineer to the State Design Services Engineer for review and approval. Forty days shall be allowed for the review of each submittal.

Materials which have not been approved shall not be delivered to the project. Eight (8) copies of each catalog cut and/or drawing shall be submitted and each shall show the material description, brand name, stock number, size, rating, manufacturing specification and the use for which it is intended.

III. CONSTRUCTION REQUIREMENTS

Trenches and Backfill for Sealed Drainage System Construction:

Trenches and backfill shall be done as shown on the details in the plans. Backfill with contaminated material is prohibited. All excavated material and contaminated water shall be handled and disposed of as set forth elsewhere in these provisions. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.

In general, all portions of the excavations shall be made so that the safe slope of the earth is not exceeded. It shall be the responsibility of the Contractor to properly and adequately protect any part of the excavation from caving or slipping by the use of sheeting, bracing, or shoring as required. All timbering or underpinning shall be put in place or driven by men skilled in such work and shall be so arranged that it may be withdrawn as backfilling progresses without disturbing the pipe or adjacent area.

Trench Excavation: No more trench (30 meters ±) shall be opened in advance of the pipe laying than is necessary to expedite the work unless prior approval is given by the Engineer. Ground conditions and/or location requirements shall govern the amount of trench open at any one time as determined by the Engineer.

Trench Width: Trench width for pipe 825 mm and smaller in inside diameter shall be equal to the outside diameter (as measured at the bells) of the pipe plus 400 mm. Trench width for pipe larger than 825 mm inside diameter shall be equal to the outside diameter (as measured at the bells) of the pipe plus 600 mm. Trench width shall be measured between faces of cut at the top of the pipe bell.

All timbering in trench excavations shall be withdrawn in stages on both sides of the trenches to prevent lateral movement of the pipe as the backfilling progresses, except where the Engineer permits the timbering to be left in place at the Contractor's request. The Contractor shall cut off any sheeting left in place at least 600 mm below finished grade wherever directed and shall remove and dispose of the material cut off.

The Contractor shall take all measures necessary to keep surface water out of the trenches by diking, ditching, or otherwise avoiding it. Provisions for surface drainage shall meet the approval of the Engineer.

All excavations shall be kept free of water while the work is in progress. Water may be removed by pumps, but must be handled as required below under the heading "Contaminated Groundwater".

Where the foundation material is found to be of poor supporting value or of rock, the Engineer may make minor adjustment in the location of the structure to provide a more suitable foundation. Where this not practical, the foundation shall be conditioned by removing the existing foundation material by undercutting to the depth as directed by the Engineer and backfilling with either a suitable local material secured from unclassified excavation or borrow excavation at the nearest accessible location along the project, or foundation conditioning

material as classified in Article 1016-3, consisting of crushed stone or gravel or a combination of sand and crushed stone or gravel approved by the Engineer as being suitable material for the purpose intended. The class of select material to be used for foundation conditioning will be stated on the plans or determined by the Engineer.

All backfill areas shall be graded and maintained in such a condition that erosion or saturation will not damage the pipe bed or backfill.

Heavy equipment shall not be operated over any pipe until it has been properly backfilled with a minimum 1 meter of cover. Where any part of the required cover is above the proposed finish grade, the Contractor shall place, maintain, and finally remove such material at no cost to the Department. Pipe which becomes misaligned, shows excessive settlement, or has been otherwise damaged by the Contractor's operations shall be removed and replaced by the Contractor at no cost to the Department.

Contaminated Soils:

For the purpose of this special provision, any soils excavated during the installation of the special sealed drainage system are to be treated as petroleum contaminated (gasoline and/or diesel) material. The Contractor is to excavate the soils as directed by the Engineer. It is estimated that approximately 1063 cubic meters of contaminated soil may be removed from this area.

The contractor is entirely responsible for compliance with all OSHA, EPA, DOT, DENR and local rules and regulations pertaining to excavation and transportation of the contaminated soil. Examples of such rules and regulations include, but are not limited to, 29 CFR 1910 and 1926, 40 CFR 260 - 265, 49 CFR 173 and 178, 15A NCAC 13A North Carolina Hazardous Waste Management Rules, NCGS 130A - 310 Inactive Hazardous Sites, the Federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Federal Resource Conservation and Recovery Act (RCRA). It must be noted that inclusion of this paragraph is meant to highlight the Contractor's responsibility for regulatory compliance in all phases of work on this project.

All excavated soil shall be temporarily stockpiled by the Contractor at a site designated by the Engineer, and in the manner described in detail on Plan Sheet _____, labeled "Diagram for Temporary Containment and Treatment of Petroleum Contaminated Soil". Removal and disposal of this soil, once stockpiled by the Contractor, shall be performed by others. The contractor must provide access to this stockpile with no more than three (3) days notification by the Engineer.

Contaminated Groundwater:

An indefinite amount of petroleum contaminated groundwater may be encountered during installation of the special sealed drainage system. Any groundwater removed from this area during dewatering shall be deemed petroleum contaminated unless otherwise cleared by appropriate laboratory analysis (as established in the Department of Environment and Natural Resources, Division of Waste Management Underground Storage Tank Section's publication entitled Underground Storage Tanks Section Guidelines for Sampling, (Version 1.2 September 1, 2003). This water must be pumped into containers for disposal by the Contractor.

Documentation of proper disposal shall be provided to the Department once completed. If no petroleum contamination is detected, then normal dewatering procedures can be followed. It is estimated that approximately 97,000 liters of contaminated groundwater may be removed from this area.

Sealed Drainage System Installation:

During the progress of the work and until the completion and final acceptance, the pipelines and drainage structures shall be kept clean throughout. Any obstructions or deposits shall be removed and disposed of properly.

If, at any time before completion of the contract, any broken pipe or any defects are found in any materials, they shall be replaced. All materials shall be carefully examined for deflects before placing, and any found deflective shall not be used.

Pipe shall not be laid upon a foundation into which frost has penetrated, or at any time, that in the opinion of the Engineer, there is danger of the formation of ice or frost at the bottom of the excavation. The Engineer may at his discretion allow construction of the pipeline to continue under freezing conditions provided the Contractor promptly backfills the trench as directed.

Pipe and accessories shall be carefully lowered into the trench with suitable equipment. Under no circumstances shall any of the materials be dropped or dumped into the trench.

Care shall be taken to avoid abrasion of the pipe coating. Poles used as levers for removing skids across trenches shall be of wood and shall have broad flat faces to prevent damage to the pipe or pipe coating.

The full length of each section of pipe shall rest solidly upon the pipe bed with recesses excavated to accommodate bells, couplings, and joints. Pipe that has been disturbed after laying shall be taken up and relaid.

When work is not in progress, open ends of pipe shall be securely closed so that water, earth, or other foreign substances can not enter.

Pipe laying shall proceed upgrade with the spigot ends pointing in the direction of flow. Each pipe shall be laid in such a manner as necessary to form a close concentric joint with the adjoining pipe and to prevent sudden offsets of the flow line. As the work progresses, the interior of the pipe shall be cleared of all foreign materials. Where cleaning after laying is difficult because of small pipe size, a suitable swab or drag shall be kept in the pipe and pulled forward past each joint immediately after the jointing has been completed. Trenches shall be kept free from water until backfilled and pipe shall not be laid when the condition of the trench or the weather is unsuitable for such work.

Any pipeline or drainage structure which contains any silt, sedimentation or other foreign material will not be accepted. The Contractor shall at his own expense flush, or otherwise cause the line (and drainage structures) to be cleaned out.

Material removed by cleaning or flushing shall be disposed of properly. Material removed by cleaning or flushing, if determined by the Engineer to be contaminated, must be handled and disposed of as approved by the Engineer. Approval must be obtained prior to any cleaning or flushing activities.

Gasket joints for pipe and drainage structures shall be handled, lubricated where necessary, and installed in accordance with the recommendations of the manufacturer.

No precast drainage structure shall be placed until the foundation has been approved by the Engineer. The precast units shall be assembled in accordance with the manufacturer's instructions. Drainage structures over 1 meter in depth shall have steps spaced 400 mm on center, of the type shown in the Standard Drawings. Steps shall be installed as directed by the Engineer and shall be tested as required in ASTM C478.

Where pipes enter drainage structures they shall be placed as the work is built up, properly connected, and accurately spaced and aligned. Pipe connections shall be made so that the pipe does not project farther than is necessary beyond the inside wall of the drainage structure. Pipe connections shall be grouted to make a smooth and uniform surface on the inside of the drainage structure.

After the drainage structure has been completed, including all pipe connections, the excavation shall be backfilled. The backfilling shall not be done until masonry has cured for at least 7 curing days, unless otherwise permitted by the Engineer. A curing day shall be as defined in Article 825-9 of the Standard Specifications for concrete or Article 830-5 for brick or block masonry. Backfill for drainage structure shall be of a type, placed, and compacted as required for ductile iron drainage pipe.

Sealed Drainage System Testing:

The special sealed drainage system shall be tested in accordance with Article 1520-4 (B) (1) of the Standard Specifications. Both infiltration and exfiltration tests will be required. Allowable leakage for both tests will be 0.02 liters per mm diameter per kilometer of pipe per hour. For the exfiltration test the system shall be plugged and filled to the rim of the drainage structure as directed by the Engineer.

Maintenance:

Maintenance shall be in accordance with Article 300-7 of the Standard Specifications.

IV. METHOD OF MEASUREMENT

Trenching, excavation and backfilling for special sealed drainage system will be considered as included in the contract price for the applicable pay item and no separate measurement will be made therefore. Such work as shoring, sheeting and dewatering of the excavation will also be considered as included in the contract price for the applicable pay item and no separate measurement will be made.

Measurement of Foundation Conditioning Material and Select Material shall be as provided for in Article 300-8 of the Standard Specifications.

The quantity of sealed drainage system lines of the various sizes which has been incorporated into the completed and accepted work will be measured from end to end by the linear meter in place with no deduction for length through drainage structures. Where two different sizes enter or go from a drainage structure, each size will be measured to the center of the drainage structure. Unless otherwise shown on the plans, branch connections, ells, or other fixtures will be included in the length measurement.

Precast drainage structures for the special sealed drainage system will be measured on a "per each" basis as provided below.

The quantity of drainage structures for the sealed drainage system to be paid for will be actual number of drainage structures which have been completed and accepted.

In addition, that portion of a drainage structure exceeding a height of 1.5 meters will be measured and paid for on a linear meter basis. The quantity of drainage structures above a height of 1.5 meters to be paid for will be the number of linear meters which, the height of the drainage structure exceeds 1.5 meters. The height will be measured vertically to the nearest centimeter from the top of the bottom slab to the top of the wall.

V. BASIS OF PAYMENT

Foundation conditioning material and select backfill material will be paid for as stated in Article 300-9 of the Standard Specifications.

The quantity of ductile iron drainage line for the sealed drainage system measured as provided above and accepted will be paid for at the contract unit prices per linear meter for the various sizes.

The quantity of precast drainage structures for the sealed drainage system measured as provided above and accepted will be paid for at the contract unit price per each for the various diameters and at the contract unit price per linear meter of depth for that portion of the drainage structure from a height of 1.5 meters to 3 meters. For that portion of the drainage structure above a height of 3 meters, payment will be made at 1.3 times the contract unit price per linear meter.

Such prices and payments will be full compensation for all work covered by these special provisions, including, but not limited to: materials, labor, equipment, backfilling, compaction, testing, pumping and incidentals necessary to complete the work as required.

Pay Items:

Foundation Conditioning Material, Minor Structures.....Metric Tons
Select Material, Class III.....Metric Tons
Contaminated Groundwater Disposal.....Liters

Masonry Drainage Structures.....Each
Masonry Drainage Structures.....Linear Meter
___ mm Ductile Iron Drainage Pipe, PC 350.....Linear Meter

SLUICE GATE: **7-1-95**

Description:

The work covered by this provision consists of the construction of a sluice gate on an endwall in accordance with the details in the plans, the applicable requirements of Section 838 of the Standard Specification, and in accordance with the manufacturer's recommendations and as directed by the Engineer. Provide a gate that forms a watertight seal when closed.

Method of Measurement:

The quantity of sluice gates to be paid for will be the actual number of sluice gates that have been incorporated into the completed and accepted work.

The end wall will be measured in accordance with Article 838-4 of the Standard Specifications.

Basis of Payment:

The quantity of sluice gates, measured as provided for above, will be paid for at the contract unit price each for "____" (mm) Sluice Gate".

The endwall will be paid for in accordance with Article 838-5 of the Standard Specifications.

Such prices and payment will be full compensation for all materials, labor, equipment and incidentals necessary to complete the work.

SP8R20

Payment will be made under:

____" (mm) Sluice Gate .....Each

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

750MM CONCRETE CURB & GUTTER WITH DEPRESSIONS FOR WHEELCHAIR RAMPS:

Description:

Construct the 750mm Concrete Curb and Gutter in accordance with Section 846 of the Standard Specifications and this provision.

The Contractor shall provide curb cuts for future wheelchair ramps as directed by the Engineer and in accordance with the detail in the plans.

Method of Measurement:

Method of Measurement shall be in accordance with Article 846-4 of the Standard Specifications.

Basis of Payment:

The quantity of 750mm Concrete Curb & Gutter with Depressions for Wheelchair Ramps measured as provided in Article 846-4, will be paid for at the contract unit price per linear foot for "750mm Concrete Curb and Gutter".

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 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

LOG VANES:

Description:

The Contractor shall construct log vanes in accordance with the detail in the plans, as directed by the Engineer and the following provision. This work shall include excavating the channel and construction the log vanes. The purpose of the weirs is to create pools for stream enhancement.

Materials:

Materials shall meet the requirements shown below:

Drainage Ditch Excavation.....Section 240
Logs.....0.3 m Diameter (min)
Anchor Rock.....45-90 Kg

Anchor rocks shall be sound, tough, dense, resistant to the action of air and water and suitable in all other respects for the purpose intended.

Method of Measurement:

The quantity of drainage ditch excavation to be paid for will be measured in accordance with the Standard Specifications.

The quantity of log vanes to be paid for will be the actual number of log vanes satisfactorily constructed and accepted.

Basis of Payment:

The quantity of drainage ditch excavation measured as provided for above will be paid for at the contract unit price per cubic meter for "Drainage Ditch Excavation".

The quantity of log vanes measured as provided for above will be paid for at the contract unit price each for "Log Vanes".

Such prices and payment shall be considered full compensation for all excavation, logs, anchor rocks, materials, labor and any incidentals necessary to complete the work.

Payment will be made under:

Drainage Ditch Excavation.....Cubic Meter
Log Vanes.....Each

PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON: 10-15-02

Description:

Construct and maintain preformed scour holes with spreader aprons at the locations shown on the plans and in accordance with the details in the plans. Work includes excavation, shaping and maintaining the hole and apron, furnishing and placing filter fabric, rip rap (class as specified in the plans) and permanent soil reinforcement matting.

Materials:

Materials shall meet the requirements of Division 10 and this provision:

Plain rip rap.....Article 1042
Filter Fabric.....Article 1042-2

The permanent soil reinforcement matting shall be permanent erosion control reinforcement mat and shall be constructed of 100% coconut fiber stitch bonded between a heavy duty UV stabilized cuspated (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/m2)
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.

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 "Preformed Scour Holes with Level Spreader Aprons" to be paid for shall be the actual number which have been incorporated into the completed and accepted work.

Basis of Payment:

The quantity of scour holes with spreader aprons, measured as provided above, will be paid for at the contract unit price each for "Preformed Scour Hole with Level Spreader Apron." Such price and payment will be full compensation for all work covered by this provision.

SP8R105

WHEELCHAIR RAMPS FOR PAVED BIKE PATH: **10-21-03**

Revise the 2002 Standard Specifications as follows:

PAGE 8-33, SECTION 848

Section 848-2 Add the following:

Detectable Warnings:

Detectable warnings may be either truncated dome concrete paving blocks or stamped concrete. Use Class "B" concrete.

Detectable warnings shall consist of raised truncated domes. Truncated Domes shall have a base diameter of no less than 0.9 inches (23 mm) to no more than 1.4 inches (36 mm), a top diameter of no less than 50 % to no more than 65% of the base diameter, and a height of 0.2 inches (5 mm). Truncated domes shall have center-to-center spacing of no less than 1.6 inches (41 mm) to no more than 2.4 inches (61 mm), and a base to base spacing of 0.65 inches (16 mm) measured between the most adjacent domes on square grid.

Section 848-3 Add the following:

Install 24 inches (600 mm) in length of truncated dome paving blocks along the bottom of the curb ramps in accordance the plans and details.

Obtain 70 percent contrast visibility with adjoining surfaces, either light-on-dark, or dark-on-light sequence covering the entire 24 inch (600mm) width of the Detectable Warning Dome area.

Section 848-5

Add the following sentence to the third paragraph:

Such price will include furnishing and installing raised truncated domes.

SP8R120 (Rev)

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 ± 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 ± 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

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC: **1-15-02$_R$**

Revise the 2002 Standard Specifications as follows:

Delete Section 1175 and insert the following:

Description

Furnish, install, and remove sheeting, shoring, and bracing necessary to maintain traffic at locations shown on the Traffic Control Plans, and other locations determined during construction. Shoring required to maintain traffic is defined as shoring necessary to provide lateral support to the side of an excavation or embankment parallel to an open travelway when a theoretical 2:1 or steeper slope from the bottom of the excavation or embankment intersects the existing ground line closer than five (5) feet (1.5 m) from the edge of pavement of the open travelway. Contractor has option of submitting their own shoring design or using the Standard shoring design, unless otherwise noted in the plans.

Materials

Sheet piling must be hot rolled and conform to the requirements of ASTM A328.

Steel piles must conform to the requirements of ASTM A36.

Timber and lumber must conform to the requirements of Article 1082-1 in Standard Specifications.

Include all materials proposed for use in temporary shoring in the shoring design submittal described below.

Provide a Type 7 Contractor's Certification for all shoring materials used.

Contractor Shoring Design

Submit shoring design for review and approval by the Engineer prior to beginning construction.

Submit calculations and detail drawings in accordance with section 410-4 of the Standard Specifications.

Design all temporary shoring in accordance with the latest edition of AASHTO's Guide Design Specifications for Bridge Temporary Works.

If temporary concrete barrier is to be located within three (3) feet (1 m) of the top of the shoring, measured to the back face of the barrier, then design the temporary shoring to resist the lateral movement of the barrier when struck by a vehicle and extend the shoring out of the ground at least to the top elevation of the temporary concrete barrier. Design the temporary shoring to resist an impact load of two (2) kips/foot (29 kN/m) applied at one and half (1.5) feet (0.5 m) above ground. This shoring will be paid for as "Temporary Shoring - Barrier Supported". Temporary concrete barrier is paid for separately.

Standard Shoring Design
Select the appropriate shoring design from the "Standard Temporary Shoring for Maintenance of Traffic" detail drawing as shown in the plans.

Submit a "Standard Shoring Selection Form" to Engineer a minimum of fourteen (14) days prior to beginning construction of shoring.

Find Standard Shoring Selection Form as follows:

1. Go to NCDOT webpage (www.doh.dot.state.nc.us)
2. Click on Doing Business with NCDOT link
3. Scroll down and click on Soils and Foundation Design Section Forms link
4. Click on Standard Shoring Selection Form

Criteria for the Standard Shoring Designs

- Maximum height of shoring excavation is eleven (11) feet (3.35 meters).
- Groundwater table is not above bottom of shoring excavation.
- Traffic surcharge equal to 240 psf (11 kPa).
- Soldier pile spacing is six (6) feet (1.8 meters).
- Soldier pile embedment depths are for driven piles.
- Timber lagging must have minimum thickness of three (3) inches (76 mm).
- Timber must have a minimum allowable bending stress of 1000 psi (6895 kPa).

If conditions at the shoring location do not meet the criteria of the Standard shoring design as outlined above and in the plans, then Contractor must submit a shoring design to the Engineer for approval.

Construction Methods

Install and interlock steel sheet piles to a tolerance of not more than 3/8 inch per foot (30mm per meter) from vertical.

If soldier piles are used, then install piles to a tolerance of not more than 1/4 inch per foot (20mm per meter) from vertical.

If soldier piles are to be installed in drilled holes, then set piles in drilled holes and fill the holes as soon as practical after installing the piles.

Excavate or auger the soil and rock in two (2) foot (610 mm) diameter holes to the required embedment depth as shown on the approved design. Maintain holes, if required, by casing or other means. Set soldier piles to bottom of the hole prior to backfilling. Backfill holes with Class A concrete to the bottom of excavation. Fill remainder of hole with a lean sand-grout mixture to the ground surface. Remove mixture as necessary to install timber lagging.

Use timber lagging with a minimum three (3) inch (76mm) thickness perpendicular to the pile flange. Install timber lagging with a minimum bearing distance of three (3) inches (76 mm) on each pile flange. Backfill voids behind lagging with granular material or compacted excavated material to the satisfaction of the Engineer.

Backfill and compact fill for shoring excavation prior to removal of shoring.

If the design embedment depth is not achieved, then notify the Engineer immediately.

Method of Measurement

The quantity of temporary shoring to be paid for will be the actual number of square feet (square meter) of exposed face of the shoring measured from the bottom of the shoring excavation or embankment to the top of the shoring, with the upper limit for pay purposes not to exceed one (1) foot (0.3 m) above the retained ground elevation.

The quantity of temporary shoring - barrier supported to be paid for will be the actual number of square feet (square meter) of exposed face of the shoring measured from the bottom of the excavation or embankment to the top of the shoring, with the upper limit for pay purposes not to exceed one (1) foot (0.3 m) above the retained ground elevation.

Basis of Payment

Payment for temporary shoring will only be made at locations where it is required in order to maintain traffic. Trench boxes are not considered temporary shoring for the maintenance of traffic and will not be paid for under this special provision. Such payment will include, but not limited to, furnishing all labor, tools, equipment, and all incidentals necessary to install shoring and complete the work as described in this special provision.

The quantity of shoring necessary for the maintenance of traffic, measured as provided above, will be paid for at the contract unit price per square foot (square meter) of "Temporary Shoring".

The quantity of shoring with temporary concrete barrier located within three (3) feet (1.0 meter) of the shoring will be paid for at the contract unit price per square foot (square meter) of "Temporary Shoring - Barrier Supported".

SP11R01

Payment will be made under:

Temporary Shoring.....Square Feet (Square Meter)
Temporary Shoring - Barrier Supported.....Square Feet (Square Meter)

DRUMS: **7/16/02**

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

PORTABLE CONCRETE BARRIER: **11-19-02**

Portable Concrete Barrier used on this project must meet one of the following:

- NC Approved NCHRP 350 Portable Concrete Barrier (design can be found at http://www.doh.dot.state.nc.us/preconstruct/traffic/congestion/TC/ or can be obtained by calling the Traffic Control Section at (919) 250-4159)
- Other NCHRP 350 Portable Concrete Barrier as approved by the Engineer and the Traffic Control Section
- NC Approved NCHRP 230 Portable Concrete Barrier in Roadway Standard Drawing 1170.01 manufactured before October 1, 2002

SP11R10

PAVEMENT MARKING GENERAL REQUIREMENTS: **7/16/02**

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: **7-1-95**

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.

Percentage of Elapsed Contract Time	Percentage Additive
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

FINAL SURFACE TESTING - ASPHALT PAVEMENTS: **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 l05-3.

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	ACCEPTANCE CATEGORY	CORRECTIVE ACTION	PAY ADJUSTMENT	
			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

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OVERHEAD SIGN ASSEMBLIES

Design, fabricate, furnish and erect various types of overhead sign assemblies with maintenance walkways, when specified in the plans and attach Type A and Type B signs to the structure in accordance with the requirements of the plans.

Fabricate supporting structures from tubular members of either aluminum or steel. Only one type of material may be used throughout the project.

Among the types of overhead sign assemblies included in this specification are: span structures, cantilever structures, and sign structures attached to bridges.

Design overhead sign assemblies to including footings and submit shop drawings for approval.

The provisions of Section 900 and Section 901 will be applicable to all work covered by this provision.

CONSTRUCTION METHODS

(A) General

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

Fabricate sign panels for overhead sign assemblies in accordance with the requirements for type A and type B signs, as indicated in the plans, unless otherwise approved by the Engineer.

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

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

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

(B) Location and Field Verification

The support lengths and dimensions for the overhead sign assemblies shown in the original plans are estimated for project bid purposes.

The Engineer, unless Contractor is required to complete all project survey in accordance with Section 801, will establish the proper offset, longitudinal location, footing elevation and S dimension for each overhead sign assembly. The Engineer will furnish field-verified S dimensions and slope verification at the supports to the Signing Section for a revision of the Structure Line drawings. If Contractor Surveying is required on project in accordance with Section 801, Contractor completes field verification of s-drops and slopes and submits to Engineer. The Engineer is responsible to confirm that these verifications are completed

accurately and in correct format and submits to the Signing Section for a revision to the structure line drawings.

Prepare shop drawings for overhead sign assembly when the revised dimensions and slope verifications have been determined and the appropriate plan revision is completed.

Provide the proper vertical plumb, level, and orientation of all signs and supports.

(C) Shop Drawings

Design the overhead sign supports, including footings prior to fabrication. Submit computations and shop drawings for the designs to the Engineer for acceptance.

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

Submit to the Engineer for approval complete design and fabrication details for each overhead sign assembly, including footings and brackets for supporting the signs, maintenance walkways, when specified in the plans, electrical control boxes, and lighting luminaires. Base design upon the revised structure line drawings, wind load area and the wind speed shown in the plans, and in accordance with the "Standard Specifications for Structural Structures for Highway Signs, Luminaires and Traffic Signals".

Submit thirteen copies of completely detailed shop drawings and one copy of the design computations for each overhead sign assembly to the Engineer for approval prior to fabrication. Shop drawings includes complete design and fabrication details, including foundations, provisions for attaching signs, maintenance walkways, when applicable, and lighting luminaires to supporting structures, applicable material specifications, and any other information necessary for procuring and replacing any part of the complete overhead sign assembly.

Allow at least 40 days for shop drawing approval after the Engineer receives them. If revised drawings are required, additional time will be required for review and approval of final shop drawings.

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

(D) Design and Fabrication

The following criteria governs the design of overhead sign assemblies:

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

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

- The wind pressure map that is developed from the 3-second gust speeds, as provided in Article 3.8, shall be used.

- Overhead cantilever sign structures shall include galloping loads, truck-induced gust loading and natural wind gust loading in the fatigue design, as provided for in Article 11.7.1, 11.7.4 and 11.7.3 respectively.

- The natural wind gust speed in North Carolina shall be assumed to be 5 meters per second or 11.6 mph for inland areas, and 7 meters per second or 15.7 mph for coastal areas. The coastal area shall be defined as any area within 2 miles from the waterfront facing the ocean or sound and all area where the design basic wind speed is above 120 mph, as shown in Figure 3-2.

- The fatigue importance category used in the design, for each type of structure, as provided for in Article 11.6, Fatigue Importance Factors, shall be Category II unless otherwise shown on the contract plans.

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

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

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

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

Case 3 For twin post truss-type upright post with the post connected to two truss chords of a horizontal tri-chord or box truss, the effective column length factor for that column shall be taken as 1.65.
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 1/5 of the upright diameter, and located concentrically with the upright pole, may be considered as a solid base plate.

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

D_1 = horizontal distance between the center of the anchor bolt and the outer face of the upright, or the difference between the radius of the bolt circle and the outside radius of the upright
M = bending moment at the critical section of the base plate induced by one anchor bolt
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 1/5 of the upright diameter

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

Uprights, footings and trusses that support overhead signs, digital message signs, or changeable message signs shall be designed for the effects of torsion. Torsion shall be considered from dead load eccentricity of these attachments, as well as for attachments such as walkways, supporting brackets, lights, etc., that add to the torsion in the assembly. Truss vertical and horizontal truss diagonals in particular and any other assembly members shall be appropriately sized for these loads.

Uprights, footings and trusses that support overhead mounted signs, digital message signs, or changeable message signs shall be designed for the proposed sign wind area and future wind areas. The design shall consider the torsion induced by the eccentric force location of the center of wind force above (or below) the center of the supporting truss. Truss vertical and horizontal truss diagonals in particular and any other assembly members shall be appropriately sized for these loads.

Fabricate all overhead sign assemblies, including footings in accordance with the details shown in the approved shop drawings and with the requirements of these specifications.

Fabricate the span and cantilever supporting structures using tubular members of either aluminum or steel, using only one type of material throughout the project. Sign support structures that are to be attached to bridges may be fabricated using other structural shapes.

Fabricate folding safety railing in lengths not exceeding 10 feet (3m) and install for the full length of the walkway. Join each folding safety railing post to walkway supports through a hinge support of appropriate design that will rotate freely. Provide a hinge support that has a locking or latching device and holds the railing in a steady manner, free of movement while in the raised position. Maximum allowable displacement from vertical at the top of the railing will be 1 inch (25mm).

Install fixed safety railing along the sign side of the walkway from the beginning of the walkway to the edge of the first sign. Provide fixed safety rails between signs when they are greater than 12 inches (304.8m) apart. Provide one fixed safety rail below any sign having a clearance between the bottom of the sign and the walkway grating of greater than 24 inches (609.6m) and less than 42 inches (1066.8m). Provide two fixed rails when the clearance between the bottom of a sign and the walkway exceeds 42 inches (1066.8m).

Provide a walkway in which the open ends have a galvanized steel coil safety chain attached on one end near the top of the safety railing, and on the other end to the walkway hanger, or other fixed member of the structure. When the railing is folded, the chain must not hang below the walkway bracket.

Where offsets in the walkway and safety railing are necessitated by variable luminaires offsets, provide safety chains between the offset handrail sections.

(F) Footings

Anchor Bolts

Materials used in steel anchor bolts shall conform to AASHTO (M 314), and have a design yield strength not to exceed 55, 000psi.

Design footings for the combined effects of dead and wind loads and may be either spread type or pole type. Design spread footings for a maximum soil bearing of 3 ksf (145 kilopascal), unless otherwise allowed by the "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals". If, in the judgment of the Engineer, the soil in a given footing excavation is not adequate for 3 ksf (145 kilopascal) bearing pressure, or any other bearing pressure noted on approved footing drawings, changes to the footing design may be required to meet actual soil conditions at no cost to the Department.

Perform all excavation and backfill necessary for footing construction to the elevations and dimensions shown in the revised plans or as directed by the Engineer.

Thoroughly compact all backfill in 6 in (152.4mm) layers. Remove all excavated material that is not needed from the site.

Construct footing excavations for overhead sign assemblies which conform to the applicable provisions of Section 410. Make sure that the sides of the excavation for pole-type footings

Horizontal components of the supporting structures for overhead signs may be of a truss design or a design using singular horizontal members to support the sign panels. Provide permanent camber in addition to dead load camber in accordance with the "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals". Indicate on the shop drawings the amount of camber provided and the method employed in the fabrication of the support to obtain the camber.

Use cantilever sign structures that meet the following design criteria:

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

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

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

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

Provided adequate supporting frames for mounting the lighting luminaires in the positions shown in the plans or approved shop drawings for all overhead sign assemblies to be illuminated.

(E) Maintenance Walkways

When plans require maintenance walkways, provide maintenance walkways with an open, skid-resistant surface, and safety railings on all overhead structures unless specifically stated otherwise in the plans. Requirements for design and fabrication of the walkways are shown in the plans. Provide a walkway that is continuous and extends from 3 feet (1m) outside the edge of pavement over the shoulder to the farthest edge of any sign on the structure. If a sign is to be located such that it extends more than three feet outside the edge of pavement, extend the walkway for the full length of that sign. Provide walkways with a safety railing along the front side that can be folded, when not in use, to a horizontal position that will not obscure the signs.

To accommodate lighting luminaires, (when required by the plans), extend supports for the walkways in front of the walkway and railing. If external ballast is required, make provisions adjacent to the walkway and between the walkway and sign to accommodate ballast boxes for lighting circuits in a manner readily accessible from the walkway. Provide ballast box, brackets, and fastening devices which will withstand the loading requirements for the walkway, and mount so that the top of the box will be flush with the top of the walkway.

The walkway sections are to be connected rigidly where sections join to avoid an uneven walking surface. Attach the walkway directly to the walkway brackets.

Install a 4-inch x 4-inch (100mm x 100mm) safety angle in back of and parallel to the walkway and extend it the entire length of the walkway, except in the area occupied by ballast boxes. Design the safety angle to withstand a loading in keeping with the walkway.

conform as nearly as practicable to the required dimensions. Place concrete for pole-type footings against undisturbed soil. If, in the judgement of the Engineer, significant discontinuities in the required configuration of the excavation for pole-type footings are created by the removal of boulders, or as a result of other causes, backfill the excavation and compacted as provided for in Section 410. Re-excavate the footings to the proper dimensions. Obtain approval prior to the use of shoring, if shoring is necessary to stabilize the sides of excavation for pole-type foundations.

Construct footings for overhead sign assemblies in accordance with Section 825. Construct all footings of Class A concrete. Where rectangular forms are used, use forms that have a chamfer strip at all corners for at least that distance protruding above ground level. Use chamfers which measure one inch along the diagonal face. Securely brace anchor bolts positioned in the form, and hold in proper position and alignment. Provide a rubbed finish on concrete surfaces to be exposed above finished ground in accordance with Subarticle 825-6(D). Do not erect overhead sign assemblies on footings until the concrete has reached a minimum compressive strength of 3,000 psi (20.7 Megapascal). Determine concrete compressive strength by nondestructive test methods, or by compressive strength tests made in accordance with AASHTO T22 and T23. Furnish equipment used for nondestructive tests and obtain Engineer approval.

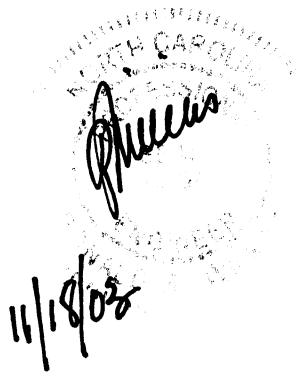
Fill the space between the top of the footing and the bottom of the base plate and neatly finish with a non-shrinking and non-metallic grout approved by the Engineer.

COMPENSATION

The work covered by this section will be paid for at the contract lump sum for each Overhead Sign Assembly "_____". Such price will be full compensation for all work covered by this specification includes all design, fabrication, construction, transportation, and erection of the complete overhead sign structure, supporting structure, hardware, lighting support brackets, and footings; preparing and furnishing shop drawings; and attaching the signs to the overhead sign structure.

Payment will be made under:

Overhead Sign Assembly "_____" .....Lump Sum



11/18/03

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 Structure" dated January 2002 and the following provisions.

The Contractor is herein forewarned as to the possibility of having to vary the depth of pipeline installation to achieve minimum clearance of existing or proposed utilities or storm drainage while maintaining minimum cover specified whether existing or proposed pipelines, conduits, cables, mains, and storm drainage are shown on the plans or not.

On new force main sewers, tie in sections of existing force main sewers, new water mains or tie in sections of existing water mains, the method of anchoring pipe bends, valves, and related appurtenances will be the responsibility of the Contractor. Tying in to these lines may alter such lines to the extent that these pipelines with existing pipe bends, valves and related appurtenances may also require reaction backing; 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 prior to any applicable force main sewer or water line construction. Such approval will not relieve the Contractor of his responsibility of properly anchoring the force main sewers or water lines.

Owner and Owner's Requirements:

The existing water lines belong to the City of Wilmington. The contact person for the City of Wilmington is Mr. Hugh T. Caldwell, Jr., PE. Mr. Caldwell can be reached by telephone at (910) 341-7805. The existing sewer lines belong to New Hanover County Water and Sewer District. The contact person for New Hanover County Water and Sewer District is Mr. James Craig, PE. Mr. Craig can be reached by telephone at (910) 798-7139. The Contractor shall provide access for the owner's representatives to all phases of construction. The owners shall be notified two weeks prior to commencement of any work and one week prior to service interruption.

After the installed pipe, fittings, valves, hydrants, corporation stops and end plugs are inserted and secured, the pipeline shall be subjected to a hydrostatic pressure of 1.38 MPa for a period of 2 hours, by pumping the section full of clean water using an approved pressure pump. Cross connection for flushing and chlorination shall be made by means of a temporary connection from the supply pipe with an approved backflow prevention

device. Cross connection and blowoff piping shall be 50mm in diameter for mains 200mm in diameter and smaller, and 100mm in diameter for mains greater than 200mm but less than 400mm in diameter. Taps for the cross connection piping shall be made to the portion of the existing water main that will be removed from service. The proposed water main shall be laid to within one pipe length of the point of final connection prior to flushing and testing. All flushing and chlorination work shall be performed in accordance with AWWA C651-99. All fittings, valves, backflow prevention devices required for chlorination and testing shall be incidental to the cost of the proposed pipe being tested.

Any cracked, damaged, or defective pipe, fittings, valves, hydrants, or other attachments discovered as a result of the pressure test, shall be removed and replaced with sound material. The tests shall be repeated until test results are satisfactory.

After the pressure test is complete, the Contractor shall make a leakage test. Such leakage test shall last at least 2 hours at a pressure of 1.38 MPa. The pressure test and leakage test may be performed concurrently.

All valves on the lines being sterilized shall be opened and closed several times during the chlorinating period. The pipeline shall then be flushed with clean water until the residual chlorine is reduced to less than 1.0 PPM or at the same level as in the existing water mains. Samples of water shall be taken at representative points along the pipeline by the Contractor in approved containers and submitted to a certified testing laboratory for bacterial and chlorine content. Test results shall be furnished to the Engineer and the owner as soon as they are available.

The owners shall be notified in advance of any interruptions of water service with ample time to make arrangements. Interruption of water service on main lines shall be limited to a maximum of 4 hours unless approved by the Engineer.

The method of restraining the proposed water line shall be concrete reaction backing as noted on the Utility Construction Plan Detail Sheets. No restrained retainer glands shall be used on the proposed water lines. The Engineer shall approve the placement, size and location of all concrete reaction backing. All concrete reaction backing shall be incidental to the water pipe. Restrained retainer glands shall be used only on the sanitary sewer force main. Payment for restrained retainer glands is provided for in these special provisions.

Ductile iron sewer pipe shall meet the requirements of ANSI A21.51/AWWA C151. Nominal pipe laying length shall be six meters. Joints shall be mechanical joint or rubber ring gasket slip joint, each conforming to ANSI A21.11/AWWA C-111. The pipe and fittings shall have an asphaltic exterior coating as specified in AWWA C151. Interior of the pipe joints shall be coated with ceramic epoxy to produce a minimum dry film thickness of 40 mils. Calcium aluminate mortar lining of the ductile iron pipe shall also be acceptable.

Utility Locations Shown on the Plans:

The location, size, and type material of the existing utilities shown on the plans is 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.

NOTE: All sewer manholes on this project, new or adjusted, shall be installed with new rings and covers provided by the New Hanover County Water and Sewer District. This requirement applies to existing manholes being adjusted, new manholes, and manholes for the air release/vacuum valve assemblies. The Contractor is advised that the new rings and covers being supplied by the New Hanover County Water and Sewer District are not of the same size and configuration as noted in the NCDOT Standard Details. The Contractor shall give New Hanover County Water and Sewer District two (2) weeks notice prior to the date the rings and covers will be installed.

COMPENSATION:

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 metric ton for "Bedding Material, Utilities Class _____". 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.

2. RESTRAINED RETAINER GLANDS:

Restrained Retainer glands shall be installed in accordance with the applicable provisions herein, as shown on the plans and/or as directed by the Engineer.

Restrained Retainer glands shall be heavy duty ductile iron conforming to ASTM A536. Restrained Retainer glands shall meet the specifications for ANSI A21.11

(AWWA C111). Restrained Retainer glands shall be capable of restraining mechanical joints or push-on joints for a minimum working pressure of 1.72 MPa WP with a minimum factor of safety of 2:1 using ductile iron wedges. Twist-off nuts shall be used to insure proper torquing of retaining devices.

Restrained Retainer glands for push-on joints shall have machined serrations on the inside surface. Wedges that bear against pipe wall shall not be used on bell and spigot type installations. The required restrained length shall be restrained by retainer glands. The Contractor shall be responsible for determining the necessary lengths to be restrained. Design of the restrained portion of the new water piping system shall be approved by a registered professional engineer, and submitted to the Utility Section, Design Services Unit for approval prior to installation.

Restrained Retainer glands, installed in accordance with the plans and provisions herein and accepted, will be measured and paid for at the contract unit price per each for "____mm Restrained Retainer Gland". Such prices and payments will be full compensation for all materials, labor, excavation and backfilling, installation, testing and incidentals necessary to complete the work as required.

3. AIR RELEASE/VACUUM VALVE AND MANHOLE

Air release/vacuum valves for use on sanitary sewer force mains shall be of the type designed specifically for sanitary sewer service, and shall allow unrestricted venting or re-entry of air during filling or draining of the force main.

Air release/vacuum valves shall incorporate two (2) stainless steel floats with stainless steel connecting float guide. All internals shall be removable through the top cover. Valves shall be supplies with inlet and blow-off valves and quick disconnect with 1.5 meters of hose. The valve shall be capable of withstanding hydrostatic pressures of 2.07 MPa. The valve shall be constructed of cast iron body and top flange with stainless steel float and shall be 50mm NPT screwed inlet and 25mm NPT outlet. Valves shall be mounted with a saddle with 316G stainless steel (or better) valves and nipples.

Bronze gate valves shall conform to ASTM B62 with a wheel handle and shall be the solid wedge type. The valves shall be designed for a working pressure of 1.38 MPa.

The manholes to house the air release/vacuum valves shall be precast concrete conforming to ASTM C478. The manhole shall have a nominal diameter of 1500mm. The manhole ring and cover shall be of an approved type and traffic bearing.

The quantity of air release/vacuum valves and manholes, installed in accordance with the plans and provisions herein and accepted, will be measured and paid for at the contract unit price each for "_____mm Air Release/Vacuum Valve and Manhole". Such prices and payments shall be full compensation for all labor, materials, excavation, backfilling, equipment, approved air release valve, gate valve, saddle, pipe, fittings, manhole construction, ring and cover, and incidentals necessary to complete the work as required.

County: New Hanover
Project: U-2734

PROJECT SPECIAL PROVISIONS
Utility

UTILITIES BY OTHERS

General:

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

A) Progress Energy – Power (Distribution)
B) Bell South (Telephone)
C) Time Warner (CATV)
D) NC Natural Gas
E) KMC Telecom - Communications

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. All utility work listed herein will be done by the utility owner. 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) Progress Energy - Power (Distribution)

1) See Utilities by Others Plans.

NOTE: Progress Energy will complete relocations of their existing power facilities to the new locations as shown on the utilities by others plans before 8/10/04.

B) Bell South (Telephone)

1) See Utilities by Others Plans.

NOTE: Bell South will complete relocations of their existing telephone facilities to the new locations as shown on the utilities by others plans before 12/01/04.

C) Time Warner (CATV)

1) See Utilities by Others Plans.

NOTE: Time Warner will relocate aerial CATV lines in joint use with proposed power throughout the project.

D) NC Natural Gas

1) See Utilities by Others Plans.

NOTE: NC Natural Gas will complete relocations of their existing gas facilities to the new locations as shown on the utilities by others plans before 7/13/04.

E) KMC Telecom - Communications

1) See Utilities by Others Plans.

NOTE: All other utilities will remain in place and will be adjusted as necessary.

U-2734 **Project Special Provisions Erosion Control** **New Hanover County**

Seeding And Mulching: (1)

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).

March 1 - August 31		September 1 - February 28	
50# (55kg)	Tall Fescue	50# (55kg)	Tall Fescue
5# (6kg)	Centipede	5# (6kg)	Centipede
25# (28kg)	Bermudagrass (hulled)	35# (40kg)	Bermudagrass (unhulled)
500# (560kg)	Fertilizer	500# (560kg)	Fertilizer
4000# (4500kg)	Limestone	4000# (4500kg)	Limestone

Slopes 2:1 and Steeper and Waste and Borrow Locations:

March 1 - August 31		September 1 - February 28	
75# (85kg)	Tall Fescue	75# (85kg)	Tall Fescue
25# (28kg)	Bermudagrass (hulled)	35# (40kg)	Bermudagrass (unhulled)
500# (560kg)	Fertilizer	500# (560kg)	Fertilizer
4000# (4500kg)	Limestone	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			

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.

All areas seeded and mulched shall be tacked with asphalt. Crimping of straw in lieu of asphalt tack shall not be allowed on this project.

Crimping Straw Mulch:

Crimping shall be required on this project adjacent to any section of roadway where traffic is to be maintained or allowed during construction. In areas within six feet (2 meters) of the edge of pavement, straw is to be applied and then crimped. After the crimping operation is complete, an additional application of straw shall be applied and immediately tacked with a sufficient amount of undiluted emulsified asphalt.

Straw mulch shall be of sufficient length and quality to withstand the crimping operation.

Crimping equipment including power source shall be subject to the approval of the Engineer providing that maximum spacing of crimper blades shall not exceed 8 inches (200 mm).

Temporary Seeding:

Fertilizer shall be the same analysis as specified for "Seeding and Mulching" and applied at the rate of 400 pounds (450 kilograms) and seeded at the rate of 50 pounds per acre (55kg per hectare). Sweet Sudan Grass, 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 on all roadway areas except slopes 2:1 and steeper shall be 10-20-20 written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre (560 kg per hectare). Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas 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", with the exception that no centipede seed will be used in the seed mix for

supplemental seeding. The rate of application for supplemental seeding 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 4 inches (100 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 ¾ inch (19 mm) and larger in diameter or other obstructions that could interfere with providing a smooth "lawn type appearance". These areas shall be reseeded to match their original vegetative conditions, unless directed otherwise by the Field Operations Engineer.

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

High Quality Waters:

The Howe Creek has been identified as high quality waters. This designation requires special procedures to be used for clearing and grubbing, temporary stream crossings, and grading operations within the "Environmentally Sensitive Areas" identified on the plans. This also requires special procedures to be used for seeding and mulching and staged seeding.

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 "High Quality Water Zone(s)" 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.

Environmentally Sensitive Areas:

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, measured from top of streambank. 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 Area", 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.

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.

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.

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.

Temporary Pipe For Culvert Construction:

The work covered by this section consists of furnishing, installing, maintaining and removing any and all temporary pipe used on this project in conjunction with the culvert construction. The Contractor shall install temporary pipe in locations shown on the plans in such a manner approved by the Engineer. The temporary pipe shall provide a passage-way for the stream through the work-site. The minimum size requirements will be as stated on the Erosion and Sediment Control plans.

The quantity of temporary pipe to be paid for will be the actual number of linear feet (meters) of temporary pipe approved by the Engineer and measured in place from end to end.

The quantity of temporary pipe measured as provided above will be paid for at the contract unit price per linear foot (meter) for "_ _ _ inch (mm) Temporary Pipe".

The above prices and payments will be full compensation for all work covered by this section including but not limited to furnishing all materials required for installation, construction, maintenance, and removal of temporary pipe.

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)

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 21+46 to 22+07 –L-(Rt)
Sta 22+80 to 23+44 –L- (Rt)

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)

Safety Fence:

Description:

The work of "Safety Fence" shall consist of furnishing, installing and maintaining polyethylene or polypropylene fence on the outside edge of the buffer, wetland, or water boundary, as well as along the construction corridor within these boundaries approved to

infringe within the buffer, wetland, or water in accordance with the special provisions included herein. The safety fence shall be installed prior to any land disturbing activities

Materials:

Fence Material:

Polyethylene or polypropylene fence shall be a preconstructed safety fence approved by the Engineer.

Posts:

Either wood posts or steel posts may be used. Wood posts shall be nominal 2" x 4" (51 mm x 102 mm) or 4" x 4" (102 mm x 102 mm), lengths as required, structural light framing, grade No. 2, Southern Pine. Steel posts shall be at least 5 feet (1.6 m) in length, approximately 1 3/8" (35 mm) wide measured parallel to the fence, and have a minimum weight of 1.25 lb./ft. (1.9 kg/m) of length. The steel post shall be equipped with an anchor plate having a minimum area of 14 square inches (90 square centimeters).

Clearing and Grading:

No additional clearing and grubbing is anticipated for the installation of this fence; however, if any clearing and grubbing is required, it will be the minimum required for the installation of the safety fence. Such clearing shall include satisfactory removal and disposal of all trees, brush, stumps and other objectionable material.

The fence shall be erected to conform to the general contour of the ground. When determined necessary by the Engineer, minor grading along the fence line shall be done to meet this requirement provided no obstructions to proper drainage are created.

Installation:

Posts shall be set and maintained in a vertical position and may be hand set or set with a post driver. If hand set, all backfill material shall be thoroughly tamped. If power driven, wood posts may be sharpened to a dull point. Posts damaged by power driving shall be removed and replaced prior to final acceptance. The tops of all wood posts shall be cut at a 30 degree angle. The wood posts may, at the option of the Contractor, be cut at this angle either before or after the posts are erected.

The fence fabric shall be attached to the wood posts with one 2" (51 mm) galvanized wire staple across each cable or to the steel posts with wire or other acceptable means.

The Contractor shall be required to maintain the safety fence in a satisfactory condition for the duration of the project as determined by the Engineer.

Method of Measurement:

The quantity of safety fence to be paid for shall be the actual number of linear feet (meter) of "Safety Fence", installed in place and accepted. No direct payment will be made for post and post bracing. Cost shall be included in the cost of the fence per linear foot (meter).

Basis of Payment:

The quantity of safety fence measured as provided above will be paid for at the contract unit price per linear foot (meter) of safety fence. Such payment will be full compensation for the work as described in the above paragraphs, including but not limited to clearing and grading, furnishing and installing fence fabric with necessary posts and post bracing, staples, tie wires, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

Safety Fence.....LF (M)

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Revised Date:

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POLICE

DESCRIPTION.

Furnish Police Officers and marked Police Vehicles to direct traffic in accordance with the plans and specifications.

CONSTRUCTION METHODS.

Utilize Police Officers who are outfitted with police uniforms.

Utilize marked Police Vehicles, which are equipped with police lights mounted on top of the vehicle, and police vehicle emblems.

Utilize Police Officers and marked Police Vehicles to direct or control traffic as required by the plans or by the Engineer.

METHOD OF MEASUREMENT.

The quantity of Police Officers and marked Police Vehicles to be paid for will be the actual number of hours that each Police Officer/marked Police Vehicle is provided during the life of the project as approved by the Engineer.

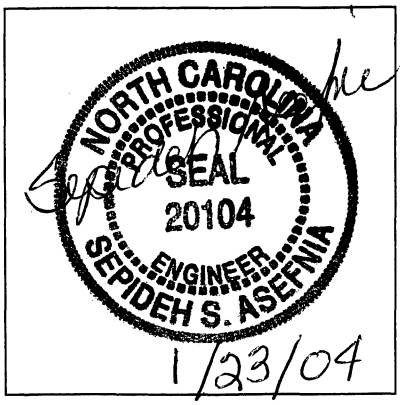
There will be no direct payment for marked Police Vehicles as they are considered incidental to the pay item in this special provision.

BASIS OF PAYMENT.

The quantity of Police Officers and marked Police Vehicles measured as provided above, will be paid for at the contract unit price per hour for "Police".

Payment will be made under:

Police.....Hour



U-2734
Project Special Provisions
(Version 02.11)
Signals and Traffic Management Systems

Prepared By: SEPI Engineering Group
23-Jan-04

Contents

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

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°C (+165°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°C (+165°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" (VTCSH) 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 above and this specification. Provide test results showing that the signal modules meet or exceed the luminous intensity requirements 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)

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.Pedestals (1098-17)

Page 10-239, Article 1098-17,

In paragraph 5, last sentence, revise "1/2 inch (2 mm) minimum diameter" to "1/2 inch (12.5 mm) minimum diameter."

Page 10-240, Article 1098-17

In paragraph 1, revise "18 inch (455 mm)" to "36 inches (900 mm)".

1.8.Type 170E Cabinets (1098-19)

Page 10-241, Subarticle 1098-19(B)

Add the following paragraph:

If additional surge protected power outlets are needed to accommodate fiber transceivers, modems, etc.; install a UL listed, industrial, heavy-duty type power outlet strip with a maximum rating of 15 A / 125 VAC, 60 Hz. Provide a strip that has a minimum of 3 grounded outlets. Ensure the power outlet strip plugs into one of the controller unit receptacles located on the rear of the PDA. Ensure power outlet strip is mounted securely; provide strain relief if necessary.

Pages 10-245-247, Subarticle 1098-19 (D) **(Model 2010 Enhanced Conflict Monitor)**

Replace Subarticle (D) with the following:

Furnish Model 2010 Enhanced Conflict Monitors with 16 channels. In addition to CALTRANS requirements, ensure that the conflict monitor monitors for the absence of a valid voltage level on at least one channel output of each load switch. Ensure that the absence of the programming card will cause the conflict monitor to trigger, and remain in the triggered state until reset.

Provide a conflict monitor that recognizes the faults specified by CALTRANS and the following additional per channel faults that apply for monitor inputs to each channel:

- consider a Red input greater than 70 Vrms as an "on" condition;
- consider a Red input less than 50 Vrms as an "off" condition (no valid signal);
- consider a Red input between 50 Vrms and 70 Vrms to be undefined by these specifications;
- consider a Yellow or Green input greater than 25 Vrms as an "on" condition;
- consider a Green or Yellow input less than 15 Vrms as an "off" condition; and
- consider a Green or Yellow input between 15 Vrms and 25 Vrms to be undefined by these specifications.

Ensure that the monitor will trigger upon detection of a fault and will remain in the triggered (failure detected) state until the unit is reset at the front panel or through the remote reset input for the following failures:

1. **Red Monitoring or Absence of Any Indication (Red Failure):** A condition in which no valid voltage signal is detected on any of the green, yellow, or red inputs to a given monitor channel. If a signal is not detected on at least one input (R, Y, or G) of a conflict monitor channel for a period greater than 1000 ms when used with a 170 controller and 1500 ms when used with a 2070L controller, ensure that the monitor will trigger and put the intersection into flash. If the absence of any indication condition lasts less that 750 ms when used with a 170 controller and 1200 ms when used with a 2070L controller, ensure that the conflict monitor will not trigger. Have red monitoring occur when the P20 Connector is installed and both of the following input conditions are in effect: a) the Red Enable input to monitor is active (Red Enable voltages are "on" at greater than 70 Vrms, off at less than 50 Vrms, undefined between 50 Vrms and 70 Vrms), and b) and neither Special Function 1 nor Special Function 2 inputs are active.
2. **Yellow Indication Sequence Error:** Yellow indication following a green is missing or shorter than 2.7 seconds (with ± 0.1-second accuracy). If a channel fails to detect an "on" signal at the Yellow input following the detection of an "on" signal at a Green input for that channel, ensure that the monitor triggers and generates a sequence error fault indication.
3. **Dual Indications on the Same Channel:** In this condition, more than one indication (R,Y,G) is detected as "on" at the same time on the same channel. If dual indications are detected for a period greater than 500 ms, ensure that the conflict monitor triggers and displays the proper failure indication (Dual Ind fault). If this condition is detected for less than 250 ms, ensure that the monitor does not trigger.

Enable the monitor function for short/missing yellows and for dual indications on a per channel basis.

Provide Special Function 1 and Special Function 2 that comply with the Los Angeles City DOT Traffic Signal Specification DOT 170 ATSAC Universal and Related Equipment #54-053-02 to eliminate red failure monitoring while allowing other additional enhanced fault monitoring functions to continue.

Ensure that the removal of the P-20 ribbon cable will cause the monitor to recognize a latching fault condition and place the cabinet into flashing operation.

Ensure that when the Conflict Monitor is triggered due to a fault, it provides an LED indication identifying the type of failure detected by the monitor except for the P20 ribbon cable removal fault. Ensure that the monitor indicates which channels were active during a conflict condition and which channels experienced a failure for all other per channel fault conditions detected, and that these indications and the status of each channel are retained until the Conflict Monitor is reset.

Ensure that the conflict monitor will store at least nine of the most recent malfunctions detected by the monitor in EEPROM memory. For each malfunction, record at a minimum the time, date, type of malfunction, relevant field signal indications, and specific channels involved with the malfunction.

Provide communications from the monitor to the 170/2070L controller via an RS-232C/D port on the monitor in order to upload all event log information from the monitor to the controller or to a system computer via the controller. Ensure that the controller can receive the data through a controller Asynchronous Communications Interface Adapter (Type 170E) or Async Serial Comm Module (2070L) determined by the controller software. Provide software capable of communicating directly through the same monitor RS-232C/D to retrieve all event log information to a laptop computer.

In addition to the connectors required by the CALTRANS Specifications, provide the conflict monitor with a connector mounted on the front of the monitor (3M-3428-5302 with two polarizing keys or equal) which mates with a 20 pin ribbon cable connector that conducts the signals from the P20 connector on the cabinet assembly. Provide a P20 connector and terminal assembly that complies with the Los Angeles City DOT "Traffic Signal Specification DOT 170 ATSAC Universal and Related Equipment #54-053-02" in effect on the date of advertisement. Provide connector pins on the monitor with the following functions:

Pin #	Function	Pin #	Function
1	Channel 15 Red	11	Channel 9 Red
2	Channel 16 Red	12	Channel 8 Red
3	Channel 14 Red	13	Channel 7 Red
4	Chassis Ground	14	Channel 6 Red
5	Channel 13 Red	15	Channel 5 Red
6	Special Function 2	16	Channel 4 Red
7	Channel 12 Red	17	Channel 3 Red
8	Special Function 1	18	Channel 2 Red
9	Channel 10 Red	19	Channel 1 Red
10	Channel 11 Red	20	Red Enable

Provide a DB-9 female connector for the purpose of data communication with the controller. Electrically isolate the port interface electronics from all monitor electronics, excluding Chassis Ground. Furnish a communications connecting cable with pin connections as follows:

170		**Conflict Monitor DB-9**
RX pin L	Connect to	TX pin 2
TX pin K	Connect to	RX pin 3
+5 pin D	Connect to	DTR pin 4
GND pin N	Connect to	GND pin 5

2070L		**Conflict Monitor DB-9**
DCD pin 1	Connect to	DCD pin 1
RX pin 2	Connect to	TX pin 2
TX pin 3	Connect to	RX pin 3
GND pin 5	Connect to	GND pin 5
RTS pin 7	Connect to	CTS pin 7
CTS pin 8	Connect to	RTS pin 8

1.9.Type 2070L Controllers (1098-20)

Page 10-247, Article 1098-20

Replace the entire article with the following:

Conform to CALTRANS Traffic Signal Control Equipment Specifications and all addenda in effect on the date of advertisement except as required herein. Where an item is no longer cited, the last applicable specification applies.

Furnish Model 2070L controllers. Ensure that removal of the program module from the controller will place the intersection into flash.

The Department will provide software at the beginning of the burning-in period. Contractor shall give 5 working days notice prior to needing software. Program software provided by the Department.

Provide model 2070L controllers with the latest version of OS9 operating software and device drivers, composed of the unit chassis and at a minimum the following modules and assemblies:

- MODEL 2070 1B, CPU Module, Single Board
- MODEL 2070-2A, Field I/O Module (FI/O)
- MODEL 2070-3B, Front Panel Module (FP), Display B (8x40)
- MODEL 2070-4A, Power Supply Module, 10 AMP
- MODEL 2070-7A, Async Serial Com Module (9-pin RS-232)

Furnish one additional MODEL 2070-7A, Async Serial Com Module (9-pin RS-232) for all master controller locations.

Furnish one removable data key with each 2070L controller unit.

For locations designated as master locations, furnish a Hayes or approved equivalent auto-dial/auto-answer external modem to accomplish the interface to the microcomputers unless otherwise required (minimum baud rate of 53K and downward compatible to the master and microcomputer communication baud rates). Include all necessary hardware to ensure telecommunications.

1.10. 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 <u>Standard Specifications</u> are revised as follows:

2.1.General Requirements (1700)

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

Revise Paragraph 3, sentence 1, "For all failures, malfunctions, or damages to this equipment, **begin** necessary **repairs within <u>TWO (2) HOURS</u> OF NOTIFICATION**."

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 **<u>$150</u>** liquidated damage per occasion, **<u>PER HOUR</u>**, 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 (E)

The Contractor shall "Remove all Department-owned signal and communications related equipment and material that will not be used. Assume ownership of removed wood poles, messenger cable, interconnect cable, communications cable, and supporting hardware." Return all other equipment and material, including but not limited to controllers, cabinets, GPS units, metal poles, and metal poles with mast arms, between 8:00 a.m. and 12:00 p.m., Monday through Thursday, to the Traffic Services Office within Division 3.

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(C)

Replace paragraph 1 with the following paragraphs:

Install metallic conduit in all paved trenching areas. Paved areas include streets, roads, and commercial driveways. Install nonmetallic conduit in areas under sidewalks, parking lots, and residential driveways.

Where metallic conduit is required, backfill the excavated area with a Class B, or better concrete backfill. For all other conduit installations, backfill the trench with the excavated material and compact to 95% of its original density. Remove any rock and debris from backfill material.

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

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:

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

$P_{TG} = 18.8C_dI_F$ (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:

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

$P_{TG} = 18.8C_d(V/65\ mph)^2 I_F$ (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 ft^2 (2.4 m^2)
- 4-section, 12-inch (300-mm)
  Surface area: 32.0 ft^2 (3.0 m^2)
- 5-section, 12-inch (300-mm)
  Surface area: 42.0 ft^2 (3.9 m^2)"

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
D_1 = horizontal distance between the center of the anchor bolt and the outer face of the upright, or the difference between the radius of the bolt circle and the outside radius of the upright

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. INTERMEDIATE CONTRACT TIMES FOR TRAFFIC SIGNALS

3.1.DESCRIPTION

Furnish and install two (2) operational fiber optic closed loop signal systems, in accordance with the plans and specifications. Comply with the provisions of Section 1700 of the 2002 Standard Specifications for Roads and Structures.

3.2.MATERIALS

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

The equipment, material, and hardware required to complete the work in this section is described in other sections of the provisions of the contract.

The Department will provide a ten (10) day review of all catalog cuts of materials submitted for use in completion of the work required by these Intermediate Contract Times.

3.3.CONSTRUCTION METHODS

A. ICT 1:

Install fiber optic cable, 170 cabinet, 2070L controller, system detector loops, and all other hardware necessary for the implementation of an operational closed loop signal system.

Install a phone drop as necessary so that the signal system successfully communicates with the City of Wilmington Traffic Control Center in accordance with the plans and specifications.

Install a fiber optic closed loop signal that incorporates the following intersections:

- 03-0189: US 76 (Oleander Dr / Wrightsville Ave) & SR 1411 (Wrightsville Ave / Airlie Rd)
- 03-0782: US 76/SR 1996 (Wrightsville Ave) & SR 1409 (Military Cutoff Rd)
- 03-0202: US 74-76 (Eastwood Rd) & SR 1409 (Military Cutoff Rd)
- 03-0752: SR 1409 (Military Cutoff Rd) & Drysdale Rd

Install fiber optic cable and all necessary equipment as shown in the Signal System Communications Cable and Conduit Routing Plan to include the above listed signals in a closed loop system. Installation of metal poles, mast arms, and accompanying new signal heads are not required for successful completion of the terms of this ICT.

Install and activate the closed loop signal system within 90 days from the date of availability. Liquidated damages, as specified in the Traffic Control Project Special Provisions, will be deducted from the payment due the Contractor, for each day, or portion thereof, the closed loop system is not successfully installed and communicating with the City of Wilmington Traffic Control Center.

B. ICT 2:

Install fiber optic cable, 170 cabinet, 2070L controller, system detector loops, and all other hardware necessary for the implementation of an operational closed loop signal system.

Install a phone drop as necessary so that the signal system successfully communicates with the City of Wilmington Traffic Control Center in accordance with the plans and specifications.

Install a fiber optic closed loop signal that incorporates the following intersections:

- 03-0884: SR 1409 (Military Cutoff Rd) & SR 2048 (Gordon Rd)
- 03-0319: US 17 (Market St) & SR 1409 (Military Cutoff Rd)
- 03-0390: US 17 (Market St) & SR 2048 (Gordon Rd)
- 03-0076: US 17 (Market St) & SR 1403 (Middle Sound Loop)
- 03-0369: US 17 (Market St) & SR 1363 (Bayshore Dr)/SR 2717 (Torchwood Dr)

Install fiber optic cable and all necessary equipment as shown in the Signal System Communications Cable and Conduit Routing Plan to include the above listed signals in a closed loop system. The installation of metal poles and mast arms at Signal Inventory # 03-0884 is not required for successful completion of the terms of this ICT.

Install and activate the closed loop signal system within 365 days from the date of availability. This Intermediate Contract Time is a part of the overall 365 day ICT for the construction of the intersection of Military Cutoff Road and Market Street as described in the Traffic Control Plans and Project Special Provisions. Liquidated damages, as specified in the Traffic Control Project Special Provisions, will be deducted from the payment due the Contractor, for each day, or portion thereof, the closed loop system is not successfully installed and communicating with the City of Wilmington signal monitoring equipment.

3.4.LIQUIDATED DAMAGES

Refer to Traffic Control specifications and Project Special Provisions for the liquidated damages for ICT 1 and ICT 2.

3.5.BASIS OF PAYMENT

There will be no direct payment for work covered in this section. Payment at the contract unit prices for the various items in the contract will be full compensation for all work covered by this section.

4. SIGNAL HEAD SPECIAL FEATURES

4.1.DESCRIPTION

Modify existing traffic signal head sections in accordance with the plans and specifications. Comply with the provisions of Section 1700 of the 2002 Standard Specifications for Roads and Structures.

Remove any existing signal heads being replaced as a part of the Contract, and return to the Traffic Services Office in Division 3 between 8:00 a.m. and 12:00 p.m., Monday through Thursday. Use methods to remove the signal heads that will not result in damage to signal heads. Repair damages that are a result of the Contractor's actions at no additional cost to the Department.

4.2.CONSTRUCTION METHODS

A. Modify Existing Vehicle Signal Heads:

Modify existing vehicle signal heads by removing incandescent lamp hardware and replacing with new LED modules with all necessary hardware.

No additional payment will be made for removal and return of existing signal heads to the Division, as this will be considered incidental to furnishing and installing new traffic signal heads.

4.3.METHOD OF MEASUREMENT

Actual number of existing vehicle signal heads modified and accepted.

4.4.BASIS OF PAYMENT

The quantity of modified vehicle signal heads, measured as provided above, will be paid for at the contract unit price each for "Modify Existing Vehicle Signal Head."

Payment will be made under:

Modify Existing Vehicle Signal Head ..... Each

5. PREFORMED INDUCTIVE DETECTION LOOPS

5.1.DESCRIPTION

Furnish and install preformed inductive detection loops, as shown in the plans. Comply with the provisions of Section 1700 of the 2002 Standard Specifications for Roads and Structures.

5.2.MATERIALS

A. General:

Furnish preformed inductive detection loops, associated couplings, connectors, and hardware.

B. Preformed Inductive Loops:

Furnish preformed inductive loops constructed of water-tight assemblies that are shipped from the manufacturer with the specified number of turns of loop wire and the specified length of tail section. Provide preformed loops that are complete and have no splices in the preformed inductive loop or the tail section. Ensure that the preformed inductive loops contain a minimum size of Number 16 AWG copper stranded wire for the specified number of turns as shown on the traffic signal plans.

Provide square or rectangular preformed inductive loops with the loop wire and tail section enclosed in polyurethane, cross-linked polyethylene, or polypropylene. Provide an outer enclosure with a minimum thickness of 3 mm and flexibility for installation in a saw slot. Ensure the assembly can withstand a hot asphalt overlay of 150 degrees C.

The tail section shall be defined as the section from the corner of the roadway loop (Tee section) to the pull box. Tail section lengths are estimated for bidding purposes only. Verify actual lengths before ordering the preformed inductive loop and use the loop with the shortest tail section to reach the termination pull box. Ensure that the tail section will reach the pull box.

Provide conductors in the tail section that are twisted a minimum of 15 turns per meter. Provide a tail section that is flexible for termination in the pull box.

Leave one meter of cable coiled inside the termination pull box when the tail section is to be connected later. Use a silicon filled heat shrinkable tubing to waterproof the ends of the cable. The Engineer reserves the right to reject material that does not demonstrate satisfactory field performance.

5.3.CONSTRUCTION METHODS

A. General:

As required by the plans, install preformed loops under brick roadway. Remove brick as necessary for installation of preformed loops and tail section. Install preformed loop in material of a quality and depth sufficient to protect loop from damage. Replace brick so as to maintain a smooth and consistent elevation, curvature, slope, and pattern to match undisturbed brick surface.

Install the preformed inductive loops as required by the manufacturer's recommended installation methods. Use these Project Special Provisions if there is conflict between the manufacturer's installation procedures and these Project Special Provisions.

Install the preformed inductive loop and tail section with a minimum final surface cover as required by the manufacturer's recommendations. Install the loop and tail section in a saw cut of sufficient depth to achieve the recommended minimum coverage if the final surface course does not provide the minimum depth of coverage.

Test the preformed inductive loop for continuity and resistance as required by the provisions of the 2002 Standard Specifications for Roads and Structures. Replace the preformed inductive loop at no additional cost to the Department if the tests fail. Weatherproof all loop ends in the pull box with silicon filled heat shrinkable tubing. Tag each loop in the pull box with sleeve labels to identify each cable with its loop location and band in pairs by lane for multiple loop locations.

Install galvanized steel conduit from the inside edge of pavement to the pull box for providing a loop entrance into the pull box. Ream conduit ends to remove burrs and sharp edges and use a conduit bushing at all conduit ends.

Install a 50 mm conduit stub-out at locations with four or fewer loops. Install a 75 mm conduit stub-out at all other locations.

5.4.METHOD OF MEASUREMENT

Actual number of preformed inductive loops of each size furnished, installed, and accepted. No payment will be made for conduit stubouts.

No payment will be made for furnishing and installing 25 mm conduit from edge of pavement to pull box.

5.5.BASIS OF PAYMENT

Payment will be made under:

Preformed Inductive Loop (___-Meter x ___-Meter) With __-Meter Tail Section..... Each

6. DIRECTIONAL DRILLING

6.1.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.

6.2.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. 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 or outer-duct 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.

6.3.CONSTRUCTION METHODS

A. Pre-Approvals and Minimum Depth Requirements:

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

At all "Controlled Access Areas" including freeways and expressways where the proposed conduit will traverse under the roadway including entrance and exit ramps, ensure the conduit(s) maintains a minimum depth of 15 feet (4.6 meters) below grade. For an installation that runs parallel to a controlled access area or entrance and exit ramps ensure the conduit maintains a minimum depth of 4 feet (1.2 meters) below grade. Also, maintain a minimum horizontal and/or vertical clearance of 5 feet (1.5 meters) from any man-made structures, including but not limited to, bridges, footings, pipe culverts, box culverts, and slope protection for bridge decks. Maintain a minimum clearance of 5 feet (1.5 meters) below grade when crossing ditch lines.

At all points where the proposed conduit will traverse under city streets, state roads, driveways and/or sidewalks, ensure the conduit maintains a minimum depth of 10 feet (3 meters).

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 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 slurry mixture to fill any voids. Jetting alone or wet boring with water shall not be permitted.

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 to simultaneously facilitate back drilling of the drill hole and installation of the conduit.

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 or outer-duct 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.

6.4.METHOD OF MEASUREMENT

Measured horizontal linear feet (meters) of directionally drilled polyethylene conduit 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.

6.5.BASIS OF PAYMENT

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

Payment will be made under:

Directional Drill Polyethylene Conduit, (_____) (_____) ..... Linear Foot (Meter)

7. VIDEO IMAGING LOOP EMULATOR DETECTOR SYSTEMS

7.1.DESCRIPTION

Design, furnish, provide training, and install video imaging loop emulator detection systems 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.

Unless otherwise specified in the contract, all loop emulator detection equipment will remain the property of the contractor.

7.2.MATERIALS

A. General:

Material and equipment furnished under this section must be pre-approved on the Department's QPL by the date of installation except miscellaneous hardware such as cables and mounting hardware do not need to be pre-approved.

Used equipment will be acceptable provided the following conditions have been met:

- Equipment is listed on the current QPL.
- Equipment is in good working condition.
- Equipment is to remain the property of the contractor.

Ensure that software is licensed for use by the Department and by any other agency responsible for maintaining or operating the loop emulation system. Provide the Department with a license to duplicate and distribute the software as necessary for design and maintenance support.

Design and furnish video imaging loop emulator detection systems that detect vehicles at signalized intersections by processing video images and providing detection outputs to the signal controller in real time (within 112 milliseconds of vehicle arrival).

Furnish all required camera sensor units, loop emulator processor units, hardware and software packages, cabling, poles, mast arms, harnesses, camera mounting assemblies, surge protection panels, grounding systems, messenger cable and all necessary hardware. Furnish systems that allow the display of detection zones superimposed on an image of the roadway on a monitor or laptop computer screen. Ensure detection zones can be defined and data entered using a simple keyboard or mouse and monitor, or using a laptop PC with software.

Provide design drawings showing design details and camera sensor unit locations for review and acceptance prior to installation. Provide mounting height and location requirements for camera sensor units on the design based on site survey. Design video imaging loop emulator detection systems with all necessary hardware. Indicate all necessary poles, spans, mast arms, luminaire arms, cables, camera mounting assemblies and hardware to achieve the required detection zones where Department owned poles are not adequate to locate the camera sensor units. Do not design for the installation of poles in medians.

Obtain the Engineer's approval before furnishing video imaging loop emulator detection systems. The contractor is responsible for the final design of video imaging loop emulator detection systems. Review and acceptance of the designs by the Department does not relieve the contractor from the responsibility to provide fully functional systems and to ensure that the required detection zones can be provided.

Provide the ability to program each detection call (input to the controller) with the following functions:

- Full Time Delay – Delay timer is active continuously,
- Normal Delay – Delay timer is inhibited when assigned phase is green (except when used with TS 2 and 170/2070L controllers),
- Extend – Call is extended for this amount of time after vehicle leaves detection area,
- Delay Call/Extend Call – This feature utilizes a combination of full time delay and extend time on the same detection call. Ensure operation is as follows: Vehicle calls are received after the delay timer times out. When a call is detected, it is held until the detection area is empty and the programmed extend time expires. If another vehicle enters the detection area before the extend timer times out, the call is held and the extend time is reset. When the extend timer times out, the delay timer has to expire before another vehicle call can be received.

Provide the ability to program each detection zone as one of the following functions:

- Presence detector,
- Directional presence detector,
- Pulse detector,
- Directional pulse detector.

Ensure previously defined detector zones and configurations can be edited.

Provide each individual system with all the necessary equipment to focus and zoom the camera lenses without the need to enter the camera enclosure.

Provide systems that allow for the placement of at least eight detection zones within the combined field of view of a single camera sensor unit. Provide a minimum of eight detection outputs per camera.

Provide detection zones that can be overlapped. Ensure systems reliably detect vehicles when the horizontal distance from the camera sensor unit to the detection zone area is less than ten times the mounting height of the sensor. Ensure systems detect vehicles in multiple travel lanes.

Ensure systems can detect vehicle presence within a 98 to 102 percent accuracy (up to 2 percent of the vehicles missed and up to 2 percent of false detection) for clear, dry, daylight conditions, a 96 to 105 percent accuracy (up to 4 percent of the vehicles missed and up to 5 percent false detection)

for dawn and dusk conditions, and a 96 percent accuracy (up to 4 percent of the vehicles missed) for night and adverse conditions (fog, snow, rain, etc.) using standard sensor optics and in the absence of occlusion.

Repair and replace all failed components within 72 hours.

The Department may conduct field-testing to ensure the accuracy of completed video imaging loop emulator detection systems.

B. Loop Emulator System:

Furnish loop emulator systems that receive and simultaneously process information from camera sensor units, and provides detector outputs to signal controllers.

Ensure systems provide the following:

- Operate in a typical roadside environment and meet the environmental specifications and are fully compatible with NEMA TS 1, NEMA TS 2, or Type 170/2070L controllers and cabinets,
- provide a "fail-safe" mode whereby failure of one or more of the camera sensor units or power failure of the loop emulator system will cause constant calls to be placed on the affected vehicle detection outputs to the signal controller,
- provide compensation for minor camera movement of up to 2 percent of the field of view at 400 feet (120 meters) without falsely detecting vehicles,
- process the video at a minimum rate of 30 times per second,
- provide separate wired connectors inside the controller cabinet for video recording each camera,
- provide remote video monitoring with a minimum refresh rate at 1 frame per second over a standard dial-up telephone line,
- provide remote video detection monitoring.

Furnish camera sensor units that comply with the following:

- have an output signal conforming to EIA RS-170 standard,
- have a nominal output impedance of 75 ohms,
- be immune to bright light sources, or have built in circuitry or protective devices to prevent damage to the sensor when pointed directly at strong light sources,
- be housed in a light colored environmental enclosure that is water proof and dust tight, and that conforms to NEMA-4 specifications or better,
- simultaneously monitor at least five travel lanes when placed at the proper mounting location with a zoom lens,
- have a sunshield attached to the environmental enclosure to minimize solar heating,
- meet FCC class B requirements for electromagnetic interference emissions,
- have a heater attached to the viewing window of the environmental enclosure to prevent ice and condensation in cold weather.

Where coaxial video cables and other cables are required between the camera sensor and other components located in the controller cabinet, furnish surge protection in the controller cabinet.

If furnishing coaxial communications cable comply with the following, as recommended by the approved loop emulator manufacturer:

- Belden 8281 or approved equivalent Number 20 AWG, solid bare copper conductor terminated with crimped-on BNC connectors (do not use BNC adapters) from the camera sensor to the signal controller cabinet.
- Belden 9259 or approved equivalent Number 22 AWG, stranded bare copper conductor terminated with crimped-on BNC connectors (do not use BNC adapters) from the camera sensor unit to the junction box, and within the signal controller cabinet.

Furnish power cable appropriately sized to meet the power requirements of the sensors. At a minimum, provide three conductor 120 VAC field power cable.

As determined during the site survey, furnish sensor junction boxes with nominal 6 x 10 x 6 inches (150 x 250 x 150 mm) dimensions at each sensor location. Provide terminal blocks and tie points for coaxial cable.

C. Video Imaging Loop Emulator System Support:

Furnish video imaging loop emulator systems with either a simple keyboard or a mouse with monitor and appropriate software, or with system software for use on department-owned laptop PCs. Ensure the system is Windows 98 and NT compatible.

Provide Windows 98 and NT compatible personal computer software, if needed, to provide remote video and video detection monitoring.

Ensure systems allow the user to edit previously defined detector configurations. When a vehicle is within a detection zone, provide for a change in color or intensity of the detection zone perimeter or other appropriate display changes on the monitor or laptop computer screen.

Provide cabling and interconnection hardware with 6-foot (1.8 m) minimum length interconnection cable to interface with the system.

Provide all associated equipment manuals and documentation.

7.3.CONSTRUCTION METHODS

Arrange and conduct site surveys with the system manufacturer's representative and Department personnel to determine proper camera sensor unit selection and placement. Provide the Department at least 3 working days notice prior to conducting site surveys. Upon completion of the site surveys the Department will provide revised plans reflecting the findings of the site survey.

Prior to beginning work at locations requiring video imaging loop emulator detection systems, furnish system software. Upon activation of detection zones, provide detector configuration files. Ensure that up-to-date detection configuration files are furnished for various detection zone configurations that may be required for construction phasing.

Place into operation loop emulator detection systems. Configure loop emulator detection systems to achieve required detection in designated zones. Have a certified manufacturer's representative on site to supervise and assist with installation, set up, and testing of the system.

Install the necessary processing and communications equipment in the signal controller cabinet. Make all necessary modifications to install equipment, cabling harnesses, and camera sensor interface panels with surge suppression.

Perform modifications to camera sensor unit gain, sensitivity, and iris limits necessary to complete the installation.

Do not install camera sensor units on signal poles unless approved by the Engineer.

Install the necessary cables from each sensor to the signal controller cabinet along signal cabling routes. Install surge protection and terminate all cable conductors.

Provide at least 8 hours of training on the set up, operation, troubleshooting, and maintenance of the loop emulator detection system to a maximum of ten Department personnel. Arrange for training to be conducted by the manufacturer's representative at an approved site within the Division responsible for administration of the project. Thirty days prior to conducting training submit a detailed course curriculum, draft manuals and materials, and resumes. Obtain approval of the submittal prior to conducting the training. At least one week prior to beginning training, provide three sets of complete documentation necessary to maintain and operate the system. Do not perform training until installation of loop emulator detection systems is complete.

7.4.METHOD OF MEASUREMENT

Actual number of site surveys, arranged, conducted, and accepted.

Actual number of luminaire arms for video imaging loop emulator detection systems furnished, installed, and accepted.

Actual number of cameras with internal loop emulator processing units furnished, installed, and accepted.

Actual number of cameras without internal loop emulator processing units furnished, installed, and accepted.

Actual number of external loop emulator processing units furnished, installed, and accepted.

No measurement will be made of video imaging loop emulator system support or training, power and video cables, and trenching as these items will be considered incidental to furnishing and installing video imaging loop emulator detection systems.

7.5.BASIS OF PAYMENT

The quantity of site surveys, measured as provided above, will be paid for at the contract unit price each for "Site Survey."

The quantity of luminaire arms for video imaging loop emulator detection systems, measured as provided above, will be paid for at the contract unit price each for "Luminaire Arm for Video System."

The quantity of cameras with internal loop emulator processing units, measured as provided above, will be paid for at the contract unit price each for "Camera with Internal Loop Emulator Processing Unit."

The quantity of cameras without internal loop emulator processing units, measured as provided above, will be paid for at the contract unit price each for "Camera without Internal Loop Emulator Processing Unit."

The quantity of external loop emulator processing units, measured as provided above, will be paid for at the contract unit price each for "External Loop Emulator Processing Unit."

Payment will be made under:

Site Survey ..... Each
Luminaire Arm for Video System ..... Each

Camera with Internal Loop Emulator Processing Unit ..... Each
Camera without Internal Loop Emulator Processing Unit ..... Each
External Loop Emulator Processing Unit ..... Each

8. FIBER-OPTIC SYSTEM SUPPORT EQUIPMENT

8.1.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.

8.2.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, ¾-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. Fiber-optic Power Meter:

Furnish fiber-optic power meters for measuring absolute power and link losses, as well as monitoring power levels and testing threshold levels. Provide the following features:

- Spectral range ..... 750 nm to 1700 nm
- Calibrated wavelengths ..... 850, 1310, and 1550 nm
- Accuracy ..... ± 3 percent (± 0.1 dB at -20 dBm at 70 degrees F (21 degrees C)

at calibrated wavelengths

- Readout resolution .....4 digits, 0.01 dBm
- Display .....Backlit LCD
- Fiber-optic connector .....ST type
- Power-up stabilization .....Less than five seconds at ambient temperature
- Tone threshold settings .....User selectable from 1 to 35 dB, plus OFF
- Analog output port
  - Voltage .....0 to + 1 V FSD of linear power range
  - Output impedance.....5 kilohms, nominal
- Temperature
  - Operating .....32 to 122 degrees F (0 to 50 degrees C)
  - Storage .....0 to 150 degrees F (-17 to 65 degrees C)
- Relative humidity .....5 to 95 percent, non-condensing
- Battery power .....Alkaline: 28 hours; NiCad: 8 hours (recharger and NiCad batteries provided)
- Carrying case

D. Optical Light Generator:

Furnish optical light generators for measuring absolute power and link losses, as well as monitoring power levels and testing threshold levels. Provide the following features:

- Calibrated wavelengths .....1310 nm, and 1550 nm
- Accuracy .....3 percent at 70 degrees F (21 degrees C) at calibrated wavelengths
- Fiber-optic connector .....ST type
- Power-up stabilization .....Less than five seconds at ambient temperature
- Temperature
  - Operating .....32 to 122 degrees F (0 to 50 degrees C)
  - Storage .....-10 to 150 degrees F (-17 to 65 degrees C)
- Relative humidity .....5 to 95 percent, non-condensing
- Battery power .....Alkaline: 28 hours; NiCad: 8 hours (recharger and NiCad batteries provided)
- Carrying case

E. 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.

8.3.METHOD OF MEASUREMENT

Actual number of fiber-optic restoration kits furnished and accepted.

Actual number of fiber-optic power meters furnished and accepted.

Actual number of optical light generators furnished and accepted.

Actual number of fiber-optic transceivers furnished and accepted.

8.4.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 power meters, measured as provided above, will be paid for at the contract unit price each for "Furnish Fiber-optic Power Meter."

The quantity of optical light generators, measured as provided above, will be paid for at the contract unit price each for "Furnish Optical Light Generator."

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 Power Meter ..... Each
Furnish Optical Light Generator ..... Each
Furnish Fiber-optic Transceiver ..... Each

9. FIBER-OPTIC TRAINING

9.1.DESCRIPTION

Provide training for the installation, operation and maintenance of the fiber-optic communications cable, fiber-optic transceivers, interconnect centers, splice trays and other related fiber-optic equipment in accordance with the plans and specifications. Comply with the provisions of Section 1700 of the 2002 Standard Specifications for Roads and Structures.

9.2.MATERIALS

Provide training to properly install, operate, maintain, diagnose and repair each piece of equipment associated with the fiber-optic system. Provide approved manufacturer's representatives or other qualified personnel to conduct training courses. Provide training for a minimum of fifteen Department personnel.

Prior to commencement of the training course, submit detailed course curricula, draft manuals, and handouts, and resumes of the instructors for review and approval. The Engineer may request modification of the material and request courses desired by the Department.

Conduct all training courses at a location provided by the Department within the Division and at a time mutually agreed upon, but not later than the start of fiber-optic cable testing. Provide training material, manuals, and other handouts to serve not only as subject guidance, but also as quick reference for use by the students. Deliver course material to in reproducible form immediately following the course.

Using VHS cassettes, videotape each training course and deliver cassettes at the conclusion of training.

Provide instruction on basic fiber-optic theories and principals as well as the installation, operation, maintenance, identification, detection, and correction of malfunctions in fiber-optic communications cable and related hardware. Include field level troubleshooting as an integral part of the training.

Provide training for the fiber-optic system for the following categories and for the minimum number of hours shown:

COURSE OUTLINES (L = Lecture; D = Demonstration; H = Hands-on by Student)

TRANSCEIVER

DAY 1 (4 Hours)
Safety - (L)
Introduction to transceivers - (L)
Review of Maintenance Manual - (L)
Review of Operations Manual - (L)
Question and answer session

FIBER-OPTIC CABLE SYSTEM

DAY 1 (8 Hours)
Safety - (L)
Introduction to fiber optics, theory, and principals - (L)
Fiber and cable types -(L, H)
National Electrical Code considerations - (L, H)
- plenum and riser type cable
- out door cable, etc.

Introduction to terminating hardware, end equipment, and applications - (L, D, H)
- connectors (ST, SC, etc.)
- splice enclosure, splice trays, and connector panels
- cable placement techniques

Question and answer session

DAY 2 (8 Hours)
Cable handling and preparation (sheath removal, grip installation, etc.) - (L, D, H)
Splicing and terminating methods - (L, D, H)
- mechanical splicing using various techniques
- fusion splicing
- field termination of connectors types

Introduction to cable plant testing procedures - (L, D, H)
- proper usage of optical light generator and power meter
- optical time domain reflectometer usage

Class project (build working system using cables/connectors made by attendees) - (L, D, H)
Question and answer session

DAY 3 (4 Hours)
Class project -- Testing and troubleshooting -- (L, D, H)
Cable system maintenance and restoration -- (L)
Question and answer session

9.3.METHOD OF MEASUREMENT

Lump sum for fiber-optic training with training packages completed and accepted.

9.4.BASIS OF PAYMENT

The quantity of fiber-optic training, measured as provided above, will be paid for at the contract unit price lump sum for "Fiber-optic Training."

Payment will be made under:

Fiber-optic Training ..... Lump Sum

10. DRILLED PIER FOUNDATIONS FOR METAL TRAFFIC SIGNAL POLES

10.1. 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.

10.2. 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.

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:

$$N_{AVG} = \frac{(N@1' + N@2.5' + \ldots\ldots\ldots N@\text{Deepest Boring Depth})}{\text{Total Number of N-values}}$$

$$Y = (N@1')^2 + (N@2.5')^2 + \ldots\ldots\ldots (N@\text{Deepest Boring Depth})^2$$

$$Z = (N@1' + N@2.5' + \ldots\ldots\ldots N@\text{Deepest Boring Depth})$$

$$N_{STD\ DEV} = \left(\frac{(\text{Total Number of N-values} \times Y) - Z^2}{(\text{Total Number of N-values}) \times (\text{Total Number of N-values} - 1)} \right)^{0.5}$$

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.

10.3. 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/yd^3 (380 kg/m^3) and a maximum cement content of 800 lbs/yd^3 (475 kg/m^3); however, if the alkali content of the cement exceeds 0.4%, reduce the cement content by 20% and replace it with fly ash at the rate of 1.2 lb (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/yd^3 (395 kg/m^3) Type IP blended cement and a maximum of 833 lbs/yd^3 (494 kg/m^3) Type IP blended cement in the mix.

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

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

10.4. 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.

10.5. 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)

11. DOUBLE MAST ARM WITH METAL POLE

11.1. DESCRIPTION

Furnish and install signal support double mast arms with metal poles and 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.

Furnish signal support double mast arms with metal poles, grounding systems, and all necessary hardware. Provide either steel or aluminum arms as indicated on the plans.

11.2. MATERIALS

Comply with the provisions of section 1741-2.

11.3. CONSTRUCTION METHODS

Comply with the provisions of section 1741-3.

11.4. METHOD OF MEASUREMENT

Actual number of double mast arms with metal poles furnished, installed, and accepted.

11.5. BASIS OF PAYMENT

The quantity of double mast arms with metal poles, measured as provided above, will be paid for at the contract unit price each for "Double Mast Arm with Metal Pole."

Payment will be made under:

Double Mast Arm with Metal Pole ..... Each

12. CABINET BASE ADAPTER

12.1. DESCRIPTION

Furnish and install cabinet base adapters in accordance with the plans and specifications. Comply with the provisions of Section 1700 of the 2002 Standard Specifications for Roads and Structures.

12.2. MATERIALS

Fabricate base adapters out of the same materials and with the same finish as the cabinet housing. Fabricate the base adapter in the same manner as the controller cabinets, meeting all applicable specifications called for in Section 6.2.2 of the CALTRANS Traffic Signal Control Equipment Specifications (TSCES). Provide base adapters that are a minimum height of 12 inches (300 mm).

12.3. CONSTRUCTION METHODS

Install cabinet base adapters at every location requiring a new base mounted cabinet whether on new or existing/modified foundations.

12.4. METHOD OF MEASUREMENT

Actual number of cabinet base adapters furnished, installed, and accepted.

12.5. BASIS OF PAYMENT

The quantity of cabinet base adapters, measured as provided above, will be paid for at the contract unit price each for "Cabinet Base Adapter."

Payment will be made under:

Cabinet Base Adapter ..... Each

13. SYSTEM COMPUTER EQUIPMENT

13.1. DESCRIPTION

Furnish and install central and notebook computers with software and 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.

13.2. MATERIALS

A. Central Computers:

Provide workstation computer with the following **minimum** features:

- 19-inch monitor size,
- processor clock speed 1.5 GHz,
- 128 MB of RAM expandable to 512 MB of RAM,
- XGA video card,
- keyboard and pointing input devices,
- tower chassis,
- operating system Windows 2000,
- 30 GB hard drive,
- 3.5-inch, 1.44 MB floppy drive,
- CD-RW,
- one RS 232 serial port,
- one parallel port,
- Network Ethernet Interface 100BaseTX (100 Mb/s Ethernet) RJ-45 connection and all software and hardware required for interface with the Division's computer network,
- modem with 56,000 bps for data and 14,400 bps for fax with RJ-11 connector.

Provide modems that comply with the following:

- Data Compatibility: V.34, V.FC, V.32, V.32bis, V.22, V.22bis, V.90
- Fax Compatibility: V.17, V.29, V.27ter
- Error Control and Data Compression:
  V.42/MNP 2-4 error control (hardware based)

V.42bis/MNP 5 data compression (hardware based)

- Ethernet: IEEE 802.3

B. Notebook Computers:

Furnish notebook computers that complies with the following **minimum** features:

- Processor clock speed 1.5 GHz,
- 128 MB of RAM expandable to 512 MB of RAM,
- 14.1 inch TFT display,
- 20.0 GB hard disk,
- one diskette drive that will accept 3.5-inch, 1.44 MB diskettes (internal or external),
- one internal CD-RW,
- one parallel port,
- one RS-232 serial port,
- AC adapter/charger, and a car cigarette lighter adapter cable,
- fully charged battery capable of a minimum of 2 hours of continuous operation,
- one spare battery,
- sound card with built in speakers,
- full function keyboard,
- pointing device that is integral to the case (clip on devices will not be acceptable),
- one cable 10 feet (3 meters) long for connection to a controller port or network port on the workstation computer,
- video capture card capable of digitizing and displaying full motion composite (NTSC/PAL) video in real time,
- operating system Windows 2000,
- full screen source editing features,
- one on board modem that provides 56,600 bps for data and 14,400 bps for fax with RJ11 connector,
- 100Base TX (100 Mb/s Ethernet) with RJ-45 connector on board,
- cushioned, soft-side carrying case.

Provide modems that comply with the following:

- Data Compatibility: V.34, V.FC, V.32, V.32bis, V.22, V.22bis, V.90
- Fax Compatibility: V.17, V.29, V.27ter
- Error Control and Data Compression:
  V.42/MNP 2-4 error control (hardware based)
  V.42bis/MNP 5 data compression (hardware based)
- Ethernet: IEEE 802.3

C. Surge Suppression Strips:

Provide surge suppression power strips with an illuminating on/off switch, isolating filter banks, a minimum of six 120 VAC, 60 HZ outlets, and a minimum of 808 Joules.

D. Printers:

Furnish printers that utilize the PCL 6 printer language featuring commands for fully integrated HP-GL/2 vector graphics and advanced imagery/special effects printing with a minimum of 80 internal, scaleable fonts. Provide the latest version of Windows print typefaces. Provide a minimum

of 16 MB of RAM. Furnish printer with modular input/output (I/O) and Ethernet 10/100 Base-T network communications protocols. Furnish a bi-directional IEEE 1284 ECP-compliant parallel interface.

13.3. CONSTRUCTION METHODS

Perform all work to furnish a fully functional central computer. Install all connecting cables and hardware as necessary to develop a complete and operational system.

Install surge suppression strips as necessary for all components and equipment.

After delivery and installation of the central hardware and software, perform detailed tests on each system component. Upon the successful completion of all component tests, provide a system acceptance test procedure for approval by the Engineer. These test procedures will demonstrate that all equipment, central and field, are fully integrated and operational, and are properly controlling the closed loop system.

13.4. METHOD OF MEASUREMENT

Actual number of central computers with operating software furnished, installed, and accepted.

Actual number of notebook computers with operating software furnished, installed, and accepted.

Actual number of printers furnished, installed, and accepted.

13.5. BASIS OF PAYMENT

The quantity of central computers, measured as provided above, will be paid for at the contract unit price each for "Central Computer."

The quantity of notebook computers, measured as provided above, will be paid for at the contract unit price each for "Notebook Computer."

The quantity of printers, measured as provided above, will be paid for at the contract unit price each for "Printer."

Payment will be made under:

Central Computer ..... Each
Notebook Computer ..... Each
Printer ..... Each

14. FIBER-OPTIC SELF-HEALING RING TRANSCEIVERS

14.1. DESCRIPTION

Furnish and install fiber-optic self-healing ring transceivers 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.

Furnish shelf mounted, modular designed, single mode, self-healing-ring fiber-optic transceivers and all necessary hardware that are compatible with the system equipment and designed for RS-232 drop-and-repeat communications. Do not provide transceivers that are internal to the system

equipment. Provide identical transceivers at all locations that are capable of being interchanged throughout the system.

14.2. MATERIALS

Furnish shelf mounted, self-healing ring fiber-optic transceivers that are capable of supporting RS-232 C/D, RS-422, or RS 485 protocols and support communications in an asynchronous, simplex or full-duplex operating mode.. Transceivers shall be switch selectable for either local or master operation. Ensure that transceivers are capable of operating at distances up to 5 miles (8 kilometers) without the need to boost the signal and without distortion of the signal.

Provide LED's on the front panel of transceivers for power, and transmitting and receiving indication. Comply with the following:

Input Power:	115 VAC
Minimum Loss Budget:	12dB with corresponding receiver
Operating Wavelength:	1310 or 1550nm
Optical Connector:	ST
Signal Connector:	Female Plug Type
Temperature Range:	0 to 150 degrees F (-17 to 65 degrees C)

14.3. CONSTRUCTION METHODS

Install fiber-optic self-healing ring transceivers in each equipment cabinet and comply with the manufacturer's installation instructions.

14.4. METHOD OF MEASUREMENT

Actual number of fiber-optic self-healing ring transceivers furnished, installed, and accepted.

14.5. BASIS OF PAYMENT

The quantity of fiber-optic self-healing ring transceivers, measured as provided above, will be paid for at the contract unit price each for "Fiber-Optic Transceiver – Seal-Healing-Ring."

Payment will be made under:

Fiber-Optic Transceiver – Self-Healing Ring..... Each

15. METAL SIGNAL POLE REMOVALS

15.1. DESCRIPTION

Remove existing metal signal poles including mast arms, and return them to the Traffic Services Office in Division 3. Remove and dispose of existing foundations, associated anchor bolts, electrical wires, and connections.

15.2. CONSTRUCTION METHODS

A. Metal Poles:

Remove and return the metal signal poles, including mast arms, to the Traffic Services Office in Division 3 between 8:00 a.m. and 12:00 p.m., Monday through Thursday. Use methods to remove

the metal signal poles and attached traffic signal equipment that will not result in damage to poles, mast arms, or other portions of the project or facility. Repair damages that are a result of the Contractor's actions at no additional cost to the Department.

B. Foundations:

Remove and promptly dispose of the metal signal pole foundations include reinforcing steel, electrical wires, and anchor bolts to a minimum depth of two feet below the finished ground elevation. At the Contractor's option, remove the complete foundation.

Transport and properly dispose of the materials.

Backfill and compact disturbed areas to match the finished ground elevation. Seed unpaved areas.

Use methods to remove the foundations that will not result in damage to other portions of the project or facility. Repair damages that are a result of the Contractor's actions at no cost to the Department.

15.3. METHOD OF MEASUREMENT

Actual number of metal signal poles removed. No additional payment will be made for the return of the metal poles to the Division 3 Traffic Services Offices.

Actual number of metal signal pole foundations removed and disposed.

15.4. BASIS OF PAYMENT

The quantity of metal poles removed, measured as provided above, will be paid for at the contract unit price each for "Metal Pole Removal."

The quantity of metal pole foundations removed, measured as provided above, will be paid for at the contract unit price each for "Metal Pole Foundation Removal."

Payment will be made under:

Metal Pole Removal ..... Each
Metal Pole Foundation Removal ..... Each

16. GPS UNIT

16.1. DESCRIPTION

Furnish and install a GPS unit in the traffic signal cabinet for time synchronization in accordance with the plans and specifications. Comply with the provisions of Section 1700 of the 2002 Standard Specifications for Roads and Structures.

16.2. MATERIALS

Provide Trimble Acutime 2000 (RS-232) GPS Unit, or an approved equivalent, for time synchronization that is compatible with Oasis 2070 controller software.

16.3. CONSTRUCTION METHODS

Install the GPS unit in the traffic signal cabinet at every location as required on the traffic signal plans. Remove existing GPS units (when appropriate) and return to the Division 3 Traffic Services

Office. No additional payment will be made for the removal and return of the GPS units to the Division 3 Traffic Services Office.

16.4. METHOD OF MEASUREMENT

Actual number of GPS units furnished, installed, and accepted.

No measurement will be made for interface cables and connectors, as these are considered incidental to furnishing and installing the GPS unit assemblies.

16.5. BASIS OF PAYMENT

The quantity of GPS units, measured as provided above, will be paid for at the contract unit price each for "GPS Unit."

Payment will be made under:

GPS Unit ..... Each

17. POWDER COAT FOR METAL POLES AND MAST ARMS

17.1. DESCRIPTION

Powder coat all metal signal poles, mast arms with metal signal poles, and pedestrian pedestals and all necessary hardware for the signalized intersections in accordance with the plans and specifications.

17.2. MATERIALS

Furnish signal support metal poles and mast arms with metal poles, grounding systems, and all necessary hardware. Furnish metal poles and metal poles and mast arms that have a high density, low gloss polyester, thermosetting resin powder coat finish that is black in color applied over a hot-dipped galvanized surface.

Provide a removable pole cap with stainless steel attachment screws for the top of each pole. Furnish removable pole caps that have a high density, low gloss polyester, thermosetting resin powder coat finish that is black in color applied over a hot-dipped galvanized surface.

Furnish housings for mounting of pedestrian pushbuttons. Provide housings that have a high density, low gloss polyester, thermosetting resin powder coat finish that is black in color applied over a hot-dipped galvanized surface.

17.3. METHOD OF MEASUREMENT

Actual number of black powder coating for metal strain pole assemblies furnished, installed and accepted.

Actual number of black powder coating for single mast arm assemblies furnished, installed and accepted.

Actual number of black powder coating for double mast arm assemblies furnished, installed and accepted.

Actual number of black powder coating for pedestrian pedestal assemblies furnished, installed and accepted.

17.4. BASIS OF PAYMENT

The quantity of black powder coating for metal strain pole assemblies will be paid for at the contract price for "Powder Coat for Metal Strain Pole."

The quantity of black powder coating for single mast arm with metal pole assemblies will be paid for at the contract price for "Powder Coat for Single Mast Arm with Metal Pole."

The quantity of black powder coating for double mast arms with metal pole assemblies will be paid for at the contract unit price each for "Powder Coat for Double Mast Arm with Metal Pole."

The quantity of black powder coating for pedestrian pedestal assemblies will be paid for at the contract unit price each for "Powder Coat for Pedestrian Pedestal."

Payment will be made under;

Powder Coat for Metal Strain Pole .....Each

Powder Coat for Single Mast Arm with Metal Pole.....Each

Powder Coat for Double Mast Arm with Metal Pole .....Each

Powder Coat for Pedestrian Pedestal .....Each

Project U-2734 **New Hanover County**

Project Special Provisions
Culvert

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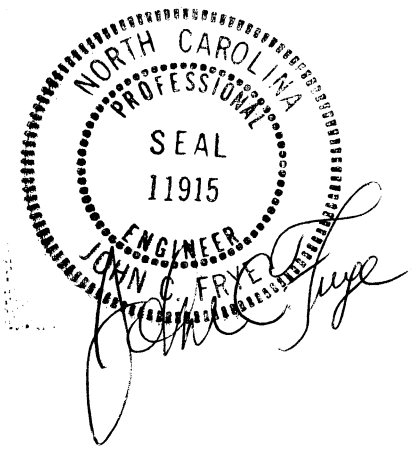

PROJECT SPECIAL PROVISIONS
CULVERT

PROJECT U-2734 **NEW HANOVER COUNTY**

ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS (10-12-01)

1.0 DESCRIPTION

The work covered by this Special Provision consists of furnishing all necessary labor, equipment, and materials and performing all operations necessary for installing anchor bolts/dowels in concrete using an adhesive bonding system in accordance with the details shown on the plans and with the requirements of this specification unless otherwise directed.

Submit a description of the proposed adhesive bonding system to the Engineer for review, comments and acceptance. Include in the description the bolt type and its deformations, equipment, manufacturer's recommended hole diameter, embedment depth, material specifications, and any other material, equipment or procedure not covered by the plans or these specifications. List the properties of the adhesive, including density, minimum and maximum temperature application, setting time, shelf life, pot life, shear strength and compressive strength. If bars/dowels containing a corrosion protective coating are required, provide an adhesive that does not contain any chemical elements that are detrimental to the coating and include a statement to this effect in the submittal.

2.0 MATERIALS

Use an adhesive bonding system that has been tested for a tensile strength of 125% of the specified anchor bolt/dowel yield load. Provide certification that, for the particular bolt grade, diameter and embedment depth required, the anchor system will not fail by adhesive failure and that the anchor bolt/dowel will not move. The minimum concrete compressive strength is 3000 psi (20.7 MPa) for certification and anchorage selection.

Package components of the adhesive so that one whole container of each component mixes to form one batch of adhesive. Use containers designed so that all of the contents may be removed easily and sealed tightly to prevent leakage. Furnish adhesive material requiring hand mixing in two separate containers designated as Component A and Component B. Provide a self contained cartridge or capsule consisting of two components which are automatically mixed as they are dispensed, as in the case of a cartridge, or drilled into, as in the case of a capsule.

Clearly label each container with the manufacturer's name, date of manufacture, batch number, batch expiration date, direction for use, and warnings and precautions concerning the contents as required by State or Federal Laws and Regulations.

3.0 PROCEDURE

A. Drilling of Holes into Concrete

When directed, use a jig or fixture to ensure the holes are positioned and aligned correctly during the drilling process. Upon approval, adjusting hole locations to avoid reinforcing steel is permitted.

Drill the holes with a pneumatic drill unless another drilling method is approved. Follow the manufacturer's recommendations regarding the diameter of the drilled hole.

Immediately after completion of drilling, blow all dust and debris out of the holes with oil-free compressed air using a wand extending to the bottom of the hole. Remove all dust from the sides of the holes by brushing the holes with a stiff-bristled brush of a sufficient size and then blow the hole free of dust. Repeat this procedure until the hole is completely clean. Check each hole with a depth gauge to ensure proper embedment depth.

Repair spalled or otherwise damaged concrete using approved methods.

B. Inspection of Holes

Inspect each hole immediately prior to placing the adhesive and the anchor bolts/dowels. Ensure all holes are dry and free of dust, dirt, oil, and grease. Rework any hole that does not meet the requirements of this Special Provision.

C. Mixing of Adhesive

Mix the adhesive in strict conformance with the manufacturer's instructions.

D. Embedment of Anchor Bolt/Dowel

Clean each anchor bolt/dowel so that it is free of all rust, grease, oil, and other contaminants.

Unless otherwise shown on the plans, the minimum anchor bolt/dowel embedment depth is such that the adhesive develops at least 125% of the anchor bolt/dowel yield load as determined by the manufacturer.

Insert the anchor bolt/dowel the specified depth into the hole and slightly agitate it to ensure wetting and complete encapsulation. After insertion of the anchor bolt/dowel, strike off any excessive adhesive flush with the concrete face. Should the adhesive fail to fill the hole, add additional adhesive to the hole to allow a flush strike-off.

Do not disturb the anchor bolts/dowels while adhesive is hardening.

4.0 FIELD TESTING

When specified on the plans, test the installed anchor bolts/dowels for adequate adhesive as specified below. Inform the Engineer when the tests will be performed at least 2 days prior to testing. Conduct the tests in the presence of the Engineer.

Use a calibrated hydraulic centerhole jack system for testing. Place the jack on a plate washer that has a hole at least 1/8 inch (3 mm) larger than the hole drilled into the concrete. Position the plate washer on center to allow an unobstructed pull. Position the anchor bolts/dowels and the jack on the same axis. Have an approved testing agency calibrate the jack within 6 months prior to testing. Supply the Engineer with a certificate of calibration.

In the presence of the Engineer, field test 10% of the first 50 anchor bolts/dowels prior to installing any additional anchors. For testing, apply and hold briefly 90% of the anchor bolt/dowel yield load shown on the plans. No visible signs of movement of the anchor bolts/dowels is permitted under this load. Upon receiving satisfactory results from these tests, install the remaining anchors. Test a minimum of 2% of the remaining anchors as previously described.

Record data for each anchor bolt/dowel tested on the report form entitled "Installation Test Report of Adhesively Anchored Anchor Bolts or Dowels". Obtain this form from the North Carolina Department of Transportation Materials and Tests Engineer. Submit a copy of the completed report forms to the Engineer.

Final acceptance of the adhesively anchored system is based on the conformance of the pull test to the requirements of this specification. Failure to meet the criteria of this specification is grounds for rejection.

5.0 BASIS OF PAYMENT

No separate measurement or payment will be made for furnishing, installing, and testing anchor bolts/dowels.

Payment at the contract unit prices for the various pay items will be full compensation for all materials, equipment, tools, labor, and incidentals necessary to complete the above work.

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)	Translyvania	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 (SPECIAL)

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.

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
State Dredge and Fill and/or CAMA	Division of Coastal Management, DENR, State of North Carolina
Water Quality (401)	Division of Environmental Management, DENR, State of North Carolina
Stormwater	Division of Environment and Natural Resources, 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.

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

March 18, 2004

IN REPLY REFER TO

Regulatory Division

SUBJECT: Action ID 199701755, TIP No. Project No. U-2734

Dr. Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA
N.C. Department of Transportation
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Dr. Thorpe:

In accordance with your written request of October 28, 2003 and the resulting administrative record, enclosed are two copies of a Department of the Army permit to authorize the discharge of dredged and fill material into waters of the United States, for construction of the Military Cutoff Road (SR 1409) widening project from two lanes to a four lane divided facility with a raised median from Drysdale Drive to US 17 (Market Street, New Hanover County, North Carolina.

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, shows 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.

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. Dave Timpy of the Wilmington Field Office regulatory staff at telephone (910) 251-4634.

Sincerely,

for E. David Franklin
Chief, NCDOT Team

Enclosures

DEPARTMENT OF THE ARMY PERMIT

Permittee NC Department of Transportation

Permit No. 199701755

Issuing Office USAED, Wilmington

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:

Place fill material impacting a total of impacting a total of 1.45 acre of wetlands and 1,480 linear feet of perennial stream, for construction of the Military Cutoff Widening project (T.I.P. No. U-2734).

Project Location:

On Military Cutoff Road between Eastwood Wood and US Highway 17 and includes the widening of Military Cutoff Road to four lanes with a divided median and bicycle and pedestrian path, in New Hanover Counties.

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)* 3/19/04

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)*

☆U.S. GOVERNMENT PRINTING OFFICE: 1986 — 717-425

SPECIAL CONDITIONS

Military Cutoff Widening
TIP Project No. U-2734
Action ID 199701755

Special Conditions to be placed on the Department of the Army permit:

1. All work must be performed as shown on the attached plans, which are a part of this permit. Failure to institute and carry out the details of the following special conditions, below, will result in a directive to cease all ongoing and permitted work within waters and/or wetlands associated with the permitted project, or such other remedies and/or fines as the District Engineer or his authorized representatives may seek.

2. One copy of the final construction drawings shall be furnished to the District Engineer prior to the pre-construction meeting. Written verification shall be provided that the final construction drawings comply with the attached permit drawings. The permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any deviation in the construction design plans shall be brought to the attention of the Corps of Engineers, Mr. Dave Timpy, Wilmington Regulatory Field Office prior to any active construction in waters or wetlands.

3. The permittee shall schedule a preconstruction meeting between its representatives, the contractor's representatives, and the Corps of Engineers, Wilmington Regulatory Field Office NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all of the terms and conditions contained within this Department of the Army Permit. The permittee shall notify the Corps of Engineers Project Manager a minimum of thirty (30) days in advance of the scheduled meeting in order to provide that individual with ample opportunity to schedule and participate in the required meeting.

4. The permittee shall require its 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 its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. Copies of this permit and any modifications authorized by the USACE shall be available for review at the construction site at all times. All violations, including non-compliance of these conditions, of the authorized permit shall be reported to the District Engineer within 24 hours of the violation.

5. The temporary placement or double handling of excavated or fill material or construction equipment and materials within waters and wetlands is not authorized.

6. All fill material must be adequately stabilized at the earliest practicable date to prevent erosion of fill material into adjacent waters or wetlands.

7. All fill material will be clean and free of any pollutants except in trace quantities.

8. The permittee shall remove all sediment and erosion control measures placed in wetlands or waters, and restore natural grades in those areas, prior to final inspection of the project.

9. This permit authorizes the clearing of an additional ten (10) feet beyond the slope stake limits in wetlands, as shown on the plans, to install the necessary sediment and erosion control measures.

10. The permittee shall take measures to prevent live or fresh concrete from coming into contact with any surface waters until the concrete has hardened.

11. The permittee will maintain the authorized work in good condition and in conformance with the terms and conditions of this permit. The permittee is not relieved of this requirement if he abandons the permitted activity without having it transferred to a third party.

12. No attempt will be made by the permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the authorized work. Use of the permitted activity must not interfere with the public's right to free navigation on all navigable waters of the United States.

13. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration of the structures or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable water, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

14. Compensatory mitigation for the 1.45 acres of wetland impacts and 1480 feet of perennial stream impacts associated with his project shall be performed as described in the letter from the North Carolina Department of Transportation dated February 6, 2004 and as detailed in the following conditions:

a. Natural channel design and relocation of 456 linear feet of stream impacted within Site 1 of U-2734 at a mitigation ratio of 1:1 or 456 mitigation credits.

b. Preservation of 614 linear feet of stream within the Site 1 right-of-way of U-2734 at a mitigation ratio of 5:1 or 122 (614/5) mitigation credits. This stream is located at Stations 22+10 to 22+80 and 23+40 to 24+50.

* c. The EEP will provide the compensatory mitigation to address the remaining 902 linear feet of stream impacts.

* Compensatory mitigation for the unavoidable impacts to 1.45 acres of wetland and 902 linear feet of perennial stream associated with the proposed project shall be provided by the Ecosystem Enhancement Program (EEP), as outlined in the letter dated March 11, 2004 from William D. Gilmore, EEP Transition Manager. The EEP will provide 14.5 acres of preservation of non-riverine wetlands and 9,020 linear feet of preservation of warm water

stream channel in the Southern Outer Coastal Plain Eco-Region at the Hancock Timber Site in Pender County that has 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 1.45 acres of restoration of non-riverine wetlands and 902 linear feet of restoration of warm water stream channel in the Howe Creek watershed (Hydrologic Cataloging Unit 03030001040020; Note: a mitigation site located in Hydrologic Catalog Unit 03030001040010 may be used if a mitigation site in Hydrologic Catalog Unit 03030001040020 is not available) by July 22, 2005 and half of the proposed preservation mitigation would be available at that time for mitigation for other project impacts. Construction within wetlands on the permitted highway project shall begin only after the EEP has provided written confirmation to the District Engineer that the EEP and not the NCDOT is responsible for providing the required mitigation, pursuant to Paragraph VI.B.7 of the MOA. The NCDOT shall, within 30 days of the issue date of this permit, certify that sufficient funds have been provided to EEP to complete the required mitigation, pursuant to Paragraph V. of the MOA.

15. All land disturbing activity associated with the highway construction will be conducted in a way that prevents a significant increase in turbidity outside the area of construction or construction-related discharge. Increases such that the turbidity in the water body is 50 NTU's or less is not considered significant.

16. The permittee and its contractors and/or agents shall not excavate, fill, or perform mechanized landclearing at any time in the construction or maintenance of this project within waters and/or wetlands, or cause the degradation of 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 wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and fill activities connected with this project.

17. To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent wetlands and streams, 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 shall ensure that all such areas comply with the preceding condition (17.) 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 information will include data regarding soils, vegetation and hydrology sufficient to clearly demonstrate compliance with the preceding condition (17.). All information will be available to the Corps of Engineers upon request. NCDOT 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. All jurisdictional wetland lines on borrow and waste sites shall be verified by the Corps of Engineers and shown on the approved reclamation plans.

18. If the permittee discovers any previously unknown historic or archeological remains while accomplishing the authorized work, he will immediately notify the Wilmington District Engineer who will initiate the required State/Federal coordination.

19. All culverts must be buried to a depth of at least one foot below the bed of the stream or wetland.

20. Aquatic Life Movements. No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.

21. All conditions attached to the Section 401 Water Quality Certification for this project, issued March 17, 2004, are incorporated as conditions of this permit.

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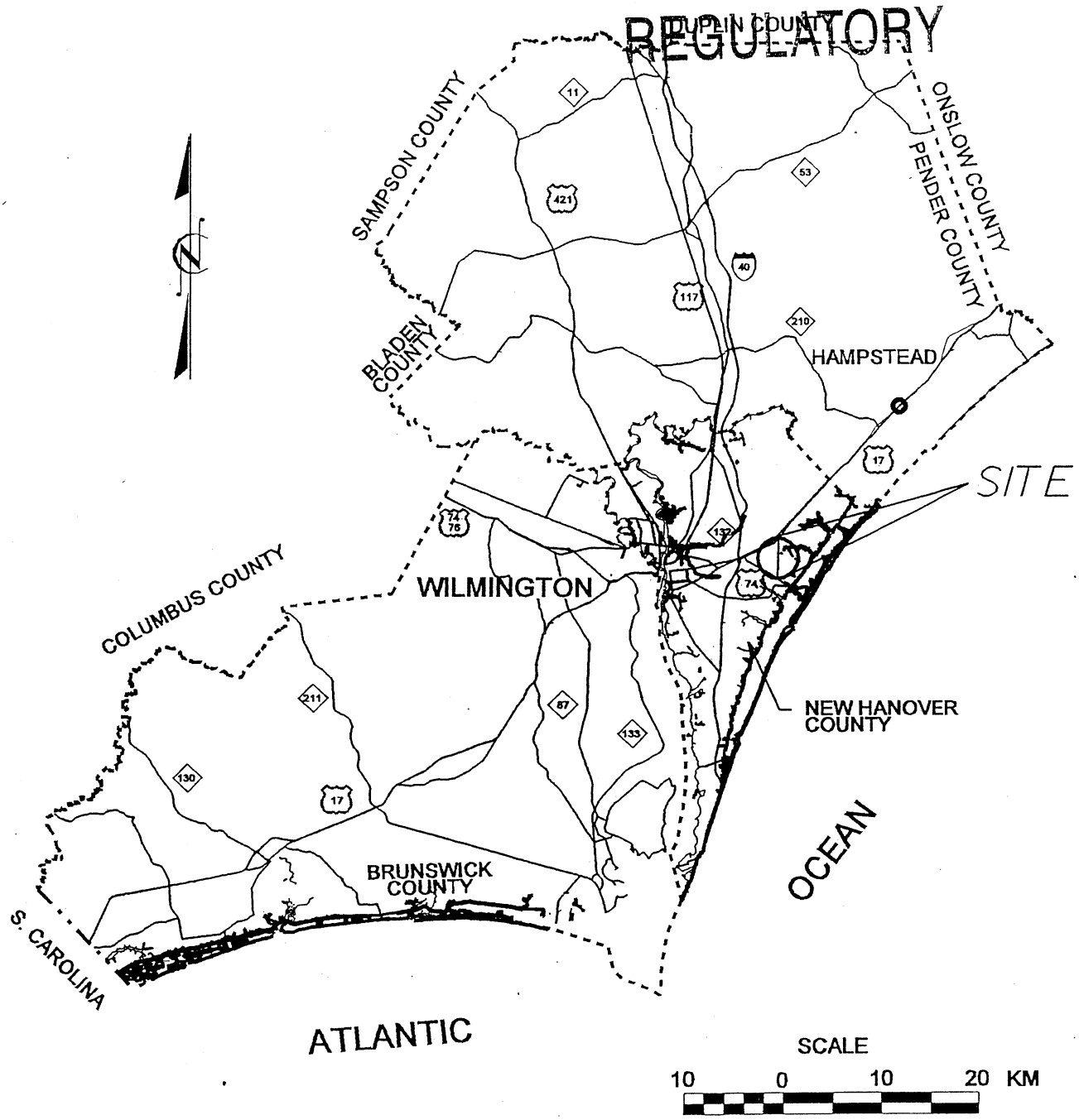
RECEIVED

OCT 29 2004

REGULATORY



VICINITY MAP

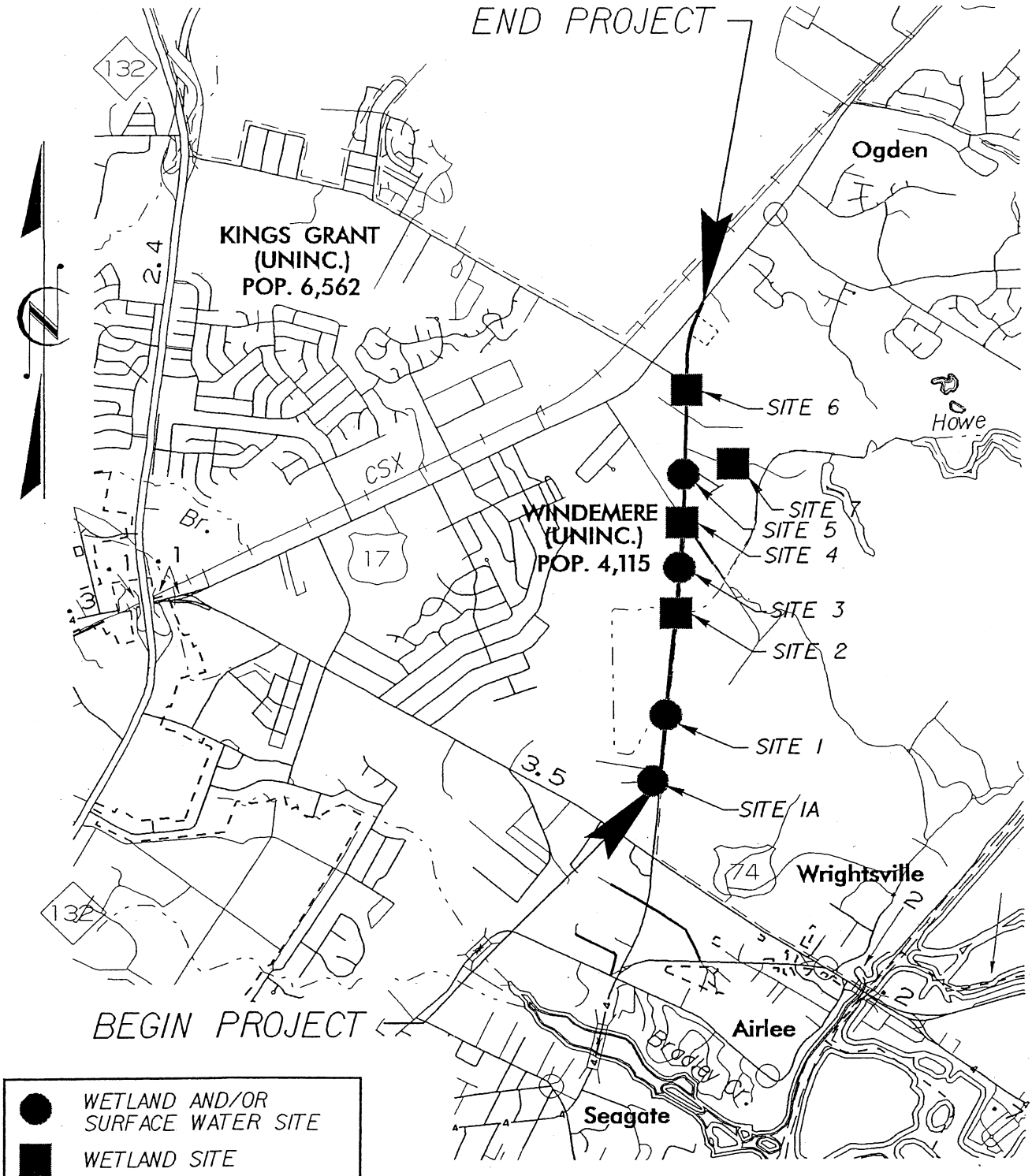
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT 34857.1.1 (U-2734)

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 1 OF 34 9/03



SITE MAP

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)
MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 2 OF 34 9/03

LEGEND

WLB WETLAND BOUNDARY

WETLAND

F F DENOTES FILL IN WETLAND

S S DENOTES FILL IN SURFACE WATER

P P DENOTES FILL IN SURFACE WATER (POND)

T T DENOTES TEMPORARY FILL IN WETLAND

E E DENOTES EXCAVATION IN WETLAND

TS TS DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES MECHANIZED CLEARING

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

LIVE STAKES

BOULDER

CORE FIBER ROLLS

PROPOSED BRIDGE

PROPOSED BOX CULVERT

PROPOSED PIPE CULVERT
12"-48" PIPES
54" PIPES & ABOVE

(DASHED LINES DENOTE EXISTNG STRUCTURES)

SINGLE TREE

WOODS LINE

DRAINAGE INLET

LOG VANE

RIP RAP

5 ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

BZ1 BUFFER ZONE 1

BZ2 BUFFER ZONE 2

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

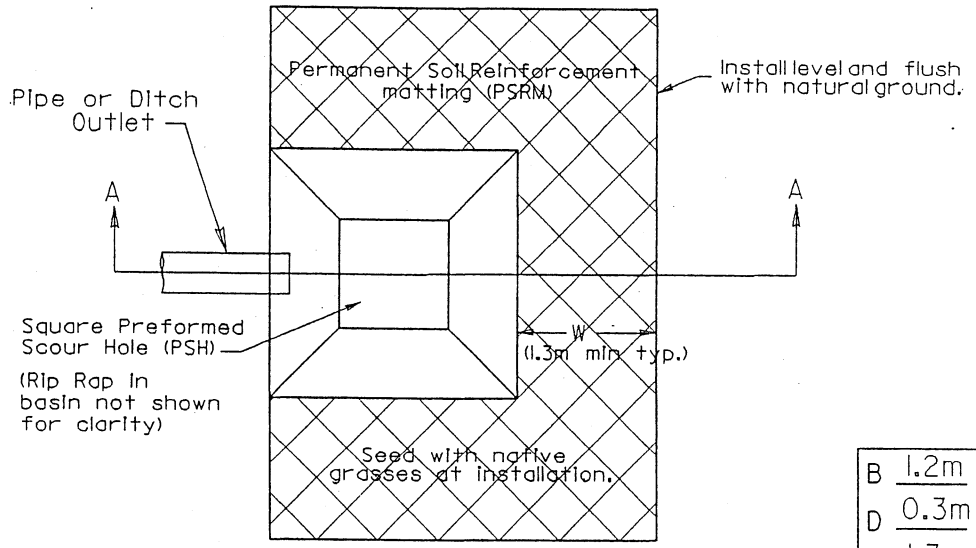
NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)
MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 3 **OF** 34 9/03

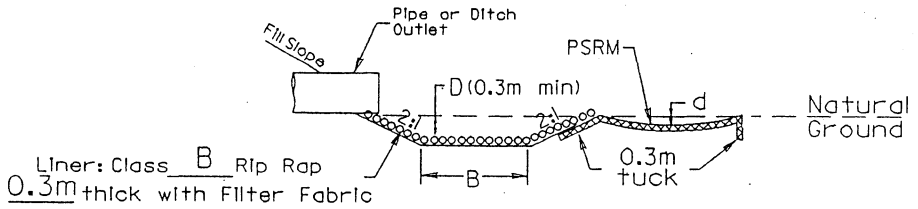
PREFORMED SCOUR HOLE

PLAN VIEW



B	1.2m
D	0.3m
W	1.3m
d	0.15m

SECTION A-A



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NCDOT

DIVISION OF HIGHWAYS

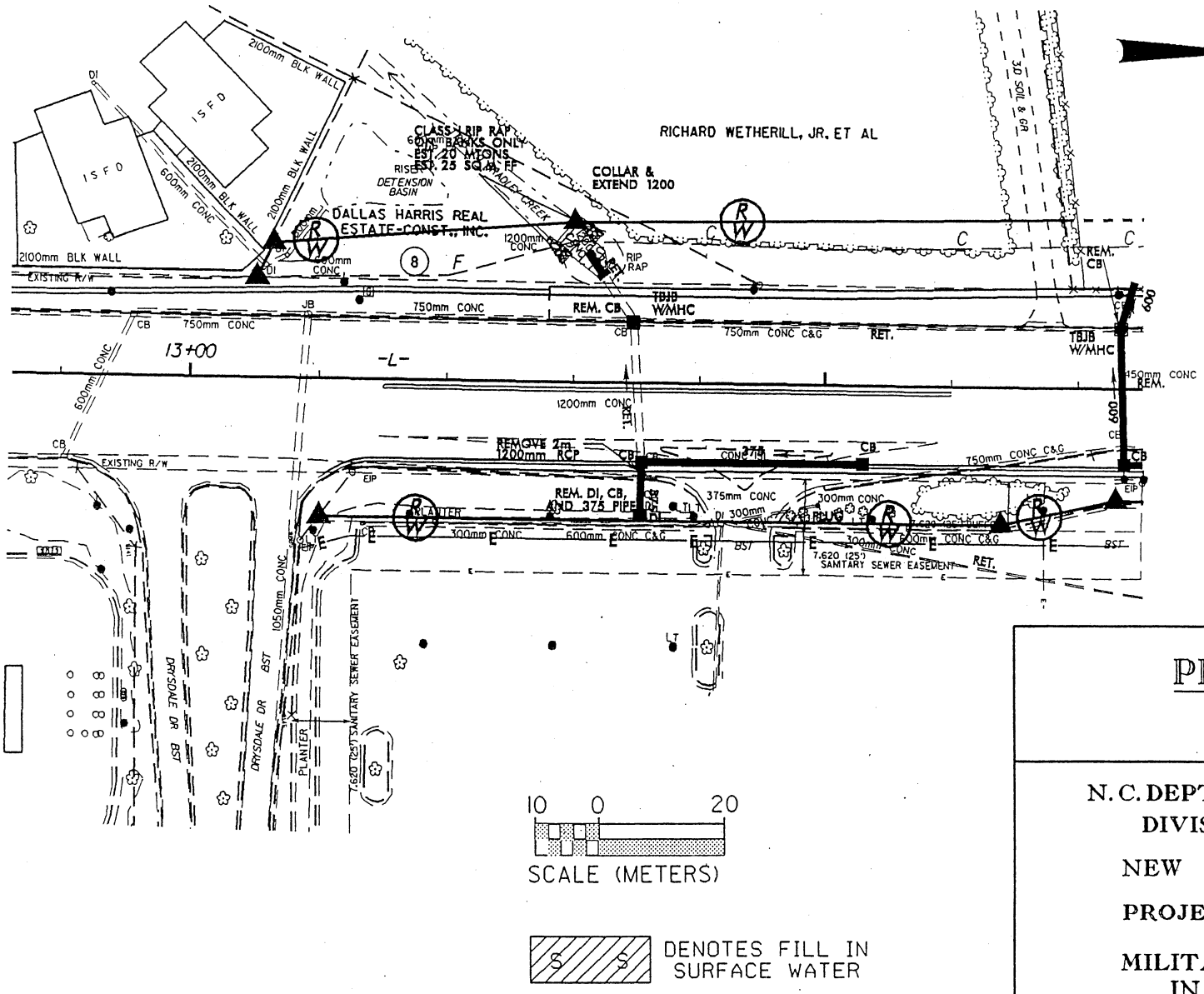
NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)

MILITARY CUTOFF ROAD IN WILMINGTON, NC

SHEET 4 OF 34

9/03



PLAN VIEW
SITE 1A

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

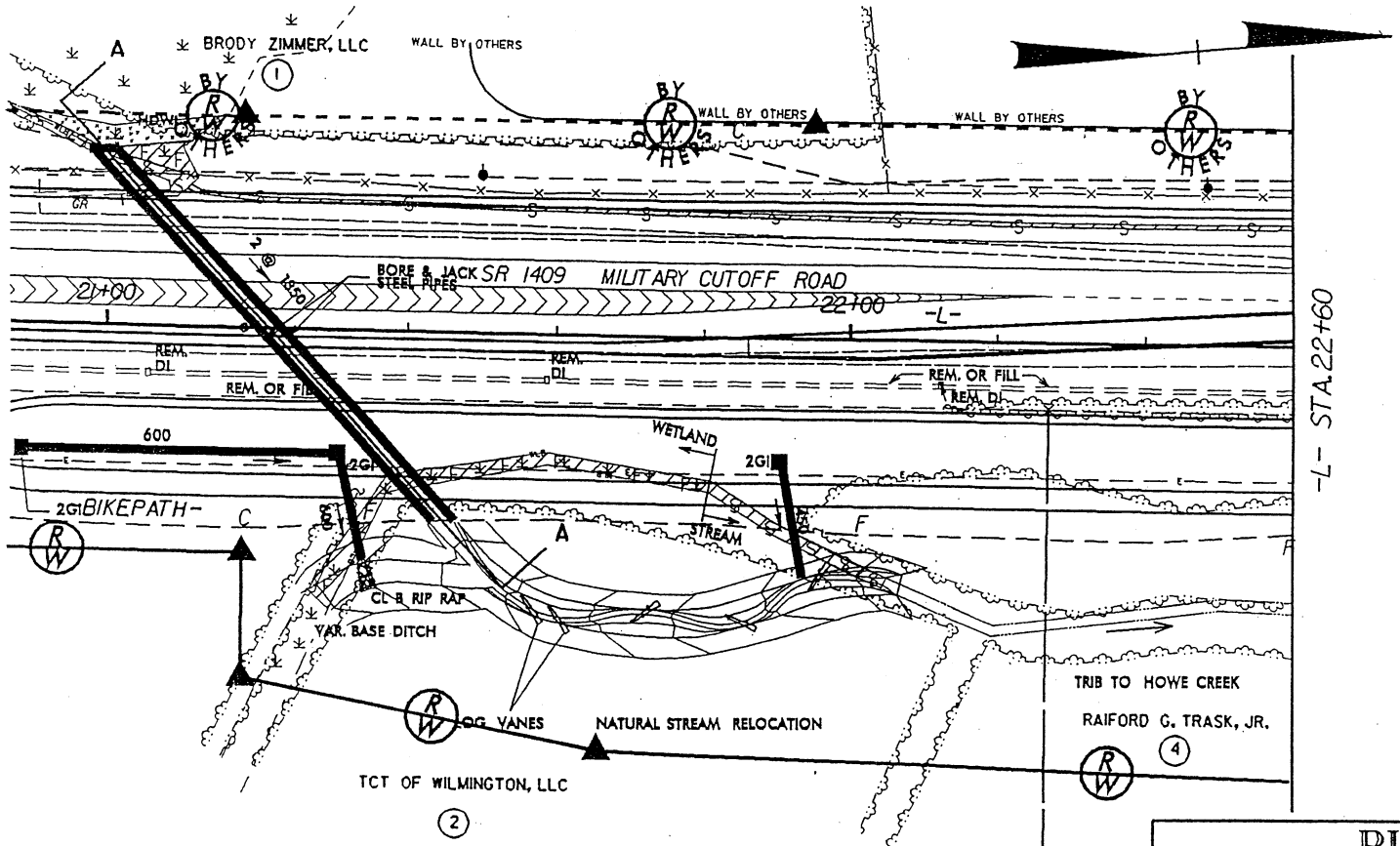
PROJECT 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 5 OF 34

9/03

0 181



PLAN VIEW
SITE 1

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 6 OF 34 10/03

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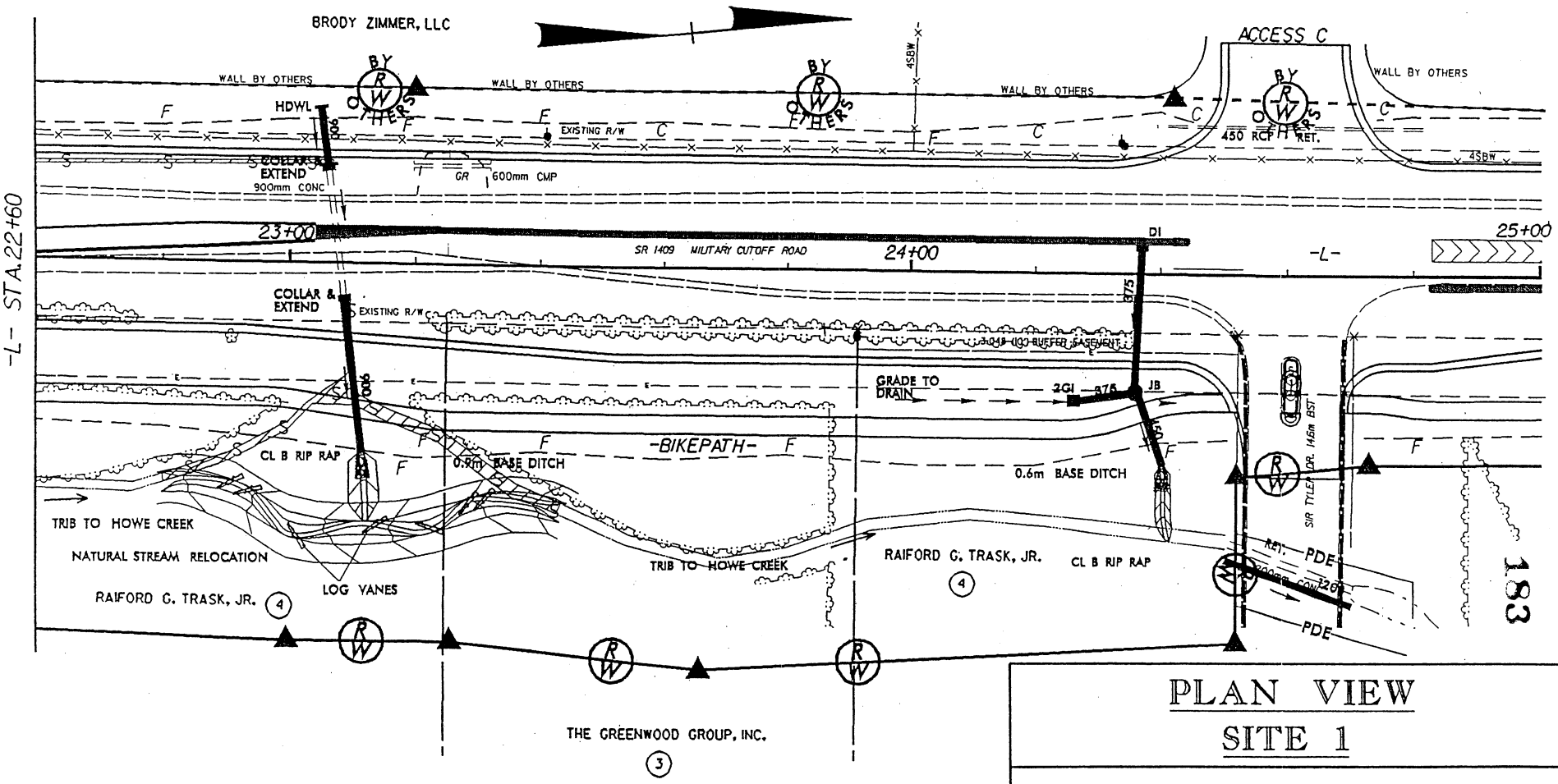


10 0 20

SCALE (METERS)

DENOTES FILL IN SURFACE WATER

PLAN VIEW
SITE 1

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

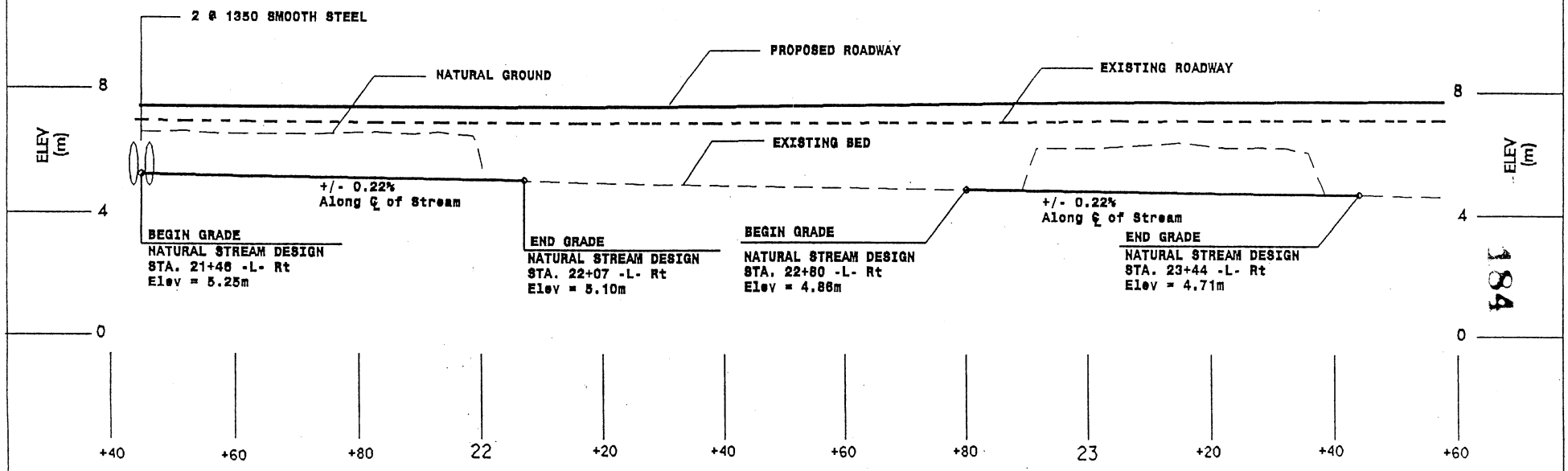
NEW HANOVER COUNTY

PROJECT 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 7 OF 34

10/03



PROFILE

NATURAL STREAM DESIGN
STA 21+46 TO 22+07 -L- (RT)
STA 22+80 TO 23+44 -L- (RT)

NCDOT

DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)

MILITARY CUTOFF ROAD

IN WILMINGTON, NC

SHEET 8 OF 34

9/03

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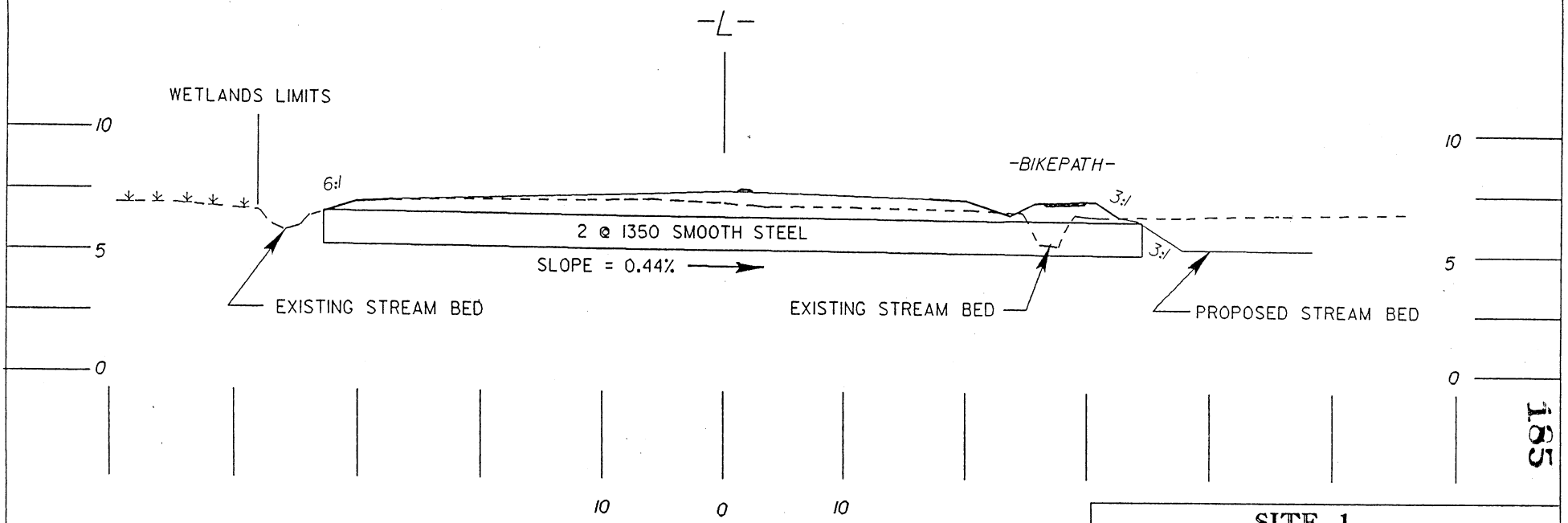
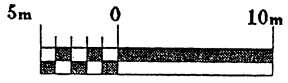
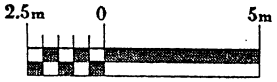




HORIZONTAL SCALE



VERTICAL SCALE

SITE 1
SECTION A-A

NCDOT
DIVISION OF HIGHWAYS
NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)
MILITARY CUTOFF ROAD
IN WILMINGTON, NC

SHEET 9 OF 34

9/03

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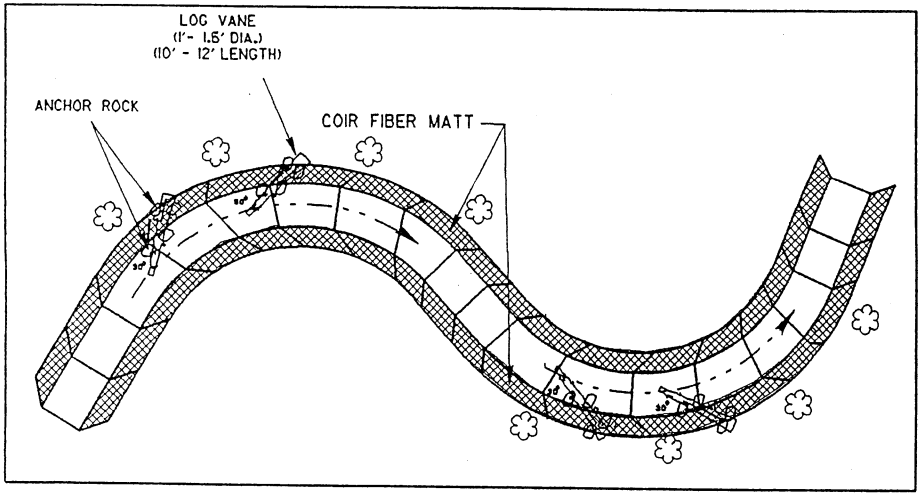


NOTES:

BURY APPROXIMATELY 1/3 OF LOG VANE LENGTH IN THE OUTSIDE POOL BANK AND 1/3 IN THE STREAM BED, WITH THE REMAINING 1/3 EXPOSED.

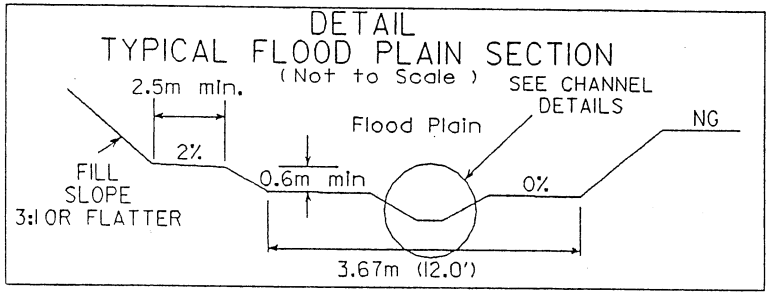
THE EXPOSED PORTION OF LOG VANE SHOULD BE APPROXIMATELY HALF OF THE BANKFULL WIDTH

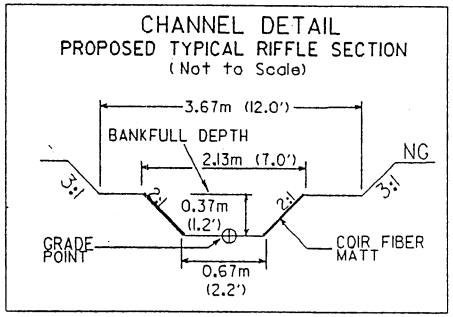
WHEN BACKFILLING OVER AND AROUND LOG VANES AND ANCHOR ROCKS FIRMLY SECURE ALL COMPONENTS INCLUDING JOINTS, CONNECTIONS AND GAPS.

PLANTINGS SHOULD BE PLACED ABOVE BANKFULL DEPTH

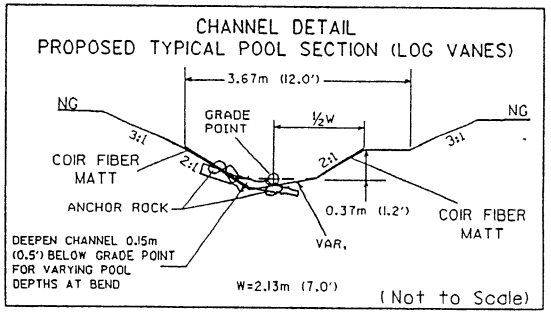
MIN. LOG VANE DIA = 0.3m. UTILIZE LOGS AT SITE.

USE ANCHOR ROCK APPROXIMATELY 100 - 200 LBS.





TYPICAL SECTION BETWEEN BENDS



TYPICAL SECTION AT BENDS

NATURAL STREAM DESIGN
STA 21+46 TO 22+07 -L- (RT)
STA 22+80 TO 23+44 -L- (RT)

NCDOT
DIVISION OF HIGHWAYS
NEW HANOVER COUNTY
PROJECT: 34857.1.1 (U-2734)
MILITARY CUTOFF ROAD
IN WILMINGTON, NC

SHEET 10 **OF** 34 **9/03**

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PROJECT #: 8.2251001 (U-2734)
COUNTY: New Hanover
DESCRIPTION: Widening of Military Cutoff Road (SR 1409) in Wilmington, NC
STREAM: Tributary to Howe Creek

NATURAL STREAM DESIGN
Sta 21+46 – Sta 22+07 –L- (Rt)
and from Sta 22+80 – Sta 23+44 –L- (Rt)

The proposed widening of Military Cutoff Road (SR 1409) will result in the impact (fill) of a portion of stream east and west of the existing facility. The stream is a tributary to Howe Creek. The stream design/classification will be based on Dave Rosgen's principles and techniques for river morphology.

The basin is urbanizing and is located in the Coastal hydrologic region. Presently, the existing stream approaches the roadway from the southwest, "heads up", and then traverses down the west side in the roadway ditch to a 36" cross pipe. It then traverses through the cross pipe to the east side of Military Cutoff Road and back into the existing natural stream. Also, from previous field meetings with NCDOT personnel and agency representatives, it was observed that another existing stream is located on the east side of Military Cutoff Road south of the location of the 36" outlet. Portions, of which, will be filled in by the widening project. It was therefore recommended to connect to this existing stream at a location further south of the present crossing and provide restoration for those portions of existing stream to be filled in.

The original stream relocation proposed the use of parallel pipe culverts crossing under Military Cutoff Road at an approximate 30° skew and reconnecting to the existing stream at Sta 21+90 –L-(Rt). From this point downstream to Sir Tyler Drive (approximately 890 ft) the stream would be redesigned and relocated. This included portions of the stream that would be filled in by the proposed roadway widening and portions of the stream that would not be impacted by the project but were to be relocated and improved. A stream reach downstream of Sir Tyler Drive was used as the reference. This design was produced in February of 2001 and was recommended until March of 2003. At this time, another field review meeting was held with Dave Timpy (USACE). From this meeting several design changes were recommended. The recommendations included:

Reconnect to the existing stream further south than original proposal, allowing for additional stream restoration.

Eliminate relocating/altering that portion of remnant stream that is not being impacted by the proposed widening.

Use the existing stream along the portion of relocation as the reference reach.

The existing stream was resurveyed to observe its morphological characteristics. These characteristics include bankfull area, depth, width and discharge. This information was then compared to data generated from the available (yet unapproved to date) NC Stream Restoration Institute's Coastal Regional equations and with the USGS Rural Coastal equations. Data was then analyzed using the HEC-RAS modeling system to compare the accuracy of all the characteristics between the surveyed reference and the regional equations.

The reference reach (existing stream) was observed to be stable, yet moderately entrenched. The stream banks were deep but vegetated. The floodplain is also vegetated, except for a portion next to Sir Tyler Road. The stream was observed to have a meandering thalweg within the main channel banks. While the main stream channel is slightly meandering the thalweg has more significant meandering. Also, the stream was observed to have a low sediment supply and deposition. Based on the observed field data, NCSRI regional information and hydraulic modeling the reference stream was classified as an E6 stream.

The proposed stream was designed to retain the bankfull characteristics of the reference stream while improving the dimensions from that of the reference reach. Flatter side slopes and a slightly wider bankfull floodplain are proposed to improve the entrenchment characteristics. A meandering thalweg is also proposed within the main stream channel. To aid in bank stability, log vanes are proposed in the bend/pool areas. Also, coir fiber mat will be placed on the banks. This will assist in stabilizing the banks and thus assist in establishing vegetation along the stream banks. With the modifications to the prescibed channel dimensions it is believed an improved E6 stream will be provided.

In addition, it is proposed to leave the portion of stream that will not be impacted by the widening in its present condition without additional channel form improvements. The proposed stream channel form is similar to that of the existing stream. It is believed the risk of adversely effecting the existing stream vegetation and stability outweighs the attempt to acquire minimal channel form improvement. It is stated in Rosgen's **Applied River Morphology** that E6 streams "are very stable unless the streambanks are disturbed and significant changes in sediment supply and/or streamflow occur." The portion of restored and preserved stream, and their buffers, will be contained within Right-of-Way from the outlet of the dual 54" pipes to Sir Tyler Road.

The bed material was found to be fine sand, silt and organic material. Shear stress and sediment transport properties for fine sand were analyzed. Shear stresses were calculated based on velocities and flow depths generated from the HEC-RAS modeling system. This information was then compared to values for critical velocity and shear stress for fine sand in the HEC-15 and HDS-5 manuals from the FHA. The Shields Diagram was also used to observe the size of particle moved by the stream energy. The comparison showed the proposed stream to be within acceptable velocity and shear stress limits that would allow proper sediment transport under bankfull conditions.

Appendix B Morphological Measurement Table

Variables	Existing Channel	Proposed Reach	USGS Station	** Reference Reach
1. Stream type	E6	E6	N/A	E6
2. Drainage area	110 Ac (44.5 Ha)	110 Ac (44.5 Ha)		110 Ac (44.5 Ha)
3. Bankfull width	7.0' (2.1m)	7.0' (2.1m)		7.0' (2.1m)
4. Bankfull mean depth	0.8' (0.24m)	0.8' (0.24m)		0.8' (0.24m)
5. Width/depth ratio	8.8	8.8		8.8
6. Bankfull cross-sectional area	5.8 ft^2 (0.54m^2)	5.5 ft^2 (0.51m^2)		5.8 ft^2 (0.54m^2)
7. Bankfull mean velocity	1.7 ft/s (0.52 m/s)	1.8 ft/s (0.55 m/s)		1.7 ft/s (0.52 m/s)
8. Bankfull discharge, cfs	10 cfs (0.28 cms)	10 cfs (0.28 cms)		10 cfs (0.28 cms)
9. Bankfull max depth	1.3' (0.40m)	1.2' (0.37m)		1.3' (0.40 m)
10. Width of floodprone area	14.5' (4.4m)	19.2' (5.9m)		14.5' (4.4m)
11. Entrenchment ratio	2.1	2.7		2.1
12. Meander length	50'-75'	50'		50'-75'
13. Ratio of meander length to bankfull width	7.1-10.7	7.1		7.1-10.7
14. Radius of curvature	102' (31m)	50' (15m)		102' (31m)
15. Ratio of radius of curvature to bankfull width	14.6	7.1		14.6
16. Belt width	36' (11m)	33' (10m)		36' (11m)
17. Meander width ratio	5.1	4.7		5.1
18. Sinuosity (stream length/valley length)	1.10	1.10		1.10
19. Valley slope	0.24%	0.24%		0.24%
20. Average slope	0.22%	0.22%		0.22%
21. Pool slope	0.00%	0.00%		0.00%
22. Ratio of pool slope to average slope	0.00	0.00		0.00
23. Maximum pool depth	1.8' (0.55m)	1.7' (0.52m)		1.8' (0.55 m)
24. Ratio of pool depth to average bankfull depth	2.3	2.1		2.3
25. Pool width	7.0' (2.1m)	7.0' (2.1m)		7.0' (2.1m)
26. Ratio of pool width to bankfull width	1.00	1.50		1.00
27. Pool to pool spacing	25'-40'	30'-40'		25'-40'
28. Ratio of pool to pool spacing to bankfull width	3.6-5.7	4.3-5.0		3.6-5.7
29. Ratio of lowest bank height to bankfull height (or max bankfull depth)	0.77	1.0		0.77

Military Cutoff Stream Mitigation Site (U-2734)
Sta 21+46 -L- (Rt) - Sta 23+44 -L- (Rt)

SEDIMENT TRANSPORT ANALYSIS

Station/Description	Flow Depth (ft)	Flow Slope (ft/ft)	Shear Stress (lb/ft^2)	Bed Material	Velocity (ft/s)
Proposed	1.2	0.0022	0.099	Sand/Silt	1.8
Reference	1.3	0.0022	0.105	Sand/Silt	1.7

Note: Velocities determined from HEC-RAS Model

Proposed Morphology

** **Critical Shear Stress** 0.10 lb/ft^2

*** **Permissable Velocity** 1.5-2.2 ft/s Clear Water Fine Sand - Firm Loam w/ Fine Sand

*** Shields:**

Particle Size	5.0	mm	
Dimensionless Shear Stress	0.0590	lb/ft^2	
Kinematic Viscosity	0.00001400	ft^2/s	at 50° F
Mass Density	1.94	slugs/ft^3	
Unit Weight (Particle)	165.0	lb/ft^3	
Unit Weight (Water)	62.4	lb/ft^3	
Reynolds Number	265.2		
Dimensionless Shear Stress from Shields Diagram	0.054	lb/ft^2	

References:

* Shields Diagram
** Hydraulic Engineering (HEC) 15 - Chart 1
*** Hydraulic Design Series (HDS) 3 - Table 2

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	Proposed		Reference	
Q_{BKF}	10.0	ft^3/s	10.0	ft^3/s
W/D	8.8		8.8	
Side Slope	2.0		1.0	
Mannings n	0.032		0.003	
Valley Slope	0.0024	ft/ft	0.0024	ft/ft
Sinuosity	1.10		1.10	
Valley Slope/Sinuosity	0.0022	ft/ft	0.0022	ft/ft
Velocity	1.8	ft/s	1.7	ft/s
Area	5.5	ft^2	5.8	ft^2
W_{BKF}	7.0	ft	7.0	ft
Base Width	2.2	ft	2.5	ft
Mean Depth	0.8	ft	0.8	ft
Wetted Perimeter	7.6	ft	7.6	ft
Hydraulic Radius	0.72	ft	0.76	ft
Shear Stress	0.10	lb/ft^2	0.10	lb/ft^2
Particle Moved	5.0	mm	5.0	mm

Stream Power:

Reference:
stream power = 0.025 lb/ft/sec

Proposed:
stream power= 0.026 lb/ft/sec

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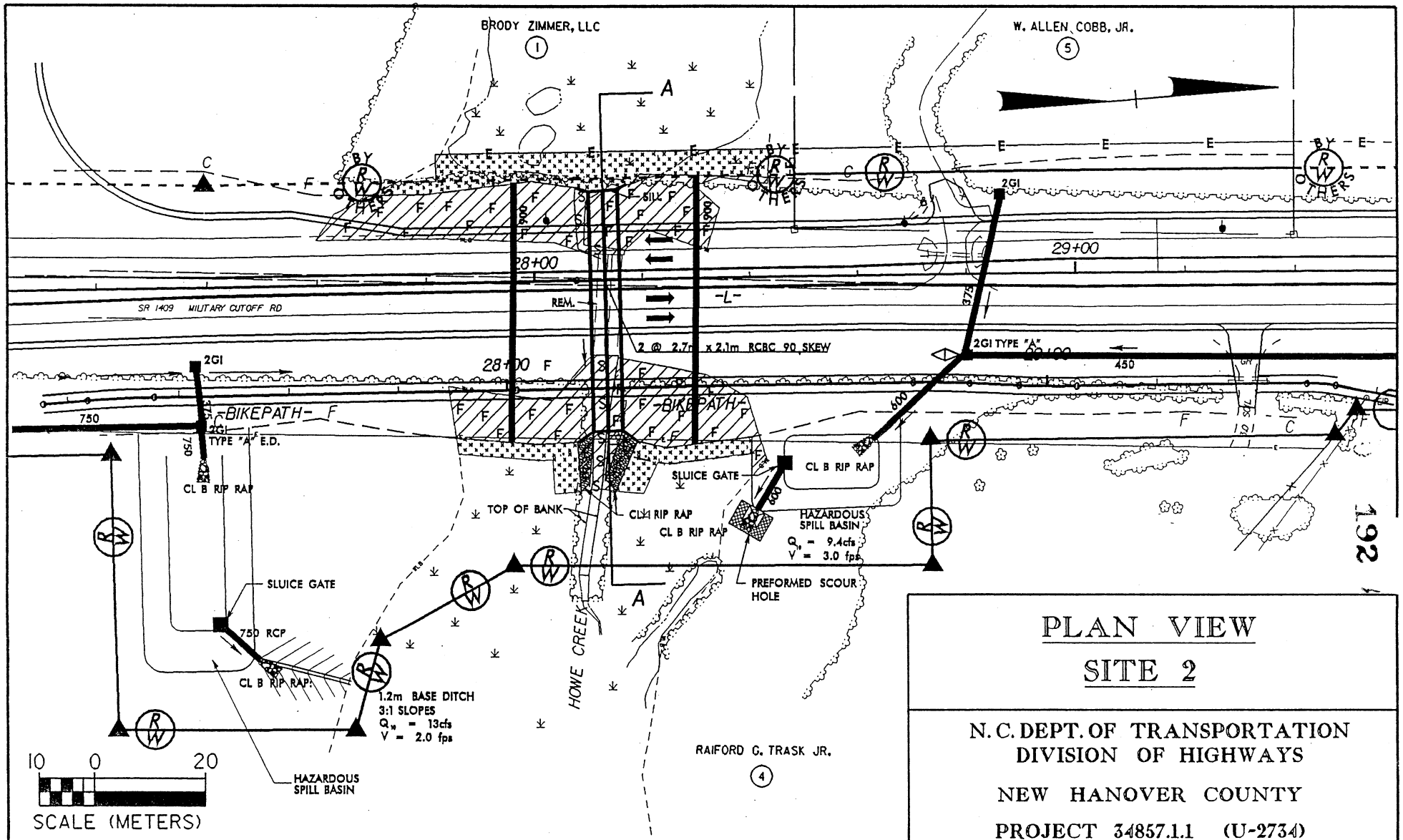


PLAN VIEW
SITE 2

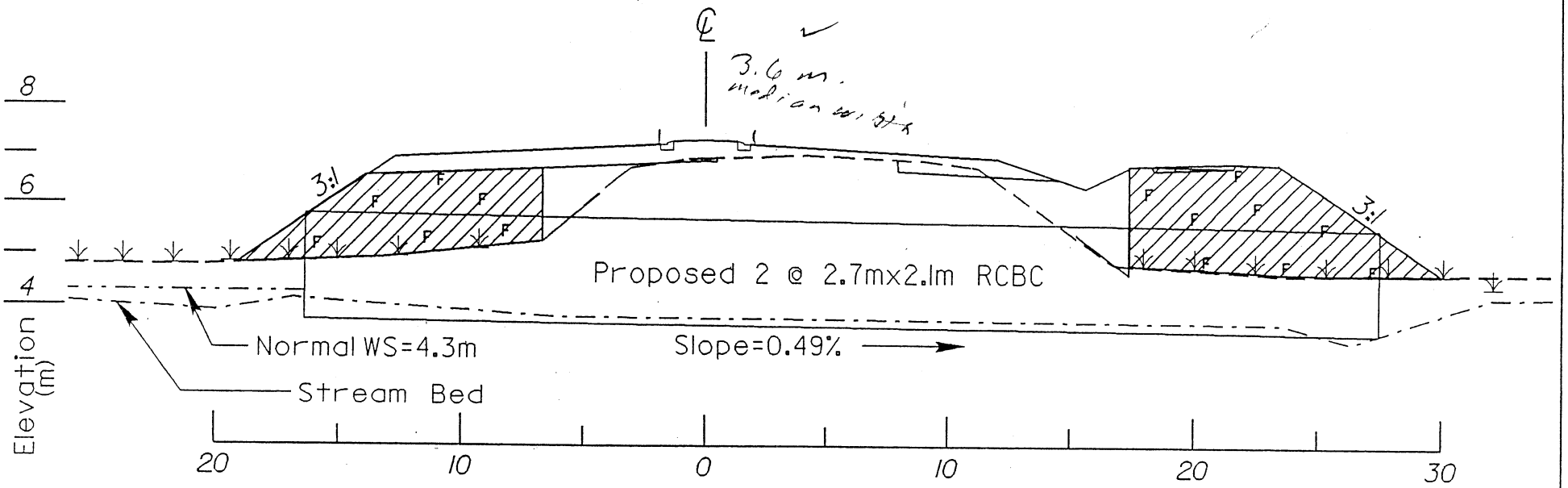
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT 34857.1.1 (U-2734)

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 16 OF 34 9/03



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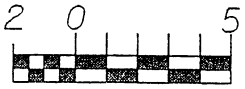
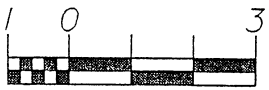
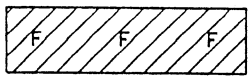


HORIZONTAL SCALE
(in meters)



VERTICAL SCALE
(in meters)



DENOTES FILL
IN WETLAND

SITE 2

SECTION A-A

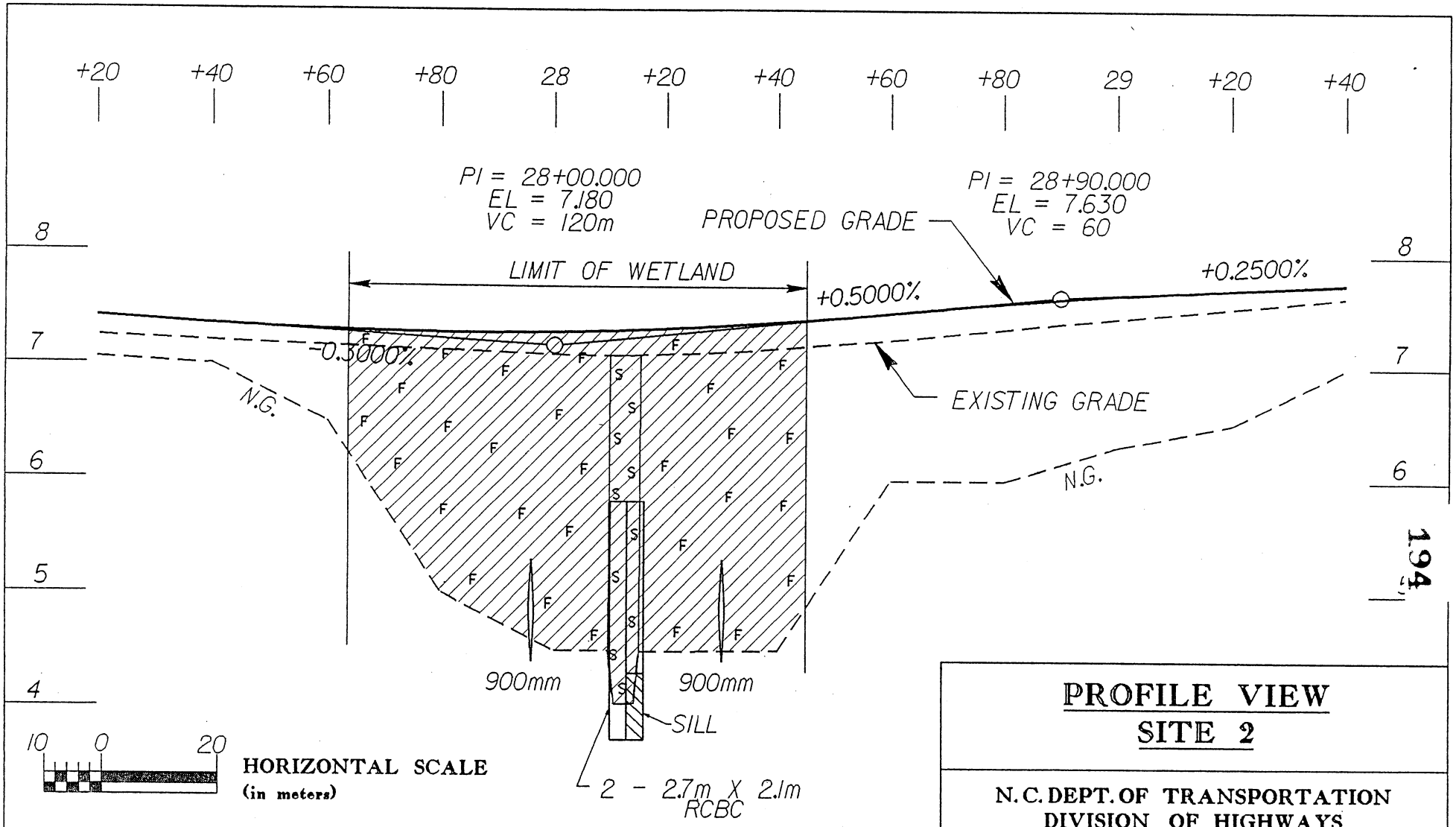
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 17 OF 34 9/03



PROFILE VIEW
SITE 2

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT: 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

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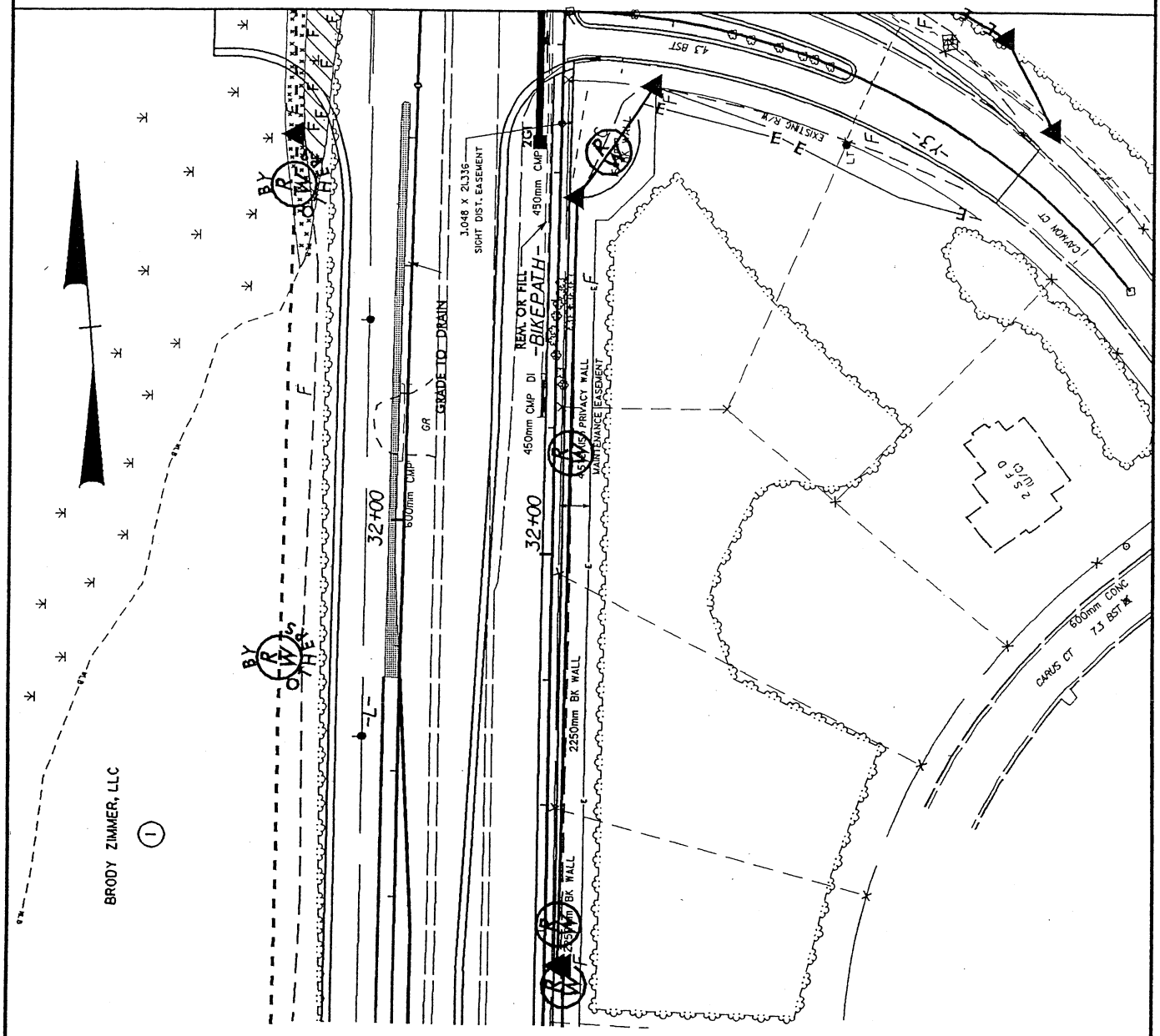
-L- STA. 32+80



PLAN VIEW
SITE 3

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

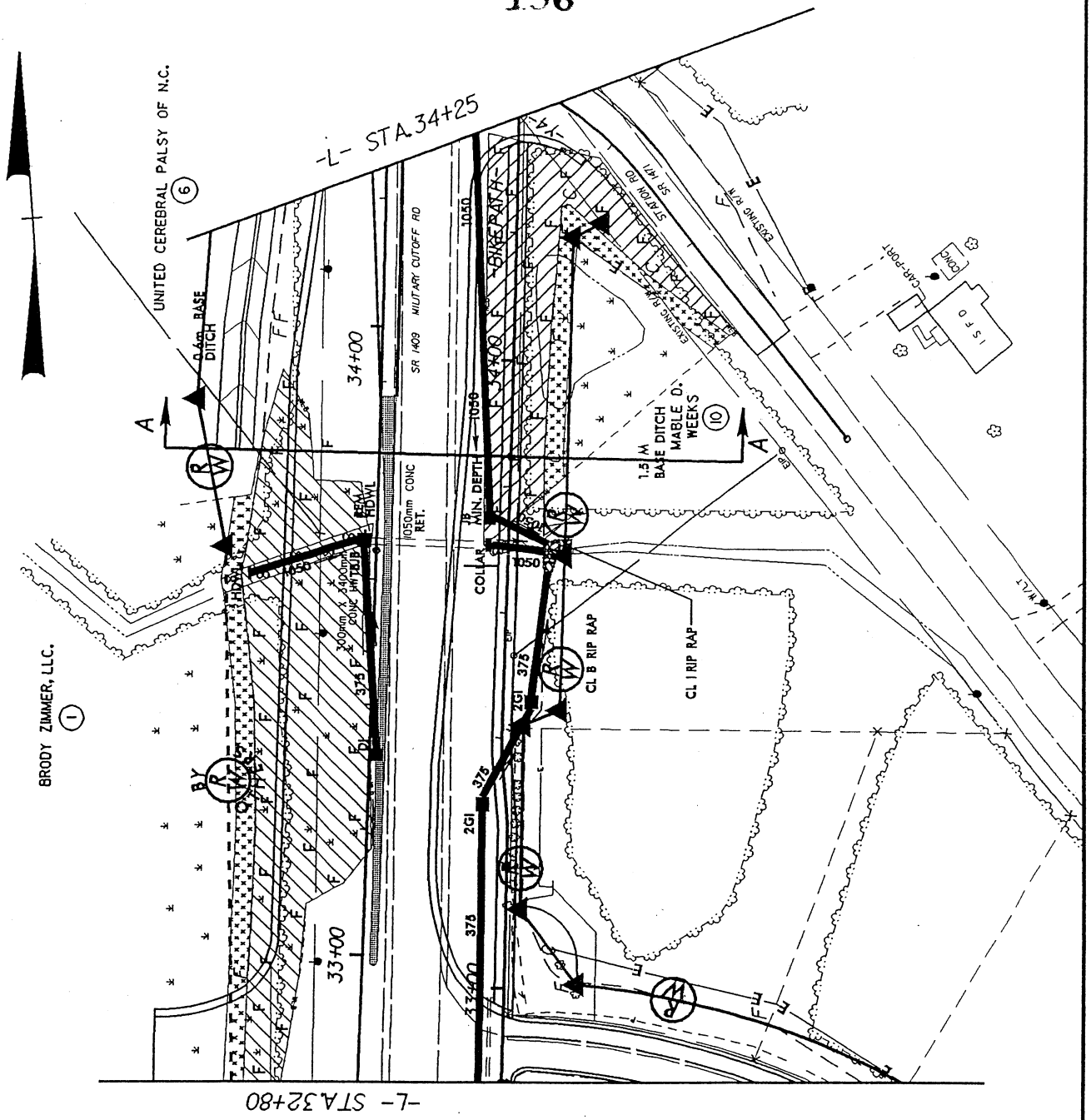
NEW HANOVER COUNTY

PROJECT 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 19 OF 34

9/03



10 0 20

SCALE (METERS)

DENOTES FILL IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

PLAN VIEW
SITE 3

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

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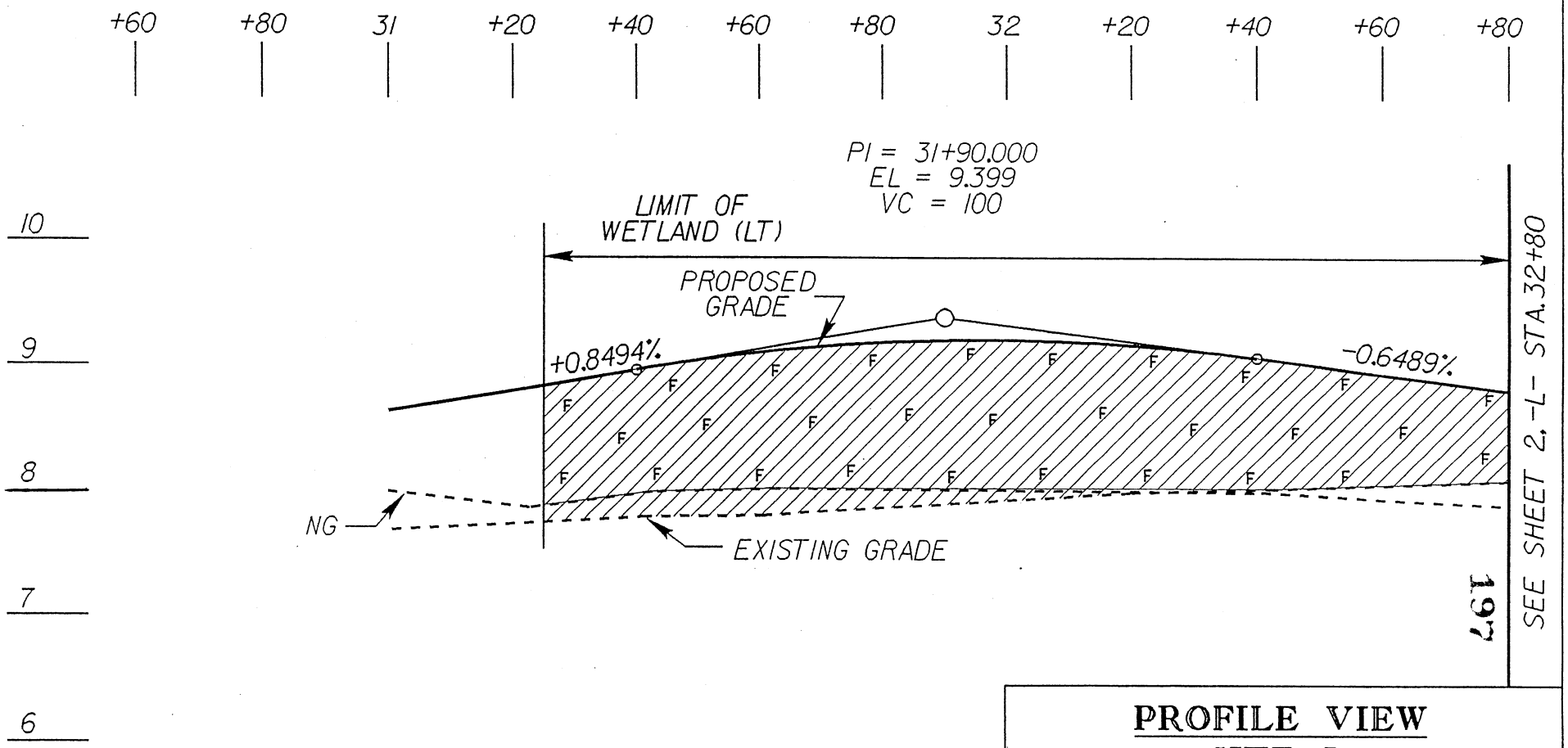


10 0 20

HORIZONTAL SCALE
(in meters)

0.5 0 1

VERTICAL SCALE
(in meters)

F F F

DENOTES FILL
IN WETLAND

PROFILE VIEW
SITE 3

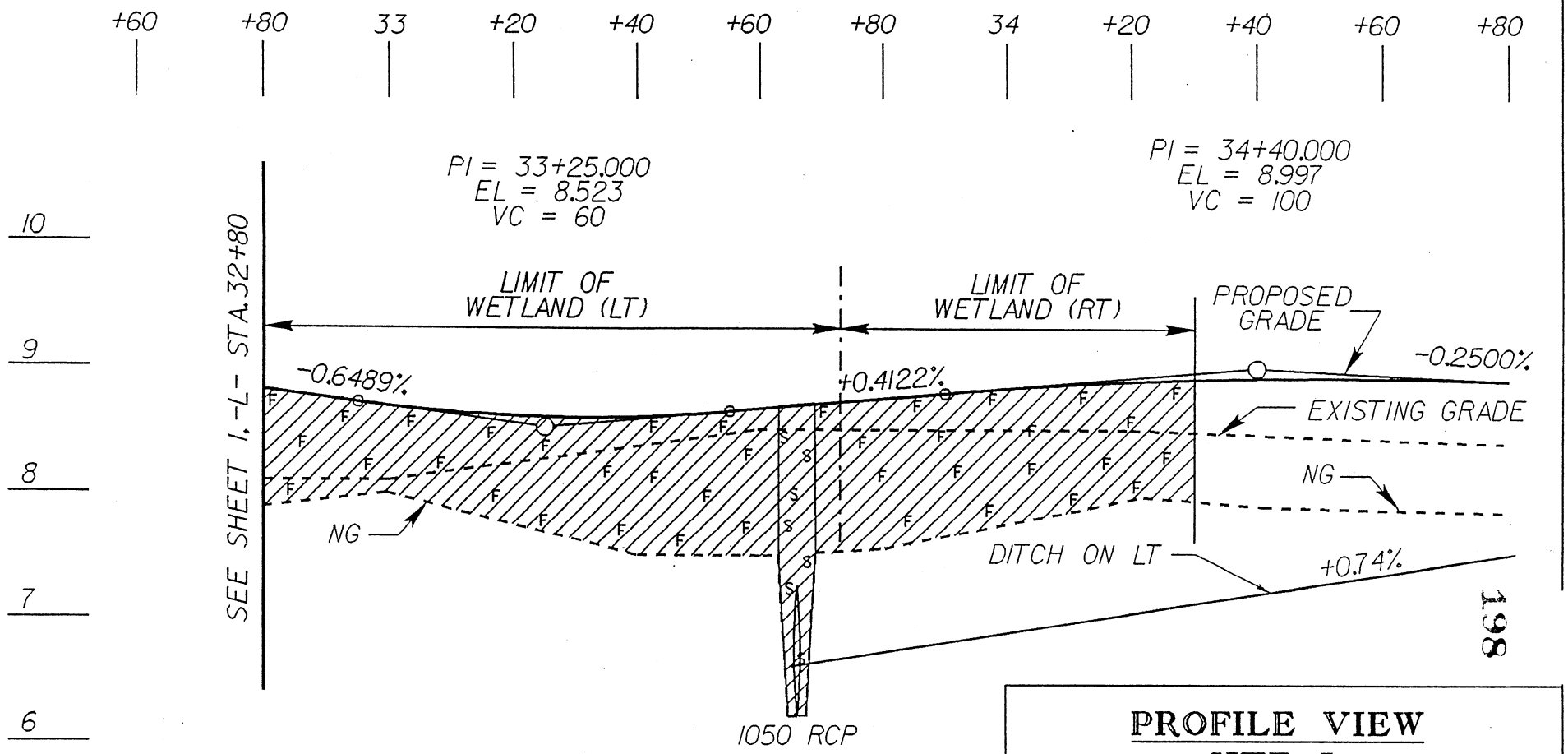
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT: 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 21 OF 34 9/03



10 0 20 HORIZONTAL SCALE (in meters)

0.5 0 1 VERTICAL SCALE (in meters)

F F F DENOTES FILL IN WETLAND

S S S DENOTES FILL IN SURFACE WATER

PROFILE VIEW
SITE 3

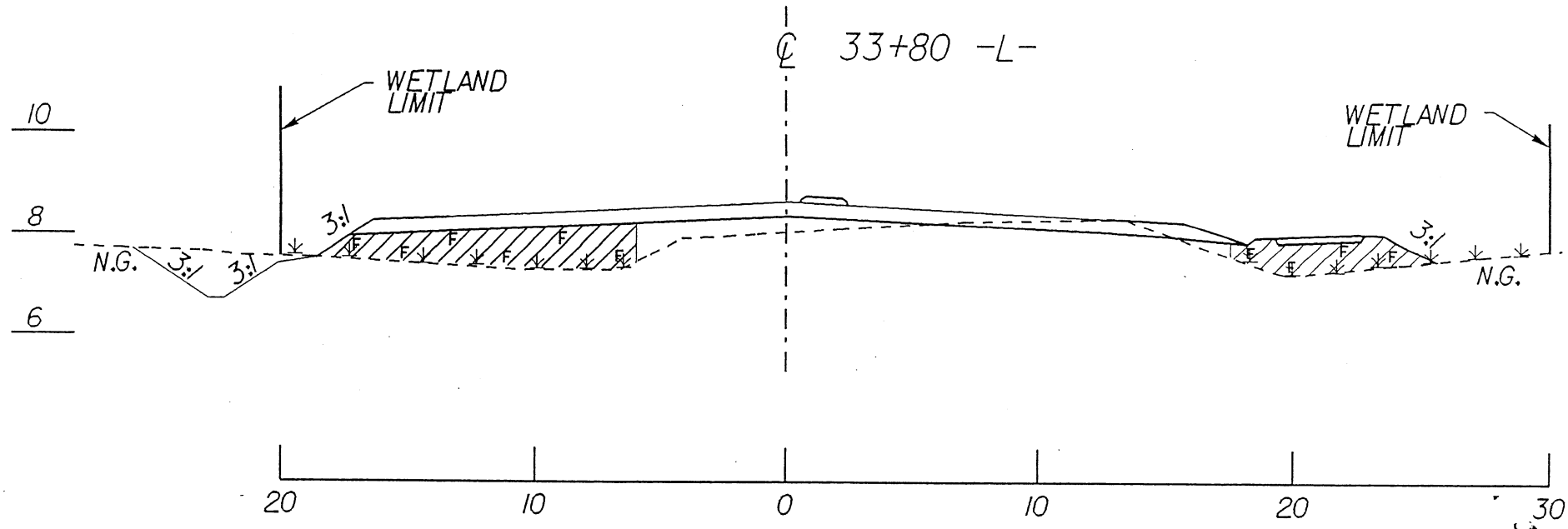
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 22 OF 34 9/03



199

2 0 5

HORIZONTAL SCALE
(in meters)

1 0 3

VERTICAL SCALE
(in meters)

F F F

DENOTES FILL
IN WETLAND

SITE 3

SECTION A-A

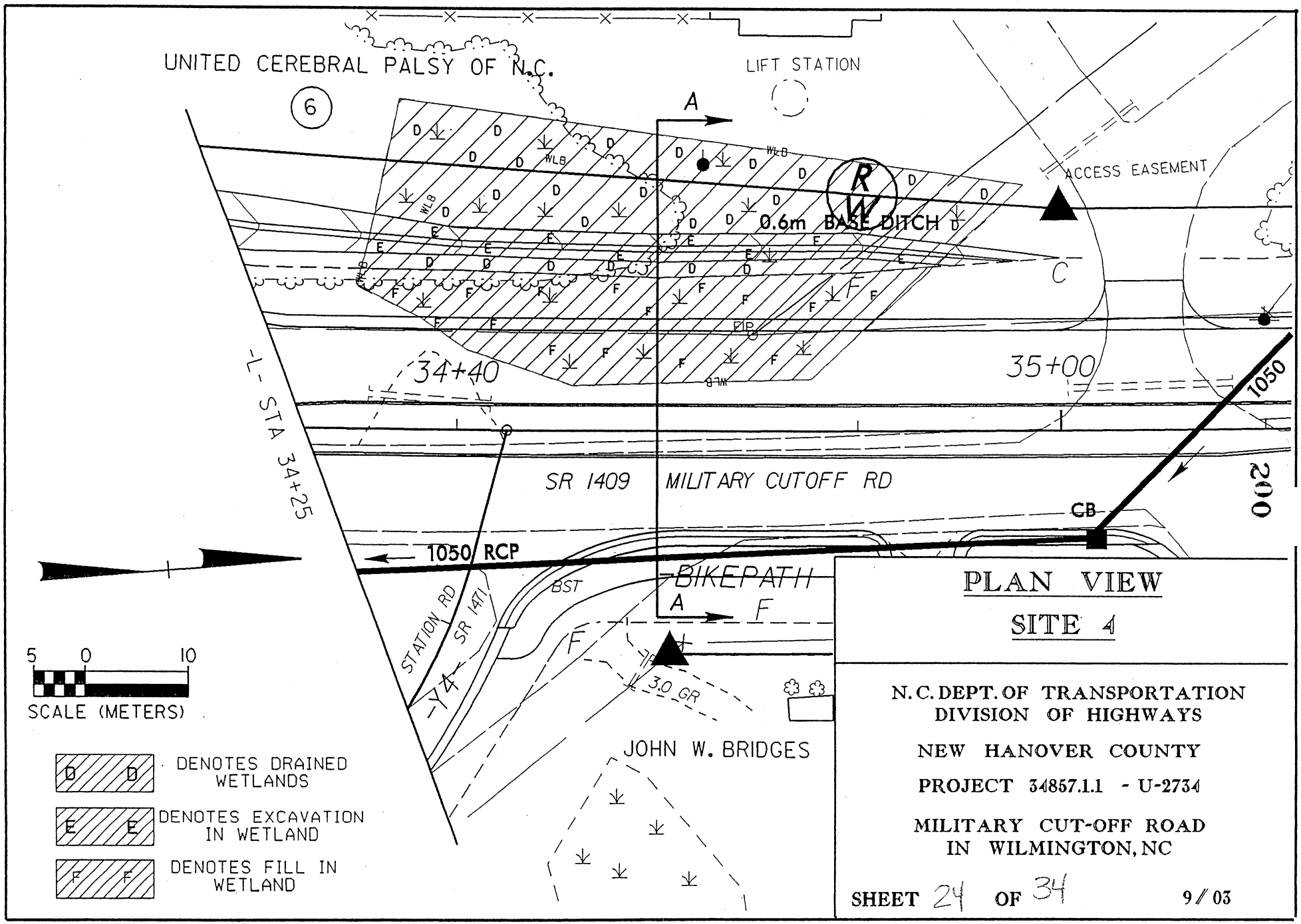
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT: 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 23 OF 34 9/03



PLAN VIEW

SITE 4

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

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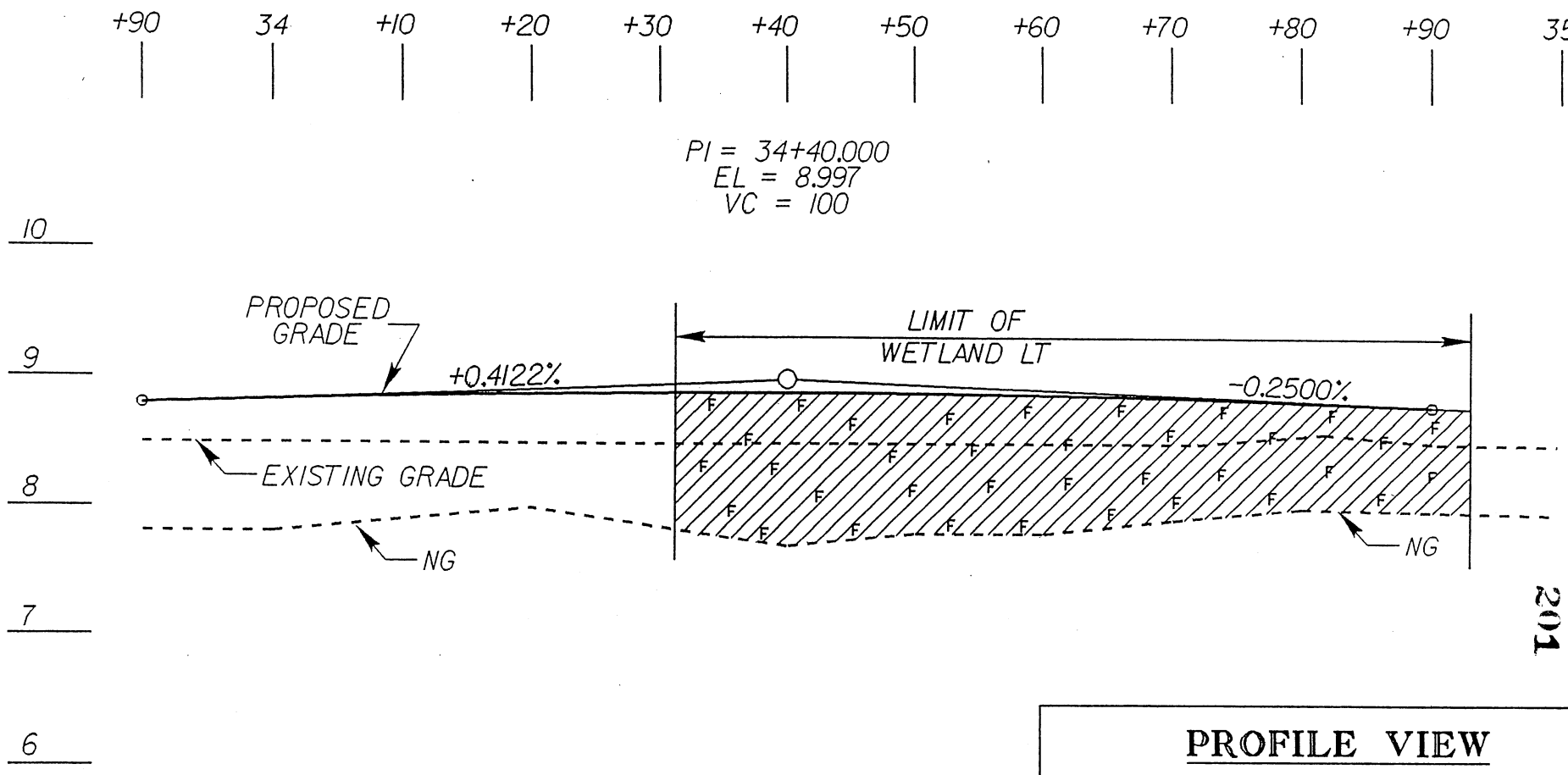


201

5 0 10
HORIZONTAL SCALE
(in meters)

0.5 0 1
VERTICAL SCALE
(in meters)

F F F
DENOTES FILL
IN WETLAND

PROFILE VIEW
SITE 4

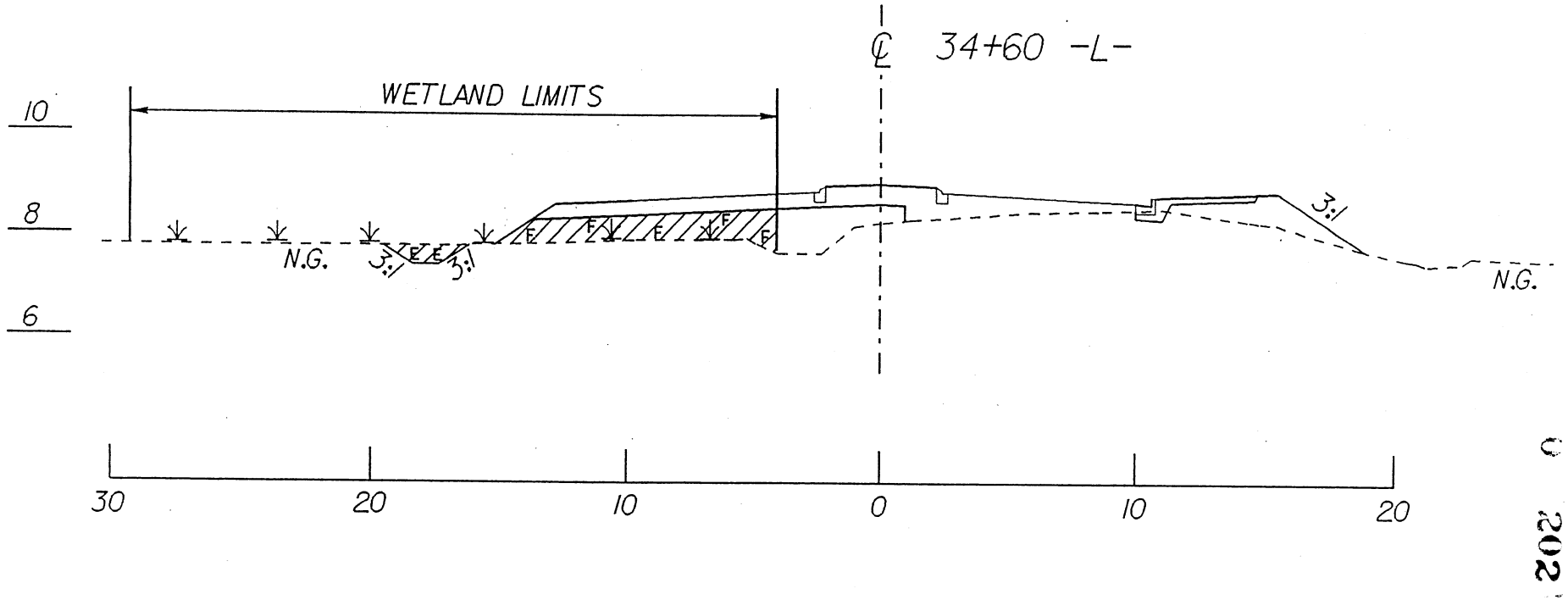
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 25 OF 34 9/03



2 0 5

HORIZONTAL SCALE
(in meters)

1 0 3

VERTICAL SCALE
(in meters)

F F F

DENOTES FILL
IN WETLAND

SITE 4

SECTION A-A

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT: 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 26 OF 34 9/03

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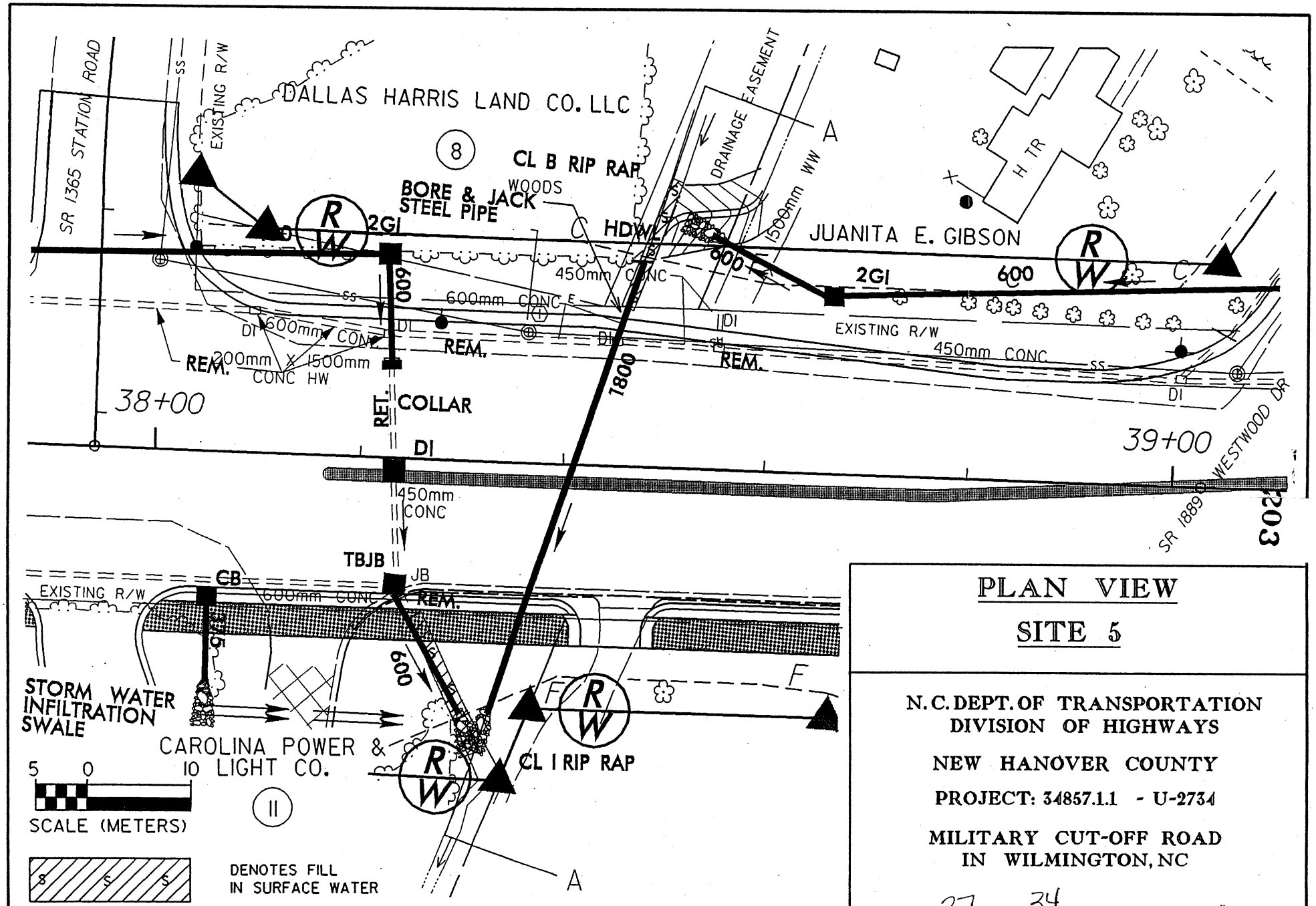


PLAN VIEW

SITE 5

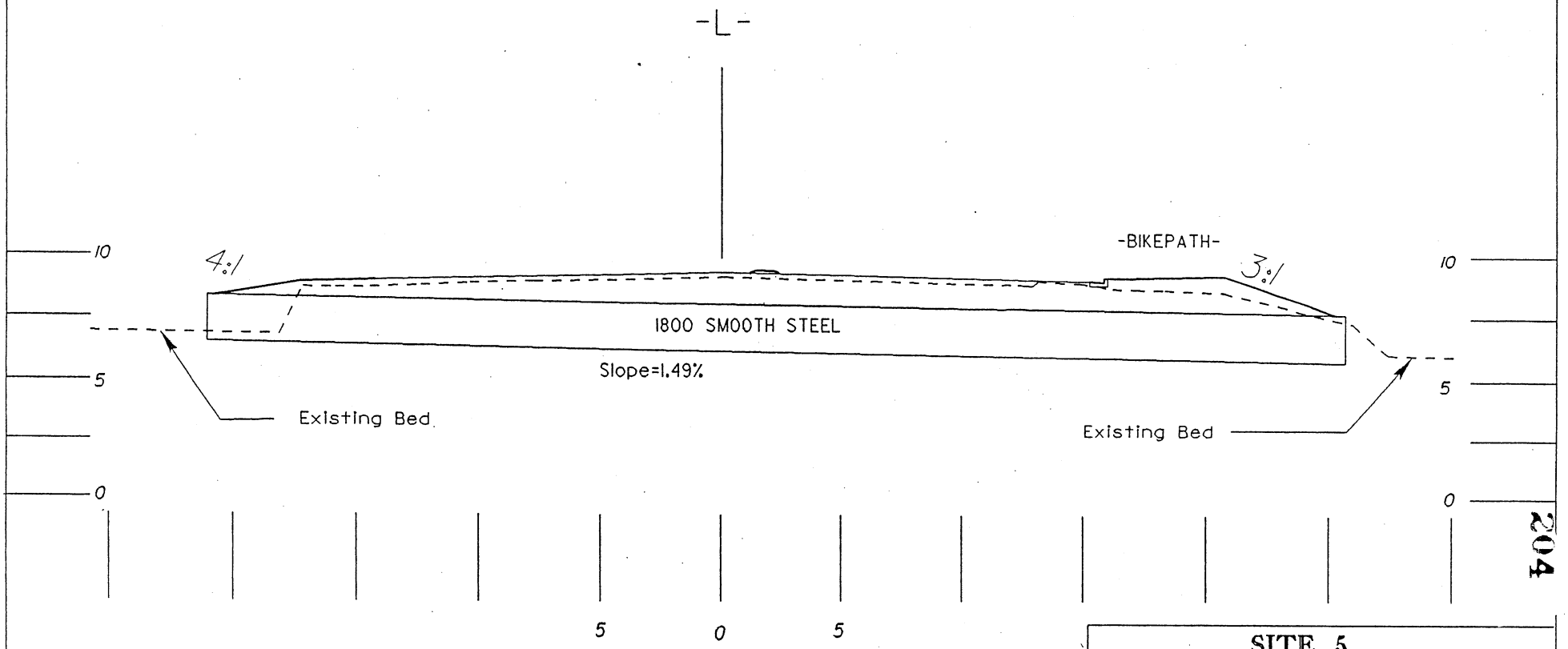
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT: 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 27 OF 34 9/03



2.5m 0 5m HORIZONTAL SCALE

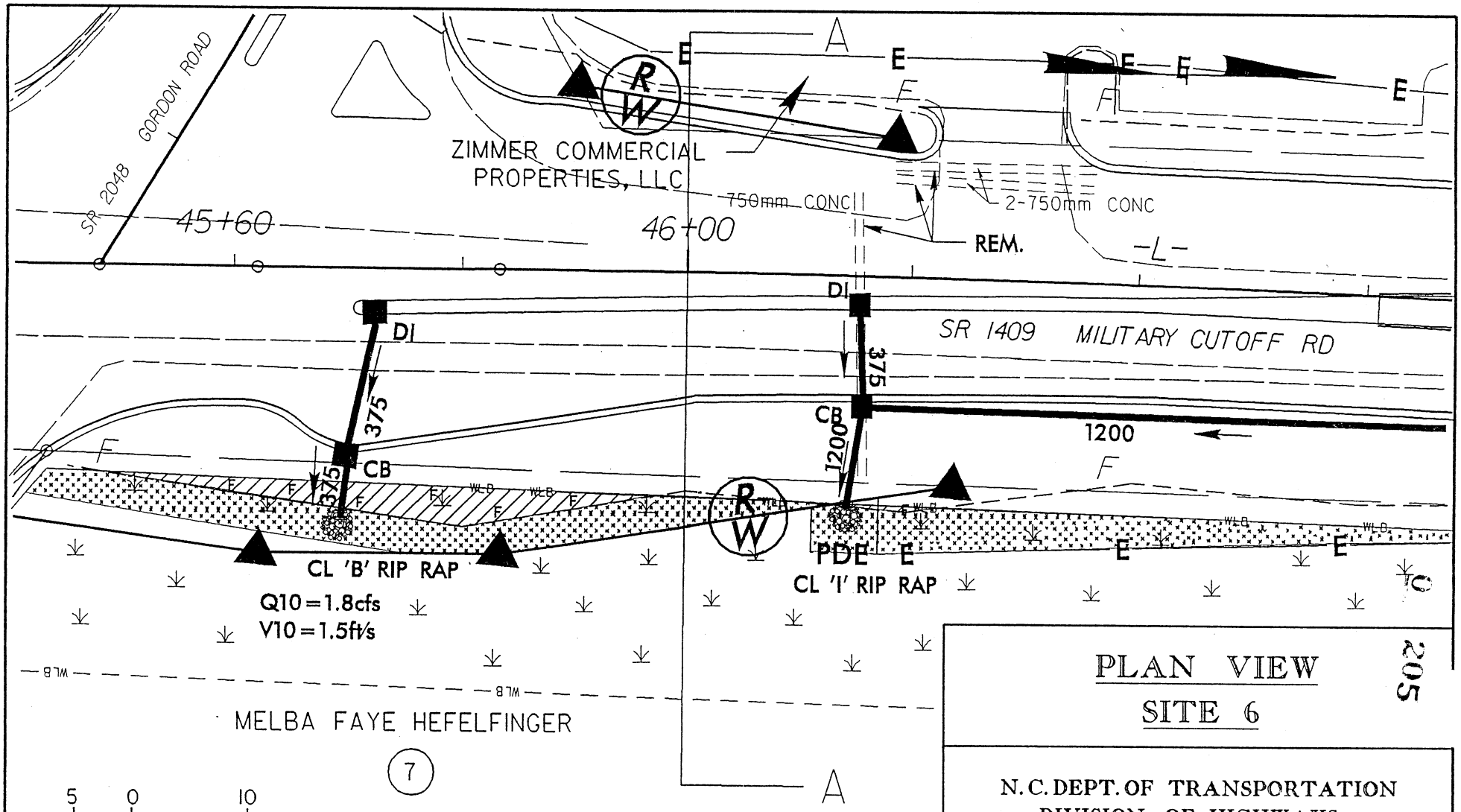
2.5m 0 5m VERTICAL SCALE

SITE 5
SECTION A-A

NCDOT
DIVISION OF HIGHWAYS
NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)
MILITARY CUTOFF ROAD
IN WILMINGTON, NC

SHEET 28 OF 34 9/03



PLAN VIEW
SITE 6

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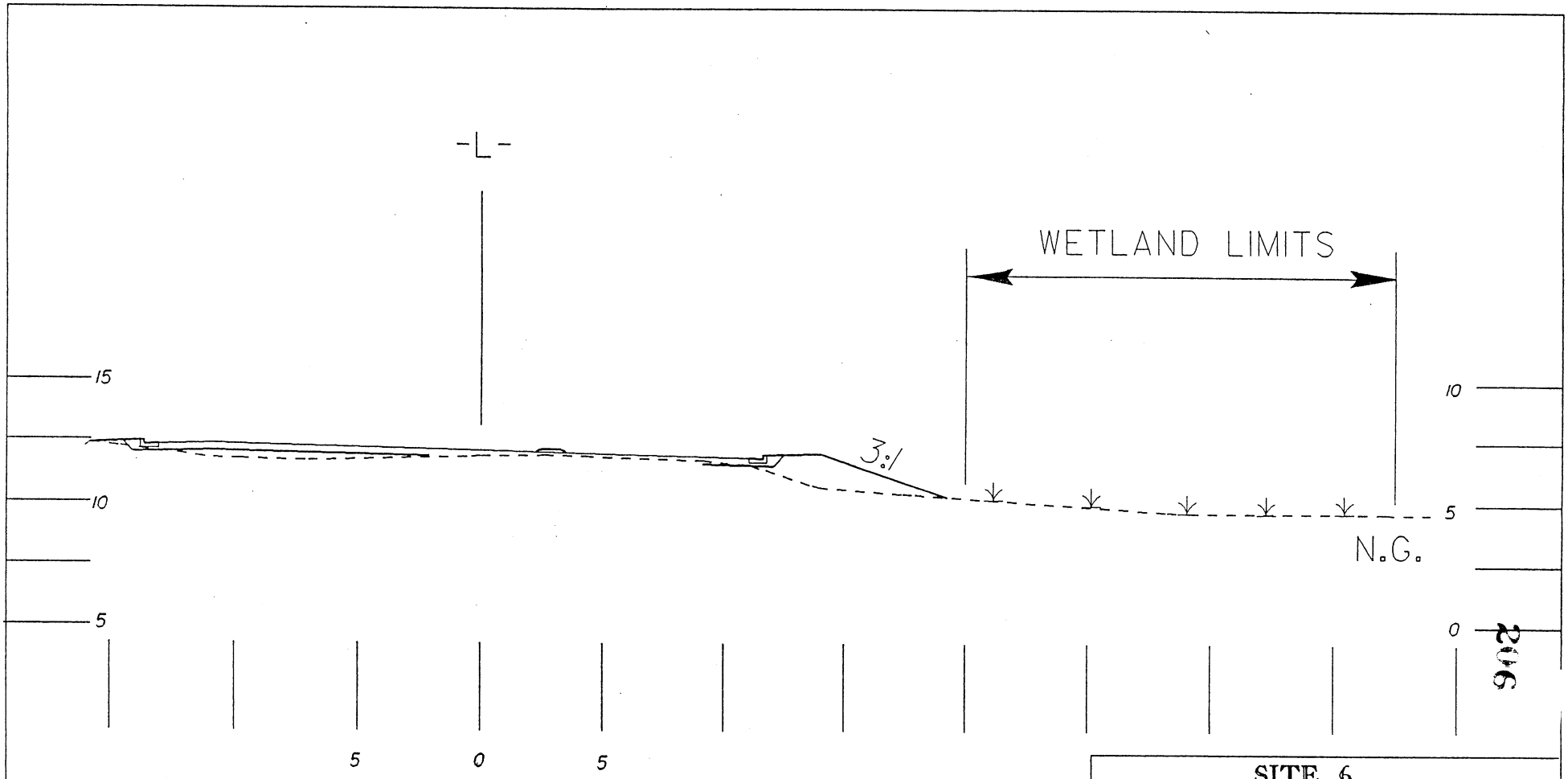
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
NEW HANOVER COUNTY

PROJECT: 34857.1.1 - U-2734
MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 29 OF 34

9/03



206

2.5m 0 5m

HORIZONTAL SCALE

2.5m 0 5m

VERTICAL SCALE

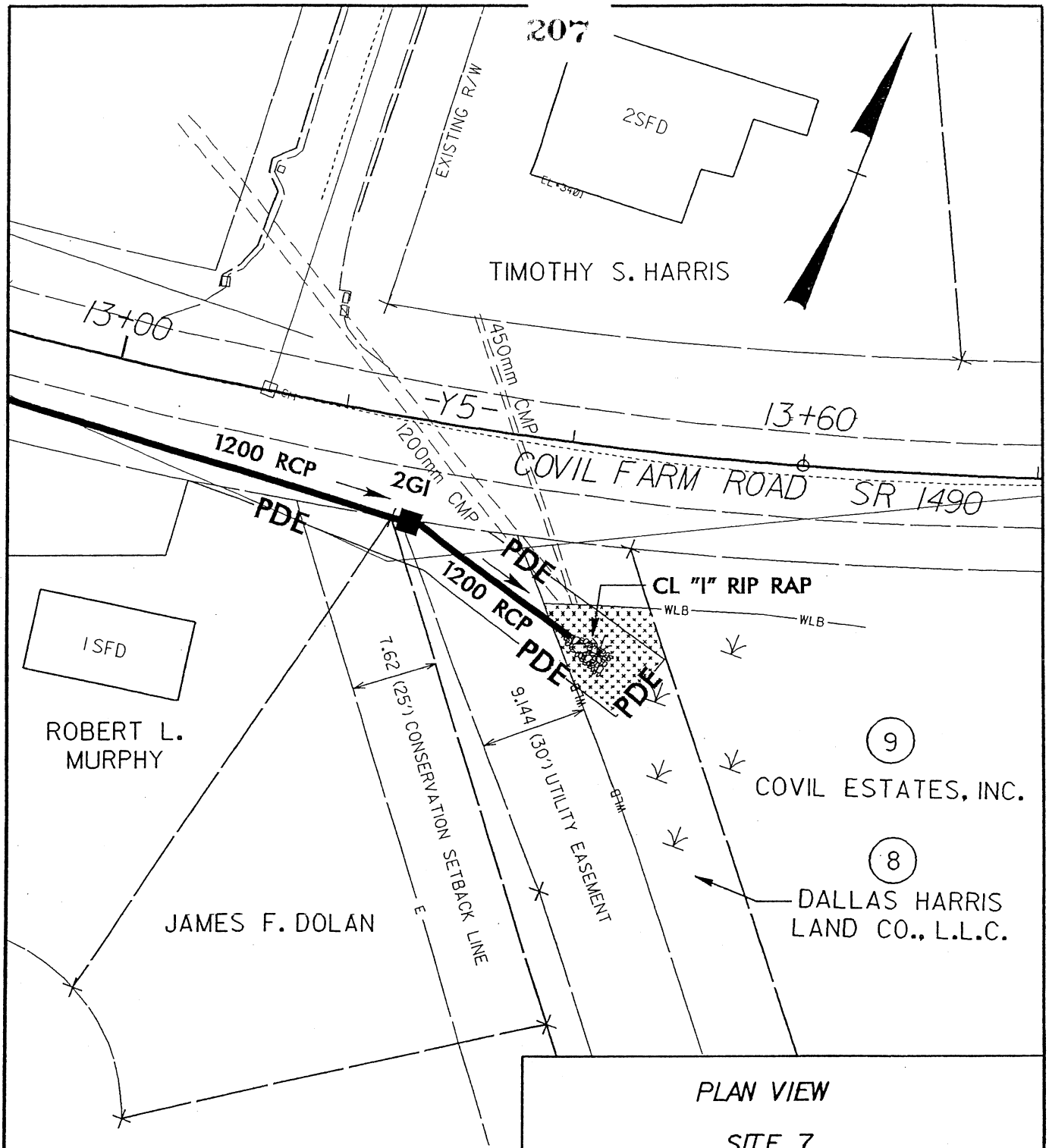
SITE 6
SECTION A-A

NCDOT
DIVISION OF HIGHWAYS
NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)
MILITARY CUTOFF ROAD
IN WILMINGTON, NC

SHEET 30 OF 34

9/03



PLAN VIEW

SITE 7

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT: 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

SHEET 31 **OF** 34

9/03

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation In Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing (Method III) (ac)	SURFACE WATER IMPACTS: Fill In SW (Natural) (ac)	SURFACE WATER IMPACTS: Fill In SW (Pond) (ac)	SURFACE WATER IMPACTS: Temp. Fill In SW (ac)	SURFACE WATER IMPACTS: Existing Channel Impacted (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
1A	13+60 -L- (Lt)	Extend 48" RCP					0.01			30	
1	21+00 (Lt)	2 @ 54"Steel Pipe	0.04			0.02	0.081			1099	*1070
	to 23+44 (Rt) -L-										
2	27+76 to 28+45	2 @ 9' x 7'	0.031		0.02	0.14	0.03			131	
	(Lt & Rt) -L-	RCBC w/ 2' sill									
3	31+25 to 34+30	Extend 42" RCP	0.6			0.15	0.02			128	
	(Lt & Rt) -L-										
4	34+40 to		0.12		** 0.20						
	34+70 (Lt) -L-										
5	38+26 (Rt) to	72" RCP					0.01			92	
	38+50 (Lt) -L-										
6	45+40 to		0.02			0.09					
	46+30 (Rt) -L-										
7	13+40 (Rt) -Y5-	48" RCP				0.02					
TOTALS:			0.81	0	0.22	0.42	0.151	0	0	1480	1070

* Includes 456' of relocated natural stream design + 614' of preserved (in R/W) stream = 1070' Total

** 0.16 Ac Drained + 0.04 Ac Excavated = 0.20 Ac Total

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT: 34857.1.1 (U-2734)
NEW HANOVER COUNTY
MILITARY CUTOFF ROAD

SHEET 32 OF 34

Form Revised 3/22/01

Oct-03

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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)
1A	Sta 13+60 -L- (Lt)	Extend 1200 RCP					0.004			9	
1	21+00 (Lt)	2 @ 1350 Steel Pipe	0.015			0.006	0.034			335	*326
	to 24+50 (Rt) -L-										
2	27+76 to 28+45	2 @ 2.7m x 2.1m	0.127		0.008	0.058	0.011			40	
	(Lt & Rt) -L-	RCBC w/ 0.6m sill									
3	31+25 to 34+30	Extend 1050 RCP	0.242			0.060	0.008			39	
	(Lt & Rt) -L-										
4	34+40 to		0.047		** 0.080						
	34+70 (Lt) -L-										
5	38+26 (Rt) to	1800 RCP					0.004			28	
	38+50 (Lt) -L-										
6	45+40 to		0.009			0.035					
	46+30 (Rt) -L-										
7	13+40 (Rt) -Y5-	1200 RCP				0.008					
TOTALS:			0.440		0.088	0.167	0.061			451	326

* Includes 139m of relocated natural stream design + 187m of preserved (in R/W) stream = 326m Total

** 0.064 Ha Drained + 0.016 Excavated = 0.080 Ha Total

Form Revised 3/22/01

NCDOT

DIVISION OF HIGHWAYS
NEW HANOVER COUNTY
PROJECT: 34857.1.1 (U-2734)

MILITARY CUTOFF ROAD
IN WILMINGTON, NC

SHEET 33 OF 34 Oct-03

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PROPERTY OWNER

PROP. NO.	SITE NO.	OWNER'S NAME	ADDRESS
1	1, 2, 3	BRODY ZIMMER, L.L.C.	3111 PRINCESS ST. WILMINGTON, NC 28401
2	1	TCT OF WILMINGTON, L.L.C.	P.O. BOX 1810 WILMINGTON, NC 28401
3	1	THE GREENWOOD GROUP, INC.	1122 OBERLIN RD. RALEIGH, NC 27605
4	1, 2	RAIFORD G. TRASK, JR.	1202 EASTWOOD RD. WILMINGTON, NC 28403
5	3	W. ALLEN COBB, JR.	P.O. BOX 1064 WILMINGTON, NC 28402
6	4	UNITED CEREBRAL PALSEY OF N.C.	P.O. BOX 27707 RALEIGH, NC 27611
7	6	MELBA HEFELFINGER	62 PELICAN DRIVE WRIGHTSVILLE BEACH, NC 28480
8	1A, 5, 7	DALLAS HARRIS LAND CO., L.L.C.	P.O. BOX 531 WRIGHTSVILLE BEACH, NC 28480
9	7	COVIL ESTATES, INC.	7158 MARKET ST. WILMINGTON, NC 28405
10	3	MABLE D. WEEKS	3413 BELLEVUE RD. RALEIGH, NC 27609
11	5	CP & L (PROGRESS ENERGY)	P.O. BOX 1551 RALEIGH, NC 27602

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)
MILITARY CUT-OFF ROAD
IN WILMINGTON, NC

Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

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Alan W. Klimek, P.E. Director
Division of Water Quality
Coleen H. Sullins, Deputy Director
Division of Water Quality

March 17, 2004

Dr. Gregory J. Thorpe, Manager
Planning and Environmental Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

Re: **Revised** 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act,
Proposed widening of Military Cutoff Road (SR 1409) from North of Eastwood Road (US 74) to Market Street (US 17) in New Hanover County.
WQC Project No. 03-1327
Corps Action ID No. 199701755
TIP Number U -2734

Attached hereto is a copy of a revised Certification No. 3453 issued to The North Carolina Department of Transportation dated March 17, 2004.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

for Alan W. Klimek, P.E.

Attachments

cc: Dave Timpy; Corps of Engineers Wilmington Field Office
Noelle Lutheran, DWQ Wilmington Regional Office
Cathy Brittingham, Division of Coastal Management
Bill Gilmore, Ecosystem Enhancement Program
Central Files
File Copy

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

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NORTH CAROLINA 401 WATER QUALITY CERTIFICATION: REVISED

THIS REVISED 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, Section .0500. This Certification authorizes the NCDOT to place fill material in 1.45 acres of jurisdictional wetlands and 1480 linear feet of streams in New Hanover County. The project shall be constructed pursuant to the application dated October 28, 2003 to construct the widening of Military Cutoff Road.

Wetland & Surface Water Impacts in the Cape Fear River Basin

Section	Non-Riverine (acres)	Stream Impacts (linear feet)	Natural Channel Design (linear feet)
Site 1A	0	30	0
Site 1	0.06	1099	456
Site 2	0.19	131	0
Site 3	0.75	128	0
Site 4	0.32	0	0
Site 5	0	92	0
Site 6	0.11	0	0
Site 7	0.02	0	0
Total	**1.45**	**1480**	**456**

The application provides adequate assurance that the discharge of fill material into the waters of the Cape Fear River Basin in conjunction 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, as described in the Public Notice. Should your project change, you are required to notify the DWQ and you may be required to submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If additional wetland or stream impacts occur for this project (now or in the future), then additional compensatory mitigation will 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, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire three years from the date of the cover letter from DWQ or on the same day as the expiration date of the corresponding Corps of Engineers Permit, whichever is sooner.

Condition(s) of Certification:

1. Construction must be conducted in such a manner as to prevent a significant increase in turbidity outside the area of construction or construction-related discharge. 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 assure compliance with the appropriate turbidity water quality standard.
   a. The erosion and sediment control measures for the project must equal or exceed the proper design, installation, operation and maintenance outlined in the most recent version of the North Carolina Sediment and Erosion Control Planning and Design Manual. These devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
   b. For borrow pit sites, the erosion and sediment control measures must equal or exceed the proper design, installation, operation and maintenance outlined in the most recent version of the North Carolina Surface Mining Manual. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.

2. 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 after the Division of Land Resources has released the project;

3. The NCDOT shall strictly adhere to sediment and erosion control Best Management Practices as described for High Quality Waters entitled "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0124) throughout design and construction of the entire project (TIP U-2734).

4. The outside edge of the buffer, 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 buffer, wetland or water prior to any land disturbing activities.

5. If an environmental document is required, this Certification is not valid until a FONSI or ROD is issued by the State Clearinghouse. All water quality-related conditions of the FONSI or ROD shall become conditions of this Certification;

6. No live or fresh concrete shall come into contact with waters of the state until the concrete has hardened.

7. There shall be no excavation from or waste disposal into jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit. Should waste or borrow sites be located in wetlands or stream, compensatory mitigation will be required since it is a direct impact from road construction activities.

8. All channel relocations will be constructed in a dry work area, and stabilized before stream flows are diverted. Channel relocations will be completed and stabilized prior to diverting water into the new channel. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. Vegetation used for bank stabilization shall be limited to native woody species, and should include establishment of a 30-foot wide wooded and an adjacent 20-foot wide vegetated buffer on both sides of the relocated channel to the maximum extent practical. A transitional phase incorporating coir fiber and seedling establishment is allowable. Also, rip-rap may be allowed if it is necessary to maintain the physical integrity of the stream, but the applicant must provide additional, written justification and any calculations used to determine the extent of rip-rap coverage requested.

9. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers.

10. All temporary fills in wetlands and surface waters shall be removed upon completion of the project. In addition, the post-construction removal of any temporary bridge structures or fill will need to return the project site to its pre-construction contours and elevations. The revegetation of the impacted areas with appropriate native species will be required.

11. Riparian vegetation must be reestablished within the construction limits of the project by the end of the growing season following completion of construction.

12. The dimension, pattern and profile of the stream above and below the crossing should not be modified by widening the stream channel or reducing the depth of the stream. Disturbed floodplains and streams should be restored to natural geomorphic conditions.

13. Any riprap used must not interfere with the location or dimensions of the stream's thalweg or aquatic life passage during low flow conditions.

14. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials.

15. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited.

16. NCDOT, and its authorized agents, shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State 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.

17. A copy of this Water Quality Certification shall be posted on the construction site at all times. In addition, the Water Quality Certification (and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager.

18. 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. This may require increasing the size of the culvert to meet flow conveyance requirements. 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.

*19. Compensatory mitigation shall be done for impacts to 1.45 acres of jurisdictional non-riverine wetlands. At a replacement ratio of 2:1, 2.90 acres of mitigation for non-riverine wetlands shall be provided. Performance of mitigation through use of the NC Ecosystem Enhancement Program is hereby approved. An effort shall be made to provide the wetland mitigation in the Howe Creek watershed. If suitable mitigation sites are not available for use in the Howe Creek watershed, then EEP shall provide a minimum of 1.45 acres of restoration of non-riverine wetlands in the Hydrologic Cataloging Unit 03030001040010 or 03030001040020 by July 22, 2005. The EEP will provide 14.5 acres of preservation in the Southern Outer Coastal Plain by July 22, 2005 and half of the proposed preservation mitigation would be available at that time for mitigation for other project impacts. Flexible wetland mitigation in the Howe Creek watershed is acceptable to the Division of Water Quality to meet a portion of this requirement.

20. Compensatory mitigation shall be done for impacts to 1044 linear feet of streams. At a replacement ratio of 1:1, 1044 linear feet of mitigation for streams shall be provided. 456 linear feet of streams shall be mitigated through the use of on-site restoration (at a replacement ratio of 1:1) of a UT to Howe Creek. The restoration shall be constructed in accordance with a final design approved by the NC Division of Water Quality. If the NC Division of Water Quality does not comment on or approve the previously submitted on-site stream mitigation plan by April 15, 2004, then that plan is automatically approved. In addition, mitigation for 122 linear feet of streams shall be provided through the use of on-site preservation of 614 linear feet of streams (preservation ratio of 5:1).

*Finally, 902 linear feet of streams shall be mitigated through the use of off-site stream mitigation. Performance of mitigation through use of the NC Ecosystem Enhancement Program is hereby approved. An effort shall be made to provide the stream mitigation in the Howe Creek watershed. If suitable mitigation sites are not available for use in the

Howe Creek watershed, then EEP shall notify DWQ of the search results and shall provide a minimum of 902 linear feet of stream mitigation in the Hydrologic Cataloging Unit 03030001040010 or 03030001040020 by July 22, 2005. Flexible stream mitigation in the Howe Creek watershed is acceptable to the Division of Water Quality to meet a portion of this requirement.

* 21. Two copies of the final construction drawings shall be furnished to NCDWQ prior to the pre-construction meeting. Written verification shall be provided along with these final construction drawings. This confirmation must state that the final construction drawings comply with the attached permit drawings contained in the application dated October 28, 2003.

* 22. 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.

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 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

If this Certification is unacceptable to you have the right to an adjudicatory hearing upon written request within sixty (60) days following receipt of this Certification. This request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-76714. If modifications are made to an original Certification, you have the right to an adjudicatory hearing on the modifications upon written request within sixty (60) days following receipt of the Certification. Unless such demands are made, this Certification shall be final and binding.

This the 17th day of March 2004

DIVISION OF WATER QUALITY

for Alan W. Klimek, P.E.

WQC No. 3453

Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources
Alan W. Klimek, P.E. Director

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Certificate of Completion

DWQ Project No.: _____ County: _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

Certificate of Completion

Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return this certificate to the 401/Wetlands Unit, North Carolina Division of Water Quality, 1650 Mail Service Center, Raleigh, NC, 27699-1621. This form may be returned to DWQ by the applicant, the applicant's authorized agent, or the Project Engineer. It is not necessary to send certificates from all of these.

Applicant's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature:_____ Date:_____

Agent's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature:_____ Date:_____

If this project was designed by a Certified Professional

I, _____, as a duly registered Professional _____ (i.e., Engineer, Landscape Architect, Surveyor, etc.) in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project, for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature _____ Registration No._____

Date _____

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NCDENR

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Michael F. Easley, Governor | **Charles S. Jones, Director** | William G. Ross Jr., Secretary

March 18, 2004

Colonel Charles R. Alexander
U.S. Army Corps of Engineers
Wilmington District
P.O. Box 1890
Wilmington, NC 28402-1890

Reference: TIP No. U-2734. Widening of Military Cutoff Road (SR 1409) from North of Eastwood Road (US 74) to Market Street (US 17) in New Hanover County. USACE Public Notice issued on 12/8/03. Action ID No. 199701755.

Dear Colonel Alexander:

The N.C. Division of Coastal Management (DCM) has completed its review of the above referenced Public Notice pursuant to 15 CFR 930 Subpart D, Consistency for Activities requiring a Federal License and NC Executive Order 15, Consistency for State Activities. As part of its review, DCM has also circulated the U.S. Army Corps of Engineers' (USACE) public notice to state agency reviewers for comment.

According to the USACE public notice issued on 12/8/03, the USACE is reviewing an application from the N.C. Department of Transportation (NCDOT) to widen Military Cutoff Road (SR 1409) from two lanes to a four lane divided facility with a raised median from Drysdale Drive to US 17 (Market Street). From Drysdale Drive to 0.2 miles north of Drysdale Drive and from Station Road to Paradise Way, a four-lane divided with raised median roadway with grassed shoulders is proposed on the west side and curb and gutter is proposed along the east side of Military Cutoff. From 0.2 miles north of Drysdale Drive to Station Road, a four-lane grassed shoulder section is proposed. From Paradise Way to US 17, a four-lane curb and gutter section is proposed. A 10-foot wide bicycle and pedestrian path is proposed along the east side of Military Cutoff from Drysdale Drive to the Gordon Road Extension project (TIP Project No. U-2725)

According to the USACE public notice issued on 12/8/03, the proposed project crosses Howe Creek and four of its unnamed tributaries. The portion of Howe Creek and its tributaries within the project have been assigned a DWQ Index No. of 18-87-23 and best usage classification of SA, ORW. Waters with a classification of SA, ORW are defined as High Quality Waters by the North Carolina Division of Water Quality.

According to the USACE public notice issued on 12/8/03, construction of the proposed project will permanently impact 1.45 acres of non-riverine wetlands and 1480 feet of jurisdictional stream associated with Howe Creek. Permanent impacts to jurisdictional wetlands are summarized as follows: wet pine flatwoods (0.06 acres); bottomland hardwoods (0.32 acres); and pond pine woodland (1.07 acres). The NCDOT is proposing to use onsite mitigation opportunities and the North Carolina Ecosystem Enhancement Program (EEP) to provide the necessary compensatory mitigation for the unavoidable wetland and stream impacts associated with this project.

DCM has determined that the proposed project as described in the USACE public notice issued on 12/8/03 **is consistent** with the North Carolina Coastal Management Program provided the following conditions are met:

1. NCDOT shall comply with the Stormwater Permit (No. SW8 030816) issued on 10/20/03 by the N.C. Division of Water Quality (DWQ) under stormwater management rules of the Environmental Management Commission.

2. NCDOT shall comply with the revised Water Quality Certification No. 3453 (DWQ Project No. 03-1327) issued on 3/17/04 by the N.C. Division of Water Quality (DWQ).

*3. In accordance with NCDOT's permit application for Section 404 and 401 permits dated 10/28/03, compensatory mitigation for 1.45 acres of non-riverine wetland impacts will be provided by the North Carolina Ecosystem Enhancement Program (EEP).

4. In accordance with the NCDOT letter to the Ecosystem Enhancement Program dated 2/6/04, compensatory mitigation for 1480 feet of stream impacts will be as follows: Natural channel design and relocation of 456 linear feet of stream impacted within Site 1 of U-2734 at a mitigation ratio of 1:1; preservation of 614 linear feet of stream within the Site 1 right-of-way of U-2734 at a mitigation ratio of 5:1; and compensatory mitigation provided by the EEP for the remaining 902 linear feet of stream impacts.

5. This project must comply with the Design Standards in Sensitive Watersheds, 15A NCAC 4B .0124.

6. In accordance with NCDOT's cover letter for the Section 404 and 401 permit application dated 10/28/03, construction related impacts associated with the proposed action will be minimized through the use of High Quality Waters erosion and sediment control measures.

7. The permittee shall follow Best Management Practices for the protection of Surface Waters and sedimentation and erosion control measures sufficient to protect aquatic resources.

8. In accordance with NCDOT's cover letter for the Section 404 and 401 permit application dated 10/28/03, the project shall not result in any temporary wetland impacts.

9. Culverts and pipes must be designed to allow for aquatic life and fish passage. The inverts of all pipes and culverts that are placed within streams appearing as blue lines on United States Geological Survey (USGS) quad sheets must be buried at least one foot below normal bed elevation.

10. The inverts of culverts and pipes that are not placed within streams appearing as blue lines on United States Geological Survey (USGS) quad sheets must be buried a minimum of one foot below the bed of the stream for pipes and culverts greater than 48 inches in diameter, and must be buried below the bed of the stream to a depth equal to or greater than 20 percent of the diameter of the pipe or culvert for pipes and culverts that are 48 inches in diameter or smaller to allow for aquatic life passage. These measurements must be based on natural thalweg depths.

11. The dimension, pattern and profile of the stream above and below the base flow barrel(s) should not be modified by widening the stream channel or reducing the depth of the stream.

12. Riprap placed for bank stabilization should be limited to the streambank below the high water mark, and vegetation should be used for stabilization above the high water elevation.

13. Heavy equipment should be operated from the bank rather than in the stream channel in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into the streams.

14. If concrete is used during construction, adequate precautions must be taken to prevent direct contact between wet (uncured) concrete and stream water due to the potential for elevated pH that can cause a fish kill. Water that has contacted uncured concrete should not be discharged to surface waters.

15. Discharging hydroseeding mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is strictly prohibited.

16. In accordance with comments received from the N.C. Division of Land Resources, all DOT land disturbing activity must be in compliance with the N.C. Sedimentation Pollution Control Act and conform with the Memorandum of Understanding that DOT has with the N.C. Division of Land Resources.

17. Any relocation of utility lines that is not already depicted on the workplan drawings, or described within the permit application, will require approval by DCM, either under the authority of this consistency determination, or by the utility company obtaining separate authorization.

In addition to the above conditions, DCM also offers the following comments.

- If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). This may be accomplished by utilizing sills on the upstream end to restrict or divert flow to the base flow barrel(s) during low flows to accommodate fish movement. Install alternating or notched baffles in a manner that mimics existing stream pattern. This should enhance aquatic life passage by depositing sediments in the barrel, maintaining channel depth and flow regimes, and providing resting places for fish and other aquatic organisms. In essence, base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.

- Stormwater should be routed to buffer areas and not discharge directly to the streams.

If you have any questions regarding DCM's finding or conditions, please contact Cathy Brittingham at (919) 733-2293 x238 or via e-mail at Cathy.Brittingham@ncmail.net. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

Doug Huggett
for
Charles S. Jones

Cc: Dave Timpy, USACE
John Hennessy, NCDWQ
Linda Lewis, NCDWQ
Jim Gregson, NCDCM
Bill Arrington, NCDCM
Travis Wilson, NCWRC
Elizabeth Lusk, NCDOT
Bill Gilmore, NCDENR-EEP

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

October 20, 2003

Gregory J. Thorpe, Ph.D., Director
NCDOT, PDEA
1548 Mail Service Center
Raleigh, NC 27699-1548

Subject: **Permit No. SW8 030816**
U-2734 Military Cutoff Widening
Other Stormwater Permit
Linear Public Road / Bridge Project
New Hanover County

Dear Mr. Thorpe:

The Wilmington Regional Office received a complete Stormwater Management Permit Application for U-2734 Military Cutoff Widening on October 13, 2003. Staff review of the plans and specifications has determined that the project, as proposed, will comply with the Stormwater Regulations set forth in Title 15A NCAC 2H .1000. We are forwarding Permit No. SW8 030816 dated October 20, 2003, for the construction of the subject project.

This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within thirty (30) days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings, P.O. Drawer 27447, Raleigh, NC 27611-7447. Unless such demands are made this permit shall be final and binding.

If you have any questions, or need additional information concerning this matter, please contact either Linda Lewis or me at (910) 395-3900.

Sincerely,

Rick Shiver

Rick Shiver
Water Quality Regional Supervisor

RSS/arl: S:\WQS\STORMWAT\PERMIT\030816.oct03
cc: David Thomas, P.E., NCDOT Division Maintenance Engineer
Marshall Clawson, P.E.
Tony Roberts, New Hanover County Building Inspections
Beth E. Wetherill, New Hanover County Engineering
Division of Coastal Management
Linda Lewis
Wilmington Regional Office
Central Files

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WATER QUALITY

STATE STORMWATER MANAGEMENT PERMIT

OTHER PERMIT

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules and Regulations

PERMISSION IS HEREBY GRANTED TO

Gregory J. Thorpe, NCDOT PDEA

U-2734 Military Cutoff Widening

New Hanover County

FOR THE

construction of a public road in compliance with the provisions of 15A NCAC 2H .1000 (hereafter referred to as the *"stormwater rules")* and the approved stormwater management plans and specifications, and other supporting data as attached and on file with and approved by the Division of Water Quality and considered a part of this permit.

The Permit shall be effective from the date of issuance until rescinded and shall be subject to the following specific conditions and limitations:

I. DESIGN STANDARDS

1. The runoff from the impervious surfaces has been directed away from surface waters as much as possible.

2. The amount of built-upon area has been minimized as much as possible.

3. Best Management Practices (BMP) are employed which minimize water quality impacts. Approved BMP's include hazardous spill basins, grassed swales, raised inlets in ditches to reduce the amount of runoff that enters Howe Creek and encourage infiltration and deposition of sediments, natural stream design, stream restoration, and use of wetlands to filter runoff.

4. Approved plans and specifications for projects covered by this permit are incorporated by reference and are enforceable parts of the permit.

5. Vegetated roadside ditches have 3:1 or flatter side slopes.

II. SCHEDULE OF COMPLIANCE

1. The permittee shall at all times provide adequate erosion control measures in conformance with the approved Erosion Control Plan.

2. The permittee shall submit all information requested by the Director or his representative within the time frame specified in the written information request.

3. The Director may notify the permittee when the permitted site does not meet one or more of the minimum requirements of the permit. Within the time frame specified in the notice, the permittee shall submit a written time schedule to the Director for modifying the site to meet minimum requirements. The permittee shall provide copies of revised plans and certification in writing to the Director that the changes have been made.

4. The permittee shall submit to the Director and shall have received approval for revised plans, specifications, and calculations prior to construction for the following items:

   a. Major revisions to the approved plans, such as road section, road realignment, deletion of any proposed BMP, changes to the drainage area or scope of the project, etc.
   b. Project name change.
   c. Redesign of, addition to, or deletion of, the approved amount of built-upon area, regardless of size.
   d. Alteration of the proposed drainage.

5. The Director may determine that other revisions to the project should require a modification to the permit.

6. The permittee shall at all times provide the operation and maintenance necessary to assure that the permitted BMP's function at optimum efficiency. The following items shall be considered minimum procedures:

   a. Grass height shall not exceed 6".
   b. Drop inlets, ditches, wetlands, and pipes shall be kept clear of trash.
   c. Eroded areas shall be repaired and reseeded in a timely manner.
   d. Accumulated sediment shall be removed.

III. GENERAL CONDITIONS

1. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to an enforcement action by the Division of Water Quality, in accordance with North Carolina General Statutes 143-215.6A to 143-215.6C.

2. The permit issued shall continue in force and effect until revoked or terminated.

3. The permit may be modified, revoked and reissued or terminated for cause. The filing of a request for a permit modification, revocation and reissuance, or termination does not stay any permit condition.

4. The issuance of this permit does not prohibit the Director from reopening and modifying the permit, revoking and reissuing the permit, or terminating the permit as allowed by the laws, rules, and regulations contained in Title 15A of the North Carolina Administrative Code, Subchapter 2H.1000; and North Carolina General Statute 143-215.1 et. al.

5. The issuance of this permit does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other government agencies (local, state and federal) which have jurisdiction.

Permit issued this, the 20th day of October, 2003

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Alan W. Klimek, P.E., Director
Division of Water Quality
By Authority of the Environmental Management Commission

8/20/03 | 42[illegible] | Permit Number [illegible]

225

State of North Carolina
Department of Environment and Natural Resources
Division of Water Quality

JAN 21 2003

DIVISION OF HIGHWAYS
HYDRAULICS UNIT

STORMWATER MANAGEMENT PERMIT APPLICATION FORM

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
LINEAR ROADWAY PROJECT

This form may be photocopied for use as an original.

DWQ Stormwater Management Plan Review:
A complete stormwater management plan submittal includes this application form, a supplement form for each BMP proposed (see Section V), design calculations, and plans and specifications showing all road and BMP details.

I. PROJECT INFORMATION

NCDOT Project Number: 8.2251001 (U-2734) County: New Hanover

Project Name: Military Cutoff Road

Project Location: Wilmington, North Carolina

Contact Person: Mr. Marshall Clawson Phone: (919) 250-4100 Fax: 250-4108

Receiving Stream Name: Howe Creek River Basin: Intra-coastal waterway Class: ORW

Proposed linear feet of project: 12,375 feet

Proposed Structural BMP and Road Station *(attach a list of station and BMP type if more room is needed)*:

Hazardous Spill Basins: Station -L- 27+60 right and Station -L-28+60 right / Raised inlets in ditches / natural stream design

Type of proposed project: *(check all that apply)*: / Stream restoration / bury pipes

☐ New ☑ Widening ☐ 2 lane* ☑ 4 lane* ☑ Curb and Gutter ☐ Bridge Replacement

☑ Other *(Describe)* Bicycle path on east side of roadway

**2 lane and 4 lane imply that roadside ditches are used unless Curb and Gutter is also checked.*

II. REQUIRED ITEMS CHECKLIST

Initial in the space provided below to indicate the following design requirements have been met and supporting documentation is attached. Supporting documentation shall, at a minimum, consist of a brief narrative description including (1) the scope of the project, (2) how the items below are met, (3) how the proposed best management practices minimize water quality impacts, and (4) any significant constraints and/or justification for not meeting a, b, c and d to the maximum extent practicable.

Designer's Initials

GNS a. The amount of impervious surface has been minimized as much as possible.

GNS b. The runoff from the impervious areas has been diverted away from surface waters as much as possible.

GNS c. Best Management Practices are employed which minimize water quality impacts.

GNS d. Vegetated roadside ditches are 3:1 slope or flatter.

See Stormwater Management Plan (Attached)

III. OPERATION AND MAINTENANCE AGREEMENT

I acknowledge and agree by my initials below that the North Carolina Department of Transportation is responsible for the implementation of the four maintenance items listed. I agree to notify DWQ of any operational problems with the BMP's that would impact water quality or prior to making any changes to the system or responsible party.

Maintenance Engineer's Initials

DT a. BMP's shall be inspected and maintained in good working order.

DT b. Eroded areas shall be repaired and reseeded as needed.

DT c. Stormwater collection systems, including piping, inlets, and outlets, shall be maintained to insure proper functioning.

Maintenance Engineer's Name: DAVID L. THOMAS, SR. P.E.

Title: DIVISION MAINTENANCE ENGINEER

IV. APPLICATION CERTIFICATION

I, *(print or type name)* _____ of _____ Branch, certify that the information included on this permit application form is, to the best of my knowledge, correct and that the project will be constructed in conformance with the approved plans and that the proposed project complies with the requirements of 15A NCAC 2H .1000.

Title: Environmental Unit Head

Address: 1598 Mail Service Center, Raleigh, NC 27699-1548

Signature: D. Lambert Cuthbertson Date: 8-11-03

V. SUPPLEMENT FORMS

The applicable state stormwater management permit supplement form(s) listed below must be submitted for each BMP specified for this project. Contact the Stormwater and General Permits Unit at (919) 733-5083 for the status and availability of these forms.

Form SWU-102	Wet Detention Basin Supplement
Form SWU-103	Infiltration Basin Supplement
Form SWU-104	Low Density Supplement
Form SWU-105	Curb Outlet System Supplement
Form SWU-106	Off-Site System Supplement
Form SWU-107	Underground Infiltration Trench Supplement
Form SWU-108	Neuse River Basin Supplement
Form SWU-109	Innovative Best Management Practice Supplement
Form SWU-110	Extended Dry Detention Basin Supplement

STORMWATER MANAGEMENT PLAN

Project: 8.2251001, TIP No. U-2734 6/10/03
New Hanover County
Hydraulics Project Manager: Gus N. Saparilas and William T. Stephens, Jr., P.E. (TGS Engineers), Galen Cail, P.E. (NCDOT Hydraulics Unit)

ROADWAY DESCRIPTION

The project involves the widening of SR 1409 (Military Cutoff Road) in New Hanover County from just north of US 74 (Eastwood Road) to US 17 (Market Street). The overall length of the project is approximately 2.33 miles. The existing roadway is a predominately 30-foot wide roadway with two 12-foot wide lanes and 2-foot paved shoulders. The existing roadway has been widened in places to accommodate turning lanes due to heavy development along the route. With Project U-2734, it is proposed to widen Military Cutoff Road to a four-lane, shoulder section roadway with a raised grass median. Curb and gutter is proposed to be added to the section along the east side of the roadway starting at -L- Station 34+60 +/- to US 17 and to the west side of the roadway from -L- Station 43+60 +/- to US 17. A 10-foot bicycle path is also proposed along the majority of the east side of the project. The project crosses one stream, (Howe Creek) and a box culvert is proposed at this crossing. The project drainage system consists of cross pipes, grated inlets and associated pipe systems, and side and lateral stormwater ditches and swales.

ENVIRONMENTAL DESCRIPTION

The project is located in the Cape Fear River Basin. The one stream crossing along the project is of Howe Creek at approximate -L- Station 28+12. Howe Creek is designated as an Outstanding Resource Water (ORW) by the Department of Coastal Management and the Division of Water Quality. There are seven wetland sites that will be impacted by the proposed project. Wetland impacts will be kept to a minimum by symmetrical widening of the roadway.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

The primary goal of Best Management Practices (BMPs) is to prevent degradation of the states surface waters by the location, construction and operation of the highway system. BMPs are activities, practices and procedures taken to prevent or reduce stormwater pollution. The BMPs and measures that will be used on this project to reduce stormwater impacts are grassed swales, raised grated inlets in ditch lines, hazardous spill basins and natural stream design. In addition, the proposed 2-barrel box culvert at Howe Creek will be buried 1-foot below the stream bed with a sill installed in one barrel to maintain the normal stream flow and channel characteristics. Infiltration basins were considered as required by the Division of Water Quality during the initial phase of the stormwater management plan. However, the infiltration basins were determined to be an unfeasible measure due to the high water tables in the project area.

The following summarizes the BMPs to be used on the proposed project:

GRASSED SWALES

Grassed swales are proposed at various locations as indicated below in the table. In addition, typical cut ditches and the ditch between the proposed roadway and bicycle path will also be used for stormwater storage by raising grated inlets 6-inches above the ditch bed.

The following table summarizes the location and storage potential for grassed swales and ditches proposed for the project.

Grassed Swale and Ditch Stormwater Runoff Storage

Location of Swale Station to Station	Lt or Rt	Storage Volume (cu. ft) (6" uniform depth)	Pavement Runoff Storage (inches)	Swale Description
-L- 16+80+/- to 18+40+/-	LT	150	0.10	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 17+00+/- to 18+47+/-	RT	122	0.07	"V"- 6:1 FRONT, 3:1 BACK SLOPE
-L- 18+90+/- to 19+60+/-	RT	185	0.25	"V"- 6:1 FRONT, 3:1 BACK SLOPE
-L- 19+00+/- to 20+47+/-	LT	185	0.10	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 21+00+/- to 21+90+/-	RT	246	0.26	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 21+90+/- to 23+20+/-	RT	540	0.46	"V"- 6:1 FRONT, 6:1 BACK SLOPE
-L- 22+00+/- to 23+00+/-	LT	985	0.50	2 FT BASE, 3:1 SLOPES
-L- 23+20+/- to 24+40+/-	RT	493	0.35	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 24+80+/- to 25+50+/-	LT	288	0.24	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 24+80+/- to 25+50+/-	RT	308	0.38	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 25+50+/- to 26+50+/-	LT	370	0.26	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 25+50+/- to 26+50+/-	RT	512	0.52	"V"- 6:1 FRONT, 6:1 BACK SLOPE
-L- 26+60+/- to 27+80+/-	RT	328	0.28	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 27+80+/- to 28+77+/-	RT	288	0.35	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 28+78+/- to 29+80+/-	RT	226	0.29	"V"- 6:1 FRONT, 3:1 BACK SLOPE
-L- 28+80+/- to 30+00+/-	LT	225	0.20	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 30+00+/- to 31+00+/-	LT	144	0.15	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 30+00+/- to 31+80+/-	RT	185	0.11	"V"- 6:1 FRONT, 3:1 BACK SLOPE
-L- 35+40+/- to 37+00+/-	LT	675	0.52	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 35+50+/- to 38+22+/-	RT	1412	0.37	2 FT BASE, 3:1 SLOPES
-L- 37+00+/- to 37+84+/-	LT	356	0.37	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 38+65+/- to 41+20+/-	LT	1080	0.43	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 40+20+/- to 41+30+/-	RT	270	0.14	"V" - 3:1 SLOPES
-L- 41+68+/- to 43+40+/-	LT	850	0.28	2 FT BASE- 4:1 FR., 3:1 B. SLOPE
-L- 41+70+/- to 44+20-/+	RT	1278	0.31	2 FT BASE, 3:1 SLOPES

RAISED GRATED INLETS

Where practicable, grated inlets in proposed grassed swales, cut ditches and the ditch between the roadway and the bicycle path will be raised 6-inches above the ditch line to promote stormwater storage and infiltration.

HAZARDOUS SPILL BASINS

Hazardous spill basins will be provided on both sides of the Howe Creek crossing at approximately -L- Station 27+60 RT and -L- Station 28+60 RT. The function of these basins will be to aid in the containment and cleanup of a potential accidental hazardous spill. These basins will not be used as a storage device during a normal rainfall event. A mechanical gate will be installed at outlet end of the basin to interrupt and contain normal free flow of runoff in the event of a hazardous spill.

NATURAL STREAM DESIGN

It appears that the stream left of -L- Station 21+00 once crossed Military Cutoff Road and connected with the remnant stream to the right of -L- Station 21+40. Presently, the stream on the left has been channelized into a straight lateral roadway ditch for approximately 650 feet before crossing under Military Cutoff Road and connecting back to the natural stream on the right. It was recommended during a field review by the NCDOT and agency personnel to install a pipe across Military Cutoff Road from the existing live stream on the left of the roadway to the remnant stream on the right at a point further south, thus providing restoration. Natural stream design methods in accordance with those recommended in, "Applied River Morphology" (Rosgen, 1996) will be used to relocate the filled in stream on the right from Station 21+46 to Station 22+07 –L- Rt and from Station 22+80 to Station 23+44 –L- Rt. The length of the natural stream design is approximately 456 feet. The length of restored remnant stream is approximately 246 feet.

BOX CULVERT

At -L- Station 28+14 an existing double line of 72-inch corrugated metal pipes will be replace by a double barrel 9-foot by 7-foot reinforced concrete box culvert. The normal stream flow and channel characteristics will be maintained at the crossing by burying the culvert inverts 1-foot below the stream bed and installing a sill in one barrel to divert low flow through the other barrel. Additionally, 36-inch overflow pipes will be installed in the floodplain on each side of the box culvert to aid floodplain and wetland drainage between the two sides of the roadway.

Two locations where BMP devices are not proposed are on the east side of Military Cutoff Road from -L- Station 13+00 to 17+00 and from -L- Station 45+00 to the end of project. Existing heavy development in these two areas prohibits the use of such devices. Additionally, at the end of the project in the intersection of Military Cutoff Road and US 17 there are properties with groundwater contamination from a service station. A sealed, watertight drainage system will be required in this area in order to prevent combining of the contaminated groundwater and the stormwater. The drainage system which collects stormwater runoff from -L- Station 45+00 to the end of the project will be discharged at approximately -L- Station 46+00 RT into a wetlands area which will aid in the filtration of stormwater before it reaches a receiving stream.

Subject: Minutes from Interagency Hydraulic Design Review Meeting on March 28, 2002 for U-2734 (Military Cutoff Road Widening), New Hanover County

Participants:

Marshall Clawson, NCDOT Hydraulics	John Hennessey, NCDWQ
Galen Cail, NCDOT Hydraulics	Cathy Brittingham, NCDCM
David Chang, NCDOT Hydraulics	Bill Arrington, NCDCM
Sue Flowers, NCDOT Roadway	Howard Hall, USFWS
Anthony West, NCDOT Roadway	Gus Saparilas, TGS Engineers
Dave Timpy, USACE	Bill Stephens, TGS Engineers
Lindsey Riddick, NCDOT PD & EA	

The meeting began with the distribution of the Stormwater Management Plan and a review of the overall project layout. Marshall Clawson and Bill Stephens proceeded to review each redline plan sheet and field agency comments and questions. The question/comments are summarized as follows:

1) Wetland and Stream Impacts at Howe Creek: The wetland limits at Howe Creek need be reinvestigated. Additional delineation may be required to determine which side is more suitable for hazardous spill basins (East or West side of Military Cutoff Road). Lindsey Riddick will check delineation. It was also questioned whether stormwater could even outlet in the wetlands or within 575' on each side of Howe Creek since it is considered an Outstanding Resource Water and falls under CAMA jurisdiction. Cathy Brittingham investigated and informed that, since no CAMA permit is required for this section of Howe Creek (non-navigatable) and it is not an AEC, stormwater can outlet within the 575' buffer and in the wetlands. However, velocities must be non-erosive.

It was determined to keep the proposed hazardous spill basins on the east side of Military Cutoff based on the following:

- *-The extent of the wetland boundaries are comparable on either side of the road*
- *-The basins will not impact the wetlands except for the minimal ditching required to enable the basin riser pipe to outlet*
- *-The future Mayfaire development has proposed detention in the Southwest quadrant of the crossing*
- *-The east side of Military Cutoff is the downstream side of the crossing and thus the discharge in the basins will not have to pass back through the proposed box culvert.*

2) Hazardous Spill Basins at Howe Creek: Dave Timpy emphasized the importance of constructing the basins on the side which will result in the least impact to the wetlands. John Hennessey wanted to know what treatment is provided since the hazardous spill basin is not a treatment facility. He was informed that treatment is acquired as stormwater traverses to the basins through grassed swales and also through storage provided by raised grated inlets (6" at each inlet) in the swales. John also emphasized that outlet velocities into the Howe Creek basin need to be non-erosive and flow spreaders should be considered. Also the basins, as designed, need to be relocated out of the wetlands.

See above responses.

3) Environmental Issues from Prior Review Meetings: Dave Timpy expressed concern that stormwater issues brought up in prior meetings and summarized in memos dated 10/2/200 and 12/5/00 may not have been addressed. He said these issues should have already been incorporated in the plans or justification provided as to why not. The memos will be reviewed and these issues will be addressed in the plans, if they have not been so.

The environmental commitments have been reviewed and will be adhered to including the addition of hazardous spill basins and overflow pipes at Howe Creek, retention in the ditches along the bike path, and the relocation/reconnection of the jurisdictional stream at the beginning of the project with natural stream design.

4) Proposed Pipe Culverts at Sta 21+43 –L- with Natural Stream Design: Bill Stephens and Marshall Clawson informed that the existing stream flowing towards Military Cutoff Road Sta 21+00 –L- (Lt) does not traverse under the road to Sta 21+90 –L- (Rt) as it seemingly should do based on the natural alignment of the stream. However, pipes are proposed to do so along with natural stream design (nsd) for those portions of stream impacted. All agency representatives wanted information detailing the nsd including stream morphology, typicals, and alignment.

NSD info provided in permit.

5) System Sta 35+10 –L- Examined: The 1050 RCP system crossing at Sta 35+10 –L- which outlets at Sta 33+66 –L- (Rt) was questioned as to it's sufficiency at stormwater treatment. It was explained that additional treatment is limited by the proximity of development to the roadway and the lack of suitable outlets. To route the stormwater in a swale would require a deep channel and would impact a building along –L- (Rt) and would impact additional wetlands along –L- (Lt).

6) System Along –Y5 (Covil Farm Road) Right: The system along Covil Farm Road right was explained to be necessary due to the poor condition of the existing ditch right and the constraints of the site development to improve this ditch. Therefore, the system was provided to eliminate future erosion of this ditch. Dave Timpy

questioned whether wetlands were present at the proposed outlet of this system. Lindsey Riddick will investigate to see if delineation has been done or whether if it will need to be. John Hennessey emphasized that if wetlands are present the outlet velocities need to be non-erosive.

System was relocated to left side of road to reduce R/W impacts. Wetlands were delineated at the outlet of the system by Lindsey. Class I rip rap used at outlet.

7) Potential Mitigation Site at Sta 46+00 –L- (Rt) (Hefelfinger Property): Dave Timpy mentioned the Hefelfinger property as a potential mitigation site that had been discussed in the past. The potential acquisition of this site will be investigated by the PD & EA Unit.

8) Sealed System at Intersection of Military Cutoff Road and Market Street: Bill and Marshall pointed out that a sealed system is proposed from Sta 48+83 to the End of Project in the vicinity of the Mid State Petroleum, Inc. property due to the presence of contaminated soil. Agency representatives seemed satisfied with the system.

C201251 January 1, 2002

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.

C201251 MARCH 20, 2001

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:

Restricted Noxious Weed	Limitations per Lb. Of Seed	Restricted Noxious Weed	Limitations per Lb. of Seed
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

C201251 03-16-04

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.

C201251 June 28, 1977

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%

FHWA-1273 Electronic version -- March 10, 1994

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

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 a approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. **Apprentices and Trainees (Programs of the U.S. DOT):**

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. **Withholding:**

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. **Overtime Requirements:**

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. **Violation:**

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. **Withholding for Unpaid Wages and Liquidated Damages:**

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. **Compliance with Copeland Regulations (29 CFR 3):**

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. **Payrolls and Payroll Records:**

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;

(3) that each laborer or mechanic has been paid not less that the applicable wage rate and fringe benefits or cash equivalent for the classification of worked performed, as specified in the applicable wage determination incorporated into the contract.

e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

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 that $10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.

3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. **Instructions for Certification - Primary Covered Transactions:**

(Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

2. **Instructions for Certification - Lower Tier Covered Transactions:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions of $25,000 or more - 49 CFR 29)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

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

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

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

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

C201251

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, & Draglne (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 : New Hanover

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	0000900000-N	SP	GENERIC MISCELLANEOUS ITEM BRICK ENTRANCE TO LANDFALL SUBDIVISION	Lump Sum	L.S.	
0004	0050000000-M	226	SUPPLEMENTARY CLEARING & GRUBBING	0.4 HA		
0005	0057000000-M	226	UNDERCUT EXCAVATION	4,220 M3		
0006	0063000000-N	SP	GRADING	Lump Sum	L.S.	
0007	0080000000-M	SP	CLASS IV SUBGRADE STABILIZATION	650 MTN		
0008	0106000000-M	230	BORROW EXCAVATION	38,000 M3		
0009	0134000000-M	240	DRAINAGE DITCH EXCAVATION	1,180 M3		
0010	0195000000-M	265	SELECT GRANULAR MATERIAL	8,840 M3		
0011	0196000000-M	270	FABRIC FOR SOIL STABILIZATION	13,500 M2		
0012	0199000000-M	SP	TEMPORARY SHORING	20 M2		
0013	0206000000-M	SP	TEMPORARY SHORING - BARRIER SUPPORTED	40 M2		
0014	0245000000-M	SP	GENERIC GRADING ITEM CONTAMINATED GROUNDWATER DISPOSAL	97,000 L		
0015	0306000000-M	300	SELECT MATERIAL, CLASS III	1,475 MTN		
0016	0318000000-M	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	1,260 MTN		
0017	0360000000-M	310	300MM RC PIPE CULVERTS, CLASS III	16.8 M		
0018	0366000000-M	310	375MM RC PIPE CULVERTS, CLASS III	931.6 M		

County : New Hanover

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0019	0372000000-M	310	450MM RC PIPE CULVERTS, CLASS III	918 M		
0020	0378000000-M	310	600MM RC PIPE CULVERTS, CLASS III	443.8 M		
0021	0384000000-M	310	750MM RC PIPE CULVERTS, CLASS III	266.4 M		
0022	0390000000-M	310	900MM RC PIPE CULVERTS, CLASS III	270 M		
0023	0396000000-M	310	1050MM RC PIPE CULVERTS, CLASS III	213.6 M		
0024	0402000000-M	310	1200MM RC PIPE CULVERTS, CLASS III	450 M		
0025	0408000000-M	310	1350MM RC PIPE CULVERTS, CLASS III	63.6 M		
0026	0426000000-M	310	1800MM RC PIPE CULVERTS, CLASS III	15.6 M		
0027	0980000000-M	SP	****MM WELDED STEEL PIPE, ****MM THICK, GRADE B, INSTAL-LED BY BORING & JACKING (1050MM, 16MM)	47.2 M		
0028	0980000000-M	SP	****MM WELDED STEEL PIPE, ****MM THICK, GRADE B, INSTAL-LED BY BORING & JACKING (1350MM, 19MM)	48 M		
0029	0980000000-M	SP	****MM WELDED STEEL PIPE, ****MM THICK, GRADE B, INSTAL-LED BY BORING & JACKING (1800MM, 25MM)	31.7 M		
0030	0980000000-M	SP	****MM WELDED STEEL PIPE, ****MM THICK, GRADE B, INSTAL-LED BY BORING & JACKING (900MM, 13MM)	48 M		
0031	0986000000-M	SP	GENERIC PIPE ITEM 375MM DUCTILE IRON DRAINAGE PIPE, PC 350	145.2 M		
0032	0986000000-M	SP	GENERIC PIPE ITEM 600MM DUCTILE IRON DRAINAGE PIPE, PC 350	109.2 M		

County : New Hanover

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0033	0986000000-M	SP	GENERIC PIPE ITEM 750MM DUCTILE IRON DRAINAGE PIPE, PC 350	100.8 M		
0034	0995000000-M	340	PIPE REMOVAL	925.5 M		
0035	0996000000-N	350	PIPE CLEAN-OUT	40 EA		
0036	1022000000-M	SP	SEALING EXISTING PAVEMENT CRACKS	1,200 KG		
0037	1110000000-M	510	STABILIZER AGGREGATE	550 MTN		
0038	1220000000-M	545	INCIDENTAL STONE BASE	2,000 MTN		
0039	1330000000-M	607	INCIDENTAL MILLING	1,000 M2		
0040	1489000000-M	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	1,860 MTN		
0041	1491000000-M	610	ASPHALT CONC BASE COURSE, TYPE B25.0C	17,800 MTN		
0042	1503000000-M	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	22,940 MTN		
0043	1519000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	1,000 MTN		
0044	1523000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	21,790 MTN		
0045	1560000000-M	620	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22	1,984 MTN		
0046	1565000000-M	620	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22	1,308 MTN		
0047	1693000000-M	654	ASPHALT PLANT MIX PAVEMENT REPAIR	680 MTN		
0048	2022000000-M	815	SUBDRAIN EXCAVATION	276 M3		
0049	2033000000-M	815	SUBDRAIN FINE AGGREGATE	207 M3		
0050	2044000000-M	815	150MM PERFORATED SUBDRAIN PIPE	500 M		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0051	2055000000-M	815	150MM SUBDRAIN PIPE WYES, TEES, & ELBOWS	50 EA		
0052	2066000000-N	815	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET	4 EA		
0053	2077000000-M	815	150MM OUTLET PIPE (SUBDRAINS)	8 M		
0054	2190000000-N	828	TEMPORARY STEEL PLATE COVERS FOR MASONRY DRAINAGE STRUCTURE	20 EA		
0055	2209000000-M	838	ENDWALLS	9.7 M3		
0056	2220000000-M	838	REINFORCED ENDWALLS	12.7 M3		
0057	2253000000-M	840	PIPE COLLARS	21.3 M3		
0058	2264000000-M	840	PIPE PLUGS	0.5 M3		
0059	2275000000-M	SP	FLOWABLE FILL	170 M3		
0060	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	147 EA		
0061	2308000000-M	840	MASONRY DRAINAGE STRUCTURES	11.99 M		
0062	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	23 EA		
0063	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	37 EA		
0064	2367000000-N	840	FRAME WITH TWO GRATES, STD 840.29	1 EA		
0065	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	9 EA		
0066	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	15 EA		
0067	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	47 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0068	2396000000-N	840	FRAME WITH COVER, STD 840.54	4 EA		
0069	2440000000-N	840	CONCRETE APRON FOR CATCH BASIN	5 EA		
0070	2451000000-N	840	CONCRETE APRON FOR DROP INLETS	11 EA		
0071	2462000000-M	SP	***MM SLUICE GATE (600MM)	1 EA		
0072	2462000000-M	SP	***MM SLUICE GATE (750MM)	1 EA		
0073	2535000000-M	846	*** X ***MM CONCRETE CURB (600MM X 238MM)	180 M		
0074	2542000000-M	846	450MM CONCRETE CURB & GUTTER	3,060 M		
0075	2549000000-M	846	750MM CONCRETE CURB & GUTTER	3,780 M		
0076	2598000000-M	848	CONCRETE WHEELCHAIR RAMPS	220 M2		
0077	2612000000-M	848	150MM CONCRETE DRIVEWAY	70 M2		
0078	2647000000-M	852	125MM MONOLITHIC CONCRETE IS-LANDS (SURFACE MOUNTED)	2,970 M2		
0079	2800000000-N	858	ADJUSTMENT OF CATCH BASINS	1 EA		
0080	2815000000-N	858	ADJUSTMENT OF DROP INLETS	1 EA		
0081	2830000000-N	858	ADJUSTMENT OF MANHOLES	1 EA		
0082	2905000000-N	859	CONVERT EXISTING DROP INLET TO JUNCTION BOX	3 EA		
0083	3030000000-M	862	STEEL BM GUARDRAIL	259.08 M		
0084	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	10 EA		
0085	3210000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	6 EA		
0086	3270000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350	6 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0087	3380000000-M	862	TEMPORARY STEEL BM GUARDRAIL	80 M		
0088	3389100000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY	2 EA		
0089	3536000000-M	866	CHAIN LINK FENCE, 1200MM FABRIC	820 M		
0090	3542000000-M	866	METAL LINE POSTS FOR 1200MM CHAIN LINK FENCE	224 EA		
0091	3548000000-M	866	METAL TERMINAL POSTS FOR 1200MM CHAIN LINK FENCE	23 EA		
0092	3554000000-M	866	METAL GATE POSTS FOR ****MM CHAIN LINK FENCE, DOUBLE GATE (1200MM)	4 EA		
0093	3565000000-M	866	DOUBLE GATES, ****MM HIGH, ****MM WIDE, ****MM OPENING (1200MM, 1800MM, 3600MM)	2 EA		
0094	3628000000-M	876	PLAIN RIP RAP, CLASS I	146 MTN		
0095	3649000000-M	876	PLAIN RIP RAP, CLASS B	91 MTN		
0096	3656000000-M	876	FILTER FABRIC FOR DRAINAGE	1,172 M2		
0097	3659000000-N	SP	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	1 EA		
0098	3691000000-N	SP	GENERIC EROSION CONTROL ITEM LOG VANES	7 EA		
0099	4054000000-M	902	PLAIN CONCRETE SIGN FOOTINGS	1 M3		
0100	4066000000-M	903	SUPPORTS, SIMPLE STEEL BEAM	233 KG		
0101	4072000000-M	903	SUPPORTS, 4.5KG STEEL U-CHANNEL	897 M		
0102	4082200000-N	SP	OVERHEAD SIGN ASSEMBLY AT STA ********* (14+20.00 - Y1)	Lump Sum	L.S.	
0103	4096000000-N	904	SIGN ERECTION, TYPE D	1 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0104	4102000000-N	904	SIGN ERECTION, TYPE E	214 EA		
0105	4108000000-N	904	SIGN ERECTION, TYPE F	6 EA		
0106	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)	2 EA		
0107	4126000000-N	905	SIGN LIGHTING SYSTEM, ******** (OVERHEAD "A")	Lump Sum	L.S.	
0108	4129000000-N	906	RELOCATE SIGN, TYPE ***** (E)	5 EA		
0109	4149000000-N	907	DISPOSAL OF SIGN SYSTEM, OVER-HEAD	1 EA		
0110	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	55 EA		
0111	4192000000-N	907	DISPOSAL OF SUPPORT, U-CHANNEL	6 EA		
0112	4238000000-N	907	DISPOSAL OF SIGN, D, E OR F	2 EA		
0113	4400000000-M	1110	WORK ZONE SIGNS (STATIONARY)	65 M2		
0114	4405000000-M	1110	WORK ZONE SIGNS (PORTABLE)	60 M2		
0115	4410000000-M	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	19 M2		
0116	4415000000-N	1115	FLASHING ARROW PANELS, TYPE C	4 EA		
0117	4420000000-N	1120	CHANGEABLE MESSAGE SIGNS	6 EA		
0118	4425000000-N	1125	WARNING FLAG SETS	4 EA		
0119	4430000000-N	1130	DRUMS	732 EA		
0120	4435000000-N	1135	CONES	200 EA		
0121	4455000000-N	1150	FLAGGER	900 MD		
0122	4460000000-N	1155	WARNING LIGHTS (TYPE B)	12 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0123	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	4 EA		
0124	4475000000-N	1165	TRUCK MOUNTED IMPACT ATTENUATOR (45 MPH)	3 EA		
0125	4485000000-M	1170	PORTABLE CONCRETE BARRIER	120 M		
0126	4510000000-N	SP	POLICE	180 HR		
0127	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	358 EA		
0128	4685000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 2.3MM)	9,515 M		
0129	4686000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 3.1MM)	6,881 M		
0130	4695000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM)	1,768 M		
0131	4697000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 3.1MM)	500 M		
0132	4710000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (600MM, 3.1MM)	539 M		
0133	4721000000-M	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (3.1MM)	2 EA		
0134	4725000000-M	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM)	240 EA		
0135	4810000000-M	1205	PAINT PAVEMENT MARKING LINES (100MM)	61,486 M		
0136	4820000000-M	1205	PAINT PAVEMENT MARKING LINES (200MM)	2,018 M		
0137	4835000000-M	1205	PAINT PAVEMENT MARKING LINES (600MM)	845 M		
0138	4840000000-N	1205	PAINT PAVEMENT MARKING CHARACTER	12 EA		
0139	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	348 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0140	4850000000-M	1205	REMOVAL OF PAVEMENT MARKING LINES (100MM)	400 M		
0141	4905000000-N	1253	SNOWPLOWABLE RAISED PAVEMENT MARKERS	1,072 EA		
0142	5255000000-N	1413	PORTABLE LIGHTING	Lump Sum	L.S.	
0143	5300000000-M	1505	FOUNDATION CONDITIONING MATERIAL, UTILITIES CLASS ******** (VI)	80 MTN		
0144	5306000000-M	SP	BEDDING MATERIAL, UTILITIES CLASS ********** (IV)	80 MTN		
0145	5360000000-M	1510	150MM DI WATER PIPE, PC 2.41MPA	159 M		
0146	5366000000-M	1510	200MM DI WATER PIPE, PC 2.41MPA	402 M		
0147	5378000000-M	1510	300MM DI WATER PIPE, PC 2.41MPA	130 M		
0148	5414000000-M	1510	20MM COPPER WATER PIPE, TYPE K	30 M		
0149	5450000000-M	1510	200MM PVC WATER PIPE, SDR 21, 1.38MPA WP	385 M		
0150	5462000000-M	1510	300MM PVC WATER PIPE, SDR 21, 1.38MPA WP	98 M		
0151	5480000000-M	1510	DUCTILE IRON WATER PIPE FITTINGS, 1.72MPA MIN WP	8,807 KG		
0152	5510000000-M	1510	20MM CORPORATION STOP	1 EA		
0153	5528000000-M	1510	50MM CORPORATION STOP	1 EA		
0154	5540000000-M	1510	150MM GATE VALVE & VALVE BOX, 1.38MPA WP	6 EA		
0155	5546000000-M	1510	200MM GATE VALVE & VALVE BOX, ****MPA WP (1.38MPA WP)	7 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0156	5558000000-M	1510	300MM GATE VALVE & VALVE BOX, ****MPA WP (1.38MPA WP)	3 EA		
0157	5576000000-M	1510	*** X ***MM TAPPING SLEEVE, VALVE & VALVE BOX, ****MPA WP (150MM X 150MM, 1.38MPA WP)	1 EA		
0158	5576000000-M	1510	*** X ***MM TAPPING SLEEVE, VALVE & VALVE BOX, ****MPA WP (200MM X 150MM, 1.38MPA WP)	1 EA		
0159	5576000000-M	1510	*** X ***MM TAPPING SLEEVE, VALVE & VALVE BOX, ****MPA WP (300MM X 300MM, 1.38MPA WP)	1 EA		
0160	5582000000-M	1510	*** X ***MM TAPPING SADDLE (200MM X 20MM)	1 EA		
0161	5648000000-N	1510	RELOCATE EXISTING WATER METER	3 EA		
0162	5666000000-M	1510	FIRE HYDRANT, ****MPA WP (1.38MPA WP)	2 EA		
0163	5672000000-N	1510	RELOCATE EXISTING FIRE HYDRANT	8 EA		
0164	5708000000-M	1520	***MM PVC FORCE MAIN SEWER PIPE, ********** (50MM, SDR 21, 1.38MPA)	4 M		
0165	5720000000-M	1520	***MM DI SEWER PIPE, PC ***MPA (100MM, PC 2.41MPA)	10 M		
0166	5726000000-M	1520	200MM DI SEWER PIPE, PC 2.41MPA	6 M		
0167	5732000000-M	1520	250MM DI SEWER PIPE, PC 2.41MPA	14 M		
0168	5750000000-M	1520	***MM DI FORCE MAIN SEWER PIPE PC ****MPA (400MM, PC 2.41MPA)	332 M		
0169	5756000000-M	1520	DUCTILE IRON SEWER PIPE FITTINGS, 1.72MPA MIN WP	6,008 KG		
0170	5768000000-N	1520	SANITARY SEWER CLEAN-OUT	2 EA		
0171	5775000000-M	1525	1200MM DIA PRECAST CONC SEWER MANHOLE 0-1.8M DEPTH	1 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0172	5780000000-M	1525	PRECAST CONC MANHOLE WALL, ****MM DIA, OVER 1.8M HT (1200MM)	1.2 M		
0173	5798000000-M	1530	FILL OR REMOVE ABANDONED ***MM PIPE, ********** (200MM, PVC WATER)	556 M		
0174	5804000000-M	1530	FILL OR REMOVE ABANDONED 300MM PIPE, ********** (DI WATER)	400 M		
0175	5810000000-M	1530	FILL OR REMOVE ABANDONED 400MM PIPE, ********** (PVC SEWER)	112 M		
0176	5816000000-N	1530	BREAK DOWN, PLUG, & FILL ABANDONED UTILITY MANHOLE	2 EA		
0177	5882000000-N	SP	GENERIC UTILITY ITEM 400MM RESTRAINED RETAINER GLANDS	78 EA		
0178	5882000000-N	SP	GENERIC UTILITY ITEM 50MM AIR RELEASE/VACUUM VALVE & MANHOLE	2 EA		
0179	6000000000-M	1605	TEMPORARY SILT FENCE	900 M		
0180	6006000000-M	1610	STONE FOR EROSION CONTROL, CLASS A	500 MTN		
0181	6009000000-M	1610	STONE FOR EROSION CONTROL, CLASS B	3,600 MTN		
0182	6012000000-M	1610	SEDIMENT CONTROL STONE	2,150 MTN		
0183	6015000000-M	1615	TEMPORARY MULCHING	8.5 HA		
0184	6018000000-M	1620	SEED FOR TEMPORARY SEEDING	375 KG		
0185	6021000000-M	1620	FERTILIZER FOR TEMPORARY SEEDING	3 MTN		
0186	6024000000-M	1622	TEMPORARY SLOPE DRAINS	12 M		
0187	6027000000-N	1622	INLET PROTECTION AT TEMPORARY SLOPE DRAINS	2 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0188	6030000000-M	1630	SILT EXCAVATION	8,500 M3		
0189	6036000000-M	1631	MATTING FOR EROSION CONTROL	7,900 M2		
0190	6042000000-M	1632	6.4MM HARDWARE CLOTH	1,150 M		
0191	6045000000-M	SP	***MM TEMPORARY PIPE (750MM)	60 M		
0192	6069000000-M	1638	STILLING BASINS	200 M3		
0193	6084000000-M	1660	SEEDING & MULCHING	9 HA		
0194	6087000000-M	1660	MOWING	5 HA		
0195	6090000000-M	1661	SEED FOR REPAIR SEEDING	125 KG		
0196	6093000000-M	1661	FERTILIZER FOR REPAIR SEEDING	0.5 MTN		
0197	6096000000-M	1662	SEED FOR SUPPLEMENTAL SEEDING	250 KG		
0198	6108000000-M	1665	FERTILIZER TOPDRESSING	15 MTN		
0199	6111000000-M	SP	IMPERVIOUS DIKE	35 M		
0200	6114000000-N	SP	SPECIALIZED HAND MOWING	2 HR		
0201	6117000000-N	1675	RESPONSE FOR EROSION CONTROL	12 EA		
0202	6126000000-M	SP	STREAMBANK REFORESTATION	0.41 HA		
0203	6141000000-M	SP	GENERIC EROSION CONTROL ITEM COIR FIBER MAT	500 M2		
0204	6147000000-M	SP	GENERIC EROSION CONTROL ITEM SAFETY FENCE	1,600 M		
0205	7000000000-M	1705	PEDESTRIAN SIGNAL HEAD (***MM, ** SECTION) (400MM, 2 SECTION W/COUNTDOWN)	10 EA		
0206	7060000000-M	1705	SIGNAL CABLE	6,995 M		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0207	7120000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 3 SECTION)	133 EA		
0208	7132000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 4 SECTION)	21 EA		
0209	7144000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 5 SECTION)	50 EA		
0210	7216000000-N	SP	MODIFY EXISTING VEHICLE SIGNAL HEAD	9 EA		
0211	7252000000-M	1710	MESSENGER CABLE (6.35MM)	4,500 M		
0212	7264000000-M	1710	MESSENGER CABLE (9.52MM)	1,030 M		
0213	7279000000-M	1715	TRACER WIRE	4,040 M		
0214	7288000000-M	1715	TRENCHING (PAVED)	155 M		
0215	7300000000-M	1715	TRENCHING (UNPAVED)	7,000 M		
0216	7302000000-M	SP	DIRECTIONAL DRILL POLYETHYLENE CONDUIT, 31.75MM (** CONDUIT) (1)	2,660 M		
0217	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	134 EA		
0218	7336000000-N	1716	JUNCTION BOX (OVER-SIZED)	66 EA		
0219	7360000000-N	1720	WOOD POLE	16 EA		
0220	7372000000-N	1721	GUY ASSEMBLY	72 EA		
0221	7408000000-M	1722	25MM RISER WITH WEATHERHEAD	5 EA		
0222	7420000000-M	1722	50MM RISER WITH WEATHERHEAD	19 EA		
0223	7432000000-M	1722	50MM RISER WITH HEAT SHRINK TUBING	21 EA		
0224	7444000000-M	1725	INDUCTIVE LOOP SAWCUT	6,236 M		
0225	7456000000-M	1726	LEAD-IN CABLE	15,290 M		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0226	7481000000-N	SP	SITE SURVEY	2 EA		
0227	7481200000-N	SP	LUMINAIRE ARM FOR VIDEO SYSTEM	8 EA		
0228	7516000000-M	1730	COMMUNICATIONS CABLE (**FIBER) (12)	10,000 M		
0229	7552000000-N	1731	INTERCONNECT CENTER	16 EA		
0230	7566000000-N	1733	DELINEATOR MARKER	41 EA		
0231	7568000000-N	SP	FURNISH FIBER-OPTIC RESTORATION KIT	1 EA		
0232	7570000000-N	SP	FURNISH FIBER-OPTIC POWER METER	1 EA		
0233	7572000000-N	SP	FURNISH OPTICAL LIGHT GENERATOR	1 EA		
0234	7574000000-N	SP	FURNISH FIBER-OPTIC TRANSCEIVER	1 EA		
0235	7575000000-N	SP	FIBER-OPTIC TRAINING	Lump Sum	L.S.	
0236	7576000000-N	1740	METAL STRAIN SIGNAL POLE	4 EA		
0237	7588000000-N	1741	SIGNAL SUPPORT MAST ARM WITH METAL POLE	43 EA		
0238	7590000000-N	SP	DOUBLE MAST ARM WITH METAL POLE	2 EA		
0239	7613000000-N	SP	SOIL TEST	49 EA		
0240	7614000000-M	SP	DRILLED PIER FOUNDATION (***MM DIA) (1067MM)	16 M		
0241	7614000000-M	SP	DRILLED PIER FOUNDATION (***MM DIA) (1220MM)	164 M		
0242	7624000000-N	1743	SIGNAL PEDESTAL WITH FOUNDATION	2 EA		

County : New Hanover

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0243	7631000000-N	1744	MAST ARM WITH METAL POLE DESIGN	2 EA		
0244	7636000000-N	1745	SIGN FOR SIGNALS	50 EA		
0245	7684000000-N	1750	SIGNAL CABINET FOUNDATION	16 EA		
0246	7688000000-N	SP	CABINET BASE ADAPTER	16 EA		
0247	7756000000-N	1751	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)	16 EA		
0248	7780000000-N	SP	DETECTOR CARD (TYPE 2070L)	103 EA		
0249	7936000000-N	SP	CENTRAL COMPUTER	1 EA		
0250	7938000000-N	SP	NOTEBOOK COMPUTER	1 EA		
0251	7942000000-N	SP	PRINTER	1 EA		
0252	7960000000-N	SP	METAL POLE FOUNDATION REMOVAL	9 EA		
0253	7972000000-N	SP	METAL POLE REMOVAL	9 EA		
0254	7980000000-N	SP	GENERIC SIGNAL ITEM FIBER-OPTIC TRANSCEIVER SELF HEALING RING	16 EA		
0255	7980000000-N	SP	GENERIC SIGNAL ITEM GPS UNIT	5 EA		
0256	7980000000-N	SP	GENERIC SIGNAL ITEM POWDER COAT FOR DOUBLE MAST ARM WITH METAL POLE	2 EA		
0257	7980000000-N	SP	GENERIC SIGNAL ITEM POWDER COAT FOR METAL STRAIN POLE	4 EA		
0258	7980000000-N	SP	GENERIC SIGNAL ITEM POWDER COAT FOR PEDESTRIAN PEDESTAL	2 EA		
0259	7980000000-N	SP	GENERIC SIGNAL ITEM POWDER COAT FOR SINGLE MAST ARM WITH METAL POLE	43 EA		

County : New Hanover

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0260	7980000000-N	SP	GENERIC SIGNAL ITEM PREFORMED INDUCTIVE LOOP (1.8M X 18.0M) WITH 6.0M TAIL SECTION	2 EA		
			******* BEGIN SCHEDULE HA ******* ******* (2 ALTERNATES) *******			
0261 HA1	7481220000-N	SP	CAMERA WITH INTERNAL LOOP EMULATOR PROCESSING UNIT	8 EA		
			*** OR ***			
0262 HA2	7481240000-N	SP	CAMERA WITHOUT INTERNAL LOOP EMULATOR PROCESSING UNIT	8 EA		
0263 HA2	7481260000-N	SP	EXTERNAL LOOP EMULATOR PROCESSING UNIT	2 EA		
			***** END SCHEDULE HA *****			
			CULVERT ITEMS			
0264	8126000000-N	414	CULVERT EXCAVATION, STA ****** (28+13.000-L-)	Lump Sum	L.S.	
0265	8196000000-M	420	CLASS A CONCRETE (CULVERT)	190.7 M3		
0266	8248000000-M	425	EPOXY COATED REINFORCING STEEL (CULVERT)	20,792 KG		

Contract No: C201251

Counties: New Hanover

ACCEPTED BY THE
DEPARTMENT OF TRANSPORTATION

_____
Contract Officer

_____
Date

Execution of Contract and Bonds
Approved as to Form:

_____
Attorney General