C202960

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

CONTRACT AND
CONTRACT BONDS

FOR CONTRACT NO. C202960

WBS 34406.3.2 HPP-0501(25)

T.I.P NO. R-2241A

COUNTY OF PERSON
THIS IS THE ROADWAY & STRUCTURE CONTRACT
ROUTE NUMBER US 501 LENGTH 6.966 KILOMETERS
LOCATION US-501 FROM NC-49 IN ROXBORO TO SR-1602.

CONTRACTOR PLT CONSTRUCTION CO., INC.
ADDRESS 5676 THOMPSON CHAPEL CHURCH
WILSON, NC 27896

BIDS OPENED APRIL 16, 2013
CONTRACT EXECUTION MAY 28 2013

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

PROPOSAL

DATE AND TIME OF BID OPENING: **APRIL 16, 2013 AT 2:00 PM**

CONTRACT ID	C202960
WBS	34406.3.2

FEDERAL-AID NO.	HPP-0501(25)
COUNTY	PERSON
T.I.P. NO.	R-2241A
KILOMETERS	6.966
ROUTE NO.	US 501
LOCATION	US-501 FROM NC-49 IN ROXBORO TO SR-1602.
TYPE OF WORK	WIDENING, GRADING, DRAINAGE, PAVING, C&G, SIGNALS & CULVERTS.

NOTICE:

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

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A <u>ROADWAY & STRUCTURE</u> PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

PROPOSAL FOR THE CONSTRUCTION OF

CONTRACT No. C202960 IN PERSON 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. **C202960**; 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 *2006 Metric 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. **C202960** in **Person 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, Metric, July 2006* with all amendments and supplements thereto, is by reference incorporated into and made a part of this contract; that, except as herein modified, all the construction and work included in this contract is to be done in accordance with the specifications contained in said volume, and amendments and supplements thereto, under the direction of the Engineer.

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

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

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

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

NORTH CAROLINA PROFESSIONAL SEAL 21076 ENGINEER RANDY A. GARRIS

3/13/13

State Contract Officer

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PROJECT SPECIAL PROVISIONS

GENERAL

CONTRACT TIME AND LIQUIDATED DAMAGES:
(8-15-00) (Rev. 12-20-07) M1 G07A

The date of availability for this contract is **May 27, 2013**, 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 13, 2016**.

Except where otherwise provided by the contract, observation periods required by the contract will not be a part of the work to be completed by the completion date and/or intermediate contract times stated in the contract. The acceptable completion of the observation periods that extend beyond the final completion date shall be a part of the work covered by the performance and payment bonds.

The liquidated damages for this contract are **Two Hundred Dollars ($200.00)** per calendar day. These liquidated damages will not be cumulative with any liquidated damages which may become chargeable under Intermediate Contract Time Number 1.

INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES:
(7-1-95) (Rev.2-21-12) M1 G13A

Except for that work required under the Project Special Provisions entitled *Planting, Permanent Vegetation Establishment* and/or *Reforestation*, included elsewhere in this proposal, the Contractor will be required to complete all work included in this contract and shall place and maintain traffic on same.

The date of availability for this intermediate contract time is **May 27, 2013**.

The completion date for this intermediate contract time is **November 15, 2015**.

The liquidated damages for this intermediate contract time are **Two Thousand Dollars ($2,000.00)** per calendar day.

Upon apparent completion of all the work required to be completed by this intermediate date, a final inspection will be held in accordance with Article 105-17 and upon acceptance, the Department will assume responsibility for the maintenance of all work except *Planting, Permanent Vegetation Establishment* and/or *Reforestation*. The Contractor will be responsible for and shall make corrections of all damages to the completed roadway caused by his planting operations, whether occurring prior to or after placing traffic through the project.

INTERMEDIATE CONTRACT TIME NUMBER 2 AND LIQUIDATED DAMAGES
(2-20-07) M1 G14 B

The Contractor shall not narrow or close a lane of traffic on **US 501 and NC 49**, detain and /or alter the traffic flow on or during holiday weekends, special events, or any other time when traffic is unusually heavy, including the following schedules:

HOLIDAY AND HOLIDAY WEEKEND LANE CLOSURE RESTRICTIONS

1. For **unexpected occurrence** that creates unusually high traffic volumes, as directed by the Engineer.

2. For **New Year's Day**, between the hours of **8:00 a.m.** December 31st and **6:00 p.m.** January 2nd. If New Year's Day is on a Friday, Saturday, Sunday or Monday, then until **6:00 p.m.** the following Tuesday.

3. For **Easter**, between the hours of **8:00 a.m.** Thursday and **6:00 p.m.** Monday.

4. For **Memorial Day**, between the hours of **8:00 a.m.** Friday and **6:00 p.m.** Tuesday.

5. For **Independence Day**, between the hours of **8:00 a.m.** the day before Independence Day and **6:00 p.m.** the day after Independence Day.

   If **Independence Day** is on a Friday, Saturday, Sunday or Monday, then between the hours of **8:00 a.m.** the Thursday before Independence Day and **6:00 p.m.** the Tuesday after Independence Day.

6. For **Labor Day**, between the hours of **8:00 a.m.** Friday and **6:00 p.m.** Tuesday.

7. For **Thanksgiving Day**, between the hours of **8:00 a.m.** Tuesday and **6:00 p.m.** Monday.

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

9. For **Lake Mayo Cyclism/Canoe/Kayak Festival**, occurring at **Lake Mayo** between **three (3)** hours before the start and **three (3)** hours after the end of the **Lake Mayo Cyclism/Canoe/Kayak Festival**.

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

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

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

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

INTERMEDIATE CONTRACT TIME NUMBER 3 AND LIQUIDATED DAMAGES

(2-20-07) M1 G14 H

The Contractor shall complete the work required of **Phase II, Steps 4 and 5** as shown on Sheet **TCP- 3A** and shall place and maintain traffic on same.

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

The completion date for this intermediate contract time will be the date which is **thirty-five (35)** consecutive calendar days after and including the date the Contractor begins this work.

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

PERMANENT VEGETATION ESTABLISHMENT:

(2-16-12) 104 M1 G16

Establish a permanent stand of the vegetation mixture shown in the contract. During the period between initial vegetation planting and final project acceptance, perform all work necessary to establish 80% coverage of permanent vegetation within the project limits, as well as, in borrow and waste pits. This work shall include erosion control device maintenance and installation, repair seeding and mulching, supplemental seeding and mulching, mowing, and fertilizer topdressing, as directed. All work shall be performed in accordance with the applicable section of the *2006 Metric Standard Specifications*.

Once the Engineer has determined that 80% coverage of permanent vegetation has been established, the Contractor will be notified to remove the remaining erosion control devices that are no longer needed. The Contractor will be responsible for, and shall correct any areas disturbed by operations performed in permanent vegetation establishment and the removal of temporary erosion control measures, whether occurring prior to or after placing traffic on the project.

Payment for *Response for Erosion Control, Seeding and Mulching, Repair Seeding, Supplemental Seeding, Mowing, Fertilizer Topdressing, Silt Excavation,* and *Stone for Erosion Control* will be made at contract unit prices for the affected items. Work required that is not represented by contract line items will be paid in accordance with Articles 104-7 or 104-3 of the *2006 Metric Standard Specifications*. No additional compensation will be made for maintenance and removal of temporary erosion control items.

DELAY IN RIGHT OF ENTRY:

(7-1-95) M1 G22

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

Parcel No.	Property Owner	Delay Date
026	Felton Carver, et al	March 31, 2013
090	Force Protection Agency	April 30, 2013

MAJOR CONTRACT ITEMS:
(2-19-02) M1 G28

The following listed items are the major contract items for this contract (See Articles 101 and 104-5 of the *2006 Metric Standard Specifications*):

Line #	Description
230	Unclassified Excavation
238	Asphalt Concrete Base Course, Type B25.0B
239	Asphalt Concrete Intermediate Course, Type I19.0B
240	Asphalt Concrete Surface Course, Type S9.5B
	or
252	Unclassified Excavation
266	200 mm PCC Pavement, Through Lanes (With Dowels)

SPECIALTY ITEMS:
(7-1-95) M1 G37

Items listed below will be the specialty items for this contract (See Article 108-6 of the *2006 Metric Standard Specifications*).

Line #	Description
88 thru 93	Guardrail
94 thru 99	Fencing
105 thru 115	Signing
133 thru 135	Long-Life Pavement Markings
and	
246 thru 250	
or	
275 thru 284	
251	Removable Tape
142	Permanent Pavement Markers
145 thru 174	Utility Construction
175 thru 205	Erosion Control
206 thru 207	Reforestation
208 thru 229	Signals/ITS System

FUEL PRICE ADJUSTMENT:
(11-15-05) (Rev 8-16-11) M1 G43

Revise the *Metric Standard Specifications* as follows:

Page 1-78 Subarticle 109-8, add the following:

The base index price for **DIESEL #2 FUEL** is **$ 0.8356** per liter.

Where any of the following are included as pay items in the contract, they will be eligible for fuel price adjustment.

The pay items and the fuel factor used in calculating adjustments to be made are as follows:

Description	Units	Fuel Usage Factor Diesel
Unclassified Excavation	L/CM	1.44
Borrow Excavation	L/CM	1.44
Class IV Subgrade Stabilization	L/MTN	2.30
Aggregate Base Course	L/MTN	2.30
Asphalt Concrete Base Course, Type ___	L/MTN	12.10
Asphalt Concrete Intermediate Course, Type ___	L/MTN	12.10
Asphalt Concrete Surface Course, Type ___	L/MTN	12.10
Open-Graded Asphalt Friction Course	L/MTN	12.10
Sand Asphalt Surface Course, Type ___	L/MTN	12.10
Aggregate for Cement Treated Base Course	L/MTN	2.30
Portland Cement for Cement Treated Base Course	L/MTN	2.30
___ mm Portland Cement Concrete Pavement	L/SM	1.11
Concrete Shoulders Adjacent to ___ mm Pavement	L/SM	1.11

SCHEDULE OF ESTIMATED COMPLETION PROGRESS:

(7-15-08) (Rev. 6-19-12) M1 G 058

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

Fiscal Year		Progress (% of Dollar Value)
2013	(7/01/12 - 6/30/13)	4% of Total Amount Bid
2014	(7/01/13 - 6/30/14)	54% of Total Amount Bid
2015	(7/01/14 - 6/30/15)	34% of Total Amount Bid
2016	(7/01/15- 6/30/16)	8% of Total Amount Bid

The Contractor shall also furnish his own progress schedule in accordance with Article 108-2 of the *2006 Metric 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.

DISADVANTAGED BUSINESS ENTERPRISE:

(10-16-07)(Rev 11-15-11) M1 G61

Description

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

Definitions

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

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

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

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

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

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

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

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

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

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

Forms and Websites Referenced in this Provision

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

DBE-IS *Subcontractor Payment Information* - Form for reporting the payments made to all DBE firms working on the project. This form is for paper bid projects only. http://www.ncdot.org/doh/forms/files/DBE-IS.xls

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

SAF *Subcontract Approval Form* - Form required for approval to sublet the contract. http://www.ncdot.org/doh/operations/dp_chief_eng/constructionunit/saf.xls

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

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

Listing of DBE Subcontractors Form - Form for entering DBE subcontractors on a project that will meet this DBE goal. This form is for paper bids only. http://www.ncdot.gov/doh/preconstruct/ps/word/MISC2.doc

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

DBE Goal

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

Disadvantaged Business Enterprises **12.0%**

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

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

Directory of Transportation Firms (Directory)

Real-time information is available about firms doing business with the Department and firms that are certified through NCUCP in the Directory of Transportation Firms. Only firms identified

in the Directory as DBE certified shall be used to meet the DBE goal. The Directory can be found at the following link. https://partner.ncdot.gov/VendorDirectory/default.html

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

Listing of DBE Subcontractors

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

(A) Electronic Bids

Bidders shall submit a listing of DBE participation in the appropriate section of Expedite, the bidding software of Bid Express®.

(1) Submit the names and addresses of DBE firms identified to participate in the contract. If the bidder uses the updated listing of DBE firms shown in Expedite, the bidder may use the dropdown menu to access the name and address of the DBE firm.

(2) Submit the contract line numbers of work to be performed by each DBE firm. When no figures or firms are entered, the bidder will be considered to have no DBE participation.

(3) The bidder shall be responsible for ensuring that the DBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that DBE's participation will not count towards achieving the DBE goal.

(B) Paper Bids

Blank forms will not be deemed to represent zero participation. Bids submitted that 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 the proposal will be rejected.

(1) *If the DBE goal is more than zero,*

(a) Bidders, at the time the bid proposal is submitted, shall submit a listing of DBE participation, including the names and addresses on *Listing of DBE Subcontractors* contained elsewhere in the contract documents in order for the bid to be considered responsive. Bidders shall indicate the total dollar value of the DBE participation for the contract.

(b) If bidders have no DBE participation, they shall indicate this on the *Listing of DBE Subcontractors* by entering the word "None" or the number "0." This form shall be completed in its entirety.

(c) The bidder shall be responsible for ensuring that the DBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that DBE's participation will not count towards achieving the DBE goal.

(2) *If the DBE goal is zero,* bidders, at the time the bid proposal is submitted, shall enter the word "None"; or the number "0"; or if there is participation, add the value on the *Listing of DBE Subcontractors* contained elsewhere in the contract documents.

DBE Prime Contractor

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

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

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

Written Documentation – Letter of Intent

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

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

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

Submission of Good Faith Effort

If the bidder fails to meet or exceed the DBE goal the apparent lowest responsive bidder shall submit to the Department documentation of adequate good faith efforts made to reach the DBE goal.

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

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

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

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

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

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

(B) Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.

(C) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(D) (1) Negotiating in good faith with interested DBEs. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.

(2) A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidding contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.

(E) Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associates and political or social affiliations (for example, union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.

(F) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or bidder.

(G) Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.

(H) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; Federal, State, and local minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs. Contact within 7 days from the bid opening the Business Development Manager in the Business Opportunity and Work Force Development Unit to give notification of the bidder's inability to get DBE quotes.

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

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

(1) Whether the bidder's documentation reflects a clear and realistic plan for achieving the DBE goal.

(2) The bidders' past performance in meeting the DBE goals.

(3) The performance of other bidders in meeting the DBE goal. For example, when the apparent successful bidder fails to meet the DBE goal, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts the apparent successful bidder could have met the goal. If the apparent successful bidder fails to meet the DBE goal, but meets or exceeds the average DBE participation obtained by other bidders, the Department may view this, in conjunction with other factors, as evidence of the apparent successful bidder having made a good faith effort.

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

Non-Good Faith Appeal

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

Counting DBE Participation Toward Meeting DBE Goal

(A) Participation

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

(B) Joint Checks

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

(C) Subcontracts (Non-Trucking)

A DBE may enter into subcontracts. Work that a DBE subcontracts to another DBE firm may be counted toward the contract goal requirement. Work that a DBE subcontracts to

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

(D) Joint Venture

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

(E) Suppliers

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

(F) Manufacturers and Regular Dealers

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

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

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

Commercially Useful Function

(A) DBE Utilization

The Contractor may count toward its contract goal requirement only expenditures to DBEs that perform a commercially useful function in the work of a contract. A DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful

function, the DBE shall also be responsible with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a commercially useful function, the Department will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work, and any other relevant factors.

(B) DBE Utilization in Trucking

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

(1) The DBE shall be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there shall not be a contrived arrangement for the purpose of meeting DBE goals.

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

(3) The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.

(4) The DBE may subcontract the work to another DBE firm, including an owner-operator who is certified as a DBE. The DBE who subcontracts work to another DBE receives credit for the total value of the transportation services the subcontracted DBE provides on the contract.

(5) The DBE may also subcontract the work to a non-DBE firm, including from an owner-operator. The DBE who subcontracts the work to a non-DBE is entitled to credit for the total value of transportation services provided by the non-DBE subcontractor not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE subcontractors receives credit only for the fee or commission it receives as a result of the subcontract arrangement. The value of services performed under subcontract agreements between the DBE and the Contractor will not count towards the DBE contract requirement.

(6) A DBE may lease truck(s) from an established equipment leasing business open to the general public. The lease must indicate that the DBE has exclusive use of and control over the truck. This requirement does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. This type of lease may count toward the DBE's credit as long as the driver is under the DBE's payroll.

(7) Subcontracted/leased trucks shall display clearly on the dashboard the name of the DBE that they are subcontracted/leased to and their own company name if it is not identified on the truck itself. Magnetic door signs are not permitted.

DBE Replacement

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

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

The Contractor shall comply with the following for replacement of a committed DBE:

(A) Performance Related Replacement

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

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

(1) Copies of written notification to DBEs that their interest is solicited in contracting the work defaulted by the previous DBE or in subcontracting other items of work in the contract.

(2) Efforts to negotiate with DBEs for specific subbids including, at a minimum:

(a) The names, addresses, and telephone numbers of DBEs who were contacted.

(b) A description of the information provided to DBEs regarding the plans and specifications for portions of the work to be performed.

(3) A list of reasons why DBE quotes were not accepted.

(4) Efforts made to assist the DBEs contacted, if needed, in obtaining bonding or insurance required by the Contractor.

(B) Decertification Replacement

(1) When a committed DBE is decertified by the Department after the SAF (*Subcontract Approval Form*) has been received by the Department, the Department will not require the 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 requirement.

(2) When a committed DBE is decertified prior to the Department receiving the SAF (*Subcontract Approval Form*) for the named DBE firm, the 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 DBE goal requirement. If a DBE firm is not found to do the same amount of work, a good faith effort must be submitted to NCDOT (see A herein for required documentation).

Changes in the Work

When the Engineer makes changes that result in the reduction or elimination of work to be performed by a committed DBE, the Contractor will not be required to seek additional participation. When the Engineer makes changes that result in additional work to be performed by a DBE based upon the Contractor's commitment, the DBE shall participate in additional work to the same extent as the DBE participated in the original contract work.

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

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

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

Reports and Documentation

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

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

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

Reporting Disadvantaged Business Enterprise Participation

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

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

(B) Removal of an approved contractor from the prequalified bidders' list or the removal of other entities from the approved subcontractors list.

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

Failure on the part of the Contractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from further bidding until the required information is submitted.

Failure on the part of any subcontractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from being approved for work on future DOT projects until the required information is submitted.

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

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

(A) Electronic Bids Reporting

The Contractor shall report the accounting of payments through the Department's DBE Payment Tracking System.

(B) Paper Bids Reporting

The Contractor shall report the accounting of payments on the Department's DBE-IS *(Subcontractor Payment Information)* with each invoice. Invoices will not be processed for payment until the DBE-IS is received.

Failure to Meet Contract Requirements

Failure to meet contract requirements in accordance with Subarticle 102-16(J) of the *2006 Metric Standard Specifications* may be cause to disqualify the Contractor from further bidding for a specified length of time.

PROGRESS SCHEDULE:
(12-18-07) M1 G70

Revise the *2006 Metric Standard Specifications* as follows:

Page 1-60, Article 108-2 Progress Schedule, delete in its entirety and replace with the following:

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

The proposed progress schedule shall be submitted no later than 7 days prior to the date of the project preconstruction conference and shall be approved before any payments will be processed for the project.

When the Engineer has extended the completion date or if the project overrun is anticipated to exceed 5%, the Contractor may submit a revised progress schedule to the Engineer for review and approval. If plan revisions are anticipated to change the sequence of operations in such a manner as will effect the progress but not the completion date, then the Contractor may submit a revised progress schedule for review and approval but the completion date shall remain unchanged.

The proposed progress schedule shall contain the following items:

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

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

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

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

Clearing and grubbing
Grading
Drainage
Soil stabilization
Aggregate base course
Pavement
Culverts
Bridges (including removal)
Signals, ITS, and lighting
Overhead signs

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

Start of construction
Intermediate completion dates or times
Seasonal limitation/observation periods/moratoriums
Traffic shifts
Beginning and end of each traffic control phase or work area
Road openings
Completion date

LIABILITY INSURANCE:
(11-18-08) M1 G80

Page 1-57, Article 107-16 is amended to include the following as the first, second, third and fourth paragraphs:

The Contractor shall be liable for any losses resulting from a breach of the terms of this contract. The Contractor shall be liable for any losses due to the negligence or willful misconduct of its agents, assigns and employees including any sub-contractors which causes damage to others for which the Department is found liable under the Torts Claims Act, or in the General Courts of Justice, provided the Department provides prompt notice to the Contractor and that the Contractor has an opportunity to defend against such claims. The Contractor shall not be responsible for punitive damages.

The Contractor shall at its sole cost and expense obtain and furnish to the Department an original standard ACORD form certificate of insurance evidencing commercial general liability with a limit for bodily injury and property damage in the amount of $5,000,000.00 per occurrence and general aggregate, covering the Contractor from claims or damages for bodily injury, personal injury, or for property damages which may arise from operating under the contract by the employees and agents of the Contractor. The required limit of insurance may be obtained by a single general liability policy or the combination of a general liability and excess liability or umbrella policy. The State of North Carolina shall be named as an additional insured on this commercial general liability policy. The policy may contain the following language as relates to the State as an additional insured: "This insurance with respect to the additional insured applies only to the extent that the additional insured is held liable for your or your agent's acts or omissions arising out of and in the course of operations performed for the additional insured."

The Contractor shall maintain all legally required insurance coverage, including without limitation, worker's compensation and vehicle liability, in the amounts required by law. Providing and maintaining adequate insurance coverage is a material obligation of the contractor and is of the essence of this contract. All such insurance shall meet all laws of the State of North Carolina. Such insurance coverage shall be obtained from companies that are authorized to provide such coverage and that are authorized by the Commissioner of Insurance to do business in North Carolina. The Contractor shall at all times comply with the terms of such insurance policies.

Upon execution of the contract, provide evidence of the above insurance requirements to the Engineer.

CERTIFICATION FOR FEDERAL-AID CONTRACTS:

(3-21-90) M1 G85

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 M4ember 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.

CONTRACTOR'S LICENSE REQUIREMENTS:

(7-1-95) M1 G88

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).

SUBMISSION OF BIDS - ALTERNATES:
(7-15-08) M1G 091

The *2006 Metric Standard Specifications* are revised as follows:

Page 1-16, Subarticle 102-8(B)(2) is revised to delete the word "not".

Page 1-22, Subarticle 103-2(B)(4) Electronic Bids, delete and replace with the following:

Do not enter zero (0) in any unit price field unless zero is the intended bid for that item. Zero will be considered a valid bid. However, where zeros are entered for items that are authorized alternates to those items for which a non-zero bid price has been submitted, zeros will be deemed invalid.

Page 1-22, Subarticle 103-2(B)(5) Electronic Bids, delete and replace with the following:

(5) When the proposal allows alternate bids, the bidder shall submit a unit or lump sum price for every item in the proposal other than items that are authorized alternates to those items for which a bid price has been submitted. Where the bidder submits a unit price other than zero for all items of an authorized alternate, the Department will determine the lowest total price based on the alternates(s) bid.

U.S. DEPARTMENT OF TRANSPORTATION HOTLINE:
(11-22-94) M1 G100

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

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

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

SUBSURFACE INFORMATION:
(7-1-95) M1 G112 D

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

LOCATING EXISTING UNDERGROUND UTILITIES:
(3-20-12) 105 M1 G115

Revise the *2006 Metric Standard Specifications* as follows:

Page 1-41, Article 105-8, after the first sentence of the second paragraph, add the following:

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

DOMESTIC STEEL:
(4-16-13) 106 M1 G120

Revise the *2006 Metric Standard Specifications* as follows:

Page 1-46, Subarticle 106-1(B) Domestic Steel, replace the first paragraph with the following:

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

PORTABLE CONCRETE BARRIER - (Partial Payments for Materials):
(7-1-95) (8-16-11) M1 G121

When so authorized by the Engineer, partial materials payments will be made up to 95 percent of the delivered cost of portable concrete barrier, provided that these materials have been delivered on the project and stored in an acceptable manner, and further provided the documents listed in Subarticle 109-5(C) of the *2006 Metric Standard Specifications* have been furnished to the Engineer.

The provisions of Subarticle 109-5(B) of the *2006 Metric Standard Specifications* will apply to the portable concrete barrier.

REMOVABLE PAVEMENT MARKINGS – (Partial Payments for Materials):
(7-1-95) (8-16-11) M1 G124

When so authorized by the Engineer, partial materials payments will be made up to 95 percent of the delivered cost of pavement marking tape, provided that these materials have been delivered on or in the vicinity of the project, stored in an acceptable manner, not to exceed the shelf life recommended by the manufacturer, and further provided the documents listed in Subarticle 109-5 (C) of the *2006 Metric Standard Specifications* have been furnished to the Engineer.

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

The provisions of Article 109-6 of the *2006 Metric Standard Specifications* will not apply to removable pavement marking materials.

CONTRACTOR CLAIM SUBMITTAL FORM:
(9-16-08) M1 G140 (Rev.)

If the Contractor elects to file a written claim or requests an extension of contract time, it shall be submitted on the *Contractor Claim Submittal Form (CCSF)* available through the Construction Unit or http://connect.ncdot.gov/projects/construction/Construction%20Forms/CCSF-1_Contractor%20Claim%20Submittal.pdf.

TWELVE MONTH GUARANTEE:
(7-15-03) M1 G145

(A) The Contractor shall guarantee materials and workmanship against latent and patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve months following the date of final acceptance of the work for maintenance and shall replace such defective materials and workmanship without cost to the Department. The Contractor will not be responsible for damage due to faulty design, normal wear and tear, for negligence on the part of the Department, and/or for use in excess of the design.

(B) Where items of equipment or material carry a manufacturer's guarantee for any period in excess of twelve months, then the manufacturer's guarantee shall apply for that particular piece of equipment or material. The Department's first remedy shall be through the manufacturer although the Contractor is responsible for invoking the warranted repair work with the manufacturer. The Contractor's responsibility shall be limited to the term of the manufacturer's guarantee. NCDOT would be afforded the same warranty as provided by the Manufacturer.

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

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

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

LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC:
(12-19-06)(Rev 3-16-10) M1 G151

Revise the *2006 Metric Standard Specifications* as follows:

Page 1-51, 107-2 Assignment of Claims Void, replace the reference from *G.S. 143-3.3* to ***G.S. 143B-426.40A***.

Page 1-58, 107-18 Contractor's Responsibility for Work, in the first paragraph, last sentence, replace the word *legally* with the word ***contractually***.

GIFTS FROM VENDORS AND CONTRACTORS:

(12-15-09) M1G 152

By Executive Order 24, issued by Governor Perdue, and *N.C. G.S.§ 133-32,* it is unlawful for any vendor or contractor (i.e. architect, bidder, contractor, construction manager, design professional, engineer, landlord, offeror, seller, subcontractor, supplier, or vendor), to make gifts or to give favors to any State employee of the Governor's Cabinet Agencies (i.e. Administration, Commerce, Correction, Crime Control and Public Safety, Cultural Resources, Environment and Natural Resources, Health and Human Services, Juvenile Justice and Delinquency Prevention, Revenue, Transportation, and the Office of the Governor). This prohibition covers those vendors and contractors who:

(1) have a contract with a governmental agency; or
(2) have performed under such a contract within the past year; or
(3) anticipate bidding on such a contract in the future.

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

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

EROSION AND SEDIMENT CONTROL/STORMWATER CERTIFICATION:

(1-16-07) (Rev 9-18-12) 105-16, 225-2, 16 M1 G180

General

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

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

(A) *Certified Supervisor* - Provide a certified Erosion and Sediment Control/Stormwater Supervisor to manage the Contractor and subcontractor operations, insure compliance with Federal, State and Local ordinances and regulations, and manage the Quality Control Program.

(B) *Certified Foreman* - Provide a certified, trained foreman for each construction operation that increases the potential for soil erosion or the possible sedimentation and turbidity of surface waters.

(C) *Certified Installer* - Provide a certified installer to install or direct the installation for erosion or sediment/stormwater control practices.

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

Roles and Responsibilities

(A) *Certified Erosion and Sediment Control/Stormwater Supervisor* - The Certified Supervisor shall be Level II and responsible for ensuring the erosion and sediment control/stormwater plan is adequately implemented and maintained on the project and for conducting the quality control program. The Certified Supervisor shall be on the project within 24 hours notice from initial exposure of an erodible surface to the project's final acceptance. Perform the following duties:

(1) Manage Operations - Coordinate and schedule the work of subcontractors so that erosion and sediment control/stormwater measures are fully executed for each operation and in a timely manner over the duration of the contract.

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

(b) Prepare the required National Pollutant Discharge Elimination System (NPDES) Inspection Record and submit to the Engineer.

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

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

(e) Provide any needed erosion and sediment control/stormwater practices for the Contractor's temporary work not shown on the plans, such as, but not limited to work platforms, temporary construction, pumping operations, plant and storage yards, and cofferdams.

(f) Acquire applicable permits and comply with requirements for borrow pits, dewatering, and any temporary work conducted by the Contractor in jurisdictional areas.

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

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

(i) Coordinate with Department, Federal, State and Local Regulatory agencies on resolution of erosion and sediment control/stormwater issues due to the Contractor's operations.

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

(k) Have available a set of erosion and sediment control/stormwater plans that are initialed and include the installation date of Best Management Practices. These practices shall include temporary and permanent groundcover and be properly updated to reflect necessary plan and field changes for use and review by Department personnel as well as regulatory agencies.

(2) Requirements set forth under the NPDES Permit - The Department's NPDES Stormwater permit (NCS000250) outlines certain objectives and management measures pertaining to construction activities. The permit references *NCG010000, General Permit to Discharge Stormwater* under the NPDES, and states that the Department shall incorporate the applicable requirements into its delegated Erosion and Sediment Control Program for construction activities disturbing one or more acres of land. The Department further incorporates these requirements on all contracted bridge and culvert work at jurisdictional waters, regardless of size. Some of the requirements are, but are not limited to:

(a) Control project site waste to prevent contamination of surface or ground waters of the state, i.e. from equipment operation/maintenance, construction materials, concrete washout, chemicals, litter, fuels, lubricants, coolants, hydraulic fluids, any other petroleum products, and sanitary waste.

(b) Inspect erosion and sediment control/stormwater devices and stormwater discharge outfalls at least once every 7 calendar days, twice weekly for construction related *Federal Clean Water Act, Section 303(d)* impaired streams with turbidity violations, and within 24 hours after a significant rainfall event of 12 mm that occurs within a 24 hour period.

(c) Maintain an onsite rain gauge or use the Department's Multi-Sensor Precipitation Estimate website to maintain a daily record of rainfall amounts and dates.

(d) Maintain erosion and sediment control/stormwater inspection records for review by Department and Regulatory personnel upon request.

(e) Implement approved reclamation plans on all borrow pits, waste sites and staging areas.

(f) Maintain a log of turbidity test results as outlined in the Department's Procedure for Monitoring Borrow Pit Discharge.

(g) Provide secondary containment for bulk storage of liquid materials.

(h) Provide training for employees concerning general erosion and sediment control/stormwater awareness, the Department's NPDES Stormwater Permit NCS000250 requirements, and the applicable requirements of the *General Permit, NCG010000.*

(i) Report violations of the NPDES permit to the Engineer immediately who will notify the Division of Water Quality Regional Office within 24 hours of becoming aware of the violation.

(3) Quality Control Program - Maintain a quality control program to control erosion, prevent sedimentation and follow provisions/conditions of permits. The quality control program shall:

(a) Follow permit requirements related to the Contractor and subcontractors' construction activities.

(b) Ensure that all operators and subcontractors on site have the proper erosion and sediment control/stormwater certification.

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

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

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

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

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

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

(1) Seeding and Mulching
(2) Temporary Seeding
(3) Temporary Mulching
(4) Sodding
(5) Silt fence or other perimeter erosion/sediment control device installations
(6) Erosion control blanket installation
(7) Hydraulic tackifier installation
(8) Turbidity curtain installation
(9) Rock ditch check/sediment dam installation

(10) Ditch liner/matting installation
(11) Inlet protection
(12) Riprap placement
(13) Stormwater BMP installations (such as but not limited to level spreaders, retention/detention devices)
(14) Pipe installations within jurisdictional areas

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

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

Preconstruction Meeting

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

Ethical Responsibility

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

Revocation or Suspension of Certification

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

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

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

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

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

Chief Engineer
1537 Mail Service Center
Raleigh, NC 27699-1537

Failure to appeal within 10 calendar days will result in the proposed adverse action becoming effective on the date specified on the certified notice. Failure to appeal within the time specified will result in a waiver of all future appeal rights regarding the adverse action taken. The certificant will not be allowed to perform duties associated with the certification during the appeal process.

The Chief Engineer will hear the appeal and make a decision within 7 days of hearing the appeal. Decision of the Chief Engineer will be final and will be made in writing to the certificant.

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

Measurement and Payment

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

PROCEDURE FOR MONITORING BORROW PIT DISCHARGE:

2-20-07 M1 G181

Water discharge from borrow pit sites shall not cause surface waters to exceed 50 NTUs (nephelometric turbidity unit) in streams not designated as trout waters and 10 NTUs in streams, lakes or reservoirs designated as trout waters. For lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTUs. If the turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased.

If during any operating day, the downstream water quality exceeds the standard, the Contractor shall do all of the following:

(A) Either cease discharge or modify the discharge volume or turbidity levels to bring the downstream turbidity levels into compliance, or

(B) Evaluate the upstream conditions to determine if the exceedance of the standard is due to natural background conditions. If the background turbidity measurements exceed the standard, operation of the pit and discharge can continue as long as the stream turbidity levels are not increased due to the discharge.

(C) Measure and record the turbidity test results (time, date and sampler) at all defined sampling locations 30 minutes after startup and at a minimum, one additional sampling of all sampling locations during that 24-hour period in which the borrow pit is discharging.

(D) Notify DWQ within 24 hours of any stream turbidity standard exceedances that are not brought into compliance.

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

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

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

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

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

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

EMPLOYMENT:
(11-15-11) M1 G184

Revise the *2006 Metric Standard Specifications* as follows:

Page 1-20, Subarticle 102-16(O), delete and replace with the following:

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

Page 1-61, Article 108-5 CHARACTER OF WORKMEN, METHODS, AND EQUIPMENT, delete the first sentence of the second paragraph and delete the first word of the second sentence of the second paragraph.

STATE HIGHWAY ADMINISTRATOR TITLE CHANGE:
(9-18-12) M1 G185

Revise the *2006 Metric Standard Specifications* as follows:

Replace all references to "State Highway Administrator" with "Chief Engineer".

PROJECT SPECIAL PROVISIONS

ROADWAY

CLEARING AND GRUBBING – METHOD III:

(4-6-06) (Rev 3-18-08) M2 R02

Perform clearing on this project to the limits established by Method "III" shown on Standard No. 200.03 of the *2006 Metric Roadway Standard Drawings*.

Revise the *2006 Metric Standard Specifications* as follows:

Page 2-2, Article 200-3, Clearing, add the following as the 6th paragraph:

> At bridge sites, clear the entire width of the right of way beginning at a station 1 m back of the beginning extremity of the structure and ending at a station 1 m beyond the ending extremity of the structure.

BUILDING AND UNDERGROUND STORAGE TANK REMOVAL:

(1-1-02) (Rev. 5-17-11) M2 R15 C

Building Removal

Remove the buildings and appurtenances listed below in accordance with Section 215 of the *2006 Metric Standard Specifications* and the following:

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 Public Health Epidemiology Branch and/or the appropriate county agency when the county performs enforcement of the Federal Regulation. Submit a copy of the notification to the Engineer prior to the building removal.

The Department has performed asbestos assessments and abatement 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 Engineer may have the abatement performed by others or the cost of asbestos removal and disposal will be paid in accordance with Article 104-7 of the *2006 Metric Standard Specifications*. When directed to perform removal and disposal of asbestos, do so in accordance with the requirements of *Title 40 Code of Federal Regulations*; 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. 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.

Underground Storage Tank Removal

Known Underground Storage Tanks (UST's) will be removed by the Department prior to the opening of bids. When UST's are discovered after the opening of bids for the project, the Engineer may have the work performed by others or the cost of assessment, closure, and/or removal will be paid for in accordance with Article 104-7 of the *2006 Metric Standard Specifications.*

When directed to remove UST'S, prior to their removal, 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 Waste Management, UST 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 disposal in compliance with the regulations set forth in *Title 40, Code of Federal Regulations*, Part 280.71 and *North Carolina Administrative Code (NCAC)* 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 Waste 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 *American Petroleum Institute Bulletin 1604*, will not be allowed. Comply with all Federal, State and local regulations when performing UST removal and contaminated material 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.

Disposal of any contaminated material associated with underground storage tanks will be made as provided in Article 107-26 of the *2006 Metric Standard Specifications.*

Building Removal
Parcel 011 – Right of Survey Station 11+48.485 to Survey Station 11+71.000, Survey Line L
Metal Canopy

Building Removal
Parcel 016 – Left of Survey Station 12+75 through Survey Station 13+15, Survey Line L
One-Story Masonry Building with Metal Canopy Porch

Building Removal
Parcel 043–Tract B - Left of Survey Station 29+55 through Survey Station 29+90, Survey Line L
One Doublewide Mobile Home with Porch and 2-Car Metal Carport

Building Removal
Parcel 043–Tract B - Left and Right of Survey Station 29+45 through Survey Station 29+60, Survey Line L
One Tobacco Barn

Building Removal
Parcel 043–Tract B and H - Right of Survey Station 29+23 through Survey Station 29+39, Survey Line L
One Stable with Shed

Building Removal
Parcel 043–Tract C - Right of Survey Station 11+20 through Survey Station 11+40, Survey Line Y9
One Doublewide Mobile Home

Building Removal
Parcel 043–Tract F – Right and Left of Survey Station 12+18 through Survey Station 12+45, Survey Line Y7
One Single Wide Mobile Home on Permanent Foundation

Building Removal
Parcel 043-Tract H – Right of Survey Station 28+93 through Survey Station 29+16, Survey Line L
One 2,400 SF Red Metal 3-Bay Garage

Building Removal
Parcel 043-Tract H – Right and Left of Survey Station 28+58 through Survey Station 29+03, Survey Line L
One Two and One-Half (2 ½)-Story Multipurpose Building

Building Removal
Parcel 054 – Left of Survey Station 11+40 through Survey Station 11+80, Survey Line Y9
One-Story Frame Mobile Home

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.

EMBANKMENTS:
(5-16-06) (Rev 10-19-10) M2 R18

Revise the *2006 Metric Standard Specifications* as follows:

Page 2-17, Article 235-3 MATERIALS, amend as follows:

Add the following as the second sentence of the first paragraph:

> Do not use material meeting the requirements of AASHTO M145 for soil classification A-2-5 and A-5 with a plasticity index (PI) of less than 8 within 300 mm of the subgrade.

Add the following as the second sentence of the second paragraph:

> Aerate and dry material containing moisture content in excess of what is required to achieve embankment stability and specified density.

Page 2-18, Subarticle 235-4(B) Embankment Formation, add the following:

(16) Do not place rock or broken pavement in embankment areas where piles or drilled shaft foundations are to be constructed. This shall include but not be limited to piles and foundations for structures, metal signal poles, overhead sign structures, and high mount lighting.

TEMPORARY DETOURS:

(7-1-95) (Rev 4-15-08) M2 R30 A (Rev.)

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

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. Place pavement and earth material removed from the detour in embankments or dispose of in waste areas furnished by the Contractor.

Aggregate base course, drainage structures, and earth material that is removed will be measured and will be paid for at the contract unit price per cubic yard for *Unclassified Excavation.* Pavement that is removed will be measured and will be paid for at the contract unit price per square yard for *Removal of Existing Pavement.* Pipe culverts removed from the detours remain the property of the Contractor. Pipe culverts that are removed will be measured and will be paid for at the contract unit price per linear foot for *Pipe Removal.* Payment for the construction of the detours will be made at the contract unit prices for the various items involved.

Such prices and payments will be full compensation for constructing the detours and for the work of removing, salvaging, and stockpiling aggregate base course; removing pipe culverts; removing drainage structures; and for placing earth material and pavement in embankments or disposing of earth material and pavement in waste areas.

AGGREGATE SUBGRADE:

(9-18-07) (Rev 3-16-10) M2 R35

Description

Construct aggregate subgrades in accordance with the contract or as directed by the Engineer. Undercut as needed in cut areas. Install fabric for soil stabilization and place Class IV Subgrade Stabilization at locations shown on the plans.

Materials

Refer to Division 10 of the *Metric Standard Specifications.*

Item	Section
Select Material, Class IV	1016
Fabric for Soil Stabilization, Type 4	1056

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

Construction Methods

When shallow undercut is required to construct aggregate subgrades, undercut 150 mm to 600 mm as shown on the plans or as directed by the Engineer. Perform undercut excavation in accordance with Section 225 of the *Metric Standard Specifications*. Install fabric for soil stabilization in accordance with Article 270-3 of the *Metric Standard Specifications*. Place Class IV Subgrade Stabilization (standard size no. ABC) by end dumping ABC on the fabric. Do not operate heavy equipment on the fabric until it is covered with Class IV Subgrade Stabilization. Compact ABC to 92% of AASHTO T180 as modified by the Department or to the highest density that can be reasonably obtained.

Maintain Class IV Subgrade Stabilization in an acceptable condition and minimize the use of heavy equipment on ABC in order to avoid damaging aggregate subgrades. Provide and maintain drainage ditches and drains as required to prevent entrapping water in aggregate subgrades.

Measurement and Payment

Shallow Undercut will be measured and paid for in cubic meters. Shallow undercut will be measured in accordance with Article 225-7 of the *Metric Standard Specifications*. The contract unit price for *Shallow Undercut* will be full compensation for excavating, hauling and disposing of materials to construct aggregate subgrades.

Class IV Subgrade Stabilization will be measured and paid for in metric tons. Class IV Subgrade Stabilization will be measured by weighing material in trucks in accordance with Article 106-7 of the *Metric Standard Specifications*. The contract unit price for *Class IV Subgrade Stabilization* will be full compensation for furnishing, hauling, handling, placing, compacting and maintaining ABC.

Fabric for Soil Stabilization will be measured and paid for in accordance with Article 270-4 of the *Metric Standard Specifications*.

Payment will be made under:

Pay Item	**Pay Unit**
Shallow Undercut	Cubic Meter
Class IV Subgrade Stabilization	Metric Ton

FALSE SUMPS:
(7-1-95) M2 R40

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 meter for *Unclassified Excavation* or *Borrow Excavation* depending on the source of material, or included in *Grading-Lump Sum*.

SHOULDER AND FILL SLOPE MATERIAL:
(5-21-02) M2 R45 C (Rev.)

Description

Perform the required shoulder and slope construction for this project in accordance with the applicable requirements of Section 560 and Section 235 of the *2006 Metric Standard Specifications* except as follows:

Construct the top 150 mm of shoulder and fill slopes with soils capable of supporting vegetation.

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

Compensation

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

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

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

When shoulder material is obtained from borrow sources or from stockpiled material, payment for the work of shoulder construction will be made at the contract unit price per cubic yard for *Borrow Excavation* or *Shoulder Borrow* in accordance with the applicable provisions of Section 230 or Section 560 of the *2006 Metric Standard Specifications*.

SELECT GRANULAR MATERIAL:
(3-16-10) M2 R80

Revise the *2006 Metric Standard Specifications* as follows:

Page 2-23, Delete Section 265 **SELECT GRANULAR MATERIAL** and replace it with the following:

SECTION 265
SELECT GRANULAR MATERIAL

265-1 Description

Furnish and place select granular material in accordance with the contract or as directed by the Engineer.

Materials

Refer to Division 10 of the *Metric Standard Specifications.*

Item	Section
Select Material, Class II	1016
Select Material, Class III	1016

265-2 Construction Methods

Use Class II or III Select Material over fabric for soil stabilization and only Class III Select Material for backfill in water.

Place select granular material to 1 m above fabric and water level.

265-3 Measurement and Payment

Select granular material will be paid for as *Select Granular Material* unless the material is obtained from the same source as the borrow material and the contract includes a pay item for *Borrow Excavation.* When this occurs, select granular material will be paid for as *Borrow Excavation* in accordance with Article 230-5 of the *Metric Standard Specifications* and no payment for *Select Granular Material* will be made.

Select Granular Material will be measured and paid for in cubic meters. When *Undercut Excavation* is in accordance with Section 226 (Comprehensive Grading) of the *Metric Standard*

Specifications and the Engineer requires undercut to be backfilled with select granular material, the second sentence of the sixth paragraph of Article 226-3 will not apply, as payment for the backfill will be made as specified in this provision.

Select granular material will be measured by in place measurement in accordance with Article 230-5 of the *Metric Standard Specifications* or by weighing material in trucks in accordance with Article 106-7 of the *Metric Standard Specifications* as determined by the Engineer. When select granular material is weighed in trucks, a unit weight of 21.2 kN/m^3 will be used to convert the weight of select granular material to cubic meters. At the Engineer's discretion, truck measurement in accordance with Article 230-5 of the *Metric Standard Specifications* may be used in lieu of weighing material in trucks.

The contract unit prices for *Select Granular Material* and *Borrow Excavation* as described above will be full compensation for furnishing, hauling, handling, placing, compacting and maintaining select granular material.

Payment will be made under:

Pay Item	**Pay Unit**
Select Granular Material	Cubic Meter

RIP-RAPPED ENERGY DISSIPATOR BASIN:

Description

This work consists of the construction and maintenance of an armored outlet structure located at culvert outlets or ditch termini.

Materials
Refer to Division 10 of the *Standard Specifications:*

Item	**Section**
Class I Riprap	Section 1042
Filter Fabric for Drainage, Type 2	Section 1056

Construction Methods

Rip-rapped Energy dissipators shall be constructed in accordance with the detail shown in the plans or as directed. From the outlet invert of a culvert or bottom of a ditch excavation will drop to a specified depth. Excavation will continue to widen through the dissipator. Rip rap will be placed along the banks and bottom of the dissipator and along the apron.

Excavate ditch in accordance with Section 204 of the *Standard Specifications*.

The quantity of energy dissipator material may be affected by site conditions during construction of the project. The quantity of materials may be increased, decreased, or eliminated 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.

Measurement and Payment

Rip-rapped energy dissipator basins will be paid for per each.

Such price and payment will be full compensation for all work covered by this special provision, including, but not limited to excavation, furnishing and placing stone, filter fabric, all materials and all labor, tools, equipment, and incidentals necessary to complete the work.

600 MM WELDED STEEL PIPE UNDER THE TRACKS OF NORFOLK SOUTHERN RAILWAY:

The 600 mm welded steel pipe required under the tracks of Norfolk Southern Railway shall conform with Section 330 of the *Standard Specifications*. The minimum thickness of the wall shall be 12 mm.

The pipe shall be installed by dry boring and jacking under the tracks as shown in the plans. The pipe shall be carefully dry bored true to the line and grade given. The bore shall be held to a minimum to insure that there will be no settlement. Pipe which has been damaged due to the Contractor's operation shall be removed and replaced at the Contractor's expense. All voids around the outside of the pipe shall be completely filled to the satisfaction of the Engineer.

The Contractor shall notify Richard Fox, Track Supervisor, Norfolk Southern Railway Co. [(540) 529-6070, richard.fox@nscorp.com] 15 days before any work is begun on the railroad's right of way. This will enable them to have a representative present, if they so desire, while the work is being performed to determine if the work is being performed in accordance with the approved plans and Special Provisions. The railroad will advise the Contractor when the work is to be done between trains and provide a flagman, if required.

The quantity of pipe to be paid for will be the actual number of linear meters of pipe which has been incorporated in the completed and accepted work. Measurement will be made by counting the number of joints used and multiplying by the length of the joint. Where partial joints are used, measurement will be made along the longest length of the partial joint to the nearest 0.03 of a meter.

The quantity of pipe measured as provided for above will be paid for at the contract unit price per linear meter for *600 mm Welded Steel Pipe, 12mm Thick, Grade B, (Under RR)*. 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.

The Contractor shall submit two (2) sets of detailed plans and a written description of his proposed method of pipe installation for approval by the Engineer and the Railway Company. Plans should include the size and location of any required jacking pits and shoring for support of the railroad roadbed if necessary.

FLOWABLE FILL:

(9-17-02) (Rev 8-21-07) M3 R30

Description

This work consists of all work necessary to place flowable fill in accordance with these provisions, the plans, and as directed.

Materials

Provide flowable fill material in accordance with Article 340-2 of the *2006 Metric Standard Specifications.*

Construction Methods

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

Measurement and Payment

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

Payment will be made under:

Pay Item	Pay Unit
Flowable Fill	Cubic Meter

DRAINAGE PIPE (WITH ELBOWS):

(7-18-06) (Rev 1-19-10) M3 R37 B

Description

Where shown in the plans the Contractor may use Reinforced Concrete Pipe, Aluminum Alloy Pipe, Aluminized Corrugated Steel Pipe, HDPE Pipe, or PVC pipe in accordance with the following requirements.

Material

Item	Section
Corrugated Aluminum Alloy Pipe	1032-2(A)
Aluminized Corrugated Steel Pipe	1032-3(A)(7)
Corrugated Polyethylene Pipe (HDPE)	1032-10
Reinforced Concrete Pipe – Class II or III	1032-9(C)
Polyvinyl-Chloride (PVC)	1032-11
Elbows	1032

Corrugated Steel Pipe will not be permitted in counties listed in the contract documents.

Only pipe with smooth inside walls will be allowed for storm drain systems. Storm drain systems are defined as pipe under curb and gutter, expressway gutter, and shoulder berm gutter that connects drainage structures and is not open ended.

Construction Methods

Pipe Culverts shall be installed in accordance with the contract documents.

Where allowed by the plans, use any of the several alternate pipes shown herein, but only one type of pipe and elbow will be permitted between drainage structures or for the entire length of a cross line pipe.

Measurement and Payment

___ *mm Drainage Pipe* will be paid for as the actual number of linear meters installed and accepted. Measurement will be in accordance with the contract documents.

Drainage Pipe Elbow will be measured and paid for in units of each.

Payment will be made under:

Pay Item	**Pay Unit**
___ mm Drainage Pipe	Linear Meter
Drainage Pipe Elbow	Each

PIPE INSTALLATION AND PIPE CULVERTS:

(1-19-10)(Rev 1-18-11) M3 R40 B

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

Replace Section 300 and Section 310 with the following:

SECTION 300

PIPE INSTALLATION

300-1 DESCRIPTION

Excavate, undercut, provide material, condition foundation, lay pipe, joint and couple pipe sections, and furnish and place all backfill material as necessary to install the various types of pipe culverts and fittings required to complete the project.

Install pipe in accordance with the detail in the plans.

Do not waste excavation unless permitted. Use suitable excavated material as backfill; or in the formation of embankments, subgrades, and shoulders; or as otherwise directed. Furnish disposal areas for the unsuitable material. The Engineer will identify excavated materials that are unsuitable.

Where traffic is to be maintained, install pipe in sections so that half the width of the roadway is available to traffic.

300-2 MATERIALS

Refer to Division 10:

Item	Section
Flowable Fill	1000
Select Materials	1016
Joint Materials	1032-9(G)
Engineering Fabrics	1056

Provide foundation conditioning material meeting the requirements of Article 1016-3 for Class V or VI Select Material as shown in the contract documents.

Provide bedding material meeting the requirements of Article 1016-3 for Class II (Type 1 only) or Class III Select Material as shown in contract documents.

Provide backfill material meeting the requirements of Article 1016-3 for Class II (Type 1 for Flexible Pipe) or Class III Select Material as shown in the contract documents.

Provide filter fabric meeting the requirements of Article 1056-2 for any type of engineering fabric.

Provide foundation conditioning fabric meeting the requirements of Article 1056-2 for Type 2 Engineering Fabric.

Do not use corrugated steel pipe in the following counties:

Beaufort, Bertie, Bladen, Brunswick, Camden, Carteret, Chowan, Columbus, Craven, Currituck, Dare, Gates, Hertford, Hyde, Jones, Martin, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrrell, and Washington.

300-3 UNLOADING AND HANDLING

Unload and handle pipe with reasonable care. Do not roll or drag metal pipe or plates over gravel or rock during handling. Take necessary precautions to ensure the method used in lifting or placing the pipe does not induce stress fatigue in the pipe. Use a lifting device that uniformly distributes the weight of the pipe along its axis or circumference. Repair minor damage to pipe when permitted. Remove pipe from the project that is severely damaged or is rejected as being unfit for use. Undamaged portions of a joint or section may be used where partial lengths are required.

300-4 PREPARATION OF PIPE FOUNDATION

Prepare the pipe foundation in accordance with the applicable method as shown in the contract documents, true to line and grade, and uniformly firm.

Camber invert grade an amount sufficient to prevent the development of sag or back slope in the flow line. The Contractor shall determine the amount of camber required and submit to the Engineer for approval.

Where material is found to be of poor supporting value or of rock and when the Engineer cannot make adjustment in the location of the pipe, undercut existing foundation material within the limits established on the plans. Backfill the undercut with foundation conditioning material. Encapsulate the foundation conditioning material with foundation conditioning fabric prior to placing bedding material. Overlap all transverse and longitudinal joints in the fabric at least 450 mm.

Maintain the pipe foundation in a dry condition.

300-5 INVERT ELEVATIONS

The proposed pipe culvert invert elevations shown on the Drainage Summary Sheets are based upon information available when the plans were prepared. If proposed invert elevations are adjusted during construction based upon actual conditions encountered, no claim for an extension of time for any reason resulting from this information will be allowed.

When a pipe culvert is to be installed in a trench and the average actual elevation of the pipe between drainage structures deviates from the average proposed elevation shown on the Drainage Summary Sheets by more than 0.3 m a pay adjustment will be made as follows:

Pay Adjustment (per linear meter) = [(APE-AAE) ± 0.3 meter] (0.15 X CUP)

Where: CUP = Contract Unit Price of Pipe Culvert

AAE = Average Actual Elevation $\frac{(\text{Actual Inlet elev.} + \text{Actual Outlet elev.})}{2}$

APE = Average Plan Elevation $\frac{(\text{Plan Inlet elev.} + \text{Plan Outlet elev.})}{2}$

When the actual location of a pipe culvert is changed from the location shown on the plans, the Engineer will make a pay adjustment deemed warranted based upon the relation of the pipe culvert as shown on the plans to the finished roadway and the relation of the pipe culvert as constructed to the finished roadway.

The top elevation column on the drainage summary sheet indicates the flow elevation at the top of structures intended to collect surface water.

The top elevation column on drainage structures not intended to collect surface water indicates the elevation at the top of the cover.

300-6 LAYING PIPE

The Department reserves the right to perform forensic testing on any installed pipe.

(A) Rigid Pipe

Concrete and welded steel pipe will be considered rigid pipe. Lay pipe on prepared foundation, bell or groove end upgrade with the spigot or tongue fully inserted. Check each joint for alignment and grade as the work proceeds.

Use flexible plastic joint material except when material of another type is specified in the contract documents. Joint material of another type may be used when permitted.

Repair lift holes in concrete pipe, if present. Thoroughly clean and soak the lift hole and completely fill the void with an approved non-shrink grout. Submit alternate details for repairing lift holes to the engineer for review and approval.

For all pipes 1050 mm in diameter and larger, wrap filter fabric around all pipe joints. Extend fabric at least 300 mm beyond each side of the joint. Secure fabric against the outside of the pipe by methods approved by the Engineer.

(B) Flexible Pipe (Except Structural Plate Pipe)

Corrugated steel, corrugated aluminum, corrugated polyethylene (HDPE), and polyvinylchloride (PVC) pipe will be considered flexible pipe. Place flexible pipe carefully on the prepared foundation starting at the downstream end with the inside circumferential laps pointing downstream and with the longitudinal laps at the side or quarter points.

Handle coated corrugated steel pipe with special care to avoid damage to coatings.

Join pipe sections with coupling band, fully bolted and properly sealed. Provide coupling bands for annular and helical corrugated metal pipe with circumferential and longitudinal strength sufficient to preserve the alignment, prevent separation of the sections, and prevent backfill infiltration. Match-mark all pipe 1500 mm or larger in diameter at the plant for proper installation on the project.

At locations indicated in the plans, corrugated steel pipe sections shall be jointed together with rod and lug coupling bands, fully bolted. Sleeve gaskets shall be used in conjunction with rod and lug couplings and the joints properly sealed. Coupling bands shall provide circumferential and longitudinal strength sufficient to preserve the alignment, prevent separation of the sections and prevent infiltration of backfill material.

300-7 BEDDING AND BACKFILLING

Loosely place bedding material, in a uniform layer, a depth equal to the inside diameter of the pipe divided by 6 or 150 mm, whichever is greater. Leave bedding material directly beneath the

pipe uncompacted and allow pipe seating and backfill to accomplish compaction. Excavate recesses to receive the bells where bells and spigot type pipe is used.

Place fill around the pipe in accordance with the applicable method shown on the plans in layers not to exceed 150 mm loose unless otherwise permitted. Compact to the density required by Subarticle 235-4(C). Approval of the backfill material is required prior to its use. Use select material as shown in the contract documents.

Take care during backfill and compaction operations to maintain alignment and prevent damage to the joints. Keep backfill free from stones, frozen lumps, chunks of highly plastic clay, or other objectionable material.

Grade and maintain all pipe backfill areas in such a condition that erosion or saturation will not damage the pipe foundation or backfill.

Excavatable flowable fill may be used for backfill when approved by the Engineer. When using excavatable flowable fill, ensure that the pipe is not displaced and does not float during backfill. Submit methods for supporting the pipe and material placement to the Engineer for review and approval.

Do not operate heavy equipment over any pipe until it has been properly backfilled with a minimum 1 m of cover. Place, maintain, and finally remove the required cover that is above the proposed finished grade at no cost to the Department. Remove and replace, at no cost to the Department, pipe that becomes misaligned, shows excessive settlement, or has been otherwise damaged by the Contractor's operations.

300-8 INSPECTION AND MAINTENANCE

Prior to final acceptance, the Engineer will perform random video camera and or mandrel inspections to ensure proper jointing and that deformations do not exceed allowable limits. Replace pipes having cracks greater than 2.5 mm or deflections greater than 7.5 percent. Repair or replace pipes with cracks greater than 0.25 mm, exhibiting displacement across a crack, exhibiting bulges, creases, tears, spalls, or delamination. Maintain all pipe installations in a condition such that they will function continuously from the time the pipe is installed until the project is accepted.

300-9 MEASUREMENT AND PAYMENT

General

No measurement will be made of any work covered by this section except as listed below. Removal and disposal of existing pavement is a part of the excavation for the new pipe culvert installation. Repair of the pavement will be made in accordance with Section 654.

Foundation Conditioning

Using Local Material

Undercut excavation is all excavation removed by undercutting below the bottom of the trench as staked. *Undercut Excavation* will be measured as the actual number of cubic meters of undercut excavation, measured in its original position and computed by the average end area method, that has been removed as called for in the contract and will be paid for at double the contract unit price for *Unclassified Excavation* as provided in Article 225-7.

Local material used for conditioning the foundation will be measured and paid for in accordance with Article 225-7 for *Unclassified Excavation* or in accordance with Article 230-5 for *Borrow Excavation* depending on the source of the material.

Local material used to replace pipe undercut excavation will be measured and paid for in accordance with Article 225-7 or Article 230-5.

Using Other Than Local Material

No measurement and payment will be made for *Undercut Excavation.* The material used to replace pipe undercut excavation will be classified as foundation conditioning material.

Foundation Conditioning Material, Minor Structures will be measured and paid for as the actual number of metric tons of this material weighed in trucks on certified platform scales or other certified weighing devices.

No direct payment will be paid for undercut excavation. Payment at the contract unit price for *Foundation Conditioning Material, Minor Structures* will be full compensation for all work of pipe undercut excavation.

Foundation Conditioning Fabric

Foundation Conditioning Fabric will be measured and paid for in square meters. The measurement will be based on the theoretical calculation using length of pipe installed and two times the standard trench width. No separate measurement will be made for overlapping fabric or the vertical fabric dimensions required to encapsulate the foundation conditioning material.

Bedding and Backfill - Select Material

No measurement will be made for select bedding and backfill material required in the contract documents. The select bedding and backfill material will be included in the cost of the installed pipe.

Where unclassified excavation or borrow material meets the requirements for select bedding and backfill and is approved for use by the Engineer, no deductions will be made to these pay items to account for use in the pipe installation.

Payment will be made under:

Pay Item	*Pay Unit*
Foundation Conditioning Material, Minor Structures	Metric Ton
Foundation Conditioning Fabric	Square Meter

SECTION 310

PIPE CULVERTS

310-1 DESCRIPTION

Furnish and install drainage pipe at locations and size called for in the contract documents. The work includes construction of joints and connections to other pipes, endwalls, and drainage structures.

310-2 MATERIALS

Refer to Division 10:

Item	**Section**
Plain Concrete Pipe Culvert	1032-9(B)
Reinforced Concrete Pipe Culvert	1032-9(C)
Precast Concrete Pipe End Sections	1032-9(D)
Concrete Pipe Tees and Elbows	1032-9(E)
Corrugated Aluminum Alloy Pipe Culvert	1032-2(A)
Corrugated Aluminum Alloy Pipe Tees and Elbows	1032-2(B)
Corrugated Steel Culvert Pipe and Pipe Arch	1032-3(A)
Prefabricated Corrugated Steel Pipe End Sections	1032-3(B)
Corrugated Steel Pipe Tees and Elbows	1032-3(C)
Corrugated Steel Eccentric Reducers	1032-3(D)
HDPE Smooth Lined Corrugated Plastic Pipe	1032-10
Polyvinylchloride (PVC) Pipe	1032-11

Suppliers that provide metal pipe culverts, fittings, and all other accessories covered by this section shall meet the requirements of the Department's Brand Certification program for metal pipe culverts, and be listed on the Department's pre-approved list for suppliers of metal pipe culvert.

Do not use corrugated steel pipe in the following counties:

Beaufort, Bertie, Bladen, Brunswick, Camden, Carteret, Chowan, Columbus, Craven, Currituck, Dare, Gates, Hertford, Hyde, Jones, Martin, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrell, and Washington.

310-3 PIPE INSTALLATION

Install pipe, pipe tees, and elbows in accordance with Section 300.

310-4 SIDE DRAIN PIPE

Side drain pipe is defined as storm drain pipe running parallel to the roadway to include pipe in medians, outside ditches, driveways, and under shoulder berm gutter along outside shoulders greater than 4 feet1.2 m wide.

Where shown in the plans, side drain pipe may be Class II Reinforced Concrete Pipe, aluminized corrugated steel pipe, corrugated aluminum alloy pipe, HDPE pipe, or PVC pipe. Corrugated steel pipe is restricted in the counties listed in Article 310-2. Install side drain pipe in accordance to Section 300. Cover for side drain pipe shall be at least 0.3 meter.

310-5 PIPE END SECTIONS

Choose which material to use for the required end sections. Both corrugated steel and concrete pipe end sections will work on concrete pipe, corrugated steel pipe, and HDPE smooth lined corrugated plastic pipe.

310-6 MEASUREMENT AND PAYMENT

Pipe will be measured and paid as the actual number of linear meter of pipe that has been incorporated into the completed and accepted work. Measurement of pipe will be made by counting the number of joints used and multiplying by the length of the joint to obtain the number of linear meter of pipe installed and accepted. Measurements of partial joints will be made along the longest length of the partial joint to the nearest 0.1 of a meter. Select bedding and backfill material will be included in the cost of the installed pipe.

Pipe End Sections, Tees, Elbows, and *Eccentric Reducers* will be measured and paid as the actual number of each of these items that have been incorporated into the completed and accepted work.

Payment will be made under:

Pay Item	***Pay Unit***
__mm R.C. Pipe Culverts, Class ____	Linear Meter
__mm x __mm x __mm R.C. Pipe Tees, Class____	Each
__mm R.C. Pipe Elbows, Class ____	Each
__mm C.A.A. Pipe Culvert, __mm Thick	Linear Meter
__mm x __ mm x__ mm C.A.A. Pipe Tees, __mm Thick	Each
__mm C.A.A. Pipe Elbows, __mm Thick	Each
__mm C.S. Pipe Culverts, __mm Thick	Linear Meter
__mm x __mm C.S. Pipe Arch Culverts, __mm Thick	Linear Meter
__ x __mm x__ mm C.S. Pipe Tees, __mm Thick	Each

__mm C.S. Pipe Elbows, __mm Thick	Each
__mm x __mm C.S. Eccentric Reducers, __mm Thick	Each
__mm HDPE Pipe	Linear Meter
___mm PVC Pipe	Linear Meter
__mm Side Drain Pipe	Linear Meter
__mm Side Drain Pipe Elbows	Each
__mm Pipe End Section	Each

SEALED DRAINAGE SYSTEM:
(3-10-04) (Rev. 3-11-13) SPI

Description

The Contractor's attention is directed to the fact that there is an area containing petroleum contaminated soil on this project.

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.

No underdrains will be allowed for any reason in the area of the sealed drainage system.

Materials

The Engineer shall approve all backfill material.

Portland Cement Concrete shall meet the requirements of Section 1000 of the *2006 Metric 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 Nitrilenitrile, polytetrafluoroethylene (PTFE)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).

Masonry Drainage Structures shall be in accordance with the applicable requirements of Section 840 of the *2006 Metric Standard Specifications* and this provision. Masonry Drainage Structures shall be precast concrete conforming to ASTM C478. 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, polytetrafluoroethylene (PTFE), 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 *2006 Metric Standard Specifications* except that the mixture shall consist of 1 part portland 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. 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.

Construction Methods

All portions of the excavations shall be made so that the safe slope of the earth is not exceeded. Backfill with contaminated material is prohibited. All excavated material and contaminated water shall be handled and disposed of as set forth elsewhere in these contract documents. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times. 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.

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 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 by the contract documents.

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 of the *2006 Metric Standard Specifications*, 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.

Sealed Drainage System Installation:

Install pipe in accordance with the project special provision entitled PIPE INSTALLATION elsewhere in these contract documents and this provision. 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 defects before placing, and any found defective 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 *2006 Metric 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 Subarticle 1520-4 3 (B) (12) of the *2006 Metric 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.

Measurement and Payment

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.

Ductile Iron Pipe will be measured and paid for as the actual number of linear meters that has been incorporated into the completed and accepted work.

Masonry Drainage Structures shall be measured and paid for in accordance with Section 840 of the *2006 Metric Standard Specifications*.

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.

Payment will be made under:

Pay Items	**Pay Units**
___ mm Ductile Iron Pipe	Linear Meter

FINE GRADING SUBGRADE, SHOULDERS AND DITCHES:
(7-21-09) M5 R01

Revise the 2006 *Metric Standard Specifications* as follows:

Page 5-1, Article 500-1 DESCRIPTION, replace the first sentence with the following:

Perform the work covered by this section including but not limited to preparing, grading, shaping, manipulating moisture content, and compacting either an unstabilized or stabilized roadbed to a condition suitable for placement of base course, pavement, and shoulders.

AGGREGATE BASE COURSE:
12-19-06 M5 R03

Revise the *2006 Metric Standard Specifications* as follows:

Page 5-9, Article 520-5 Hauling and Placing Aggregate Base Material, 6th paragraph, replace the first sentence with the following:

Base course that is in place on November 15 shall have been covered with a subsequent layer of pavement structure or with a sand seal. Base course that has been placed between November 16 and March 15 inclusive shall be covered within 7 calendar days with a subsequent layer of pavement structure or with a sand seal.

PREPARATION OF SUBGRADE AND BASE:
(1-16-96) M5 R05

On mainline portions and ramps of this project, prepare the subgrade and base beneath the pavement structure in accordance with the applicable sections of the *2006 Metric Standard Specifications* except use an automatically controlled fine grading machine utilizing string lines, laser controls, or other approved methods to produce final subgrade and base surfaces meeting the lines, grades, and cross sections required by the plans or established by the Engineer.

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

AGGREGATE FOR SOIL-CEMENT BASE:
(7-18-06) M5 R15

Revise the *2006 Metric Standard Specifications* as follows:

Page 5-23, Article 542-1. Delete the first sentence and substitute the following:

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

Page 5-23, Article 542-2. Add the following:

Item	Section
Aggregate, Std. Size ABC	1005

Page 5-24, Article 542-7. Add the following after the first paragraph:

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

Page 5-26, Article 542-16. Add the following paragraph after the first paragraph:

Aggregate for Soil-Cement Base will be measured and paid for in metric tons at the contract unit price per metric ton. The aggregate will be measured by weighing in trucks or certified platform

scales or other certified weighing devices. No deductions will be made for any moisture contained in the aggregate at the time of weighing.

Add the following to the pay item:

Pay Item	Pay Unit
Aggregate for Soil-Cement Base	Metric Ton

ASPHALT PAVEMENTS - SUPERPAVE:
(7-18-06)(Rev 4-16-13) M6 R01

Revise the *2006 Metric Standard Specifications* as follows:

Page 6-2, Article 600-9 Measurement and Payment, delete the second paragraph.

Page 6-3, Article 605-7 APPLICATION RATES AND TEMPERATURES, replace this article, including Table 601-1, with the following:

Apply tack coat uniformly across the existing surface at target application rates shown in Table 605-1.

TABLE 605-1
APPLICATION RATES FOR TACK COAT

Existing Surface	Target Rate (l/m^2)
	Emulsified Asphalt
New Asphalt	0.18 ± 0.04
Oxidized or Milled Asphalt	0.27 ± 0.04
Concrete	0.36 ± 0.04

Apply tack coat at a temperature within the ranges shown in Table 605-2. Tack coat shall not be overheated during storage, transport or at application.

TABLE 605-2
APPLICATION TEMPERATURE FOR TACK COAT

Asphalt Material	Temperature Range
Asphalt Binder, Grade PG 64-22	177 - 96°C
Emulsified Asphalt, Grade RS-1H	54 - 71°C
Emulsified Asphalt, Grade CRS-1	54 - 71°C
Emulsified Asphalt, Grade CRS-1H	54 - 71°C
Emulsified Asphalt, Grade HFMS-1	54 - 71°C
Emulsified Asphalt, Grade CRS-2	54 - 71°C

Page 6-10, Subarticle 609-5(C)(2), Required Sampling and Testing Frequencies, first partial paragraph at the top of the page, delete last sentence and replace with the following:

If the Engineer allows the mix to remain in place, payment will be made in accordance with Article 105-3.

Page 6-10, Subarticle 609-5(C)(2), Quality Control Minimum Sampling and Testing Schedule, first paragraph and replace with the following:

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

Second paragraph, delete the fourth sentence and replace with the following:

When daily production of each mix design exceeds 100 metric tons and a regularly scheduled full test series random sample location for that mix design does not occur during that day's production, perform at least one partial test series consisting of Items A and B in the schedule below.

Page 6-10, Subarticle 609-5(C)(2)(c) Maximum Specific Gravity, add after (AASHTO T 209):

or ASTM D 2041

Page 6-11, Subarticle 609-5(C)(2)(e) Tensile Strength Ratio (TSR), add a heading before the first paragraph as follows:

(i) Option 1

Insert the following immediately after the first paragraph:

(ii) Option 2

Mix sampled from truck at plant with one set of specimens prepared by the Contractor and then tested jointly by QA and QC at a mutually agreed upon lab site within the first 7 calendar days after beginning production of each new mix design.

Second paragraph, delete and replace with the following:

Test all TSR specimens required by either option noted above on either a recording test press or a test press that maintains the peak load reading after the specimen has broken.

Page 6-11, Subarticle 609-5(C)(3) Control Charts, delete the second sentence of the first paragraph and replace with the following:

For mix incorporated into the project, record full test series data from all regularly scheduled random samples or directed samples that replace regularly scheduled random samples, on control charts the same day the test results are obtained.

Page 6-12, Subarticle 609-5(C)(3) Control Charts, fourth paragraph on this page, delete the last sentence and replace with the following:

Denote the moving average control limits with a dash green line and the individual test limits with a dash red line.

Page 6-15, Subarticle 609-5(C)(3)(a), (b) and (c), replace (a) (b) and (c) with the following:

(a) A change in the binder percentage, aggregate blend, or G_{mm} is made on the JMF, or

(b) When the Contractor elects to stop or is required to stop production after one or two moving average values, respectively, fall outside the moving average limits as outlined in Subarticle 609-5(C)(6)), or,

(c) If failure to stop production after two consecutive moving averages exceed the moving average limits occurs, but production does stop at a subsequent time, re-establish a new moving average beginning at the actual production stop point.

Page 6-15, Subarticle 609-5(C)(4) Control Limits, replace the first paragraph and the CONTROL LIMITS Table on page 6-13 with the following:

The following are established as control limits for mix production. Apply the individual limits to the individual test results. Control limits for the moving average limits are based on a moving average of the last 4 data points. Apply all control limits to the applicable target source.

CONTROL LIMITS

Mix Control Criteria	Target Source	Moving Average Limit	Individual Limit
2.36 mm Sieve	JMF	±4.0 %	±8.0 %
0.075 mm Sieve	JMF	±1.5 %	±2.5 %
Binder Content	JMF	±0.3 %	±0.7 %
VTM @ N_{des}	JMF	±1.0 %	±2.0 %
VMA @ N_{des}	Min. Spec. Limit	Min Spec. Limit	-1.0%
$P_{0.075}$/ P_{be} Ratio	1.0	±0.4	±0.8
%G_{mm} @ N_{ini}	Max. Spec. Limit	N/A	+2.0%
TSR	Min. Spec. Limit	N/A	- 15%

Page 6-13, Subarticle 609-5(C)(5) Warning Bands, delete this subarticle in its entirety.

Pages 6-13 through 6-15, Subarticle 609-5(C)(6) Corrective Actions, delete the word "warning" and replace with the words "moving average".

Page 6-13, Subarticle 609-5(C)(6) Corrective Actions, first paragraph, first sentence, delete and replace with the following:

Immediately notify the Engineer when moving averages exceed the moving average limits.

Page 6-14, Subarticle 609-5(C)(6) Corrective Actions, second paragraph, delete and replace with the following:

Failure to stop production when required due to an individual mix test not meeting the specified requirements will subject all mix from the stop point tonnage to the point when the next individual test is back on or within the moving average limits, or to the tonnage point when production is actually stopped, whichever occurs first, to being considered unacceptable.

Fifth full paragraph, delete the first, second, and third sentence and replace with the following:

Immediately notify the Engineer when any moving average value exceeds the moving average limit. If two consecutive moving average values for any one of the mix control criteria fall outside the moving average limits, cease production of that mix, immediately notify the Engineer of the stoppage, and make adjustments. The Contractor may elect to stop production after only one moving average value falls outside the moving average limits.

Page 6-14, Subarticle 609-5(C)(6) Corrective Actions, eighth paragraph, delete and replace with the following:

If the process adjustment improves the property in question such that the moving average after four additional tests is on or within the moving average limits, the Contractor may continue production with no reduction in payment.

Page 6-14, Subarticle 609-5(C)(6) Corrective Actions, delete the last paragraph and the first paragraph on Page 6-15, including the Table for Payment for Mix Produced in the Warning Bands and substitute the following:

If the adjustment does not improve the property in question such that the moving average after four additional individual tests is outside the moving average limits, the mix will be evaluated for acceptance in accordance with Article 105-3. Reduced payment for or removal of the mix in question will be applied starting from the plant sample tonnage at the stop point to the sample tonnage when the moving average is on or within the moving average limits. In addition, any mix that is obviously unacceptable will be rejected for use in the work.

Page 6-15, Second full paragraph, delete and replace with the following:

Failure to stop production and make adjustments when required due to two consecutive moving average values falling outside the moving average limits will subject all mix produced from the stop point tonnage to the tonnage point when the moving average is back on or within the moving average limits or to the tonnage point when production is actually stopped, whichever occurs first, to being considered unacceptable. Remove this material and replaced with materials that comply with the Specifications at no additional costs to the Department, unless otherwise approved. Payment will be made for the actual quantities of materials required to replace the removed quantities, not to exceed the original amounts.

Page 6-16, Subarticle 609-5(D)(1) General, delete the last paragraph, and replace with the following:

Perform the sampling and testing at the minimum test frequencies as specified above. Should the density testing frequency fail to meet the minimum frequency as specified above, all mix without the required density test representation will be considered unsatisfactory. If the Engineer allows the mix to remain in place, payment will be made in accordance with Article 105-3.

Page 6-18, Subarticle 609-5(D)(4) Nuclear Gauge Density Procedures, third paragraph, insert the following as the second sentence:

Determine the Daily Standard Count in the presence of the QA Roadway Technician or QA Nuclear Gauge Technician on days when a control strip is being placed.

Page 6-18, Subarticle 609-5(D)(5) Limited Production Procedure, delete the last paragraph including (a), (b), (c) and substitute the following:

Proceed on limited production when, for the same mix type and on the same contract, one of the following conditions occur (except as noted in the first paragraph below).

(a) Two consecutive failing lots, except on resurfacing*
(b) Three consecutive failing lots on resurfacing*
(c) Two consecutive failing nuclear control strips.

* Resurfacing is defined as the first new uniform layer placed on an existing pavement.

Page 6-20, Article 609-6 QUALITY ASSURANCE, DENSITY QUALITY ASSURANCE, insert the following items after item (E):

(F) By retesting Quality Control core samples from control strips (either core or nuclear) at a frequency of 100% of the frequency required of the Contractor;

(G) By observing the Contractor perform all standard counts of the Quality Control nuclear gauge prior to usage each nuclear density testing day; or

(H) By any combination of the above.

Page 6-23 through Page 6-24, Subarticle 610-3(A) Mix Design-General, delete the fourth and fifth paragraphs and replace with the following:

Reclaimed Asphalt Pavement (RAP) or Reclaimed Asphalt Shingles (RAS) may be incorporated into asphalt plant mixes in accordance with Article 1012-1 and the following applicable requirements.

Reclaimed asphalt pavement (RAP) may constitute up to 50% of the total material used in recycled mixtures, except for mix Type S 12.5D, Type S 9.5D, and mixtures containing reclaimed asphalt shingle material (RAS). Reclaimed asphalt shingle (RAS) material may constitute up to 6% by weight of total mixture for any mix. When both RAP and RAS are used, do not use a combined percentage of RAS and RAP greater than 20% by weight of total mixture, unless otherwise approved. When the percent of binder contributed from RAS or a combination of RAS and RAP exceeds 20% but not more than 30% of the total binder in the completed mix, the virgin binder PG grade shall be one grade below (both high and low temperature grade) the binder grade specified in Table 610-2 for the mix type, unless otherwise approved. When the percent of binder contributed from RAS or a combination of RAS and RAP exceeds 30% of the

total binder in the completed mix, the Engineer will establish and approve the virgin binder PG grade. Use approved methods to determine if any binder grade adjustments are necessary to achieve the performance grade for the specified mix type.

For Type S 12.5D and Type S 9.5D mixes, the maximum percentage of reclaimed asphalt material is limited to 20% and shall be produced using virgin asphalt binder grade PG 76-22. For all other recycled mix types, the virgin binder PG grade shall be as specified in Table 610-2A for the specified mix type.

When the percentage of RAP is greater than 20% but not more than 30% of the total mixture, use RAP meeting the requirements for processed or fractionated RAP in accordance with the requirements of Article 1012-1.

When the percentage of RAP is greater than 30% of the total mixture, use an approved stockpile of RAP in accordance with Subarticle 1012-1(C). Use approved test methods to determine if any binder grade adjustments are necessary to achieve the performance grade for the specified mix type. The Engineer will establish and approve the virgin asphalt binder grade to be used.

Page 6-26, Subarticle 610-3(C) Job Mix Formula (JMF), second paragraph, replace "Mixes with binder grade" values with Table 610-0 as follows:

TABLE 610-0
DESIGN MIXING TEMPERATURE AT THE ASPHALT PLANT[A]

Binder Grade	HMA JMF Temperature	WMA JMF Temperature Range
PG 64-22	149°C	107 - 135°C
PG 70-22	157°C	116 - 143°C
PG 76-22	168°C	127 - 154°C

A. The mix temperature, when checked in the truck at the roadway, shall be within plus -9°C and minus 4° of the temperature specified on the JMF.

Page 6-28, Subarticle 610-3(C) Job Mix Formula, delete Table 610-2 and associated notes and replace with the following:

TABLE 610-2
SUPERPAVE MIX DESIGN CRITERIA

Mix Type	Design ESALs Millions (a)	Binder PG Grade (b)	Compaction Levels No. Gyrations @		Max. Rut Depth (mm)	Volumetric Properties (c)			
			N_{ini}	N_{des}		VMA % Min.	VTM %	VFA Min. - Max.	$\%G_{mm}$ @ N_{ini}
S-4.75A(e)	< 0.3	64 -22	6	50	-----	20.0	7.0 - 15.0	-----	-----
SF-9.5A	< 0.3	64 -22	6	50	11.5	16.0	3.0 - 5.0	70 - 80	≤ 91.5
S-9.5B	0.3 - 3	64 -22	7	65	9.5	15.5	3.0 - 5.0	65 - 80	≤ 90.5
S-9.5C	3 - 30	70 -22	7	75	6.5	15.5	3.0 - 5.0	65 - 78	≤ 90.5
S-9.5D	> 30	76 -22	8	100	4.5	15.5	3.0 - 5.0	65 - 78	≤ 90.0
S-12.5C	3 - 30	70 -22	7	75	6.5	14.5	3.0 - 5.0	65 - 78	≤ 90.5
S-12.5D	> 30	76 -22	8	100	4.5	14.5	3.0 - 5.0	65 - 78	≤ 90.0
I-19.0B	< 3	64 -22	7	65	-----	13.5	3.0 - 5.0	65 - 78	≤ 90.5
I-19.0C	3 - 30	64 -22	7	75	-----	13.5	3.0 - 5.0	65 - 78	≤ 90.0
I-19.0D	> 30	70 -22	8	100	-----	13.5	3.0 - 5.0	65 - 78	≤ 90.0
B-25.0B	< 3	64 -22	7	65	-----	12.5	3.0 - 5.0	65 - 78	≤ 90.5
B-25.0C	> 3	64 -22	7	75	-----	12.5	3.0 - 5.0	65 - 78	≤ 90.0

	Design Parameter	Design Criteria
All Mix Types	1. Dust to Binder Ratio ($P_{0.075}$ / P_{be})	0.6 – 1.4
	2. Retained Tensile Strength (TSR) (AASHTO T283 Modified)	85% Min. **(d)**

Notes:
(a) Based on 20 year design traffic.
(b) Volumetric Properties based on specimens compacted to Ndes as modified by the Department.
(c) AASHTO T 283 Modified (No Freeze-Thaw cycle required). TSR for Type S 4.75A, Type B 25.0B, and Type B 25.0C mixes is 80% minimum.
(d) Mix Design Criteria for Type S 4.75A may be modified subject to the approval of the Engineer.

Page 6-28, Insert the following immediately after Table 610-2:

TABLE 610-2A
SUPERPAVE MIX DESIGN CRITERIA

	Percentage of RAP in Mix		
	Category 1	**Category 2**	**Category 3**
Mix Type	% RAP ≤20%	20.1% ≤ %RAP ≤ 30.0%	%RAP > 30.0%
All A and B Level Mixes, I19.0C, B25.0C	PG 64 -22	PG 64 -22	TBD
S9.5C, S12.5C, I19.0D	PG 70 -22	PG 64-22	TBD
S 9.5D and S12.5D	PG 76-22	N/A	N/A

Note: (1) Category 1 RAP has been processed to a maximum size of 50mm.
(2) Category 2 RAP has been processed to a maximum size of 25 mm by either crushing and or screening to reduce variability in the gradations.
(3) Category 3 RAP has been processed to a maximum size of 25 mm, fractionating the RAP into 2 or more sized stockpiles.

Page 6-29, Table 610-3 delete and replace with the following:

TABLE 610-3
PLACEMENT TEMPERATURES FOR ASPHALT

Asphalt Concrete Mix Type	Minimum Surface and Air Temperature
B25.0B, C	2°C
I19.0B, C, D	2°C
SF9.5A, S9.5B	4°C
S9.5C, S12.5C	7°C
S9.5D, S12.5D	10°C

Page 6-36, Article 610-8 SPREADING AND FINISHING, sixth paragraph, replace the first sentence with the following:

Use the 9 m minimum length mobile grade reference system or the non-contacting laser or sonar type ski *with at least four referencing stations mounted on the paver at a minimum length of 7.3 m* to control the longitudinal profile when placing the initial lanes and all adjacent lanes of all layers, including resurfacing and asphalt in-lays, unless otherwise specified or approved.

Page 6-37, Article 610-8 SPREADING AND FINISHING, delete the fourth paragraph on page 6-37 and replace with the following:

Use a Material Transfer Vehicle (MTV) when placing all asphalt concrete plant mix pavements which require the use of asphalt binder grade PG 76-22 and for all types of OGAFC, unless otherwise approved. Use a MTV for all surface mix regardless of binder grade placed on Interstate and US routes that have four or more lanes and median divided. Where required above, utilize the MTV when placing all full width travel lanes, and collector lanes. Use MTV for all ramps, loops, -Y- line travel lanes, full width acceleration and deceleration lanes, and full width turn lanes that are greater than 305 m in length.

Page 6-36, Article 610-8 SPREADING AND FINISHING, sixth paragraph, replace the first sentence with the following:

Use the 9 m minimum length mobile grade reference system or the non-contacting laser or sonar type ski with at least four referencing stations mounted on the paver at a minimum length of 24 feet to control the longitudinal profile when placing the initial lanes and all adjacent lanes of all layers, including resurfacing and asphalt in-lays, unless otherwise specified or approved.

Page 6-41, Article 610-13 DENSITY ACCEPTANCE, delete the second full paragraph and replace with the following:

As an exception, when the first layer of mix is a surface course and is being placed directly on an unprimed aggregate or soil base, the layer will be included in the "Other" construction category.

Page 6-41, Article 610-13 DENSITY ACCEPTANCE, delete the formula and description in the middle of the page and replace with the following:

$$PF = 100 - 10(D)^{1.465}$$

Where: PF = Pay Factor (computed to 0.1%)
D = the deficiency of the lot average density, not to exceed 2.0%

Page 6-42, Article 610-15 MEASUREMENT AND PAYMENT, fourth paragraph, delete and replace with the following:

Furnishing asphalt binder will be paid for as provided in Article 620-4.

Page 6-43, Article 620-4 MEASUREMENT AND PAYMENT, modify as follows:

First Paragraph, delete and replace with the following:

Asphalt Binder for Plant Mix and *Polymer Modified Asphalt Binder for Plant Mix* will be measured and paid for as the theoretical number of tons required by the applicable job mix formula based on the actual number of tons of plant mix completed and accepted on the job.

Second paragraph, delete entire paragraph.

Sixth paragraph, delete the last sentence.

Seventh paragraph, delete the paragraph and replace with the following:

The adjusted contract unit price will then be applied to the theoretical quantity of asphalt binder authorized for use in the plant mix placed during the partial payment period involved, except that where recycled plant mix is used, the adjusted unit price will be applied only to the theoretical number of tons of additional asphalt binder materials required by the job mix formula.

Delete pay items and add the following pay items:

Pay Item	Pay Unit
Asphalt Binder for Plant Mix	Metric Ton
Polymer Modified Asphalt Binder for Plant Mix	Metric Ton

Page 6-45, Article 650-2 Materials, insert the following at the end of the list of items.

Reclaimed asphalt shingles 1012-1(F)

Page 6-47, Subarticle 650-3(B), Mix Design Criteria, insert the following as the fourth paragraph.

Reclaimed asphalt shingle (RAS) material may constitute up to 6% by weight of total mixture. The maximum percentage of binder contributed from reclaimed asphalt material will be 20% of the total binder in the completed mix.

Page 6-49, Article 650-5 CONSTRUCTION REQUIREMENTS delete the seventh paragraph beginning "Use a Material Transfer Vehicle (MTV)..." and replace with the following:

Use a Material Transfer Vehicle (MTV) when placing all asphalt concrete plant mix pavements which require the use of asphalt binder grade PG 76-22 and for all types of OGAFC, unless otherwise approved. Use a MTV for all surface mix regardless of binder grade placed on Interstate and US routes that have four or more lanes and median divided. Where required above, utilize the MTV when placing all full width travel lanes and collector lanes. Use MTV for all ramps, loops, -Y- line travel lanes, full width acceleration and deceleration lanes, and full width turn lanes that are greater than 305 m in length.

Page 6-50, Article 650-7 MEASUREMENT AND PAYMENT delete the second paragraph and replace with the following:

Furnishing asphalt binder for the mix will be paid for as provided in Article 620-4 for *Asphalt Binder for Plant Mix* or *Polymer Modified Asphalt Binder for Plant Mix.* Adjustments in contract unit price due to asphalt binder price fluctuations will be made in accordance with Article 620-4.

Page 6-53, Article 652-6 MEASUREMENT AND PAYMENT delete the second paragraph and replace with the following:

Asphalt Binder for Plant Mix will be paid for in accordance with Article 620-4.

Page 6-57, TABLE 660-1 MATERIAL APPLICATION RATES AND TEMPERATURES, add the following:

Type of Coat	Grade of Asphalt	Asphalt Rate L/M^2	Application Temperature °C	Aggregate Size	Aggregate Rate KG/M^2 Total
Sand Seal	CRS-2 or CRS-2P	1.00-1.36	66-79	Blotting Sand	6-8

Page 6-62, Subarticle 660-9(B) Asphalt Seal Coat, add the following as sub-item (5):

(5) Sand Seal

Place the fully required amount of asphalt material in one application and immediately cover with the seal coat aggregate. Uniformly spread the fully required amount of aggregate in one application and correct all non-uniform areas prior to rolling.

Immediately after the aggregate has been uniformly spread, perform rolling.

When directed, broom excess aggregate material from the surface of the seal coat.

When the sand seal is to be constructed for temporary sealing purposes only and will not be used by traffic, other grades of asphalt material meeting the requirements of Articles 1020-6 and 1020-7 may be used in lieu of the grade of asphalt required by Table 660-1 when approved.

Page 6-63, Article 661-1 DESCRIPTION, add the following as the 2nd paragraph:

Provide and conduct the quality control and required testing for acceptance of the UBWC in accordance with *Quality Management System for Asphalt Pavements (OGAFC, PADL, and Ultra-Thin HMA Version)*, included in the contract.

Page 6-63, Article 661-2 MATERIALS, add the following after Asphalt Binder, Grade 70-28:

Item	Section
Asphalt Binder, Grade 76-22	1020
Reclaimed Asphalt Shingles	1012

Page 6-65, Subarticle 661-2(E), Asphalt Binder For Plant Mix, Grade PG 70-28, rename as POLYMER MODIFIED ASPHALT BINDER FOR PLANT MIX and add the following as the first paragraph:

Use either PG 70-28 or PG 76-22 binder in the mix design. The grade of asphalt binder to be paid for the production of Ultra-thin will be *Polymer Modified Asphalt Binder For Plant Mix*.

Page 6-65, Subarticle 661-2(G) Composition of Mix, add the following as the third sentence of the first paragraph:

The percent of asphalt binder contributed from the RAS shall not exceed 20% of the total binder in the completed mix.

Page 6-66, Article 661-2(G) Composition of Mix, replace Table 661-4 and associated notes with the following:

TABLE 661-4 – MIXTURE DESIGN CRITERIA Gradation Design Criteria (% Passing by Weight)				
Standard Sieves		**12.7 mm Type A**	**9.5 mm Type B**	**6.4 mm Type C**
ASTM	**mm**	**(% Passing by Weight)**		
¾ inch	19.0	100		
½ inch	12.5	85 - 100	100	
3/8 inch	9.5	60 - 80	85 - 100	100
#4	4.75	28 - 38	28 – 44	40 - 55
#8	2.36	19 - 32	17 – 34	22 - 32
#16	1.18	15 - 23	13 - 23	15 - 25
#30	0.600	10 - 18	8 - 18	10 - 18
#50	0.300	8 - 13	6 - 13	8 - 13
#100	0.150	6 - 10	4 - 10	6 - 10
#200	0.075	4.0 - 7.0	3.0 - 7.0	4.0 - 7.0

Mix Design Criteria			
	12.7 mm Type A	**9.5 mm Type B**	**6.4 mm Type C**
Asphalt Content, %	4.6 - 5.6	4.6 - 5.8	5.0 – 5.8
Draindown Test, AASHTO T 305	0.1% max.		
Moisture Sensitivity, AASHTO T 283*	80% min.		
Application Rate, Kg/M^2	49	38	27
Approximate Application Depth, mm	19.0	15.9	12.5
Asphalt PG Grade, AASHTO M 320	PG 70-28 or PG 76-22	PG 70-28 or PG 76-22	PG 70-28 or PG 76-22

NOTE: *Specimens for T-283 testing are to be compacted using the SUPERPAVE gyratory compactor. The mixtures shall be compacted using 100 gyrations to achieve specimens approximately 95 mm in height. Use mixture and compaction temperatures recommended by the binder supplier.

Page 6-66, Subarticle 661-3(A) Equipment, add the following as the first paragraph:

Use asphalt mixing plants in accordance with Article 610-5 of the *Standard Specifications*.

Page 6-68, Subarticle 661-3(C), Application of Ultra-thin Bonded Wearing Course, delete the first paragraph and add the following as the first and second paragraphs:

Use only one asphalt binder PG grade for the entire project, unless the Engineer gives written approval.

Do not place Ultra-thin Bonded Wearing Course between October 31 and April 1, when the pavement surface temperature is less than 10°C or on a wet pavement. In addition, when PG 76-22 binder is used in the JMF, place the wearing course only when the road pavement

surface temperature is 16°C or higher and the air temperature in the shade away from artificial heat is 16°C or higher.

Page 6-69, Article 661-4, MEASUREMENT AND PAYMENT delete third paragraph and replace with the following:

Polymer Modified Asphalt Binder For Plant Mix will be paid for in accordance with Article 620-4. Asphalt binder price adjustments when applicable will be based on Grade PG 64-22, regardless of the grade used.

Page 10-33, Subarticle 1012-1(A) General, add the following at the end of the last paragraph, last sentence:

or ultra-thin bonded wearing course.

Page 10-34, Table 1012-1, delete the entries for OGAFC and add new entries for OGAFC and a row for UBWC with entries:

Mix Type	Coarse Aggregate Angularity [b] ASTM D5821	Fine Aggregate Angularity % Minimum AASHTO T304 Method A	Sand Equivalent % Minimum AASHTO T176	Flat & Elongated 5:1 Ratio % Maximum ASTM D4791 Section 8.4
S 9.5 D	100/100	45	50	10
OGAFC	100/100	N/A	N/A	10
UBWC	100/85	40	45	10

Delete Note (c) under the Table 1012-1 and replace with the following:

(c) Does not apply to Mix Types SF 9.5A and S 9.5B.

Page 10-34, Subarticle 1012-1(B)(6) Toughness (Resistance to Abrasion), add as the last sentence:

The percentage loss for aggregate used in UBWC shall be no more than 35%.

Page 10-35, Subarticle 1012-1(F) Reclaimed Asphalt Shingle Material (RAS), delete and replace with the following:

(F) Reclaimed Asphalt Shingles (RAS)

For use in asphalt mix, Reclaimed Asphalt Shingles (RAS) can be either manufacturer- waste shingles or post-consumer shingles that have been processed into a product that meets the requirements of this section.

Manufacturer-waste RAS (MRAS) are processed shingle materials discarded from the manufacturing of new asphalt shingles. It may include asphalt shingles or shingle tabs that have been rejected by the shingle manufacturer.

Post-consumer RAS (PRAS) are processed shingle materials recovered from mixed roofing material scrap removed from existing structures. Tear-off shingle scrap must be sorted and other roofing debris, including nails, plastic, metal, wood, coal tar epoxy, rubber materials, or other undesirable components, shall be removed. This sorting of the scrap must be done prior to grinding of the PRAS for use in asphalt production.

Sample and test PRAS for asbestos and provide results demonstrating that the bulk samples contain less than one percent of asbestos containing material in accordance with Federal, State of North Carolina, and Local regulations. Use NC-accredited Asbestos Inspectors or Roofing Supervisors to sample the PRAS to meet the above criteria. Maintain records on-site indicating shingle source(s), asbestos operation plan approved by Division of Public Health's Health Hazards Control Unit, and all asbestos analytical reports. All documentation will be subject to review by the Department.

Process RAS by ambient grinding or granulating methods such that 100% of the particles will pass the 9.50 mm (3/8") sieve when tested in accordance with AASHTO T27. Perform sieve analysis on processed asphalt shingles prior to ignition or solvent extraction testing.

RAS shall contain no more than 0.5% by total cumulative weight of deleterious materials. These materials include, but are not limited to, excessive dirt, debris, concrete, metals, glass, paper, rubber, wood, plastic, soil, brick, tars, or other contaminating substances.

Blend RAS with fine aggregate or RAP, meeting the requirements of this Section, if needed to keep the processed material workable.

MRAS and PRAS shall not be blended together for the production of hot mix asphalt.

(1) Mix Design RAS

Incorporate RAS from stockpiles that have been tested for uniformity of gradation and binder content prior to use in an asphalt mix design.

(2) Mix Production RAS

New Source RAS is defined as acceptable material which was not included in the stockpile when samples were taken for mix design purposes. Process new source RAS so that all materials will meet the gradation requirements prior to introduction into the plant mixer unit.

After a stockpile of processed RAS has been sampled and mix designs made from these samples, do not add new source RAS to the original stockpile without prior field testing to insure gradation and binder uniformity. Sample and test new source RAS before blending with the existing stockpile.

Store new source RAS in a separate stockpile until the material can be sampled and tested for comparison with the original recycled mix design data. New source RAS may also be placed against the existing stockpile in a linear manner provided it is sampled for mix design conformity

prior to its use in the recycled mix. Store RAS materials in such a manner as to prevent contamination.

Field approval of new source RAS will be based on the table below and volumetric mix properties on the mix with the new source RAS included. Provided these tolerances are met, volumetric properties of the new mix will then be performed. If all volumetric mix properties meet the mix design criteria for that mix type, the new source RAS may continue to be used.

If the gradation, binder content, or any of the volumetric mix properties are not within the allowable tolerances of the table below, do not use the new source RAS unless approved by the Engineer. The Contractor may elect to either not use the stockpile, to request an adjustment to the JMF, or to redesign the mix.

NEW SOURCE RAS BINDER AND GRADATION TOLERANCES (Apply Tolerances to Mix Design Data)	
P_b %	**±2.5**
Sieve Size, mm	*Tolerance*
4.75	±5
2.36	±4
1.18	±4
0.300	±4
0.150	±4
0.075	±2.0

Page 10-35 through 10-37, Subarticle 1012-1(G), delete this subarticle in its entirety and replace with the following:

(G) Reclaimed Asphalt Pavement (RAP)

(1) Mix Design RAP

Incorporate RAP from stockpiles or other sources that have been tested for uniformity of gradation and binder content prior to use in an asphalt mix design. Use reclaimed asphalt pavement that meets all requirements specified for *one of* the following *two* classifications.

(a) Millings

Existing reclaimed asphalt pavement (RAP) that is removed from its original location bya milling process as specified in Section 607. Millings should be such that it has a uniform gradation and binder content and all materials will pass a 50 mm sieve prior to introduction into the plant mixer unit.

(b) Processed RAP

RAP that is processed in some manner (possibly by crushing and/or use of a blending method) to produce a uniform gradation and binder content in the RAP prior to use in a recycled mix. Process RAP so that all materials have a uniform gradation and binder content and will pass a 25 mm sieve prior to introduction into the plant mixer unit.

(c) Fractionated RAP

Fractionated RAP is defined as having two or more RAP stockpiles, where the RAP is divided into coarse and fine fractions. Grade RAP so that all materials will pass a 25 mm sieve. The coarse RAP stockpile shall only contain material retained on a 9.5 mm screen, unless otherwise approved. The fine RAP stockpile shall only contain material passing the 9.5 mm screen, unless otherwise approved. The Engineer may allow the Contractor to use an alternate to the 9.5 mm screen to fractionate the RAP. The maximum percentages of fractionated RAP may be comprised of coarse, fine, or the combination of both. Utilize a separate cold feed bin for each stockpile of fractionated RAP used.

(d) Approved Stockpiled RAP

Approved Stockpiled RAP is defined as fractionated RAP which has been isolated and tested for asphalt content, gradation, and asphalt binder characteristics with the intent to be used in mix designs with greater than 30% RAP materials. Fractionate the RAP in accordance with Subarticle 1012-1(G)(1)(c). Utilize a separate cold feed bin for each approved stockpile of RAP used.

Perform extraction tests at a rate of 1 per 1,000 metric tons of RAP, with a minimum of 5 tests per stockpile to determine the asphalt content and gradation. Separate stockpiles of RAP material by fine and coarse fractions. Erect and maintain a sign satisfactory to the Engineer on each stockpile to identify the material. Assure that no deleterious material is allowed in any stockpile. The Engineer may reject by visual inspection any stockpiles that are not kept clean, separated, and free of foreign materials.

Submit requests for RAP stockpile approval to the Engineer with the following information at the time of the request:

(1) Approximate tons of materials in stockpile
(2) Name or Identification number for the stockpile
(3) Asphalt binder content and gradation test results
(4) Asphalt characteristics of the Stockpile.

For the Stockpiled RAP to be considered for approval, the gradation and asphalt content shall be uniform. Individual test results, when compared to the target, will be accepted if within the tolerances listed below:

APPROVED STOCKPILED RAP GRADATION and BINDER TOLERANCES
(Apply Tolerances to Mix Design Data)

P_b %	±0.3%
Sieve Size (mm)	**Percent Passing**
25.0	±5%
19.0	±5%
12.5	±5%
9.5	±5%
4.75	±5%
2.36	±4%
1.18	±4%
0.300	±4%
0.150	±4%
0.075	±1.5%

Note: If more than 20% of the individual sieves are out of the gradation tolerances, or if more than 20% of the asphalt binder content test results fall outside the appropriate tolerances, the RAP shall not be used in HMA unless the RAP representing the failing tests is removed from the stockpile.

Do not add additional material to any approved RAP stockpile, unless otherwise approved by the Engineer.

Maintain at the plant site a record system for all approved RAP stockpiles. Include at a minimum the following: Stockpile identification and a sketch of all stockpile areas at the plant site; all RAP test results (including asphalt content, gradation, and asphalt binder characteristics).

(2) Mix Production RAP

During mix production, use RAP that meets the criteria for one of the following categories:

(a) Mix Design RAP

RAP contained in the mix design stockpiles as described above may be used in all applicable JMFs. These stockpiles have been pretested: however, they are subject to required QC/QA testing in accordance with Subarticle 609-5(C)(2).

(b) New Source RAP

New Source RAP is defined as any acceptable material that was not included in the stockpile or other source when samples were taken for mix design purposes. Process new source RAP so that all materials have a uniform gradation and binder content and will pass a 50 mm sieve prior to introduction into the plant mixer unit.

After a stockpile of millings, processed RAP, or fractionated RAP has been sampled and mix designs made from these samples, do not add new source RAP to the original stockpile without prior field testing to insure gradation and binder uniformity. Sample and test new source RAP before blending with the existing stockpile.

Store new source RAP in a separate stockpile until the material can be sampled and tested for comparison with the original recycled mix design data. New source RAP may also be placed against the existing stockpile in a linear manner provided it is sampled for mix design conformity prior to its use in the recycled mix.

Unprocessed RAP is asphalt material that was not milled and/or has not been processed to obtain a uniform gradation and binder content and is not representative of the RAP used during the applicable mix design. Unprocessed RAP shall not be incorporated into any JMFs prior to processing. Different sources of unprocessed RAP may be stockpiled together provided it is generally free of contamination and will be processed prior to use in a recycled mix. RAP contamination in the form of excessive dirt, debris, clean stone, concrete, etc. will not be allowed. Incidental amounts of dirt, concrete, and clean stone may be acceptable. Unprocessed RAP may be processed and then classified as a new source RAP as described above.

Field approval of new source RAP will be based on Table 1012-2 below and volumetric mix properties on the mix with the new source RAP included. Provided the Table 1012-2 tolerances are met, volumetric properties of the new mix will then be performed. If all volumetric mix properties meet the mix design criteria for that mix type, the new source RAP may continue to be used.

If the gradation, binder content, or any of the volumetric mix properties are not within the allowable tolerances of Table 1012-2, do not use the new source RAP unless approved by the Engineer. The Contractor may elect to either not use the stockpile, to request an adjustment to the JMF, or to redesign the mix.

TABLE 1012-2
NEW SOURCE RAP GRADATION and BINDER TOLERANCES
(Apply Tolerances to Mix Design Data)

Mix Type	**0-20% RAP**			**20^+-30 % RAP**			**30^+ % RAP**		
Sieve (mm)	**Base**	**Inter.**	**Surf.**	**Base**	**Inter.**	**Surf.**	**Base**	**Inter.**	**Surf.**
P_b %	± 0.7%			± 0.4%			± 0.3%		
25.0	±10	-	-	±7	-	-	±5	-	-
19.0	±10	±10	-	±7	±7	-	±5	±5	-
12.5	-	±10	±10	-	±7	±7	-	±5	±5
9.5	-	-	±10	-	-	±7	-	-	±5
4.75	±10	-	±10	±7	-	±7	±5	-	±5
2.36	±8	±8	±8	±5	±5	±5	±4	±4	±4
1.18	±8	±8	±8	±5	±5	±5	±4	±4	±4
0.300	±8	±8	±8	±5	±5	±5	±4	±4	±4
0.150	-	-	±8	-	-	±5	-	-	±4
0.075	±4	±4	±4	±2	±2	±2	±1.5	±1.5	±1.5

ASPHALT PAVEMENTS - WARM MIX ASPHALT SUPERPAVE:
(1-18-11) (Rev. 4-16-13) M6 R02A

Warm mix asphalt (WMA) is allowed for use at the Contractor's option in accordance with the NCDOT Approved Products List for WMA Technologies available at:

https://connect.ncdot.gov/resources/Materials/MaterialsResources/WMA%20Approved%20Lists.pdf

Notify the Engineer at least 2 weeks before producing the WMA so the Engineer can arrange a pre-pave meeting. Discuss special testing requirements necessary for WMA at the pre-pave meeting. Include at the pre-pave meeting the Contractor's QC manager, Paving Superintendent, and manufacturer's representative for the WMA technology, the Department's Roadway Construction Engineer, Resident Engineer, State Pavement Construction Engineer, and Quality Assurance Supervisor.

Require a manufacturer's representative for the WMA technology used to be present on site at the plant during the initial production and on the roadway during the laydown of the warm mix asphalt.

The requirement for the manufacturer's representative to be present at the pre-pave meeting and on-site at the plant may be waived by the Engineer based on previous work experience with the specific WMA technology used.

If the use of WMA is suspended during production, and the Contractor begins using Hot Mix Asphalt (HMA), then the Contractor shall be required to use HMA for the remainder of the specific route or map unless otherwise approved by the Engineer.

Revise the *2006 Metric Standard Specifications* as follows:

Page 6-7, Article 609-1 Description, insert the following as the second paragraph:

Warm Mix Asphalt (WMA) is defined as additives or processes that allow a reduction in the temperature at which asphalt mixtures are produced and placed. Use WMA at the Contractor's option when shown in the contract.

Page 6-7, Article 609-4 Field Verification of Mixture and Job Mix Formula Adjustments, second paragraph, insert the following immediately after the first sentence:

When producing a WMA, perform field verification testing including Tensile Strength Ratio (TSR) testing in accordance with AASHTO T 283 as modified by the Department.

Third paragraph, delete the third sentence and replace with the following:

Verification is satisfactory for HMA when all volumetric properties except $\%G_{mm}@N_{ini}$ are within the applicable mix design criteria and the gradation, binder content, and $\%G_{mm}@N_{ini}$ are within the individual limits for the mix type being produced. Verification is satisfactory for

WMA when all volumetric properties except $\%G_{mm}@N_{ini}$ are within the applicable mix design criteria, the TSR meets the design criteria, and the gradation, binder content, and $\%G_{mm}@N_{ini}$ are within the individual limits for the mix type being produced.

Page 6-10, Subarticle 609-5(C)(2)(d) Bulk Specific Gravity of Compacted Specimens, add after (AASHTO T 312):

When producing WMA, gyrate specimens to specified N_{des} compaction effort without reheating mix other than to desired compaction temperature. Record time needed to reheat samples (if any).

Page 6-11, Subarticle 609-5(C)(2)(e) Tensile Strength Ratio, insert the following immediately after the third paragraph:

When producing WMA, perform TSR testing:
(i.) Prior to initial production for each JMF and
(ii.) Every 13,600 metric tons.

After three (3) consecutive passing TSR tests for a specific JMF, a request may be submitted to the State Asphalt Design Engineer to revert the *Hot-Mix Asphalt QMS Manual* procedures for TSR testing on that JMF. This request shall be submitted in writing and include all Material and Tests Unit Form 612s performed on the specific JMF.

Page 6-22, Article 610-1 Description, insert the following as the third paragraph:

Warm Mix Asphalt (WMA) is defined as additives or processes that allow a reduction in the temperature at which asphalt mixtures are produced and placed. Use WMA at the Contractor's option when shown in the contract.

Page 6-23, Article 610-2 Materials, insert the following at the end of this Article:

Use only WMA technologies on the allowable routes listed on the Department's approved list maintained by the Materials and Tests Unit. The Department's approved list can be found at the following website: **http://www.ncdot.org/doh/operations/materials/pdf/wma.pdf.**

Page 6-26, Subarticle 610-3(B) Mix Design-Criteria, add the following as the fifth paragraph:

When WMA is used, submit the mix design without including the WMA additive.

Page 6-26, Subarticle 610-3(C) Job Mix Formula, add the following as the second paragraph:

When WMA is used, document the technology used, the recommended dosage rate, and the requested plant mix temperature on the JMF submittal. Verify the JMF based on plant produced mixture from the field verification test.

Immediately following PG 76-22 335°F, add the following paragraph:

When WMA is used, produce an asphalt mixture within the temperature range of 107°C to 135°C.

ASPHALT BINDER CONTENT OF ASPHALT PLANT MIXES:

(11-21-00) (Rev 7-17-12) M6 R15

The approximate asphalt binder content of the asphalt concrete plant mixtures used on this project will be as follows:

Asphalt Concrete Base Course	Type B 25.0__	4.4%
Asphalt Concrete Intermediate Course	Type I 19.0__	4.8%
Asphalt Concrete Surface Course	Type S 4.75A	6.8%
Asphalt Concrete Surface Course	Type SA-1	6.8%
Asphalt Concrete Surface Course	Type SF 9.5A	6.7%
Asphalt Concrete Surface Course	Type S 9.5__	6.0%
Asphalt Concrete Surface Course	Type S 12.5__	5.6%

The actual asphalt binder content will be established during construction by the Engineer within the limits established in the *2006 Metric Standard Specifications.*

ASPHALT PLANT MIXTURES:

(7-1-95) M6 R20

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

PRICE ADJUSTMENT - ASPHALT BINDER FOR PLANT MIX:

(11-21-00) M6 R25

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

The base price index for asphalt binder for plant mix is **$610.39** per metric ton.

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on **March 1, 2013**.

FINAL SURFACE TESTING - ASPHALT PAVEMENTS (Rideability):

(5-18-04) (Rev. 7-15-08) M6 R45

On portions of this project where the typical section requires two or more layers of new pavement, perform acceptance testing of the longitudinal profile of the finished pavement surface in accordance with these provisions using a North Carolina Hearne Straightedge (Model No. 1). Furnish and operate the straightedge to determine and record the longitudinal profile of the pavement on a continuous graph. Final surface testing is an integral part of the paving operation and is subject to observation and inspection by the Engineer as deemed necessary.

Push the straightedge manually over the pavement at a speed not exceeding 2 miles per hour. For all lanes, take profiles in the right wheel path approximately 3 feet from the right edge of pavement in the same direction as the paving operation, unless otherwise approved due to traffic control or safety considerations. As an exception, lanes adjacent to curb and gutter, expressway gutter, or shoulder berm gutter may be tested in the left wheel path. Make one pass of the

straightedge in each full width travel lane. The full lane width should be comparable in ride quality to the area evaluated with the Hearne Straightedge. If deviations exist at other locations across the lane width, utilize a 10 foot 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 no later than 24 hours following placement of the pavement, unless otherwise authorized by the Engineer. Take profiles over the entire length of final surface travel lane pavement exclusive of -Y- line travel lanes less than or equal to 1000 feet in length, ramps less than or equal to 1000 feet in length, turn lanes less than or equal to 1000 feet in length, structures, approach slabs, paved shoulders, loops, and tapers or other irregular shaped areas of pavement, unless otherwise approved by the Engineer. Test in accordance with this provision all mainline travel lanes, full width acceleration or deceleration lanes, -Y- line travel lanes greater than 1000 feet in length, ramps, full width turn lanes greater than 1000 feet in length, and collector lanes.

At the beginning and end of each day's testing operations, and at such other times as determined by the Engineer, operate the straightedge over a calibration strip so that the Engineer can verify correct operation of the straightedge. The calibration strip shall be a 100 foot section of pavement that is reasonably level and smooth. Submit each day's calibration graphs with that day's test section graphs to the Engineer. Calibrate the straightedge in accordance with the current NCDOT procedure titled *North Carolina Hearne Straightedge - Calibration and Determination of Cumulative Straightedge Index*. Copies of this procedure may be obtained from the Department's Pavement Construction Section.

Plot the straightedge graph at a horizontal scale of approximately 25 feet per inch with the vertical scale plotted at a true scale. Record station numbers and references (bridges, approach slabs, culverts, etc.) on the graphs. Distances between references/stations must not exceed 100 feet. 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 to evaluate the graph for acceptance. The 0.2 inch and 0.3 inch 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 bands within a 100 foot 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 blanking band is used to further evaluate deviations on an individual basis. The CSI will be determined by the Engineer in accordance with the current procedure titled "North Carolina Hearne Straightedge - Calibration and Determination of Cumulative Straightedge Index".

The pavement will be accepted for surface smoothness on a lot by lot basis. A test section represents pavement one travel lane wide not more than 100 feet 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 that is less than 2500 feet 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 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, 5 lots require corrective action, then proceed on limited production for unsatisfactory laydown in accordance with Article 610-12 of the *Standard Specifications*. Proceeding on limited production is based upon the Contractor's initial evaluation of the straightedge test results and shall 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 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 acceptable laydown results are obtained or until three consecutive 2500 foot sections have been attempted without achieving acceptable laydown results. The Engineer will determine if normal production may resume based upon the CSI for the limited production lot and any adjustments to the equipment, placement methods, and/or personnel performing the work. Once on limited production, the Engineer may require the 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 sections have been attempted, cease production of that mix type until such time as the cause of the unsatisfactory laydown results can be determined.

As an exception, the Engineer may grant approval to produce a different mix design of the same mix type if the cause is related to mix problem(s) rather than laydown procedures. If production of a new mix design is allowed, proceed under the limited production procedures detailed above.

After initially proceeding under limited production, the 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.

If the Contractor does not operate by the limited production procedures as specified above, the 5 lots, which require corrective action, will be considered unacceptable and may be subject to removal and replacement. Mix placed under the limited production procedures for unsatisfactory laydown will be evaluated for acceptance in accordance with Article 105-3.

The pay adjustment schedule for the Cumulative Straightedge Index 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 foot test sections)				
*CSI	ACCEPTANCE CATEGORY	CORRECTIVE ACTION	PAY ADJUSTMENT	
			Before Corrective	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 blanking band such that the deviation is reduced to 0.3 inches 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 that 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 4-0 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 shall 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 4-0 or better. If the retested lot after corrective action has a CSI indicating a disincentive, the appropriate disincentive will be applied.

Test sections and/or lots that are initially tested by the Contractor that indicate excessive deviations such that either a disincentive or corrective action is necessary, may be re-rolled with asphalt rollers while the mix is still warm and in a workable condition, to possibly correct the problem. In this instance, reevaluation of the test section(s) shall be completed within 24 hours of pavement placement and these test results will serve as the initial test results.

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 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. 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.

QUALITY MANAGEMENT SYSTEM FOR ASPHALT PAVEMENTS: (OGAFC, PADL, and ULTRA-THIN HMA Version)

(3-20-07)(Rev 4-20-10) M6 R62

Description

Produce and construct Open Graded Asphalt Friction Course, Permeable Asphalt Drainage Course, and Ultra-thin Hot Mix Asphalt Concrete Wearing Surface asphalt mixtures and pavements in accordance with a Quality Management System described herein. All materials and work shall conform to Division 6 of the *2006 Metric Standard Specifications* except as modified herein. Perform all applicable quality control activities in accordance with the Department's *Hot Mix Asphalt Quality Management System (HMA/QMS) Manual* in effect on the date of contract advertisement, unless otherwise approved.

Description of Responsibilities

(A) Quality Control (QC)

Provide and conduct a quality control program. A quality control program is defined as all activities, including mix design, process control inspection, plant and equipment calibration, sampling and testing, and necessary adjustments in the process that are related to production of a pavement which meets all requirements of the Specifications.

(B) Quality Assurance (QA)

The Department will conduct a quality assurance program in accordance with Article 609-6 of the *Standard Specifications* and this provision. A quality assurance program is defined as all activities, including inspection, sampling, and testing related to determining that the quality of the completed pavement conforms to specification requirements.

Mix Design/Job Mix Formula Requirements

All applicable mix design and job mix formula requirements of Article 650-3, Article 652.3, or Article 661-2 of the *2006 Metric Standard Specifications* and the contract documents shall apply. In addition, submit Superpave gyratory compactor printouts for all specimens required to be compacted during the mix design process.

Field Verification Of Mixture And Job Mix Formula Adjustments

Conduct field verification of the mix at each plant within 30 calendar days prior to initial production of each mix design, when required by the Allowable Mix Adjustment Policy, and when directed as deemed necessary.

Field verification testing consists of performing a minimum of 1 test series on mix sampled and tested in accordance *Required Sampling and Testing Frequencies*. Mix obtained from NCDOT or non-NCDOT work may be used for this purpose provided it is sampled, tested, and the test data handled in accordance with current procedures in the Department's *HMA/QMS Manual* and the following provisions. Obtain the mix verification sample and split in accordance with the Department's *HMA/QMS Manual*. Do not begin normal plant production until all field verification test results have been completed and the Contractor's Level II Technician has satisfactorily verified the mix. Verification is considered satisfactory when the mix meets all applicable individual test control limits as specified elsewhere in these provisions, except that the drain down test shall meet the requirements as specified in Section 661 of the *2006 Metric Standard Specifications* for the applicable mix type.

In addition to the required sampling and testing for field verification, perform all preliminary inspections and plant calibrations as shown in the *HMA/QMS Manual*.

Retain records of these calibrations and mix verification tests, including Superpave Gyratory Compactor (SGC) printouts, at the QC laboratory. In addition, furnish copies, including SGC printouts, to the Engineer for review and approval within one (1) working day after beginning production of the mix.

Conduct the initial mix verification of all new mix designs with the plant set up to produce the aggregate blend and binder content in accordance with the initially approved job mix formula (JMF). If the Contractor and/or the Engineer determine from results of quality control tests conducted during mix verification that adjustments to the job mix formula are necessary to achieve specified mix properties, adjustments to the JMF may be made within tolerances permitted by specifications for the mix type being produced, subject to approval. All JMF adjustments will be approved and documented in writing by the Engineer.

Failure by the Contractor to fully comply with the above mix verification requirements will result in immediate production stoppage by the Engineer. Do not resume normal production

until all mix verification sampling, testing, calibrations, and plant inspections have been performed and approved. 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 surface deficiencies.

Contractor's Quality Control System

(A) Personnel Requirements

Obtain all certifications in accordance with the Department's QMS Asphalt Technician Certification Program as shown in the *HMA/QMS M*anual. Perform all sampling, testing, data analysis and data posting by or under the direct supervision of a certified QMS Asphalt Plant Technician.

Provide a certified Asphalt Plant Technician Level I to perform quality control operations and activities at each plant site at all times during production of material for the project. A plant operator who is a certified Asphalt Plant Technician Level I may be utilized to meet this requirement when daily production for each mix design is less than 90.7 metric tons (100 tons) provided the randomly scheduled increment sample is not within that tonnage. When performing in this capacity, the plant operator shall be responsible for all quality control activities that are necessary and required. Absences of the Level I Technician, other than those for normal breaks and emergencies, shall be pre-approved by the appropriate QA Supervisor or his designated representative. Any extended absence of the Technician that has not been approved will result in immediate suspension of production by the Engineer. All mix produced during this absence will be accepted in accordance with Article 105-3 of the *2006 Metric Standard Specifications*.

Provide and have readily available a certified Asphalt Plant Technician Level II to supervise, coordinate, and make any necessary adjustments in the mix quality control process in a timely manner. The Level II Technician may serve in a dual capacity and fulfill the Level I Technician requirements specified.

Provide a certified QMS Roadway Technician with each paving operation at all times during placement of asphalt. This person is responsible for monitoring all roadway paving operations and all quality control processes and activities, to include stopping production or implementing corrective measures when warranted.

Post in the quality control laboratory an organizational chart, including names, telephone numbers and current certification numbers of all personnel responsible for the quality control program while asphalt paving work is in progress.

(B) Field Laboratory Requirements

Furnish and maintain a Department certified laboratory at the plant site. A minimum of 320 square feet of floor space (exclusive of toilet facilities), equipment, and supplies necessary for performing Contractor quality control testing is required. Provide convenient telephone and fax machine access for QMS personnel at the plant site.

Provide testing equipment meeting the requirements of the test methods identified herein. Provide equipment that is properly calibrated and maintained. Allow all measuring and testing devices to be inspected to confirm both calibration and condition. If at any time the Engineer determines that the equipment is not operating properly or is not within the limits of dimensions or calibration described in the applicable test method, the Engineer may stop production until corrective action is taken. Maintain and have available a record of all calibration results at the laboratory.

(C) Plant Mix Quality Control

(1) General

Include in the quality control process the preliminary inspections, plant calibrations and field verification of the mix and JMF. In addition, conduct at a minimum but not limited to, the sampling, testing, and determination of all parameters outlined in these provisions using test methods and minimum frequencies as specified herein. Perform additional sampling and testing when conditions dictate. Obtain, split, and retain all scheduled samples at randomly selected locations in accordance with the Department's *HMA/QMS Manual*, except as modified below. Log all samples taken on forms provided by the Department. Provide documentation in accordance with Subarticle 609-5(E) of the *2006 Metric Standard Specifications*. Identify any additional quality control samples taken and tested at times other than the regularly scheduled random samples or directed samples that take the place of regularly scheduled as process control (PC) samples on the appropriate forms. Process Control test results shall not be plotted on control charts nor reported to Quality Assurance Laboratory.

Split and retain samples in accordance with procedures in the Department's *HMA/QMS Manual*. Obtain at least 2000 grams of mix for each QC, QA, and retained sample. QC samples shall be tested immediately. Place QA samples and retained samples in silicone-lined sample boxes and store for possible testing in accordance with the procedures established below.

Retain the untested split portion of quality control aggregate and mix samples and the tested TSR specimens for 5 calendar days at the plant site, commencing the day the samples are tested. Quality Assurance personnel may give permission for disposal prior to these minimum storage periods. Retain the split portion of the Contractor's mix verification and referee mix samples until either procured by or permission for disposal is given by QA. Store all retained samples in a dry and protected location.

(2) Required Sampling and Testing Frequencies

All mix sampling, testing, data analysis and data posting shall be performed or directly supervised by a certified QMS Asphalt Plant Technician.

Maintain minimum test frequencies as established in the schedule below. Complete all tests within 24 hours of the time the sample is taken, unless specified otherwise within these provisions. Should the specified tests not be completed within the required time frame, cease production at that point until such time the tests are completed.

Should the Contractor's testing frequency fail to meet the minimum frequency requirements as specified, all mix without the specified test representation will be considered unsatisfactory. If the Engineer allows the mix to remain in place, payment will be made in accordance with Article 105-3 of the *2006 Metric Standard Specifications*.

If desired, innovative equipment or techniques not addressed by these specifications to produce or monitor the production of mix may be utilized, subject to approval.

Quality Control Minimum Sampling and Testing Schedule

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

Accumulative Production Increment	Number of Samples per Increment
500 tons	1

If production is discontinued or interrupted before the accumulative production increment tonnage is completed, continue the increment on the next production day(s) until the increment tonnage is completed. Obtain a random sample within the specified increment at the location determined in accordance with the current edition of the Department's *HMA/QMS Manual*. Conduct quality control sampling and testing on each random sample as scheduled below. When daily production of each mix design exceeds 90.7 metric tons (100 tons) and a regularly scheduled test series random sample location for that mix design does not occur during that day's production, perform a partial test series consisting of Items (a) and (b) in the schedule below. This partial test series does not substitute for the regularly scheduled random sample for that increment.

Perform the following test series on all regularly scheduled random samples:

Asphalt Mixture - Sampled From Truck at Plant (AASHTO T-168 Modified) (Split Sample Required)

(a) Asphalt Binder Content, % (Contractor may select either option below)

1. Ignition Furnace (AASHTO T 308 Modified)
2. Other (Contractor may request and use other means of determining percent asphalt binder subject to approval)

(b) Gradation on Recovered Blended Aggregate from Mix Sample (AASHTO T-30 Modified) (Graded on all sieves specified on the job mix formula.)

In addition to the above schedule, conduct the following sampling and testing as indicated:

(a) Aggregate Stockpile Gradations (AASHTO T 27 and T 11) (Sampled from stockpiles or cold feed system as follows; split samples not required)

1. Coarse Aggregates (Approved Standard Sizes)
   a. At beginning of production*
   b. Weekly thereafter*
2. Fine Aggregates (Stone Screenings, Natural Sands, Etc.)
   a. At or within 1 week prior to mix verification (Gradations valid for multiple mix designs).
   b. Weekly after mix verification *
   c. Anytime production is stopped due to plant mix gradation related problems.

*In lieu of the aggregate stockpile gradations performed by QC personnel, gradation quality control data conducted by the aggregate producer, which is representative of the Contractor's current stockpiles, may be furnished.

(b) Reclaimed Asphalt Shingle Material (RAS) Binder Content and Gradation (AASHTO T 308 Modified or T 164 and AASHTO T 30 Modified) (sample from stockpiles or cold feed system at beginning of production and weekly thereafter). Have RAS approved for use in accordance with Subarticle 1012-1 (F) of the *2006 Metric Standard Specifications*. (Split Sample Required)

(c) Combined Aggregate Moisture Content (AASHTO T 255) Drum Plant Only (sampled from stockpiles or cold feed system a minimum of once daily).

(d) Asphalt Drain Down Test Procedure, AASHTO T 305; Copy of procedure may be obtained from the M & T Asphalt Design Engineer. Mix sampled from truck at plant within the first day's production and weekly thereafter. **Note**: Drain Down Test not required for Permeable Asphalt Drainage Course.

(e) Retained Tensile Strength (TSR) - (AASHTO T 283 Modified)
Note: TSR only required for Ultra-thin HMA.

1. Option 1
   Mix sampled from truck at plant, tested, and results furnished to the Engineer within seven (7) calendar days after beginning production of each new mix design. From the split sample, QC

will prepare and submit within 5 calendar days of the sample date, an additional set of specimens to the QA Lab for TSR testing (Split Sample Required).

2. Option 2
   Mix sampled from truck at plant with one set of specimens prepared by the Contractor and then tested jointly by QA and QC at a mutually agreed upon lab site within the first seven (7) calendar days after beginning production of each new mix design.

Test all TSR specimens required by either option noted above on either a recording test press or a test press that maintains the peak load reading after the specimen has broken.

Additional TSR testing required prior to mix production in accordance with above procedures is required when a change is made in anti-strip additive dosage or when a new anti-strip additive source or grade is utilized, unless otherwise approved. Other TSR test(s) may be directed as deemed necessary. TSR testing not required for mix verification, but may be performed at that time.

(3) Control Charts

Maintain standardized control charts furnished by the Department at the field laboratory. For mix incorporated into the project, record test data from all regularly scheduled random samples or directed samples that replace regularly scheduled random samples, on control charts the same day the tests results are obtained. Process Control (PC) test results shall not be plotted on control charts nor reported to Quality Assurance Laboratory.

In addition, partial test series results obtained due to reasons outlined above will be reported to Quality Assurance personnel on the proper forms, but will not be plotted on the control charts.

Results of quality assurance tests performed by the Engineer will be posted on the Contractor's control charts as data becomes available.

Record the following data on the standardized control charts:

(a) Aggregate Gradation Test Results:

1. 12.5 mm (<u>Types P57 & FC-2 Mod. Only</u>)
2. 9.5 mm (<u>Excluding Type P57</u>)
3. 4.75 mm
4. 2.36 mm
5. 0.075 mm Sieves

(b) Binder Content, %, P_b

Both the individual test values and the moving average of the last four (4) data points shall be plotted on each chart. The Contractor's test data shall be shown in black and the moving average in red. The Engineer's assurance data will be plotted in blue. Denote the moving average limits with a dash green line and individual test limits with a dash red line. Maintain a continuous moving average with the following exceptions. Re-establish a new moving average only when:

1. A change in the binder percentage or aggregate blend is made in the JMF, or,
2. When the Contractor elects to stop or is required to stop production after one or two moving average values, respectively, fall outside the moving average limits or,
3. If failure to stop production after two consecutive moving averages exceed the moving average limits occurs, but production does stop at a subsequent time, re-establish a new moving average beginning at the actual production stop point.

In addition, re-establish the moving averages for all mix properties. Moving averages will not be re-established when production stoppage occurs due to an individual test result exceeding the individual test limits and/or specifications.

All individual test results for regularly scheduled samples or directed samples that replace regularly scheduled samples are part of the plant quality control record and shall be included in moving average calculations with the following exception. When the Contractor's testing data has been proven incorrect, use the correct data as determined by the Engineer in lieu of the Contractor's data.

(4) Control Limits

The following are established as control limits for mix production. Apply the individual limits to the individual test results. Control limits for the moving average limits are based on a moving average of the last four (4) data points. Apply all control limits to the applicable target on the job mix formula.

Mix Control Criteria	**Control Limits, %**	
	Moving Average	**Individual Test**
Asphalt Binder Content	+/-0.3	+/-0.7
12.5 mm Sieve (Types P57 & FC-2 Mod)	+/-4.0	+/-8.0
9.5 mm Sieve (Excluding Type P57)	+/-4.0	+/-8.0
4.75 mm Sieve	+/-4.0	+/-8.0
2.36 mm Sieve	+/-4.0	+/-8.0
0.075 mm Sieve	+/-1.5	+/-2.5
TSR (Ultra-thin Only)	N/A	15%

(5) Corrective Actions

All required corrective actions are based upon initial test results and shall be taken immediately upon obtaining those results. In the event situations occur which warrant more than one corrective action and/or adjustment, give precedence to the more severe of these actions. Stopping production when required takes precedence over all other corrective actions. Document all corrective actions.

(a) Immediately cease production and immediately notify the Engineer when any of the following occur:

1. When an individual test result for a mix control criteria exceeds both the individual test control limits and the applicable specification design criteria, or,

2. When two consecutive field TSR values fail to meet the minimum specification requirement, or,

3. When two consecutive binder content test results exceed the individual limits.

(b) Do not resume normal plant production until one of the following has occurred:

1. Option 1 - Approval has been granted by the appropriate QA Supervisor.

2. Option 2 - The mix in question has been satisfactorily verified. Normal production may resume based on the approval of the contractor's Level II technician, provided notification and the verification test results have been furnished to the QA Laboratory.

Failure to comply fully with one of the above provisions will result in immediate production stoppage by the Engineer. Normal production shall not then resume until a complete verification process has been performed and approved by the Engineer.

Acceptance of all mix failing to meet the individual test control or minimum TSR requirements as described above will be determined in accordance with Article 105-3 of the *2006 Metric Standard Specifications*. In addition, any mix, which is deemed unacceptable, will be rejected for use in the work.

Failure to stop production when required due to an individual mix test not meeting the specified requirements shall subject all mix from the stop point tonnage to the point when the next individual test is back on or within the moving average limits, or to the tonnage point when production is actually stopped, whichever occurs first, to being considered unacceptable.

Failure to stop production when required due to two consecutive TSR tests failing to meet the specification requirements will subject all mix from the stop point tonnage to the point when the next TSR test meets or exceeds the specification requirement, or to the tonnage point when production is actually stopped, whichever occurs first, to being considered unacceptable.

In either case, remove and replace this mix with materials that comply with the specifications at no additional costs to the Department, unless otherwise approved. Payment will be made for the actual quantities of materials required to replace the removed quantities, not to exceed the original amounts.

Immediately notify the Engineer when any moving average value exceeds the moving average limit. If two consecutive moving average values for any one of the mix control criteria fall outside the moving average limits, cease production of that mix, immediately notify the Engineer of the stoppage, and make adjustments. The Contractor may elect to stop production after only one moving average value falls outside the moving average limits. In either case, do not determine a new moving average until the fourth test after the elective or mandatory stop in production.

Do not resume normal plant production until one of the following has occurred:

(a) Option 1 - Approval has been granted by the appropriate QA Supervisor.

(b) Option 2 - The mix in question has been satisfactorily verified. Normal production may resume based on the approval of the contractor's Level II technician, provided notification and the verification test results have been furnished to the QA Laboratory.

Failure to comply fully with one of the above provisions will result in immediate production stoppage by the Engineer. Normal production shall not then resume until a complete verification process has been performed and approved by the Engineer.

If the process adjustment improves the property in question such that the moving average after four additional tests is on or within the moving average limits, the Contractor may continue production with no reduction in payment.

If the adjustment does not improve the property in question such that the moving average after four (4) individual tests is outside the moving average control limits, the mix will be evaluated for acceptance. If the Engineer determines the mix is reasonably acceptable based on the test data and an inspection of the completed pavement, the mix will be accepted in accordance with Article 105-3 of the *2006 Metric Standard Specifications*. If the mix is determined to be unacceptable, the mix will be removed and replaced with materials that comply with the specifications. In either case, the adjustment or removal, respectively, for the mix in question will be applied starting from the plant sample tonnage at the stop point to the sample tonnage when the moving average is on or within the moving average limit. In addition, any mix that is obviously unacceptable will be rejected for use in the work.

Failure to stop production and make adjustments when required due to two consecutive moving average values falling outside the moving average limits will subject all mix produced from the stop point tonnage to the tonnage point when the moving average is back on or within the moving average limits or to the tonnage point when production is actually stopped, whichever occurs first, to being considered unacceptable. Remove this material and replace with materials that comply with the specifications at no additional costs to the Department, unless otherwise approved. Payment will be made for the actual quantities of materials required to replace the removed quantities, not to exceed the original amounts.

(6) Allowable Retesting for Mix Deficiencies

The Contractor may elect to resample and retest for plant mix deficiencies when individual QC test(s) exceed one or more mix property target(s) by more than the tolerances indicated below. Perform the retesting within 10 days after initial test results are determined. Retesting shall be approved prior to being performed and in accordance with the Department's Guidelines for Retests of Plant Mix Deficiencies as shown in the *HMA/QMS Manual*. The Contractor, under the supervision of the Department's QA personnel will perform these retests. Retests for any mix deficiency other than as listed below will not be allowed unless otherwise permitted. Acceptance of the mix in question will be based on the retest data in accordance with Article 105-3 of the *2006 Metric Standard Specifications*.

The Department reserves the right to require the Contractor to resample and retest at any time or location as directed.

(a)	% Binder Content	by more than +/- 1.0%
(b)	12.5 mm Sieve (Types P 57 & FC-2 Mod)	by more than +/- 9.0%
(c)	9.5 mm Sieve (Excluding Type P 57)	by more than +/- 9.0%
(d)	4.75 mm sieve	by more than +/- 9.0%
(e)	2.36 mm sieve	by more than +/- 9.0%
(f)	0.075 mm sieve	by more than +/- 3.0%
(g)	TSR (Ultra-thin only)	by more by more than -15% from Specification limit

(7) Documentation (Records)

Document all quality control observations, records of inspection, samples taken, adjustments to the mix, and test results on a daily basis. Note the results of observations and records of inspection as they occur in a permanent field record. Record adjustment to mix production and test results on forms provided.

Identify any additional quality control samples taken and tested at times other than the regularly scheduled random samples or directed samples that take the place of regularly scheduled as process control (PC) samples on the appropriate

forms. Process Control test results shall not be plotted on control charts nor reported to Quality Assurance Laboratory. Process control sample test results are for the Contractor's informational purposes only.

Make all such records available to the Engineer, upon request, at any time during project construction. Complete all QC records and forms and distribute in accordance with the most current edition of the Department's *HMA/QMS Manual*. Maintain all QC records, forms and equipment calibrations for a minimum of 3 years from their completion date. Failure to maintain QC records and forms as required, or to provide these records and forms to the Engineer upon request, may result in production and/or placement stoppage until the problem is resolved.

Falsification of test results, documentation of observations, records of inspection, adjustments to the process, discarding of samples and/or test results, or any other deliberate misrepresentation of the facts will result in the revocation of the applicable person's QMS certification. The Engineer will determine acceptability of the mix and/or pavement represented by the falsified results or documentation. If the mix or pavement in question is determined to be acceptable, the Engineer may allow the mix to remain in place at no pay for the mix, asphalt binder and other mix components. If the mix and/or pavement represented by the falsified results are determined not to be acceptable, remove and replace with mix that complies with the Specifications. Payment will be made for the actual quantities of materials required to replace the falsified quantities, not to exceed the original amounts.

Quality Assurance

The Department's quality assurance program will be conducted by a certified QMS technician(s) and will be accomplished in the following ways:

Plant Mix Quality Assurance

(A) By conducting assurance testing of split samples obtained by the Contractor at a frequency equal to or greater than 5% of the frequency required of the Contractor;

(B) By periodically observing sampling and testing procedures performed by the Contractor;

(C) By monitoring required control charts exhibiting test results of control parameters;

(D) By directing the Contractor to take additional samples at any time and any location during production (in lieu of the next scheduled random sample for that increment);

(E) By conducting verification sampling and testing on samples taken independently of the Contractor's quality control samples at a frequency equal to or greater than 10% of the QC sample frequency; or

(F) By any combination of the above

The Engineer will periodically obtain quality assurance and verification samples for testing independently of the Contractor's quality control process. The Engineer will conduct assurance tests on both split QC samples taken by the Contractor and verification samples taken by the Department. These samples may be the regular quality control samples or a sample selected by the Engineer from any location in the process, or verification samples taken at random by the Department. The Engineer may select any or all split samples for assurance testing.

Results of quality assurance tests will be provided to the Contractor within 3 working days after the sample has been obtained, except for verification TSR test results that will be provided within 7 calendar days.

Limits of Precision

Differences between the Contractor's and the Department's split sample test results will be considered acceptable if within the following limits of precision:

Mix Property	**Acceptable Limits of Precision**
Asphalt Binder Content	±0.5 %
12.5 mm Sieve (Types P 57 & FC-2 Mod. Only)	±6.0 %
9.5 mm Sieve (Excluding Type P 57)	±5.0 %
4.75 mm Sieve	±5.0 %
2.36 mm Sieve	±5.0 %
0.075 mm Sieve	±2.0 %
TSR (Ultra-thin HMA Only)	±15.0 %

The Engineer will immediately investigate the reason for differences if any of the following occur:

(A) QA test results of QC split sample does not meet above limits of precision, or

(B) QA test results of QC split sample does not meet the individual test control limits or the specification requirements, or

(C) QA verification sample test results exceed the allowable retesting tolerances.

If the potential for a pavement failure exists, the Engineer may suspend production, wholly or in part, in accordance with Article 108-7 of the *2006 Metric Standard Specifications* while the investigation is in progress. The Engineer's investigation may include, but not be limited to the following:

(A) Joint testing of any remaining split samples,

(B) Review and observation of the QC technician's sampling and testing procedures,

(C) Evaluation and calibration of QC testing equipment, and/or

(D) Comparison testing of other retained quality control samples

If additional mix samples or core samples are necessary to resolve the difference, these samples will be taken as directed and tested jointly by the Contractor's quality control and Department's quality assurance personnel. If reasons for the difference cannot be determined, payment for the mix in question will be determined in accordance with Article 105-3 of the *2006 Metric Standard Specifications*. If the reason for the difference is determined to be an error or other discrepancy in the quality control test results, the applicable quality assurance test results or verification test results will be used to determine compliance with the applicable mix specification requirements.

The Engineer will periodically witness the sampling and testing being performed by the Contractor. If the Engineer observes that the sampling and quality control tests are not being performed in accordance with the applicable test procedures, the Engineer may stop production until corrective action is taken. The Engineer will promptly notify the Contractor of observed deficiencies, both verbally and in writing. The Engineer will document all witnessed samples and tests.

Acceptance

The Engineer will base final acceptance of the mix on the results of random testing made on split samples during the assurance process and validation of the Contractor's quality control process.

Measurement and Payment

Produce and construct all asphalt mixtures and pavements in accordance with these Specifications. There will be no direct payment for work covered by this specification. Payment at the contract unit prices for the various asphalt items will be full compensation for all work covered by these specifications.

CONCRETE PAVEMENTS AND SHOULDERS:

(10-16-07) (Rev. 4-16-13) M7 R20

Revise the *2006 Metric Standard Specifications* as follows:

Page 10-1, Subarticle 1000-3(A) Composition and Design, delete the Subarticle and substitute the following:

Submit concrete paving mix design in terms of saturated surface dry weights on M&T Form 312U for approval a minimum of 30 days prior to proposed use. Use a mix that contains a minimum of 239 kg of cement per cubic yard, a maximum water cement ratio of 0.559, an air content in the range of 4.5 to 5.5 percent, a maximum slump of 1.5" and a minimum flexural strength of 4.5 MPa and a minimum compressive strength of 31 MPa at 28 days.

The cement content of the mix design may be reduced by a maximum of 20% and replaced with fly ash at a minimum rate of 0.5 kg of fly ash to each pound of cement replaced. Use a maximum water-cementitious material ratio not to exceed 0.538.

The cement content of the mix design may be reduced by a maximum of 50% and replaced with blast furnace slag pound for pound.

Include in the mix design the source of aggregates, cement, fly ash, slag, and admixtures; the gradation and specific gravity of the aggregates; the fineness modulus (F.M.) of the fine aggregate; and the dry rodded unit weight and size of the coarse aggregate. Submit test results showing that the mix design conforms to the criteria, including the 1, 3, 7, 14 and 28-day strengths of the average of two beams and the average of two cylinders for each age made and tested in accordance with AASHTO R39, T22 and T97. Design the mix to produce an average strength sufficient to indicate that a minimum strength of 4.5 MPa in flexure and 31 MPa in compression will be achieved in the field within 28 days.

If any change is made to the mix design, submit a new mix design.

If any major change is made to the mix design, also submit new test results showing the mix design conforms to the criteria. A major change to the mix design is defined as:

1) A source change in Coarse aggregate, Fine aggregate, Cement or Pozzolan (applies only to a change from one type of pozzolan to another; e.g., Class F fly ash to Class C fly ash).

2) A quantitative change in Coarse aggregate (applies to an increase or decrease greater than 5%), Fine aggregate (applies to an increase or decrease greater than 5%), Water (applies to an increase only), Cement (applies to a decrease only), Pozzolan (applies to a decrease only).

Where concrete with a higher slump for hand methods of placing and finishing is necessary, submit an adjusted mix design for approval to provide a maximum slump of 75 mm and to maintain the water-cementitious material ratio established by the original mix design.

Page 10-5, Table 1000-1, under column titled "Minimum compressive Strength at 28 days, MPa", in row titled "Pavement", delete "4.5 (flexural)" and substitute "31.0".

SECTION 700
GENERAL REQUIREMENT FOR PORTLAND CEMENT CONCRETE PAVING

Page 7-1, Article 700-3, Concrete Hauling Equipment, delete the fourth paragraph and substitute the following:

For concrete hauled in a transit mix (ready mix) truck, use Table 1000-2 to determine the maximum elapsed time. For concrete hauled in other equipment, minimize the elapsed time to be 60 minutes or less, unless otherwise approved. The elapsed time is defined as the period from first contact between mixing water and cement until the entire operation of placing and finishing up to micro-surfacing, including corrective measures if necessary, has been completed.

Page 7-2, Article 700-4 Preparation of Subgrade and Base, last paragraph, delete the 3rd and 4th sentence and substitute the following:

Set pins at a distance no farther than 15 m apart. When located on a vertical curve, set pins no farther than 7.5 m apart.

Page 7-2, Subarticle 700-5 (A)(4), delete the 2nd and 3rd paragraph and substitute the following:

Where additional pavement, aggregate or soil must be placed adjacent to new pavement by machine methods, do not place it until the concrete has attained a compressive strength of at least 20.6 MPa.

Construction equipment or hauling equipment will not be allowed over the pavement until the concrete has attained a compressive strength of 20.6 MPa.

Page 7-4, Article 700-7 Finishing, insert the following as the second sentence:

The use of excessive water for finishing will not be allowed.

Page 7-4, Subarticle 700-8(C) Hot Weather, 1st sentence:

Substitute 32°C for 27°C.

Page 7-6, 700-11(A) General, delete the fourth paragraph and substitute the following:

Immediately after sawing the joint to the dimensions shown on the plans, completely remove the resulting slurry from the joint. Immediately reapply curing membrane following the sawing operation to damaged areas in the vicinity of the joint.

Page 7-7, insert the following as Subarticle 700-11(G):

(G) Verification of Dowel Bar Alignment

Use either properly secured dowel baskets or a dowel bar inserter, provided the ability to correctly locate and align the dowels at the joints is demonstrated as described below.

Provide a calibrated magnetic imaging device that will document dowel bar location and alignment. Calibrate the magnetic imaging device to the type and size dowel bar used in the work. Utilize this device as a process control and make necessary adjustment to ensure the dowels are placed in the correct location.

Scan at least 25% percent of the joints in the initial placement or 1.6 km of pavement, whichever is greater, at random intervals throughout the pavement each time the paving train is mobilized. Mark scanned joints on the pavement.

Scan all joints in this initial placement if the dowel bars exhibit longitudinal translation (side shift), horizontal translation, vertical translation (depth), horizontal skew, or vertical tilt, above the allowable tolerances defined below. In addition, continue scanning no less than 25% of the joints until it is established that the dowel bar inserter or secured dowel basket assemblies are consistently placing the dowel bars at the correct location (meeting the tolerances defined below). Once the engineer determines that consistency is established, the contractor may reduce the percentage of scanned joints to no less than 10%. Any time inconsistency in the placement of the dowel bars becomes evident, additional scanning may be required up to 100% of the joints.

If consistency of the proper dowel bar alignment cannot be established within a reasonable time frame, the Engineer will have the option of suspending the paving operation.

Provide a report of the scanned joints within 48 hours of completing the day's production. The report should include the station and lane of the joint scanned, as well as the horizontal location, depth, longitudinal translation (side shift), horizontal skew, and vertical tilt, of each dowel bar in the joint. If a dowel bar inserter is used, the joint score described below should also be provided in the report.

Longitudinal translation (side shift) is defined as the position of the center of the dowel bar in relation to the sawed joint. The maximum allowable longitudinal translation (side shift) is 50 mm.

Horizontal translation is defined as difference in the actual dowel bar location from its theoretical position as detailed in the standard details. The maximum allowable horizontal translation is 50 mm.

Vertical translation (depth) is the difference in the actual dowel bar location from the theoretical midpoint of the slab. The maximum allowable vertical translation is 12.5 mm higher than the theoretical midpoint, and 25 mm lower than the theoretical midpoint.

Dowel bar misalignment, either vertical tilt or horizontal skew is defined as the difference in position of the dowel bar ends with respect to each other. Vertical tilt is measured in the vertical axis whereas horizontal skew is measured in the horizontal axis.
If a dowel bar inserter is used, determine a joint score for each joint scanned. The joint score is a measure of the combined effects from the dowel's horizontal skew or vertical tilt. The joint score is determined by summing the product of the weight (shown in the table below) and the number of bars in each misalignment category and adding 1. The vertical tilt and horizontal skew should be evaluated and the greater misalignment shall be utilized in determining the joint score. If two lanes are poured simultaneously, the joint score is calculated for the 730 cm section.

Misalignment Category, mm	**Weight**
0 <= d <= 15	0
15< d <= 20	2
20< d <= 25	4
25 < d <= 38	5
38 <= d	10

where d is the individual dowel bar misalignment.

A joint that has a joint score of 10 or greater will be considered locked.

When a locked joint as defined above is discovered, scan the two joints immediately adjacent to the locked joint. If either of the adjacent joints are deemed to be locked, provide a written

proposal to address the dowel misalignment for each locked joint. No corrective action should be performed without written approval.

Any and all corrective action necessitated by improper joint alignment shall be at no cost to the Department.

Page 7-8, Article 700-13 USE OF NEW PAVEMENT OR SHOULDER, delete the Article and substitute the following:

Traffic or other heavy equipment will not be allowed on the concrete pavement or shoulder until the estimated compressive strength of the concrete using the maturity method has exceeded 20.6 MPa unless otherwise permitted.

Estimate the compressive strength of concrete pavement in accordance with the most current version of ASTM C1074 unless otherwise specified herein.

Furnish thermocouples or thermistors and digital data logging maturity meters that automatically compute and display the maturity index in terms of a temperature-time factor. The maturity meters must be capable of storing a minimum of 28 days worth of data and exporting data into an Excel spreadsheet. Submit the proposed equipment to the Engineer for approval.

When establishing a strength-maturity relationship, perform compressive tests at ages 1, 3, 7, 14 and 28 days in accordance with AASHTO Test Method T22.

Use the temperature-time factor maturity function to compute the maturity index from the measured temperature history of the concrete. Set the datum temperature at –10°C to calculate the temperature-time factor in Equation 1 of ASTM C1074.

Establish and submit a strength-maturity relationship in conjunction with each concrete pavement mix design. Determine the temperature-time factor corresponding to the strength-maturity relationship at 20.6 MPa, TTF. Any changes to plant operations, material sources, or mix proportions will affect the strength-maturity relationship. If any changes occur during production, develop a new strength-maturity relationship unless otherwise directed.

Verify the strength-maturity relationship during the first day's production. Utilize the temperature-time factor developed at mix design TTF to verify the production strength-maturity relationship. Verify the strength-maturity relationship at a minimum of every 10 calendar days or when production is suspended for more than 10 days. If the verification sample's compressive strength when tested at TTF is less than 20.6 MPa, immediately suspend early opening of traffic on pavement that has not obtained TTF until a new strength-maturity relationship is developed.

No permanent traffic will be allowed on the pavement until construction of the joints, including all sawing, sealing, and curing that is required, has been completed.

Take particular care to protect the exposed pavement edges and ends.

Page 7-9, Subarticle 700-15(E) Flexural Strength, delete the Subarticle and replace with the following:

(E)Compressive Strength

Determine the compressive strength of concrete using one set of two 15cm x 30.5 cm cylinders at 28 calendar days. Test samples will be made by the Engineer from the concrete as it comes from the mixer. The samples will be made and cured in accordance with AASHTO T 23. Test specimens will be tested by the Engineer in accordance with AASHTO T22. Furnish curing facilities for the test samples in accordance with Section 725.

Page 7-8, Subarticle 700-15(F) Thickness, delete the first and second paragraphs and replace with the following:

The thickness of the pavement will be determined by measurement of cores in accordance with AASHTO T148.

Take 10 cm diameter cores in the presence of the Engineer. Take the cores when the concrete has attained a compressive strength of at least 20.6 MPa and at least 72 hours have elapsed since placement of the pavement. If the concrete has not attained a compressive strength of at least 20.6 MPa, the gross vehicle weight rating of vehicles supporting the coring operation may not exceed 3,175 kg. Take cores no later than 30 days after the pavement has been placed. The core locations for each lot will be selected at random by the Engineer.

Patch all core holes within 72 hours of taking the core, using a Department approved nonshrink grout compatible with the pavement or shoulder concrete.

SECTION 710
CONCRETE PAVEMENT

Page 7-9. Article 710-1 DESCRIPTION, 1st sentence:
Insert *and cylinders* after the words *test beams*.

Insert *verifying dowel bar alignment*; after the words *sealing joints*;

Page 7-10, Article 710-3 COMPOSITION OF CONCRETE, after the first paragraph, insert the following:

Prior to placement, concrete produced by the plant must demonstrate that it is represented by the mix design submitted. The Engineer will make compressive and flexural samples from plant produced mix for testing at 1, 3, 7, 14 and 28 days of age. The strength results must be within 10% of the strengths reported by the Contractor during the mix design process. If the plant produced mix meets this criteria at 14 days of age, the Engineer will notify the Contractor that placement of concrete may commence.

If any major change as defined in Article 1000-3 is made to the mix design, the process shall be initiated again.

Page 7-10, Article 710-4 ACCEPTANCE OF CONCRETE, delete the first sentence and replace with the following:

Test the concrete pavement for acceptance with respect to compressive strength and thickness on a lot by lot basis in accordance with the requirements of Article 700-15 and the following requirements:

For all concrete pavement, including mainline, shoulders, ramps, tapers, intersections, entrances, crossovers, and irregular areas not otherwise defined, produce a lot consisting of 1,333.3 square yards or fraction thereof placed within 28 calendar days. From each lot, make a minimum of one set of two 15 cm x 30.5 cm cylinders from a randomly selected batch of concrete. The average compression strength of the two cylinders is considered one test. If Division of Highways personnel make and test additional sets of cylinders for a lot, these sets will be averaged with the original set to determine the strength. In the case of low strength, the Engineer will perform an investigation.

Page 7-10, Article 710-6 FINISHING, insert the following at the end of the last paragraph:

Provide a textured surface with an average texture depth of 0.8 mm as tested in accordance with ASTM E965 (*Test Method for Measuring Pavement Macrotexture Depth Using a Sand Volumetric Technique*) with no single test having a texture depth of 0.5 mm or less. Perform four randomly located tests in accordance with ASTM E965 within the initial pavement lot of each mobilization and provide test results to the Engineer. A lot is defined in Article 710-4. If the average of the four tests does not meet the above criteria, make appropriate changes to the surface texture operations and test the next lot as detailed above. Once the surface texture process is established to meet minimum texture requirements, maintain consistency within the operation to provide the above minimum texture depth. Perform additional sand patch tests in accordance with ASTM E965 when directed.

Should the surface texture become damaged or reduced by rain, grinding or any other action, reestablish or restore surface texture by an approved method.

Page 7-12, Article 710-9 Thickness Tolerances, delete the 4th and 5th paragraph and substitute with the following:

When the measurement of the core from a lot is deficient by 5.1 mm or less from the plan thickness, full payment will be made. When such measurement is deficient by more than 5.1 mm from the plan thickness, take 2 additional cores at random within the lot and calculate the average thickness of the lot from the 3 cores. In determining the average thickness of the pavement lot, the Engineer will use all 3 core measurements. Individual core measurements which are greater than the plan thickness plus 5.1 mm will be considered as the plan thickness plus 5.1 mm. Individual cores which are less than the plan thickness minus 25 mm will be considered as the plan thickness minus 25 mm. If the average measurement of the 3 cores is within 5.1 mm from the plan thickness, full payment will be made. If the average measurement of the 3 cores is deficient by more than 5.1 mm from the plan thickness, an adjusted unit price in accordance with Subarticle 710-10(B) will be paid for the lot represented.

Areas found deficient in thickness by more than 1.0" will be removed and replaced with concrete of the thickness shown on the plans. Any full lane or full shoulder width repairs to the concrete pavement must be performed in accordance with the *North Carolina Department of Transportation Partial and Full Depth Repair Manual* and not be less than 1/2 of the panel length (2.3 meters).

When the measurement of any core (original core or additional cores taken to calculate the average) is less than the plan thickness by more than 25 mm, the extent of the removal area due to thickness deficiency will be determined by taking additional exploratory cores at approximately 3 meter intervals parallel to the center line in each direction from the deficient core until an exploratory core is found in each direction which is within 25 mm of the plan thickness. The pavement between these exploratory cores will be removed full lane width wide and replaced with concrete of the thickness shown on the plans. Exploratory cores for deficient thickness will not be used in averages for adjusted unit price. Patch all core holes within 72 hours of taking the core, using a Department approved nonshrink grout compatible with the pavement concrete.

Page 7-13, Article 710-10 (A) Measurement and Payment, delete the second paragraph and substitute the following:

Separate measurement will be made of pavement that is deficient in thickness by more than 5.1 mm and of pavement that is deficient in compressive strength.

Page 7-13, Subarticle 710-10(C) Concrete Pavement Varying In Flexural Strength, delete the title, first paragraph and the equation for the pay factor calculation and substitute the following:

(C) Concrete Pavement Varying in Compressive Strength

The pay factor for pavement achieving a compressive strength in 28 days of 31.0 MPa or greater is 100%. The pay factor for pavement achieving a compressive strength in 28 days between 20.6 MPa and 31.0 MPa is determined by the following formula:

$$\text{Pay Factor (\%)} = 0.0002296(\text{MPa}) - 50$$

(pay factor rounded to nearest tenth of one percent)

Page 7-14, Subarticle 710-10(C) Concrete Pavement Varying In Flexural Strength, delete the first sentence of the third paragraph and substitute the following:

Any pavement that fails to attain 20.6 MPa in compression is subject to removal.

Page 7-15, Article 720-4 ACCEPTANCE OF CONCRETE, delete the first sentence and substitute the following:

Concrete shoulders will be tested for acceptance with respect to compressive strength and thickness on a lot by lot basis.

Page 7-16, Article 720-9 THICKNESS TOLERANCES, replace the first paragraph with the following:

The thickness of the shoulder will be determined by measurement of cores in accordance with AASHTO T148.

Page 7-20, Subarticle 720-10(C) Concrete Shoulder Varying in Flexural Strength, delete the title and the first sentence of the second paragraph and substitute the following, respectively:

(C) Concrete Pavement Varying in Compressive Strength

The quantities of concrete shoulder that fail to meet 31.0 MPa, measured as provided in Article 710-10, will be paid for at an adjusted unit price per square yard completed in place and accepted.

SECTION 725
FIELD LABORATORY FOR PORTLAND CEMENT CONCRETE PAVEMENT

Page 7-17, Subarticle 725-2, General Requirements, replace with the following:

Furnish and maintain for the exclusive use of the Engineer a field office and laboratory in which to house and use all testing equipment needed. Only Department representatives will have access to these facilities. Provide a field office that is dust and water tight, floored, and has an adequate foundation so as to prevent excessive floor movement. Provide a field office that contains 6 or more 110 volt electrical double outlets properly grounded and spaced; a telephone; at least 2 windows, satisfactory locks on all doors and windows; adequate lighting, heating, and air conditioning; sink; running water to sink; and satisfactory exhaust fan. Provide a field office that meets the following approximate minimum requirements: 18.6m^2 of floor space; 3 meter interior width; 2 meters interior height; 1.9 m^2 of counter space, 0.8 to 0.9 meters high and 0.6 meters deep with cabinets or drawers below the counter top; and 0.6 m^2 of desk space not enclosed with cabinets. Locate the office in a position that will permit full view of the plant from the interior of the office. At or near the office, furnish toilet facilities, with waste disposal, available for use of the Department personnel. Maintain these toilets in a neat and clean condition.

Provide a laboratory trailer adjacent to the field office that is at least 37.2 m^2 in area, approximately 6.1 meters wide, 6.1 meters long, and 2.1 meters in height. Provide a laboratory trailer that contains 6 or more 110 volt electrical double outlets properly grounded and spaced; satisfactory locks on all doors and windows; adequate lighting, heating, and air conditioning; sink; running water to sink; and satisfactory exhaust fans. Provide two workbenches that are approximately 3 meters long, 0.6 meters wide, and 0.8 meters high. One workbench shall be installed inside the trailer and the other across the end of the trailer. Provide a shelter or roof over the outside workbench to provide protection from weather. Provide, in the laboratory, an adequate number of water storage tanks to hold all acceptance beams and any additional beams made for the purpose of determining early strengths. Construct the water storage tanks of non-corroding materials and have requirements for automatic control of the water temperature.

Maintain the water in the tank at a temperature of 23°C ±1.7°C. Equip each tank with a recording thermometer with its bulb located in the water. Provide sufficient tank volume to maintain all beams, stored with the long axis vertical, in a fully submerged condition for the duration of the required curing period. Furnish a wooden mixing board at least 19 mm thick and approximately 1.2 meters wide and 1.2 meters long, that is covered on one side with sheet metal of at least 22 gage, at the shelter. Provide facilities to maintain the test beams at temperature between 16°C and 27°C during initial curing.

CONCRETE SHOULDERS ADJACENT TO **mm PAVEMENT (WITH DOWELS):

Construct concrete shoulders adjacent to pavement with dowels in accordance with Section 720 of the *Standard Specifications, The Roadway Standard Drawings,* and as directed by the Engineer.

Concrete Shoulders Adjacent To __mm Pavement (With Dowels) will be measured and paid for in accordance with Article 720-10 of the *Standard Specifications.*

Pay Item

Concrete Shoulders Adjacent To __mm Pavement (With Dowels)

MASONRY DRAINAGE STRUCTURES:
(10-16-07) M8 R01

Revise the *2006 Standard Specifications* as follows:

Page 8-25, Article 840-4 Measurement and Payment, add the following at the end of the second paragraph:

For that portion of *Masonry Drainage Structure* measured above a height of 3 meters, payment will be made at 1.3 times the contract unit price per linear meter for *Masonry Drainage Structure.*

BORROW EXCAVATION AND SHPO DOCUMENTATION FOR BORROW/WASTE SITES:
(12-18-07) (4-15-08) M8 R02

Revise the *2006 Metric Standard Specifications* as follows:

Division 2 Earthwork

Page 2-12, Subarticle 230-1(D), add the words: *The Contractor specifically waives* as the first words of the sentence.

Page 2-13, Article 230-4(B) Contractor Furnished Sources, first paragraph, first sentence replace with the following:

Prior to the approval of any borrow sources developed for use on any project, obtain certification from the State Historic Preservation Officer of the State Department of Cultural

Resources certifying that the removal of the borrow material from the borrow sources(s) will have no effect on any known district, site building, structure, or object, architectural and/or archaeological that is included or eligible for inclusion in the National Register of Historic Places.

Division 8 Incidentals

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

Prior to the removal of any waste from any project, obtain certification from the State Historic Preservation Officer of the State Department of Cultural Resources certifying that the deposition of the waste material to the proposed waste area will have no effect on any known district, site building, structure, or object, architectural and/or archaeological that is included or eligible for inclusion in the National Register of Historic Places. Furnish a copy of this certification to the Engineer prior to performing any work in the proposed waste site.

Page 8-8, Article 802-2, General Requirements, 7th paragraph, add the following as the 2nd sentence:

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

CONCRETE TRANSITIONAL SECTIONS FOR CATCH BASINS AND DROP INLETS:
(1-20-09) M8R03

Revise the *Metric Standard Specifications* as follows:

Page 8-26, Article 840-4 Measurement and Payment, delete the eighth full paragraph and replace with the following:

No separate payment will be made for Concrete Aprons as shown in Standard Drawings 840.17, 840.18, 840.19, 840.26, 840.27 and 840.28 and will be incidental to the other work in this section.

Page 8-31, Article 852-4 Measurement and Payment, add the following as the fourth paragraph.

Concrete Transitional Section for Catch Basin will be measured and paid for in units of each.

Concrete Transitional Section for Drop Inlet will be measured and paid for in units of each.

Payment will be made under:

Pay Item	Pay Unit
Concrete Transitional Section for Catch Basin	Each
Concrete Transitional Section for Drop Inlet	Each

Revise the *Metric Roadway Standard Drawings* as follows:

On page 852.04, change Pay Limits for Concrete Apron for Drop Inlets in two places on the drawing to *Pay Limits for Concrete Transitional Section for Drop Inlet.*

On page 852.05, change Concrete Apron for Catch Basin on the drawing to *Concrete Transitional Section for Catch Basin.*

On page 852.06, change Pay Limits for Concrete Apron for Drop Inlets in two places on the drawing to *Pay Limits for Concrete Transitional Section for Drop Inlet.*

SUBSURFACE DRAINAGE:
(7-20-10) M8 R05

Revise the *2006 Metric Standard Specifications* as follows:

Page 8-11, Delete Section 815 SUBSURFACE DRAINAGE and replace it with the following:

SECTION 815
SUBSURFACE DRAINAGE

815-1 Description

Construct subsurface drains, underdrains, blind drains and other types of drains in accordance with the contract or as directed by the Engineer. Install markers to locate concrete pads for drains as shown on the plans. This provision does not apply to shoulder drains.

815-2 Materials

Refer to Division 10 of the *Standard Specifications.*

Item	Section
Portland Cement Concrete, Class B	1000
Select Material, Class V	1016
Subsurface Drainage Materials	1044
Filter Fabric for Subsurface Drains, Type 1	1056
Steel Markers	1072-4
Steel Marker Paint	1080-14
Pavement Marker Paint	1087

Use Class B Concrete for concrete pads and Class V Select Material for subdrain coarse aggregate. Provide subdrain coarse aggregate for subsurface drains and subdrain fine aggregate for underdrains and blind drains.

815-3 Construction Methods

Do not leave filter fabrics uncovered for more than 7 days. Excavate trenches as necessary in accordance with the contract or as directed by the Engineer. For subsurface drains, line trench with filter fabric and overlap fabric ends a minimum of 150 mm on top of subdrain coarse aggregate.

Install blind drains at a depth of 1.2 to 1.8 meters below subgrade elevation. Install subdrain pipes for subsurface drains and underdrains at a depth of 1.2 to 1.8 meters below subgrade elevation unless the subgrade will be proof rolled. For subsurface drains and underdrains in subgrades that will be proof rolled, install subdrain pipes at a depth of 1.8 meters below subgrade elevation. Firmly connect subdrain pipes together as needed. Place perforated subdrain pipes with perforations down except for pipes in dry materials, in which case turn perforations up or use non-perforated pipes. For concrete pipes in dry materials, construct mortar joints in accordance with Subarticle 300-6(A) of the *Standard Specifications*.

Place subdrain aggregate beneath, around and over subdrain pipes such that pipes are covered by at least 150 mm of aggregate unless shown otherwise on the plans. Do not displace or damage subdrain pipes while placing and compacting subdrain aggregate. Lightly compact backfill material such that settlement is minimized.

Use solvent cement for connecting polyvinyl chloride (PVC) outlet pipes and fittings such as wyes, tees and elbows. Provide connectors for outlet pipes and fittings that are watertight and suitable for gravity flow conditions. Cover open ends of outlet pipes with rodent screens as shown on the plans.

Connect drains to concrete pads or existing drainage structures at ends of outlet pipes. Construct concrete pads and provide an Ordinary Surface Finish in accordance with Subarticle 825-6(B) of the *Standard Specifications*. Furnish and install steel and pavement markers at concrete pads as shown on the plans.

Allow drains to function for up to 30 days or a sufficient time as determined by the Engineer before undercutting, proof rolling or constructing embankments over drains.

815-4 Measurement and Payment

Subdrain Excavation will be measured and paid for in cubic meters. Excavation will be measured based on the trench width shown on the plans or as directed by the Engineer and the actual trench depth as determined by the Engineer. The contract unit price for *Subdrain Excavation* will be full compensation for excavating trenches and backfilling above subdrain aggregate.

Filter Fabric for Subsurface Drains will be measured and paid for in square meters. Filter fabric in a trench will be measured in place based on the subdrain aggregate width shown on the plans or as directed by the Engineer and the actual aggregate depth as determined by the Engineer. No additional payment will be made for overlapping fabric. The contract unit price for *Filter Fabric for Subsurface Drains* will be full compensation for supplying, transporting and installing filter fabric.

Subdrain Fine Aggregate and *Subdrain Coarse Aggregate* will be measured and paid for in cubic meters. Subdrain aggregate in a trench will be measured in place based on the aggregate width shown on the plans or as directed by the Engineer and the actual aggregate depth as determined by the Engineer. When subdrain aggregate is not placed in a trench, aggregate will be measured in place based on the aggregate dimensions shown on the plans or as determined by the Engineer. The contract unit prices for *Subdrain Fine Aggregate* and *Subdrain Coarse Aggregate* will be full compensation for furnishing, hauling, handling, placing, compacting and maintaining subdrain aggregate.

__mm Perforated Subdrain Pipe and *__mm Outlet Pipe* will be measured and paid for in linear feet. Pipes will be measured in place as the pipe length, including fittings, to the nearest 0.1 meters with no deduction for fittings. The contract unit prices for *__mm Perforated Subdrain Pipe* and *__mm Outlet Pipe* will be full compensation for supplying, transporting and installing pipes, fittings and rodent screens and making joint connections.

Subdrain Pipe Outlets will be measured and paid for in units of each. Outlets will be measured as the number of concrete pads or connections to existing drainage structures. The contract unit price for *Subdrain Pipe Outlets* will be full compensation for concrete pads including furnishing concrete, constructing pads and providing and placing markers and connecting pipes to existing drainage structures including cutting into structures, removing existing paved ditches and grouting around connections.

Payment will be made under:

Pay Item	**Pay Unit**
Subdrain Excavation	Cubic Meter
Filter Fabric for Subsurface Drains	Square Meter
Subdrain Fine Aggregate	Cubic Meter
Subdrain Coarse Aggregate	Cubic Meter
__mm Perforated Subdrain Pipe	Linear Meter
__mm Outlet Pipe	Linear Meter
Subdrain Pipe Outlets	Each

ENDWALLS:
(5-20-08) M8 R25

Revise the *Standard Specifications* as follows:

Page 8-23, Article 838-4 Replace the 1st and 2nd paragraph with the following:

> *Endwalls* will be measured and paid for in cubic meters of concrete or brick that have been completed and accepted. This quantity will be computed from the dimensions shown on the plans or from revised authorized dimensions. Where precast concrete units have been approved and are used in lieu of cast-in-place units the quantity to be paid for will be computed the same as if cast-in-place units were used, as no reduction in pay quantity will be made due to the use of precast in lieu of cast in place endwalls.

Reinforced Endwalls will be measured and paid for in cubic meters of concrete or brick that have been completed and accepted. This quantity will be computed from the dimensions shown on the plans or from revised authorized dimensions. Where precast concrete units have been approved and are used in lieu of cast-in-place units the quantity to be paid for will be computed the same as if cast-in-place units were used, as no reduction in pay quantity will be made due to the use of precast in lieu of reinforced cast in place endwalls.

GUARDRAIL ANCHOR UNITS, TYPE 350:

(4-20-04) (Rev 8-16-11) M8 R65

Description

Furnish and install guardrail anchor units in accordance with the details in the plans, the applicable requirements of Section 862 of the *2006 Metric Standard Specifications*, and at locations shown in the plans.

Materials

The Contractor may at his option, furnish any one of the guardrail anchor units or approved equal.

Guardrail anchor unit (ET-Plus) as manufactured by:

Trinity Industries, Inc.
2525 N. Stemmons Freeway
Dallas, Texas 75207
Telephone: 800-644-7976

The guardrail anchor unit (SKT 350) as manufactured by:

Road Systems, Inc.
3616 Old Howard County Airport
Big Spring, Texas 79720
Telephone: 915-263-2435

Prior to installation the Contractor shall submit to the Engineer:

(A) FHWA acceptance letter for each guardrail anchor unit certifying it meets the requirements of NCHRP Report 350, Test Level 3, in accordance with Section 106-2 of the *2006 Standard Specifications*.

(B) Certified working drawings and assembling instructions from the manufacturer for each guardrail anchor unit in accordance with Section 105-2 of the *2006 Metric Standard 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 Methods

Guardrail end delineation is required on all approach and trailing end sections for both temporary and permanent installations. Guardrail end delineation consists of yellow reflective sheeting applied to the entire end section of the guardrail in accordance with Section 1088-3 of the *2006 Metric 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 862-6 of the *2006 Metric Standard Specifications*.

Payment will be made under:

Pay Item	**Pay Unit**
Guardrail Anchor Units, Type 350	Each

FENCE:
(3-6-06) M8 R86

Revise the *2006 Metric Standard Specifications* as follows:

Page 8-44, Subarticle 866-3(A), second sentence,

Add *existing fencing* after stumps

CHAIN LINK FENCING WITH BARBED WIRE ON EXTENSION ARMS:
(7-1-95) M8 R100

Description

Provide 1,800 mm chain link fencing with barbed wire on extension arms in accordance with the plans, Section 866 of the *2006 Metric Standard Specifications*, and the provisions herein.

Construction Methods

On all 1,800 mm fencing on this project, place three strands of barbed wire placed at the top of the fence fabric. Attach the barbed wire to extension arms that are to be fitted to the post tops.

Provide extension arms constructed to locate the top most strand of barbed wire approximately 300 mm above and approximately 300 mm out from the top rail. Space all strands of barbed wire at an approximately equal distance from each other. Make provisions for supporting the top

rail. The arm shall make a 45 degree angle with the post, and be an item of standard manufacture. Have samples of extension arms to be used on the project approved prior to their installation.

Fabricate the extension arms from pressed steel or malleable wrought iron, or either of these materials in conjunction with a cast base. Provide a minimum weight of the arm material of 14 gauge. Provide a complete arm assembly of sufficient strength to support the barbed wire when stretched to proper tension. Galvanize all arms in accordance with ASTM A153.

Erect extension arms so as to point away from the pavement. Splicing of barbed wire between the arms will not be permitted. Use a method of attaching barbed wire to the arms acceptable to the Engineer.

Measurement and Payment

No direct payment will be made for furnishing and installing the barbed wire and extension arms as such work will be considered incidental to other work being paid for by the various fencing items in the contract.

PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON:

(10-15-02) (Rev 6-17-08) M8 R105

Description

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

Materials

Item	Section
Plain Rip Rap	1042
Filter Fabric	1056

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 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*
Light Penetration	ASTM D6567	15 %
Thickness	ASTM D6525	13 mm
Mass Per Unit Area	ASTM D6566	0.339 kg/m^2
Tensile Strength	ASTM D6818	572 kg/m
Elongation (Maximum)	ASTM D6818	49 %
Resiliency	ASTM D6524	> 70 %

UV Stability*	ASTM D4355	≥80 %
Porosity (Permanent Net)	Calculated	≥85 %
Minimum Filament	Measured	0.76 mm
Maximum Permissible Shear Stress (Vegetated)	Performance Test	≥ 39.1 kg/m^2
Maximum Allowable Velocity	Performance Test	≥ 4.9 m/s

*ASTM D1682 Tensile Strength and % strength retention of material after 1000 hours of exposure.

Submit a certification from the manufacturer showing:

(A) the chemical and physical properties of the mat used, and
(B) conformance of the mat with this specification

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 that would prevent the mat from lying in direct contact with the soil surface. Areas where the mat is to be placed will not need to be mulched.

Measurement and Payment

Preformed Scour Holes with Level Spreader Aprons will be measured and paid as the actual number that has been incorporated into the completed and accepted work. Such price and payment will be full compensation for all work covered by this provision.

Payment will be made under:

Pay Item	**Pay Unit**
Preformed Scour Hole with Level Spreader Aprons	Each

STREET SIGNS AND MARKERS AND ROUTE MARKERS:
(7-1-95) M9 R01

Move any existing street signs, markers, and route markers out of the construction limits of the project and install the street signs and markers and route markers so that they will be visible to the traveling public if there is sufficient right of way for these signs and markers outside of the construction limits.

Near the completion of the project and when so directed by the Engineer, move the signs and markers and install them in their proper location in regard to the finished pavement of the project.

Stockpile any signs or markers that cannot be relocated due to lack of right of way, or any signs and markers that will no longer be applicable after the construction of the project, at locations directed by the Engineer for removal by others.

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

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

STEEL U-CHANNEL POSTS AND STEEL SQUARE TUBE SUPPORTS:
(7-18-06) (Rev 1-18-11) M9 R02

Revise the *2006 Standard Specifications* as follows:

Page 9-12 Subarticle 903-3(D) delete the last sentence in the first paragraph and add the following:

Use posts of sufficient length to permit the appropriate sign mounting height. Spliced posts are not permitted on new construction.

Page 9-12 Subarticle 903-3(G) delete the last sentence in the first paragraph and add the following:

Use posts of sufficient length to permit the appropriate sign mounting height. Spliced posts are not permitted on new construction.

Page 9-12 Subarticle 903-3(G), delete the fourth paragraph and add the following:

Do not weld or cut supports in the field except for the saw cutting of steel square tube material for the frames and cross-braces that may be required for Types D, E, and F signs with two or more supports.

SHIPPING SIGNS:
5-15-07 M9 R03

Revise the *2006 Metric Standard Specifications* as follows:

Page 9-2, Section 901-3(A), General, add the following as the 7th paragraph:

Ship all multi-panel signs to the project intact, completely assembled and ready to be hung. Fabricate signs taller than 3.6 m as 2 separate signs with a horizontal splice, ready to be spliced and hung. No assembly other than a horizontal splice will be permitted.

GALVANIZED HIGH STRENGTH BOLTS, NUTS AND WASHERS:
(2-17-09) (Rev 5-17-11) M10 R02

Revise the *Metric Standard Specifications* as follows:

Page 10-101, Subarticle 1072-7(F)(3) Change the AASHTO reference to ASTM B695 Class 55.

Page 10-201, Table 1092-2, Steel Sign Materials, Change High Strength Bolts, Nuts & Washers ASTM Specifications for Galvanizing to B695 Class 55.

Page 10-211, Subarticle 1094-1(A) Breakaway or Simple Steel Beam Sign Supports, replace the first full paragraph with the following:

Fabricate high strength bolts, nuts, and washers required for breakaway supports from steel in accordance with ASTM A325 and galvanize in accordance with ASTM B695 Class 55.

Page 10-212, Article 1096-2 Steel Overhead Sign Structures, replace the last sentence with the following:

The galvanizing shall meet ASTM B695 Class 55 for fasteners and ASTM A123 for other structural steel.

GALVANIZING:
(8-17-10) M10 R03

Revise the *2006 Metric Standard Specifications* as follows:

Page 10-121, Subarticle 1076-1, Galvanizing, add a second paragraph as the follows:

Allow the Engineer to obtain samples of molten zinc directly from the galvanizing vat upon request.

AGGREGATE PRODUCTION:
(11-20-01) M10 R05

Provide aggregate from a producer who uses the current 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 use the program. Participation in the program does not relieve the producer of the responsibility of complying with all requirements of the *2006 Metric Standard Specifications*. Copies of this procedure are available upon request from the Materials and Test Unit.

#57 STONE:

Description

The Contractor shall place #57 stone in the in accordance with the details in the plans and the following provision.

Materials

Item	Section
# 57 Stone	1005

Construction Methods

The stone shall be placed and compacted as directed by the Engineer.

Measurement and Payment

#57 stone will be measured and paid for in metric tons that are completed and accepted. The stone will be measured by being weighed in trucks on certified platform scales or other certified weighing devices. The price and payment will be full compensation for furnishing, hauling, placing, and all incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
#57 Stone	Metric Ton

CONCRETE BRICK AND BLOCK PRODUCTION:
(11-20-01) M10 R10

Provide concrete brick and block from a producer who uses the current 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 use the program. Participation in the program does not relieve the producer of the responsibility of complying with all requirements of the *2006 Metric Standard Specifications*. Copies of this procedure are available upon request from the Materials and Test Unit.

SHOULDER AND SLOPE BORROW:
(3-19-13) 1019 M10 R11

Use shoulder and slope material to construct shoulders and plate slopes with materials capable of supporting vegetation. Material that contains roots, root mats, stumps or other unsatisfactory material will not be acceptable. Remove stones and other foreign material 50 mm or larger in diameter. Use approved material obtained from unclassified excavation, fine grading operations or borrow sources as provided in Section 230.

Use aggregate shoulder borrow (ASB) that meets the following gradation in the following table:

GRADATION OF AGGREGATE SHOULDER BORROW	
Sieve	**Percentage Passing**
1 1/2"	100
1/2"	55-95
#4	35-74

Use soil consisting of loose, friable, sandy material with a PI greater than 6 and less than 25 and a pH ranging from 5.5 to 7.0. Soil with a pH ranging from 4.0 to 5.5 will be accepted without further testing if additional limestone is provided in accordance with the application rates shown in table below. Soil type is identified during the soil analysis. Soils with a pH above 7.0 require

acidic amendments to be added. Submit proposed acidic amendments to the Engineer for review and approval. Soils with a pH below 4.0 or that do not meet the PI requirements shall not be used.

ADDITIONAL LIMESTONE APPLICATION RATE TO RAISE pH			
pH TEST RESULT	**Sandy Soils Additional Rate (kg/ha)**	**Silt Loam Soils Additional Rate (kg/ha)**	**Clay Loam Soils Additional Rate (kg/ha)**
4.0 - 4.4	1,125	4,500	6,750
4.5 - 4.9	560	3,375	5,625
5.0 - 5.4	NA	2,250	4,500

Note: Limestone application rates shown in this table are in addition to the standard rate of 4,500 kg/ha required for seeding and mulching.

No direct payment will be made for providing additional lime or acidic amendments for Ph adjustment.

VOLUMETRIC CONCRETE BATCHING:
(5-18-10) M10 R13

Revise the *2006 Standard Specifications* as follows:

Page 10-19, after **Article 1000-12**, add the following as a new article:

1000-13 VOLUMETRIC MIXED CONCRETE

Upon written request by the contractor, the Department may approve the use of concrete proportioned by volume. The volumetric producer must submit and have approved a process control plan and product quality control plan by the Materials and Tests Unit. If concrete is proportioned by volume, the other requirements of these specifications with the following modifications will apply. Unless otherwise approved by the Department, use of concrete proportioned by volume shall be limited to Class B concrete and a maximum of 22.94 cubic meters per unit per day.

(A) Materials

Use materials that meet the requirements for the respective items in the *Standard Specifications* except that they will be measured by a calibrated volume-weight relationship.

Storage facilities for all material shall be designed to permit the Department to make necessary inspections prior to the batching operations. The facilities shall also permit identification of approved material at all times, and shall be designed to avoid mixing with or contaminating by unapproved material. Coarse and fine aggregate shall be furnished and handled so variations in the moisture content affecting the uniform consistency of the concrete will be avoided.

Moisture content of the coarse and fine aggregate will be made available onsite for the Engineer's review for each load. The frequency of moisture testing will be dependent on certain variables such as weather, season and source; however, moisture tests should be performed at least once at the beginning of the work day for each source material. Additional daily moisture tests for the coarse and fine aggregate shall be performed if requested by the Engineer.

Unused materials should be emptied from hopper daily. Concrete should not be mixed with materials that have been left in the hopper overnight.

(B) Equipment

Provide volumetric mixers with rating plates indicating that the performance of the mixer is in accordance with the Volumetric Mixer Manufacturer Bureau or equivalent. Mixers must comply with ASTM C685. Unless otherwise specified, all mixing operations must be in strict accordance with the manufacturer's recommended procedures. Such procedures shall be provided to the Department for review upon request.

The volumetric mixer shall be capable of carrying sufficient unmixed dry bulk cement, pozzolan (if required), fine aggregate, coarse aggregate, admixtures and water, in separate compartments and accurately proportioning the specified mix. Each batching or mixing unit (or both) shall carry in a prominent place a metal plate or plates on which are plainly marked the gross volume of the unit in terms of mixed concrete, discharge speed and the weight-calibrated constant of the machine in terms of a revolution counter or other output indicator.

The concrete mixing device shall be an auger-type continuous mixer used in conjunction with volumetric proportioning. The mixer shall produce concrete, uniform in color and appearance, with homogeneous distribution of the material throughout the mixture. Mixing time necessary to produce uniform concrete shall be established by the contractor and shall comply with other requirements of these specifications. Only equipment found acceptable in every respect and capable of producing uniform results will be permitted.

Each volumetric mixer shall be equipped with an onboard ticketing system that will electronically produce a record of all material used and their respective weights and the total volume of concrete placed. Alternate methods of recordation may be used if approved by the Engineer. Tickets should also identify the following information, at minimum:

- Contractor Name
- Contractor Phone Number
- NCDOT Project No. and TIP No.
- Date
- Truck No.
- Ticket No.
- Time Start/End of Pour
- Mix ID & Description (Strength)
- Aggregate Moisture Before Mixing

(C) Proportioning Devices

Volume proportioning devices, such as counters, calibrated gate openings or flow meters, shall be easily accessible for controlling and determining the quantities of the ingredients discharged. All indicating devices that affect the accuracy of proportioning and mixing of concrete shall be in full view of and near enough to be read by the operator and Engineer while concrete is being produced. In operation, the entire measuring and dispensing mechanism shall produce the specified proportions of each ingredient.

The volumetric mixer shall provide positive control of the flow of water and admixtures into the mixing chamber. Water flow shall be indicated by a flow meter and be readily adjustable to provide for slump control and/or minor variations in aggregate moisture. The mixer shall be capable of continuously circulating or mechanically agitating the admixtures.

Liquid admixtures shall be dispensed through a controlled, calibrated flow meter. A positive means to observe the continuous flow of material shall be provided. If an admixture requires diluting, the admixture shall be diluted and thoroughly mixed prior to introducing the admixture into the dispenser. When admixtures are diluted, the ratio of dilution and the mixing shall be approved by and performed in the presence of the Department.

The volumetric mixer shall be capable of measurement of cement, pozzolan (if required), liquids and aggregate being introduced into the mix.

(D) Calibration

Volume-weight relationships will be based on calibration. The proportioning devices shall be calibrated by the contractor prior to the start of each NCDOT job, and subsequently at intervals recommended by the equipment manufacturer. Calibrations will be performed in the presence of the Department and subject to approval from the Department. Calibration of the cement and aggregate proportioning devices shall be accomplished by weighing (determining the mass of) each component. Calibration of the admixture and water proportioning devices shall be accomplished by weight (mass) or volume. Tolerances in proportioning the individual components will be as follows:

TABLE 1000-4
VOLUMETRIC MIXED CONCRETE CALIBRATION
PROPORTION TOLERANCES

Item	Tolerance
Cement, Weight (Mass) percent	0 to +4
Fine Aggregate, Weight (Mass) percent	± 2
Coarse Aggregate, Weight (Mass) percent	± 2
Admixtures, Weight (Mass) or Volume percent	± 3
Water, Weight (Mass) or Volume percent	± 1

Each volumetric mixer must be accompanied at all times by completed calibration worksheets and they shall be made available to the Department upon request.

(E) Verification of Yield

Verification of the proportioning devices may be required at any time by the Department. Verification shall be accomplished by proportioning the rock and sand based on the cement meter count for each concrete mobile mixer. Once the count (revolutions) for 42.64 kilograms of cement has been determined then delivery of the correct amount of rock and sand can be verified.

(F) Uniformity

When concrete is produced, have present during all batching operations a Certified Concrete Batch Technician. During batching and placement, the sole duty of this employee is to supervise the production and control of the concrete, perform moisture tests, adjust mix proportions of aggregates for free moisture, complete and sign approved delivery tickets, and assure quality control of the batching.

Two samples of sufficient size to make the required tests will be taken after discharge of approximately 15 and 85 percent of the load. Each of the 2 samples of concrete will be separately tested for the properties listed in Table 1000-3. Tests will be conducted in accordance with the test procedures specified in Table 1000-3 or procedures established by the Materials and Tests Unit. The Engineer may recheck mixer performance at any time when in his opinion satisfactory mixing is not being accomplished.

PORTLAND CEMENT CONCRETE (Alkali-Silica Reaction):
(2-20-07) M10 R16

Revise the *2006 Metric Standard Specifications* as follows:

Page 10-49, Article 1024-1(A), replace the 2nd paragraph with the following:

Certain combinations of cement and aggregate exhibit an adverse alkali-silica reaction. The alkalinity of any cement, expressed as sodium-oxide equivalent, shall not exceed 1.0 percent. For mix designs that contain non-reactive aggregates and cement with an alkali content less than 0.6%, straight cement or a combination of cement and fly ash, cement and ground granulated blast furnace slag or cement and microsilica may be used. The pozzolan quantity shall not exceed the amount shown in Table 1024-1. For mixes that contain cement with an alkali content between 0.6% and 1.0%, and for mixes that contain a reactive aggregate documented by the Department, regardless of the alkali content of the cement, use a pozzolan in the amount shown in Table 1024-1.

Obtain the list of reactive aggregates documented by the Department at:
http://www.ncdot.org/doh/operations/materials/pdf/quarryasrprob.pdf

Table 1024-1 **Pozzolans for Use in Portland Cement Concrete**	
Pozzolan	*Rate*
Class F Fly Ash	20% by weight of required cement content, with 1.2 kg Class F fly ash per kg of cement replaced
Ground Granulated Blast Furnace Slag	35%-50% by weight of required cement content with 1 kg slag per kg of cement replaced
Microsilica	4%-8% by weight of required cement content, with 1 kg microsilica per kg of cement replaced

WATER FOR CONCRETE:
(10-19-10) M10 R17

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

Page 10-51, Article 1024-4, replace article with the following:

1024-4 WATER

Ensure that water used to condition, wash, or as an integral part of materials is clear and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substance. It shall not be salty or brackish. Water used in the production of concrete or grout shall be from wells or public water systems which are suitable for drinking and must meet the criteria listed in Table 1024-1.

Test all water from wells and public water supplies from all out of state locations and in the following counties: Beaufort, Bertie, Brunswick, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Hyde, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrell, and Washington unless the Engineer waives the testing requirements. Water from a municipal water supply in all other NC counties may be accepted by the Engineer without testing.

TABLE 1024-1
ACCEPTANCE CRITERIA FOR WATER
USED IN THE PRODUCTION OF CONCRETE

Requirement	Limit	Test Method
Compressive Strength, minimum percent of control at 3 and 7 days	90 percent	NCDOT Modified / AASHTO T106
Time of set, deviation from control	From 1:00 hr. earlier to 1:30 hr. later	NCDOT Modified / AASHTO T131
pH	4.5 to 8.5	NCDOT Modified / AASHTO T26
Chloride Ion Content, Max.	250 ppm	ASTM D512
Total Solids Content (Residue), Max.	1000 ppm	NCDOT Modified / Standard Methods for Examination of Water and Wastewater

Resistivity, Min.	0.500 kohm-cm	NCDOT Modified / ASTM D1125
Sulfate as SO_4,, Max.	1500 ppm	NCDOT Modified / ASTM D516
Presence of Sugar	None	NCDOT Procedure
Dissolved Organic Matter	None	NCDOT Modified / AASHTO T26

Page 10-53, Article 1026-4, replace article with the following:

1026-4 WATER

All water used for curing concrete shall meet the requirements of Article 1024-4 and Table 1024-1. Water from wells, streams, ponds, or public water systems may be used.

CULVERT PIPE:
(1-19-10) M10R32

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

Page 10-54, Article 1032-1, replace (A), (B), (C), (D), (E) and (F) with the following:

(A) Coated corrugated metal culvert pipe and pipe arches.
(B) Coated corrugated metal end sections, coupling band, and other accessories
(C) Corrugated aluminum alloy structural plate pipe and pipe arches
(D) Corrugated aluminum alloy end sections, coupling band, and other accessories
(E) Welded steel pipe

Page 10-56, Subarticle 1032-3(A)(5) Coating Repair, replace with the following:

Repair shall be in accordance with Section 1076-6 of the *Standard Specifications*.

Subarticle 1032-3(A)(7) Aluminized Pipe, replace with the following:

Aluminized pipe shall meet all requirements herein, except that the pipe and coupling bands shall be fabricated from aluminum coated steel sheet meeting the requirements of AASHTO M274.

Page 10-57, Article 1032-4 Coated Culvert Pipe, replace (A), (1), (2), (3), (4), (B), (C), (D), (E), (F) and (G) with the following:

(A) Coatings for Steel Culvert Pipe or Pipe Arch

The below coating requirements apply for steel culvert pipe, pipe arch, end sections, tees, elbows, and eccentric reducers.

(1) Steel Culvert pipe shall have an aluminized coating, meeting the requirement of AASHTO M274

(2) When shown on the plans or as approved by the Engineer, a polymeric coating meeting the requirements of AASHTO M246 for Type B coating may be substituted for aluminized coating.

(B) Acceptance

Acceptance of coated steel culvert pipe, and its accessories will be based on, but not limited to, visual inspections, classification requirements, check samples taken from material delivered to the project, and conformance to the annual Brand Registration.

Page 10-59, Article 1032-5, sixth paragraph, third sentence, remove the word "spelter"

Page 10-60, 1032-7 Vitrified Clay Culvert Pipe, delete section in its entirety.

Page 10-60, Article 1032-8 Welded Steel Pipe, change title to WELDED STEEL PIPE FOR DRAINAGE

Subarticle 1032-9(B) Plain Concrete Culvert Pipe, delete section in its entirety.

Page 10-62, Article 1032-10 Corrugated Polyethylene Culvert Pipe, change title to CORRUGATED POLYETHYLENE (HDPE) CULVERT PIPE

Add the following: Article 1032-11 Polyvinyl Chloride (PVC) Pipe

Polyvinyl Chloride pipe shall conform to AASHTO M 304 or ASTM 949. When rubber gaskets are to be installed in the pipe joint, the gasket shall be the sole element relied on to maintain a tight joint. Test pipe joints at the plant hydrostatically using test methods in ASTM D 3212. Soil tight joints shall be watertight to 13.8 kPa. Watertight joints shall be watertight to 34.5 kPa unless a higher pressure rating is specified in the plans.

GLASS BEADS:
(7-18-06)(Rev 10-19-10) M10 R35

Revise the *2006 Metric Standard Specifications* as follows:

Page 10-181, 1087-4(A) Composition, add the following as the fourth paragraph:

Glass beads shall have no more than 75 parts per million of arsenic as determined by the United States Environmental Protection Agency Method 6010B in conjunction with the United States Environmental Protection Agency Method 3052 modified.

Page 10-182, 1087-4(C) Gradation & Roundness, delete the last paragraph and replace the second sentence of the first paragraph with the following:

All Drop-On and Intermixed Glass Beads shall be tested in accordance with ASTM D1155.

Page 10-184, 1087-8 Material Certification, add the following below the first sentence:

Glass Beads (for paint, thermoplastic and polyurea) – Type 3 Material Certification for no more than 75 parts per million of arsenic

ENGINEERING FABRICS:
(7-18-06) (Rev 10-19-10) M10 R40

Revise the *2006 Metric Standard Specifications* as follows:

Page 10-78, Delete Section 1056 ENGINEERING FABRICS and replace it with the following:

SECTION 1056
ENGINEERING FABRICS

1056-1 General

Use engineering fabrics that meet the requirements of Article 4.1 of AASHTO M288 and have been evaluated by National Transportation Product Evaluation Program (NTPEP). When required, sew fabrics together in accordance with Article X1.1.4 of AASHTO M288. Provide sewn seams with seam strengths meeting the required strengths for the engineering fabric type and class specified.

Load, transport, unload and store fabrics such that they are kept clean and free of damage. Label, ship and store fabrics in accordance with Section 7 of AASHTO M288. Fabrics with defects, flaws, deterioration or damage will be rejected. Do not unwrap fabrics until just before installation. With the exception of fabrics for temporary silt fences and mechanically stabilized earth (MSE) wall faces, do not leave fabrics exposed for more than 7 days before covering fabrics with material.

When required, use pins a minimum of 5 mm in diameter and 450 mm long with a point at one end and a head at the other end that will retain a steel washer with a minimum outside diameter of 38 mm. When wire staples are required, provide staples in accordance with Subarticle 1060-8(D) of the *2006 Metric Standard Specifications*.

1056-2 Fabric Properties

Provide Type 1 Certified Mill Test Report, Type 2 Typical Certified Mill Test Report or Type 4 Certified Test Report in accordance with Article 106-3 of the *2006 Metric Standard Specifications*. Furnish certifications with minimum average roll values (MARV) as defined by ASTM D4439 for all fabric properties with the exception of elongation and apparent opening size (AOS). For testing fabrics, a lot is defined as a single day's production.

Provide engineering fabric types and classes in accordance with the contract. Machine direction (MD) and cross-machine direction (CD) are as defined by ASTM D4439. Use woven or nonwoven fabrics with properties meeting the requirements of Table 1056-1.

TABLE 1056-1
FABRIC PROPERTY REQUIREMENTS

Property	ASTM Test Method	Requirements (MARV[1])				
		Type 1	Type 2	Type 3[2]	Type 4	Type 5[3]
Typical Application		*Shoulder Drains*	*Under Riprap*	*Temporary Silt Fence*	*Soil Stabilization*	*Temporary MSE Walls*
Elongation (MD & CD)	D4632	≥ 50 %	≥ 50 %	≤ 25 %	< 50 %	< 50 %
Grab Strength (MD & CD)	D4632	400 N	900 N	445 N	800 N	---
Tear Strength (MD & CD)	D4533	180 N	350 N	---	300 N	---
Puncture Strength	D6241	900 N	1925 N	---	1650 N	---
Wide Width Tensile Strength @ Ultimate (MD & CD)	D4595	---	---	---	---	35 kN/m (unless required otherwise in the contract)
Permittivity	D4491	0.20 sec^{-1}	0.20 sec^{-1}	0.05 sec^{-1}	0.05 sec^{-1}	0.20 sec^{-1}
Apparent Opening Size (AOS)[4]	D4751	0.25 mm	0.25 mm	0.60 mm	0.43 mm	0.60 mm
Ultraviolet Stability (retained strength)[5]	D4355	50 %	50 %	70 %	50 %	50%

[1]MARV does not apply to elongation and AOS
[2]Minimum roll width of 900 mm required
[3]Minimum roll width of 4 m required unless otherwise approved
[4]Maximum average roll value
[5]After 500 hours of exposure

QUALIFICATION OF WELDS AND PROCEDURES:

(7-21-09) M10 R43

Page 10-114, Subarticle 1072-20(D) Qualification of Welds and Procedures, replace the third sentence of the first paragraph with the following:

For all prequalified field welds, submit Welding Procedure Specifications (WPS) for each joint configuration for approval at least 30 days prior to performing any welding. In lieu of this, use

the WPS provided and preapproved by the Department. These preapproved WPS are available from the Materials and Tests Unit or at: http://www.ncdot.org/doh/operations/materials/structural/appr_proc.html. Use non-prequalified welds only if approved by the Engineer. Submit WPS for all non-prequalified welds to the Engineer for approval. At no cost to the Department, demonstrate their adequacy in accordance with the requirements of the Bridge Welding Code.

PORTABLE CONCRETE BARRIER
(2-20-07) M10 R50

The *2006 Metric Standard Specifications* is revised as follows:

Page 10-200, Article 1090-1(A) General, add the following after the first sentence:

The requirement for approved galvanized connectors will be waived if the barrier remains the property of the Contractor.

CHANNELIZING DEVICES (Drums):
7-20-10 M10 R60

Revise the *2006 Metric Standard Specifications* as follows:

Page 10-192, Subarticle 1089-5(A) Drums (1) General, replace the paragraph with the following:

(1) General

Provide drums composed of a body, alternating orange and white 4 band pattern of Type III-High Intensity Microprismatic Sheeting and ballasts that have been evaluated by NTPEP.

The following guidelines will be used during the transition from drums with the standard 5 band engineer's grade sheeting to the new 4 band configuration.

(a) All **new** drums purchased **after July 20, 2010** shall have the new sheeting and 4 band configuration.

(b) Existing 5 band drums with engineer's grade sheeting (both new and used devices in existing inventories) will be allowed for use on all on-going construction projects until project completion and will also be allowed for use on other projects until a sunset date has been established.

(c) Intermixing of "old drums" and "new drums" on the same project is acceptable during the transition.

(d) 4 band drums with engineer's grade sheeting will not be allowed at anytime.

Page 10-192, Subarticle 1089-5(A) Drums (3) Retroreflective Stripes, replace the paragraph with the following:

(3) Retroreflective Bands

Provide a minimum of 4 retroreflective bands- 2 orange and 2 white alternating horizontal circumferential bands. The top band shall always be orange. Use a 150mm to 200 mm wide band Type III–High Intensity Microprismatic Retroreflective Sheeting or better that meets the requirement of Section 1093 for each band. Do not exceed 50 mm for any non-reflective spaces between orange and white stripes. Do not splice the retroreflective sheeting to create the 150 mm band. Apply the retroreflective sheeting directly to the drum surface. Do not apply the retroreflective sheeting over a pre-existing layer of retroreflective sheeting. Do not place bands over any protruding corrugations areas. No damage to the reflective sheeting should result from stacking and unstacking the drums, or vehicle impact.

Page 10-193, Subarticle 1089-5(B) Skinny-Drums (1) General, replace the paragraph with the following:

(1) General

All existing skinny-drums that do not have Type III-High Intensity Microprismatic Sheeting as a minimum will have the same transition requirements as drums as stated above. All **new** skinny-drums purchased **after July 20, 2010** shall have Type III–High Intensity Microprismatic Sheeting as the minimum. Type IV and higher grade sheeting is acceptable for use on both new and used devices.

Provide skinny-drums composed of a body, reflective bands, and ballasts that have been evaluated by NTPEP.

Page 10-193, Subarticle 1089-5(B) Skinny Drums (3) Retroreflective Stripes, replace the paragraph with the following:

(3) Retroreflective Bands

Provide a minimum of 4 retroreflective bands- 2 orange and 2 white alternating horizontal circumferential bands for each skinny-drum. The top band shall always be orange. Use a 150mm to 200 mm wide band Type III–High Intensity Microprismatic Retroreflective Sheeting or better that meets the requirement of Section 1093 for each band. Do not exceed 50 mm for any non-reflective spaces between orange and white stripes. Do not splice the retroreflective sheeting to create the 150 mm band. Apply the retroreflective sheeting directly to the skinny-drum surface. Do not apply the retroreflective sheeting over a pre-existing layer of retroreflective sheeting. Do not place bands over any protruding corrugations areas. No damage to the reflective sheeting should result from stacking and unstacking the skinny-drums, or vehicle impact.

TEMPORARY SHORING:
(2-20-07) (Rev 9-25-07) M11 R02

Description

Design and construct temporary shoring in accordance with the contract. Temporary shoring includes standard shoring, temporary mechanically stabilized earth (MSE) walls and non-anchored temporary shoring. Trench boxes are not considered temporary shoring. "Standard shoring" refers to *standard temporary shoring* and *standard temporary MSE walls*. Notes on plans may restrict the use of one or both types of standard shoring. Notes on plans may also require or prohibit temporary MSE walls.

Unless noted otherwise on the plans, temporary shoring is required as shown on the plans and to maintain traffic. Temporary shoring to maintain traffic is defined as shoring necessary to provide lateral support to the side of an excavation or embankment parallel to an open travelway when a theoretical 2:1 (H:V) slope from the bottom of the excavation or embankment intersects the existing ground line closer than 1.5 m from the edge of pavement of the open travelway.

This provision is not applicable to anchored temporary shoring or the installation of pipes, drop inlets and utilities unless noted otherwise on the plans. Provide all shoring submittals before beginning work.

Materials

(A) Certifications, Storage and Handling

Provide Type 7 Contractor's Certifications in accordance with Article 106-3 of the *2006 Metric Standard Specifications* for all shoring materials used with the exception of reinforcing fabrics and geogrids. Furnish Type 2 Typical Certified Mill Test Reports in accordance with Article 106-3 of the *2006 Metric Standard Specifications* for all seam strengths and reinforcing fabric and geogrid properties. Provide minimum average roll values (MARV) in accordance with ASTM D4759 for test reports. For testing reinforcing fabric and geogrids, a lot is defined as a single day's production.

Load, transport, unload and store shoring materials such that they are kept clean and free of damage. Identify, store and handle all geogrids and geotextile fabrics in accordance with ASTM D4873. Geogrids and fabrics with defects, flaws, deterioration or damage will be rejected. Do not leave fabrics or geogrids uncovered for more than 7 days.

(B) Shoring Backfill

Use shoring backfill for the construction of all temporary shoring including backfilling behind non-anchored temporary shoring and in the reinforced zone for temporary MSE walls. Unless backfilling around culverts, use shoring backfill that meets the requirements of Class II Type I, Class III, Class V or Class VI select material in accordance with Section 1016 of the *2006 Metric Standard Specifications* or AASHTO

M145 for soil classification A-2-4 with a maximum plasticity index (PI) of 6. For backfilling around culverts, use shoring backfill as defined herein except for A-2-4 soil.

(C) Non-anchored Temporary Shoring

Use steel shapes, plates and piles that meet the requirements of ASTM A36 and steel sheet piles that meet the requirements of Article 1084-2 of the *2006 Metric Standard Specifications*. Use timber lagging with a minimum allowable bending stress of 6.9 MPa that meets the requirements of Article 1082-1 of the *2006 Metric Standard Specifications*. For standard temporary shoring, use pile sections and lengths and lagging sizes as shown on the plans.

(D) Temporary MSE Walls

Use welded wire reinforcement forms, facings, mesh and mats that meet the requirements of AASHTO M55 or M221. Use connector bars and wires for welded wire wall components and support struts that meet the requirements of AASHTO M32. For standard temporary MSE walls, use wire gauges, strut sizes and welded wire components as shown on the plans.

(1) Geotextile Fabrics

Use geotextile fabrics that meet the requirements of Article 1056-1 of the *2006 Metric Standard Specifications*.

(a) Reinforcing Fabric

The reinforcement direction (RD) is defined as the direction perpendicular to the wall face and the cross-reinforcement direction (CRD) is defined as the direction parallel to the wall face.

Use woven polyester or polypropylene fabric that meets the following properties:

Property	Test Method	Requirement (MARV)
Wide Width Tensile Strength @ Ultimate (RD)	ASTM D4595	Varies – 35 kN/m min
Wide Width Tensile Strength @ Ultimate (CRD)	ASTM D4595	18 kN/m min
Trapezoidal Tear Strength	ASTM D4533	0.44 kN min
CBR Puncture Strength	ASTM D6241	2.67 kN min
UV Resistance after 500 hrs	ASTM D4355	70 %
Apparent Opening Size (AOS), US Sieve	ASTM D4751	0.212 mm min – 0.850 mm max
Permittivity	ASTM D4491	0.20 sec^{-1}

For standard temporary MSE walls (temporary fabric wall) use reinforcing fabric wide width tensile strengths and lengths in the RD as shown on the plans.

(b) Retention Fabric

Retain shoring backfill at the face of temporary MSE walls with retention fabric. Use fabric that meets the requirements of Class 3 and the UV resistance, AOS and permittivity for separation geotextile in accordance with AASHTO M288.

(2) SierraScape Temporary Wall

Use uniaxial (UX) geogrids composed of high-density polyethylene (HDPE) manufactured by Tensar Earth Technologies. Test geogrids in accordance with ASTM D6637. Use connection rods manufactured by Tensar Earth Technologies to transfer the load between the facings and geogrids.

For standard temporary MSE walls (SierraScape temporary wall) use geogrid types and lengths as shown on the plans.

(3) Terratrel Temporary Wall

Use ribbed reinforcing steel strips manufactured by The Reinforced Earth Company that meet the requirements of ASTM A572, Grade 450. Use connector rods that meet the requirements of AASHTO M31, Grade 415 and hair pin connectors that meet the requirements of ASTM A1011, Grade 345. Use bolts, nuts and washers that meet the requirements of AASHTO M164.

For standard temporary MSE walls (Terratrel temporary wall) use ribbed steel strip size and lengths, rod lengths and diameters, hairpin connectors, bolts, nuts and washers as shown on the plans.

Embedment

"Embedment" is defined as the depth of shoring below the bottom of the excavation or the grade in front of the shoring. For cantilever shoring, embedment is the depth of the piling below the grade in front of the shoring. For temporary MSE walls, embedment is the difference between the grade elevation in front of the wall and the elevation of the bottom of the reinforced zone.

Portable Concrete Barriers

Provide portable concrete barriers in accordance with the plans and if shoring is located within the clear zone as defined in the *AASHTO Roadside Design Guide*. Use NCDOT portable concrete barriers (PCBs) in accordance with Roadway Metric Standard Drawing No. 1170.01

and Section 1170 of the *2006 Metric Standard Specifications*. Use Oregon Tall F-Shape Concrete Barriers in accordance with detail drawing and special provision obtained from:

http://www.ncdot.org/doh/preconstruct/wztc/DesRes/English/DesResEng.html

The clear distance is defined as the horizontal distance from the back face of the barrier to the edge of pavement and the minimum required clear distance is shown on the traffic control plans. At the Contractor's option or if the minimum required clear distance is not available, set an unanchored PCB against the traffic side of the shoring and design shoring for traffic impact or use the "surcharge case with traffic impact" for the standard temporary shoring. An anchored PCB or Oregon barrier is required for barriers above and behind temporary MSE walls.

Contractor Designed Shoring

"Contractor designed shoring" is defined as non-anchored temporary shoring or temporary MSE walls designed by the Contractor. Unless prohibited or required, Contractor designed shoring is optional. Contractor designed shoring is required when notes on plans prohibit the use of standard shoring. Non-anchored Contractor designed shoring is prohibited when notes on plans require the use of temporary MSE walls and Contractor designed temporary MSE walls are prohibited when notes on plans prohibit the use of temporary MSE walls.

Before beginning design, survey the shoring location to determine existing elevations and actual design heights. Submit design calculations and drawings including typical sections for review and acceptance showing details of the proposed design and construction sequence in accordance with Article 105-2 of the *2006 Metric Standard Specifications*. Have shoring designed, detailed and sealed by a Professional Engineer registered in the State of North Carolina. Submit 3 hard copies of design calculations and 10 hard copies of drawings and an electronic copy (pdf or jpeg format on CD or DVD) of both the calculations and drawings.

Design non-anchored temporary shoring in accordance with the *AASHTO Guide Design Specifications for Bridge Temporary Works* and temporary MSE walls in accordance with the *AASHTO Allowable Stress Design Standard Specifications for Highway Bridges*. Use the following soil parameters for shoring backfill in the reinforced zone.

Total Unit Weight = 18.8 kN/m^3
Friction Angle = 30 degrees
Cohesion = 0 kPa

Design temporary shoring in accordance with the in-situ assumed soil parameters shown on the plans. Design shoring for a 3-year design service life and a traffic surcharge equal to 11.5 kPa. This surcharge is not applicable for construction traffic. If a construction surcharge will be present within a horizontal distance equal to the height of the shoring, design the shoring for the required construction surcharge. If the edge of pavement or a structure to be protected is within a horizontal distance equal to the height of the shoring, design shoring for a maximum deflection of 75 mm. Otherwise, design shoring for a maximum deflection of 150 mm.

For non-anchored temporary shoring, the top of shoring elevation is defined as the elevation where the grade intersects the back face of the shoring. For traffic impact, apply 29.2 kN/m to the shoring 450 mm above the top of shoring elevation. When designing for traffic impact, extend shoring at least 800 mm above the top of shoring elevation. Otherwise, extend shoring at least 150 mm above the top of shoring elevation.

Standard Shoring

Unless notes on plans prohibit the use of one or both types of standard shoring, standard shoring is optional. Submit a "Standard Temporary MSE Wall Selection Form" for each standard temporary MSE wall location and a "Standard Temporary Shoring Selection Form" for up to three standard temporary shoring locations. Submit selection forms at least 14 days before beginning shoring construction. Obtain standard shoring selection forms from:

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

(A) Standard Temporary Shoring

Determine the shoring height, traffic impact, groundwater condition and slope or surcharge case for each standard temporary shoring location. Determine the minimum required extension, embedment and sheet pile section modulus or H pile section from the plans for each location.

(B) Standard Temporary MSE Walls

Choose a standard temporary MSE wall from the multiple temporary MSE wall options shown in the plans. Do not use more than one option per wall location.

Step bottom of reinforced zone in increments equal to vertical reinforcement spacing for the wall option chosen. Determine the wall height and slope or surcharge case for each section of standard temporary MSE wall. With the exception of either the first or last section of wall, use horizontal section lengths in increments equal to the following for the wall option chosen.

Standard Temporary MSE Wall Option	Increment
Temporary Fabric Wall	2.7 m min (varies)
Hilfiker Temporary Wall	3.0 m min (varies)
SierraScape Temporary Wall	5.7 m
Retained Earth Temporary Wall	7.3 m
Terratrel Temporary Wall	6.0 m

Determine the appropriate facings and/or forms and reinforcement length, spacing, strength, type, density and/or size from the plans for each wall section.

Construction Methods

When using an anchored PCB, anchor the barrier in accordance with Roadway Metric Standard Drawing 1170.01 and Section 1170 of the *2006 Metric Standard Specifications*. Control drainage during construction in the vicinity of temporary shoring. Collect and direct run off away from temporary MSE walls, shoring and shoring backfill.

(A) Non-anchored Temporary Shoring

Install and interlock sheet piling or install piles as shown on the plans or accepted submittals with a tolerance of 42 mm per meter from vertical. Contact the Engineer if the design embedment is not achieved. If piles are placed in drilled holes, perform pile excavation to the required elevations and backfill excavations with concrete and lean sand grout.

Remove grout as necessary to install timber lagging. Install timber lagging with a minimum bearing distance of 75 mm on each pile flange. Backfill voids behind lagging with shoring backfill.

Perform welding in accordance with the accepted submittals and Article 1072-20 of the *2006 Metric Standard Specifications*.

(1) Pile Excavation

Excavate a hole with a diameter that will result in at least 75 mm of clearance around the entire pile. Use equipment of adequate capacity and capable of drilling through soil and non-soil including rock, boulders, debris, man-made objects and any other materials encountered. Blasting is not permitted to advance excavations. Blasting for core removal is permitted only when approved by the Engineer. Dispose of drilling spoils in accordance with Section 802 of the *2006 Metric Standard Specifications*. Drilling spoils consist of all excavated material including water removed from excavations by either pumping or drilling tools.

If unstable, caving or sloughing soils are encountered, stabilize excavations with clean watertight steel casing. Steel casings may be either sectional type or one continuous corrugated or non-corrugated piece. Provide casings of ample strength to withstand handling and driving stresses and the pressures imposed by concrete, earth or backfill. Use steel casings with an outside diameter equal to the hole size and a minimum wall thickness of 6 mm.

Before placing concrete, check the water inflow rate in the excavation after any pumps have been removed. If the inflow rate is less than 150 mm per half hour, remove any water and free fall the concrete into the excavation. Ensure that concrete flows completely around the pile. If the water inflow rate is greater than 150 mm per half hour, propose and obtain approval of the concrete placement procedure before placing concrete.

Center the pile in the excavation and fill the excavation with Class A concrete in accordance with Section 1000 of the *2006 Metric Standard Specifications* except as modified herein. Provide concrete with a slump of 150 to 200 mm. Use an approved high-range water reducer to achieve this slump. Place concrete in a continuous manner to the bottom of shoring or the elevations shown on the accepted submittals. Fill the remainder of the excavation with a lean sand grout and remove all casings.

(B) Temporary MSE Walls

The Engineer may require a wall preconstruction meeting to discuss the construction and inspection of the temporary MSE walls. If required, conduct the meeting with the Site Superintendent, the Resident or Bridge Maintenance Engineer, the Bridge Construction Engineer and the Geotechnical Operations Engineer before beginning wall construction.

Perform all necessary clearing and grubbing in accordance with Section 200 of the *2006 Metric Standard Specifications*. Excavate as necessary as shown on the plans or accepted submittals. Notify the Engineer when foundation excavation is complete. Do not place shoring backfill or first reinforcement layer until obtaining approval of the excavation depth and foundation material.

If applicable, install foundations located within the reinforced zone in accordance with the plans or accepted submittals.

Erect and maintain facings and forms as shown on the plans or accepted submittals. Stagger vertical joints of facings and forms to create a running bond when possible unless shown otherwise on the plans or accepted submittals.

Place facings and forms as near to vertical as possible with no negative batter. Construct temporary MSE walls with a vertical and horizontal tolerance of 75 mm when measured with a 3 m straight edge and an overall vertical plumbness (batter) and horizontal alignment of less than 150 mm.

Place reinforcement at locations and elevations shown on the plans or accepted submittals and in slight tension free of kinks, folds, wrinkles or creases. Repair or replace any damaged reinforcement. Contact the Engineer when existing or future structures such as foundations, pavements, pipes, inlets or utilities will interfere with reinforcement. To avoid structures, deflect, skew and modify reinforcement.

Do not splice reinforcement in the reinforcement direction (RD), i.e., parallel to the wall face. Seams are allowed in the cross-reinforcement direction (CRD). Bond or sew adjacent reinforcing fabric together or overlap fabric a minimum of 450 mm with seams oriented perpendicular to the wall face.

Place shoring backfill in 200 to 250 mm thick lifts and compact in accordance with Subarticle 235-4(C) of the *2006 Metric Standard Specifications*. Use only hand operated

compaction equipment within 1 m of the wall face. Do not damage reinforcement when placing and compacting shoring backfill. End dumping directly on the reinforcement is not permitted. Do not operate heavy equipment on reinforcement until it is covered with at least 250 mm of shoring backfill. Do not use sheepsfoot, grid rollers or other types of compaction equipment with feet.

Cover reinforcing and retention fabric with at least 75 mm of shoring backfill. Place top reinforcement layer between 100 to 600 mm below top of wall as shown on the plans or accepted submittals.

Bench temporary MSE walls into the sides of excavations where applicable. If the top of wall is within 1.5 m of finished grade, remove top form or facing and incorporate the top reinforcement layer into the fill when placing fill in front of the wall. Temporary MSE walls remain in place permanently unless required otherwise.

Measurement and Payment

Temporary Shoring will be measured and paid for at the contract unit price per square meter of exposed face area at locations shown on the plans or required by the Engineer. For temporary MSE walls, the wall height will be measured as the difference between the top and bottom of wall and does not include the embedded portions of the wall or any pavement thickness above the wall. For all other temporary shoring, the shoring height will be measured as the difference between the top and bottom of shoring elevation. The bottom of shoring elevation is defined as where the grade intersects the front face of the shoring. The top of shoring elevation is defined as where the grade intersects the back face of the shoring. No payment will be made for any extension of shoring above the top of shoring or any embedment below the bottom of shoring. Such price and payment will be full compensation for furnishing all labor, tools, equipment, materials and all incidentals necessary to design and install the temporary shoring and complete the work as described in this provision.

No payment will be made for temporary shoring not shown on the plans or required by the Engineer including shoring for OSHA reasons or the Contractor's convenience. No value engineering proposals will be accepted based solely on revising or eliminating the shoring locations shown on the plans or the estimated quantities shown in the bid item sheets as a result of actual field measurements or site conditions.

No additional payment will be made for anchoring PCBs or providing Oregon barriers in lieu of unanchored PCBs. Additional costs for anchoring PCBs or providing Oregon barriers will be considered incidental to *Temporary Shoring*.

Payment will be made under:

Pay Item	**Pay Unit**
Temporary Shoring	Square Meter

CHANGEABLE MESSAGE SIGNS
(11-21-06) M11 R11

Revise the *2006 Metric Standard Specifications* as follows:

Page 11-7, Article 1120-3, Replace the 3rd sentence with the following:

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

WORK ZONE TRAFFIC CONTROL:
(8-16-11) M11 R20

Revise the *2006 Metric Standard Specifications* as follows:

Page 11-3, Article 1101-12 Traffic Control Supervision, in addition to the stated requirements, add the following:

Provide the service of at least one qualified Work Zone Supervisor. The Work Zone Supervisor shall have the overall responsibility for the proper implementation of the traffic management plan, as well as ensuring all employees working inside the NCDOT Right of Way have received the proper training appropriate to the job decisions each individual is required to make.

The work zone supervisor is not required to be on site at all times but must be available to address concerns of the Engineer. The name and contact information of the work zone supervisor shall be provided to the Engineer prior to or at the preconstruction conference.

Qualification of Work Zone Supervisors shall be done by an NCDOT approved training agency or other approved training provider. For a complete listing of these, see the Work Zone Traffic Control's webpage, http://www.ncdot.gov/doh/preconstruct/wztc/.

Page 11-10, Article 1150-3 Construction Methods, replace the article with the following:

Provide the service of properly equipped and qualified flaggers (see *Roadway Standard Drawings* No. 1150.01) at locations and times for such period as necessary for the control and protection of vehicular and pedestrian traffic. Anyone who controls traffic is required to be qualified. Qualification consists of each flagger receiving proper training in the set-up and techniques of safely and competently performing a flagging operation. Qualification of flaggers is to be done at an NCDOT approved training agency. For a complete listing of these, see the Work Zone Traffic Control's webpage, http://www.ncdot.gov/doh/preconstruct/wztc/.

Prior to beginning work on the project, a Qualification Statement that all flaggers used on the project have been properly trained through an NCDOT approved training resource shall be provided to the Engineer.

Flagging operations are not allowed for the convenience of the Contractor's operations. However, if safety issues exist (i.e. sight or stopping sight distance), the Engineer may approve the use of flagging operations. Use flagging methods that comply with the guidelines in the MUTCD.

PAVEMENT MARKING LINES:
(11-21-06) (Rev. 08-17-10) M12 R01

Revise the *2006 Metric Standard Specifications* as follows:

Page 12-2, 1205-3(D) Time Limitations for Replacement, add the following at the beginning of the chart:

Facility Type	Marking Type	Replacement Deadline
Full-control-of-access multi-lane roadway (4 or more total lanes) and ramps, including Interstates	All markings including symbols	By the end of each workday's operation if the lane is opened to traffic

Page 12-4, 1205-3 (H) Observation Period, delete 1205-3 (H) and replace with the following:

Maintain responsibility for debonding and color of the pavement markings during a 12 month observation period beginning upon final acceptance of the project as defined under Article 105-17. Guarantee the markings under the payment and performance bond in accordance with Article 105-17.

During the 12 month observation period, provide pavement marking material that shows no signs of failure due to blistering, chipping, bleeding, discoloration, smearing or spreading under heat or poor adhesion to the pavement materials. Pavement markings that debond due to snowplowing will not be considered a failed marking. Replace, at no additional expense to the Department, any pavement markings that do not perform satisfactorily under traffic during the 12 month observation period.

Page 12-6, 1205-4 (C) Application, delete the last two sentences of the second paragraph and replace with the following:

Produce in place markings with minimum retroreflective values shown below, as obtained with a LTL 2000 Retroreflectometer or Department approved mobile retroreflectometer. Retroreflective measurements will be taken within 30 days after final placement of the pavement marking.

Page 12-7, 1205-4 (D) Observation Period, delete the entire section and replace with the following:

In addition to the requirements of Subarticle 1205-3(H), maintain responsibility for minimum retroreflective values for a 30-day period beginning upon the Engineer's acceptance of all markings on the project. Guarantee retroreflective values of the markings during the 30-day period under the payment and performance bond in accordance with Article 105-17.

Page 12-8, 1205-5 (B) Application, delete the second sentence of the fourth paragraph and replace with the following:

Produce in place markings with minimum retroreflective values shown below, as obtained with a LTL 2000 Retroreflectometer or Department approved mobile retroreflectometer.

Retroreflective measurements will be taken within 30 days after final placement of the pavement marking.

Page 12-8, 1205-5 (C) Observation Period, delete this entire section and replace with the following:

Maintain responsibility for minimum retroreflective values for a 30-day period beginning upon satisfactory final placement of all markings on the project. Guarantee retroreflective values of the markings during the 30-day period under the payment and performance bond in accordance with Article 105-17.

Page 12-11, Article 1205-9, Maintenance, delete Article 1205-9 and replace with the following:

Replace pavement markings that prematurely deteriorate, fail to adhere to the pavement, lack reflectorization, or are otherwise unsatisfactory during the life of the project or during the 12 month observation period as determined by the Engineer at no cost to the Department.

Upon notification from the Engineer, winterize the project by placing an initial or additional application of paint pavement marking lines in accordance with Article 1205-8. Payment for *Paint Pavement Marking Lines* required to winterize the project will be made in accordance with Article 1205-10 except that no payment will be made on resurfacing projects where paving is completed more than 30 days prior to the written notification by the Department that winterization is required.

Page 12-11, Article 1205-10, Measurement and Payment, add the following after the first sentence of the first paragraph:

In addition, *Paint Pavement Marking Lines* will be paid per linear foot for each 15 mil application placed in accordance with Subarticle 1205-8(C).

EXCAVATION, TRENCHING, PIPE LAYING AND BACKFILLING FOR UTILITIES:
(2-17-09) M15 R01

Revise the *2006 Metric Standard Specifications* as follows:

Page 15-4, Article 1505-4 Repair of Pavements, Sidewalks and Driveways, first paragraph, add at the end of the first sentence

in accordance with Section 848

Page 15-5, Article 1505-6

Second paragraph,

Delete *(E) Repair of Sidewalks and Driveways* in its entirety

Add as the eighth paragraph:

__*mm Concrete Sidewalk* and __*mm Concrete Driveways* will be measured and paid for in accordance with Article 848-4.

PERMANENT SEEDING AND MULCHING:
(7-1-95) M16 R01

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.

R-2241A

NORTH CAROLINA LICENSED SEAL 1912 GEOLOGIST NEIL T. ROBERSON 3/5/13

NORTH CAROLINA PROFESSIONAL SEAL 18899 ENGINEER JAMES R. BATTS, JR. 3/5/13

ROCK BLASTING (SPECIAL)

DESCRIPTION

Use blasting as needed to excavate, break up or remove rock, construct stable rock cut slopes and for other approved reasons. This provision applies to all types of blasting including production, controlled, cushion, trim, trench and secondary blasting except blasting adjacent to highway structures. See Article 410-11 of the Standard Specifications for blasting adjacent to highway structures. Provide blasting plans, blast monitoring and post-blast reports as necessary or required. Perform blasting in accordance with the contract, accepted submittals and as directed by the Engineer. Use a prequalified Blasting Contractor for blasting.

PROJECT REQUIREMENTS

Blasting within 300 meters of the structure listed below is subject to the following warning levels and not-to-exceed limits measured at the premises of the structure.

Structure	Location
Residence, 1.5 SBKD	Parcel 38, Left of -L- Sta. 22+30

Variable	Warning Level	Not-to-Exceed Limit
Vibration (PPV) > 40 Hz	0.75 in/sec (19 mm/sec)	1.0 in/sec (25 mm/sec)
Vibration (PPV) < 40 Hz	0.40 in/sec (10 mm/sec)	0.50 in/sec (13 mm/sec)
Air-overpressure (noise)	120 dBL	133 dBL

The Contractor must notify the Engineer a minimum of 7 days prior to any blasting within 300 meters of the structure listed above.

If warning levels are exceeded, the Engineer may require additional blasting monitoring. If vibration and/or air-overpressure recorded are higher than not-to-exceed limits, the Engineer may suspend blasting until the post-blast report is reviewed and a new or revised blasting plan is accepted.

Design and perform rock blasting such that no flyrock occurs. If flyrock occurs, the Engineer may suspend blasting operations in accordance with Article 108-7 of the Standard Specifications and require a revised general blast plan.

MATERIALS

Refer to Division 10 of the Standard Specifications.

Item	Section
Coarse Aggregate	1005 of the Standard Specifications

Use coarse aggregate (standard size No. 67 or 78M) for stemming.

CONSTRUCTION METHODS

Notify the Engineer and all occupants and owners of residences, businesses and utilities near where blasting will occur of the intention to use explosives. Inform the Engineer, occupants and owners of blasting at least 48 hours before each blast. When blasting in the vicinity of an open travelway, provide traffic control in accordance with the contract and Section 1101 of the Standard Specifications.

Control blasting to avoid endangering lives or damaging property. The Contractor is responsible for any injuries and damages due to blasting in accordance with Article 107-11 of the Standard Specifications. Exercise the utmost care when blasting near sensitive environmental or populated areas, urban or sensitive communities or historical structures. Comply with all the latest applicable Federal, State and local codes, laws and regulations, as well as professional society standards for the storage, transportation and use of explosives. Keep a copy of all regulations on site and in case of conflict, the more stringent applies.

When blasts will be within 300 meters of a utility, house, residence, building, business or any other structure, a blasting plan and blast monitoring that meet Subarticles (B) and (C) below are required. Otherwise, provide a blasting plan and monitor blasts as needed.

(A) Vibration and Air Overpressure Limits

Define "peak particle velocity" (PPV) as the maximum ground vibration velocity measured in any direction. Design blasts so the PPV at any utility or structure does not exceed the "Alternative Blasting Level Criteria" from Appendix B of the *U.S. Bureau of Mines Report of Investigations 8507*. Design blasts so the maximum air-overpressure at any structure does not exceed 133 dB (linear).
If the PPV or air overpressure limits are exceeded at any utility or structure in any direction from blasts, the Engineer may suspend blasting until the post-blast report is reviewed and a new or revised blasting plan is accepted.

(B) Blasting Plan

When required, submit the proposed blasting plan for all blasting for acceptance. Acceptance of this plan does not relieve the Contractor of responsibility and liability for blasting in accordance with the contract.

Submit 2 copies and a PDF copy of the blasting plan at least 30 days before starting blasting. Do not deliver explosives to the project site or begin blasting until a blasting plan is accepted. Submit one copy to the Resident Engineer and the other copy and PDF copy to the appropriate Geotechnical Engineering Unit regional office. Provide detailed project specific information in the blasting plan that includes the following:

(1) Work procedures and safety precautions for storage, transportation, handling and detonation of explosives;

(2) Explosive products and devices for dry and wet blast holes including explosives, primers and detonators with MSDS;

(3) Drilling equipment including methods for maintaining blast hole alignment;

(4) Typical plan, profile and sectional views for blasting showing blasting limits, blast hole diameters, depths, inclinations and spacing, burden, subdrill depths and minimum and maximum charge per delay;

(5) Initiation and delay methods and delay times;

(6) Equipment and procedures for blast monitoring with calibration certificates dated within one year of submittal date; and

(7) Post-blast report format.

If alternate blasting procedures are proposed or necessary, a revised blasting plan submittal may be required. If blasting deviates from the accepted submittal without prior approval, the Engineer may suspend blasting until a revised plan is accepted.

(C) Blast Monitoring

If necessary or required, monitor blasts using seismographs capable of measuring air overpressure and vibration in the vertical, longitudinal and transverse directions. At a minimum, monitor vibration and air-overpressure at the closest utility or structure to each blast and the closest utility or structure in the direction of each blast in accordance with the accepted blasting plan. Include the following in post-blast reports for each blast monitoring location:

(1) Type, identification and specific location of seismograph,

(2) Distance and direction from blast,

(3) PPV in each direction and peak vector sum, and

(4) Maximum air overpressure level.

(D) Blasting Requirements

Before beginning drilling, a pre-blast meeting may be required to discuss the blasting and if applicable, blast monitoring. Schedule this meeting after any blast plans have been accepted. The Resident or District Engineer, Roadway Construction Engineer, Geotechnical Operations Engineer, and Contractor will attend this pre-blast meeting.

Drill and blast in accordance with the contract and if applicable, the accepted blast plan. Use explosives in accordance with all applicable government regulations, professional

society standards and manufacturer guidelines and recommendations. Do not allow ammonium nitrate fuel oil (ANFO) to leach into bodies of water.

Before blasting for excavations, remove all overburden material along top of excavations for at least 10 meters beyond blasting or rock limits, whichever is less. Inspect any free faces to ensure adequate burden. Drill blast holes within 75 mm of plan location and maintain hole alignment when drilling.

Cover blast holes after drilling to prevent unwanted backfill and identify and mark each blast hole with hole number and depth. Blast holes shall be free of obstructions the entire depth. Load blast holes without dislodging material or caving in hole walls. Stem blast holes 13 cm or larger in diameter with No. 67 stone and blast holes smaller than 13 cm in diameter with No. 78M stone. Do not stem blast holes with drill cuttings.

Contain flyrock within construction limits. Use matting when blast monitoring or traffic control is required. Soil cover may be used instead of matting, if approved. If flyrock occurs outside the construction limits, the Engineer may suspend blasting until the post blast report is reviewed and a new or revised blasting plan is accepted. When traffic control is required for blasting, have equipment standing by to remove material that interferes with traffic flow. Check for misfires immediately after each blast before signaling all clear.

Remove all loose, hanging and potentially dangerous material from rock cut slopes by scaling. The Contractor is responsible for the stability of rock cuts. If rock cuts are damaged during blasting, stabilize cuts to the satisfaction of the Engineer. Resume drilling only after scaling is complete. Adjust blast hole alignments to account for any drift occurring in preceding drilling or lifts.

Define "secondary blasting" as blasting to reduce the size of naturally occurring boulders or those resulting from initial blasting. Use an approved method for secondary blasting consisting of small explosive charges in small diameter blast holes. Define "mudcapping" as placing unconfined explosive charges in contact with rock without blast holes and covering charges with mud. Do not use mudcapping for blasting.

(E) Post-Blast Report

Submit 2 copies and a PDF copy of a post-blast report within 3 days of each blast or before the next blast, whichever is sooner. Provide post-blast reports that include the following:

(1) Material data information about explosive products and devices including explosives, primers and detonators;

(2) Scaled blast drawings with cross sections showing blasting limits, blast hole diameters, depths, inclinations and spacing, burden, subdrill depth, free face location and

any joints, bedding planes, weathered zones, voids or other significant rock structure information;

(3) Loading pattern diagram with location and amount of each type of explosive including primers and detonators;

(4) Locations and depths of stemming, column heights and maximum charge per delay for each type of loading;

(5) Delay and initiation diagram showing delay pattern, sequence and times;

(6) Results and effectiveness of the blast and any proposed changes to subsequent blasting;

(7) If applicable, blast monitoring results; and

(8) Blast damage report when necessary.

(F) Blast Damage Report

If damage occurs from blasting, notify the Engineer immediately and submit a blast damage report with the post-blast report that includes the following:

(1) Property owner's and injured person's, if any, names, addresses and telephone numbers;

(2) Details and description of property damage and injury, if any, with photographs or video; and

(3) Any associated tort claims, complaint letters and other applicable information.

MEASUREMENT AND PAYMENT

No direct payment will be made for blasting including blasting plans, blast monitoring, post blast reports, scaling and stabilizing rock cuts.

No direct payment will be made for blasting for roadway excavation. Blasting for roadway excavation will be incidental to the contract unit price for *Unclassified Excavation* in accordance with Article 225-7 or the lump sum price for *Grading* in accordance with Article 226-3.

No direct payment will be made for blasting for any pipe, utility or foundation excavation. Blasting for these items will be incidental to the compensation for the excavation. Where no direct payment is made for excavation, blasting will be incidental to the work and no separate payment will be made for blasting.

No additional payment will be made and no extension of completion date or time will be allowed when the Engineer suspends blasting.

NORTH CAROLINA PROFESSIONAL SEAL 022243 ENGINEER SCOTT A. HIDDEN 3/4/13

GEOTEXTILE FOR PAVEMENT STABILIZATION: SPECIAL

Description

Furnish and install geotextile for pavement stabilization in accordance with the contract. Geotextile for pavement stabilization may be required to prevent longitudinal pavement cracks and provide separation between the subgrade and pavement structure at locations shown on the plans.

Materials

Load, transport, unload and store geotextiles such that they are kept clean and free of damage. Label, ship and store geotextiles in accordance with Section 7 of AASHTO M288. Geotextiles with defects, flaws, deterioration or damage will be rejected. Do not unwrap geotextiles until just before installation and do not leave geotextiles exposed for more than 7 days before covering geotextiles with base course.

Use geotextiles with a minimum roll width of 13 ft (4 m) that meet the requirements of Article 1056-1 of the *Standard Specifications*. Provide Type 1 Certified Mill Test Report in accordance with Article 106-3 of the *Standard Specifications* with minimum average roll values (MARV) as defined by ASTM D4439 for geotextile properties. For testing geotextiles, a lot is defined as a single day's production.

Machine direction (MD) and cross-machine direction (CD) are as defined by ASTM D4439. Use woven polyester or polypropylene geotextiles with properties meeting the following requirements.

Property	ASTM Test Method	Requirement (MARV)
Wide Width Tensile Strength @ 5% Strain (MD & CD)	D4595	1900 lbs/ft (27.7 kN/m)
Wide Width Tensile Strength @ Ultimate (MD & CD)	D4595	4800 lbs/ft (70.0 kN/m)
Permittivity	D4491	0.10 sec^{-1}
Apparent Opening Size[1]	D4751	#30 (0.60 mm)
Ultraviolet Stability (retained strength)[2]	D4355	70 %
Melting Point	D276	300°F (150°C)

[1]US Sieve No. per AASHTO M92
[2]After 500 hours of exposure

Construction Methods

Construct embankments to subgrade elevation in accordance with the contract. The Engineer will determine if a geotextile for pavement stabilization is required at locations shown on the plans based on testing subgrade soils for quality. For subgrades that are not stabilized, allow 24

calendar days for the Engineer to determine if a geotextile for pavement stabilization is required. When using geotextiles on stabilized subgrades, stabilize subgrade soils to 12" (300 mm) beyond the bottom of the base course as shown on the plans.

Place the geotextile for pavement stabilization on the subgrade immediately below the pavement structure as shown on the plans. Place geotextiles in slight tension free of kinks, folds, wrinkles or creases. Install geotextiles with the machine direction (MD) perpendicular to the roadway centerline. The MD is the direction of the length or long dimension of the roll. Do not splice or overlap geotextiles in the MD such that splices or overlaps are parallel to the roadway centerline. Extend geotextiles 12" (300 mm) beyond the bottom of the base course as shown on the plans.

Cover the entire subgrade at each location by placing geotextile rolls adjacent to each other in the cross-machine direction (CD), i.e., perpendicular to the MD. The CD is the direction of the width or short dimension of the roll. Overlapping adjacent geotextiles in the CD is permitted but not required. Overlap geotextiles in the direction that base courses will be placed to prevent lifting the edge of the top geotextile.

Do not damage the geotextile for pavement stabilization when constructing base courses. Place and compact base courses in accordance with the *Standard Specifications*. Do not operate heavy equipment on the geotextiles more than necessary to construct the pavement structure. Replace any damaged geotextiles to the satisfaction of the Engineer.

Measurement and Payment

Geotextile for Pavement Stabilization will be measured and paid for in square yards (meters). Geotextiles will be measured along the top surface of the subgrade and no additional payment will be made for overlapping geotextiles. The contract unit price bid for *Geotextile for Pavement Stabilization* will be full compensation for supplying, transporting and installing geotextiles.

Payment will be made under:

Pay Item	Pay Unit
Geotextile for Pavement Stabilization	Square Yard (Meter)

PROJECT SPECIAL PROVISIONS
GEOENVIRONMENTAL

CONTAMINATED SOIL AND GROUNDWATER (3-5-2012)

The Contractor's attention is directed to the fact that soil and groundwater contaminated with petroleum hydrocarbon compounds and volatile organic compounds exist within the project area. Soil samples collected from Parcel #04 W.O. Humphreys Property, Parcel #07 Linda S. Carver Property, Parcel #09 Jai Uck Kim Property, Parcel #11 King NEB Property, Parcel 17 (Former Clifton Wayne Henderson), Parcel #48 Bonnie Ray Lundsford Property and Parcel 49 Fielding Harris Property indicated petroleum contaminated soils are present in the right of way. The NCDENR UST Section documents groundwater incidents have occurred on Parcel #04 W.O. Humphreys Property, Parcel #07 Linda S. Carver Property, Parcel #09 Jai Uck Kim Property and Parcel #11 King NEB Property. Monitoring wells are located on these parcels and petroleum contaminated soils and/or volatile organic compounds may be present in the right of way.

The known areas of contamination are indicated on corresponding plans sheets. Information relating to these contaminated areas, sample locations, and laboratory reports are available at the following web address by navigating to the correct letting year and month then selecting, "Plans and Proposals", "Person R-2241A C202960", "GeoEnvironmental":

http://dotw-xfer01.dot.state.nc.us/dsplan/

Impact to contaminated soil is possible during any earthwork activities on the project. The Contractor shall only excavate those soils which the Engineer designates necessary to complete a particular task. The Engineer shall determine if soil is contaminated based on petroleum odors and unusual soil staining. Contaminated soil not required to be excavated is to remain in place and undisturbed. Undisturbed soil shall remain in place, whether contaminated or not. The Contractor shall transport all contaminated soil excavated from the project to an approved disposal facility licensed to accept contaminated soil. In the event that the Contractor needs to stockpile the soil temporarily, the stockpile shall be created within the property boundaries of the source material and in accordance with the Stockpile Detail found in the plans. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDENR UST Section Raleigh Regional Office for off-site temporary storage. The Contractor shall provide disposal manifests and weigh tickets to the Engineer for review and approval. The Engineer will in turn provide the GeoEnvironmental Section with a copy of the disposal manifests and weigh tickets for their records.

If groundwater is encountered and dewatering is required in areas of known contamination then the contractor shall containerize the groundwater in vessels provided by the Department. The Department will be responsible for the sampling and disposal of the water.

Measurement and Payment:

The quantity of contaminated soil excavated, hauled, and disposed of shall be the actual number of metric tons of material, which has been acceptably excavated, transported and weighed with

certified scales as documented by disposal manifests and weigh tickets. The quantity of excavated contaminated soil, measured as provided above, shall be paid for at the contract unit price per metric ton for "Excavation, Hauling, and Disposal of Contaminated Soil".

The above price and payment shall be full compensation for all work covered by this section, including, but not limited to, excavation, loading, transportation, weighing, laboratory testing, disposal, equipment, decontamination of equipment, labor, and personal protective equipment. Stockpiling the contaminated soil will be at the Contractors discretion and will be incidental to the project.

Payment shall be made under:

Pay Item	**Pay Unit**
Excavation, Hauling, and Disposal of Contaminated Soil	Metric Ton

3/5/2012

NORTH CAROLINA PROFESSIONAL SEAL 031499 ENGINEER CYRUS F. PARKER

August 10, 2012

NORTH CAROLINA PROFESSIONAL SEAL 16832 ENGINEER JAMES S. McKEE

Project: R-2241A
County: Person

PROJECT SPECIAL PROVISIONS
Utility Construction

Specifications:

The proposed utility construction shall meet the applicable requirements of the NC Department of Transportation's "Standard Specifications for Roads and Structures" dated January 2006, and the following provisions.

Revise the 2006 Standard Specifications as follows:

Utility Owner's Contact Information:

Page 15-1; Sub-article 1500-2 Cooperation with the Utility Owner, paragraph 2, add the following sentences:

The utility owner is the City of Roxboro. The contact person is Mr. Andrew Oakley and he can be reached by phone at (336) 599-5658.

Page 15-6; Subarticle 1510-3 (B) Testing and Sterilization, change the allowable leakage formula to:

$W=LD\,(P)^{1/2}/148{,}000$

Page 15-6; Subarticle 1510-3 (B) Testing and Sterilization; seventh paragraph delete the words (concurrently or) in the following sentence.

Testing, cleaning and sterilization may be performed ~~concurrently or~~ consecutively.

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 (Transmission)
B) Progress Energy - Power (Distribution)
C) Piedmont EMC - Power (Distribution)
D) CenturyLink - Telephone
E) Charter Communications – CATV
F) PSNC Energy - Gas

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 (Transmission)

1) Progress Energy will remove its existing poles and overhead lines and install new poles and lines within the project limits at the locations shown on the Utilities by Others Plans prior to the date of availability.
2) Contact person for Progress Energy (Transmission) is Mr. Jamie Loy at 919-546-6034.

B) Progress Energy - Power (Distribution)

1) Progress Energy will remove its existing poles and overhead lines and install new poles and lines within the project limits at the locations shown on the Utilities by Others Plans by July 31, 2013.
2) Contact person for Progress Energy (Distribution) is Mr. Tom Edwards at 919-882-5046.

C) Piedmont EMC - Power (Distribution)
1) Piedmont EMC will remove its existing poles and overhead lines and install new poles and lines within the project limits at the locations shown on the Utilities by Others Plans by July 31, 2013.

2) Contact person for Piedmont EMC is Mr. Barry Bradsher at 336-503-2808.

D) CenturyLink - Telephone

1) CenturyLink will abandon its existing cables and install new underground conduits within the project limits at the locations shown on the Utilities by Others Plans by July 1, 2013.
2) Contact person for CenturyLink is Mr. Kevin Godwin at 910-366-2142.

E) Charter Communications - CATV

1) Charter Communications will remove its existing poles and cables and install new cables attached to Progress Energy's new poles within the project limits to the locations shown on the Utilities by Others Plans by August 30, 2013.
2) Contact person for Charter Communications is Mr. Rex Gray at 919-353-2712.

F) PSNC Energy - Gas

1) PSNC will abandon its existing facilities and relocate them to new locations within the project limits at the locations shown on the Utilities by Others Plans prior to date of availability except as noted below.
2) Contractor shall provide a two (2) week notice to PSNC Energy prior to the completion of rough grading from -L- station 30+58 to -Y9- station 15+40. PSNC Energy shall complete its work within two (2) weeks in this area.
3) Contractor shall provide a two (2) week notice to PSNC Energy when the work of installing the water and sewer lines crossing the stream at -L- station 13+40 will begin. Contractor and PSNC Energy shall coordinate installations of the lines in the stream to minimize impacts. PSNC Energy shall complete all their work associated with this line within two (2) weeks.
4) Contact person for PSNC Energy is Mrs. Nakima Bogan at 919-367-2720.

STABILIZATION REQUIREMENTS:

Stabilization for this project shall comply with the time frame guidelines as specified by the NCG-010000 general construction permit effective August 3, 2011 issued by the North Carolina Department of Environment and Natural resources Division of Water Quality. Temporary or permanent ground cover stabilization shall occur within 7 calendar days from the last land-disturbing activity, with the following exceptions in which temporary or permanent ground cover shall be provided in 14 calendar days from the last land-disturbing activity:

- Slopes between 2:1 and 3:1, with a slope length of 3 meters or less
- Slopes 3:1 or flatter, with a slope of length of 15 meters or less
- Slopes 4:1 or flatter

The stabilization timeframe for High Quality Water (HQW) Zones shall be 7 calendar days with no exceptions for slope grades or lengths. High Quality Water Zones (HQW) Zones are defined by North Carolina Administrative Code 15A NCAC 04A.0105 (25). Temporary and permanent ground cover stabilization shall be achieved in accordance with the provisions in this contract and as directed.

SEEDING AND MULCHING: (East)

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. All rates are in kilograms per hectare.

All Roadway Areas

March 1 - August 31		**September 1 - February 28**	
55kg	Tall Fescue	55kg	Tall Fescue
12kg	Centipede	12kg	Centipede
28kg	Bermudagrass (hulled)	40kg	Bermudagrass (unhulled)
560kg	Fertilizer	560kg	Fertilizer
4500kg	Limestone	4500kg	Limestone

Waste and Borrow Locations

March 1 – August 31		**September 1 - February 28**	
85kg	Tall Fescue	85kg	Tall Fescue
28kg	Bermudagrass (hulled)	40kg	Bermudagrass (unhulled)
560kg	Fertilizer	560kg	Fertilizer
4500kg	Limestone	4500kg	Limestone

Note: 55kgof Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

2nd Millennium	Duster	Magellan	Rendition
Avenger	Endeavor	Masterpiece	Scorpion
Barlexas	Escalade	Matador	Shelby
Barlexas II	Falcon II, III, IV & V	Matador GT	Signia
Barrera	Fidelity	Millennium	Silverstar
Barrington	Finesse II	Montauk	Southern Choice II
Biltmore	Firebird	Mustang 3	Stetson
Bingo	Focus	Olympic Gold	Tarheel
Bravo	Grande II	Padre	Titan Ltd
Cayenne	Greenkeeper	Paraiso	Titanium
Chapel Hill	Greystone	Picasso	Tomahawk
Chesapeake	Inferno	Piedmont	Tacer
Constitution	Justice	Pure Gold	Trooper
Chipper	Jaguar 3	Prospect	Turbo
Coronado	Kalahari	Quest	Ultimate
Coyote	Kentucky 31	Rebel Exeda	Watchdog
Davinci	Kitty Hawk	Rebel Sentry	Wolfpack
Dynasty	Kitty Hawk 2000	Regiment II	
Dominion	Lexington	Rembrandt	

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 6 kilograms per hectare and add 23kg of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. 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 and as directed.

Native Grass Seeding and Mulching **(East)**

Native Grass Seeding and Mulching shall be performed on the disturbed areas of wetlands and riparian areas, and adjacent to Stream Relocation construction within a 15.2 meter zone on both sides of the stream or depression, measured from top of stream bank or center of depression. The stream bank of the stream relocation shall be seeded by a method that does not alter the typical cross section of the stream bank. Native Grass Seeding and Mulching shall also be performed in the permanent soil reinforcement mat section of preformed scour holes, and in other areas as directed.

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. All rates are in kg per hectare.

March 1 - August 31		September 1 - February 28	
20kg	Creeping Red Fescue	20kg	Creeping Red Fescue
7kg	Indiangrass	7kg	Indiangrass
9kg	Little Bluestem	9kg	Little Bluestem
5kg	Switchgrass	5kg	Switchgrass
28kg	Browntop Millet	39kg	Rye Grain
560kg	Fertilizer	560kg	Fertilizer
4500kg	Limestone	4500kg	Limestone

Approved Creeping Red Fescue Cultivars:

Aberdeen	Boreal	Epic	Cindy Lou

Fertilizer shall be 10-20-20 analysis. 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 and as directed.

Native Grass 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.

Measurement and Payment

Native Grass *Seeding and Mulching* will be measured and paid for in accordance with Article 1660-8 of the *Standard Specifications*.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 450 kilograms and seeded at the rate of 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 8 grade and shall be applied at the rate of 560kg per hectare. 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 10-20-20 analysis and as directed.

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 560kg per hectare. 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 and as directed.

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 28kg to 85kg per hectare. The actual rate per hectare will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per 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 102mm.

LAWN TYPE APPEARANCE:

All areas adjacent to lawns must be hand finished as directed to give a lawn type appearance. Remove all trash, debris, and stones 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:

Description

This work 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.

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 that occur during the construction of the project. The quantity of mowing may be increased, decreased or eliminated entirely as directed. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

Measurement and Payment

Specialized Hand Mowing will be measured and paid for as the actual number of man hours worked while hand mowing along the surface of the ground, as directed. Where an area has been mowed more than once, as directed, separate measurement will be made each time the area is mowed.

Payment will be made under:

Pay Item	Pay Unit
Specialized Hand Mowing	MHR

REFORESTATION:

Description

Reforestation will be planted along the outside borders of the road, and in other areas as directed. *Reforestation* is not shown on the plan sheets. See the Reforestation Detail Sheet.

All non-maintained riparian buffers impacted by the placement of temporary fill or clearing activities shall be restored to the preconstruction contours and revegetated with native woody species.

The entire *Reforestation* operation shall comply with the requirements of Section 1670 of the *Standard Specifications*.

Materials

Reforestation shall be bare root seedlings 305-457mm tall.

Construction Methods

Reforestation shall be shall be planted as soon as practical following permanent S*eeding and Mulching*. The seedlings shall be planted in a 4.9-meter wide swath adjacent to mowing pattern line, or as directed.

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 designated 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.

Seasonal Limitations: *Reforestation* shall be planted from November 15 through March 15.

Measurement and Payment

Reforestation will be measured and paid for in accordance with Article 1670-17 of the *Standard Specifications*.

RESPONSE FOR EROSION CONTROL:

Description

Furnish the labor, materials, tools and equipment necessary to move personnel, equipment, and supplies to the project necessary for the pursuit of any or all of the following work as shown herein, by an approved subcontractor.

Section	Erosion Control Item	Unit
1605	Temporary Silt Fence	M
SP	Special Sediment Control Fence	M/MTON
1615	Temporary Mulching	HA
1620	Seed - Temporary Seeding	KG
1620	Fertilizer - Temporary Seeding	MTON
1631	Matting for Erosion Control	SM
SP	Coir Fiber Mat	M
SP	Coir Fiber Baffles	M
SP	Permanent Soil Reinforcement Mat	SM
1660	Seeding and Mulching	HA
1661	Seed - Repair Seeding	KG
1661	Fertilizer - Repair Seeding	MTON
1662	Seed - Supplemental Seeding	KG
1665	Fertilizer Topdressing	MTON
SP	Safety/Highly Visible Fencing	M
SP	Response for Erosion Control	EA

Construction Methods

Provide an approved subcontractor who performs an erosion control action as described in the NPDES Inspection Form SPPP30. Each erosion control action may include one or more of the above work items.

Measurement and Payment

Response for Erosion Control will be measured and paid for by counting the actual number of times the subcontractor moves onto the project, including borrow and waste sites, and satisfactorily completes an erosion control action described in Form 1675. The provisions of Article 104-5 of the *Standard Specifications* will not apply to this item of work.

Payment will be made under:

Pay Item	Pay Unit
Response for Erosion Control	Each

MINIMIZE REMOVAL OF VEGETATION:

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

STOCKPILE AREAS:

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

ACCESS AND HAUL ROADS:

At the end of each working day, the Contractor shall install or re-establish temporary diversions or earth berms across access/haul roads to direct runoff into sediment devices. Silt fence sections that are temporarily removed shall be reinstalled across access/haul roads at the end of each working day.

WASTE 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 that may be required on a commercial borrow or waste site will be done at the Contractor's expense.

GRAVEL CONSTRUCTION ENTRANCE:

Description

This work consists of furnishing, installing, and maintaining and removing any and all material required for the construction of a *Gravel Construction Entrance.*

Materials

Refer to Division 10

Item	Section
Filter Fabric for Drainage, Type 2	1056
Stone for Erosion Control, Class A	1042

Construction Methods

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

Measurement and Payment

Filter Fabric for Drainage will be measured and paid for in accordance with Article 876-4 of the *Standard Specifications*.

Stone for Erosion Control, Class __ will be measured and paid for in accordance with Article 1610-4 of the *Standard Specifications*.

Such price and payment shall be considered full compensation for all work covered by this section including all materials, construction, maintenance, and removal of *Gravel Construction Entrance*.

TEMPORARY DIVERSION:

This work consists of installation, maintenance, and cleanout of *Temporary Diversions* in accordance with Section 1630 of the *Standard Specifications*. The quantity of excavation for installation and cleanout will be measured and paid for as *Silt Excavation* in accordance with Article 1630-4 of the *Standard Specifications*.

SPECIAL SEDIMENT CONTROL FENCE:

Description

This work consists of furnishing materials, and the construction, maintenance, and removal of *Special Sediment Control Fence*. Place special sediment control fence as shown on the plans or as directed.

Materials

(A) Posts

Steel posts shall be at least 1.5 meters in length, approximately 35 mm wide measured parallel to the fence, and have a minimum weight of 1.86 kg/m of length. The post shall be equipped with an anchor plate having a minimum area of 9000 square milimeters, and shall have a means of retaining wire in the desired position without displacement.

(B) 6.4 mm Hardware Cloth

Hardware cloth shall have 6.35mm openings constructed from #24 gauge wire. Install hardware cloth in accordance with the detail in the plans.

(C) Sediment Control Stone

Sediment Control Stone shall meet the requirements of Section 1005 of the *Standard Specifications*. Install stone in accordance with the detail in the plans.

Construction Methods

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 in accordance with the requirements of Section 1630 of the *Standard Specifications*.

Measurement and Payment

6.4mm Hardware Cloth will be measured and paid for in accordance with Article 1632-5 of the *Standard Specifications*.

Sediment Control Stone will be measured and paid for in accordance with Article 1610-4 of the *Standard Specifications*.

SAFETY FENCE AND JURISDICTIONAL FLAGGING:

Description

Safety Fence shall consist of furnishing materials, installing and maintaining polyethylene or polypropylene fence along the outside riparian buffer, wetland, or water boundary, or other boundaries located within the construction corridor to mark the areas that have been approved to infringe within the buffer, wetland, endangered vegetation, culturally sensitive areas or water. The fence shall be installed prior to any land disturbing activities.

Interior boundaries for jurisdictional areas noted above shall be delineated by stakes and highly visible flagging.

Jurisdictional boundaries at staging areas, waste sites, or borrow pits, whether considered outside or interior boundaries shall be delineated by stakes and highly visible flagging.

Materials

(A) Safety Fencing

Polyethylene or polypropylene fence shall be a highly visible preconstructed safety fence approved by the Engineer. The fence material shall have an ultraviolet coating.

Either wood posts or steel posts may be used. Wood posts shall be hardwood with a wedge or pencil tip at one end, and shall be at least 1.5 m in length with a minimum nominal 51 mm x 51 mm cross section. Steel posts shall be at least 1.5 m in length, and have a minimum weight of 1.25 kg/m of length.

(B) Boundary Flagging

Wooden stakes shall be 1.2 m in length with a minimum nominal 19 mm x 45 mm cross section. The flagging shall be at least 25 mm in width. The flagging material shall be vinyl and shall be orange in color and highly visible.

Construction Methods

No additional clearing and grubbing is anticipated for the installation of this fence. The fence shall be erected to conform to the general contour of the ground.

(A) Safety Fencing

Posts shall be set at a maximum spacing of 3 m, maintained in a vertical position and hand set or set with a post driver. If hand set, all backfill material shall be thoroughly tamped. Wood posts may be sharpened to a dull point if power driven. 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 geotextile shall be attached to the wood posts with one 51 mm galvanized wire staple across each cable or to the steel posts with wire or other acceptable means.

Place construction stakes to establish the location of the safety fence in accordance with Article 105-9 or Article 801-1 of the *Standard Specifications.* No direct pay will be made for the staking of the safety fence. All stakeouts for safety fence shall be considered incidental to the work being paid for as "Construction Surveying", except that where there is no pay item for construction surveying, all safety fence stakeout will be performed by state forces.

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.

(B) Boundary Flagging

Boundary flagging delineation of interior boundaries shall consist of wooden stakes on 7.6 m maximum intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 152 mm into the ground. Interior boundaries may be staked on a tangent that runs parallel to buffer but must not encroach on the buffer at any location. Interior boundaries of hand clearing shall be identified with a different colored flagging to distinguish it from mechanized clearing.

Boundary flagging delineation of interior boundaries will be placed in accordance with Article 105-9 or Article 801-1 of the *Standard Specifications.* No direct pay will be made for delineation of the interior boundaries. This delineation will be considered incidental to the work being paid for as *Construction Surveying,* except that where there is no pay item or construction surveying the cost of boundary flagging delineation shall be included in the unit prices bid for the various items in the contract. Installation for delineation of all jurisdictional boundaries at

staging areas, waste sites, or borrow pits shall consist of wooden stakes on 7.6 m maximum intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 152 mm into the ground. Additional flagging may be placed on overhanging vegetation to enhance visibility but does not substitute for installation of stakes.

Installation of boundary flagging for delineation of all jurisdictional boundaries at staging areas, waste sites, or borrow pits shall be performed in accordance with Subarticle 230-4(B)(3)(d) or Subarticle 802-2(F) of the *Standard Specifications*. No direct pay will be made for this delineation, as the cost of same shall be included in the unit prices bid for the various items in the contract.

The Contractor shall be required to maintain alternative stakes and highly visible flagging in a satisfactory condition for the duration of the project as determined by the Engineer.

Measurement and Payment

Safety Fence will be measured and paid as the actual number of linear feet of polyethylene or polypropylene fence installed in place and accepted. Such payment will be full compensation including but not limited to furnishing and installing fence geotextile with necessary posts and post bracing, staples, tie wires, tools, equipment and incidentals necessary to complete this work.

Payment will be made under:

Pay Item	Pay Unit
Safety Fence	Linear Meter

PERMANENT SOIL REINFORCEMENT MAT:

Description

This work consists of furnishing and placing *Permanent Soil Reinforcement Mat*, of the type specified, over previously prepared areas as directed.

Materials

The product shall be a permanent erosion control reinforcement mat and shall be constructed of synthetic or coconut fibers evenly distributed throughout the mat between a bottom UV stabilized netting and a heavy duty UV stabilized top net. The matting shall be stitched together with UV stabilized polypropylene thread to form a permanent three-dimensional structure. The mat shall have the following minimum physical properties:

Property	Test Method	Value	Unit
Light Penetration	ASTM D6567	9	%
Thickness	ASTM D6525	10	mm
Mass Per Unit Area	ASTM D6566	0.293	kg/m^2
Tensile Strength	ASTM D6818	572	kg/m
Elongation (Maximum)	ASTM D6818	49	%

Resiliency	ASTM D1777	>70	%
UV Stability *	ASTM D4355	≥80	%
Porosity (Permanent Net)	ECTC Guidelines	≥85	%
Maximum Permissible Shear Stress (Vegetated)	Performance Bench Test	≥39.1	kg/m^2
Maximum Allowable Velocity (Vegetated)	Performance Bench Test	≥4.9	m/s

*ASTM D1682 Tensile Strength and % strength retention of material after 1000 hours of exposure.

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

(A) the chemical and physical properties of the mat used, and
(B) conformance of the mat with this specification.

Construction Methods

Matting shall be installed in accordance with Subarticle 1631-3(B) of the *Standard Specifications*.

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

Measurement and Payment

Permanent Soil Reinforcement Mat will be measured and paid for as the actual number of square meters measured along the surface of the ground over which Permanent Soil Reinforcement Mat is installed and accepted. Overlaps will not be included in the measurement, and will be considered as incidental to the work. Such payment shall be full compensation for furnishing and installing the mat, including overlaps, and for all required maintenance.

Payment will be made under:

Pay Item	**Pay Unit**
Permanent Soil Reinforcement Mat	Square Meter

SKIMMER BASIN WITH BAFFLES:

Description

Provide a skimmer basin to remove sediment from construction site runoff at locations shown in the erosion control plans. See the Skimmer Basin with Baffles Detail sheet provided in the erosion control plans. Work includes constructing sediment basin, installation of temporary

slope drain pipe and coir fiber baffles, furnishing, installation and cleanout of Faircloth Skimmers or other approved equivalent device, providing and placing stone pad on bottom of basin underneath skimmer device, providing and placing fabric emergency spillway liner, providing coir fiber mat stabilization for the skimmer outlet, disposing of excess materials, removing temporary slope drain, coir fiber baffles, fabric liner and skimmer device, backfilling basin area with suitable material and providing proper drainage when basin area is abandoned.

Materials

Item	**Section**
Stone for Erosion Control, Class B	1042
Fabric for Soil Stabilization, Type 4	1056
Fertilizer for Temporary Seeding	1060-2
Seed for Temporary Seeding	1060-4
Seeding and Mulching	1060-4
Matting for Erosion Control	1060-8
Staples	1060-8
Temporary Slope Drain	1622-2

Coir Fiber Baffles shall meet the specifications as provided elsewhere in this contract.

Provide appropriately sized Faircloth skimmer or other approved equivalent device.

Provide Schedule 40 PVC pipe with a length of 2m to attach to the skimmer and the coupling connection to serve as the arm pipe. For skimmer sizes of 64mm and smaller, the arm pipe diameter shall be 38mm. For skimmer sizes of 76mm and larger, refer to manufacturer recommendation.

Provide 102mm diameter Schedule 40 PVC pipe to attach to coupling connection of Faircloth skimmer to serve as the barrel pipe through the earthen dam.

Coir Fiber Mat: Coir fiber matting for stabilization of the skimmer outlet shall meet the following requirements:

100% coconut fiber (coir) twine woven into high strength matrix

Thickness -	7.6mm minimum
Tensile Strength	1650.5 x 766.5 kg/m minimum
Elongation	34% x 38% maximum
Flexibility (mg-cm)	65030 x 29590
Flow Velocity	Observed 3.35m/s
Weight	678g/SM
Size	100 SM
"C" Factor	0.002
Open Area (measured)	50%

Anchors: Staples, stakes, or reinforcement bars shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes 305mm - 610mm long with a 51mm x 51mm nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 25mm - 51mm long head at the top with a 25mm - 51mm notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 610mm nominal length. The bars shall have a 102mm diameter bend at one end with a 102mm straight section at the tip to catch and secure the coir fiber mat.

Staples:

Provide staples made of 3.18mm diameter new steel wire formed into a *u* shape not less than 305mm in length with a throat of 25mm in width.

Construction Methods

Excavate basin according to the erosion control plans with basin surface free of obstructions, debris, and pockets of low-density material. Install temporary slope drain pipe and construct the emergency spillway according to the Skimmer Basin with Baffles Detail sheet in the erosion control plans. Temporary slope drain pipe at inlet of basin may be replaced by fabric as directed. Construct the coir fiber baffles according to the details in the plans and as provided elsewhere in this contract.

Install Faircloth skimmer or other approved equivalent device according to manufacturer recommendations. Install 102mm Schedule 40 PVC pipe into dam on the lower side of basin 305mm from the bottom of the basin and according to the detail, and attach the 2 meter arm pipe to the coupling connection and Faircloth skimmer according to manufacturer recommendations. Attach the rope included with the skimmer to the tee between the vent socket and the tube inlet, and the other end to a wooden stake or metal post. Clean out skimmer device when it becomes clogged with sediment and/or debris and is unable to float at the top of water in skimmer basin. Take appropriate measures to avoid ice accumulation in the skimmer device. Construct a stone pad of Class B stone directly underneath the skimmer device at bottom of basin. The pad shall be a minimum of 305mm in height, and shall have a minimum cross sectional area of 1.2 meters by 1.2 meters.

Line emergency spillway with fabric unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury edges of fabric in a trench at least 127 mm deep and tamp firmly. If fabric for the emergency spillway is not one continuous piece of material, make horizontal overlaps a minimum of 457 mm with upstream fabric overlapping the downstream fabric. Secure fabric with eleven gauge wire staples shaped into a *u* shape with a length of not less than 305 mm and a throat not less than 25 mm in width. Place staples along outer edges and throughout the fabric a maximum of 0.9 meter horizontally and vertically.

Fabric shall be placed to the bottom and across the entire width of the basin according to the Skimmer Basin with Baffles detail.

At the skimmer outlet, provide a smooth soil surface free from stones, clods, or debris that will prevent contact of the coir fiber matting with the soil. Unroll the matting and apply without stretching such that it will lie smoothly but loosely on the soil surface. Wooden stakes, reinforcement bars, or staples may be used as anchors in accordance with the details in the plans and as directed. Place anchors across the matting at the ends approximately 0.3 meters apart. Place anchors along the outer edges and down the center of the matting 0.9 meters apart.

All bare side slope sections of the skimmer basin shall be seeded with a temporary or permanent seed mix as directed and in accordance with Articles 1620-3, 1620-4, 1620-5, 1660-4, 1660-5 and 1660-7 of the *Standard Specifications*. Straw or excelsior matting shall be installed on all bare side slope sections immediately upon the completion of seeding and in accordance with Subarticle 1631-3(B) of the *Standard Specifications*.

Measurement and Payment

Silt Excavation will be measured and paid for in accordance with Article 1630-4 of the *Standard Specifications*, as calculated from the typical section throughout the length of the basin as shown on the final approved plans.

Fabric for Soil Stabilization will be measured and paid for in accordance with Article 270-4 of the *Standard Specifications*.

Coir Fiber Baffles will be measured and paid for as provided elsewhere in this contract.

__mm Skimmer will be measured in units of each. *__mm Skimmer* will be measured and paid for as the maximum number of each size skimmer acceptably installed and in use at any one time during the life of the project. Barrel and arm pipe, cleanout, relocation and reinstallation of *__mm Skimmer* is considered incidental to the measurement of the quantity of *__mm Skimmer* and no separate payment will be made. No separate payment shall be made if *__mm Skimmer*, barrel and/or arm pipe are damaged by ice accumulation.

Coir Fiber Mat will be measured and paid for as the actual number of square meters measured along the surface of the ground over which coir fiber mat is installed and accepted.

Temporary Slope Drains will be measured and paid for in accordance with Article 1622-4 of the *Standard Specifications*.

Stone for Erosion Control, Class __ will be measured and paid for in accordance with Article 1610-4 of the *Standard Specifications*.

Seeding and Mulching will be measured and paid for in accordance with Article 1660-8 of the *Standard Specifications*.

Seed for Temporary Seeding will be measured and paid for in accordance with Article 1620-6 of the *Standard Specifications*.

Fertilizer for Temporary Seeding will be measured and paid for in accordance with Article 1620-6 of the *Standard Specifications*.

Matting for Erosion Control will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*.

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

Payment will be made under:

Pay Item	**Pay Unit**
__mm Skimmer	Each
Coir Fiber Mat	Square Meter

COIR FIBER BAFFLE:

Description

Furnish material, install and maintain coir fiber baffles according to the details in the plans or in locations as directed. Coir Fiber Baffles shall be installed in silt basins and sediment dams at drainage outlets. Work includes providing all materials, placing, securing, excavating and backfilling of *Coir Fiber Baffles*.

Materials

(A) Coir Fiber Mat

Matting: Provide matting to meet the following requirements:

100% coconut fiber (coir) twine woven into high strength matrix

Thickness -	7.6mm minimum
Tensile Strength	1650.5 x 766.5 kg/m minimum
Elongation	34% x 38% maximum
Flexibility (mg-cm)	65030 x 29590
Flow Velocity	Observed 3.35m/s
Weight	678g/SM
Size	100 SM
"C" Factor	0.002
Open Area (measured)	50%

(B) Staples

Provide staples made of 3.18 mm diameter new steel wire formed into a *u* shape not less than 305 mm in length with a throat of 25 mm in width.

(C) Posts

Steel posts shall be at least 1.5 m in length, approximately 35 mm wide measured parallel to the fence, and have a minimum weight of 1.86 kg/m of length. The post shall be equipped with an anchor plate having a minimum area of 9000 square millimeters, and shall be of the self-fastener angle steel type to have a means of retaining wire and coir fiber mat in the desired position without displacement.

(D) Wire

Provide 9-gauge high-tension wire strand of variable lengths.

Construction Methods

Place the coir fiber baffles immediately upon excavation of basins. Install three (3) baffles in basins with a spacing of one fourth (1/4) the basin length and according to the detail sheets. Two (2) coir fiber baffles shall be installed in basins less than 6 m in length with a spacing of one third (1/3) the basin length.

Steel posts shall be placed at a depth of 0.6 m below the basin surface, with a maximum spacing of 1.2 m. The top height of the coir fiber baffles shall not be below the elevation of the emergency spillway base of dams and basins. Attach a 9-gauge high-tension wire strand to the steel posts at a height of 0.9 m with plastic ties or wire fasteners. Install a steel post into side of the basin at a variable depth and a height of 0.9 m from the bottom of the basin to anchor coir fiber mat. Secure anchor post to the upright steel post in basin with wire fasteners.

The coir fiber mat shall be draped over the wire strand to a minimum of 0.9 m of material on each side of the strand. Secure the coir fiber mat to the wire strand with plastic ties or wire fasteners. Place staples across the matting at ends and junctions approximately 0.3 m apart at the bottom and side slopes of basin. Overlap matting at least 152 mm where 2 or more widths of matting are installed side by side. Refer to details in the plan sheets. The Engineer may require adjustments in the stapling requirements to fit individual site conditions.

Measurement and Payment

Coir Fiber Baffles will be measured and paid for by the actual number of linear meters of coir fiber baffles which are installed and accepted. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to install the coir fiber baffles.

Payment will be made under:

Pay Item	**Pay Unit**
Coir Fiber Baffle	Linear Meter

COIR FIBER WATTLES WITH POLYACRYLAMIDE (PAM):

Description

Coir Fiber Wattles are tubular products consisting of coir fibers (coconut fibers) encased in coir fiber netting. Coir Fiber Wattles are used on slopes or channels to intercept runoff and act as a velocity break. Coir Fiber Wattles are to be placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation of coir fiber wattles, matting installation, PAM application, and removing wattles.

Materials

Coir Fiber Wattle shall meet the following specifications:

100% Coir (Coconut) Fibers	
Minimum Diameter	305 mm
Minimum Density	56 kg/m^3 +/- 10%
Net Material	Coir Fiber
Net Openings	5 cm x 5 cm
Net Strength	40.8 kg
Minimum Weight	3.9 kg/m +/- 10%

Anchors: Stakes shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes a minimum of 610 mm long with a 51 mm x 51 mm nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving down into the underlying soil.

Matting shall meet the requirements of Article 1060-8 of the *Standard Specifications*, or shall meet specifications provided elsewhere in this contract.

Provide staples made of 3 mm diameter new steel wire formed into a *u* shape not less than 305 mm in length with a throat of 25 mm in width.

Polyacrylamide (PAM) shall be applied in powder form and shall be anionic or neutrally charged. Soil samples shall be obtained in areas where the wattles will be placed, and from offsite material used to construct the roadway, and analyzed for the appropriate PAM flocculant to be utilized with each wattle. The PAM product used shall be listed on the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Water Quality (DWQ) web site as an approved PAM product for use in North Carolina.

Construction Methods

Coir Fiber Wattles shall be secured to the soil by wire staples approximately every 0.3 linear meters and at the end of each section of wattle. A minimum of 4 stakes shall be installed on the

downstream side of the wattle with a maximum spacing of 0.6 linear meters along the wattle, and according to the detail. Install a minimum of 2 stakes on the upstream side of the wattle according to the detail provided in the plans. Stakes shall be driven into the ground a minimum of 254 mm with no more than 51 mm projecting from the top of the wattle. Drive stakes at an angle according to the detail provided in the plans.

Only install coir fiber wattle(s) to a height in ditch so flow will not wash around wattle and scour ditch slopes and according to the detail provided in the plans and as directed. Overlap adjoining sections of wattles a minimum of 152 mm.

Installation of matting shall be in accordance with the detail provided in the plans, and in accordance with Subarticle 1631-3(B) of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

Apply PAM over the lower center portion of the coir fiber wattle where the water is going to flow over at a rate of 50 grams per wattle, and 25 grams of PAM on matting on each side of the wattle. PAM applications shall be done during construction activities after every rainfall event that is equal to or exceeds 12 mm.

The Contractor shall maintain the coir fiber wattles until the project is accepted or until the wattles are removed, and shall remove and dispose of silt accumulations at the wattles when so directed in accordance with the requirements of Section 1630 of the *Standard Specifications*.

Measurement and Payment

Coir Fiber Wattles will be measured and paid for by the actual number of linear meters of wattles which are installed and accepted. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to install the *Coir Fiber Wattles*.

Matting will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

Polyacrylamide(PAM) will be measured and paid for by the actual weight in kilograms of PAM applied to the coir fiber wattles. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to apply the *Polyacrylamide(PAM)*.

Payment will be made under:

Pay Item	**Pay Unit**
Polyacrylamide(PAM)	Kg
Coir Fiber Wattle	Linear Meter

TEMPORARY ROCK SILT CHECK TYPE A WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM):

Description

Temporary Rock Silt Checks Type A with Excelsior Matting and Polyacrylamide (PAM) are devices utilized in temporary and permanent ditches to reduce runoff velocity and incorporate PAM into the construction runoff to increase settling of sediment particles and reduce turbidity of runoff. Temporary Rock Silt Checks Type A with Excelsior Matting and PAM are to be placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation of Temporary Rock Silt Checks Type A, matting installation, PAM application, and removing Temporary Rock Silt Checks Type A with Excelsior Matting and PAM.

Materials

Structural stone shall be class B stone that meets the requirements of Section 1042 of the *Standard Specifications* for Stone for Erosion Control, Class B.

Sediment control stone shall be #5 or #57 stone, which meets the requirements of Section 1005 of the *Standard Specifications* for these stone sizes.

Matting shall meet the requirements of Excelsior Matting in Subarticle 1060-8(B) of the *Standard Specifications*, or shall meet specifications provided elsewhere in this contract.

Polyacrylamide (PAM) shall be applied in powder form and shall be anionic or neutrally charged. Soil samples shall be obtained in areas where the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM will be placed, and from offsite material used to construct the roadway, and analyzed for the appropriate PAM flocculant to be utilized with each Temporary Rock Silt Check Type A. The PAM product used shall be listed on the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Water Quality (DWQ) web site as an approved PAM product for use in North Carolina.

Construction Methods

Temporary Rock Silt Checks Type A shall be installed in accordance with Subarticle 1633-3(A) of the *Standard Specifications*, Roadway Standard Drawing No. 1633.01 and the detail provided in the plans.

Installation of matting shall be in accordance with the detail provided in the plans, and anchored by placing Class B stone on top of the matting at the upper and lower ends.

Apply PAM at a rate of 100 grams over the center portion of the Temporary Rock Silt Checks Type A and matting where the water is going to flow over. PAM applications shall be done during construction activities and after every rainfall event that is equal to or exceeds 12 mm.

The Contractor shall maintain the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM until the project is accepted or until the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM are removed, and shall remove and dispose of silt accumulations at the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM when so directed in accordance with the requirements of Section 1630 of the *Standard Specifications*.

Measurement and Payment

Temporary Rock Silt Checks Type A will be measured and paid for in accordance with Article 1633-5 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

Matting will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

Polyacrylamide(PAM) will be measured and paid for by the actual weight in kilograms of PAM applied to the Temporary Rock Silt Checks Type A. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to apply the *Polyacrylamide(PAM)*.

Payment will be made under:

Pay Item	Pay Unit
Polyacrylamide(PAM)	Kg

CULVERT DIVERSION CHANNEL:

Description

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

Materials

Refer to Division 10

Item	Section
Fabric for Soil Stabilization, Type 4	1056

Construction Methods

Grade channel according to the plans with channel surface free of obstructions, debris, and pockets of low-density material. Utilize suitable material and provide disposal area for unsuitable material.

Line channel with fabric unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury top of slope fabric edge in a trench at least 127 mm deep and tamp securely. Make vertical overlaps a minimum of 457 mm with upstream fabric overlapping the downstream fabric.

Secure fabric with 3.05 mm wire staples shaped into a *u* shape with a length of not less than 152 mm and a throat not less than 25 mm in width. Place staples along outer edges and throughout the fabric a maximum of 0.9 meters horizontally and vertically.

Measurement and Payment

Culvert Diversion Channel will be measured and paid for as the actual number of cubic meters excavated, as calculated from the typical section throughout the length of the diversion channel as shown on the final approved plans.

Fabric for Soil Stabilization will be measured and paid for in accordance with Article 270-4 of the *Standard Specifications*.

Such price and payment shall be considered full compensation for all work covered by this section including all materials, construction, maintenance, and removal of *Culvert Diversion Channel*.

Payment will be made under:

Pay Item	**Pay Unit**
Culvert Diversion Channel	Cubic Meter

IMPERVIOUS DIKE:

Description

This work 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.

Materials

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.

Measurement and Payment

Impervious Dike will be measured and paid as the actual number of linear meters of impervious dike(s) constructed, measured in place from end to end of each separate installation that has been completed and accepted. Such price and payment will be full compensation for all work including but not limited to furnishing materials, construction, maintenance, and removal of the impervious dike.

Payment will be made under:

Pay Item	Pay Unit
Impervious Dike	Linear Meter

TEMPORARY STREAM CROSSING:

Description

This work consists of the construction and maintenance of culverted temporary stream crossings. Temporary stream crossings are not shown on the plan sheets, and shall be determined as directed.

The quantity of stream crossings to be installed will be affected by the actual conditions that occur during the construction of the project. The quantity of stream crossings may be increased, decreased, or eliminated entirely as directed. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

Materials

Refer to Division 10

Item	Section
No. 57 Stone	1005
Stone for Erosion Control, Class B	1042-1
Filter Fabric for Drainage, Type 2	1056
Temporary Pipe for Stream Crossing	SP

Construction Methods

Stream crossings shall be constructed according to the stream crossing detail provided in the plans or as directed.

The Contractor shall determine the diameter of pipe(s) that will pass the peak or bankfull flow, whichever is less, from a 2-yr. peak storm, without overtopping. Filter Fabric shall be placed on natural ground, on streambanks, and in streambed beneath the temporary pipe(s) and stone according to the detail. Class B stone shall be installed around the pipe(s), in the stream channel, and on the crossing road sideslopes. Place No. 57 Stone on top of Class B stone according to the detail provided in the plans.

Measurement and Payment

No. 57 Stone will be measured and paid for as provided elsewhere in this contract.

Stone for Erosion Control, Class __ will be measured and paid for in accordance with Article 1610-4 of the *Standard Specifications*.

Filter Fabric for Drainage will be measured and paid for in accordance with Article 876-4 of the *Standard Specifications*.

Temporary Pipe for Stream Crossing will be measured and paid for at the contract unit price per linear meter of temporary pipe approved by the Engineer and measured in place from end to end. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to construct the stream crossings.

Payment will be made under:

Pay Item	**Pay Unit**
Temporary Pipe for Stream Crossing	Linear Meter

STREAMBANK REFORESTATION:

Description

Streambank Reforestation will be planted in areas designated on the plans and as directed. See the Streambank Reforestation Detail Sheets.
The entire *Streambank Reforestation* operation shall comply with the requirements of Section 1670 of the *Standard Specifications*.

Materials

Live Stakes:

Type I Streambank Reforestation shall be live stakes, planted along both streambanks. Live stakes shall be 13mm - 51mm in diameter. Stakes shall also be 0.6 meters - 0.9 meters in length.

Live staking plant material shall consist of a random mix made up of 50% Black Willow (*Salix nigra*) and 50% Silky Dogwood (*Cornus amomum*). Other species may be substituted upon approval of the Engineer. All plant material shall be harvested locally (within the same physiographic ecoregion and plant hardiness zone) or purchased from a local nursery, with the approval of the Engineer. All live stakes shall be dormant at time of acquisition and planting.

Coir Fiber Matting:

Provide matting that meets the following requirements:

100% coconut fiber (coir) twine woven into high strength matrix

Thickness -	7.6mm minimum
Tensile Strength	1650.5 x 766.5 kg/m minimum
Elongation	34% x 38% maximum
Flexibility (mg-cm)	65030 x 29590
Flow Velocity	Observed 3.35m/s
Weight	678g/SM
Size	100 SM
"C" Factor	0.002
Open Area (measured)	50%

Staples, stakes, or reinforcement bars shall be used as anchors and shall meet the following requirements:

Wooden Stakes:

Provide hardwood stakes 305mm - 610mm long with a 51mm x 51mm nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 25mm - 51mm long head at the top with a 25mm - 51mm notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 610mm nominal length. The bars shall have a 102mm diameter bend at one end with a 102mm straight section at the tip to catch and secure the coir fiber mat.
Staples:

Provide staples made of 3.18mm diameter new steel wire formed into a *u* shape not less than 305mm in length with a throat of 25mm in width.

Bare Root Seedlings:

Type II Streambank Reforestation shall be bare root seedlings 305mm – 457mm tall.

Construction Methods

Coir fiber matting shall be installed on the streambanks where live staking is to be planted as shown on the Streambank Reforestation Detail Sheets and in locations as directed. Work includes providing all materials, excavating and backfilling, and placing and securing coir fiber mat.

Provide a smooth soil surface free from stones, clods, or debris that will prevent the contact of the matting with the soil. Place the matting immediately upon final grading and permanent seeding. 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 152mm 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 152mm overlap. Construct check trenches at least 305mm deep every 15.2 meters longitudinally along the edges of the matting, or as directed. Fold over and bury matting to the full depth of the trench, close and tamp firmly. Overlap matting at least 152mm where 2 or more widths of matting are installed side by side.

Wooden stakes, reinforcement bars, or staples may be used as anchors in accordance with the Streambank Reforestation Detail Sheets and as directed. Place anchors across the matting at ends, junctions, and check trenches approximately 0.3 meters apart. Place anchors down the center of each strip of matting 0.9 meters apart. Place anchors along all lapped edges 0.3 meters apart. Refer to the Streambank Reforestation Detail Sheets for anchoring pattern. The Engineer may require adjustments in the trenching or anchoring requirements to fit individual site conditions.

During preparation of the live stakes, the basal ends shall be cleanly cut at an angle to facilitate easy insertion into the soil, while the tops shall be cut square or blunt for tamping. All limbs shall be removed from the sides of the live cutting prior to installation.

Live stakes shall be installed within 48 hours of cutting. Outside storage locations should be continually shaded and protected from wind and direct sunlight. Live cut plant material shall remain moist at all times before planting.

Stakes shall be spaced approximately 1.2 meters on center. Live stakes shall be installed according to the configuration presented on the Streambank Reforestation Detail Sheets.
Tamp live stakes perpendicularly into the finished bank slope with a dead blow hammer, with buds oriented in an upward direction. Stakes should be tamped until approximately ¾ of the

stake length is within the ground. The area around each live stake shall be compacted by foot after the live stake has been installed.

25mm – 51mm shall be cut cleanly off of the top of each live stake with loppers at an angle of approximately 15 degrees following installation. Any stakes that are split or damaged during installation shall be removed and replaced.

The bare root seedlings shall be planted as soon as practical following permanent *Seeding and Mulching*. The seedlings shall be planted from top of bank out, along both sides of the stream, as designated on the plans.

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 designated 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.

Seasonal Limitations: Streambank reforestation shall be planted from November 15 through March 15.

Measurement and Payment

Streambank Reforestation will be measured and paid for as the actual number of hectares of land measured along the surface of the ground, which has been acceptably planted in accordance with this section.

Payment will be made under:

Pay Item	**Pay Unit**
Streambank Reforestation	Hectare

TEMPORARY SILT FENCE: **(10-19-10)**

Revise the *Standard Specifications* as follows:

Page 16-1, **Subarticle 1605-2(C) Filter Fabric**, replace the only sentence with the following:

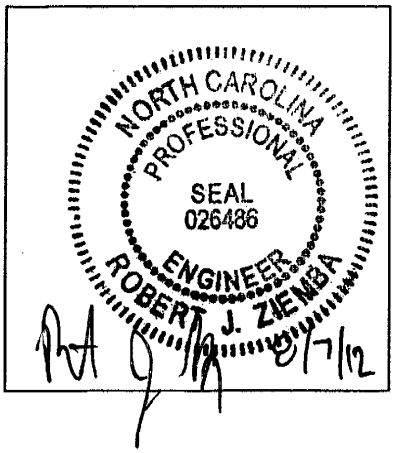
> Provide Type 3 Engineering Fabric meeting the requirements of Section 1056 of the *Standard Specifications*.

Page 16-2, **Article 1605-3 INSTALLATION**, replace the third sentence with the following:

> Filter fabric may be used without woven wire fence backing in accordance with the following conditions:

Page 16-2, **Subarticle 1605-3(B)** Post spacing is inclined……., replace first item in list with the following:

(1) Attach filter fabric to the post with wire or other acceptable methods.



R-2241A

Project Special Provisions
(Version 06.7)
Signals and Intelligent Transportation Systems

Prepared By: RJZ
6-Aug-12

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1. 2006 STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES

The 2006 Standard Specifications are revised as follows:

1.1. General Requirements (1098-1)

Page 10-268, Subarticle 1098-1(H)

In the first paragraph, revise the second sentence to "Ensure service disconnects are listed as meeting UL Standard UL-489 and marked as being suitable for use as service equipment."

In the second paragraph, revise the first sentence to "Furnish NEMA Type 3R meter base rated 100 Ampere minimum that meets the requirements of the local utility. Provide meter base with sockets' ampere rating based on sockets being wired with minimum of 167 degrees F insulated wire."

In the second paragraph, last item on page, revise to "With or without horn bypass."

Page 10-269, Subarticle 1098-1(H)

Revise the second line to "Listed as meeting UL Standard UL-414."

In the first full paragraph on page, remove the first sentence.

Revise the last paragraph to "If meter base and electrical service disconnect are supplied in the same enclosure, ensure assembly is marked as being suitable for use as service equipment. Ensure combination meter and disconnect mounted in a pedestal for underground service is listed as meeting UL Standard UL-231. Otherwise, ensure combination meter and disconnect is listed as meeting UL Standard UL-67.

Page 10-269, Subarticle 1098-1 (J)

ADD new Subarticle 1098-1 (J) **Performance of Warranty Repair and Maintenance**

Provide authorization to the Traffic Electronics Center of the North Carolina Department of Transportation (NCDOT) to perform all warranty repairs after project acceptance. The decision to perform warranty work at the Traffic Electronics Center by NCDOT electronics technicians or to have warranty work performed by the vendor shall be at the discretion of the State. Provide any training required by the manufacturer to authorize the Traffic Electronics Center to perform warranty work and ensure manufacturer will furnish parts to the Traffic Electronics Center for all warranty repairs at no cost to the State. In addition, ensure the manufacturer agrees to provide prompt technical support to the NCDOT electronics technicians for a period of one year after the end of the warranty period at no cost to the State. Defective parts replaced under warranty by the Traffic Electronics Center will be returned to the vendor at the vendor's request. Provide schematics, part lists, and other documentation to perform bench repair to the Traffic Electronics Center within two weeks upon request. The Department agrees not to divulge any proprietary information in the schematics, part lists, and other documentation upon request from the vendor. After project acceptance and at the request of the State, manufacturer shall perform warranty repairs to equipment which fails during the warranty period at no cost to the State including freight costs to ship repaired equipment back to the Traffic Electronics Center. Ensure all equipment is repaired and returned to the Traffic Electronics Center within twenty-one calendar days of receipt by the manufacturer.

Page 10-269, Subarticle 1098-1 (K)

ADD new Subarticle 1098-1 (K) **Maintenance and Repair of Materials**

Perform maintenance (testing) on all Traffic Signal Conflict Monitors every twelve (12) months for the life of the project beginning with the initial test and every twelve (12) months thereafter.

Provide the initial test date via the manufacturer's certification or via testing prior to installation of the conflict monitor at an intersection. Use the ATSI Incorporated Model PCMT-2600 Conflict Monitor Tester, or an Engineer approved equivalent. Ensure that the Conflict Monitor Tester is maintained and calibrated per the manufacturer's recommendation. Provide to the Engineer a copy of the manufacturer's certification that the Conflict Monitor Tester is in proper working order before testing the Traffic Signal Conflict Monitors. Perform the test on the Traffic Signal Conflict Monitors per the manufacturer's recommendation. For each Traffic Signal Conflict Monitor tested, provide two (2) dated copies of the test results: one (1) copy for the Engineer and one (1) copy for the traffic signal cabinet.

1.2. Wood Poles (1098-6)

Page 10-272, Delete article. Refer to Subarticles 1082 –3(F) and 1082-4(G).

1.3. Loop Lead-in Cable (1098-8)

Page 10-274, Delete article and replace with the following:

Furnish lead-in cable with two conductors of number 14 AWG fabricated from stranded tinned copper that complies with IMSA Specification 50-2 except as follows:

Ensure conductor is twisted with a maximum lay of 2.0 inches, resulting in a minimum of 6 turns per foot.

Provide a ripcord to allow cable jacket to be opened without using a cutter.

Provide length markings in a contrasting color showing sequential feet and within one percent of actual cable length. Ensure character height of the markings is approximately 0.10 inch.

1.4. Underground Conduit – Construction Methods (1715-3)

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

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

1.5. Junction Boxes – Construction Methods (1716-3)

Page 17-15, Subarticle 1716-3, add the following information at the end of the subarticle:

Provide real world coordinates for all junction boxes and equipment cabinets installed or utilized under this project. Provide the coordinates in feet units using the North Carolina State Plane coordinate system (1983 North American Datum also known as NAD '83). Furnish coordinates that do not deviate more than 1.7 feet in the horizontal plane and 3.3 feet in the vertical plane. Global positioning system (GPS) equipment able to obtain the coordinate data within these tolerances may be used. Submit cut sheets on the GPS unit proposed to collect the data for approval by the Engineer.

Provide both a digital copy and hard copy of all information regarding the location (including to but not limited to manufacturer, model number, and NCDOT inventory number) in the Microsoft spreadsheet provided by the Department, shown by example below.

NCDOT Inv #	Name	Location	Latitude	Longitude	Manufacturer	Model #
05-0134	Equipment Cabinet	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5500	35.6873	McCain	Type 332
05-0134	Junction Box # 1 (Phase 2 Side)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5516	35.6879	Quazite	PG1118BA12(Box) PG118HA00(Cover)
05-0134	Junction Box # 2 (Phase 7 Side)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5506	35.6876	Quazite	PG1118BA12(Box) PG118HA00(Cover)
5-0134	Junction Box # 3 (Near Cabinet)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5501	35.6873	Quazite	PG1118BA12(Box) PG118HA00(Cover)
05-0134	Junction Box # 4 (Phase 6 Side)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5486	35.6873	Quazite	PG1118BA12(Box) PG118HA00(Cover)
05-0134	Junction Box # 5 (Phase 6 Side)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5499	35.6876	Quazite	PG1118BA12(Box) PG118HA00(Cover)
05-0134	Junction Box # 6 (Phase 4 Side)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5503	35.6879	Quazite	PG1118BA12(Box) PG118HA00(Cover)

1.6. Riser Assemblies – Construction Methods (1722-3)

Page 17-18, Subarticle 1722-3, Add the following:

Transition from the rigid galvanized steel risers to underground PVC conduits using an approved rigid galvanized steel sweeping elbow with PVC female adaptor.

1.7. Inductive Detection Loops – Construction Methods (1725-3)

Page 17-20, Subarticle 1725-3, In the first paragraph, revise the first sentence to:

"Between where loop conductor pairs leave saw cut in pavement and junction boxes, twist loop conductor pairs a minimum of 5 turns per foot."

1.8. Loop Lead-in Cable – Measurement and Payment (1726-4)

Page 17-20, Delete first paragraph and replace with the following:

Lead-in cable will be measured and paid as the actual linear feet of lead-in cable furnished, installed, and accepted. Measurement will be made by calculating the difference in length markings located on outer jacket from start of run to end of run for each run. Terminate all cables before determining length of cable run.

2. ELECTRICAL REQUIREMENTS

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

3. SIGNAL HEADS

3.1. MATERIALS

A. General:

Fabricate vehicle signal head housings and end caps from die-cast aluminum. Provide visor mounting screws, door latches, and hinge pins fabricated from stainless steel. Provide interior screws, fasteners, and metal parts fabricated from stainless steel or corrosion resistant material.

Fabricate tunnel and traditional visors from sheet aluminum.

Paint all surfaces inside and outside of signal housings and doors. Paint outside surfaces of tunnel and traditional visors, messenger cable mounting assemblies, pole and pedestal mounting assemblies, and pedestrian pushbutton housings. Have electrostatically-applied, fused-polyester paint in highway yellow (Federal Standard 595C, Color Chip Number 13538) a minimum of 2.5 to 3.5 mils thick. Do not apply paint to the latching hardware or rigid vehicle signal head mounting brackets for mast-arm attachments.

Have the interior surfaces of tunnel and traditional visors painted an alkyd urea black synthetic baking enamel with a minimum gloss reflectance and meeting the requirements of MIL-E-10169, "Enamel Heat Resisting, Instrument Black."

For light emitting diode (LED) traffic signal modules, provide the following requirements for inclusion on the Department's Qualified Products List for traffic signal equipment.

1. Sample submittal,
2. Third-party independent laboratory testing results for each submitted module with evidence of testing and conformance with all of the Design Qualification Testing specified in section 6.4 of each of the following Institute of Transportation Engineers (ITE) specifications:
   - Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement
   - Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement
   - Pedestrian Traffic Control Signal Indications – Part 2: Light Emitting Diode (LED) Pedestrian Traffic Signal Modules.

   (Note: The Department currently recognizes two approved independent testing laboratories. They are Intertek ETL Semko and Light Metrics, Incorporated with Garwood Laboratories. Independent laboratory tests from other laboratories may be considered as part of the QPL submittal at the discretion of the Department,
3. Evidence of conformance with the requirements of these specifications,
4. A manufacturer's warranty statement in accordance with the required warranty, and
5. Submittal of manufacturer's design and production documentation for the model, including but not limited to, electrical schematics, electronic component values, proprietary part numbers, bill of materials, and production electrical and photometric test parameters.
6. Evidence of approval of the product to bear the Intertek ETL Verified product label for LED traffic signal modules.

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 installation of the modules. During the warranty period, the manufacturer must provide new replacement modules within 45 days of receipt of modules that have failed at no cost to the State. Repaired or refurbished modules may not be used to fulfill the manufacturer's warranty obligations. Provide manufacturer's warranty documentation to the Department during evaluation of product for inclusion on Qualified Products List (QPL).

B. Vehicle Signal Heads:

Comply with the ITE standard "Vehicle Traffic Control Signal Heads". Provide housings with provisions for attaching backplates.

Provide visors that are 10 inches in length for 12-inch vehicle signal heads.

Provide a termination block with one empty terminal for field wiring for each indication plus one empty terminal for the neutral conductor. Have all signal sections wired to the termination block.

Provide barriers between the terminals that have terminal screws with a minimum Number 8 thread size and that will accommodate and secure spade lugs sized for a Number 10 terminal screw.

Mount termination blocks in the yellow signal head sections on all in-line vehicle signal heads. Mount the termination block in the red section on five-section vehicle signal heads.

Furnish vehicle signal head interconnecting brackets. Provide one-piece aluminum brackets less than 4.5 inches in height and with no threaded pipe connections. Provide hand holes on the bottom of the brackets to aid in installing wires to the signal heads. Lower brackets that carry no wires and are used only for connecting the bottom signal sections together may be flat in construction.

For messenger cable mounting, provide messenger cable hangers, wire outlet bodies, balance adjusters, bottom caps, wire entrance fitting brackets, and all other hardware necessary to make complete, watertight connections of the vehicle signal heads to the messenger cable. Fabricate mounting assemblies from malleable iron or steel and provide serrated rings made of aluminum. Provide messenger cable hangers and balance adjusters that are galvanized before being painted. Fabricate balance adjuster eyebolt and eyebolt nut from stainless steel or galvanized malleable iron. Provide messenger cable hangers with U-bolt clamps. Fabricate washers, screws, bolts, clevis pins, cotter pins, nuts, and U-bolt clamps from stainless steel.

Provide LED vehicular traffic signal modules (hereafter referred to as modules) that consist of an assembly that uses 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°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.

For the modules, provide spade terminals crimped to the lead wires and sized for a #10 screw connection to the existing terminal block in a standard signal head. Do not provide other types of crimped terminals with a spade adapter.

Ensure the power supply is integral to the module assembly. On the back of the module, permanently mark the date of manufacture (month & year) or some other method of identifying date of manufacture.

Tint the red, yellow and green lenses to correspond with the wavelength (chromaticity) of the LED. Transparent tinting films are unacceptable. Provide a lens that is integral to the unit with a smooth outer surface.

1. LED Circular Signal Modules:

Provide modules in the following configurations: 12-inch circular sections. All makes and models of LED modules purchased for use on the State Highway System shall appear on the current NCDOT Traffic Signal Qualified Products List (QPL).

Provide the manufacturer's model number and the product number (assigned by the Department) for each module that appears on the 2012 or most recent Qualified Products List. In addition, provide manufacturer's certification in accordance with Article 106-3 of the *Standard Specifications,* that each module meets or exceeds the requirements for 12-inch omnidirectional modules specified in the ITE "Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement" dated July 1, 2007 (hereafter referred to as VTCSH Arrow Supplement) and other requirements stated in this specification.

Provide modules that meet the following requirements when tested under the procedures outlined in the VTCSH Circular Supplement:

Module Type	Max. Wattage at 165° F	Nominal Wattage at 77° F
12-inch red circular	17	11
12-inch green circular	15	15

For yellow circular signal modules, provide modules tested under the procedures outlined in the VTCSH Circular Supplement to insure power required at 77° F is 22 Watts or less for the 12-inch circular module.

Note: Use a wattmeter having an accuracy of ±1% to measure the nominal wattage and maximum wattage of a circular traffic signal module. Power may also be derived from voltage, current and power factor measurements.

2. LED Arrow Signal Modules

Provide 12-inch omnidirectional arrow signal modules. All makes and models of LED modules purchased for use on the State Highway System shall appear on the current NCDOT Traffic Signal Qualified Products List (QPL).

Provide the manufacturer's model number and the product number (assigned by the Department) for each module that appears on the 2012 or most recent Qualified Products List. In addition, provide manufacturer's certification in accordance with Article 106-3 of the *Standard Specifications,* that each module meets or exceeds the requirements for 12-inch omnidirectional modules specified in the ITE "Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement" dated July 1, 2007 (hereafter referred to as VTCSH Arrow Supplement) and other requirements stated in this specification.

Provide modules that meet the following requirements when tested under the procedures outlined in the VTCSH Arrow Supplement:

Module Type	Max. Wattage at 165° F	Nominal Wattage at 77° F
12-inch red arrow	12	9
12-inch green arrow	11	11

For yellow arrow signal modules, provide modules tested under the procedures outlined in the VTCSH Arrow Supplement to insure power required at 77° F is 12 Watts or less.

Note: Use a wattmeter having an accuracy of ±1% to measure the nominal wattage and maximum wattage of an arrow traffic signal module. Power may also be derived from voltage, current and power factor measurements.

C. Signal Cable:

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. Provide a cable jacket labeled with the IMSA specification number and provide conductors constructed of stranded copper.

4. UNPAVED TRENCHING FOR TEMPORARY LEAD-IN CABLE

4.1. DESCRIPTION

Furnish and install temporary lead-in cable or conduit for underground cable installation. The Contractor may install temporary lead-in cable in PVC, HDPE or rigid metallic conduit at no additional cost to the Department.

4.2. MATERIALS

Furnish material, equipment and hardware under this section that is pre-approved on the ITS and Signals QPL.

4.3. CONSTRUCTION METHODS

As shown in plans or as directed by the Engineer, direct bury lead-in cable for temporary traffic signal installations.

Furnish and install temporary lead-in cable in accordance with the plans and specifications. Comply with the provisions of Section 1715 of the 2006 *Standard Specifications for Roads and Structures*.

4.4. MEASUREMENT AND PAYMENT

Actual linear meters of trenching for placement of temporary lead-in cable installed and accepted. Measurement will be along the approximate centerline of the trench.

Payment will be made under:

Unpaved Trenching for Temporary Lead-In..... Meter

5. TRAFFIC SIGNAL SUPPORTS

5.1. METAL TRAFFIC SIGNAL SUPPORTS – ALL POLES

A. General:

Furnish and install metal strain poles, grounding systems, and all necessary hardware. The work covered by this special provision includes requirements for the design, fabrication, and installation of both standard and custom/site specifically designed metal traffic signal supports and associated foundations.

Provide metal traffic signal support systems that contain no guy assemblies, struts, or stay braces. Provide designs of completed assemblies with hardware that equals or exceeds AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals* 4th Edition, 2001 (hereafter called 4th Edition AASHTO), including the latest interim specifications. Provide assemblies with a round or near-round (18 sides or more) cross-section, or a multi sided cross section with no less than six sides. The sides may be straight, convex, or concave.

Pole heights shown on signal plans are estimated from available data for bid purposes. Prior to furnishing metal signal poles, use field measurements and adjusted cross-sections to determine whether pole heights are sufficient to obtain required clearances. If pole heights are not sufficient, the Contractor should immediately notify the Engineer of the required revised pole heights.

Ensure that metal signal poles permit cables to be installed inside poles and any required mast arms. For holes in the poles and arms used to accommodate cables, provide full-circumference

grommets. Arm flange plate wire access hole should be debarred, non grommeted and oversized to fit around the 2" dia. grommeted shaft flange plate wire access hole.

After fabrication, have steel poles, required mast arms, and all parts used in the assembly hot-dip galvanized per section 1076. Design structural assemblies with weep holes large enough and sufficiently located to drain molten zinc during galvanization process. Provide hot-dip galvanizing on structures that meets or exceeds ASTM Standard A-123. Provide galvanizing on hardware that meets or exceeds ASTM Standard A-153. Ensure that threaded material is brushed and retapped as necessary after galvanizing. Perform repair of damaged galvanizing that complies with the following:

Repair of Galvanizing.....Article 1076-6

Standard Drawings for Metal Poles are available that supplement these project special provisions. These drawings are located on the Department's website:

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

Comply with Sub article 1098-1B "General Requirements" of the 2006 STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES, hereinafter referred to as the *Standard Specifications* for submittal requirements. Furnish shop drawings for approval. Provide the copies of detailed shop drawings for each type of structure as summarized below. Ensure that shop drawings include material specifications for each component and identify welds by type and size on the drawing details, not in table format. Do not release structures for fabrication until shop drawings have been approved by NCDOT. Provide an itemized bill of materials for all structural components and associated connecting hardware on the drawings.

Comply with Sub article 1098-1A "General Requirements" of the *Standard Specifications* for QPL submittals. All shop drawings must include project location description, signal inventory number(s) and a project number or work order number on the drawings.

Summary of information required for metal pole review submittal:

Item	Hardcopy Submittal	Electronic Submittal	Comments / Special Instructions
Sealed, Approved Signal Plan/Loading Diagram	1	1	All structure design information needs to reflect the latest approved signal plans
Custom Pole Shop Drawings	4 sets	1 set	Submit drawings on 11" x 17" format media Show NCDOT inventory number(s) in or above the title block
Standard Pole Shop Drawings (from the QPL)	4 sets	1 set	Submit drawings on 11" x 17" format media Show NCDOT inventory number(s) in or above the title block
Structure Calculations	1 set	1 set	Not required for Standard QPL Poles
Standard Pole Foundation Drawings	Will vary with number of poles	1 set	Submit drawings on 11" x 17" format media. Submit a completed Standard Foundation Selection form for each pole using foundation table on Metal Pole Drawing M-8.
Custom Foundation Drawings	4 sets	1 set	Submit drawings on 11" x 17" format media. If QPL Poles are used, include the corresponding QPL pole shop drawings with this submittal.
Foundation Calculations	1	1	Not required for Standard QPL Poles
Soil Boring Logs and Report	1	1	Report should include a location plan and a soil classification report including soil capacity, water level, etc. for each pole.

NOTE – All shop drawings and custom foundation design drawings must be sealed by a Professional Engineer licensed in the State of North Carolina. All geotechnical information must be sealed by either a Professional Engineer or Geologist licensed in the State of North Carolina. Include a title block and revision block on the shop drawings and foundation designs showing the NCDOT inventory number.

Shop drawings and foundation drawings may be submitted together or separately for approval. However, shop drawings must be approved before foundations can be reviewed. Foundation designs will be returned without review if the associated shop drawing has not been approved. Incomplete submittals will be returned without review.

B. Materials:

Fabricate metal pole and arm shaft from coil or plate steel that conforms to ASTM A 595 Grade A. For structural steel shapes, plates and bars use A572 Gr 55 or Gr 65. Provide pole and arm shafts that are round in cross section or multisided tubular shapes and have a uniform linear taper of 0.14 in/ft. Construct shafts from one piece of single ply plate or coil so there are no circumferential weld splices. Galvanize in accordance with AASHTO M 111 and or ASTM A 123.

Use the submerged arc process to continuously weld pole shafts and arm shafts along their entire length. Ground smooth exposed welds until flush with the base metal. Ensure shafts have no circumferential welds except at the lower end joining the shaft to the pole base and arm base. Provide welding that conforms to Article 1072-20 of the *Standard Specifications*, except that no field welding on any part of the pole will be permitted unless approved by a qualified engineer.

Refer to Metal Pole Standard Drawing Sheets M2 thru M5 for metal poles for fabrication details. Fabricate anchor bases from plate steel meeting as a minimum the requirements of ASTM A 36M or cast steel meeting the requirements of ASTM A 27M Grade 485-250, AASHTO M270 grade 36 or an approved equivalent. Conform to the applicable bolt pattern and orientation specified by the design as shown on Metal Pole Standard Drawing Sheet M2.

Capacity of tapped flange plate must be sufficient to develop the full capacity of the connecting bolts. In all incidences the flange plate both arm and shaft must be at least as thick as the arm connecting bolts are in diameter.

Ensure all hardware is galvanized steel or stainless steel. The Contractor is responsible for ensuring that the designer/fabricator specifies connecting hardware and/or materials that do not create a dissimilar metal corrosive reaction.

Unless otherwise required by the design, ensure each anchor rod is 2" diameter and 60" length. Provide 10" minimum thread projection at the top of the rod, and 8" minimum at the bottom of the rod. Use anchor rod assembly and drilled pier foundation materials that meet the *Foundations and Anchor Rod Assemblies for Metal Poles* provision.

For each structural bolt and other steel hardware, hot dip galvanizing shall conform to the requirements of AASHTO M 232 (ASTM A 153). Ensure end caps for poles or mast arms are constructed of cast aluminum conforming to Aluminum Alloy 356.0F.

Provide a circular anchor bolt lock plate that will be secured to the anchor bolts at the embedded end with 2 washers and 2 nuts. Provide a base plate template that matches the bolt circle diameter of the anchor bolt lock plate. Construct plates and templates from ¼" minimum thick steel with a minimum width of 4". Galvanizing is not required.

Provide 4 heavy hex nuts and 4 flat washers for each anchor bolt. For nuts, use AASHTO M291 grade 2H, DH, or DH3 or equivalent material. For flat washers, use AASHTO M293 or equivalent material.

C. Construction Methods:

Erect signal support poles only after concrete has attained a minimum allowable compressive strength of 3000 psi. Install anchor rod assemblies in accordance with the *Foundations and Anchor Rod Assemblies for Metal Poles* provision.

For further construction methods, see construction methods for Metal Strain Pole, or Metal Pole with Mast Arm.

Connect poles to grounding electrodes and bond them to the electrical service grounding electrodes.

For holes in the poles used to accommodate cables, install grommets before wiring pole or arm. Do not cut or split grommets.

Attach the terminal compartment cover to the pole by a sturdy chain or cable. Ensure the chain or cable is long enough to permit the cover to hang clear of the compartment opening when the cover is removed, and is strong enough to prevent vandalism. Ensure the chain or cable will not interfere with service to the cables in the pole base.

Attach cap to pole with a sturdy chain or cable. Ensure the chain or cable is long enough to permit the cap to hang clear of the opening when the cap is removed.

Perform repair of damaged galvanizing that complies with the *Standard Specifications*, Article 1076-6 "Repair of Galvanizing."

Install galvanized wire mesh around the perimeter of the base plate to cover the gap between the base plate and top of foundation for debris and pest control.

Install a ¼" thick plate for concrete foundation tag to include: concrete grade, depth, diameter, and reinforcement sizes of the installed foundation.

D. Anchor Nut Tightening Procedure:

Prior to installation

Protect the anchor rod threads from damage prior to installation and during installation.
Prior to installation of the rods in the foundation, turn nuts onto and off the rods, well past the elevation of the bottom of the leveling nuts. Turn by the effort of one worker using an ordinary wrench without a cheater bar. Report to the Engineer any thread damage that requires a significant amount of extra effort to turn any nut.

During installation

1. Place leveling nuts (bottom nuts) on the anchor rods.
2. Place leveling nut washers on top of the anchor rod leveling nuts.
3. Place a rigid template on top of the leveling nuts to check the level of the nuts. If the anchor nut and washer cannot be brought into firm contact with the template, then use beveled washers.
4. Verify that the distance between the bottom of the leveling nut and the top of the concrete foundation is no more than one anchor rod diameter. If an upright is required to be back-raked, then the distance between the bottom of the leveling nut and the top of the concrete

foundation should be no more than one anchor rod diameter, averaged over the anchor rod group.

5. Place the base plate and structural element to which it is attached. However, do not attach to the upright element, during tightening of the anchor nuts, cantilever beams or arms with span in excess of 10 feet. Luminaire arms and fixtures may be attached prior to standing the pole on the foundation.
6. Place top nut washers.
7. Do not use lock washers.
8. Lubricate threads and bearing surfaces of top nuts. Lubricant shall be beeswax, stick paraffin, or other approved lubricant.
9. Place top nuts. If the anchor nut and washer cannot be brought into firm contact with the base plate, then use beveled washers.
10. Tighten top nuts to snug tight. A snug-tight condition is defined as the washer and nut being in full contact with the base plate, and the application of the full effort of a workman on a 12-inch wrench. Turn top nuts in increments following a star pattern (using at least two full tightening cycles).
11. To ensure proper pretension, after all top nuts have been brought to snug-tight condition, repeat the procedure on the leveling nuts. Turn leveling nuts in increments following a star pattern (using at least two full tightening cycles).
12. At this point, verify if beveled washers are required. Beveled washers are necessary under the leveling nut or top nut if any face of the base plate has a slope greater than 1:20 and / or any nut can not be brought into firm contact with the base plate.
13. Before further nut turning, mark the reference position of the nut in the snug-tight condition with a suitable marking (ink or paint that is not water-soluble). Mark on the corner at the intersection of two flats with a corresponding reference mark on the base plate at each nut. After tightening, verify the nut rotation.
14. Achieve pretension by turn-of-nut method. Turn the top nuts to 1/6 of a turn. Do so in a star pattern using at least two full-tightening cycles.
15. After installation, ensure that firm contact exists between the anchor rod nuts, washers, and base plate on any anchor rod installed.
16. The messenger cable (span wires) or mast arms may be attached to the upright at this time.
17. After a period of no less than 4 days, and no more than 2 weeks, and in the presence of the Engineer, use a torque wrench to verify that a torque at least equal to 600 foot-pounds is provided on each top nut. For cantilever structures, verify the torque after erection of the remainder of the structure and any heavy attachments to the structure.
18. If any top nut torque reveals less than 600 foot-pounds of effort is required to move the nut, then tighten the nut to no less than 600 foot-pounds.
19. Calibrate, at least annually, the torque indicator on the wrench used for tightening the nuts. Provide the Engineer a certification of such calibration.
20. Because inspection or re-tightening of the leveling nuts would be prevented, and to reduce moisture retention and associated corrosion, do not place grout under the base plate.

5.2. METAL STRAIN POLE

A. Materials:

Provide either steel or aluminum poles as indicated on the plans.

Comply with the following for Aluminum Poles:

- Have poles fabricated from Aluminum Association Alloy 6061-T6, 6063-T6, or approved equivalent. The structural requirement does not pertain to castings that are decorative only.
- Have shafts tapered by spinning and cold-working a seamless extruded tube of the aluminum alloy.
- Have shafts with no circumferential welds except at the lower end joining the shaft to the base.
- Ensure aluminum poles are properly protected from damage prior to shipment.
- Have bases of the shaft fabricated in accordance with the Aluminum Association Alloy 356.0-T6, and of adequate strength, shape and size, and capable of withstanding the design load of the shaft.
- Have aluminum surfaces in contact with concrete or dissimilar metal coated with bituminous paint.

Comply with the following for Steel Poles:

- Have shafts of the tapered tubular type and fabricated of steel conforming to ASTM A-595 Grade A or an approved equivalent.
- Have galvanization in accordance with AASHTO M 111 (ASTM A 123).
- Have shafts that are continuously welded for the entire length by the submerged arc process, and with exposed welds ground or rolled smooth and flush with the base metal. Provide welding that conforms to Article 1072-20 per *Standard Specification* except that no field welding on any part of the pole will be permitted.
- Have anchor bases for steel poles fabricated from plate steel meeting as a minimum the requirements of ASTM A 36M or cast steel meeting the requirements of ASTM A 27M Grade 485-250 or an approved equivalent.

For each strain pole, provide 2 messenger cable (span wire) clamps and associated hardware for attachment of support cable of the messenger cable suspension. Ensure that diameter of the clamp is appropriate to its location on the pole and that the diameter of the clamps is appropriately designed to be adjustable from 1'-6" below the top, down to 6'-6" below the top of the pole. Do not attach more than one support cable to a messenger cable clamp.

For strain poles, provide a minimum of three (3) 2 inch (50 mm) holes equipped with an associated coupling and weatherhead on the messenger cable load side of the pole to accommodate passage of signal cables from inside the pole to the suspension. Provide galvanized threaded plugs for all unused couplings at pole entrance points. Refer to Metal Pole Standard Drawing Sheet M3 for fabrication details.

Provide a grounding lug(s) in the approximate vicinity of the messenger cable clamp for bonding and grounding messenger cable. Lugs must accept #4 or #6 AWG wire to bond messenger cables to the pole in order to provide an effective ground fault circuit path. Refer to Metal Pole Standard Drawing Sheet M6 for construction details.

Have poles permanently stamped above the hand holes with the identification tag details as shown on Metal Pole Standard Drawing Sheet M2.

Provide liquidtight flexible metal conduit (Type LFMC), liquidtight flexible nonmetallic conduit (Type LFNC), high density polyethylene conduit (Type HDPE), or approved equivalent to isolate conductors feeding luminaires.

Fabricate poles from a single piece of steel or aluminum with single line seam weld with no transverse butt welds. Fabrication of two ply pole shafts is not acceptable except for fluted shafts. Provide tapers for all shafts that begin at base and that have diameters which decrease uniformly at the rate of not more than 0.14 inch per foot (11.7 millimeters per meter) of length.

Ensure that allowable pole deflection does not exceed that allowed by AASHTO Specifications. For messenger cable poles (with primarily transverse loads), ensure that maximum deflection at the top of the pole does not exceed 2.5 percent of the pole height. For mast arm poles (with primarily moment loads), ensure that maximum angular rotation of the top of the pole does not exceed 1° 40'.

Provide four anchor nuts and four washers for each anchor bolt. Have anchor bolts fabricated from steel per AASHTO M 314 or equivalent. Ensure that anchor bolts have required diameters, lengths, and positions, and will develop strengths comparable to their respective poles.

Provide a terminal compartment with cover and screws in each pole that encompasses the hand hole and contains a 12-terminal barrier type terminal block. Provide two terminal screws with a removable shorting bar between them for each termination. Furnish terminal compartment covers attached to the pole by a sturdy chain or cable approved by the Engineer. Ensure that the chain or cable is long enough to permit the cover to hang clear of the compartment opening when the cover is removed, and is strong enough to prevent vandals from being able to disconnect the cover from the pole. Ensure that the chain or cable will not interfere with service to the cables in the pole base.

Install grounding lugs that will accept #4 or #6 AWG wire to electrically bond messenger cables to the pole. Refer to Metal Pole Standard Drawing Sheet M6 for construction details.

For each pole, provide a 1/2 inch minimum thread diameter, coarse thread stud and nut for grounding which will accommodate Number 6 AWG ground wire. Ensure that the lug is electrically bonded to the pole and is conveniently located inside the pole at the hand hole.

Provide a removable pole cap with stainless steel attachment screws for the top of each pole. Ensure that the cap is cast aluminum conforming to Aluminum Association Alloy 356.0F. Furnish cap attached to the pole with a sturdy chain or cable approved by the Engineer. Ensure that the chain or cable is long enough to permit the cap to hang clear of the pole-top opening when the cap is removed.

When required by the plans, furnish couplings 42 inches above the bottom of the base for mounting of pedestrian pushbuttons. Provide mounting points consisting of 1-1/2 inch internally threaded half-couplings that comply with the NEC and that are mounted within the poles. Ensure that couplings are essentially flush with the outside surfaces of the poles and are installed before any required galvanizing. Provide a threaded plug in each mounting point. Ensure that the surface of the plug is essentially flush with the outer end of the mounting point when installed and has a recessed hole to accommodate a standard wrench.

B. Construction Methods:

Install metal poles, hardware, and fittings as shown on the manufacturer's installation drawings. Install metal poles so that when the pole is fully loaded it is within 2 degrees of vertical. Install poles with the manufacturer's recommended "rake." Use threaded leveling nuts to establish rake if required.

5.3. DRILLED PIER FOUNDATIONS FOR METAL TRAFFIC SIGNAL POLES

Analysis procedures and formulas shall be based on AASHTO, ACI code and per FHWA manuals. Design methods based on Engineering publications or research papers needs to have prior approval from NCDOT. The Department reserves the right to accept or disapprove any method used for the analysis.

Use a Factor of Safety of 1.33 for torsion and 2.0 for bending for the foundation design.

Foundation design for lateral load shall not exceed 1" lateral deflection at top of foundation.

Design all custom foundations to carry the maximum capacity of each metal pole. For standard case strain poles only, if a custom foundation is designed, use the actual moment reactions from the Standard Foundation Selection Table shown on Standard Drawing No. M8.

When poor soil conditions are encountered which could create an excessively large foundation design, consideration may be given to allowing an exemption to the maximum capacity design. The contractor must gain approval from the engineer before reducing a foundation's capacity. On projects where poor soil is known to be present, it is advisable that the contractor consider getting foundations approved before releasing poles for fabrication.

A. Description:

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. However, the Contractor is not required to use a standard foundation. If the Contractor chooses to design a non-standard site-specific foundation for a standard pole or 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 and Section B4 (Non-Standard Foundation Design) below. If non-standard site specific foundations are designed for standard QPL approved strain poles, the foundation designer must use the design moment specified by load case on Metal Pole Standard Drawing Sheet M8. Failure to conform to this requirement will be grounds for rejection of the design.

If the Contractor chooses to design a non-standard foundation for a standard pole and the soil test results indicate a standard foundation is feasible for the site, the Contractor will be paid the cost of the standard foundation (drilled pier and wing wall, if applicable). Any additional costs associated with a non-standard site-specific foundation including additional materials, labor and equipment will be considered incidental to the cost of the standard foundation. All costs for the non-standard foundation design will also be considered incidental to the cost of the standard foundation.

B. Soil Test and Foundation Determination:

1. General:

Drilled piers are reinforced concrete sections, cast-in-place against in situ, undisturbed material. Drilled piers are of straight shaft type and vertical.

Some standard drilled piers for supporting poles with mast arms may require wing walls to resist torsional rotation. Based upon this provision and the results of the required soil test, a drilled pier length and wing wall requirement may be determined and constructed in accordance with the plans.

For non-standard site-specific poles, the contractor-selected pole fabricator will determine if the addition of wing walls is necessary for the supporting foundations.

2. Soil Test:

Perform a soil test at each proposed metal pole location. Complete all required fill placement and excavation at each signal pole location to finished grade before drilling each boring. Soil tests performed that are not in compliance with this requirement may be rejected and will not be paid. Drill one boring to a depth of 26 feet within a 25 foot radius of each proposed foundation.

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. Discontinue the boring if one of the following occurs:

- A total of 100 blows have been applied in any 2 consecutive 6-in. intervals.
- A total of 50 blows have been applied with < 3-in. 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. Pole numbers should be made available to the drill contractor. Include pole numbers in the boring label if they are available. If they are not available, ensure the boring labels can be cross-referenced to corresponding pole numbers. 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.

3. Standard Foundation Determination:

Use the following method for determining the Design N-value:

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

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

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

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

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 2 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 2 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 strain poles are shown on the plans and the Contractor chooses to use standard foundations, determine a drilled pier length, "L," for each signal pole from the Standard

Foundations Chart (sheet M 8) 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. Signature on form is for verification purposes only. 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 completed boring logs collected in accordance with Section 2 (Soil Test) above along with pole loading diagrams from the plans to the contractor-selected pole fabricator to assist in the pole and foundation design.

If one of the following occurs, the Standard Foundations Chart 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 Standard Foundations Chart, is greater than the depth of the corresponding boring.

In the case where a standard foundation cannot be used, the Department will be responsible for the additional cost of the non-standard foundation.

Foundation designs are based on level ground around the traffic signal pole. If the slope around the edge of the drilled pier is steeper than 8:1 (H:V) or the proposed foundation will be less than 10 feet from the top of an embankment slope, the contractor is responsible for providing slope information to the foundation designer and to the Engineer so it can be considered in the design.

The "Metal Pole Standard Foundation Selection Form" may be found at:

http://www.ncdot.gov/doh/preconstruct/highway/geotech/formdet/misc/MetalPole.pdf

If assistance is needed, contact the Engineer.

4. Non-Standard Foundation Design:

Design non-standard foundations based upon site-specific soil test information collected in accordance with Section 2 (Soil Test) above. Design drilled piers for side resistance only in accordance with Section 4.6 of the *AASHTO Standard Specifications for Highway Bridges*. Use the computer software LPILE version 5.0 or later manufactured by Ensoft, Inc. to analyze drilled piers. Use the computer software gINT version 8.0 or later manufactured by Bentley Systems, Inc. with the current NCDOT gINT library and data template to produce SPT boring logs. Provide a drilled pier foundation for each pole with a length and diameter that result in a horizontal lateral movement of less than 1 inch at the top of the pier and a horizontal rotational movement of less than 1 inch at the edge of the pier. Contact the Engineer for pole loading diagrams for standard poles to be used for non-standard foundation designs. Submit any non-standard foundation designs including drawings, calculations, and soil boring logs to the Engineer for review and approval before construction.

C. Drilled Pier Construction:

Construct drilled pier foundations in accordance with the *Foundations and Anchor Rod Assemblies for Metal Poles* provision.

1. 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 *Standard Specifications*. Drilling spoils consist of all material excavated including water or slurry removed from the excavation either by pumping or with augers.

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

Construct drilled piers within the tolerances specified herein. If tolerances are exceeded, provide additional construction as approved by the Engineer to bring the piers within the tolerances specified. Construct drilled piers such that the axis at the top of the piers is no more than 3 inches in any direction from the specified position. Build drilled piers within 1% of the plumb deviation for the total length of the piers. Construct the finished top of pier elevation between 5 inches to 3 inches above the finished grade elevation. Form the top of the pier such that the concrete is smooth and level.

If unstable, caving, or sloughing soils are anticipated or encountered, stabilize drilled pier excavations with either steel casing or polymer slurry. Steel casing may be either the sectional type or one continuous corrugated or non-corrugated piece. Ensure all steel casings consist of clean watertight steel of ample strength to withstand handling and driving stresses and the pressures imposed by concrete, earth or backfill. Use steel casings with an outside diameter equal to the specified pier size and a minimum wall thickness of 1/4 inches. 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 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.

Any steel casing left in place will be considered permanent casing. Permanent steel casings are only allowed for strain poles. When installing permanent casing, do not drill or excavate below the tip of the permanent casing at any time so that the permanent casing is against undisturbed soil. The Contractor may excavate a hole smaller than the specified pier size to facilitate permanent casing installation. Ensure the sides of the excavation do not slough during drilling. Ensure the hole diameter does not become larger than the inside diameter of the casing. No additional compensation will be paid for permanent casing.

If polymer slurry is chosen to stabilize the excavation, use one of the following polymers listed in the table below:

PRODUCT	MANUFACTURER
SlurryPro CDP	KB Technologies Ltd 3648 FM 1960 West, Suite 107 Houston, TX 77068 (800) 525-5237
Super Mud	PDS Company 105 West Sharp Street El Dorado, AR 71730 (800) 243-7455
Shore Pac GCV	CETCO Drilling Products Group 1500 West Shure Drive Arlington Heights, IL 60004 (800) 527-9948
Novagel Polymer	Geo-Tech Drilling Fluids 220 North Zapata Hwy, Suite 11A Laredo, TX 78043 (210) 587-4758

Use slurry in accordance with the manufacturer's guidelines and recommendations unless approved otherwise by the Engineer. The Contractor should be aware that polymer slurry may not be appropriate for a given site. Polymer slurry should not be used for excavations in soft or loose soils as determined by the Engineer.

In wet pour conditions, advise and gain approval from the Engineer as to the planned construction method intended for the complete installation of the drilled pier before excavating.

2. Reinforcing Steel:

Completely assemble a cage of reinforcing steel consisting of longitudinal and spiral / hoop 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 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 / hoops reinforcement at each intersection with double wire. Support or hold down the cage so that the vertical displacement during concrete placement and casing extraction does not exceed 2 inches.

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

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

No welding of or to reinforcement is permitted. No welding of or to Anchor Bolt is permitted.

3. Concrete:

Begin concrete placement immediately after inserting reinforcing steel into the drilled pier excavation. If the drilled pier excavation is entirely cased down to the tip, immediately placement of the concrete is not required.

a) Concrete Mix

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

Designate the concrete as NCDOT AA mix or better with a minimum compressive strength of 4500 psi at 28 days. The Contractor may use a high early strength mix. Make certain the cementitious material content complies with one of the following options:

- Provide a minimum cement content of 640 lbs/yd^3 and a maximum cement content of 800 lbs/yd^3; however, if the alkali content of the cement exceeds 0.4%, reduce the cement content by 20% and replace it with fly ash at the rate of 1.2 lb of fly ash per lb of cement removed.
- If Type IP blended cement is used, use a minimum of 665 lbs/yd^3 Type IP blended cement and a maximum of 833 lbs/yd^3 Type IP blended cement in the mix.

Limit the water-cementitious material ratio to a maximum of 0.45. Air-entrain the concrete mix in accordance with Section 1000-3 (B) of the *Standard Specifications*. Produce a workable mix so that vibrating or prodding is not required to consolidate the concrete. When placing the concrete, make certain the slump is between 5 and 7 inches for dry placement of concrete or 7 and 9 inches for wet placement of concrete.

Use Type I or Type II cement or Type IP blended cement and either No. 67 or No. 78M coarse aggregate in the mix. Use an 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 or less.

b) Concrete Placement

Place concrete such that the drilled pier is a monolithic structure. Temporary casing may be completely removed and concrete placement may be temporarily stopped when the concrete level is within 45 to 50 inches of the ground elevation to allow for placement of anchor bolts and conduit. Do not pause concrete placement if unstable caving soils are present at the ground surface. Remove any water or slurry above the concrete and clean the concrete surface of all scum and sediment to expose clean, uncontaminated concrete before inserting the anchor bolts and conduit. Resume concrete pouring within 2 hours.

Do not dewater any drilled pier excavations unless the excavation is entirely cased down to tip. Do not begin to remove the temporary casing until the level of concrete within the casing is in excess of 10 feet above the bottom of the casing being removed. Maintain the concrete level at least 10 feet above the bottom of casing throughout the entire casing extraction operation except when concrete is near the top of the drilled pier elevation. Maintain a sufficient head of concrete above the bottom of casing to overcome outside soil and water pressure. As the temporary casing is withdrawn, exercise care in maintaining an adequate level of concrete within the casing so that fluid trapped behind the

casing is displaced upward and discharged at the ground surface without contaminating or displacing the drilled pier concrete. Exerting downward pressure, hammering, or vibrating the temporary casing is permitted to facilitate extraction.

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

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

- **Dry Placement:** Before placing concrete, make certain the drilled pier excavation is dry so the flow of concrete completely around the reinforcing steel can be certified by visual inspection. Place the concrete by free fall with a central drop method where the concrete is chuted directly down the center of the excavation. In wet conditions, dewatering of a drill shaft prior to concrete placement does not change the placement method to a "Dry placement" method without approval.
- **Wet Placement:** Maintain a static water or slurry level in the excavation before placing concrete. Place concrete with a tremie or a pump in accordance with the applicable parts of Sections 420-6 and 420-8 of the *Standard Specifications*. Use a tremie tube or pump pipe made of steel with watertight joints. Passing concrete through a hopper at the tube end or through side openings as the tremie is retrieved during concrete placement is permitted. Use a discharge control to prevent concrete contamination when the tremie tube or pump pipe is initially placed in the excavation. Extend the tremie tube or pump pipe into the concrete a minimum of 5 feet at all times except when the concrete is initially introduced into the pier excavation. If the tremie tube or pump pipe pulls out of the concrete for any reason after the initial concrete is placed, restart concrete placement with a steel capped tremie tube or pump pipe. At no circumstances may concrete mix free fall through water.

Once the concrete in the excavation reaches the same elevation as the static water level, placing concrete with the dry method is permitted. Before changing to the dry method of concrete placement, remove any water or slurry above the concrete and clean the concrete surface of all scum and sediment to expose clean, uncontaminated concrete.

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

Permanently mark the top of each foundation with a stamp or embedded plate to identify the depth of the foundation, size and number of vertical reinforcements and the concrete strength.

4. Concrete Placement Time:

Place concrete within the time frames specified in Table 1000-2 of the *Standard Specifications* 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.

5. Scheduling and Restrictions:

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, install adjacent piles, or allow any heavy construction equipment loads or "excessive" vibrations to occur at any point within a 20 foot radius of the drilled pier.

The foundation will be considered acceptable for loading when the concrete reaches a minimum compressive strength of 3000 psi. This provision is intended to allow the structure to be installed on the foundation in a shorter time frame, and does not constitute full acceptance of the drilled pier. Full acceptance will be determined when the concrete meets its full strength at 28 days.

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. Propose remedial measures for any defective drilled piers and obtain approval of all proposals from the Engineer before 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.

5.4. CUSTOM DESIGN OF TRAFFIC SIGNAL SUPPORTS

A. General:

Design traffic signal supports with foundations consisting of metal strain poles.

The lengths of the metal signal poles shown on the plans are estimated from available data for bid purposes. Determine the actual length of each pole from field measurements and adjusted cross-sections. Furnish the revised pole heights to the Engineer. Use all other dimensional requirements shown on the plans.

Ensure each pole includes an identification tag with information and location positions as defined on Metal Pole Standard Drawing Sheets M2, M3 and M4. All pole shaft tags must include the NCDOT Inventory number followed by the pole number shown on the traffic signal or ITS (non-signalized locations) plan.

Design all traffic signal support structures using the following 4th Edition AASHTO specifications:

- Design for a 50 year service life as recommended by Table 3-3.
- Use the wind pressure map developed from 3-second gust speeds, as provided in Article 3.8.
- Ensure signal support structures include natural wind gust loading and truck-induced gust loading in the fatigue design, as provided for in Articles 11.7.3 and 11.7.4, respectively. Designs need not consider periodic galloping forces.
- Assume the natural wind gust speed in North Carolina is 11.2 mph.
- Design for Category II fatigue, as provided for in Article 11.6, unless otherwise specified.
- Calculate all stresses using applicable equations from Section 5. The Maximum allowable stress ratios for all signal support designs are 0.9.
- Conform to article 10.4.2 and 11.8 for all deflection requirements.

Ensure that the design permits cables to be installed inside poles and mast arms.

Unless otherwise specified by special loading criteria, the computed surface area for ice load on signal heads is:

- 3-section, 12-inch, Surface area: 26.0 ft^2
- 4-section, 12-inch, Surface area: 32.0 ft^2
- 5-section, 12-inch, Surface area: 42.0 ft^2

The ice loading for signal heads defined above includes the additional surface area that back plates will induce. Special loading criteria may be specified in instances where back plates will not be installed on signal heads. Refer to the Loading Schedule on each Metal Pole Loading Diagram for revised signal head surface areas. The pole designer should revise ice loads accordingly in this instance. Careful examination of the plans when this is specified is important as this may impact sizing of the metal support structure and foundation design which could affect proposed bid quotes. All maximum stress ratios of 0.9 still apply.

Assume the combined minimum weight of a messenger cable bundle (including messenger cable, signal cable and detector lead-in cables) is 1.3 lbs/ft. Assume the combined minimum diameter of this cable bundle is 1.3 inches.

Ensure that designs provide a removable pole cap with stainless steel attachment screws for each pole top and mast arm end.

B. Metal Poles:

Submit design drawings for approval including pre-approved QPL pole drawings. Show all the necessary details and calculations for the metal poles including the foundation and connections. Include signal inventory number on design drawings. Include as part of the design calculations the ASTM specification numbers for the materials to be used. Provide the types and sizes of welds on the design drawings. Include a Bill of Materials on design drawings. Ensure design drawings and calculations are signed, dated, and sealed by the responsible professional engineer licensed in the state of North Carolina. Immediately bring to the attention of the Engineer any structural deficiency that becomes apparent in any assembly or member of any assembly as a result of the design requirements imposed by these specifications, the plans, or the typical drawings. Said Professional Engineer is wholly responsible for the design of all poles and arms. Review and acceptance of these designs by the Department does not relieve the said Professional Engineer of his responsibility. Do not fabricate the assemblies until receipt of the Department's approval of the design drawings.

For strain poles, where ice is present, assume wind loads as shown in Figure 3-5 of the 4th Edition AASHTO Specification for Group III loading.

For each strain pole, provide two messenger cable clamps and associated hardware to attach the messenger support cable. Ensure that the diameter of the clamps is appropriately designed to be adjustable from 18 inches below the top, down to 6'-6" below the top of the pole. Do not attach more than one messenger support cable to a messenger cable clamp.

Provide a grounding lug(s) in the approximate vicinity of the messenger cable clamp for bonding and grounding messenger cable. Lugs must accept #4 or #6 AWG wire to bond messenger cables to the pole in order to provide an effective ground fault circuit path. Refer to Metal Pole Standard Drawing Sheet M6 for construction details.

Design tapers for all pole shafts that begin at the base with diameters that decrease uniformly at the rate of 0.14 inch per foot of length.

Design a base plate on each pole. The minimum base plate thickness for all poles is determined by the following criteria:

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 is $M = (P \times D_1) / 2$, 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 anchor bolt center and the outer face of the upright, or the difference between the bolt circle radius and the outside radius of the upright

Locate the critical section at the face of the anchor bolt and perpendicular to the bolt circle radius. The overlapped part of two adjacent critical sections is 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 is $M = P \times D_2$,
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

Locate the critical section 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 is considered ineffective.

If the base plate thickness calculated for Case 2 is less than Case 1, use the thickness calculated for Case 1.

The following additional owner requirements apply concerning pole base plates.

- Ensure that whichever case governs as defined above, the anchor bolt diameter is set to match the base plate thickness. If the minimum diameter required for the anchor bolt exceeds the thickness required for the base plate, set the base plate thickness equal to the required bolt diameter.
- For dual mast arm supports, or for single mast arm supports 50' or greater, use a minimum 8 bolt orientation with 2" diameter anchor bolts, and a 2" thick base plate.
- For all metal poles with mast arms, use a full penetration groove weld with a backing ring to connect the pole upright component to the base. Refer to Metal Pole Standard Drawing Sheet M4.

Ensure that designs have anchor bolt holes with a diameter 1/4 inch larger than the anchor bolt diameters in the base plate.

Ensure that the anchor bolts have the required diameters, lengths, and positions, and will develop strengths comparable to their respective poles.

Provide designs with a 6 x 12-inch hand hole with a reinforcing frame for each pole.

Provide designs with a terminal compartment with cover and screws in each pole that encompasses the hand hole and contains provisions for a 12-terminal barrier type terminal block.

For each pole, provide designs with provisions for a 1/2 inch minimum thread diameter, coarse thread stud and nut for grounding which will accommodate a #6 AWG ground wire. Ensure the lug is electrically bonded to the pole and is conveniently located inside the pole at the hand hole.

When required, design couplings on the pole for mounting pedestrian pushbuttons at a height of 42 inches above the bottom of the base. Provide mounting points consisting of 1-1/2 inch internally

threaded half-couplings that comply with the NEC that are mounted within the poles. Ensure the couplings are essentially flush with the outside surfaces of the poles and are installed before any required galvanizing. Provide a threaded plug for each half coupling. Ensure that the surface of the plug is essentially flush with the outer end of the mounting point when installed and has a recessed hole to accommodate a standard wrench.

5.5. POLE NUMBERING SYSTEM

A. New Poles

Attach an identification tag to each pole shaft and mast arm section as shown on Metal Pole Standard Drawing Sheet M2 "Typical Fabrication Details Common To All Metal Poles".

5.6. MEASUREMENT AND PAYMENT

Actual number of metal strain signal poles (without regard to height or load capacity) furnished, installed and accepted.

Actual number of soil tests with SPT borings drilled furnished and accepted.

Actual volume of concrete poured in cubic meters of drilled pier foundation furnished, installed and accepted.

No measurement will be made for foundation designs prepared with metal pole designs, as these will be considered incidental to designing signal support structures.

Payment will be made under:

Metal Strain Signal Pole .....Each
Soil Test .....Each
Drilled Pier Foundation.....Cubic Meter

6. CONTROLLERS WITH CABINETS

6.1. MATERIALS – TYPE 2070L CONTROLLERS

Conform to CALTRANS *Transportation Electrical Equipment Specifications* (TEES) (dated August 16, 2002, plus Errata 1 dated October 27, 2003 and Errata 2 dated June 08, 2004) except as required herein.

Furnish Model 2070L controllers. Ensure that removal of the CPU 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 before 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.

6.2. MATERIALS – GENERAL CABINETS

Provide a moisture resistant coating on all circuit boards.

Provide one 20 mm diameter radial lead UL-recognized metal oxide varistor (MOV) between each load switch field terminal and equipment ground. Electrical performance is outlined below.

PROPERTIES OF MOV SURGE PROTECTOR	
Maximum Continuous Applied Voltage at 185° F	150 VAC (RMS) 200 VDC
Maximum Peak 8x20μs Current at 185° F	6500 A
Maximum Energy Rating at 185° F	80 J
Voltage Range 1 mA DC Test at 77° F	212-268 V
Max. Clamping Voltage 8x20μs, 100A at 77° F	395 V
Typical Capacitance (1 MHz) at 77° F	1600 pF

Provide a power line surge protector that is a two-stage device that will allow connection of the radio frequency interference filter between the stages of the device. Ensure that a maximum continuous current is at least 10A at 120V. Ensure that the device can withstand a minimum of 20 peak surge current occurrences at 20,000A for an 8x20 microsecond waveform. Provide a maximum clamp voltage of 395V at 20,000A with a nominal series inductance of 200μh. Ensure that the voltage does not exceed 395V. Provide devices that comply with the following:

Frequency (Hz)	Minimum Insertion Loss (dB)
60	0
10,000	30
50,000	55
100,000	50
500,000	50
2,000,000	60
5,000,000	40
10,000,000	20
20,000,000	25

6.3. MATERIALS – TYPE 170E CABINETS

A. Type 170 E Cabinets General:

Conform to the city of Los Angeles' Specification No. 54-053-08, *Traffic Signal Cabinet Assembly Specification* (dated July 2008), except as required herein.

Furnish model 332 base mounted cabinets configured for 8 vehicle phases, 4 pedestrian phases, and 6 overlaps. When overlaps are required, provide auxiliary output files for the overlaps. Do not reassign load switches to accommodate overlaps unless shown on electrical details.

Provide model 200 load switches, model 222 loop detector sensors, model 252 AC isolators, and model 242 DC isolators according to the electrical details. As a minimum, provide one (1) model 2018 conflict monitor, one (1) model 206L power supply unit, two (2) model 204 flashers, one (1) DC isolator (located in slot I14), and four (4) model 430 flash transfer relays (provide seven (7) model 430 flash transfer relays if auxiliary output file is installed) with each cabinet.

B. Type 170 E Cabinet Electrical Requirements:

Provide a cabinet assembly designed to ensure that upon leaving any cabinet switch or conflict monitor initiated flashing operation, the controller starts up in the programmed start up phases and start up interval.

Furnish two sets of non-fading cabinet wiring diagrams and schematics in a paper envelope or container and placed in the cabinet drawer.

All AC+ power is subject to radio frequency signal suppression.

Provide surge suppression in the cabinet for each type of cabinet device. Provide surge protection for the full capacity of the cabinet input file. Provide surge suppression devices that operate properly over a temperature range of -40° F to +185° F. Ensure the surge suppression devices provide both common and differential modes of protection.

Provide a pluggable power line surge protector that is installed on the back of the PDA (power distribution assembly) chassis to filter and absorb power line noise and switching transients. Ensure the device incorporates LEDs for failure indication and provides a dry relay contact closure for the purpose of remote sensing. Ensure the device meets the following specifications:

- Peak Surge Current (Single pulse, 8x20µs).....20,000A
- Occurrences (8x20µs waveform).....10 minimum @ 20,000A
- Maximum Clamp Voltage.....395VAC
- Operating Current.....15 amps
- Response Time.....< 5 nanoseconds

Provide a loop surge suppressor for each set of loop terminals in the cabinet. Ensure the device meets the following specifications:

- Peak Surge Current (6 times, 8x20µs)
  - (Differential Mode).....400A
  - (Common Mode).....1,000A
- Occurrences (8x20µs waveform).....500 min @ 200A
- Maximum Clamp Voltage
  - (Differential Mode @400A).....35V
  - (Common Mode @1,000A).....35V
- Response Time.....< 5 nanoseconds
- Maximum Capacitance.....35 pF

Provide a data communications surge suppressor for each communications line entering or leaving the cabinet. Ensure the device meets the following specifications:

- Peak Surge Current (Single pulse, 8x20µs).....10,000A
- Occurrences (8x20µs waveform).....100 min @ 2,000A
- Maximum Clamp Voltage.....Rated for equipment protected
- Response Time.....< 1 nanosecond
- Maximum Capacitance.....1,500 pF
- Maximum Series Resistance.....15Ω

Provide a DC signal surge suppressor for each DC input channel in the cabinet. Ensure the device meets the following specifications:

- Peak Surge Current (Single pulse, 8x20µs).....10,000A
- Occurrences (8x20µs waveform).....100 @ 2,000A
- Maximum Clamp Voltage.....30V
- Response Time.....< 1 nanosecond

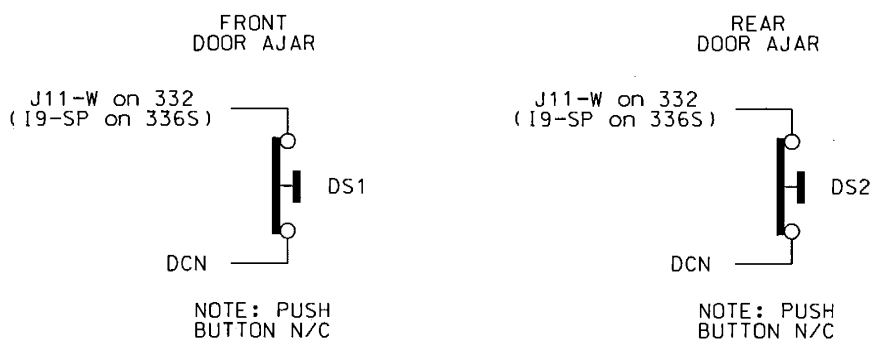
Provide a 120 VAC signal surge suppressor for each AC+ interconnect signal input. Ensure the device meets the following specifications:

- Peak Surge Current (Single pulse, 8x20µs).....20,000A
- Maximum Clamp Voltage.....350VAC
- Response Time.....< 200 nanoseconds
- Discharge Voltage.....<200 Volts @ 1,000A
- Insulation Resistance.....≥100 MΩ

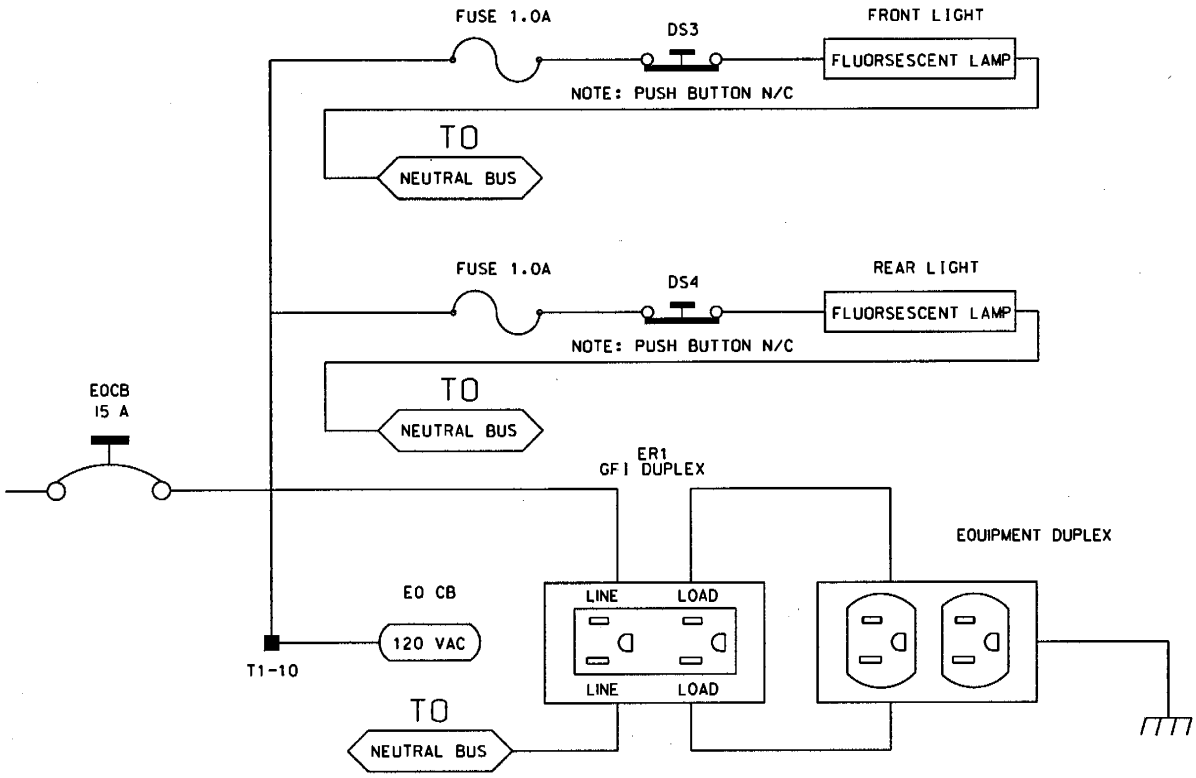
Provide conductors for surge protection wiring that are of sufficient size (ampacity) to withstand maximum overcurrents which could occur before protective device thresholds are attained and current flow is interrupted.

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 minimum 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.

Provide a door switch in the front and a door switch in the rear of the cabinet that will provide the controller unit with a Door Ajar alarm when either the front or the rear door is open. Ensure the door switches apply DC ground to the Input File when either the front door or the rear door is open.



Furnish a fluorescent fixture in the rear across the top of the cabinet and another fluorescent fixture in the front across the top of the cabinet at a minimum. Ensure that the fixtures provide sufficient light to illuminate all terminals, labels, switches, and devices in the cabinet. Conveniently locate the fixtures so as not to interfere with a technician's ability to perform work on any devices or terminals in the cabinet. Provide a protective diffuser to cover exposed bulbs. Install 16 watt T-4 lamps in the fluorescent fixtures. Provide a door switch to provide power to each fixture when the respective door is open. Wire the fluorescent fixtures to the 15 amp ECB (equipment circuit breaker).



Furnish a police panel with a police panel door. Ensure that the police panel door permits access to the police panel when the main door is closed. Ensure that no rainwater can enter the cabinet even with the police panel door open. Provide a police panel door hinged on the right side as viewed from the front. Provide a police panel door lock that is keyed to a standard police/fire call box key. In addition to the requirements of LA Specification No. 54-053-08, provide the police panel with a toggle switch connected to switch the intersection operation between normal stop-and-go operation (AUTO) and manual operation (MANUAL). Ensure that manual control can be implemented using inputs and software such that the controller provides full programmed clearance times for the yellow clearance and red clearance for each phase while under manual control.

Provide a 1/4-inch locking phone jack in the police panel for a hand control to manually control the intersection. Provide sufficient room in the police panel for storage of a hand control and cord.

For model 332 base mounted cabinets, ensure terminals J14-E and J14-K are wired together on the rear of the Input File. Connect TB9-12 (J14 Common) on the Input Panel to T1-2 (AC-) on the rear of the PDA.

Provide detector test switches mounted at the top of the cabinet rack or other convenient location which may be used to place a call on each of eight phases based on the chart below. Provide three positions for each switch: On (place call), Off (normal detector operation), and Momentary On (place momentary call and return to normal detector operation after switch is released). Ensure that the switches are located such that the technician can read the controller display and observe the intersection.

Connect detector test switches for cabinets as follows:

332A Cabinet	
Detector Call Switches	**Terminals**
Phase 1	I1-W
Phase 2	I4-W
Phase 3	I5-W
Phase 4	I8-W
Phase 5	J1-W
Phase 6	J4-W
Phase 7	J5-W
Phase 8	J8-W

Provide the PCB 28/56 connector for the conflict monitor unit (CMU) with 28 independent contacts per side, dual-sided with 0.156 inch contact centers. Provide the PCB 28/56 connector contacts with solder eyelet terminations. Ensure all connections to the PCB 28/56 connector are soldered to the solder eyelet terminations.

Ensure that all cabinets have the CMU connector wired according to the 332 cabinet connector pin assignments (include all wires for auxiliary output file connection). Wire pins 13, 16, R, and U of the CMU connector to a separate 4 pin plug, P1, as shown below. Provide a second plug, P2, which will mate with P1 and is wired to the auxiliary output file as shown below. Provide an additional plug, P3, which will mate with P1 and is wired to the pedestrian yellow circuits as shown below. When no auxiliary output file is installed in the cabinet, provide wires for the green and yellow inputs for channels 11, 12, 17, and 18, the red inputs for channels 17 and 18, and the wires for the P2 plug. Terminate the two-foot wires with ring type lugs, insulated, and bundled for optional use.

	P1		P2		P3	
PIN	**FUNCTION**	**CONN TO**	**FUNCTION**	**CONN TO**	**FUNCTION**	**CONN TO**
1	CH-9G	CMU-13	OLA-GRN	A123	2P-YEL	114
2	CH-9Y	CMU-16	OLA-YEL	A122	4P-YEL	105
3	CH-10G	CMU-R	OLB-GRN	A126	6P-YEL	120
4	CH-10Y	CMU-U	OLB-YEL	A125	8P-YEL	111

Connect the P20 terminal assembly (red monitor board) to a connector installed on the front of the type 2018 enhanced conflict monitor through a 3-1/2 foot 20-wire ribbon cable. Ensure that the ribbon cable connector and the connector on the conflict monitor are keyed to ensure proper connection. Ensure that removal of the P20 ribbon cable will cause the conflict monitor to recognize a latching fault condition and place the cabinet into flashing operation.

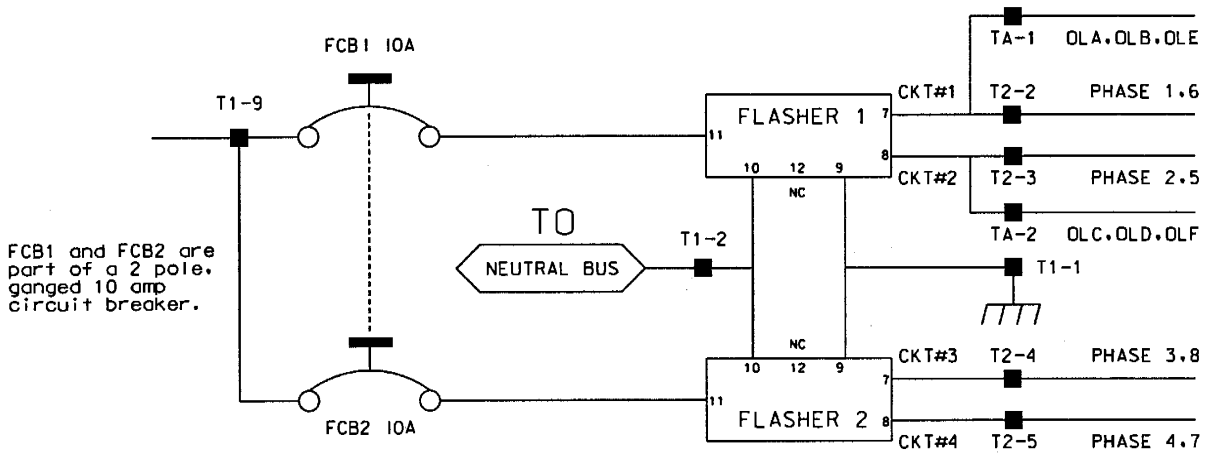
Wire the P20 connector to the traffic signal red displays to provide inputs to the conflict monitor as shown below. Ensure the pedestrian Don't Walk circuits are wired to channels 13 through 16 of the P20 connector. When no auxiliary output file is installed in the cabinet, provide wires for channels 9 through 12 reds. Terminate the two-foot wires with ring type lugs, insulated, and bundled for optional use.

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	GND	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

Ensure the controller unit outputs to the auxiliary output file are pre-wired to the C5 connector. When no auxiliary output file is installed in the cabinet, connect the C5 connector to a storage socket located on the Input Panel or on the rear of the PDA.

In addition to the requirements of LA Specification No. 54-053-08, ensure relay K1 on the Power Distribution Assembly (PDA) is a four pole relay and K2 on the PDA is a two pole relay.

Provide a two pole, ganged circuit breaker for the flash bus circuit. Ensure the flash bus circuit breaker is an inverse time circuit breaker rated for 10 amps at 120 VAC with a minimum of 10,000 RMS symmetrical amperes short circuit current rating. Do not provide the auxiliary switch feature on the flash bus circuit breaker. Ensure the ganged flash bus circuit breaker is certified by the circuit breaker manufacturer to provide gang tripping operation.



Ensure auxiliary output files are wired as follows:

AUXILIARY OUTPUT FILE TERMINAL BLOCK TA ASSIGNMENTS	
POSITION	**FUNCTION**
1	Flasher Unit #1, Circuit 1/FTR1 (OLA, OLB)/FTR3 (OLE)
2	Flasher Unit #1, Circuit 2/FTR2 (OLC, OLD)/FTR3 (OLF)
3	Flash Transfer Relay Coils
4	AC -
5	Power Circuit 5
6	Power Circuit 5
7	Equipment Ground Bus
8	NC

Provide four spare load resistors mounted in each cabinet. Ensure each load resistor is rated as shown in the table below. Wire one side of each load resistor to AC-. Connect the other side of each resistor to a separate terminal on a four (4) position terminal block. Mount the load resistors and terminal block either inside the back of Output File No. 1 or on the upper area of the Service Panel.

ACCEPTABLE LOAD RESISTOR VALUES	
VALUE (ohms)	**WATTAGE**
1.5K – 1.9 K	25W (min)
2.0K – 3.0K	10W (min)

Provide Model 200 load switches, Model 204 flashers, Model 242 DC isolators, Model 252 AC isolators, and Model 206L power supply units that conform to CALTRANS' "*Transportation Electrical Equipment Specifications*" dated March 12, 2009 with Erratum 1.

C. Type 170 E Cabinet Physical Requirements:

Do not mold, cast, or scribe the name "City of Los Angeles" on the outside of the cabinet door as specified in LA Specification No. 54-053-08. Do not provide a Communications Terminal Panel as specified in LA Specification No. 54-053-08. Do not provide terminal block TBB on the Service Panel. Do not provide Cabinet Verification Test Program software or associated test jigs as specified in LA Specification No. 54-053-08.

Furnish unpainted, natural, aluminum cabinet shells. Ensure that all non-aluminum hardware on the cabinet is stainless steel or a Department approved non-corrosive alternate.

Ensure the lifting eyes, gasket channels, police panel, and all supports welded to the enclosure and doors are fabricated from 0.125 inch minimum thickness aluminum sheet and meet the same standards as the cabinet and doors.

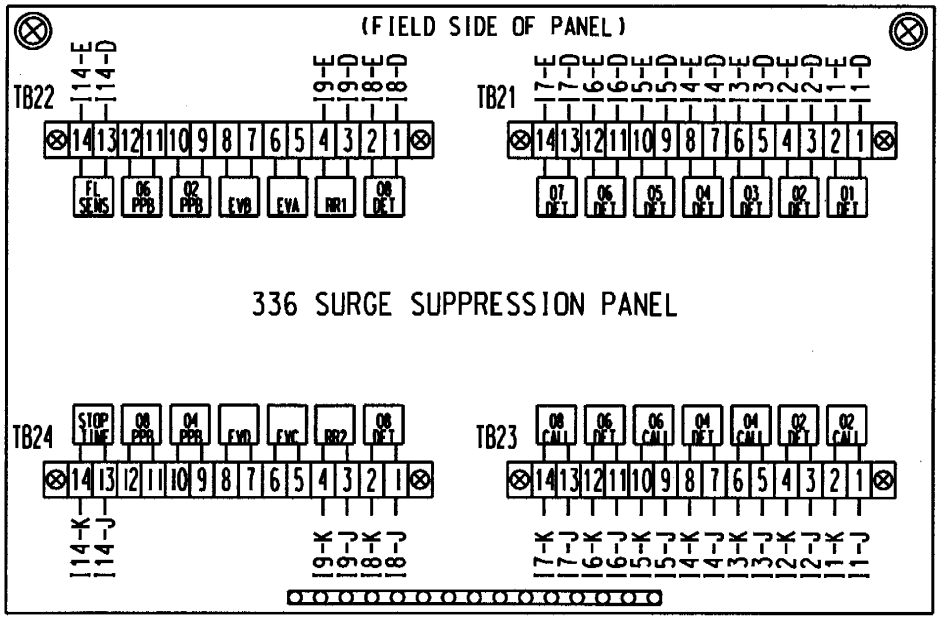
Provide front and rear doors with latching handles that allow padlocking in the closed position. Furnish 0.75 inch minimum diameter stainless steel handles with a minimum 0.5 inch shank. Place the padlocking attachment at 4.0 inches from the handle shank center to clear the lock and key. Provide an additional 4.0 inches minimum gripping length.

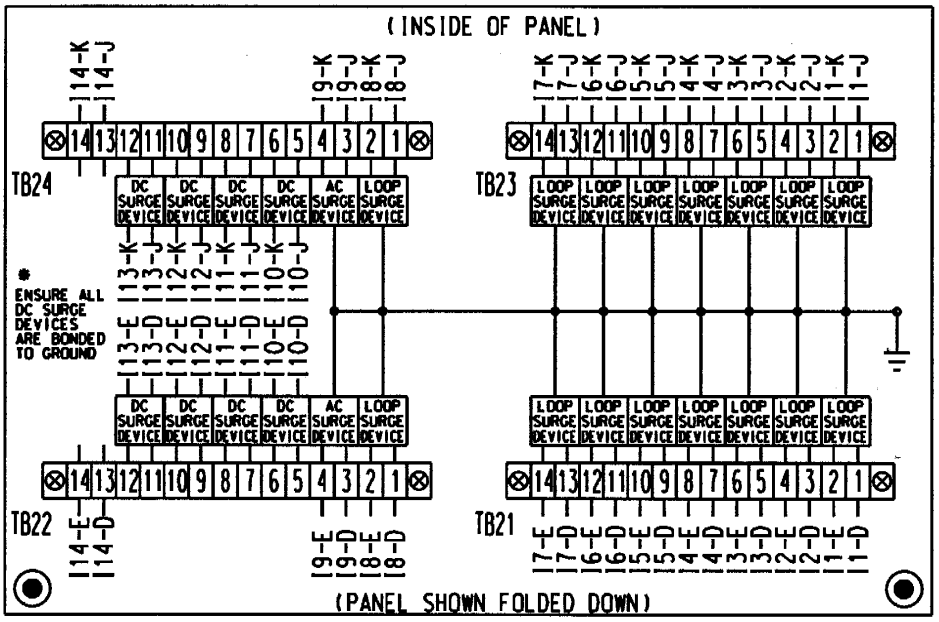
Provide Corbin #2 locks on the front and rear doors. Provide one (1) Corbin #2 and one (1) police master key with each cabinet. Ensure main door locks allow removal of keys in the locked position only.

Provide a surge protection panel with 16 loop surge protection devices and designed to allow sufficient free space for wire connection/disconnection and surge protection device replacement. For model 332 cabinets, provide an additional 20 loop surge protection devices. Provide an additional

two AC+ interconnect surge devices to protect one slot and eight DC surge protection devices to protect four slots. Provide no protection devices on slot I14.

For pole mounted cabinets, mount surge protection devices for the AC+ interconnect inputs, inductive loop detector inputs, and low voltage DC inputs on a swing down panel assembly fabricated from sturdy aluminum. Attach the swing down panel to the bottom rear cabinet rack assembly using thumb screws. Ensure the swing down panel allows for easy removal of the input file without removing the surge protection panel assembly or its parts. Have the surge protection devices mounted horizontally on the panel and soldered to the feed through terminals of four 14 position terminal blocks with #8 screws mounted on the other side. Ensure the top row of terminals is connected to the upper slots and the bottom row of terminals is connected to the bottom slots. Provide a 15 position copper equipment ground bus attached to the field terminal side (outside) of the swing down panel for termination of loop lead-in shield grounds. Ensure that a Number 4 AWG green wire connects the surge protection panel assembly ground bus to the main cabinet equipment ground.





For base mounted cabinets, mount surge protection panels on the left side of the cabinet as viewed from the rear. Attach each panel to the cabinet rack assembly using bolts and make it easily removable. Mount the surge protection devices in vertical rows on each panel and connect the devices to one side of 12 position, double row terminal blocks with #8 screws. For each surge protection panel, terminate all grounds from the surge protection devices on a copper equipment ground bus attached to the surge protection panel. Wire the terminals to the rear of a standard input file using spade lugs for input file protection.

Provide permanent labels that indicate the slot and the pins connected to each terminal that may be viewed from the rear cabinet door. Label and orient terminals so that each pair of inputs is next to

each other. Indicate on the labeling the input file (I or J), the slot number (1-14) and the terminal pins of the input slots (either D & E for upper or J & K for lower).

Provide a minimum 14 x 16 inch pull out, hinged top shelf located immediately below controller mounting section of the cabinet. Ensure the shelf is designed to fully expose the table surface outside the controller at a height approximately even with the bottom of the controller. Ensure the shelf has a storage bin interior which is a minimum of 1 inch deep and approximately the same dimensions as the shelf. Provide an access to the storage area by lifting the hinged top of the shelf. Fabricate the shelf and slide from aluminum or stainless steel and ensure the assembly can support the 2070L controller plus 15 pounds of additional weight. Ensure shelf has a locking mechanism to secure it in the fully extended position and does not inhibit the removal of the 2070L controller or removal of cards inside the controller when fully extended. Provide a locking mechanism that is easily released when the shelf is to be returned to its non-use position directly under the controller.

D. Type 170 E Model 2010 Enhanced Conflict Monitor:

Furnish Model 2018 Enhanced Conflict Monitors that provide monitoring of 18 channels. Ensure each channel consists of a green, yellow, and red field signal input. Ensure that the conflict monitor meets or exceeds CALTRANS' Transportation Electrical Equipment Specifications dated March 12, 2009 with Erratum 1 (hereafter referred to as CALTRANS' 2009 TEES) for a model 210 monitor unit and other requirements stated in this specification.

Ensure the conflict monitor is provided with an 18 channel conflict programming card. Pin EE and Pin T of the conflict programming card shall be connected together. Pin 16 of the conflict programming card shall be floating. Ensure that the absence of the conflict programming card will cause the conflict monitor to trigger (enter into fault mode), and remain in the triggered state until the programming card is properly inserted and the conflict monitor is reset.

Provide a conflict monitor that incorporates LED indicators into the front panel to dynamically display the status of the monitor under normal conditions and to provide a comprehensive review of field inputs with monitor status under fault conditions. Ensure that the monitor indicates the channels that were active during a conflict condition and the channels that experienced a failure for all other per channel fault conditions detected. Ensure that these indications and the status of each channel are retained until the Conflict Monitor is reset. Furnish LED indicators for the following:

- AC Power (Green LED indicator)
- VDC Failed (Red LED indicator)
- WDT Error (Red LED indicator)
- Conflict (Red LED indicator)
- Red Fail (Red LED indicator)
- Dual Indication (Red LED indicator)
- Yellow/Clearance Failure (Red LED indicator)
- PCA/PC Ajar (Red LED indicator)
- Monitor Fail/Diagnostic Failure (Red LED indicator)
- 54 Channel Status Indicators (1 Red, 1 Yellow, and 1 Green LED indicator for each of the 18 channels)

Provide a switch to set the Red Fail fault timing. Ensure that when the switch is in the ON position the Red Fail fault timing value is set to 1350 +/- 150ms (2018 mode). Ensure that when the switch is in the OFF position the Red Fail fault timing value is set to 850 +/- 150ms (210 mode).

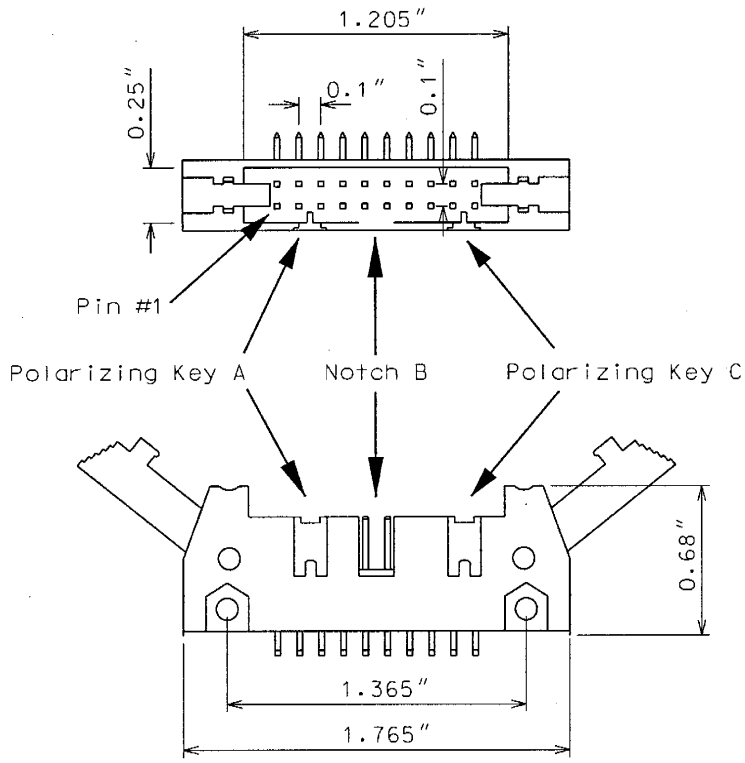
Provide a switch to set the Watchdog fault timing. Ensure that when the switch is in the ON position the Watchdog fault timing value is set to 1.0 +/- 0.1s (2018 mode). Ensure that when the switch is in the OFF position the Watchdog fault timing value is set to 1.5 +/- 0.1s (210 mode).

Provide a jumper or switch to set the AC line brown-out levels. Ensure that when the jumper is present or the switch is in the ON position the AC line dropout voltage threshold is 98 +/- 2 Vrms, the AC line restore voltage threshold is 103 +/- 2 Vrms, and the AC line brown-out timing value is set to 400 +/- 50ms (2018 mode). Ensure that when the jumper is not present or the switch is in the OFF position the AC line dropout voltage threshold is 92 +/- 2 Vrms, the AC line restore voltage threshold is 98 +/- 2 Vrms, and the AC line brown-out timing value is set to 80 +/- 17ms (210 mode).

Provide a jumper or switch that will enable and disable the Watchdog Latch function. Ensure that when the jumper is not present or the switch is in the OFF position the Watchdog Latch function is disabled. In this mode of operation, a Watchdog fault will be reset following a power loss, brownout, or power interruption. Ensure that when the jumper is present or the switch is in the ON position the Watchdog Latch function is enabled. In this mode of operation, a Watchdog fault will be retained until a Reset command is issued.

Provide a jumper that will reverse the active polarity for pin #EE (output relay common). Ensure that when the jumper is not present pin #EE (output relay common) will be considered 'Active' at a voltage greater than 70 Vrms and 'Not Active' at a voltage less than 50 Vrms (Caltrans mode). Ensure that when the jumper is present pin #EE (output relay common) will be considered 'Active' at a voltage less than 50 Vrms and 'Not Active' at a voltage greater than 70 Vrms (Failsafe mode).

In addition to the connectors required by CALTRANS' 2009 TEES, provide the conflict monitor with a red interface connector mounted on the front of the monitor. Ensure the connector is a 20 pin, right angle, male connector with latching clip locks and polarizing keys. Ensure the right angle solder tails are designed for a 0.062" thick printed circuit board. Keying of the connector shall be between pins 3 and 5, and between 17 and 19. Ensure the connector has two rows of pins with the odd numbered pins on one row and the even pins on the other row. Ensure the connector pin row spacing is 0.10" and pitch is 0.10". Ensure the mating length of the connector pins is 0.24". Ensure the pins are finished with gold plating 30μ" thick.



Ensure the red interface connector pins on the monitor have the following functions:

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

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

Provide Special Function 1 and Special Function 2 inputs to the unit which shall disable only Red Fail Monitoring when either input is sensed active. A Special Function input shall be sensed active when the input voltage exceeds 70 Vrms with a minimum duration of 550 ms. A Special Function input shall be sensed not active when the input voltage is less than 50 Vrms or the duration is less than 250 ms. A Special Function input is undefined by these specifications and may or may not be sensed active when the input voltage is between 50 Vrms and 70 Vrms or the duration is between 250 ms and 550 ms.

Ensure the conflict monitor recognizes field signal inputs for each channel that meet the following requirements:

- consider a Red input greater than 70 Vrms and with a duration of at least 500 ms as an "on" condition;
- consider a Red input less than 50 Vrms or with a duration of less than 200 ms as an "off" condition (no valid signal);
- consider a Red input between 50 Vrms and 70 Vrms or with a duration between 200 ms and 500 ms to be undefined by these specifications;
- consider a Green or Yellow input greater than 25 Vrms and with a duration of at least 500 ms as an "on" condition;
- consider a Green or Yellow input less than 15 Vrms or with a duration of less than 200 ms as an "off" condition; and
- consider a Green or Yellow input between 15 Vrms and 25 Vrms or with a duration between 200 ms and 500 ms to be undefined by these specifications.

Provide a conflict monitor that recognizes the faults specified by CALTRANS' 2009 TEES and the following additional faults. Ensure the conflict monitor will trigger upon detection of a fault and will remain in the triggered (in fault mode) state until the unit is reset at the front panel or through the external remote reset input for the following failures:

1. **Red Monitoring or Absence of Any Indication (Red Failure):** A condition in which no "on" 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 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 conflict monitor will not trigger. Red fail monitoring shall be enabled on a per channel basis by the use of switches located on the conflict monitor. Have red monitoring occur when all of the following input conditions are in effect:

   a) 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 and 70 Vrms), and

   b) Neither Special Function 1 nor Special Function 2 inputs are active.

   c) Pin #EE (output relay common) is not active

2. **Short/Missing Yellow Indication Fault (Clearance 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 for a minimum of 2.7 seconds (± 0.1 second) following the detection of an "on" signal at a Green input for that channel, ensure that the monitor triggers and generates a clearance/short yellow error fault indication. Short/missing yellow (clearance) monitoring shall be enabled on a per channel basis by the use of switches located on the conflict monitor. This fault shall not occur when the channel is programmed for Yellow Inhibit, when the Red Enable signal is inactive or pin #EE (output relay common) is active.

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 200 ms, ensure that the monitor does not trigger. G-Y-R dual indication monitoring shall be enabled on a per channel basis by the use of switches located on the conflict monitor.

G-Y dual indication monitoring shall be enabled for all channels by use of a switch located on the conflict monitor. This fault shall not occur when the Red Enable signal is inactive or pin #EE (output relay common) is active.

4. **Configuration Settings Change:** The configuration settings are comprised of (as a minimum) the permissive diode matrix, dual indication switches, yellow disable jumpers, any option switches, any option jumpers, and the Watchdog Enable switch. Ensure the conflict monitor compares the current configuration settings with the previous stored configuration settings on power-up, on reset, and periodically during operation. If any of the configuration settings are changed, ensure that the conflict monitor triggers and causes the program card indicator to flash. Ensure that configuration change faults are only reset by depressing and holding the front panel reset button for a minimum of three seconds. Ensure the external remote reset input does not reset configuration change faults.

Ensure the conflict monitor will trigger and the AC Power indicator will flash at a rate of 2 Hz ± 20% with a 50% duty cycle when the AC Line voltage falls below the "drop-out" level. Ensure the conflict monitor will resume normal operation when the AC Line voltage returns above the "restore" level. Ensure the AC Power indicator will remain illuminated when the AC voltage returns above the "restore" level. Should an AC Line power interruption occur while the monitor is in the fault mode, then upon restoration of AC Line power, the monitor will remain in the fault mode and the correct fault and channel indicators will be displayed.

Provide a flash interval of at least 6 seconds and at most 10 seconds in duration following a power-up, an AC Line interruption, or a brownout restore. Ensure the conflict monitor will suspend all fault monitoring functions, close the Output relay contacts, and flash the AC indicator at a rate of 4 Hz ± 20% with a 50% duty cycle during this interval. Ensure the termination of the flash interval after at least 6 seconds if the Watchdog input has made 5 transitions between the True and False state and the AC Line voltage is greater than the "restore" level. If the watchdog input has not made 5 transitions between the True and False state within 10 ± 0.5 seconds, the monitor shall enter a WDT error fault condition.

Ensure the conflict monitor will monitor an intersection with a minimum of four approaches using the four-section Flashing Yellow Arrow (FYA) vehicle traffic signal as outlined by the NCHRP 3-54 research project for protected-permissive left turn signal displays. Ensure the conflict monitor will operate in the FYA mode and FYAc (Compact) mode as specified below to monitor each channel for the following fault conditions: Conflict, Red Fail, Dual Indication, and Clearance. Provide a switch to select between the FYA mode and FYAc mode. Provide a switch to select each FYA phase movement for monitoring.

FYA mode

FYA Signal Head	Phase 1	Phase 3	Phase 5	Phase 7
Red Arrow	Channel 9 Red	Channel 10 Red	Channel 11 Red	Channel 12 Red
Yellow Arrow	Channel 9 Yellow	Channel 10 Yellow	Channel 11 Yellow	Channel 12 Yellow
Flashing Yellow Arrow	Channel 9 Green	Channel 10 Green	Channel 11 Green	Channel 12 Green
Green Arrow	Channel 1 Green	Channel 3 Green	Channel 5 Green	Channel 7 Green

FYAc mode

FYA Signal Head	Phase 1	Phase 3	Phase 5	Phase 7
Red Arrow	Channel 1 Red	Channel 3 Red	Channel 5 Red	Channel 7 Red
Yellow Arrow	Channel 1 Yellow	Channel 3 Yellow	Channel 5 Yellow	Channel 7 Yellow
Flashing Yellow Arrow	Channel 1 Green	Channel 3 Green	Channel 5 Green	Channel 7 Green
Green Arrow	Channel 9 Green	Channel 9 Yellow	Channel 10 Green	Channel 10 Yellow

Ensure that the conflict monitor will log at least nine of the most recent events detected by the monitor in non-volatile EEPROM memory (or equivalent). For each event, record at a minimum the time, date, type of event, status of each field signal indication with RMS voltage, and specific channels involved with the event. Ensure the conflict monitor will log the following events: monitor reset, configuration, previous fault, and AC line. Furnish the signal sequence log that shows all channel states (Greens, Yellows, and Reds) and the Red Enable State for a minimum of 2 seconds prior to the current fault trigger point. Ensure the display resolution of the inputs for the signal sequence log is not greater than 50 ms.

Provide a RS-232C/D compliant port (DB-9 female connector) on the front panel of the conflict monitor in order to provide communications from the conflict monitor to the 170/2070L controller or to a Department-furnished laptop computer. Electrically isolate the port interface electronics from all monitor electronics, excluding Chassis Ground. Ensure that the controller can receive all event log information through a controller Asynchronous Communications Interface Adapter (Type 170E) or Async Serial Comm Module (2070L). Provide a Windows based graphic user interface software to communicate directly through the same monitor RS-232C/D compliant port to retrieve and view all event log information to a Department-furnished laptop computer. The RS-232C/D compliant port on the monitor shall allow the monitor to function as a DCE device with pin connections as follows:

Conflict Monitor RS-232C/D (DB-9 Female) Pinout		
Pin Number	**Function**	**I/O**
1	DCD	O
2	TX Data	O
3	RX Data	I
4	DTR	I
5	Ground	-
6	DSR	O
7	CTS	I
8	RTS	O
9	NC	-

MONITOR BOARD EDGE CONNECTOR

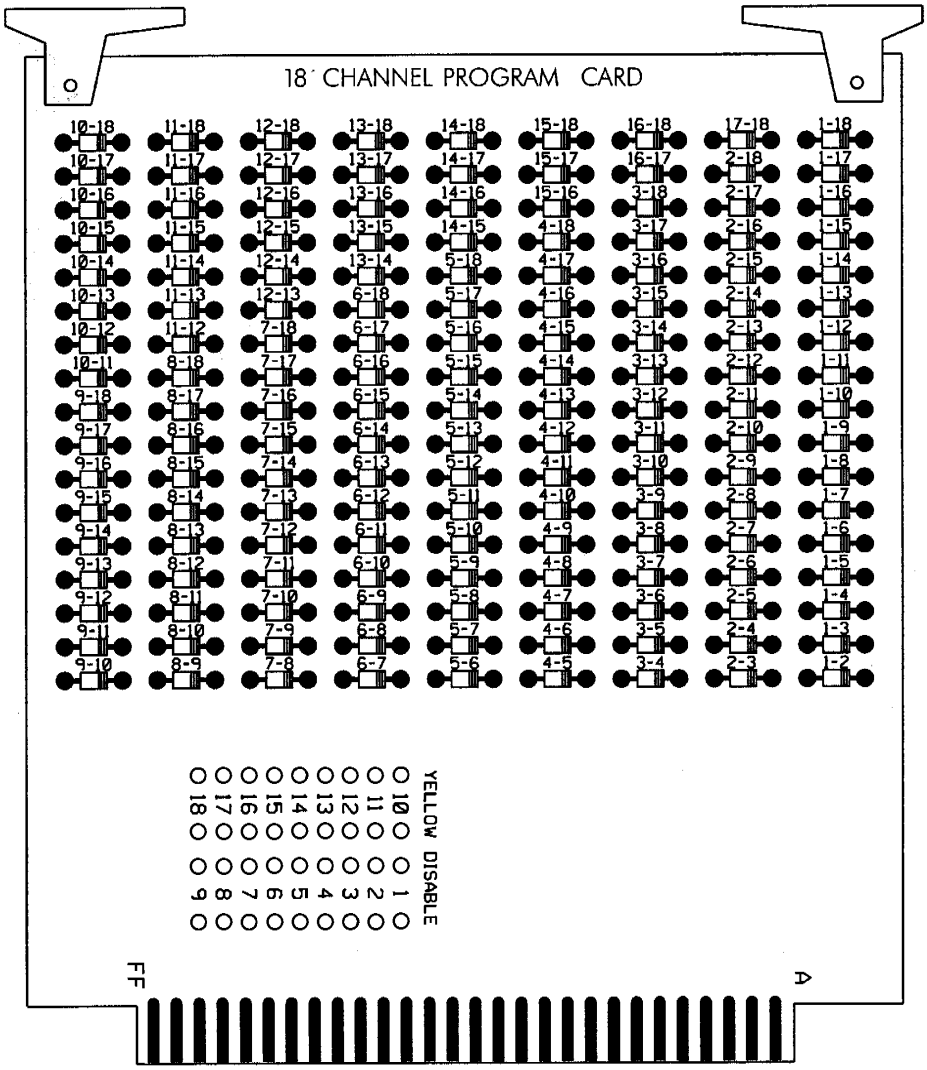
Pin #	Function (Back Side)	Pin #	Function (Component Side)
1	Channel 2 Green	A	Channel 2 Yellow
2	Channel 13 Green	B	Channel 6 Green
3	Channel 6 Yellow	C	Channel 15 Green
4	Channel 4 Green	D	Channel 4 Yellow
5	Channel 14 Green	E	Channel 8 Green
6	Channel 8 Yellow	F	Channel 16 Green
7	Channel 5 Green	H	Channel 5 Yellow
8	Channel 13 Yellow	J	Channel 1 Green
9	Channel 1 Yellow	K	Channel 15 Yellow
10	Channel 7 Green	L	Channel 7 Yellow
11	Channel 14 Yellow	M	Channel 3 Green
12	Channel 3 Yellow	N	Channel 16 Yellow
13	Channel 9 Green	P	Channel 17 Yellow
14	Channel 17 Green	R	Channel 10 Green
15	Channel 11 Yellow	S	Channel 11 Green
16	Channel 9 Yellow	T	Channel 18 Yellow
17	Channel 18 Green	U	Channel 10 Yellow
--		--	
18	Channel 12 Yellow	V	Channel 12 Green
19	Channel 17 Red	W	Channel 18 Red
20	Chassis Ground	X	Not Assigned
21	AC-	Y	DC Common
22	Watchdog Timer	Z	External Test Reset
23	+24VDC	AA	+24VDC
24	Tied to Pin 25	BB	Stop Time (Output)
25	Tied to Pin 24	CC	Not Assigned
26	Not Assigned	DD	Not Assigned
27	Relay Output, Side #3, N.O.	EE	Relay Output,Side #2,Common
28	Relay Output, Side #1, N.C.	FF	AC+

-- Slotted for keying between Pins 17/U and 18/V

CONFLICT PROGRAM CARD PIN ASSIGNMENTS

Pin #	Function (Back Side)	Pin #	Function (Component Side)
1	Channel 2 Green	A	Channel 1 Green
2	Channel 3 Green	B	Channel 2 Green
3	Channel 4 Green	C	Channel 3 Green
4	Channel 5 Green	D	Channel 4 Green
5	Channel 6 Green	E	Channel 5 Green
6	Channel 7 Green	F	Channel 6 Green
7	Channel 8 Green	H	Channel 7 Green
8	Channel 9 Green	J	Channel 8 Green
9	Channel 10 Green	K	Channel 9 Green
10	Channel 11 Green	L	Channel 10 Green
11	Channel 12 Green	M	Channel 11 Green
12	Channel 13 Green	N	Channel 12 Green
13	Channel 14 Green	P	Channel 13 Green
14	Channel 15 Green	R	Channel 14 Green
15	Channel 16 Green	S	Channel 15 Green
16	N/C	T	PC AJAR
17	Channel 1 Yellow	U	Channel 9 Yellow
18	Channel 2 Yellow	V	Channel 10 Yellow
19	Channel 3 Yellow	W	Channel 11 Yellow
20	Channel 4 Yellow	X	Channel 12 Yellow
21	Channel 5 Yellow	Y	Channel 13 Yellow
22	Channel 6 Yellow	Z	Channel 14 Yellow
23	Channel 7 Yellow	AA	Channel 15 Yellow
24	Channel 8 Yellow	BB	Channel 16 Yellow
--		--	
25	Channel 17 Green	CC	Channel 17 Yellow
26	Channel 18 Green	DD	Channel 18 Yellow
27	Channel 16 Green	EE	PC AJAR (Program Card)
28	Yellow Inhibit Common	FF	Channel 17 Green

-- Slotted for keying between Pins 24/BB and 25/CC


18 CHANNEL PROGRAM CARD
10-18 11-18 12-18 13-18 14-18 15-18 16-18 17-18 1-18
10-17 11-17 12-17 13-17 14-17 15-17 16-17 2-18 1-17
10-16 11-16 12-16 13-16 14-16 15-16 3-18 2-17 1-16
10-15 11-15 12-15 13-15 14-15 4-18 3-17 2-16 1-15
10-14 11-14 12-14 13-14 5-18 4-17 3-16 2-15 1-14
10-13 11-13 12-13 6-18 5-17 4-16 3-15 2-14 1-13
10-12 11-12 7-18 6-17 5-16 4-15 3-14 2-13 1-12
10-11 8-18 7-17 6-16 5-15 4-14 3-13 2-12 1-11
9-18 8-17 7-16 6-15 5-14 4-13 3-12 2-11 1-10
9-17 8-16 7-15 6-14 5-13 4-12 3-11 2-10 1-9
9-16 8-15 7-14 6-13 5-12 4-11 3-10 2-9 1-8
9-15 8-14 7-13 6-12 5-11 4-10 3-9 2-8 1-7
9-14 8-13 7-12 6-11 5-10 4-9 3-8 2-7 1-6
9-13 8-12 7-11 6-10 5-9 4-8 3-7 2-6 1-5
9-12 8-11 7-10 6-9 5-8 4-7 3-6 2-5 1-4
9-11 8-10 7-9 6-8 5-7 4-6 3-5 2-4 1-3
9-10 8-9 7-8 6-7 5-6 4-5 3-4 2-3 1-2
YELLOW DISABLE
10 11 12 13 14 15 16 17 18
1 2 3 4 5 6 7 8 9
FF
A

SPECIAL PROVISIONS FOR PROTECTION OF RAILWAY INTEREST
NORFOLK SOUTHERN RAILWAY COMPANY 09/06

14 **INSURANCE**: State Project: R-2241A (34406.2.3) County: Person

A. In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the Prime Contractor will be required to provide coverage conforming to the requirements of the Federal-Aid Policy Guide outlined under 23 CFR 646A for all work to be performed on Railroad right(s) of way by carrying insurance of the following kinds and amounts:

1. **CONTRACTOR'S COMMERCIAL GENERAL LIABILITY INSURANCE:**

The Contractor shall furnish an original and one copy of the certificate of insurance and one certified copy of the policy to the Department as evidence that, with respect to the operations he performs on railroad right of way, he carries regular Commercial General Liability Insurance having a combined single limit of not less than $2,000,000 per occurrence for all loss, damage, cost and expense, including attorneys' fees, arising out of bodily injury liability and property damage liability during the policy period. Said policy shall include explosion, collapse, and underground hazard (XCU) coverage, shall be endorsed to name Railroad specified in item A.2.c. below as an additional insured, and shall include a severability of interests provision.

2. **RAILROAD PROTECTIVE LIABILITY INSURANCE:**

The Contractor shall furnish to the Department an original and one duplicate of the Railroad Protective Liability Insurance having a combined single limit of not less than $2,000,000 each occurrence and $6,000,000 in the aggregate applying separately to each annual period. If the project involves track over which passenger trains operate, the insurance limits required are not less than a combined single limit of $5,000,000 each occurrence and $10,000,000 in the aggregate applying separately to each annual period. Said policy shall provide coverage for all loss, damage or expense arising from bodily injury and property damage liability, and physical damage to property attributed to acts or omissions at the job site.

The standards for the Railroad Protective Liability Insurance are as follows:

a. The insurer must be rated A- or better by A.M. Best Company, Inc.
b. The policy must be written using one of the following combinations of Insurance Services Office ("ISO") Railroad Protective Liability Insurance Form Numbers:
   (1) CG 00 35 01 96 and CG 28 31 10 93; or
   (2) CG 00 35 07 98 and CG 28 31 07 98; or
   (3) CG 00 35 10 01; or

(4) CG 00 35 12 04.

c. The named insured shall read:

Norfolk Southern Railway Company
Three Commercial Place
Norfolk, Virginia 23510-2191
Attn: Director Risk Management

d. The description of operations must appear on the Declarations, must match the project description in this agreement, and must include the appropriate Department project and contract identification numbers.

The Description and Designation shall read:
Construction of US 501 within the railroad right of way in Roxboro for NCDOT Project R-2241A

e. The job location must appear on the Declarations and must include the city, state, and appropriate highway name/number.
f. The name and address of the prime contractor must appear on the Declarations.
g. The name and address of the Department must be identified on the Declarations as the "Involved Governmental Authority or Other Contracting Party."
h. Other endorsements/forms that will be accepted are:
   (1) Broad Form Nuclear Exclusion – Form IL 00 21
   (2) 30-day Advance Notice of Non-renewal or cancellation
   (3) 60- day written notice be given the Department prior to cancellation or change
   (4) Quick Reference or Index Form CL/IL 240
i. Endorsements/forms that are **NOT** acceptable are:
   (1) Any Pollution Exclusion Endorsement except CG 28 31
   (2) Any Punitive or Exemplary Damages Exclusion
   (3) Known injury or Damage Exclusion form CG 00 59
   (4) Any Common Policy Conditions form
   (5) Any other endorsement/form not specifically authorized in item no. 2.h above.

B. If any part of the work is sublet, similar insurance, and evidence thereof as specified in A.1 above, shall be provided by or on behalf of the subcontractor to cover its operations on Railroad's right of way. As an alternative, the Prime Contractor may provide insurance for the subcontractor by means of separate and individual policies.

C. Prior to entry on Railroad right-of-way, the original and one duplicate copy of the Railroad Protective Liability Insurance Policy shall be submitted by the Prime Contractor to the Department at the address below for its review and transmittal to the Railroad. In addition, certificates of insurance evidencing the Prime Contractor's Commercial General Liability Insurance shall be issued to the Railroad and the Department at the addresses

below, and one certified copy of the Prime Contractor's policy is to be forwarded to the Department for its review and transmittal to the Railroad. All policies and certificates of insurance shall state that the insurance coverage will not be suspended, voided, canceled, or reduced in coverage or limits without (30) days advance written notice to Railroad and the Department. No work will be permitted by Railroad on its right-of-way until it has reviewed and approved the evidence of insurance required herein.

DEPARTMENT:
Department of Transportation
Rail Division
C/O Mr. David Hinnant, State Railroad Agent
1556 Mail Service Center
Raleigh, NC 27699-1556

RAILROAD:
Director, Risk Management
Norfolk Southern Railway Company
Three Commercial Place
Norfolk, Virginia 23510-2191

D. The insurance required herein shall not limit the obligations of Department or its Contractors under the terms of this agreement.

E. All insurance herein before specified shall be carried until the final inspection and acceptance of the project, or that portion of the project within railroad right of way, by the Department or, in the case of subcontractors, until the Contractor furnishes a letter to the Engineer stating that the subcontractor has completed his subcontracted work within railroad right of way to the satisfaction of the Contractor and that the Contractor will accomplish any additional work necessary on railroad right of way with his own forces. It is understood that the amounts specified are minimum amounts and that the Contractor may carry insurance in larger amounts if he so desires. As to "aggregate limits", if the insurer establishes loss reserves equal to or in excess of the aggregate limit specified in any of the required insurance policies, Contractor shall immediately notify the Department of Transportation and shall cease all operations until the aggregate limit is reinstated. If the insurer establishes loss reserves equal to or in excess of one/half of the aggregate limit, Contractor shall arrange to restore the aggregate limit to at least the minimum amount stated in these requirements. Any insurance policies and certificates taken out and furnished due to these requirements shall be approved by the Department and the Railroad Company as to form and amount prior to beginning work on railroad right of way.

15. FAILURE TO COMPLY:

A. In the event the Contractor violates or fails to comply with any of the requirements of these Special Provisions:

(1) The Railroad Engineer may require that the Contractor vacate Railroad property.

(2) The Engineer may withhold all monies due the Contractor on monthly statements.

Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Engineer.

16. PAYMENT FOR COST OF COMPLIANCE:

A. No separate payment will be made for any extra cost incurred on account of compliance with these special provisions. All such cost shall be included in prices bid for other items of the work as specified in the payment items.

RAILROAD SITE DATA:

The following information is provided as a convenience to the Contractor. This information is subject to change and the Contractor should contact the Railroad to verify the accuracy. Since this information is shown as a convenience to the Contractor but is subject to change, the Contractor shall have no claims whatsoever against either the Railroad or the Department of Transportation for any delays or additional costs incurred based on changes in this information.

Number of tracks	-	one
Number of trains per day	-	two
Maximum speed of trains	-	ten

Project R-2241A **Person County**

Project Special Provisions
Culverts

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NORTH CAROLINA PROFESSIONAL SEAL 022508 ENGINEER JESSE McARTHUR BAILEY

Jesse McArthur Bailey
11/30/13

PROJECT SPECIAL PROVISIONS
CULVERTS

PROJECT R-2241A **PERSON COUNTY**

OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT AT STATIONS 13+43.400 -L-, 20+86.000 -L- **(2-14-04)**

1.0 GENERAL

This Special Provision covers precast reinforced concrete box culverts intended for the construction of culverts and for the conveyance of storm water.

If the option is indicated on the plans, the submittal of a design for a precast reinforced box culvert in lieu of a cast-in-place culvert is permitted. Provide the size and number of barrels as indicated on the plans. Precast wing walls will not be allowed. For culverts with less than 2 feet (0.6 m) of cover, design the precast culvert sections in accordance with AASHTO M273. Detail the culvert with cast in place wings. Provide a precast box culvert that meets the requirements of Section 1077 and any other applicable parts of the Standard Specifications.

The design of the precast members is the responsibility of the Contractor and is subject to review, comments and approval. Submit two sets of detailed plans for review. Include all details in the plans, including the size and spacing of the required reinforcement necessary to build the precast box culvert. Include checked design calculations for the precast members complying with the latest AASHTO Standard Specifications and requirements detailed herein. Have a North Carolina Registered Professional Engineer check and seal the plans and design calculations. After the plans are reviewed and, if necessary, the corrections made, submit one set of reproducible tracings on 22" x 34" sheets to become the revised contract plans.

A pre-installation meeting is required prior to installation. Representatives from the Contractor, the precast box manufacturer, and the Department should attend this meeting. The precast box manufacturer representative shall be on site during installation.

2.0 PRECAST REINFORCED CONCRETE BOX SECTIONS

A. Types

Precast reinforced concrete box sections manufactured in accordance with this Special Provision are designated by span, rise, and design earth cover.

B. Design

1. Design – The box section dimensions and reinforcement details are subject to the provisions of Section F.

2. Placement of Reinforcement – Provide a 1 inch (25 mm) concrete cover over the circumferential reinforcement subject to the provisions of Section F. Extend the inside circumferential reinforcement into the male portion of the joint and the outside circumferential reinforcement into the female portion of the joint. Detail the clear distance of the end circumferential wires so it is not less than 1/2 inch (13 mm) nor more than 2 inches (51 mm) from the ends of the box section. Assemble reinforcement per the requirements of AASHTO M259, Section 7.3. The exposure of the ends of the wires used to position the reinforcement is not a cause for rejection.

3. Laps and Spacing – Use lap splices for the circumferential reinforcement. Detail the circumferential wires so that the center to center spacing is not less than 2 inches (50 mm) nor more than 4 inches (100 mm). Do not detail the longitudinal wires with a center to center spacing of more than 8 inches (200 mm).

4. The design earth cover is reported on the plans as the elevation difference between the point of maximum fill and the top of the top slab.

C. Joints

1. Produce the precast reinforced concrete box section with male and female ends. Design and form these ends of the box section so, when the sections are laid together, they make a continuous line of box sections with a smooth interior free of appreciable irregularities in the flowline, all compatible with the permissible variations given in Section F. The internal joint formed at the male and female ends of the precast units shall be sealed with either bitumen/butyl sealant or closed-cell neoprene material. The internal joint material shall be installed in accordance with the manufacturer's recommendations. The material shall be shown on the shop drawings when they are submitted for review.

2. Seal the external joint with an outside sealer wrap that is at least 12 inches (300 mm) wide and covers the joint on both the sides and the top of the box section. Use ConWrap CS-212 from Concrete Sealants, Inc., EZ-Wrap from Press-Seal Gasket Corporation, Seal Wrap from Mar-Mac Manufacturing Co., Inc., Cadilloc External Pipe Joint from Cadilloc, or an approved equal for the outside sealer wrap. If the outside sealer wrap is not applied in a continuous strip along the entire joint, a 12 inch (300 mm) minimum lap of the outside sealer wrap is permitted. Before placing the outside sealer wrap, clean and prime the area receiving the outside sealer wrap in accordance with the sealer wrap manufacturer recommendations. The joint wrap

manufacturer installation recommendations shall be included with shop drawings submitted for review. The external joint wrap shall be installed in three pieces, as indicated on Figure 1 below:

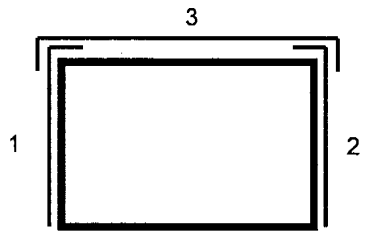

Figure 1

Cover the external joint sealer with a 3 foot (900 mm) strip of filter fabric conforming to Type 4 requirements in Section 1056 of the Standard Specifications. Place multiple lines of a precast reinforced concrete box culvert such that the longitudinal joint between the sections has a minimum width of 3 inches (75 mm). Fill the joint between multiple lines of precast box sections with Class A concrete. Use Class A concrete that meets the requirements listed in the Standard Specifications except that Field Compressive Strength Specimens are not required.

D. Manufacture

Precast box culverts may be manufactured by either the wet cast method or dry cast method.

1. Mixture – In addition to the requirements of Section 1077 of the Standard Specifications, do not proportion the mix with less than 564 lb/yd^3 (335 kg/m^3) of portland cement.

2. Strength – Make sure that all concrete develops a minimum 28-day compressive strength of 5000 psi (34.5 MPa). Movement of the precast sections should be minimized during the initial curing period. Any damage caused by moving or handling during the initial curing phase will be grounds for rejection of that precast section.

3. Air Entrainment – Air entrain the concrete in accordance with Section 1077 - 5(A) of the Standard Specifications. For dry cast manufacturing, air entrainment is not required.

4. Testing – Test the concrete in accordance with the requirements of Section 1077 - 5(B).

5. Handling – Handling devices or holes are permitted in each box section for the purpose of handling and laying. Submit details of handling devices or holes for approval and do not cast any concrete until approval is granted. Remove all handling devices flush with concrete surfaces as directed. Fill holes in a neat and workmanlike manner with an approved non-metallic non-shrink grout, concrete, or hole plug.

E. Physical Requirements

Acceptability of precast culvert sections is based on concrete cylinders made and tested in accordance with AASHTO T22 and AASHTO T23.

F. Permissible Variations

1. Flatness – All external surfaces shall be flat, true, and plumb. Irregularities, depressions, or high spots on all external surfaces shall not exceed 1/2 inch (12 mm) in 8 feet (2.5 meters).

2. Internal Dimensions – Produce sections so that the internal and haunch dimensions do not vary by more than 1/4 inch (6 mm) from the plan dimensions.

3. Adjacent Sections - Internal, external, and haunch dimensions for connecting sections shall not vary by more than 1/2 inch (12 mm).

4. Length of Tongue and Groove – The minimum length of the tongue shall be 4 inches (100 mm). The minimum length of the groove shall be 4 inches (100 mm). The dimensions of the tongue and groove shall not vary by more than 1/4 inch (6 mm) from the plan dimensions.

5. Slab and Wall Thickness – Produce sections so that the slab and wall thickness are not less than that shown on the plans by more than 5% or 3/16 inch (5 mm), whichever is greater. A thickness more than that required on the plans is not a cause for rejection.

6. Length of Opposite Surfaces – Produce sections so that variations in laying lengths of two opposite surfaces of the box section meet the requirements of AASHTO M259, Section 11.3.

7. Length of Section – Produce sections so that the underrun in length of a section is not more than 1/2 inch (13 mm) in any box section.

8. Position of Reinforcement – Produce sections so that the maximum variation in the position of the reinforcement is ±3/8" (±10 mm) for slab and wall thicknesses of 5 inches (125 mm) or less and ±1/2" (±13 mm) for slab and wall thicknesses greater than 5 inches (125 mm). Produce sections so that the concrete cover is never less than 5/8 inch (16 mm) as measured to the internal surface or the external surface. The preceding minimum cover limitations do not apply at the mating surfaces of the joint.

9. Area of Reinforcement – Use the design steel shown on the plans for the steel reinforcement. Steel areas greater than those required are not cause for rejection. The permissible variation in diameter of any wire in finished fabric is prescribed for the wire before fabrication by either AASHTO M32 or M225.

G. Marking

1. Each section shall be match-marked in order of intended installation as indicated on the approved shop drawings. Ensure that pieces fit together neatly and in a workmanlike manner. In order to ensure a good, neat field fit, assemble adjacent sections at the producer's facility and match-mark the pieces. This will require that a minimum of three adjacent sections of the culvert be fitted at the production yard at a time and then match-marked. Once three sections have been match-marked, the first section may be removed for shipment and a fourth section set for marking. Continue in a progressive manner until all sections have been properly match-marked.

2. Clearly mark each section of the box culvert in accordance with AASHTO M259, Section 15.

H. Construction

1. Foundation – Foundation for precast box culvert shall meet the requirements of Section 414 of the Standard Specifications. In addition, Type VI foundation material shall be encapsulated in filter fabric conforming to Type 4 requirements in Section 1056 of the Standard Specifications. The filter fabric shall be placed perpendicular to the culvert barrel. Provide sufficient overhang beyond the excavation to allow a minimum lap of 3 feet (900 mm) when the foundation material is placed and fabric wrapped on top. Perpendicular sections of fabric shall be continuous. A minimum lap of 2 feet (600 mm) shall be provided between sections of fabric.

2. Installation – Sections shall be placed at the beginning of the outlet end of the culvert with the groove end being laid upgrade. Tongue sections shall be laid into the groove sections. Positive means shall be provided to pull each section firmly into the previously placed section so that the joints are tightly homed. Use a "come-along", box pullers or other approved methods to create a positive means of joining box sections. Construction equipment shall not have direct contact with the box section. The load of the box shall be suspended by lifting device during joining procedure.

3. Backfill – Complete backfill in accordance with Section 414 of the Standard Specifications.

3.0 BASIS OF PAYMENT

Any additional cost of redesigning will be paid for by the Contractor if Precast Reinforced Concrete Culvert is used in lieu of the cast-in-place culvert shown on the plans. Except for Foundation Conditioning Material and Culvert Excavation, payment for the Precast Box Culvert will be a lump sum amount equal to the payment that would be allowed for construction of a Cast-in-Place Box Culvert. Plan quantities and unit bid prices will be used to compute the lump sum amount. Such price and payment will be full compensation

for all work covered by this Special Provision, the plans and applicable parts of the Standard Specifications and will include, but not be limited to, furnishing all labor, materials (including all filter fabric), equipment and other incidentals necessary to complete this work. Such price and payment will also be full compensation for concrete, reinforcing steel, labor, equipment and all other related materials necessary for the completion of the barrel section, and the construction of the headwalls, leveling pad, end curtain walls, wings and wing footings.

FALSEWORK AND FORMWORK (4-1-11)

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.

On the drawings, show all information necessary to allow the design of any component to be checked independently as determined by the Engineer.

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.

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. Falsework hangers that support concentrated loads and are installed at the edge of thin top flange concrete girders (such as bulb tee girders) shall be spaced so as not to exceed 75% of the manufacturer's stated safe working load. Use of dual leg hangers (such as Meadow Burke HF-42 and HF-43) are not allowed on concrete girders with thin top flanges. 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.

When staged construction of the bridge deck is required, detail falsework and forms for screed and fluid concrete loads to be independent of any previous deck pour components when the mid-span girder deflection due to deck weight is greater than ¾".

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 or metalize these devices. Electroplating will not be allowed. Any coating required by the Engineer will be considered incidental to the various pay items requiring temporary works.

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 420-16 of the Standard Specifications and these Special Provisions.

Do not remove forms until the concrete has sufficient strength to prevent damage to the surface.

Table 2.2A - Steady State Maximum Wind Speeds by Counties in North Carolina

COUNTY	25 YR (mph) (km/hr)	COUNTY	25 YR (mph) (km/hr)	COUNTY	25 YR (mph) (km/hr)
Alamance	70 (112.7)	Franklin	70 (112.7)	Pamlico	100 (160.9)
Alexander	70 (112.7)	Gaston	70 (112.7)	Pasquotank	100 (160.9)
Alleghany	70 (112.7)	Gates	90 (144.8)	Pender	100 (160.9)
Anson	70 (112.7)	Graham	80 (128.7)	Perquimans	100 (160.9)
Ashe	70 (112.7)	Granville	70 (112.7)	Person	70 (112.7)
Avery	70 (112.7)	Greene	80 (128.7)	Pitt	90 (144.8)
Beaufort	100 (160.9)	Guilford	70 (112.7)	Polk	80 (128.7)
Bertie	90 (144.8)	Halifax	80 (128.7)	Randolph	70 (112.7)
Bladen	90 (144.8)	Harnett	70 (112.7)	Richmond	70 (112.7)
Brunswick	100 (160.9)	Haywood	80 (128.7)	Robeson	80 (128.7)
Buncombe	80 (128.7)	Henderson	80 (128.7)	Rockingham	70 (112.7)
Burke	70 (112.7)	Hertford	90 (144.8)	Rowan	70 (112.7)
Cabarrus	70 (112.7)	Hoke	70 (112.7)	Rutherford	70 (112.7)
Caldwell	70 (112.7)	Hyde	110 (177.0)	Sampson	90 (144.8)
Camden	100 (160.9)	Iredell	70 (112.7)	Scotland	70 (112.7)
Carteret	110 (177.0)	Jackson	80 (128.7)	Stanley	70 (112.7)
Caswell	70 (112.7)	Johnston	80 (128.7)	Stokes	70 (112.7)
Catawba	70 (112.7)	Jones	100 (160.9)	Surry	70 (112.7)
Cherokee	80 (128.7)	Lee	70 (112.7)	Swain	80 (128.7)
Chatham	70 (112.7)	Lenoir	90 (144.8)	Transylvania	80 (128.7)
Chowan	90 (144.8)	Lincoln	70 (112.7)	Tyrell	100 (160.9)
Clay	80 (128.7)	Macon	80 (128.7)	Union	70 (112.7)
Cleveland	70 (112.7)	Madison	80 (128.7)	Vance	70 (112.7)
Columbus	90 (144.8)	Martin	90 (144.8)	Wake	70 (112.7)
Craven	100 (160.9)	McDowell	70 (112.7)	Warren	70 (112.7)
Cumberland	80 (128.7)	Mecklenburg	70 (112.7)	Washington	100 (160.9)
Currituck	100 (160.9)	Mitchell	70 (112.7)	Watauga	70 (112.7)
Dare	110 (177.0)	Montgomery	70(112.7)	Wayne	80 (128.7)
Davidson	70 (112.7)	Moore	70 (112.7)	Wilkes	70 (112.7)
Davie	70 (112.7)	Nash	80 (128.7)	Wilson	80 (128.7)
Duplin	90 (144.8)	New Hanover	100 (160.9)	Yadkin	70 (112.7)
Durham	70 (112.7)	Northampton	80 (128.7)	Yancey	70 (112.7)
Edgecombe	80 (128.7)	Onslow	100 (160.9)		
Forsyth	70 (112.7)	Orange	70 (112.7)		

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.

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.

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.

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 (4-1-11)

1.0 GENERAL

Submit working drawings in accordance with Article 105-2 of the *Standard Specifications* and this provision. For this provision, "submittals" refers to only those listed in this provision. The list of submittals contained herein does not represent a list of required submittals for the project. Submittals are only necessary for those items as required by the contract. Make submittals that are not specifically noted in this provision directly to the Resident Engineer. Either the Structure Design Unit or the Geotechnical Engineering Unit or both units will jointly review submittals.

If a submittal contains variations from plan details or specifications or significantly affects project cost, field construction or operations, discuss the submittal with and submit all copies to the Resident Engineer. State the reason for the proposed variation in the submittal. To minimize review time, make sure all submittals are complete when initially submitted. Provide a contact name and information with each submittal. Direct any questions regarding submittal requirements to the Resident Engineer, Structure Design Unit contacts or the Geotechnical Engineering Unit contacts noted below.

In order to facilitate in-plant inspection by NCDOT and approval of working drawings, provide the name, address and telephone number of the facility where fabrication will actually be done if different than shown on the title block of the submitted working drawings. This includes, but is not limited to, precast concrete items, prestressed concrete items and fabricated steel or aluminum items.

2.0 ADDRESSES AND CONTACTS

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.

Submittals may also be made via email.

Send submittals to:

plambert@ncdot.gov (Paul Lambert)

Send an additional e-copy of the submittal to the following address:

jgaither@ncdot.gov (James Gaither)

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:

Mr. John Pilipchuk, L. G., P. E.
Western Regional Geotechnical Manager
North Carolina Department of Transportation
Geotechnical Engineering Unit
Western Regional Office
5253 Z Max Boulevard
Harrisburg, NC 28075

Via other delivery service:

Mr. John Pilipchuk, L. G., P. E.
Western Region Geotechnical Manager
North Carolina Department of Transportation
Geotechnical Engineering Unit
Western Regional Office
5253 Z Max Boulevard
Harrisburg, NC 28075

The status of the review of structure-related submittals sent to the Structure Design Unit can be viewed from the Unit's web site, via the "Contractor Submittal" link.

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@ncdot.gov

Secondary Structures Contacts:

James Gaither (919) 250 – 4042
David Stark (919) 250 – 4044

Eastern Regional Geotechnical Contact (Divisions 1-7):

K. J. Kim
(919) 662 – 4710
(919) 662 – 3095 facsimile
kkim@ncdot.gov

Western Regional Geotechnical Contact (Divisions 8-14):

John Pilipchuk
(704) 455 – 8902
(704) 455 – 8912 facsimile
jpilipchuk@ncdot.gov

3.0 SUBMITTAL COPIES

Furnish one complete copy of each submittal, including all attachments, to the Resident Engineer. At the same time, submit the number of hard copies shown below of the same complete submittal directly to the Structure Design Unit and/or the Geotechnical Engineering Unit.

The first table below covers "Structure Submittals". The Resident Engineer will receive review comments and drawing markups for these submittals from the Structure Design Unit. The second table in this section covers "Geotechnical Submittals". The Resident Engineer will receive review comments and drawing markups for these submittals from the Geotechnical Engineering Unit.

Unless otherwise required, submit one set of supporting calculations to either the Structure Design Unit or the Geotechnical Engineering Unit unless both units require submittal copies in which case submit a set of supporting calculations to each unit. Provide additional copies of any submittal as directed.

STRUCTURE SUBMITTALS

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 & "Falsework and Formwork"
Box Culvert Falsework [7]	5	0	Plan Note, SN Sheet & "Falsework and Formwork"
Cofferdams	6	2	Article 410-4
Evazote Joint Seals [6]	9	0	"Evazote Joint Seals"
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 [2] (substructure)	8	0	Article 420-3 & "Falsework and Formwork"
Falsework & Forms (superstructure)	8	0	Article 420-3 & "Falsework and Formwork"
Girder Erection over Railroad	5	0	Railroad Provisions
Maintenance and Protection of Traffic Beneath Proposed Structure	8	0	"Maintenance and Protection of Traffic Beneath Proposed Structure at Station ___"
Metal Bridge Railing	8	0	Plan Note
Metal Stay-in-Place Forms	8	0	Article 420-3
Metalwork for Elastomeric Bearings [4,5]	7	0	Article 1072-10
Miscellaneous Metalwork [4,5]	7	0	Article 1072-10
Optional Disc Bearings [4]	8	0	"Optional Disc Bearings"
Overhead Signs	13	0	Article 903-3(C) & Applicable Provisions
Placement of Equipment on Structures (cranes, etc.)	7	0	Article 420-20
Pot Bearings [4]	8	0	"Pot Bearings"
Precast Concrete Box Culverts	2, then 1 reproducible	0	"Optional Precast Reinforced Concrete Box Culvert at Station ___"
Precast Retaining Wall Panels	10	1	Article 1077-2
Prestressed Concrete Cored Slab (detensioning sequences) [3]	6	0	Article 1078-11
Prestressed Concrete Deck Panels	6 and 1 reproducible	0	Article 420-3
Prestressed Concrete Girder (strand elongation and detensioning sequences)	6	0	Articles 1078-8 and 1078-11
Removal of Existing Structure over Railroad	5	0	Railroad Provisions

Revised Bridge Deck Plans (adaptation to prestressed deck panels)	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"
Sound Barrier Wall Casting Plans	10	0	Article 1077-2 & "Sound Barrier Wall"
Sound Barrier Wall Steel Fabrication Plans [5]	7	0	Article 1072-10 & "Sound Barrier Wall"
Structural Steel [4]	2, then 7	0	Article 1072-10
Temporary Detour Structures	10	2	Article 400-3 & "Construction, Maintenance and Removal of Temporary Structure at Station ____"
TFE Expansion Bearings [4]	8	0	Article 1072-10

FOOTNOTES

1. References are provided to help locate the part of the contract where the submittals are required. References in quotes refer to the provision by that name. Articles and subarticles refer to the *Standard Specifications*.
2. Submittals for these items are necessary only when required by a note on plans.
3. Submittals for these items may not be required. A list of pre-approved sequences is available from the producer or the Materials & Tests Unit.
4. The fabricator may submit these items directly to the Structure Design Unit.
5. The two sets of preliminary submittals required by Article 1072-10 of the *Standard Specifications* are not required for these items.
6. Submittals for Fabrication Drawings are not required. Submittals for Catalogue Cuts of Proposed Material are required. See Section 5.A of the referenced provision.
7. Submittals are necessary only when the top slab thickness is 18" or greater.

GEOTECHNICAL SUBMITTALS

Submittal	Copies Required by Geotechnical Engineering Unit	Copies Required by Structure Design Unit	Contract Reference Requiring Submittal [1]
Drilled Pier Construction Plans [2]	1	0	"Drilled Piers"
Crosshole Sonic Logging (CSL) Reports [2]	1	0	"Crosshole Sonic Logging" & "Drilled Piers"
Pile Driving Equipment Data Form [2,3]	1	0	Article 450-5 & "Piles"
Pile Driving Analyzer (PDA) Reports [2]	1	0	"Pile Driving Analyzer" & "Piles"
Retaining Walls [4]	8	2	Applicable Provisions
Contractor Designed Shoring [4]	7	2	"Temporary Shoring", "Anchored Temporary Shoring" & "Temporary Soil Nail Walls"

FOOTNOTES

1. References are provided to help locate the part of the contract where the submittals are required. References in quotes refer to the provision by that name. Articles refer to the *Standard Specifications*.

2. Submit one hard copy of submittal to the Resident or Bridge Maintenance Engineer. Submit a second copy of submittal electronically (PDF via email) or by facsimile, US mail or other delivery service to the Geotechnical Engineering Unit. Electronic submission is preferred.

3. Download Pile Driving Equipment Data Form from the following link:
   www.ncdot.org/doh/preconstruct/highway/geotech/formdet/
   See second page of form for submittal instructions.

4. Electronic copies of submittal are required. See referenced provision.

CRANE SAFETY (8-15-05)

Comply with the manufacturer specifications and limitations applicable to the operation of any and all cranes and derricks. Prime contractors, sub-contractors, and fully operated rental companies shall comply with the current Occupational Safety and Health Administration regulations (OSHA).

Submit all items listed below to the Engineer prior to beginning crane operations involving critical lifts. A critical lift is defined as any lift that exceeds 75 percent of the manufacturer's crane chart capacity for the radius at which the load will be lifted or requires the use of more than one crane. Changes in personnel or equipment must be reported to the Engineer and all applicable items listed below must be updated and submitted prior to continuing with crane operations.

CRANE SAFETY SUBMITTAL LIST

A. **Competent Person:** Provide the name and qualifications of the "Competent Person" responsible for crane safety and lifting operations. The named competent person will have the responsibility and authority to stop any work activity due to safety concerns.

B. **Riggers:** Provide the qualifications and experience of the persons responsible for rigging operations. Qualifications and experience should include, but not be limited to, weight calculations, center of gravity determinations, selection and inspection of sling and rigging equipment, and safe rigging practices.

C. **Crane Inspections:** Inspection records for all cranes shall be current and readily accessible for review upon request.

D. **Certifications:** **By July 1, 2006**, crane operators performing critical lifts shall be certified by NC CCO (National Commission for the Certification of Crane Operators), or satisfactorily complete the Carolinas AGC's Professional Crane Operator's Proficiency Program. Other approved nationally accredited programs will be considered upon request. All crane operators shall also have a current CDL medical card. Submit a list of anticipated critical lifts and corresponding crane operator(s). Include current certification for the type of crane operated (small hydraulic, large hydraulic, small lattice, large lattice) and medical evaluations for each operator.

GROUT FOR STRUCTURES (7-12-07)

1.0 DESCRIPTION

This special provision addresses grout for use in structures, including continuous flight auger (CFA) piles, micropiles, soil nail and anchored retaining walls and backfilling crosshole sonic logging (CSL) tubes or grout pockets, shear keys, dowel holes and recesses for cored slabs and box beams. This provision does not apply to grout placed in post-tensioning ducts for bridge beams, girders, or decks. Provide grout composed of portland

cement, water and at the Contractor's option, fine aggregate and/or pozzolan. If necessary, use set controlling admixtures. Proportion, mix and place grout in accordance with the plans, the applicable section of the *Standard Specifications* or special provision for the application and this provision.

2.0 MATERIALS

Refer to Division 10 of the *Standard Specifications*:

Item	Article
Portland Cement	1024-1
Water	1024-4
Fine Aggregate	1014-1
Fly Ash	1024-5
Ground Granulated Blast Furnace Slag	1024-6
Admixtures	1024-3

At the Contractor's option, use an approved packaged grout in lieu of the materials above with the exception of the water. Contact the Materials and Tests (M&T) Unit for a list of approved packaged grouts. Consult the manufacturer to determine if the packaged grout selected is suitable for the application and meets the compressive strength and shrinkage requirements.

3.0 REQUIREMENTS

Unless required elsewhere in the Contract, provide non-metallic grout with minimum compressive strengths as follows:

Property	Requirement
Compressive Strength @ 3 days	2500 psi (17.2 MPa)
Compressive Strength @ 28 days	4500 psi (31.0 MPa)

For applications other than micropiles, soil nails and ground anchors, use non-shrink grout with shrinkage of less than 0.15%.

When using approved packaged grout, a grout mix design submittal is not required. Submit grout mix designs in terms of saturated surface dry weights on M&T Form 312U in accordance with the applicable section of the *Standard Specifications* or special provision for the structure. Use an approved testing laboratory to determine the grout mix proportions. Adjust proportions to compensate for surface moisture contained in the aggregates at the time of mixing. Changes in the saturated surface dry mix proportions will not be permitted unless a revised grout mix design submittal is accepted.

For each grout mix design, provide laboratory test results for compressive strength, density, flow and if applicable, aggregate gradation and shrinkage. Submit compressive strength for at least 3 cube and 2 cylinder specimens at the age of 3, 7, 14 and 28 days for a total of at least 20 specimens tested. Perform laboratory tests in accordance with the following:

Property	Test Method
Compressive Strength	AASHTO T106 and T22
Density	AASHTO T133
Flow for Sand Cement Grout	ASTM C939 (as modified below)
Flow for Neat Cement Grout (no fine aggregate)	Marsh Funnel and Cup API RP 13B-1, Section 2.2
Aggregate Gradation for Sand Cement Grout	AASHTO T27
Shrinkage for Non-shrink Grout	ASTM C1090

When testing grout for flow in accordance with ASTM C939, modify the flow cone outlet diameter from ½ to ¾ inch (13 to 19 mm).

When grout mix designs are submitted, the Engineer will review the mix designs and notify the Contractor as to their acceptability. Do not use grout mix designs until written acceptance has been received. Acceptance of grout mix designs or use of approved packaged grouts does not relieve the Contractor of responsibility to furnish a product that meets the Contract requirements.

Upon written request from the Contractor, a grout mix design accepted and used satisfactorily on a Department project may be accepted for use on other projects.

4.0 SAMPLING AND PLACEMENT

The Engineer will determine the locations to sample grout and the number and type of samples collected for field and laboratory testing. Use API RP 13B-1 for field testing grout flow and density of neat cement grout. The compressive strength of the grout will be considered the average compressive strength test results of 3 cube or 2 cylinder specimens at 28 days.

Do not place grout if the grout temperature is less than 50°F (10°C) or more than 90°F (32°C) or if the air temperature measured at the location of the grouting operation in the shade away from artificial heat is below 40°F (4°C).

Provide grout at a rate that permits proper handling, placing and finishing in accordance with the manufacturer's recommendations unless directed otherwise by the Engineer. Use grout free of any lumps and undispersed cement. Agitate grout continuously before placement.

Control grout delivery so the interval between placing batches in the same component does not exceed 20 minutes. Place grout before the time between adding the mixing water and placing the grout exceeds that in the table below.

ELAPSED TIME FOR PLACING GROUT (with continuous agitation)		
Air or Grout Temperature Whichever is Higher	**Maximum Elapsed Time**	
	No Set Retarding Admixture Used	**Set Retarding Admixture Used**
90°F (32°C) or above	30 min.	1 hr. 15 min.
80°F (27°C) through 89°F (31°C)	45 min.	1 hr. 30 min.
79°F (26°C) or below	60 min.	1 hr. 45 min.

5.0 MISCELLANEOUS

Comply with Articles 1000-9 through 1000-12 of the *Standard Specifications* to the extent applicable for grout in lieu of concrete.

CURING CONCRETE **(6-12-09)**

The 2006 Standard Specifications shall be revised as follows:

Replace the first paragraph of Section **420-15(A) – Curing Concrete – General** with the following:

Unless otherwise specified in the contract, use any of the following methods except for membrane curing compounds on bridge deck and approach slab, or on concrete which is to receive epoxy protective coating in accordance with 420-18. Advise the Engineer in advance of the proposed method. Have all material, equipment, and labor necessary to promptly apply the curing on the site before placing any concrete. Cure all patches in accordance with this article. Improperly cured concrete is considered defective.

Replace the third paragraph of Section **420-15(C) – Curing Concrete – Membrane Curing Compound Method** with the following:

Seal the surface with a single uniform coating of the specified type of curing compound applied at the rate of coverage recommended by the manufacturer or as directed, but not less than 1 gallon per 150 square feet of surface area.

PROJECT SPECIAL PROVISION

(10-18-95) Z-1

PERMITS

The Contractor's attention is directed to the following permits, which have been issued to the Department of Transportation by the authority granting the permit.

PERMIT	AUTHORITY GRANTING THE PERMIT
Dredge and Fill and/or Work in Navigable Waters (404)	U. S. Army Corps of Engineers
Water Quality (401)	Division of Environmental Management, DENR State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-14 of the *Standard Specifications* and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the Engineer to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.

R-2

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

RECEIVED
AUG 31 2012
PDEA-OFFICE OF NATURAL ENVIRONMENT

REPLY TO
ATTENTION OF

August 27, 2012

Regulatory Division/1145b

SUBJECT: Action ID 2009-00439; TIP No. R-2241A

Mr. Gregory J. Thorpe, Ph.D
North Carolina Department of Transportation
Division of Highways
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Dr. Thorpe:

Reference the Department of the Army permit issued to the North Carolina Department of Transportation (NCDOT) on June 6, 2012, to authorize the discharge of fill material into waters of the United States, for construction of Section A of the US 501 improvements (TIP No. R-2241A), from NC 49 in Roxboro to SR 1602 (Jesse Banks Road), in Person County, North Carolina. Also, please reference your July 30, 2012, letter requesting modification of the permit for a net decrease of permanent loss impacts to streams with more than minimal function, an increase of streambank stabilization impacts, and a net decrease of temporary impacts to streams. These changes in impacts result from design modifications to provide additional necessary stream bank protection, re-calculation of impacts, and necessary relocation of a natural gas pipeline main. Additional mitigation is not proposed because the revisions result in a net decrease of permanent loss impacts to streams with more than minimal function.

We have reviewed the requested modification, and determined that it is appropriate and reasonable, and that no public notice is required for this modification. Therefore, the permit is hereby modified to include the changes listed and shown in the modified drawings in the July 30, 2012, modification request, for a net decrease of permanent loss impacts to streams with more than minimal function of 12 linear feet, an increase of stream bank stabilization impacts of 86 linear feet, and a net decrease of temporary impacts to streams of 86 linear feet, and to include the revised mitigation requirement below. This section of the project will now permanently impact 3,381 linear feet of streams (including 3,184 linear feet of stream with more than minimal function) and 2.38 acre of wetlands, impact 525 linear feet of streams for stream bank stabilization, and temporarily impact 772 linear feet of streams.

k) In order to compensate for permanent losses of 3,184 linear feet of stream with more than minimal function, and 2.38 acres of wetlands, the permittee shall make payment to the North Carolina Ecosystem Enhancement Program (NCEEP) in the amount determined by the NCEEP, sufficient to perform the restoration of 6,364 linear feet of warm water stream

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and 5.76 acres of riparian non-riverine wetlands in the Lower Dan River Basin, Cataloging Unit 03010104. Construction within jurisdictional areas on the property shall begin only after the permittee has made full payment to the NCEEP and provided a copy of the payment documentation to the Corps, and the NCEEP has provided written confirmation to the Corps that it agrees to accept responsibility for the mitigation work required, in compliance with the NCEEP In-Lieu Fee Instrument, approved by the United States Army Corps of Engineers, Wilmington District on July, 28, 2010.

All other conditions of the previously modified permit, including the permit expiration date of December 31, 2017, remain applicable.

Should you have any questions, please call Mr. Eric Alsmeyer at (919) 554-4884, extension 23.

Sincerely,

Andrew Williams for Steven A. Baker

Steven A. Baker
Colonel, U.S. Army
District Commander

Copies Furnished:

Ms. Amy Chapman
Division of Water Quality
North Carolina Department of
Environment and Natural Resources
1650 Mail Service Center
Raleigh, NC 27699-1650

Mr. Clarence Coleman
Federal Highway Administration
310 New Bern Ave., Room 410
Raleigh, North Carolina 27601-1442

Mr. J.W. Bowman, PE, Division Engineer
North Carolina Department of Transportation
Division of Highways
2612 North Duke Street
Durham, North Carolina 27704

Ms. Beth Harmon
North Carolina Ecosystem Enhancement Program
(by e-mail)

R-5

RECEIVED
JUN 06 2012
REG. WILM. FLD. OFC.

DEPARTMENT OF THE ARMY PERMIT

Permittee: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ATTN: DR. GREGORY J. THORPE, PH.D.

Permit No: SAW- 2009-00439

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 the office acting under the authority of the commanding officer.

You are authorized to perform work in the accordance with the terms and conditions specified below.

Project Description: The proposed project includes 4.5 mile of improvements to existing US 501 and NC 49, to make a multilane roadway facility from NC 49 in Roxboro to SR 1602 (Jesse Banks Road) (TIP No. R-2241A). Impacts to waters of the United States (streams and wetlands) will be from roadway fills and mechanized clearing, new and replacement pipe and box culverts, riprap bank protection, and a utility line crossing (water and sewer). The project will permanently impact 3,832 linear feet of streams at fifteen sites, and 2.38 acre of wetlands at eleven sites. Additional temporary impacts are also proposed to 858 linear feet of stream at fourteen sites.

Project Location: US 501 (TIP No. R-2241A), from NC 49 in Roxboro to SR 1602 (Jesse Banks Road), in Person County, North Carolina. The project starts at approximately Latitude 36.4098 N, Longitude 78.9724 W, and ends at Latitude 36.4535 N, Longitude 78.9247 W.

Permit Conditions:

General Conditions:

1. The time Limit for completing the work authorized ends on December 31, 2017. 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 Conditions 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 eligible for listing in the National Register of Historic Places.

4. If you sell the property associate 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 ATTACHED SPECIAL CONDITIONS

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.

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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 mad 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 33CFR 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 measure 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.

06/04/2012

(PERMITTEE) NORTH CAROLINA DEPARTMENT OF TRANSPORTATION *(DATE)*
ATTN: DR. GREGORY J. THORPE, PH.D.

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

6 June 2012

(DISTRICT ENGINEER) STEVEN A. BAKER, COLONEL *(DATE)*

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
ACTION ID SAW-2009-00439
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION - TIP R-2241A

Work Limits

a) All work authorized by this permit must be performed in strict compliance with the attached plans, which are a part of this permit. Any modification to these plans must be approved by the US Army Corps of Engineers (USACE) prior to implementation.

b) Except as authorized by this permit or any USACE approved modification to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands. This permit does not authorize temporary placement or double handling of excavated or fill material within waters or wetlands outside the permitted area. This prohibition applies to all borrow and fill activities connected with this project.

c) Except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters or wetlands.

Related Laws

d) All mechanized equipment will be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. In the event of a spill of petroleum products or any other hazardous waste, the permittee shall immediately report it to the N.C. Division of Water Quality at (919) 807-6308 or (800) 858-0368 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act will be followed.

Project Maintenance

* e) The permittee shall advise the Corps in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit.

f) Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source and will be clean and free of any pollutants except in trace quantities. Metal products, organic materials (including debris from land clearing activities), or unsightly debris will not be used.

g) 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

SPECIAL CONDITIONS
ACTION ID SAW-2009-00439
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION - TIP R-2241A

maintenance of this project with a copy of this permit. A copy of this permit, including all conditions, shall be available at the project site during construction and maintenance of this project.

h) The permittee shall employ all sedimentation and erosion control measures necessary to prevent an increase in sedimentation or turbidity within waters and wetlands outside the permit area. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project must remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4).

i) The permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.

Enforcement

j) Violations of these conditions or violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act must be reported in writing to the Wilmington District U.S. Army Corps of Engineers within 24 hours of the permittee's discovery of the violation.

modified, see attached Aug 27, 2012

Mitigation

k) In order to compensate for permanent losses of 3,196 linear feet of stream with more than minimal function/, and 2.38 acres of wetlands, the permittee shall make payment to the North Carolina Ecosystem Enhancement Program (NCEEP) in the amount determined by the NCEEP, sufficient to perform the restoration of 6,392 linear feet of warm water stream and 5.76 acres of riparian non-riverine wetlands in the Lower Dan River Basin, Cataloging Unit 03010104. Construction within jurisdictional areas on the property shall begin only after the permittee has made full payment to the NCEEP and provided a copy of the payment documentation to the Corps, and the NCEEP has provided written confirmation to the Corps that it agrees to accept responsibility for the mitigation work required, in compliance with the NCEEP In-Lieu Fee Instrument, approved by the United States Army Corps of Engineers, Wilmington District on July, 28, 2010.

R-10

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: **North Carolina Department of Transportation**	File Number: **SAW-2009-00439**	Date: **May 23, 2012**

Attached is:	See Section below
☒ INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
☐ PROFFERED PERMIT (Standard Permit or Letter of permission)	B
☐ PERMIT DENIAL	C
☐ APPROVED JURISDICTIONAL DETERMINATION	D
☐ PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT		
REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)		
ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.		
POINT OF CONTACT FOR QUESTIONS OR INFORMATION:		
If you have questions regarding this decision and/or the appeal process you may contact: **District Engineer, Wilmington Regulatory Div.** **Attn: Mr. Eric Alsmeyer** **3331 Heritage Trade Drive** **Raleigh, North Carolina 27587** **Phone: (919) 554-4884, extension 23**	If you only have questions regarding the appeal process you may also contact: **Mr. Jason Steele, Administrative Appeal Review Officer** **CESAD-PDO** **U.S. Army Corps of Engineers, South Atlantic Division** **60 Forsyth Street, Room 10M15** **Atlanta, Georgia 30303-8801** **Phone: (404) 562-5137**	
RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.		
_____ Signature of appellant or agent.	Date:	Telephone number:

For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, Attn: Eric Alsmeyer, 69 Darlington Avenue, Wilmington, North Carolina 28403

For Permit denials, Proffered Permits and approved Jurisdictional Determinations send this form to:

Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Jason Steele, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801
Phone: (404) 562-5137

R-12

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality
Charles Wakild, P.E
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

RECEIVED
AUG 16 2012
DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

August 13, 2012

Dr. Greg Thorpe, PhD., Manager
Project Development and Environmental Analysis
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina, 27699-1548

Subject: MODIFICATION to 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for Proposed improvements to US 501 North in Person County, Federal Aid Project No. STP-501(1), State Project No. 34406.2.3, TIP No. R-2241A. NCDWQ Project No. 20120073 version 2.

Dear Dr. Thorpe:

Attached hereto is a modification of Certification No. 3910 issued to The North Carolina Department of Transportation (NCDOT) dated March 23, 2012.

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

Sincerely,

for Charles Wakild
Director

Attachments

cc: Eric Alsmeyer, US Army Corps of Engineers, Raleigh Field Office
Chris Murray, Division 5 Environmental Officer
Beth Harmon, Ecosystem Enhancement Program
Rachelle Beauregard, NCDOT Natural Environment Unit
File Copy

Transportation and Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1617
Location: 512 N. Salisbury St. Raleigh, North Carolina 27604
Phone: 919-807-6300 \ FAX: 919-807-6492
Internet: www.ncwaterquality.org

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R-13

MODIFICATION to 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (NCDWQ) Regulations. This certification authorizes the NCDOT to impact 2.39 acres of jurisdictional wetlands and 4,310 linear feet of jurisdictional streams in Person County. The project shall be constructed pursuant to the application dated received January 26, 2012. The authorized impacts are as described below:

Additional (or Decrease) to Stream Impacts in the Roanoke River Basin

Site	Permanent Fill in Intermittent Stream (linear ft)	Temporary Impacts to Intermittent Stream (linear ft)	Riprap Stabilization to Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Impacts to Perennial Stream (linear ft)	Riprap Stabilization to Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
1	0	0	0	0	+ 2	0	+ 2	0
6	0	- 10	+ 7	0	0	0	- 3	0
11	0	0	0	0	- 17	+16	-1	+16
17	0	0	0	- 2	- 39	+31	- 10	+ 29
18	0	0	0	- 10	- 22	+ 32	0	+ 22
Total	**0**	**- 10**	**+ 7**	**- 12**	**- 76**	**+ 79**	**- 14**	**+ 67**

Total Additional Stream Impact for Project: -14 linear feet

The application provides adequate assurance that the discharge of fill material into the waters of the Roanoke 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 dated received January 26, 2012 and modification request received August 2, 2012. Should your project change, you are required to notify the NCDWQ and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Conditions of Certification:

* 1. Compensatory mitigation for 3,626 linear feet of impact to streams in the Roanoke River Basin is now required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Ecosystem Enhancement Program (EEP), and that the EEP has agreed to implement the mitigation for the project. EEP has indicated in a letter dated January 17, 2012 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the EEP Mitigation Banking Instrument signed July 28, 2010.

2. All other conditions in the first version of this Certification dated April 5, 2012 for this project still apply.

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 you wish to contest any statement in the attached Certification you must file a petition for an administrative hearing. You may obtain the petition form from the office of Administrative hearings. You must file the petition with the office of Administrative Hearings within sixty (60) days of receipt of this notice. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

The petition may be faxed-provided the original and one copy of the document is received by the Office of Administrative Hearings within five (5) business days following the faxed transmission.
The mailing address for the Office of Administrative Hearings is:

Office of Administrative Hearings
6714 Mail Service Center
Raleigh, NC 27699-6714
Telephone: (919)-733-2698, Facsimile: (919)-733-3478

A copy of the petition must also be served on DENR as follows:

Ms. Mary Penny Thompson, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, NC 27699-1601

This the 13th day of August 2012

DIVISION OF WATER QUALITY

for Charles Wakild
Director

WQC No. 3910

R-15

NCDENR

North Carolina Department of Environment and Natural Resources
Division of Water Quality
Charles Wakild, P.E
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

April 5, 2012

RECEIVED
Division of Highways
APR 12 2012
Preconstruction
Project Development and
Environmental Analysis Branch

Dr. Greg Thorpe, PhD., Manager
Project Development and Environmental Analysis
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina, 27699-1548

Subject: CORRECTION to 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for Proposed improvements to US 501 North in Person County, Federal Aid Project No. STP-501(1), State Project No. 34406.2.3, TIP No. R-2241A. NCDWQ Project No. 20120073

Dear Dr. Thorpe:

Attached hereto is a corrected copy of Certification No. 3910 issued to The North Carolina Department of Transportation (NCDOT) dated March 23, 2012.

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

Sincerely,

Robert Rudisill

for Charles Wakild
Director

Attachments

cc: Eric Alsmeyer, US Army Corps of Engineers, Raleigh Field Office
Chris Murray, Division 5 Environmental Officer
Beth Harmon, Ecosystem Enhancement Program
Rachelle Beauregard, NCDOT Natural Environment Unit
File Copy

Transportation and Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1617
Location: 512 N. Salisbury St. Raleigh, North Carolina 27604
Phone: 919-807-6300 \ FAX: 919-807-6492
Internet: www.ncwaterquality.org

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R-16

401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (NCDWQ) Regulations. This certification authorizes the NCDOT to impact 2.39 acres of jurisdictional wetlands and 4,310 linear feet of jurisdictional streams in Person County. The project shall be constructed pursuant to the application dated received January 26, 2012. The authorized impacts are as described below:

Stream Impacts in the Roanoke River Basin

Site	Permanent Fill in Intermittent Stream (linear ft)	Temporary Impacts to Intermittent Stream (linear ft)	Riprap Stabilization to Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Impacts to Perennial Stream (linear ft)	Riprap Stabilization to Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
1	0	0	0	138	32	125	289	263
3	23	0	0	0	0	0	23	0
4	0	0	0	112	39	59	210	171
6	23	30	16	0	0	0	69	0
7A	0	0	0	518	108	82	708	600
7B	59	0	0	0	0	0	59	0
8	0	0	0	194	36	13	243	207
9	0	0	0	279	33	16	328	295
10	92	43	20	0	0	0	155	0
11	0	0	0	282	102	36	420	318
13	0	0	0	246	72	0	318	246
14	0	0	0	262	23	13	298	275
15	0	0	0	653	75	13	741	666
17	0	0	0	148	62	36	246	184
18	0	0	0	364	203	10	203	374
Total	**197**	**73**	**36**	**3196**	**785**	**403**	**4310**	**3559**

Total Stream Impact for Project: 4,310 linear feet

Wetland Impacts in the Roanoke River Basin

Site	Permanent Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Total Wetland Impact (ac)	Wetland Impacts Requiring Mitigation (ac)
2	0.11	0.01	0.06	0.18	0.18
5	0.22	0	0.06	0.28	0.28
7A	0.13	0	< 0.01	0.13	0.13
8	0.02	< 0.01	0.03	0.05	0.05
11	< 0.01	0	0	< 0.01	0
12	0.12	0	0	0.12	0.12
13	0.17	< 0.01	0.07	0.24	0.24
14	0.09	< 0.01	0	0.09	0.09
15	0.36	0	0.03	0.39	0.39
17	0.47	0.15	0.18	0.80	0.80
19	0.01	0	0.10	0.11	0.11
Total	**1.70**	**0.16**	**0.53**	**2.39**	**2.39**

Total Wetland Impact for Project: 2.39 acres

Open Water (Pond) Impacts in the Roanoke River Basin

Site	Pond Removal (ac)	Total Impacts to Open Waters (ac)
16	0.041	0.041
Total	**0.041**	**0.041**

Total Open Water Impact for Project: 0.041 acres.

The application provides adequate assurance that the discharge of fill material into the waters of the Roanoke 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 dated received January 26, 2012. Should your project change, you are required to notify the NCDWQ and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit. **This approval replaces the one issued March 23, 2012.**

Conditions of Certification:

* Aug 13, 2012 modified

1. Compensatory mitigation for 3,559 linear feet of impact to streams in the Roanoke River Basin is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Ecosystem Enhancement Program (EEP), and that the EEP has agreed to implement the mitigation for the project. EEP has indicated in a letter dated January 17, 2012 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the EEP Mitigation Banking Instrument signed July 28, 2010.

* 2. Compensatory mitigation for impacts to 2.39 acres of wetlands in the Roanoke River Basin is required. We understand that you have chosen to perform compensatory mitigation for impacts to wetlands through the North Carolina Ecosystem Enhancement Program (EEP), and that the EEP has agreed to implement the mitigation for the project. EEP has indicated in a letter dated January 17, 2012 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the Tri-Party MOA signed on July 22, 2003 and the Dual-Party MOA signed on April 12, 2004

3. Unless otherwise approved in this certification, placement of culverts and other structures in open waters and streams, shall be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWQ. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWQ for guidance on how to proceed and to determine whether or not a permit modification will be required.

4. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel should be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.

5. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed.

6. For all streams being impacted due to site dewatering activities, the site shall be graded to its preconstruction contours and revegetated with appropriate native species. The channel shall be stable prior to diverting water back into it. The banks should also be revegetated with native riparian species to the greatest extend possible.

7. At locations where ponds will be drained, proper measures will be taken to drain the pond with limited impact to upstream and downstream channel stability as well as to native aquatic species. Proper measures will be taken to avoid sediment release and/or sediment accumulation downstream as a result of pond draining.

8. The stream channel shall be excavated no deeper than the natural bed material of the stream, to the maximum extent practicable. Efforts must be made to minimize impacts to the stream banks, as well as to vegetation responsible for maintaining the stream bank stability. Any applicable riparian buffer impact for access to stream channel shall be temporary and be revegetated with native riparian species

9. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.

10. 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.

11. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions.

12. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage.

* 13. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval.

14. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water.

15. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream.

16. 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.

17. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification.

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

19. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If NCDWQ determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, NCDWQ may reevaluate and modify this certification.

20. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification..

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

22. The outside wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification.

23. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.

24. The Permittee shall report any violations of this certification to the Division of Water Quality within 24 hours of discovery.

* 25. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify NCDWQ when all work included in the 401 Certification has been completed.

26. Native riparian vegetation (i.e., trees and shrubs native to your geographic region) must be reestablished in the riparian areas within the construction limits of the project by the end of the growing season following completion of construction.

27. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities.

28. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards:

a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual.*
b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual.* The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual.*
d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.

29. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification.

30. Pipes and culverts used exclusively to maintain equilibrium in wetlands, where aquatic life passage is not a concern, shall not be buried. These pipes shall be installed at natural ground elevation.

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.

R-20

If you wish to contest any statement in the attached Certification you must file a petition for an administrative hearing. You may obtain the petition form from the office of Administrative hearings. You must file the petition with the office of Administrative Hearings within sixty (60) days of receipt of this notice. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

The petition may be faxed-provided the original and one copy of the document is received by the Office of Administrative Hearings within five (5) business days following the faxed transmission.
The mailing address for the Office of Administrative Hearings is:

Office of Administrative Hearings
6714 Mail Service Center
Raleigh, NC 27699-6714
Telephone: (919)-733-2698, Facsimile: (919)-733-3478

A copy of the petition must also be served on DENR as follows:

Ms. Mary Penny Thompson, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, NC 27699-1601

This the 5th day of April 2012

DIVISION OF WATER QUALITY

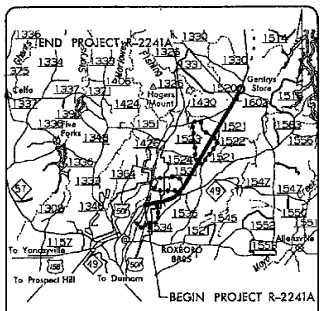
Robert Ridings

for Charles Wakild
Director

WQC No. 3910

PROJECT: 34406.1.1 TIP PROJECT: R-2241A

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PERSON COUNTY

LOCATION: US 501 FROM NC 49 IN ROXBORO TO SOUTH OF SR 1602

TYPE OF WORK: GRADING, DRAINAGE, PAVING, GUARDRAIL, CULVERTS, AND SIGNALS

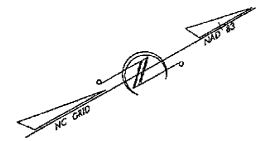
METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

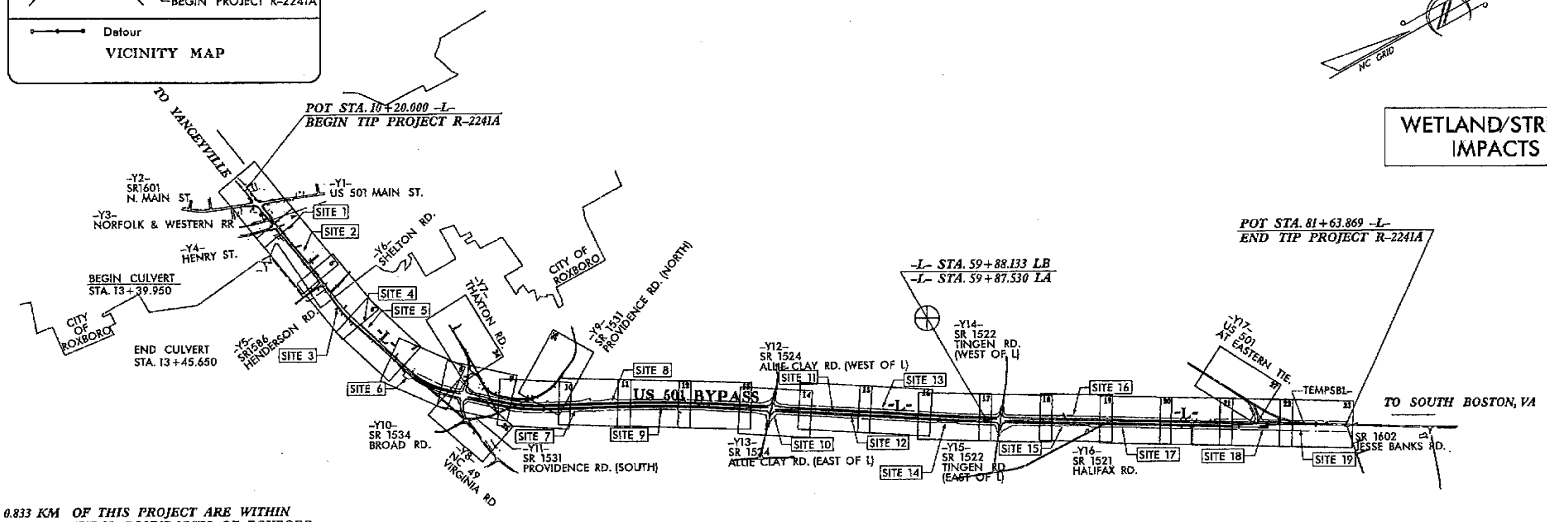
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2241A	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34406.1.1	MA-STP-501	PE

Permit Drawing Sheet 1 of 48



WETLAND/STREAM IMPACTS



0.833 KM OF THIS PROJECT ARE WITHIN THE MUNICIPAL BOUNDARIES OF ROXBORO

NCDOT CONTACT: MALCOLM WATSON, P.E. PROJECT ENGINEER (NCDOT)

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALE

5 0 10 — PLANS

5 0 10 — PROFILE (HORIZONTAL)

1 0 2 — PROFILE (VERTICAL)

DESIGN DATA

ADT	5 LANE C&G	4 LANE DIVIDED
2007 =	21,725	10,500
ADT 2027 =	34,142	17,500
DHV =	10%	10 %
D =	60%	60 %
T =	11%*	6%**
V =	65 km/h	100 km/h

* TTST 3% + DUAL 8%
** TTST 2% + DUAL 4%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2241A = 7.138 km

LENGTH OF STRUCTURES TIP PROJECT R-2241A = 0.006 km

TOTAL LENGTH OF TIP PROJECT R-2241A = 7.144 km

Prepared in the Office of:
RALPH WHITEHEAD ASSOCIATES, INC.
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCT. 20, 2006

LETTING DATE: OCT. 18, 2011

JOSEPH A. FREEMAN, P.E. — PROJECT ENGINEER

RICHARD A. ODYNSKI, P.E. — PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

APPROVED P.E.
STATE HIGHWAY DESIGN ENGINEER

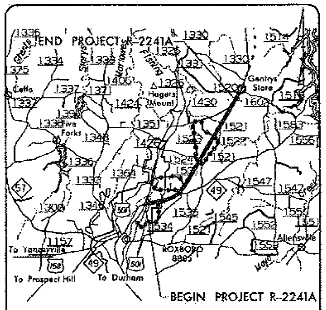
PROJECT: 34406.1.1 TIP PROJECT: R-2241A

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2241A	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34406.1.1	MA-STP-501	PE	

METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

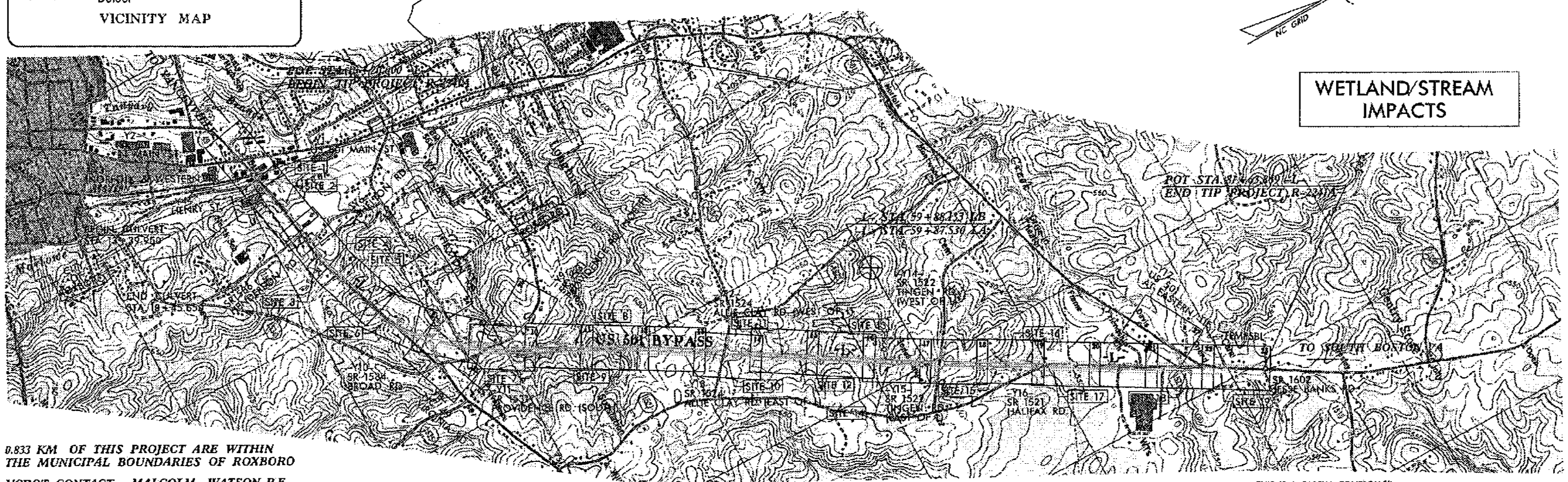
PERSON COUNTY

LOCATION: US 501 FROM NC 49 IN ROXBORO TO SOUTH OF SR 1602

TYPE OF WORK: GRADING, DRAINAGE, PAVING, GUARDRAIL, CULVERTS, AND SIGNALS

Permit Drawing Sheet 2 of 48

WETLAND/STREAM IMPACTS



0.833 KM OF THIS PROJECT ARE WITHIN THE MUNICIPAL BOUNDARIES OF ROXBORO

NCDOT CONTACT: MALCOLM WATSON, P.E.
PROJECT ENGINEER (NCDOT)

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALE

PLANS: 5 0 10

PROFILE (HORIZONTAL): 5 0 10

PROFILE (VERTICAL): 1 0 2

DESIGN DATA

	5 LANE C&G	4 LANE DIVIDED
ADT 2007	=21,725	10,500
ADT 2027	=34,142	17,500
DHV	=10%	10 %
D	= 60%	60 %
T	= 11%*	6%**
V	= 65 km/h	100 km/h

* TTST 3% + DUAL 8%
** TTST 2% + DUAL 4%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2241A = 7.138 km

LENGTH OF STRUCTURES TIP PROJECT R-2241A = 0.006 km

TOTAL LENGTH OF TIP PROJECT R-2241A = 7.144 km

Prepared In the Office of:
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2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCT. 20, 2006

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PROJECT ENGINEER

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HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

APPROVED P.E.
STATE HIGHWAY DESIGN ENGINEER

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	2H
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

NOT TO SCALE

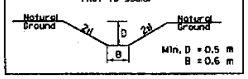
CONST. REV.

R/W REV.

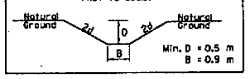
Revised 7/5/12

Permit Drawing Sheet 3 of 48

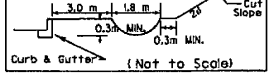
DETAIL 1
STANDARD BASE DITCH
(Not to Scale)



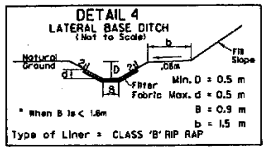
DETAIL 2
STANDARD BASE DITCH
(Not to Scale)



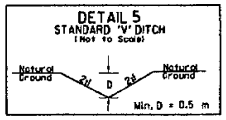
DETAIL 3
PARABOLIC SWALE



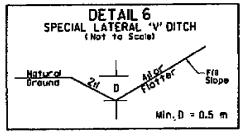
DETAIL 4
LATERAL BASE DITCH
(Not to Scale)



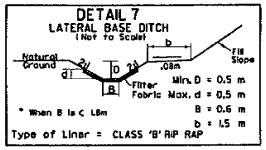
DETAIL 5
STANDARD 'V' DITCH
(Not to Scale)



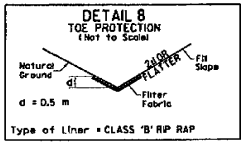
DETAIL 6
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



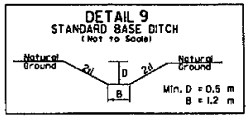
DETAIL 7
LATERAL BASE DITCH
(Not to Scale)



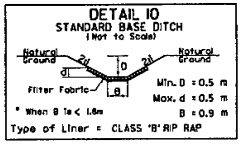
DETAIL 8
TOE PROTECTION
(Not to Scale)



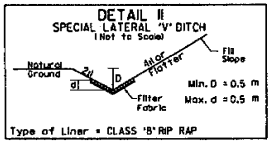
DETAIL 9
STANDARD BASE DITCH
(Not to Scale)



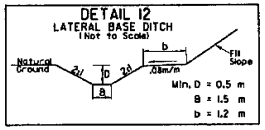
DETAIL 10
STANDARD BASE DITCH
(Not to Scale)



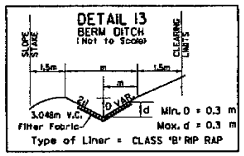
DETAIL 11
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



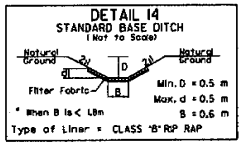
DETAIL 12
LATERAL BASE DITCH
(Not to Scale)



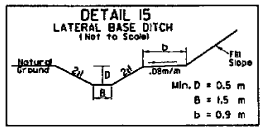
DETAIL 13
BERM DITCH
(Not to Scale)



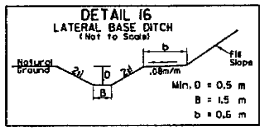
DETAIL 14
STANDARD BASE DITCH
(Not to Scale)



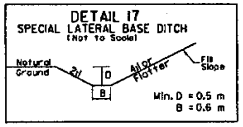
DETAIL 15
LATERAL BASE DITCH
(Not to Scale)



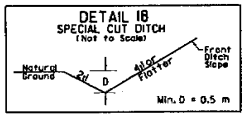
DETAIL 16
LATERAL BASE DITCH
(Not to Scale)



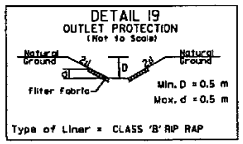
DETAIL 17
SPECIAL LATERAL BASE DITCH
(Not to Scale)



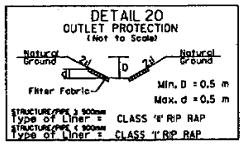
DETAIL 18
SPECIAL CUT DITCH
(Not to Scale)



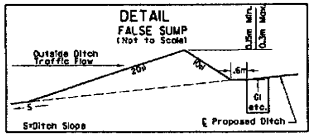
DETAIL 19
OUTLET PROTECTION
(Not to Scale)



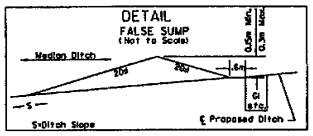
DETAIL 20
OUTLET PROTECTION
(Not to Scale)



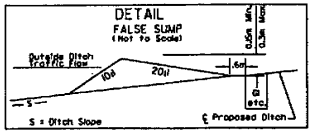
DETAIL
FALSE SUMP
(Not to Scale)



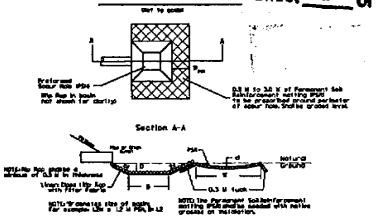
DETAIL
FALSE SUMP
(Not to Scale)



DETAIL
FALSE SUMP
(Not to Scale)

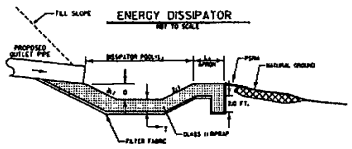


PREFORMED SCOUR HOLE
NOT TO SCALE

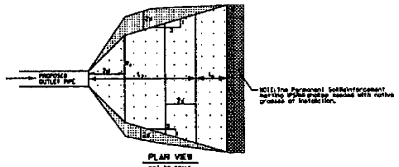


STATION	B M	D M	W_{PSH} M	d M	CLASS I RIP RAP MTONS	DDE (CU M)	FILTER FABRIC (SQ M)
13+80 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
33+60 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
36+60 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
48+30 -L-	1.8	.5	1.5	0.15	11.5	15	1.7
50+26 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
52+00 -L-	1.2	.5	1.5	0.15	6.5	10.0	1.0
66+60 -L-	1.2	.5	1.5	0.15	6.5	10.0	1.0

ENERGY DISSIPATOR
NOT TO SCALE



PROFILE
NOT TO SCALE



PLAN VIEW
NOT TO SCALE

STATION	L_P M	W_P M	L_A M	T M	D M	CLASS I RIP RAP MTONS	DDE (CU M)	FILTER FABRIC (SQ M)
20+70 -L-	8.0	5.0	1.8	.6	1.0	110	86	75
39+80 -L-	7.0	4.3	2.0	.6	1.0	120	95	85

R-23

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	2H-2
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

NOT TO SCALE

CONST.REV.

R /W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DETAIL
(NOT TO SCALE)

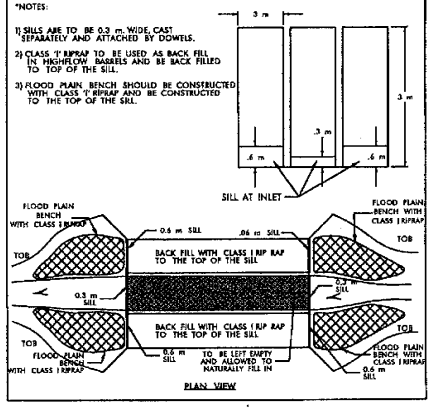
MULTI-BARREL – FOR 2 OR 3 BARRELS GENERAL DETAIL LOW FLOW CHANNEL AND FLOOD PLAIN SILLS

*NOTES:

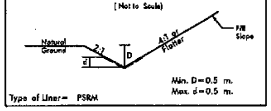
1) SILLS ARE TO BE 0.3 m. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

2) CLASS 'I' RIPRAP TO BE USED AS BACK FILL IN HIGHFLOW BARRELS AND BE BACK FILLED TO TOP OF THE SILL.

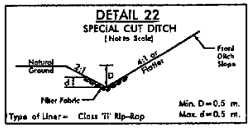
3) FLOOD PLAIN BENCH SHOULD BE CONSTRUCTED WITH CLASS 'I' RIPRAP AND BE CONSTRUCTED TO THE TOP OF THE SILL.



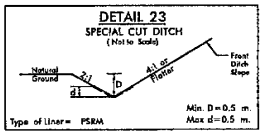
DETAIL 21
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



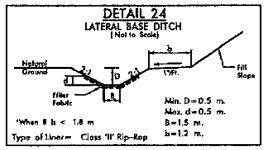
DETAIL 22
SPECIAL CUT DITCH
(Not to Scale)



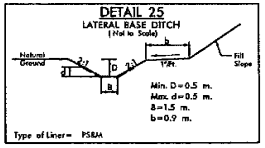
DETAIL 23
SPECIAL CUT DITCH
(Not to Scale)



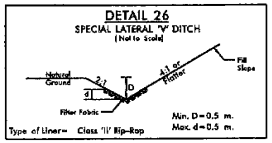
DETAIL 24
LATERAL BASE DITCH
(Not to Scale)



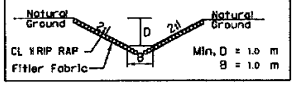
DETAIL 25
LATERAL BASE DITCH
(Not to Scale)



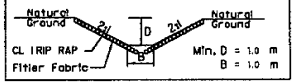
DETAIL 26
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



INLET CHANNEL DETAIL
STRUCTURES/PIPES ≥ 900mm



INLET CHANNEL DETAIL
STRUCTURES/PIPES < 900mm



Revised 7/5/12

Permit Drawing
Sheet 39 of 48

R-24

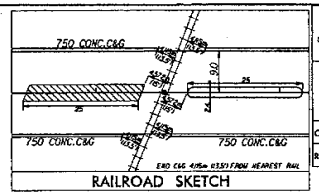
STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Suite 200
Charlotte, NC 28208
NC License Number F-0287

REVISIONS	
08-02-12 -	PARCEL 16 PROPERTY LINE MODIFIED & REMOVED SHED. ADDED UNDERGROUND DRAIN LINE & MANHOLES. PARCEL 16A ADDED NEW PARCEL BETWEEN 16 & 17 REVISED OWNER NAME ON PARCELS 4,9,8,16
	PARCEL 10: REVISED DRIVEWAY CONNECTION & MODIFIED PROPOSED CHAIN LINK FENCE
08-16-11 -	PARCEL 16: 108M DRIVEWAY SHIFTED TO WEST SIDE OF PROPERTY
03-05-11 -	PARCELS 8 & 8A COMBINED, REVISED OWNER NAME
10-07-11 -	REVISED PARCEL BOUNDARIES FOR PARCEL 16 AND 16A
10-07-11 -	ADDED SUBSURFACE DRAINAGE FOR PARCEL 16 AND 16A
10-27-11 -	PARCEL 16 ADDED PIPE FOR DRAINAGE STRUCTURE
10-31-11 -	PARCEL 7: ADDED R/W AND MODIFIED TEMPORARY EASEMENTS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR "JKA PANEL 13"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 300205.1151m) EASTING: 616308.8681m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT IGROUND TO GRID) IS: 1.000077057
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "JKA PANEL 13" TO -L- POT STATION 10+20.000 IS
S 40° 03' 09.53" W 67.29.835 (m)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NAD 83 NC GRID



RAILROAD SKETCH

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Revised 6/15/12
Permit Drawing
Sheet 4 of 48

CONST. REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE STA 12+80 -Y1- SEE SHEET 24

MATCHLINE STA 13+40 -L- SEE SHEET 5

US 501 -Y1- & -Y2- TRAFFIC VOLUMES

SITE 1

SEE SHEET 28 FOR -L- PROFILE.
SEE SHEET 3B FOR -Y1- PROFILE.
SEE SHEET 3B FOR -Y2- PROFILE.
SEE SHEET 2-I FOR DETOUR DETAIL

R-25

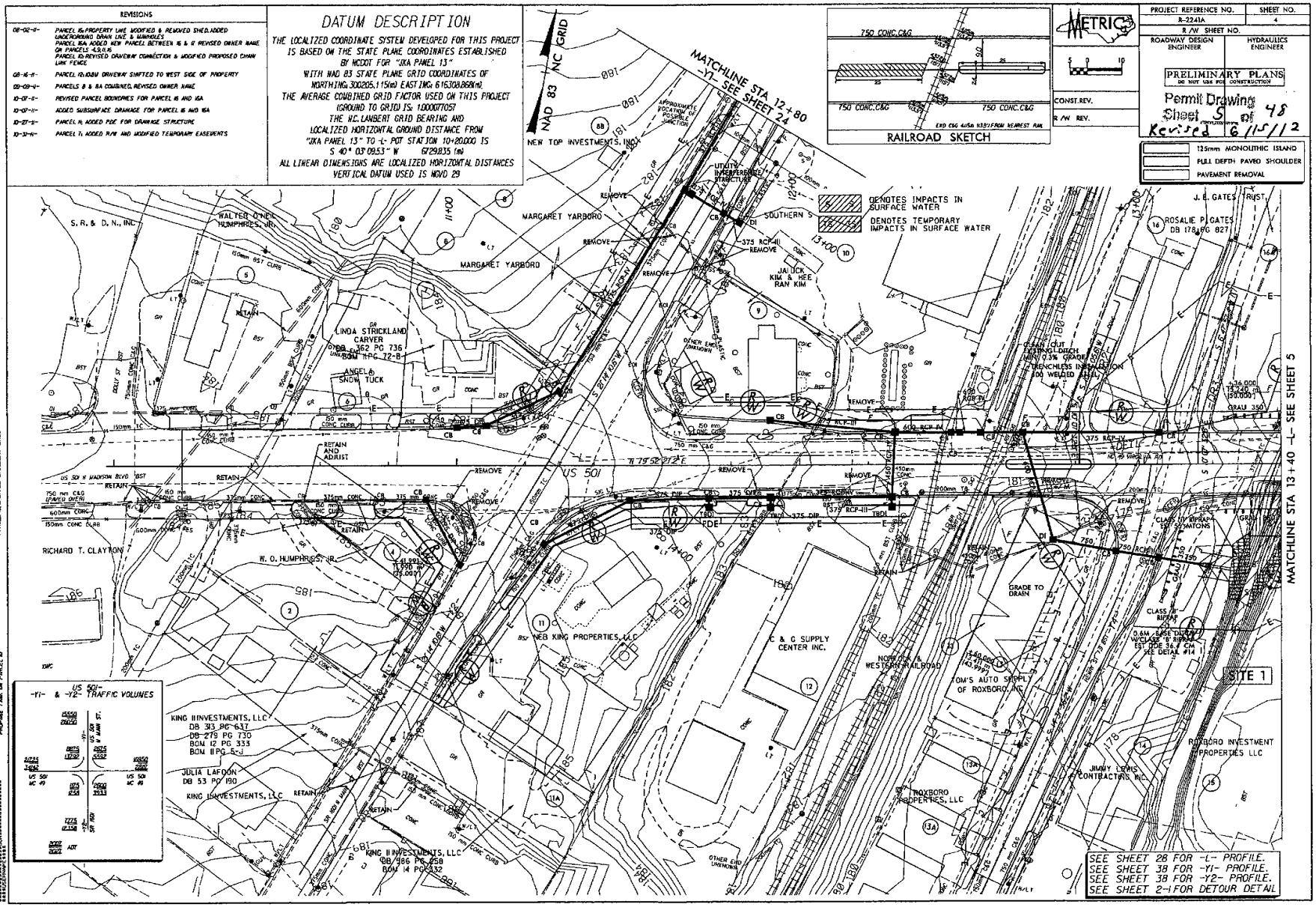
STV / Ralph Whitehead Associates, Inc.
1000 West Morehead Street, Suite 300
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

08-02-11-	PARCEL 15/PROPERTY LINE MODIFIED & REMOVED SHED. ADDED UNDERGROUND DRAIN LINE & MANHOLES
	PARCEL 16A ADDED NEW PARCEL BETWEEN 16 & 17 REVISED OWNER NAME OR PARCELS 4,5,11,16
	PARCEL 17-REVISED DRIVEWAY CONNECTION & MODIFIED PROPOSED CHAIN LINK FENCE
08-16-11-	PARCEL 12-ADDED DRIVEWAY SHIFTED TO WEST SIDE OF PROPERTY
09-09-11-	PARCELS 8 & 8A COMBINED, REVISED OWNER NAME
10-07-11-	REVISED PARCEL BOUNDRIES FOR PARCEL 16 AND 16A
10-07-11-	ADDED SUBSURFACE DRAINAGE FOR PARCEL 16 AND 16A
10-27-11-	PARCEL 16 ADDED PDE FOR DRAINAGE STRUCTURE
10-31-11-	PARCEL 7: ADDED R/W AND MODIFIED TEMPORARY EASEMENTS
05-31-12 -	PARCEL 14D CLAIM REVISED PARCEL NUMBER PARCELS 5,6-REVISED PARCEL NAME PARCELS 8,8A-REVISED R/W OF ROAD BY SURVEY PARCEL 9-REVISED OWNER NAME
	MODIFIED RIGHT TURN LANE STORAGE LENGTH AND RAILROAD SKETCH
	REVISED RIGHT TURN LANE STORAGE LENGTH AND REVISED SIDEWALK CURB AND GUTTER, ADJUSTED RW AND EASEMENT TE-NIS
	MOVED RIGHT TURN LANE FENCE AND GATE, UPDATED RW AND EASEMENT TE-NIS
	REVISED SIDEWALK CURB AND GUTTER, ADJUSTED RW AND EASEMENT TE-NIS
	PARCEL 13A-UPDATED NOTES
	PARCEL 13-UPDATED NOTES
	PARCEL 12-UPDATED NOTES
	PARCEL 7-REVISED PARCEL NUMBER, DIVIDED INTO TWO OWNERSHIPS, UPDATED RW AND EASEMENT TE-NIS
05-25-12 -	PARCEL 14D CLAIM REVISED PARCEL NUMBER PARCELS 5,6-REVISED PARCEL NAME PARCELS 8,8A-REVISED R/W OF ROAD BY SURVEY PARCEL 9-REVISED OWNER NAME
	MOVED RIGHT TURN LANE STORAGE LENGTH AND RAILROAD SKETCH
	REVISED SIDEWALK CURB AND GUTTER, ADJUSTED RW AND EASEMENT TE-NIS
	MOVED RIGHT TURN LANE FENCE AND GATE, UPDATED RW AND EASEMENT TE-NIS
	REVISED SIDEWALK CURB AND GUTTER, ADJUSTED RW AND EASEMENT TE-NIS
	PARCEL 13A-UPDATED NOTES
	PARCEL 13-UPDATED NOTES
	PARCEL 12-UPDATED NOTES
	PARCEL 7-REVISED PARCEL NUMBER, DIVIDED INTO THRIV OWNERSHIPS, UPDATED RW AND EASEMENT TE-NIS
06-25-12 -	PULLED PIPE STAGE 1 REVISED CATCHBASIN, AND ADDED DATE OF PARCEL 14
06-04-12 -	MOVED DRIVEWAY ON PARCEL 6, SLOPE PULLING AT PARCEL 14 ADDED DATE OF PARCEL 14 REMOVED EASEMENT FROM PARCEL 14, ADDED PARCEL 14D, ADJUSTED PARCEL 14 BOUNDRIES
	PARCEL 14D, ADJUSTED PARCEL 14 BOUNDRIES, ADJUSTED TE ON PARCEL 14, ADJUSTED TE ON PARCEL 14, NAME CHANGE ON PARCEL 5,6,9,9A, ADJUSTED TE ON PARCEL 5, ADJUSTED TE ON PARCEL 6, ADJUSTED TE ON PARCEL 9A, PARCEL 6,14D CREATED NEW PARCEL 9A
06-06-12 -	ADDED ROW MARKERS ON PARCEL 16, ADJUSTED ROW ON PARCEL 16, ADDED BALLAROUS, REMOVED PIPE SPLITTING INTO RAILROAD DITCH, ADDED 2 PIPES AND ICD TO CONNECT TO PIPE
06-21-12 -	PARCEL 16 REVISED
07-02-12 -	ELIMINATED EASEMENT FROM WITHIN BOLLARDS AT PROPANE TANK ON PARCEL 10
08-28-12 -	PARCEL 8 REVISED PARCEL INFORMATION PARCEL 9A CREATED EASEMENT LINES

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR "JXA PANEL 13"
WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 300205.1150(m) EASTING: 616300.8681(m).
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000077057
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "JXA PANEL 13" TO -L- POT STATION 10+20.000 IS
S 40° 03' 09.53" W 6729.835 (m)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29



METRIC

CONST. REV.

R/W REV.

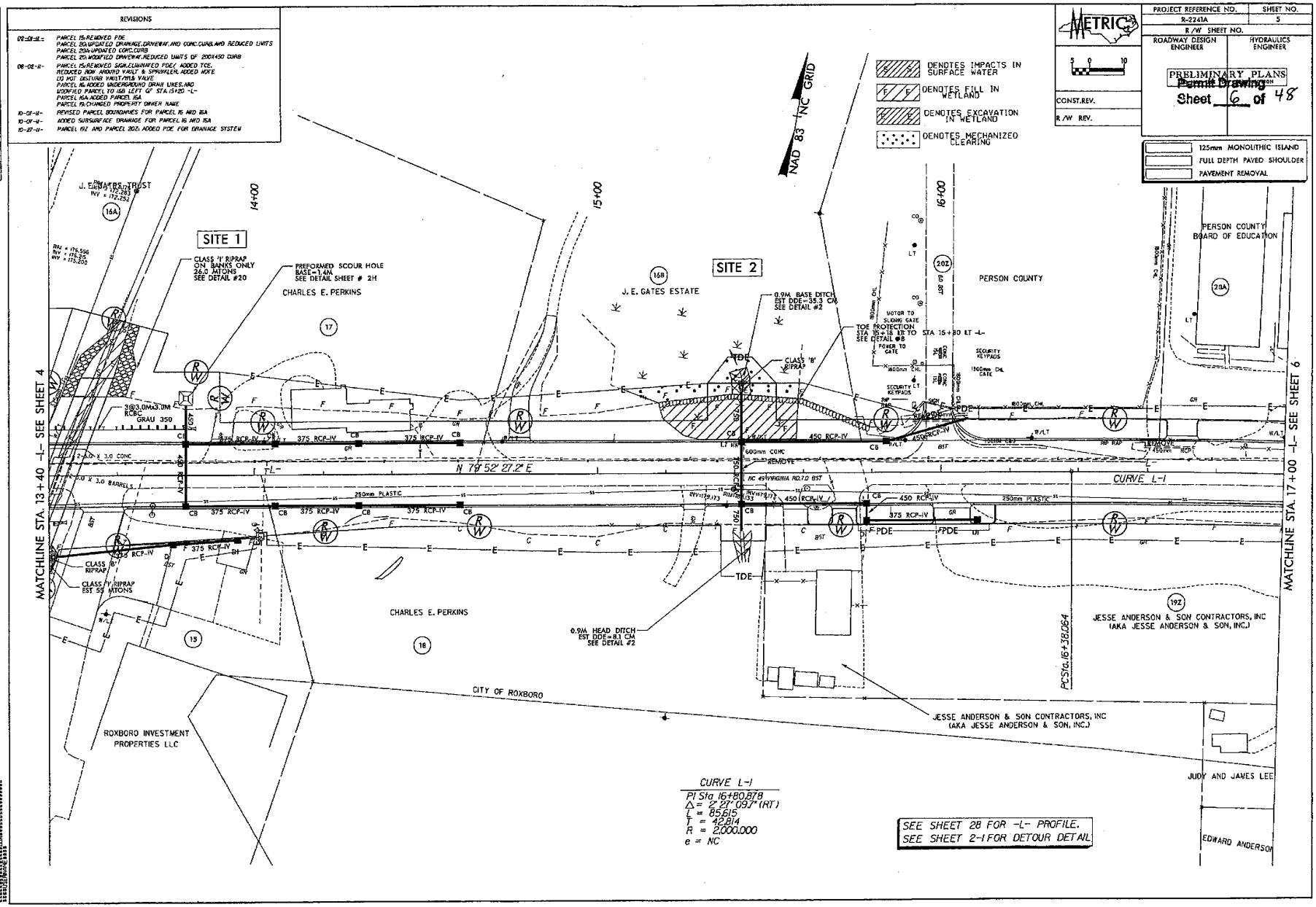
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 5 of 48
Revised 6/15/12

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

R-26


REVISIONS
07-09-11- PARCEL 15: REMOVED PDE
PARCEL 20A: UPDATED DRAINAGE, DRIVEWAY, AND CONC. CURB, AND REDUCED LIMITS
PARCEL 20A: UPDATED CONC. CURB
PARCEL 20: MODIFIED DRIVEWAY, REDUCED LIMITS OF 200X450 CURB
08-02-11- PARCEL 15: REMOVED SIGN, CLEANUP AND PDE/ ADDED TOE.
REDUCED ROW AROUND VAULT & SPRINKLER, ADDED NOTE TO NOT DISTURB VAULT/MB VALVE
PARCEL 16: ADDED UNDERGROUND DRAIN LINES, AND MODIFIED PARCEL TO 16B LEFT OF STA. 15+20 -L-
PARCEL 16A: ADDED PARCEL 16A
PARCEL 16A: CHANGED PROPERTY OWNER NAME
10-07-11- REVISED PARCEL BOUNDARIES FOR PARCEL 16 AND 16A
10-07-11- ADDED SUBSURFACE DRAINAGE FOR PARCEL 16 AND 15A
10-27-11- PARCEL 19Z AND PARCEL 20Z: ADDED PDE FOR DRAINAGE SYSTEM
STV/Ralph Whitehead Associates, Inc.
1000 Westgate Drive, Suite 200
Raleigh, NC 27609
NC License Number F-0891
METRIC
CONST.REV.
R/W REV.
PROJECT REFERENCE NO. R-2241A
SHEET NO. 5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
Permit Drawing
Sheet 6 of 48
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
NAD 83 NC GRID
SITE 1
SITE 2
CLASS 'I' RIPRAP ON BANKS ONLY 26.0 MTONS SEE DETAIL #20
PREFORMED SCOUR HOLE BASE=1.4M SEE DETAIL SHEET # 2H
CHARLES E. PERKINS
J. E. GATES ESTATE
PERSON COUNTY
PERSON COUNTY BOARD OF EDUCATION
0.9M BASE DITCH EST DDE=35.3 CM SEE DETAIL #2
TOE PROTECTION STA 15+18 LT TO STA 15+80 LT -L- SEE DETAIL #8
CLASS 'B' RIPRAP
3@3.0M x 3.0M RCBC GRAU 350
N 79°52'27.2" E
CURVE L-1
MATCHLINE STA. 13+40 -L- SEE SHEET 4
MATCHLINE STA. 17+00 -L- SEE SHEET 6
CLASS 'B' RIPRAP
CLASS 'I' RIPRAP EST 52 MTONS
0.9M HEAD DITCH EST DDE=8.1 CM SEE DETAIL #2
JESSE ANDERSON & SON CONTRACTORS, INC (AKA JESSE ANDERSON & SON, INC.)
CITY OF ROXBORO
ROXBORO INVESTMENT PROPERTIES LLC
JUDY AND JAMES LEE
EDWARD ANDERSON
PCSta. 16+38.064
CURVE L-1
PI Sta 16+80.878
Δ = 2°21'09.7" (RT)
L = 85.615
T = 42.814
R = 2,000.000
e = NC
SEE SHEET 28 FOR -L- PROFILE.
SEE SHEET 2-1 FOR DETOUR DETAIL

R-27

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 7 of 48

CONST. REV.
R/W REV.

DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 320
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

02-21-11-	PARCEL 15: REMOVED FDE PARCEL 20A: UPDATED DRAINAGE, DRIVEWAY, AND CONC. CURB, AND REDUCED UNITS PARCEL 20A: UPDATED CONC. CURB PARCEL 20A: MODIFIED DRIVEWAY, REDUCED UNITS OF 200X450 CUAB
08-02-11-	PARCEL 15: REMOVED SIGN, ELIMINATED FDE, ADDED TDE. REDUCED RSR AROUND VAULT & SPRINKLER, ADDED NOTE DO NOT DISTURB VAULT/MLB VALVE PARCEL 15: ADDED UNDERGROUND DRAIN LINES, AND MODIFIED PARCEL TO 168' LEFT OF STA 15+20 -L- PARCEL 15A: ADDED PARCEL 15A PARCEL 15: CHANGED PROPERTY OWNER NAME
10-07-11-	REVISED PARCEL BOUNDARIES FOR PARCEL 16 AND 15A
10-01-11-	ADDED SUBSURFACE DRAINAGE FOR PARCEL 16 AND 15A
10-21-11-	PARCEL 15Z AND PARCEL 20Z1 ADDED FDE FOR DRAINAGE SYSTEM

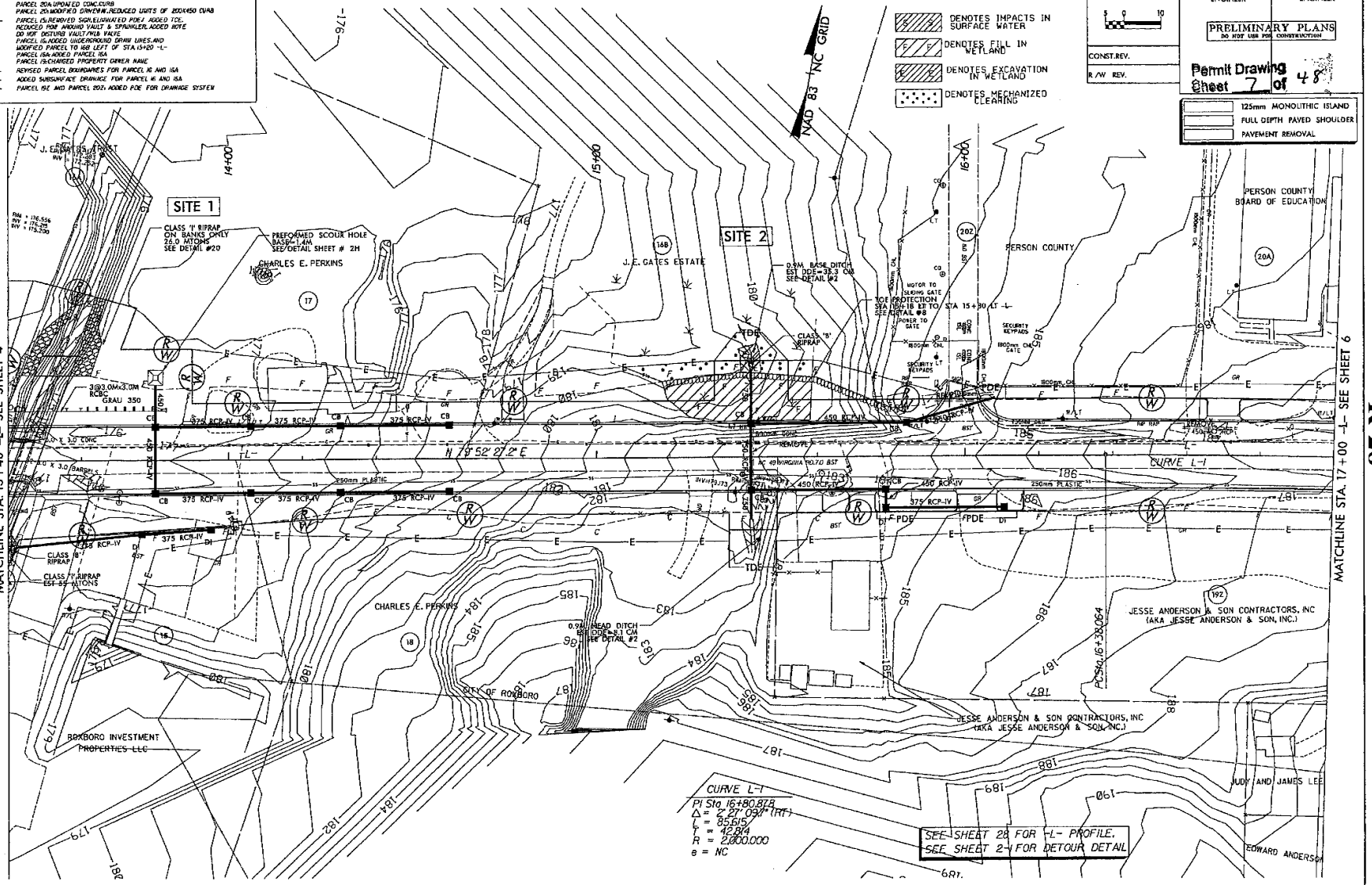
05-04-11- ADDED A FOR MONUMENT & REMOVED 2 MONUMENTS, NAME CHANGE, PARCELS 15A, 15Z, 15Z1, 20A, 20Z, 20Z1, 20Z2, 20Z3, 20Z4, OF PARCEL 15, AND ESTABLISHED NEW PARCEL 15A

05-23-11-CAL- MOVED FOR MONUMENTS OF PARCEL 15.

05-03-11- PARCELS 15, 20, 20A, REVISED PARCEL BOUNDARIES, ADDED SECURITY GATE ENTRANCE, SECURITY FENCE, REMOVED OLD PROPERTY LINE, REVISED PARCELS 20Z1, 20Z2, 20Z3, 20Z4

05-20-11- PARCEL 15, ADJUSTED PR. AND EASEMENT TIE-INS. PARCELS 20Z1, 20Z2, 20Z3, 20Z4, ADDED CURB & GUTTER, MODIFIED DRIVEWAY TIE-IN LOCATION

02-28-11- PARCEL 20, RELOCATED DRIVEWAY ENTRANCE.



R-28

KAUPE WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28256

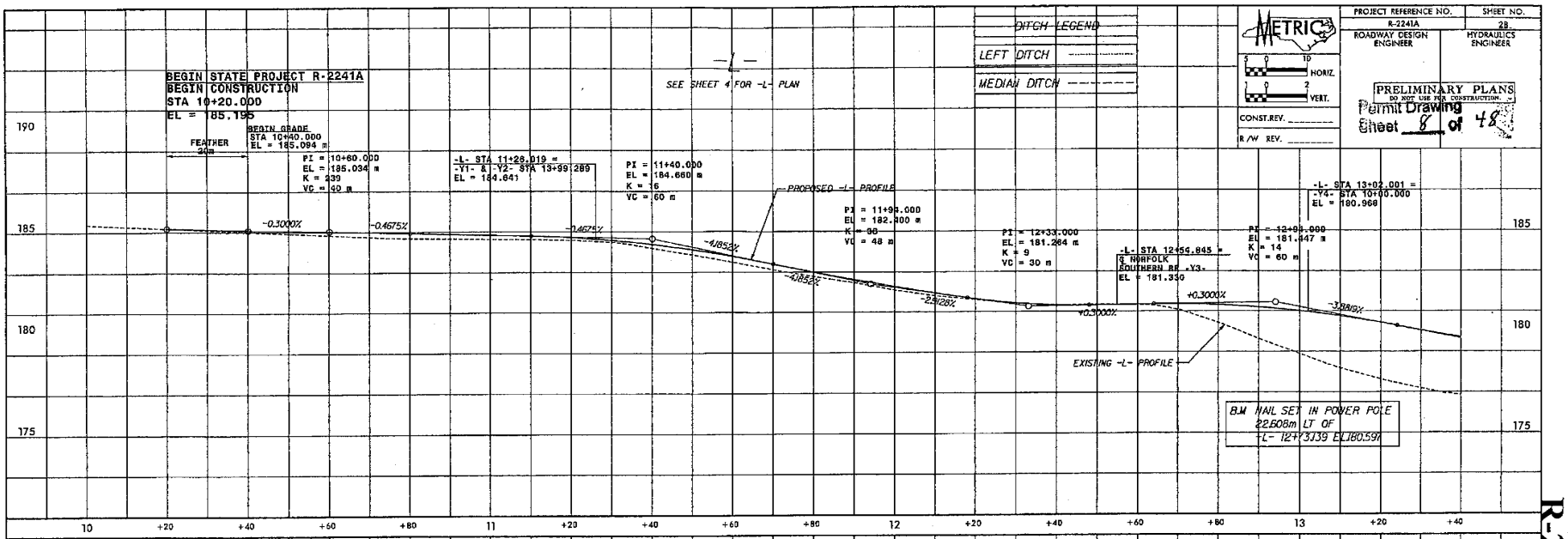
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

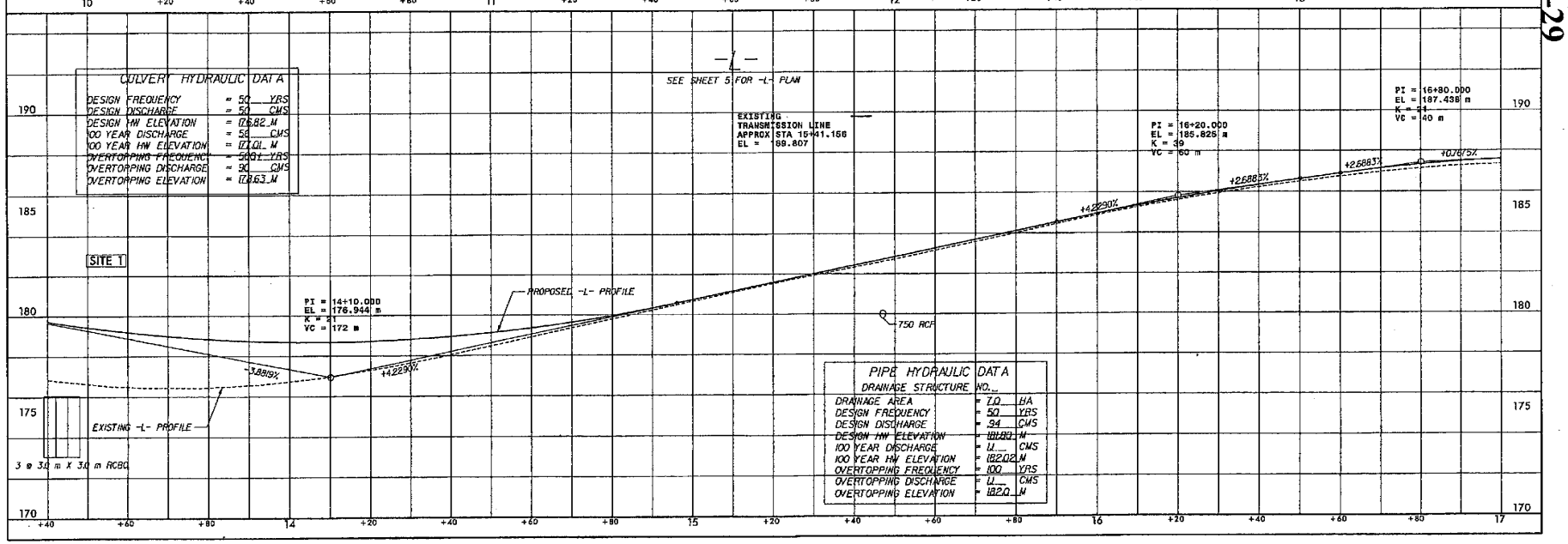
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 8 of 48

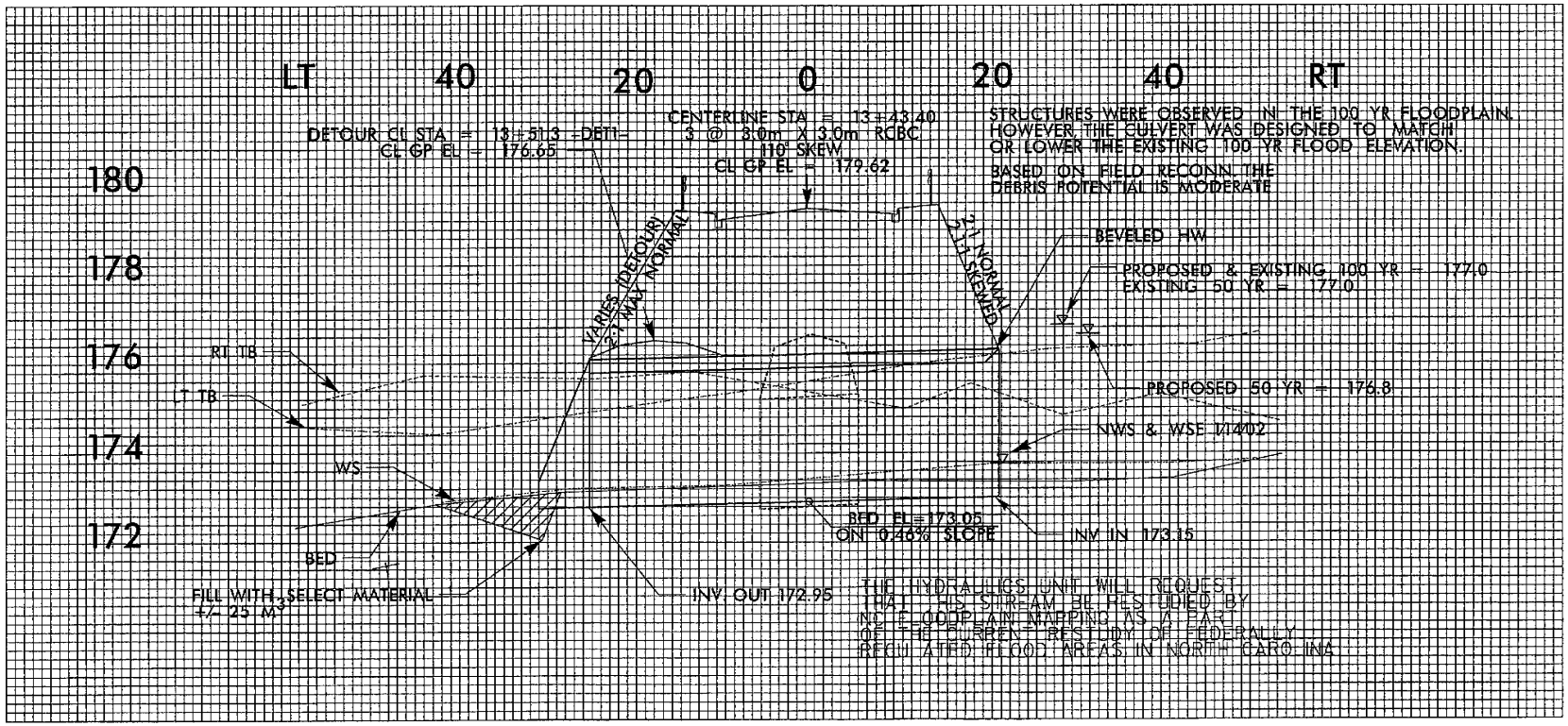
METRIC
5 0 10 HORIZ.
1 0 2 VERT.
CONST.REV. _____
R/W REV. _____

DITCH LEGEND
LEFT DITCH
MEDIAN DITCH





R-29

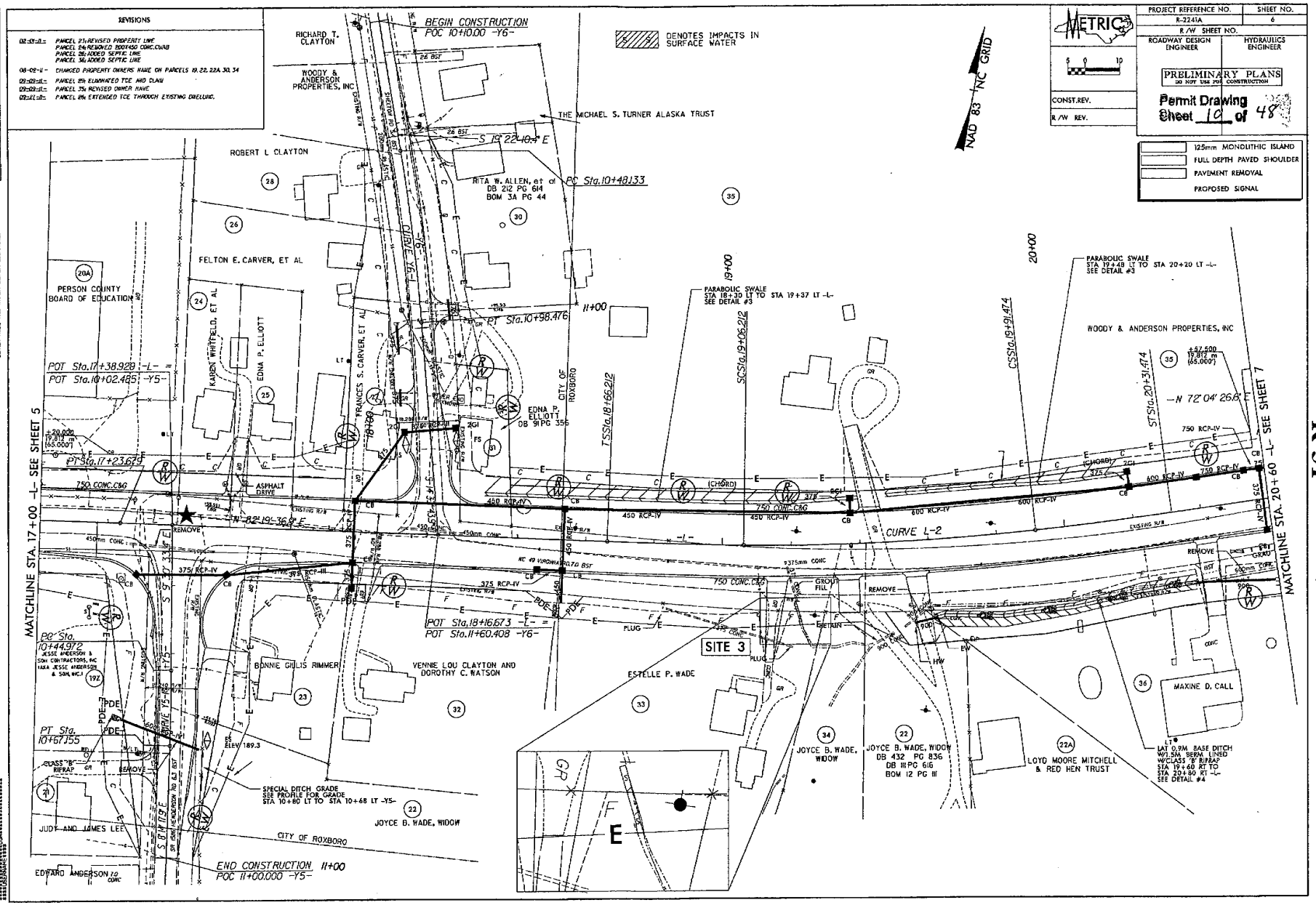

LT
40
20
0
20
40
RT
180
178
176
174
172
DETOUR CL STA = 13+51.3 = DETI=
CL GP EL = 176.65
CENTERLINE STA = 13+43.40
3 @ 3.0m X 3.0m RCBC
110° SKEW
CL GP EL = 179.62
STRUCTURES WERE OBSERVED IN THE 100 YR FLOODPLAIN. HOWEVER, THE CULVERT WAS DESIGNED TO MATCH OR LOWER THE EXISTING 100 YR FLOOD ELEVATION.
BASED ON FIELD RECONN. THE DEBRIS POTENTIAL IS MODERATE
VARIES (DETOUR) 2:1 MAX NORMAL
2:1 NORMAL
BEVELED HW
PROPOSED & EXISTING 100 YR = 177.0
EXISTING 50 YR = 177.0
RT TB
LT TB
PROPOSED 50 YR = 176.3
NWS & WSE 1/4/02
WS
BED
BED EL=173.05
ON 0.46% SLOPE
INV IN 173.15
FILL WITH SELECT MATERIAL
+/- 25 M3
INV OUT 172.95
THE HYDRAULICS UNIT WILL REQUEST THAT THIS STREAM BE RESTUDIED BY NCF FLOODPLAIN MAPPING AS A PART OF THE CURRENT RESTUDY OF FEDERALLY REGULATED FLOOD AREAS IN NORTH CAROLINA

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, North Carolina 28208
NC License Number F-0891

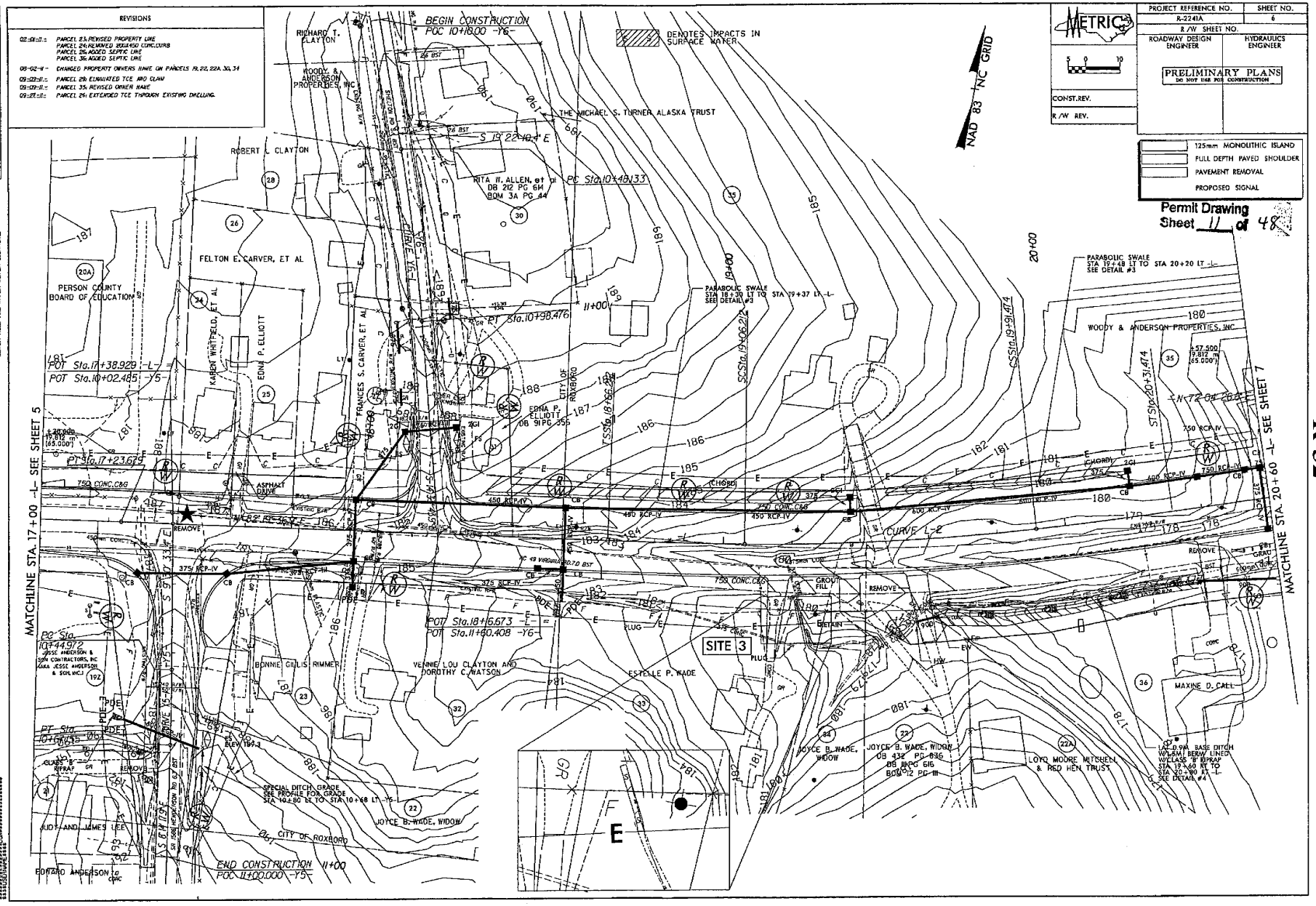
REVISIONS	
02-09-01-	PARCEL 27; REVISED PROPERTY LINE. PARCEL 24; REMOVED 800X450 CONC.CULV.B. PARCEL 26; ADDED SEPTIC LINE. PARCEL 36; ADDED SEPTIC LINE.
06-02-01-	CHANGED PROPERTY OWNERS NAME ON PARCELS 19, 22, 22A, 30, 34
09-09-01-	PARCEL 25; ELIMINATED TCE AND CLAIM
09-09-01-	PARCEL 35; REVISED OWNER NAME
09-21-01-	PARCEL 24; EXTENDED TCE THROUGH EXISTING DWELLING.

02-09-01- REVISED RECONSTRUCTION OF PARCEL 27, REMOVED CULVERT, REVISED PROPERTY LINE, RELOCATED FILL AS OUT ON PARCEL DRAWING, CHANGED OR ADDED SEPTIC LINES ON PARCELS 24, 26, 36, CHANGED OR ADDED CONTOURS ON PARCEL 27, PROPERTY LINE CHANGE ON PARCELS 21, 22, 22A, 30, 34.

06-21-01- PARCEL 30; REVISED PARCEL NAME, RELOCATED CORRECT PROPERTY LINE.
PARCEL 36; REVISED PARCEL NAME, REMOVED FIRE HYDRANT, SEWER REEL AND WATER LOCATIONS.



R-31


REVISIONS
STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 300
Charlotte, North Carolina 28208
NC License Number F-0991
PROJECT REFERENCE NO.
R-2241A
SHEET NO.
6
R /W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
CONST.REV.
R /W REV.
METRIC
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
PROPOSED SIGNAL
Permit Drawing
Sheet 11 of 48
NAD 83 NC GRID
DENOTES IMPACTS IN SURFACE WATER
BEGIN CONSTRUCTION
POC 10+18.00 -Y6-
RICHARD T. CLAYTON
WOODY & ANDERSON PROPERTIES, INC
THE MICHAEL S. TURNER ALASKA TRUST
ROBERT L. CLAYTON
RITA W. ALLEN, et al
DB 212 PG 614
BOM 3A PG 44
PC Sta.10+48.133
FELTON E. CARVER, ET AL
PERSON COUNTY BOARD OF EDUCATION
KAREN WHITFIELD, ET AL
EDNA P. ELLIOTT
FRANCES S. CARVER, ET AL
CITY OF ROXBORO
EDNA P. ELLIOTT
DB 91 PG 255
PT Sta.10+98.476
POT Sta.17+38.929 -L-
POT Sta.10+02.485 -Y5-
PT Sta.17+23.679
MATCHLINE STA. 17+00 -L- SEE SHEET 5
PARABOLIC SWALE
STA 19+48 LT TO STA 20+20 LT -L-
SEE DETAIL #3
PARABOLIC SWALE
STA 18+30 LT TO STA 19+37 LT -L-
SEE DETAIL #3
WOODY & ANDERSON PROPERTIES, INC
N 72°04'26.8"
CURVE L-2
MATCHLINE STA. 20+60 -L- SEE SHEET 7
SITE 3
POT Sta.18+16.673 -L-
POT Sta.11+60.408 -Y6-
BONNIE GILLIS RIMMER
VENNIE LOU CLAYTON AND DOROTHY C. WATSON
ESTELLE P. WADE
GROUT FILL
MAXINE D. CALL
JOYCE B. WADE, WIDOW
JOYCE B. WADE, WIDOW
DB 432 PG 836
DB 11 PG 615
BOM 12 PC III
LOYD MOORE MITCHEN & RED HEN TRUST
SPECIAL DITCH GRADE
SEE PROFILE FOR GRADE
STA 10+50 LT TO STA 10+68 LT -Y6-
JOYCE B. WADE, WIDOW
CITY OF ROXBORO
END CONSTRUCTION
POC 11+00.000 -Y5-
EDWARD ANDERSON
MATCHLINE STA. 20+60 -L- SEE SHEET 7

R-32

STV/Ralph Whitehead Associates, Inc.
1900 West Morehead St., Ste 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS	
06-04-08 -	SHIFTED POB MONUMENT OFF OF PROPERTY LINE, AND PROPERTY LINE CHANGE PARCELS 35,36
06-21-10 -	PARCEL 35; REMOVED PARCEL AND OWNERSHIP OF PARCEL 36
02-04-9 -	PARCEL 38; UPDATED PARCEL INFORMATION
04-02-4 -	PARCEL 37; ADDED NOTE NOT TO DISTURB SEPTIC LINES PARCEL 35; REDUCED TOE 3 METERS SOUTHWARD OFF SEPTIC LINES, ADDED NOTE TO NOT DISTURB
05-09-11 -	PARCEL 35; REVISED OWNER NAME

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

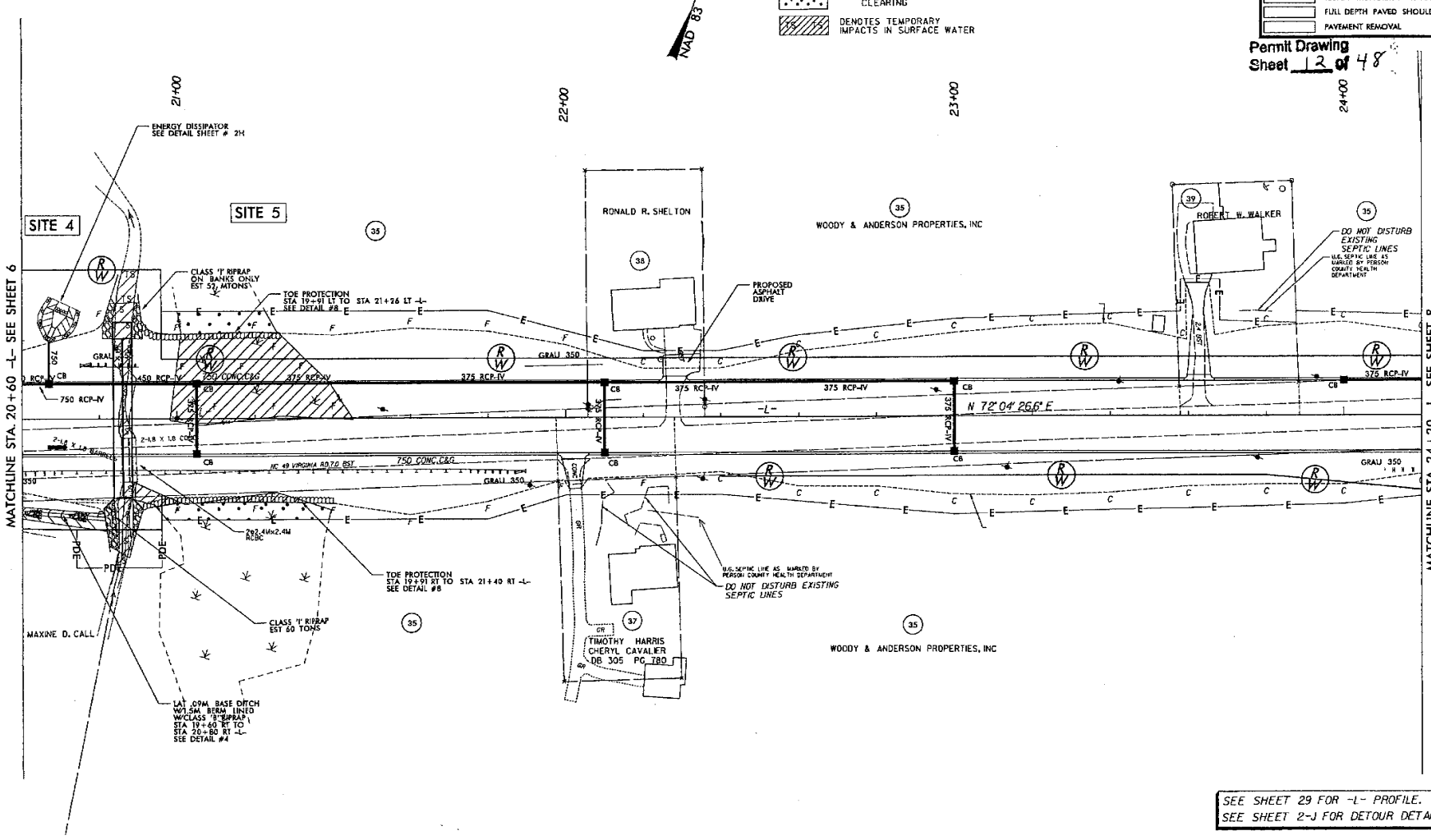
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.
R/W REV.

DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

Permit Drawing
Sheet 12 of 48



SEE SHEET 29 FOR -L- PROFILE.
SEE SHEET 2-J FOR DETOUR DETAIL

R-33

STV / Ralph Whitehead Associates, Inc.
1000 Westgate Mall, Suite 200
Charlotte, NC 28204
NC License Number F-0293

REVISIONS

06-04-08 -	SHIFTED ROW MONUMENT OFF OF PROPERTY LINE, AND PROPERTY LINE CHANGE PARCELS 35,36
06-21-10 -	PARCEL 35, REMOVED PARCEL AND OWNERSHIP OF PARCEL 36
02-01-11 -	PARCEL 38, UPDATED PARCEL INFORMATION
08-02-11 -	PARCEL 37, ADDED NOTE NOT TO DISTURB SEPTIC LINES PARCEL 39, REDUCED TCE 3 METERS SOUTHWARD OFF SEPTIC LINES. ADDED NOTE TO NOT DISTURB
09-28-11 -	PARCEL 35, REVISED OWNER NAME

NAD 83 NC GRID

DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

METRIC
5 0 10

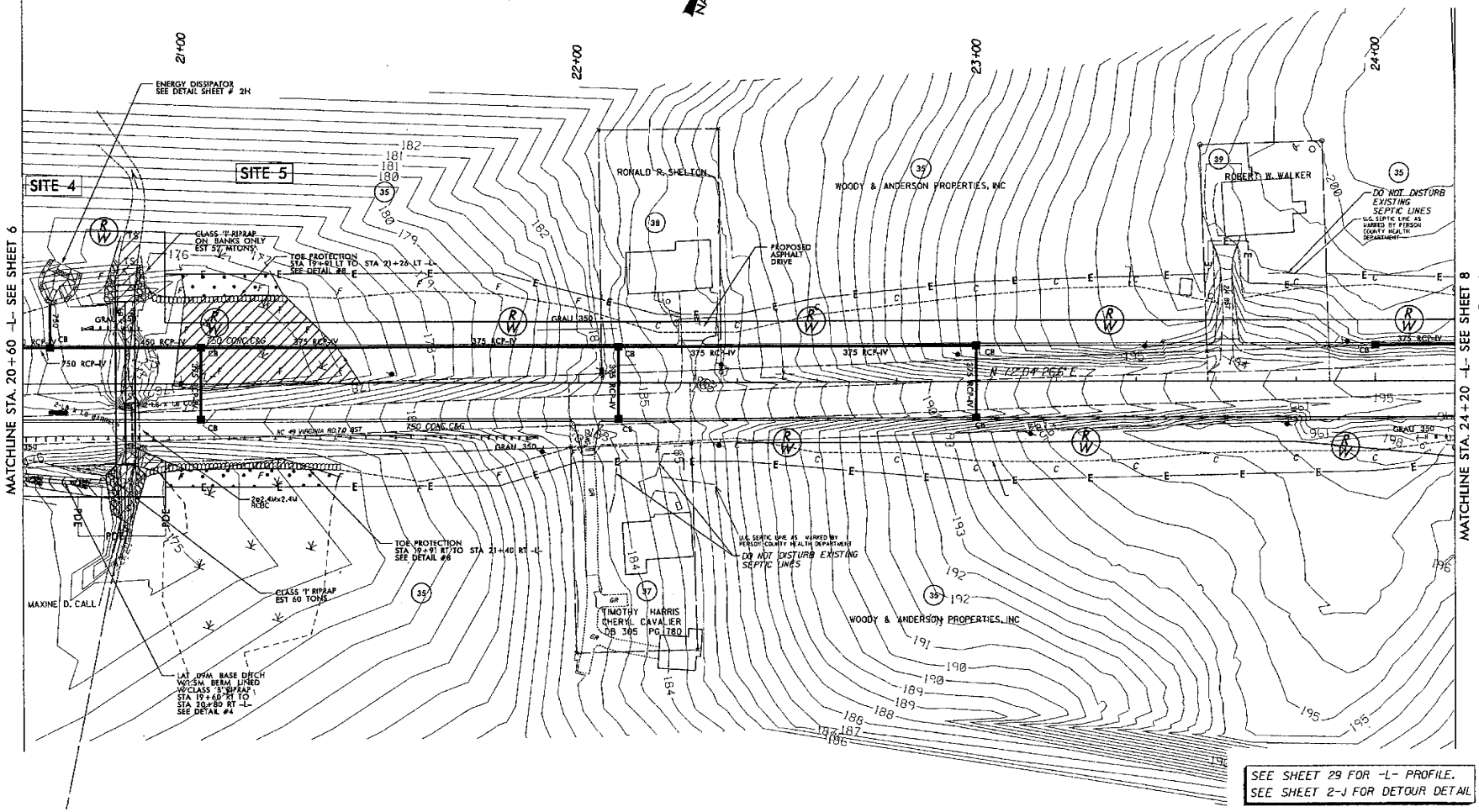
CONST. REV.	
R/W REV.	

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 13 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



SEE SHEET 29 FOR -L- PROFILE.
SEE SHEET 2-J FOR DETOUR DETAIL

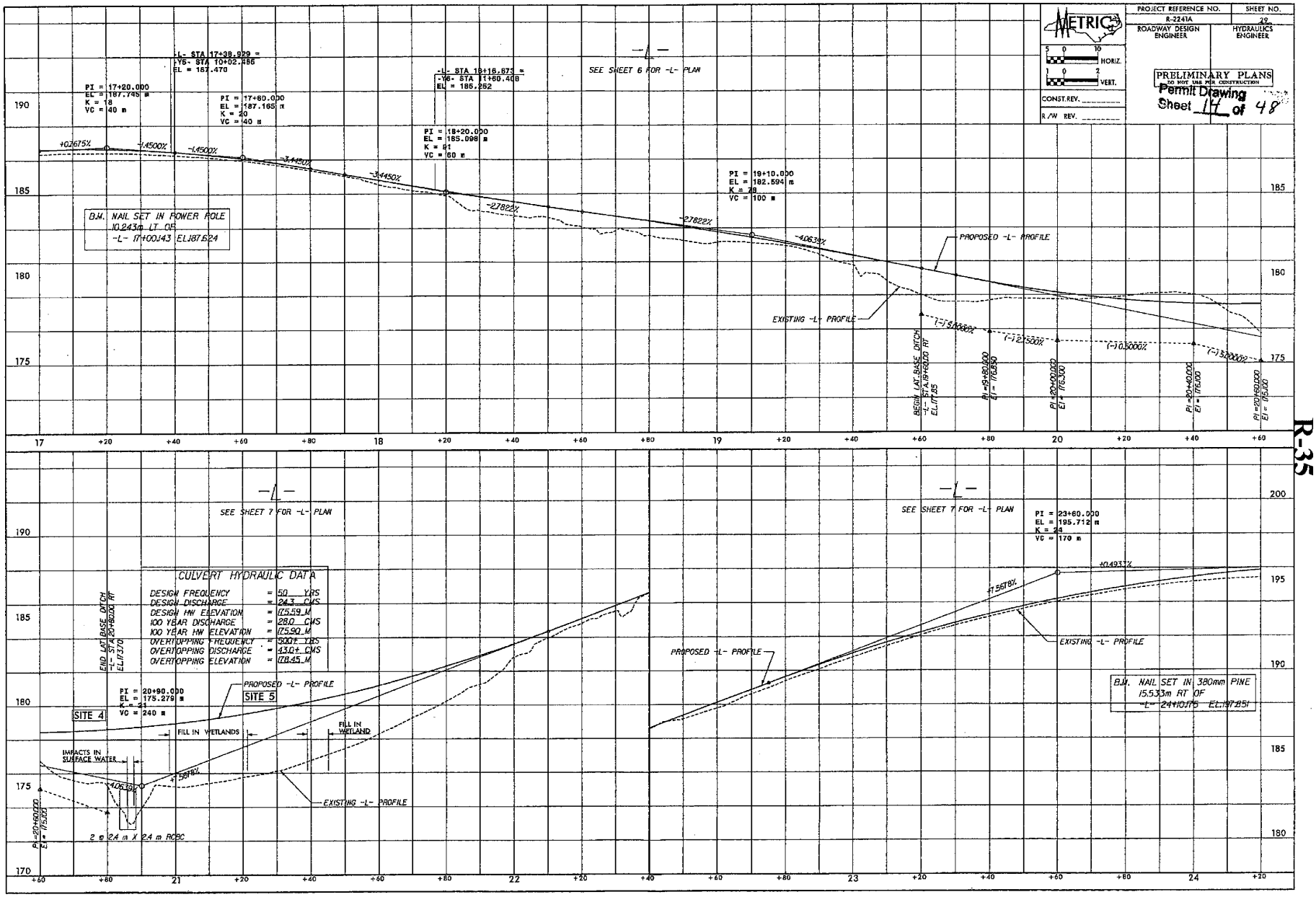
R-34

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35084
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

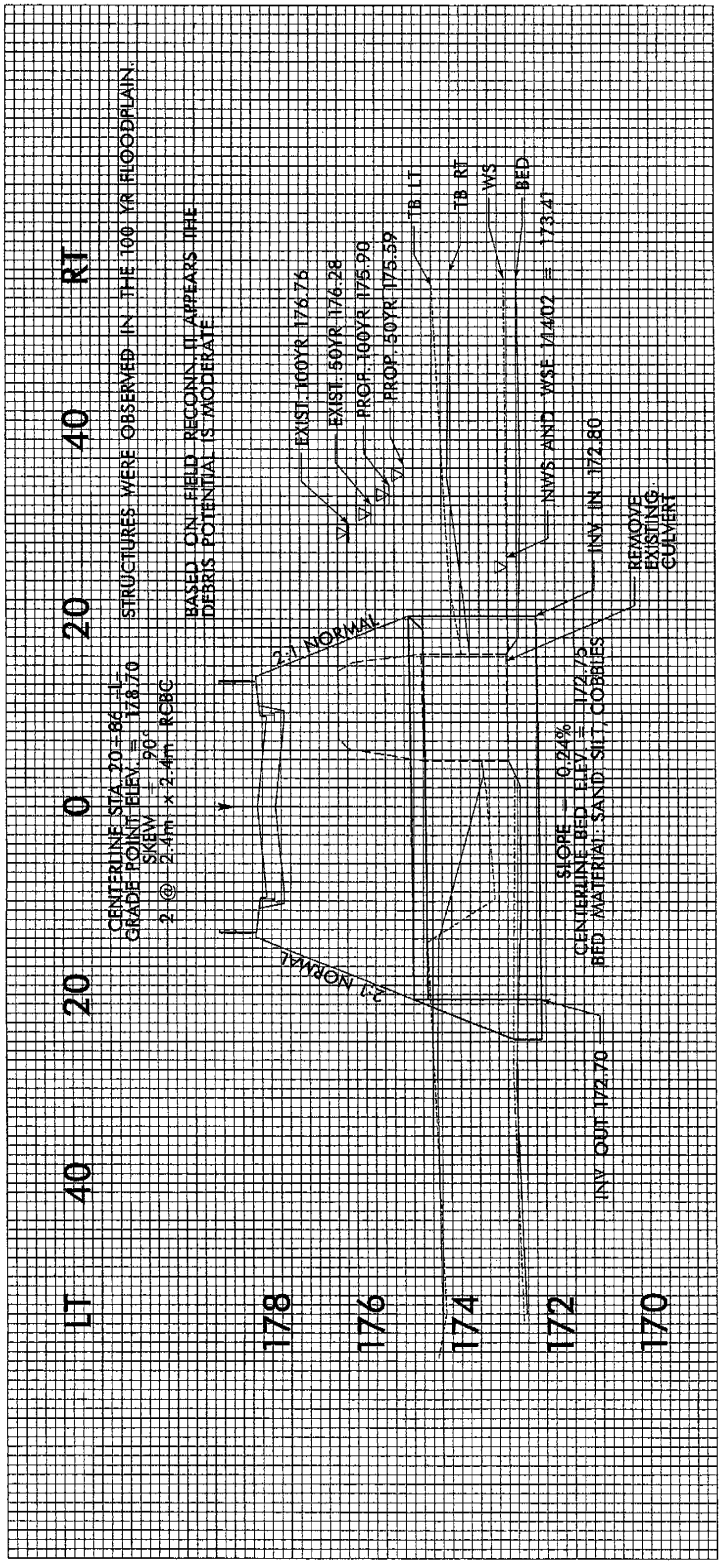
METRIC
5 0 10 HORIZ.
1 0 2 VERT.
CONST. REV.
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 14 of 48



R-35

Permit Drawing
Sheet 15 of 48



STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste 200
Charlotte, NC 28208
NC License: Engineering-0891

REVISIONS

06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 41, AND CHANGED NAME ON PARCEL 41
06-21-10 -	PARCEL 4a REVISED PARCEL NAME
06-23-10 -	PARCEL 4a REVISED PARCEL INFORMATION
02-09-11 -	PARCEL 37; ADDED SEPTIC LINE PARCEL 30; ADDED WELL PARCEL 34; ADDED SEPTIC LINE
08-02-11 -	COMBINED PARCELS 43A-43D INTO TRACTS 1A-1D, DENOTING EACH ACCORDINGLY
09-09-11 -	PARCEL 35, REVISED OWNER NAME

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

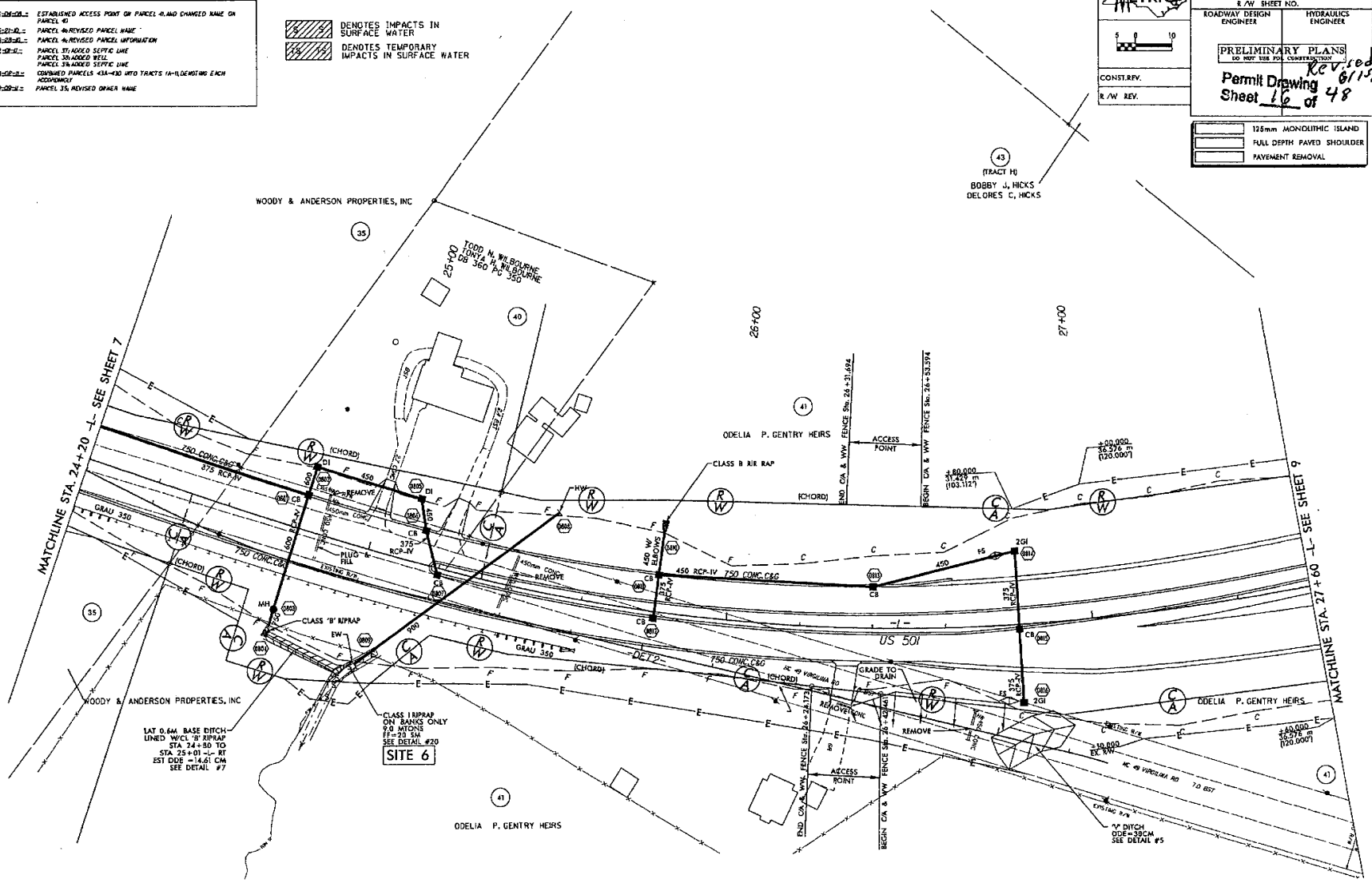
Revised 6/13/12

Permit Drawing
Sheet 16 of 48

CONST. REV.

R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



R-37

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License No. C-0891

REVISIONS

06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 41 AND CHANGED NAME ON PARCEL 40
06-21-10 -	PARCEL 46 REVISED PARCEL NAME
09-08-11 -	PARCEL 46 REVISED PARCEL INFORMATION
02-09-12 -	PARCEL 37; ADDED SEPTIC LINE PARCEL 38; ADDED WELL PARCEL 39; ADDED SEPTIC LINE
06-12-12 -	COMBINED PARCELS 43A-43C INTO TRACTS 1A-1D DEMOTING EACH ACCORDINGLY
09-09-12 -	PARCEL 35; REVISED OWNER NAME

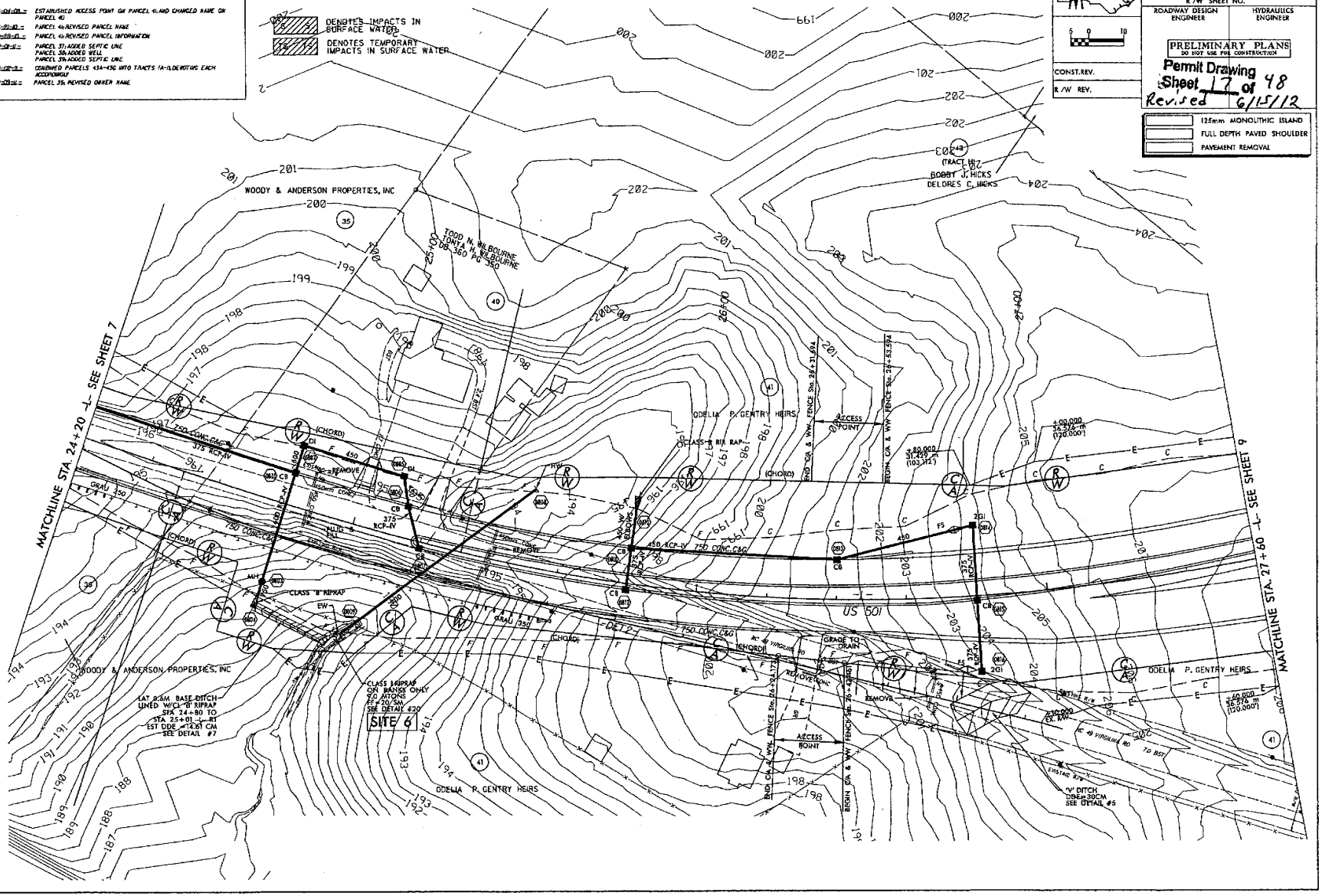
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	8
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 17 of 48
Revised 6/15/12

CONST.REV.
R /W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER



R-38

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste 300
Charlotte, NC 28208
NC License Number F-0895

REVISIONS	
06-04-08 -	MOVED ROW LINE ON PARCEL 63A AND ESTABLISHED ACCESS POINT ON PARCEL 62.
06-23-08 -	REMOVED ROW MONUMENTS, STRAIGHTENED CA AND WW FENCE ON PARCEL 62.
07-09-09 -	REMOVED PARCEL 63A, UPDATED DEED AND PLAT REFERENCES FOR PARCEL 63. UPDATED BEGIN C/A & WW FENCE STATION LABEL ON PARCEL 62.
08-02-11 -	CHANGED PROPERTY OWNER NAMES ON PARCELS 62 & 69.

METRIC

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

Permit Drawing
Sheet 18 of 48

DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83 NC GRID

MATCHLINE STA. 34+80 -L- SEE SHEET 10

MATCHLINE STA. 38+40 -L- SEE SHEET 12

35+00 36+00 37+00 38+00

63 ELLIE R. PENTECOST
64 HOWARD T. SMITH
66 MARY P. SMITH BOM 8 PG 72-3
67 SYBIL P. WOOTEN
66 MARY P. SMITH
62 ALMEADE G. GARRETT et al
62 ALMEADE G. GARRETT et al
68 CHARLES E. PERKINS
69

SITE 7A
SITE 7B
SITE 8

LAT 0.6M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 35+20 LT TO STA 36+17 LT -L- SEE DETAIL #7

BEGIN SHOULDER BERM GUTTER STA 35+40 LT -L-

+40.000 35.062 m [115.000']

+80.000 41.453 m [136.000']

CLASS 'I' RIPRAP 45.0 MTONS

END FENCE STA. 36+19.84

BEGIN FENCE STA. 36+30.80

PREFORMED SCOUR HOLE BASE=1.4M SEE DETAIL SHEET # 2H

CLASS 'I' RIPRAP ON BANKS ONLY 3.0 MTONS FF=26 SM SEE DETAIL #20

LAT 0.6M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 37+40 LT TO STA 37+60 LT -L- SEE DETAIL #7

CLASS 'B' RIPRAP

END SHOULDER BERM GUTTER STA 36+60 LT -L-

1@ 2.7m X 1.8m RCBC W/SILLS

2GI W/FLAT GRATE

CAT-1

N 27°39'14.1"E

375 W/ ELBOW

BDO

PDE

+60.000 30.480 m [100.000']

END SHOULDER BERM GUTTER STA 35+80 RT -L-

TOE PROTECTION STA 35+00 RT TO STA 35+80 RT -L- SEE DETAIL #8

STD BERM DITCH STA 36+20 RT TO STA 36+80 RT -L-

BEGIN FENCE STA. 35+81.24

CLASS 'I' RIPRAP EST. +/- 45 MTONS

END FENCE STA. 34+91.76

END CA & WW FENCE Sta. 34+97.472

+80.000 39.624 m [130.000']

ACCESS POINT

BEGIN CA & WW FENCE Sta. 37+17.257

TRANSITION STONE W/CLASS 'B' RIPRAP EST 3.0 MTONS

1.2M HEAD BASE DITCH DDE=5CM SEE DETAIL #9

TOE PROTECTION STA 37+34 RT TO STA 37+51 RT -L- SEE DETAIL #6

SPECIAL DITCH GRADE SEE PROFILE FOR GRADE STA 37+56 (SAG) TO STA 37+80 MED -L-

+80.000 37.004 m [105.000']

-L- PCS to 37+95.343

APPROXIMATE EL. OF PEGRAM, INC.

APPROXIMATE EL. OF CSX

SEE SHEET 31 FOR -L- PROFILE.

R-39

STV / Ralph Whitehead Associates, Inc.
1000 Wyatt Waterway Drive, Suite 200
Charleston, South Carolina 29492
NC License Number F-0261

REVISIONS	
06-01-08 -	MOVED ROW LINE ON PARCEL 63A, AND ESTABLISHED ACCESS POINT ON PARCEL 62.
06-23-08 -	REMOVED ROW MONUMENTS, STRAIGHTENED C/A AND W/W FENCE ON PARCEL 62.
07-05-09 -	REMOVED PARCEL 63A UPDATED DEED AND PLAT REFERENCES FOR PARCEL 63. UPDATED BEGIN C/A & W/W FENCE STATION LABEL ON PARCEL 62.
08-02-11 -	CHANGED PROPERTY OWNER NAMES ON PARCELS 62 & 63.

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

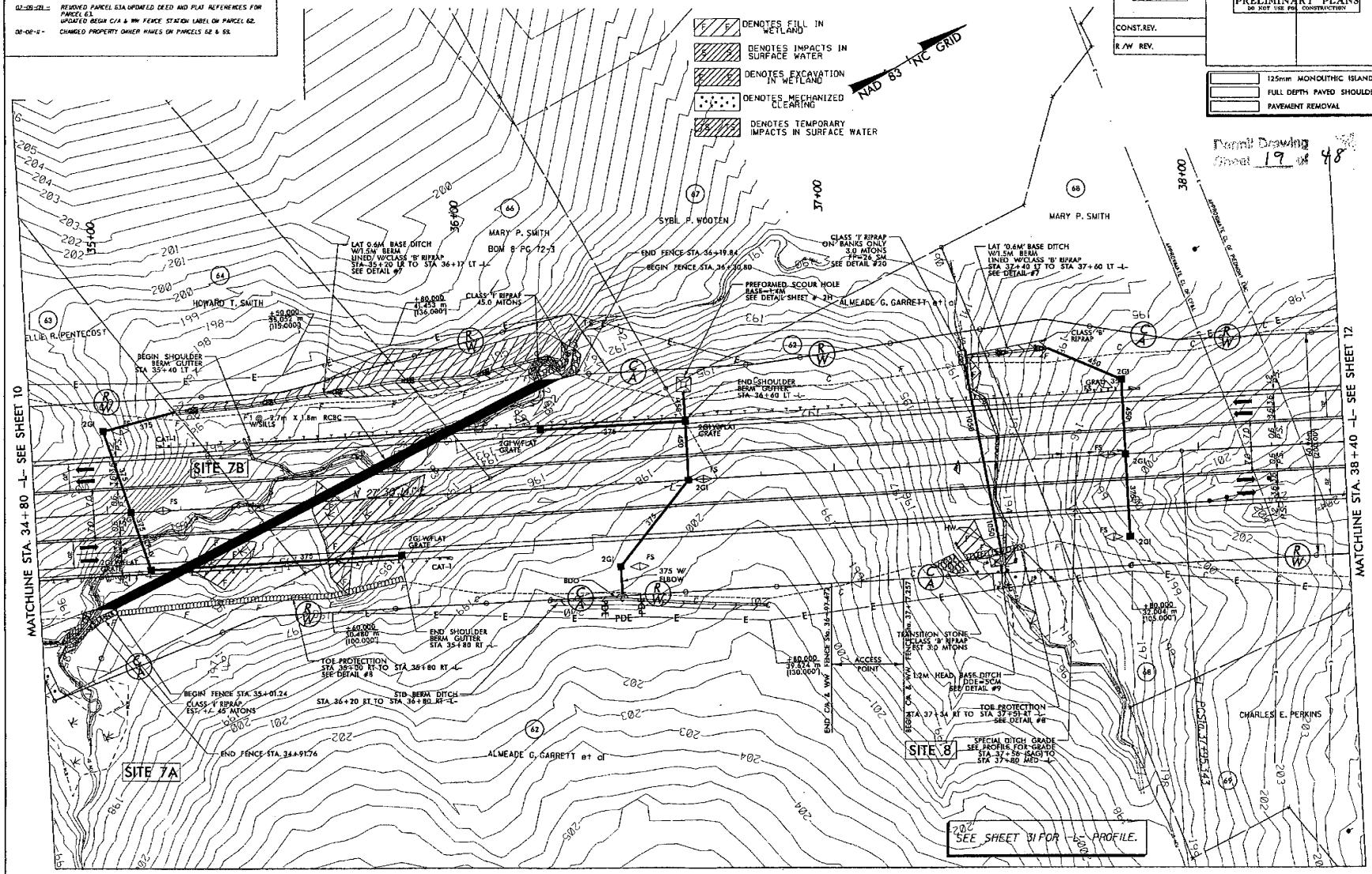
CONST. REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83 NC GRID

Permit Drawing
Sheet 19 of 48



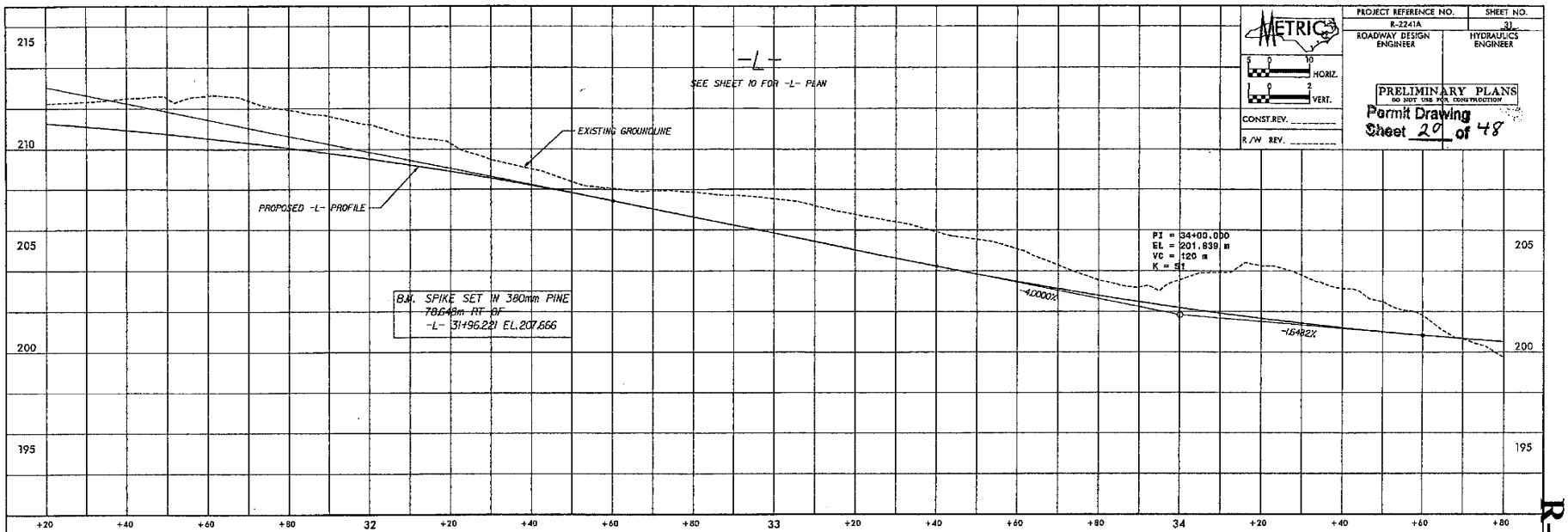
R-40

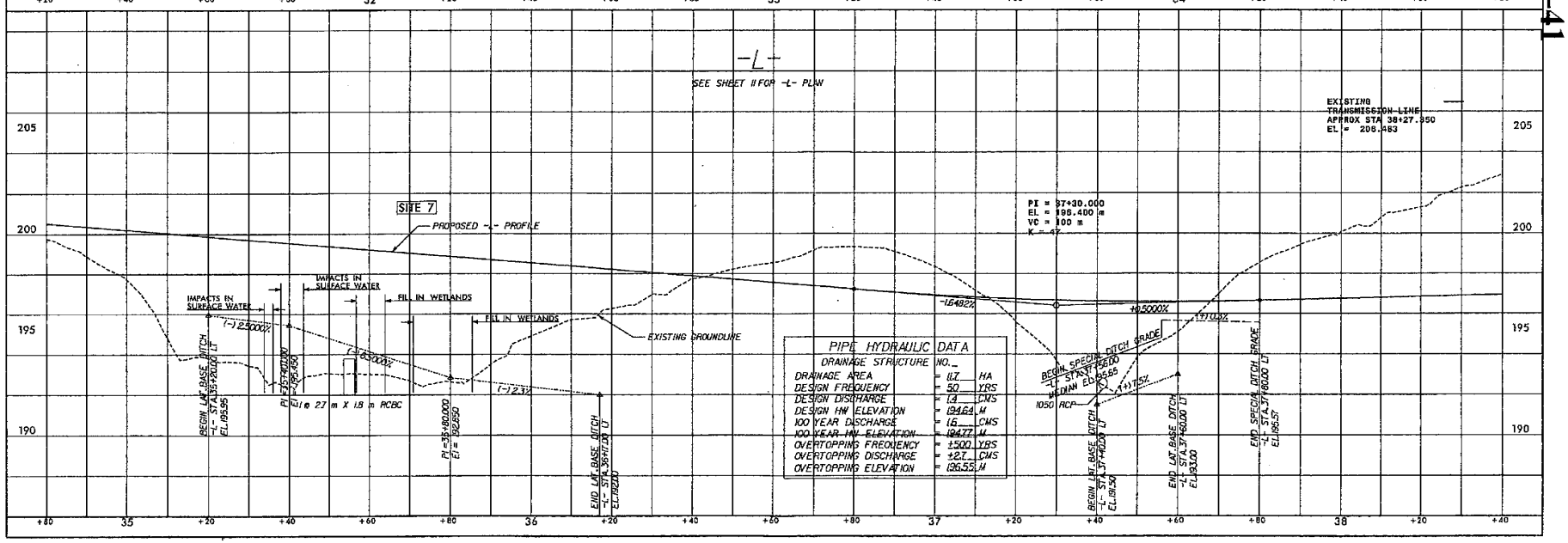
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35164
CHARLOTTE, NORTH CAROLINA 28235

METRIC
HORIZ. 5 0 10
VERT. 0 2
CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 29 of 48





PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 11.7	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 14	CMS
DESIGN HW ELEVATION	= 194.64	M
100 YEAR DISCHARGE	= 16	CMS
100 YEAR HW ELEVATION	= 194.77	M
OVERTOPPING FREQUENCY	= ±500	YRS
OVERTOPPING DISCHARGE	= ±2.7	CMS
OVERTOPPING ELEVATION	= 196.55	M

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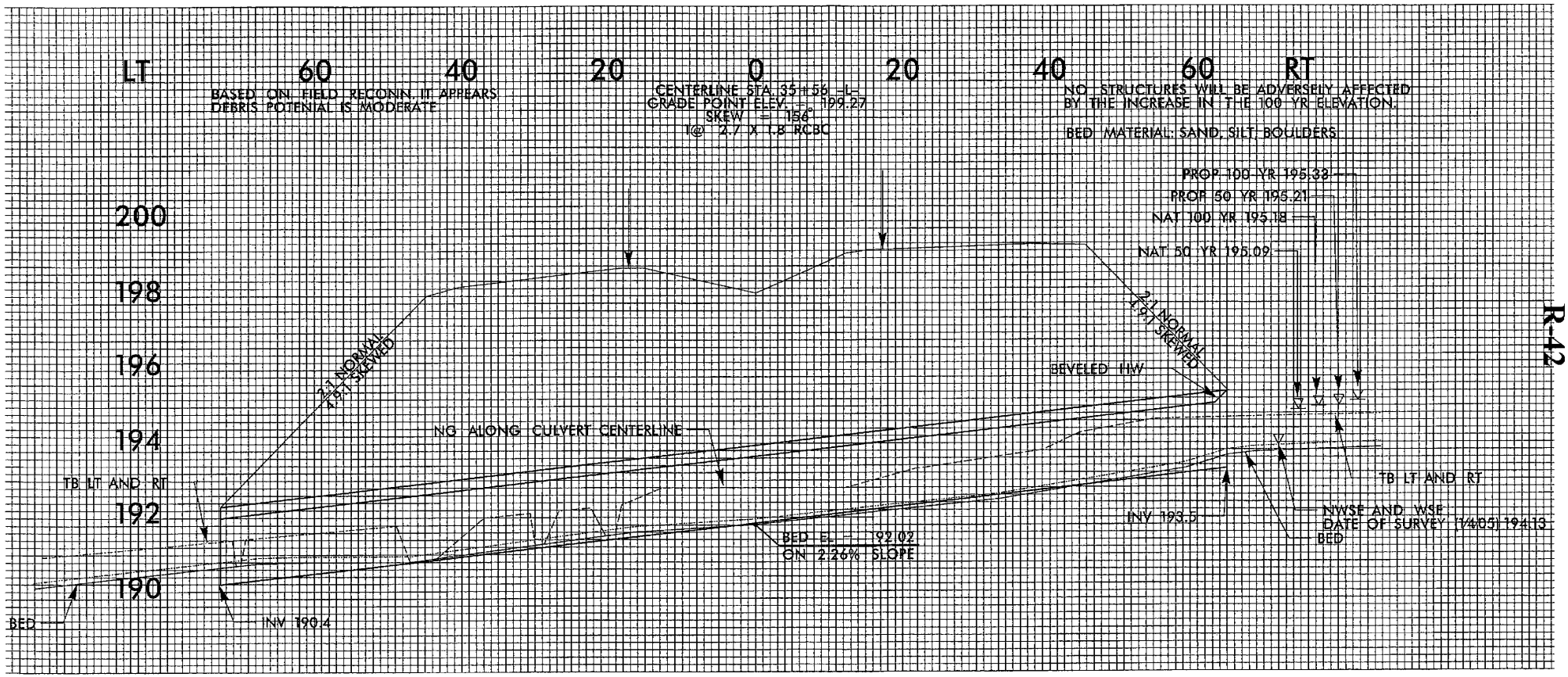
Permit Drawing
Sheet 21 of 48



R-42

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead Street, Ste. 200
Charlotte, North Carolina 28208
NC License Number F-0893

REVISIONS	
06-04-08 -	ESTABLISHED ACCESS POINT PARCEL 69, ELIMINATED TCE, AND WELL SHOWN ON PARCEL 71
06-24-08 -	TIED TCE TO ROW ON PARCEL 71
08-21-10 -	PARCEL 76, REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCEL 69
10-27-11 -	PARCEL 70Z1, CHANGED TCE TO PDE

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 22 of 48

METRIC
5 0 10

CONST. REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83 / NC GRID

SITE 9

MATCHLINE STA. 38+40 -L- SEE SHEET 11

MATCHLINE STA. 42+00 -L- SEE SHEET 13

MARY P. SMITH

MIRIAM J. LAVELLE AND HUSBAND CHARLES F. SAWS, JR.

CHARLES E. PERKINS

NADINE IRENE DIX

CLASS "I" RIPRAP ON BANKS ONLY +/-4.0 MTONS FF = +/-36 SM SEE DETAIL #20

END FENCE STA. 40+08.49

ENERGY DISSIPATOR SEE DETAIL SHEET # 2H

BEGIN FENCE STA. 40+10.04

1500 CLASS IV W/METHOD 'B' INSTALLATION

END FENCE STA. 40+62.50

BEGIN FENCE STA. 40+64.06

CL "I" RIP RAP (BANKS ONLY) +/- 1.7 MTONS FF +/- 2.1 SM

END C/A & WW FENCE Sta. 40+90.000

BEGIN C/A & WW FENCE Sta. 41+08.000

END C/A & WW FENCE Sta. 41+72.950

BEGIN C/A & WW FENCE Sta. 41+91.238

END C/A & WW FENCE Sta. 41+33.772

BEGIN C/A & WW FENCE Sta. 41+53.600

ACCESS POINT

CURVE L-5
PI Sta 41+08.408
D = 5°07'17.5" (RT)
L = 625.713
T = 313.065
R = 7,000.000
e = N.C.

SEE SHEET 32 FOR -L- PROFILE.

R-43

STV/Ralph Whitehead Associates, Inc.
1000 Edwards Ridge Drive, Suite 200
Cary, NC 27513
NC License Number F-0891

REVISIONS	
05-02-08 -	ESTABLISHED ACCESS POINT PARCEL 69.ELIMINATED TCE.AND WELL SHOWN ON PARCEL 71
05-23-08 -	TIED TCE TO ROW ON PARCEL 71
08-21-10 -	PARCEL 76 REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCEL 69
10-27-11 -	PARCEL 702, CHANGED TCE TO PDE

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83 NC GRID

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

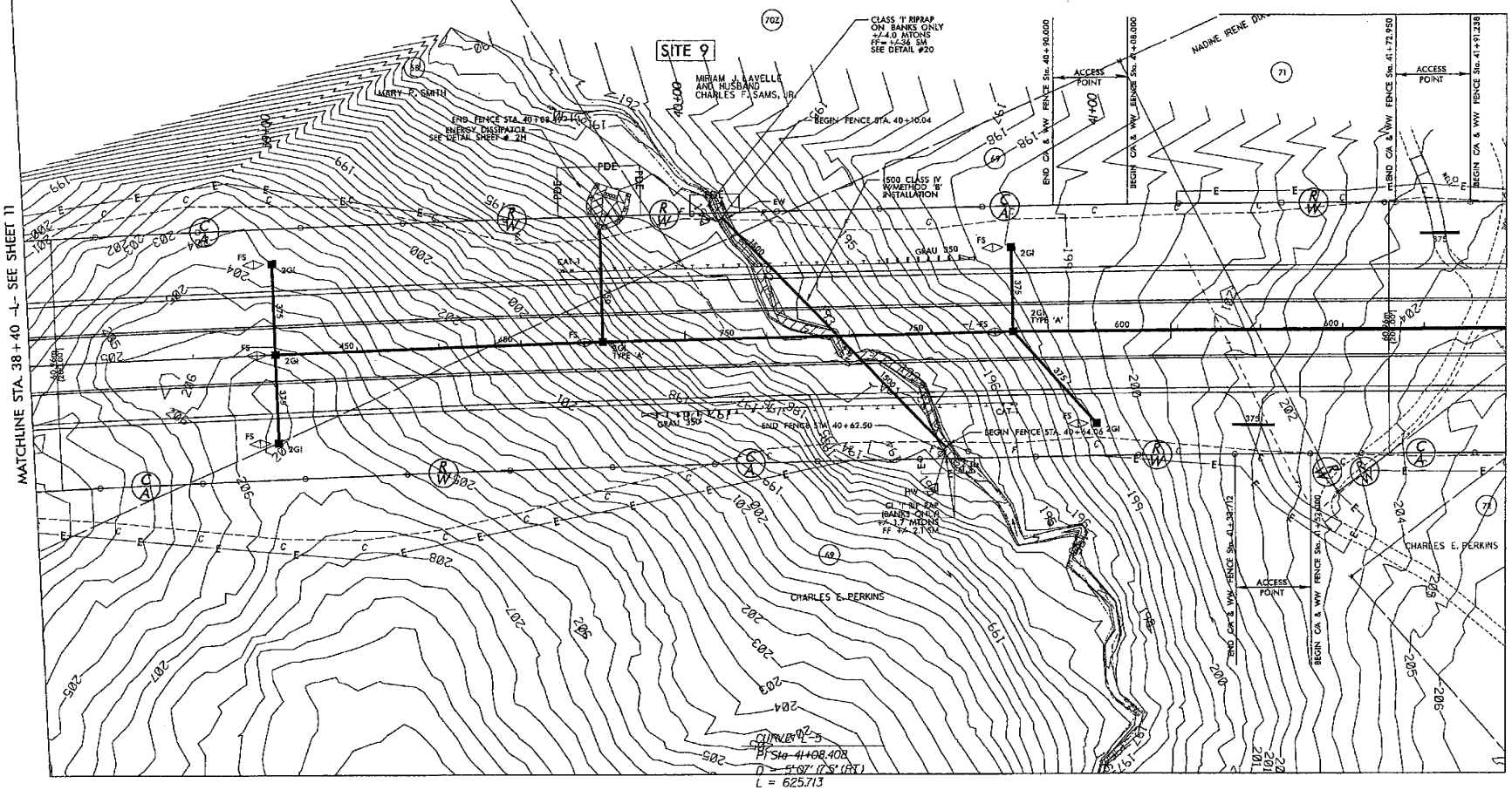
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

Permit Drawing
Sheet 23 of 48

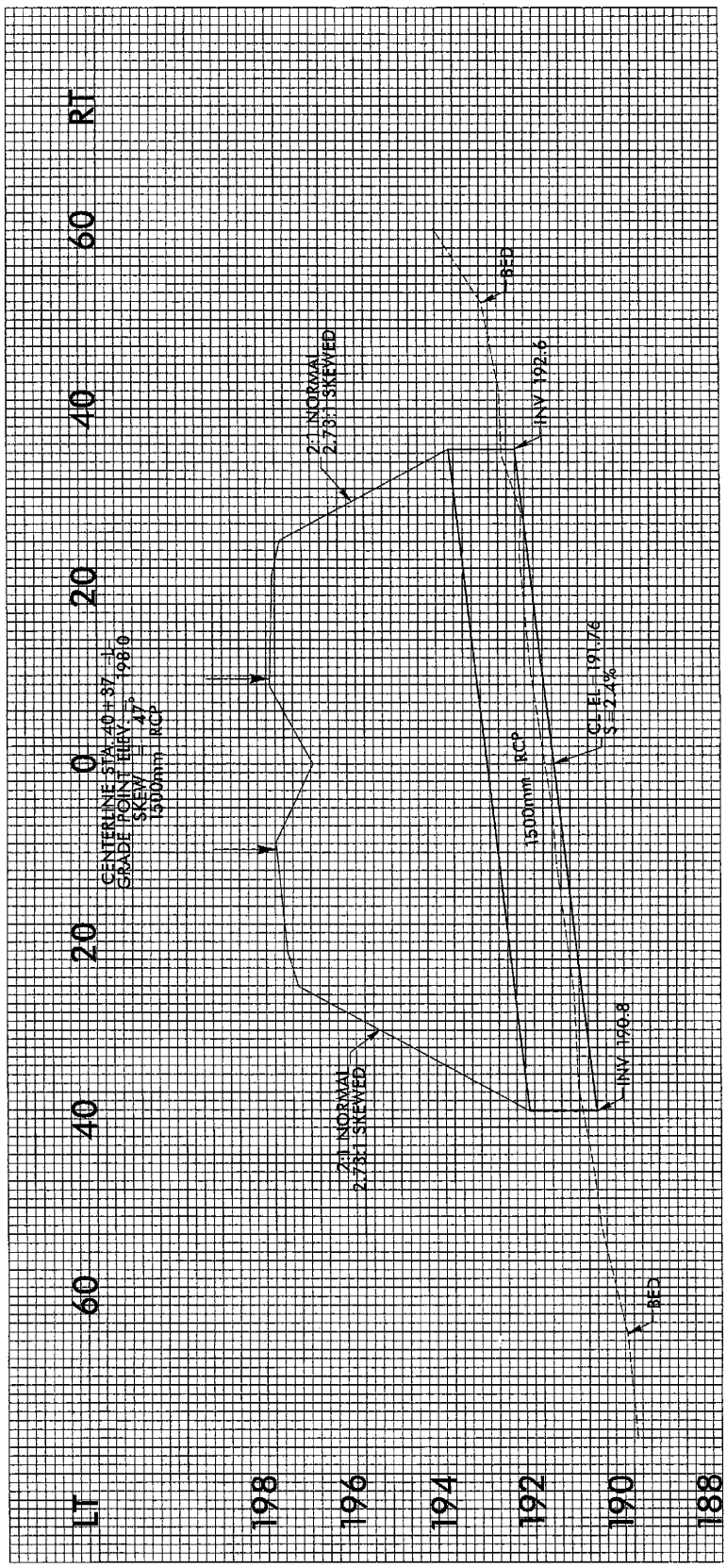
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

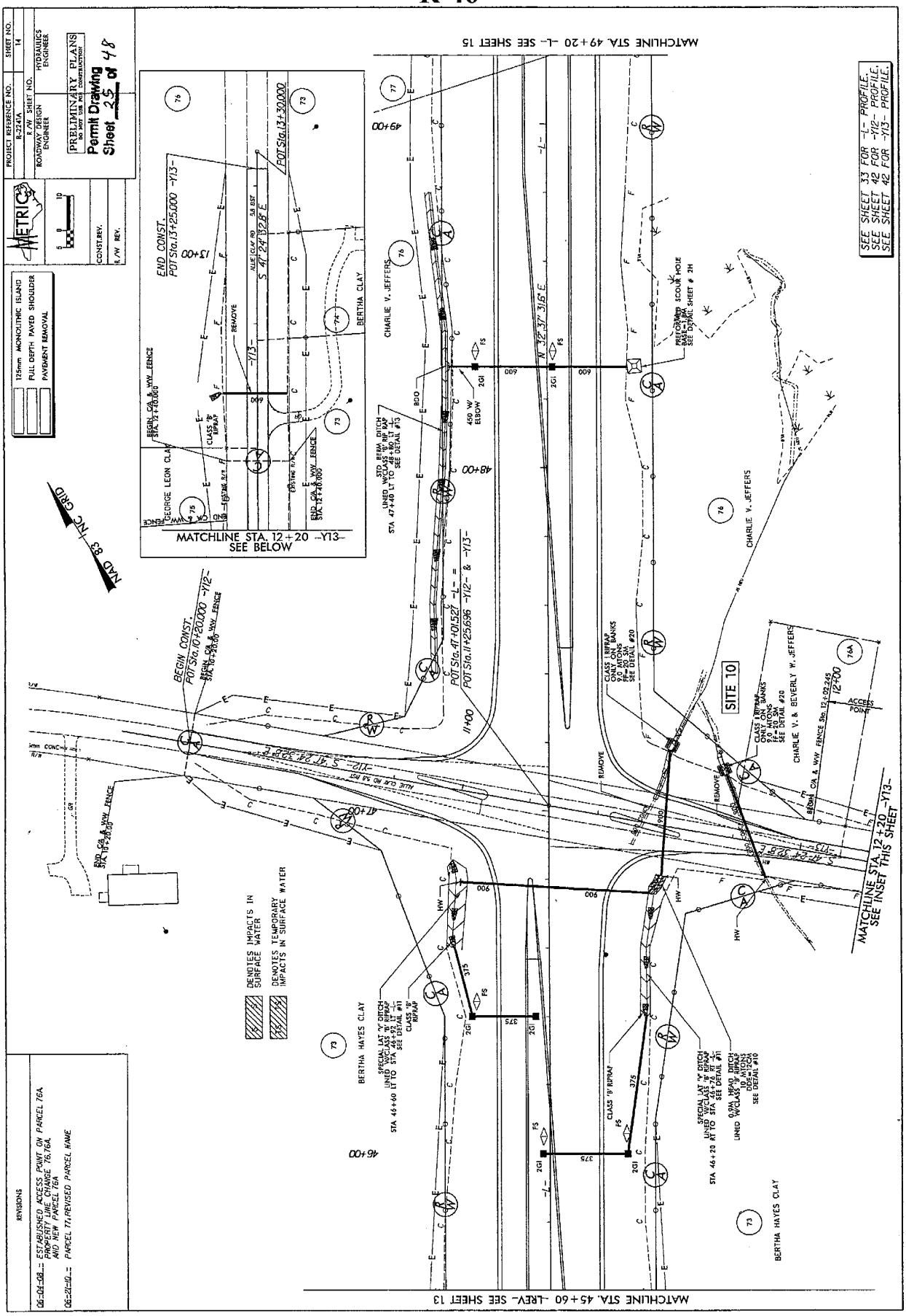


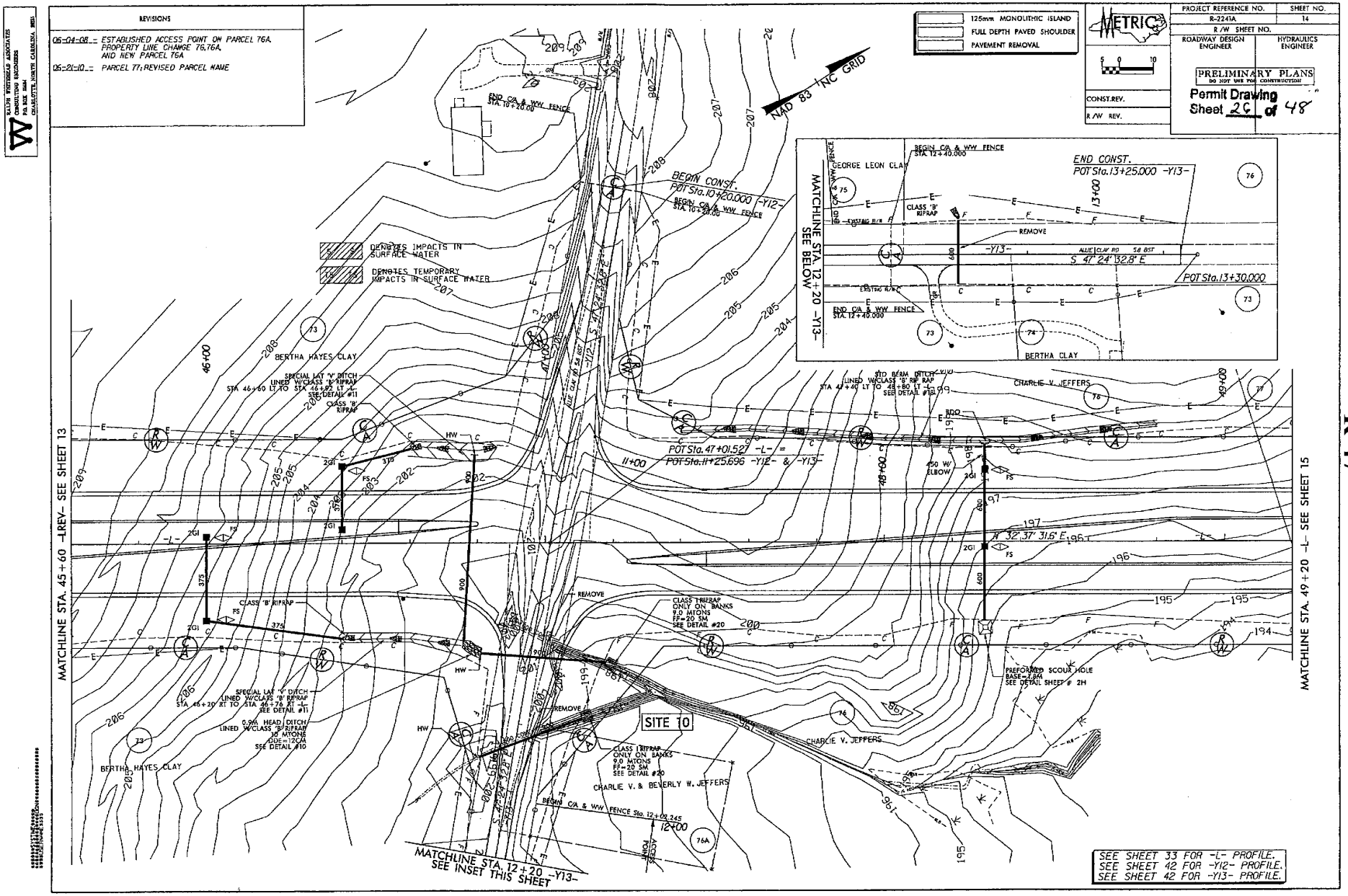
SEE SHEET 32 FOR -L- PROFILE.

R-44

Permit Drawing
Sheet 24 of 48




PROJECT REFERENCE NO.
R-2414A
SHEET NO.
14
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
NO RIGHT OF WAY OR CONSTRUCTION
Permit Drawing
Sheet 25 of 48
METRIC
CONST.REV.
R/W REV.
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
NAD 83 / NC GRID
MATCHLINE STA. 12+20 -Y13-
SEE BELOW
END CONST.
POT Sta.13+25.000 -Y13-
POT Sta.13+30.000
BEGIN CONST.
POT Sta.10+20.000 -Y12-
POT Sta.4+01.527 -L-
POT Sta.11+25.696 -Y12- & -Y13-
MATCHLINE STA. 49+20 -L- SEE SHEET 15
MATCHLINE STA. 45+60 -LREV- SEE SHEET 13
MATCHLINE STA. 12+20 -Y13-
SEE INSET THIS SHEET
SEE SHEET 33 FOR -L- PROFILE.
SEE SHEET 42 FOR -Y12- PROFILE.
SEE SHEET 42 FOR -Y13- PROFILE.
SITE 10
CHARLIE V. JEFFERS
BERTHA CLAY
BERTHA HAYES CLAY
GEORGE LEON CLAY
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
REVISIONS
06-04-08 -- ESTABLISHED ACCESS POINT ON PARCEL 76A PROPERTY LINE CHANGE 76,76A AND NEW PARCEL 76A
06-21-10 -- PARCEL 77, REVISED PARCEL NAME
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 2444
CHARLOTTE, NORTH CAROLINA 28201


REVISIONS
06-04-08 -- ESTABLISHED ACCESS POINT ON PARCEL 76A. PROPERTY LINE CHANGE 76,76A, AND NEW PARCEL 76A
06-21-10 -- PARCEL 77; REVISED PARCEL NAME
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
METRIC
PROJECT REFERENCE NO.
R-2241A
SHEET NO.
14
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 26 of 48
CONST.REV.
R/W REV.
NAD 83 NC GRID
BEGIN CONST.
POT Sta.10+20.000 -Y12-
END CONST.
POT Sta.13+25.000 -Y13-
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
MATCHLINE STA. 12+20 -Y13- SEE BELOW
MATCHLINE STA. 45+60 -L-REV- SEE SHEET 13
MATCHLINE STA. 49+20 -L- SEE SHEET 15
MATCHLINE STA. 12+20 -Y13- SEE INSET THIS SHEET
SITE 10
BERTHA HAYES CLAY
CHARLIE V. JEFFERS
CHARLIE V. & BEVERLY W. JEFFERS
GEORGE LEON CLAY
BERTHA CLAY
SPECIAL LAT 'Y' DITCH LINED W/CLASS 'B' RIPRAP STA 46+60 LT TO STA 46+22 LT SEE DETAIL #11
CLASS 'B' RIPRAP
SPECIAL LAT 'Y' DITCH LINED W/CLASS 'B' RIPRAP STA 45+20 RT TO STA 46+76 RT -L- SEE DETAIL #11
0.9M HEAD DITCH LINED W/CLASS 'B' RIPRAP 30 MTONS FF=120 SM SEE DETAIL #10
CLASS I RIPRAP ONLY ON BANKS 9.0 MTONS FF=20 SM SEE DETAIL #20
STD BEAM DITCH LINED W/CLASS 'B' RIP RAP STA 47+40 LT TO 48+80 LT -L- SEE DETAIL #18
PREFORMED SCOUR HOLE BASE=1.6M SEE DETAIL SHEET # 2H
POT Sta.47+01.527 -L- = POT Sta.11+25.696 -Y12- & -Y13-
N 32°37' 31.6" E
S 47°24' 32.8" E
POT Sta.13+30.000
BEGIN C/A & WW FENCE Sta. 12+02.345
END C/A & WW FENCE STA. 10+20.00
BEGIN C/A & WW FENCE STA. 12+40.000
END C/A & WW FENCE STA. 12+40.000
REMOVE
SEE SHEET 33 FOR -L- PROFILE.
SEE SHEET 42 FOR -Y12- PROFILE.
SEE SHEET 42 FOR -Y13- PROFILE.

R-47

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number: C-0910

REVISIONS	
05-04-08 -	NAME CHANGE ON PARCEL 79,AND ESTABLISHED ACCESS POINT ON PARCEL 77,78
05-21-10 -	PARCELS 77,78 REVISED PARCEL NAME
05-26-10 -	PARCEL 78 REVISED PARCEL INFORMATION
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCEL 79
09-09-11 -	PARCEL 78 & 78 REVISED OWNER NAME/ PARCEL INFORMATION

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC
5 0 10
CONST. REV.
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 27 of 48
Revised 6/15/12

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 / NC GRID

DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE STA. 49+20 -L- SEE SHEET 14

MATCHLINE STA. 52+80 -L- SEE SHEET 16

AUSTIN B. CLAY HEIRS

RONALD E. THOMAS, JR AND WIFE, JODI R. THOMAS

LAT 0.6M BASE DITCH W/CLASS 'B' RIPRAP STA 50+81 TO STA 51+04 -L- LT SEE DETAIL #7

BEGIN SHOULDER BERM GUTTER STA 50+80 LT -L-

TOE PROTECTION STA 50+55 LT TO STA 50+81 LT -L- SEE DETAIL #8

TRANSITION STONE CLASS 'B' RIPRAP 5.0 MTONS

CLASS 'B' RIPRAP ON BANKS ONLY 3.5 MTONS FF=36 SM

END SHOULDER BERM GUTTER STA 51+80 LT -L-

CLASS 'B' RIPRAP

PREFORMED SCOUR HOLE BASE=1.2M SEE DETAIL SHEET # 2H GRAU 350

2GI W/FLAT GRATE

-L- US 501

TOE PROTECTION STA 50+50 RT TO STA 51+20 RT -L- SEE DETAIL #8

TOE PROTECTION STA 51+70 RT TO STA 51+90 RT -L- SEE DETAIL #8

GRAU 350

SPECIAL DITCH GRADE W/CLASS 'B' RIPRAP SEE PROFILE FOR GRADE STA 49+80 RT TO STA 50+00 RT -L- SEE DETAIL #22

PREFORMED SCOUR HOLE BASE=1.4M SEE DETAIL SHEET # 2H

CLASS 'B' RIPRAP FF=5M

SITE 11

SITE 12

0.6M BASE HEAD DITCH LINED W/CLASS 'B' RIPRAP DDE=20 CM EST=8.0 MTONS SEE DETAIL #14

WILLIE M. DIXON
CLYDE C. DIXON

LONZY C. DIXON

ACCESS POINT

END C/A & WW FENCE Sta. 49+66.888

BEGIN C/A & WW FENCE Sta. 49+85.176

END C/A & WW FENCE Sta. 52+26.436

BEGIN C/A & WW FENCE Sta. 52+44.978

CHARLIE V. JEFFERS & BEVERLY W. JEFFERS

AUSTIN B. CLAY HEIRS

SEE SHEET 33 FOR -L- PROFILE.

R-48

STV/Ralph Whitehead Associates, Inc.
1000 Westgate Mall, Suite 200
Charlotte, NC 28204
NC License Number C-0891

REVISIONS

06-04-08 -	NAME CHANGE ON PARCEL 79 AND ESTABLISHED ACCESS POINT ON PARCEL 77,79
06-21-12 -	PARCELS 77,78 REVISED PARCEL NAME
09-20-10 -	PARCEL 78, REVISED PARCEL INFORMATION
08-02-9 -	CHANGED PROPERTY OWNER INFORMATION ON PARCEL 79
09-09-9 -	PARCEL 76 & 78 REVISED OWNER NAME/ PARCEL INFORMATION

NAD 83 / NC GRID

F/F DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

METRIC

5 0 10

CONST.REV.

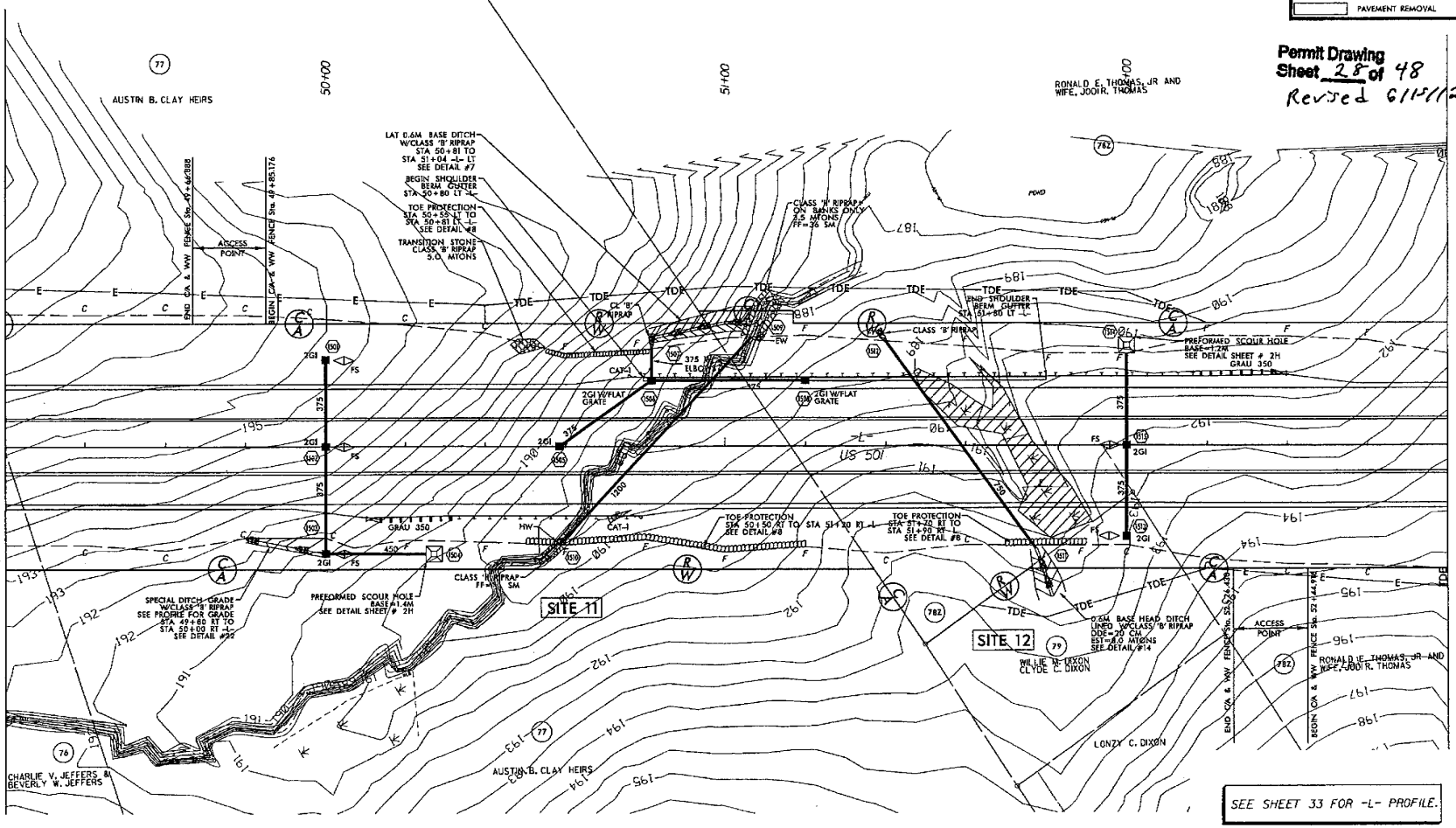
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

Permit Drawing
Sheet 28 of 48
Revised 6/19/12



R-49

REVISIONS
06-04-08 ... ESTABLISHED ACCESS POINT ON PARCEL 80
06-21-10 ... PARCEL 78: REVISED PARCEL NAME
09-28-10 ... PARCEL 78: REVISED PARCEL INFORMATION

DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING

NAD 83 / NC GRID

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 29 of 48

CONST. REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

MATCHLINE STA. 52+80 -L- SEE SHEET 15

53+00 54+00 55+00 56+00

0.9M BASE TAIL DITCH DDE=9 CM SEE DETAIL #2

TRANSITION STONE CLASS 'B' RIPRAP 5.0 MTONS

STA 53+51 LT TO TOE PROTECTION STA 53+67 LT -L- SEE DETAIL #8

0.6M BASE TAIL DITCH DDE=10 CM SEE DETAIL #1

JOHN D. CLAY HEIRS (78)

JAMES F. SHOTWELL, JR. (80)

END CA & WW FENCE Sta. 53+61.08

ACCESS POINT

BEGIN CA & WW FENCE Sta. 55+80.641

CLASS 'B' RIPRAP ON BANKS ONLY 6.5 MTONS FF=15 SM

CLASS 'B' RIP RAP GRADE 350

CAT-1

-L-

N 32° 37' 31.6" E

FS (EL 192.25)

TRANSITION STONE CLASS 'B' RIPRAP 5.0 MTONS

HW

CLASS 'B' RIP RAP (ON BANKS ONLY) +/-1.7 MTONS FF +/-2.1 SM

SITE 13

TOE PROTECTION STA 53+12 RT TO STA 53+20 RT -L- SEE DETAIL #8

JOHN D. CLAY HEIRS (78)

STD. BERM DITCH STA 55+00 RT TO STA 56+40 RT -L-

JAMES F. SHOTWELL, JR. (80)

+15.000 30.480 m (100.000')

+25.000 30.480 m (100.000')

+15.000 41.148 m (135.000')

+25.000 41.148 m (135.000')

MATCHLINE STA. 56+40 -L- SEE SHEET 17

SEE SHEET 34 FOR -L- PROFILE.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA 27615
CHARLOTTE, NORTH CAROLINA 28255

R-50

REVISIONS
06-04-08 - ESTABLISHED ACCESS POINT ON PARCEL 80
06-21-10 - PARCEL 78: REVISED PARCEL NAME
09-28-10 - PARCEL 78: REVISED PARCEL INFORMATION

DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING

NAD 83 NC GRID

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 30 of 48

CONST. REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

MATCHLINE STA. 52+80 -L- SEE SHEET 15

MATCHLINE STA. 56+40 -L- SEE SHEET 17

53+00 54+00 55+00 56+00

0.7M BASE TAIL DITCH DDE=9 CM SEE DETAIL #2

0.6M BASE TAIL DITCH DDE=10 CM SEE DETAIL #1

TRANSITION STONE CLASS "B" RIPRAP 5.0 MTONS

STA 53+51 LT TO TDE PROTECTION STA 53+67 LT -L- SEE DETAIL #5

CLASS "B" RIPRAP ON BANKS ONLY 5.5 MTONS FF=15 SM

CLASS "B" RIP RAP GRAD=350

JOHN D. CLAY HEIRS

JAMES F. SHOTWELL, JR.

ACCESS POINT

BEGIN C/A & WW FENCE Sta. 55+61.08

END C/A & WW FENCE Sta. 55+80.41

N 32 37' 31.6" E

FS (EL. 192.25)

TRANSITION STONE CLASS "B" RIPRAP 5.0 MTONS

CLASS "B" RIP RAP (ON BANKS ONLY) +/-1.7 MTONS FF +/-2.5 SM

SITE 13

TDE PROTECTION STA 53+72 RT TO STA 53+20 RT -L- SEE DETAIL #3

STD BERM DITCH STA 55+00 RT TO STA 54+40 RT -L-

C 40 WW FENCE

±15.000 30.480 m (100.000')

±25.000 41.148 m (135.000')

SEE SHEET 34 FOR -L- PROFILE.

R-51

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License Number F-0207

REVISIONS

05-24-08 – ESTABLISHED ACCESS POINT ON PARCEL 80
05-22-10 – PARCEL 84 REVISED PARCEL NAME, LOCATED WIRE FENCING. PARCEL 85 LOCATED ELECTRIC FENCE
10-31-11 – PARCEL 84 ADDED PDE AND MODIFIED C/A FENCE. AND TEMPORARY EASEMENTS

METRIC

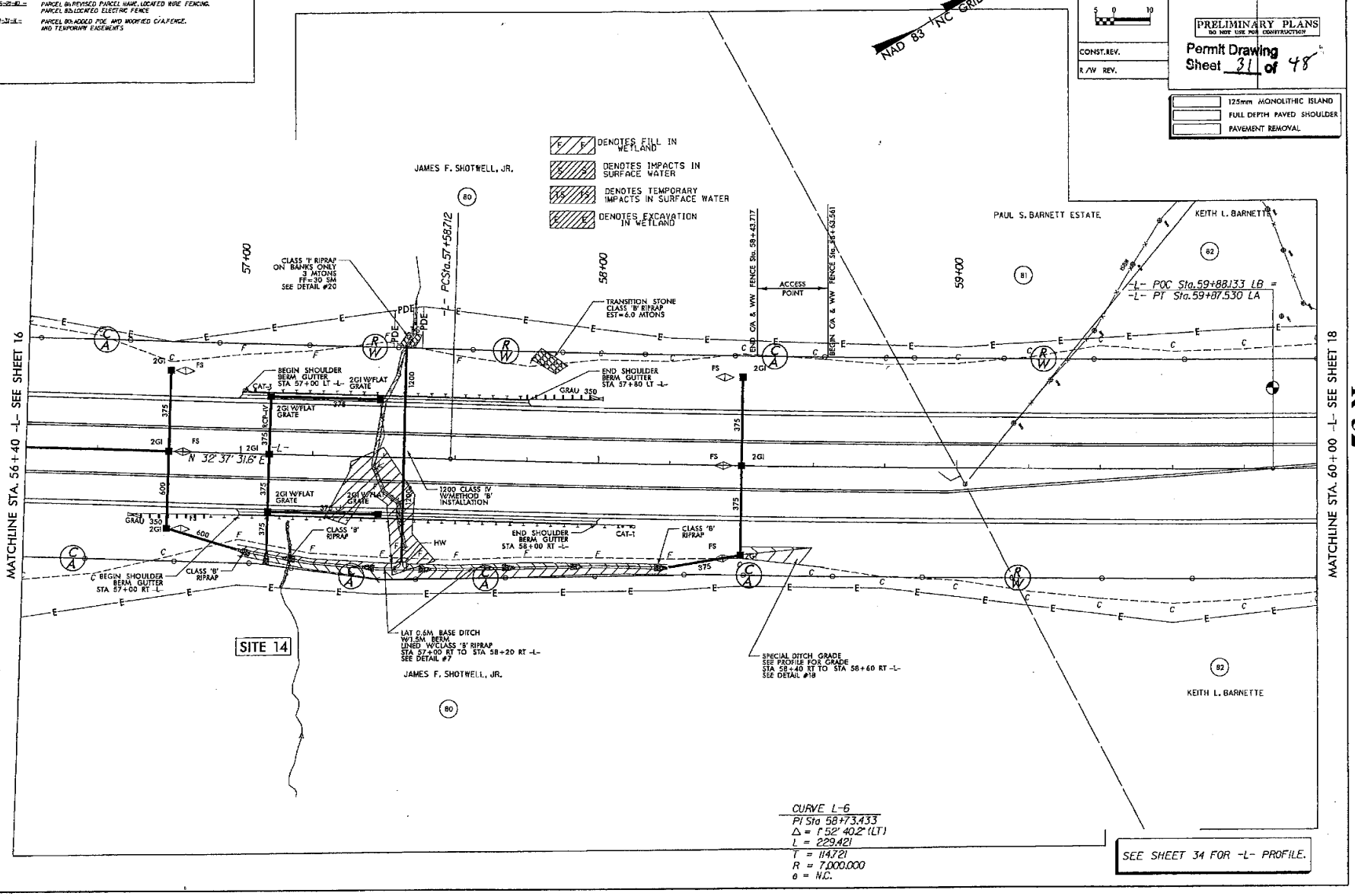
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 31 of 48

CONST. REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



R-52

STV / Ralph Whitehead Associates, Inc.
1000 Tyvola Boulevard Sq., Ste. 200
Charlotte, NC 28210
NC License Number F-0907

REVISIONS

06-06-08	ESTABLISHED ACCESS POINT ON PARCEL 80
06-27-10	PARCEL 66 REVISED, PARCEL 66 HAS LOCATED WIRE FENCING. PARCEL 80 LOCATED ELECTRIC FENCE
07-31-11	PARCEL 80 ADDED POE AND MODIFIED C/A FENCE. AND TEMPORARY EASEMENTS

METRIC

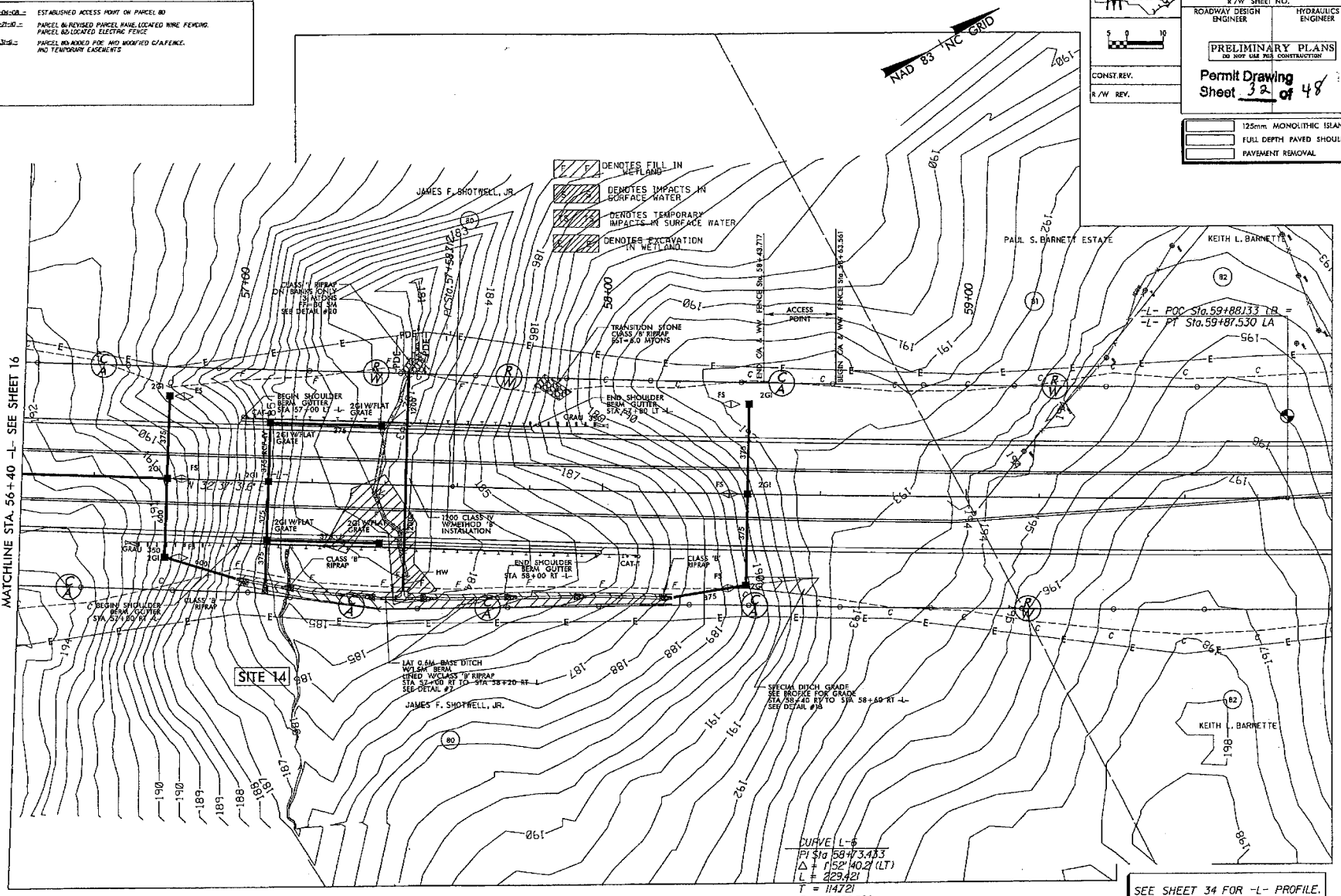
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 32 of 48

CONST. REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



R-53

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, North Carolina 28208
NC License Number F-0991

REVISIONS	
06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 83. DRIVEWAY RECONNECTION ON PARCEL 84A. ESTABLISHED ACCESS POINT ON PARCEL 82. WELL SHOWN ON PARCEL 84A. NEW PARCEL 84A
06-27-10 -	PARCEL 82; LOCATED ELECTRIC FENCE, BARN, EXISTING DRIVEWAYS PARCEL 84A, 84B; LOCATED FENCE
09-20-10 -	PARCEL 84A; MOVED PM MONUMENT AND LINE 2 FEET FROM WELL
08-28-10 -	PARCEL 82; REMOVED C/A SYMBOL, ELIMINATED R/W CALL-OUT, RELOCATED FENCE ALONG C/A
10-22-11 -	PARCEL 82; ADDED POE

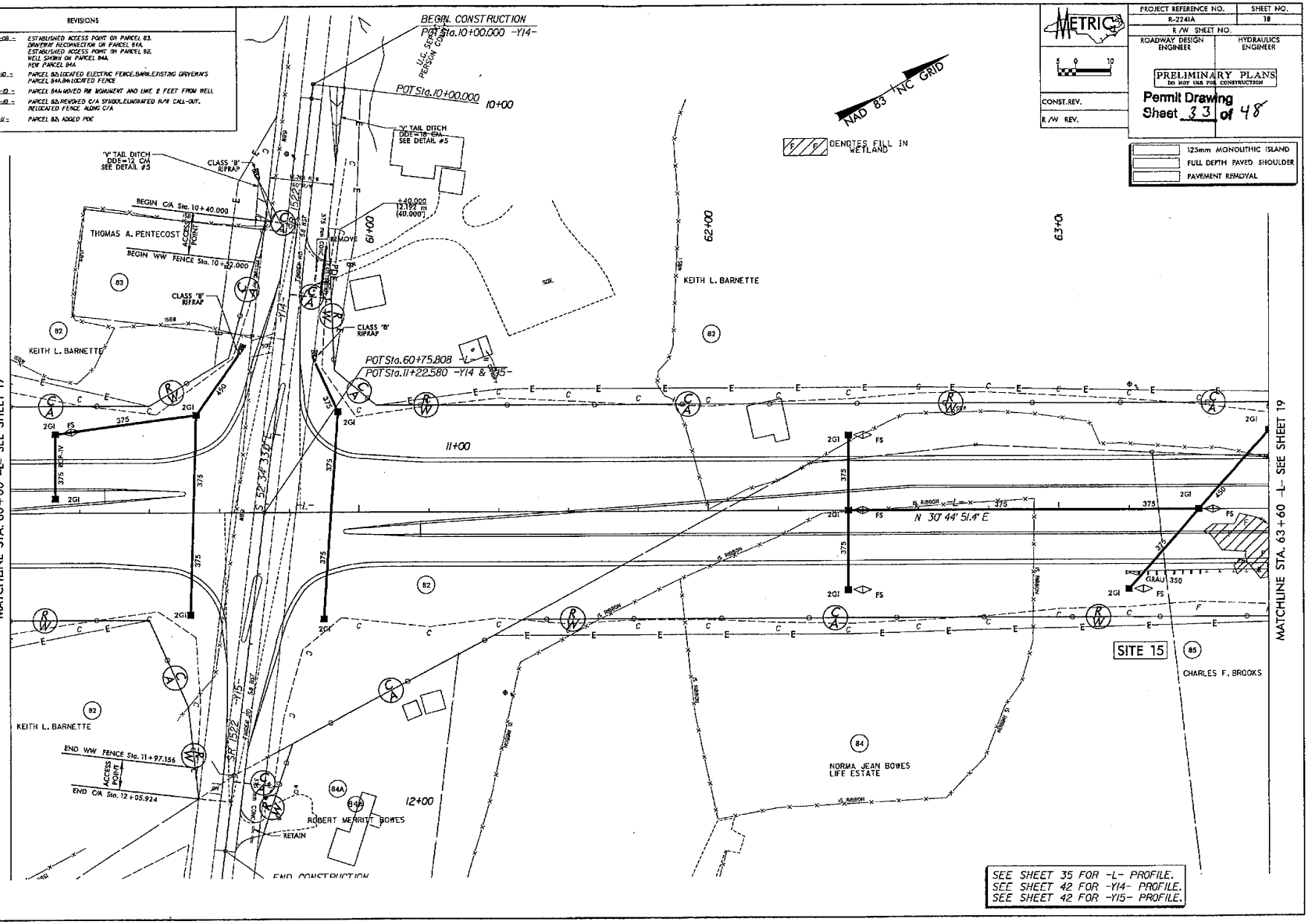
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 33 of 48

CONST. REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



SEE SHEET 35 FOR -L- PROFILE.
SEE SHEET 42 FOR -Y14- PROFILE.
SEE SHEET 42 FOR -Y15- PROFILE.

R-54

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0891

REVISIONS	
06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 83. DRIVEWAY RECONNECTION OR PARCEL 84A. ESTABLISHED ACCESS POINT ON PARCEL 82. WELL SHOWN ON PARCEL 84A. NEW PARCEL 84A
06-21-10 -	PARCEL 82: LOCATED ELECTRIC FENCE. BARN. EXISTING DRIVEWAYS PARCEL 84A & 84: LOCATED FENCE
02-20-10 -	PARCEL 84A: MOVED PM MONUMENT AND LINE 2 FEET FROM WELL
03-26-10 -	PARCEL 82: REMOVED C/A STAKE. ELIMINATED R/W CALL-OUT. RELOCATED FENCE. RLOIG C/A
10-27-11 -	PARCEL 82: ADDED POE

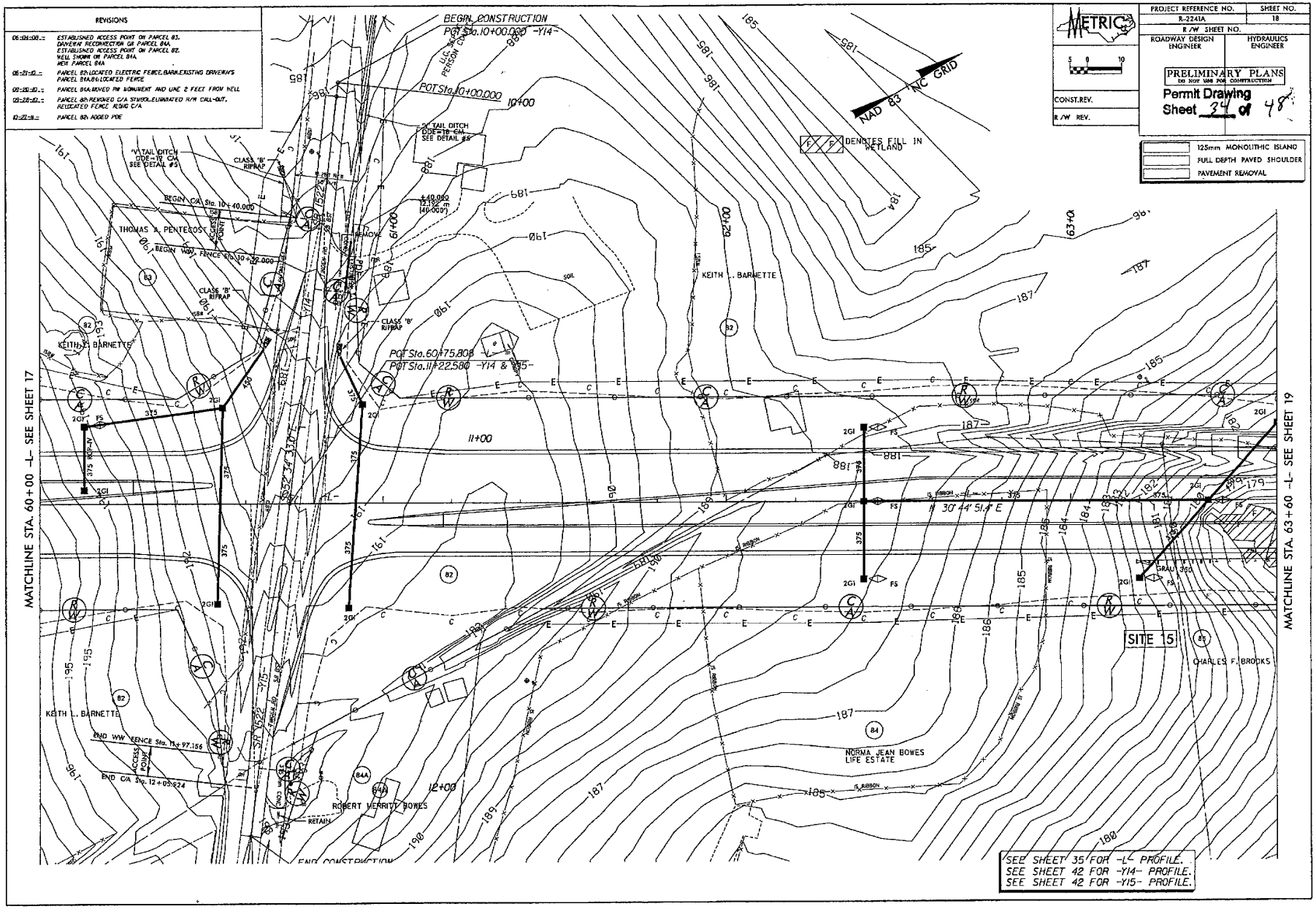
METRIC
5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 34 of 48

CONST. REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



R-55

STV/Ralph Whitehead Associates, Inc.
Consulting Engineers
1000 Rex Hospital Drive, Suite 200
Cary, NC 27511
NC License Number C-0901

REVISIONS	
06-06-08 -L-	NEW PARCEL 87A, AND PROPERTY LINE CHANGE ON PARCEL 87
06-06-10 -L-	PARCEL 82: LOCATED FENCE PARCEL 87A: LOCATED SHED, GARAGE, MOBILE HOME, REVISED PARCEL NAME PARCEL 96: REVISED PARCEL NAME
08-02-11 -	COMBINED PARCEL 87A WITH PARCEL 87 CHANGED PROPERTY INFORMATION ON PARCEL 89
09-09-11 -L-	PARCEL 87: REVISED OWNER NAME
10-27-11 -L-	PARCEL 85, 86, 87Z AND 89Z: MODIFIED C/A, FENCE, AND TEMPORARY EASEMENTS

NAD 83 NC GRID

METRIC 5 0 10

CONST. REV.

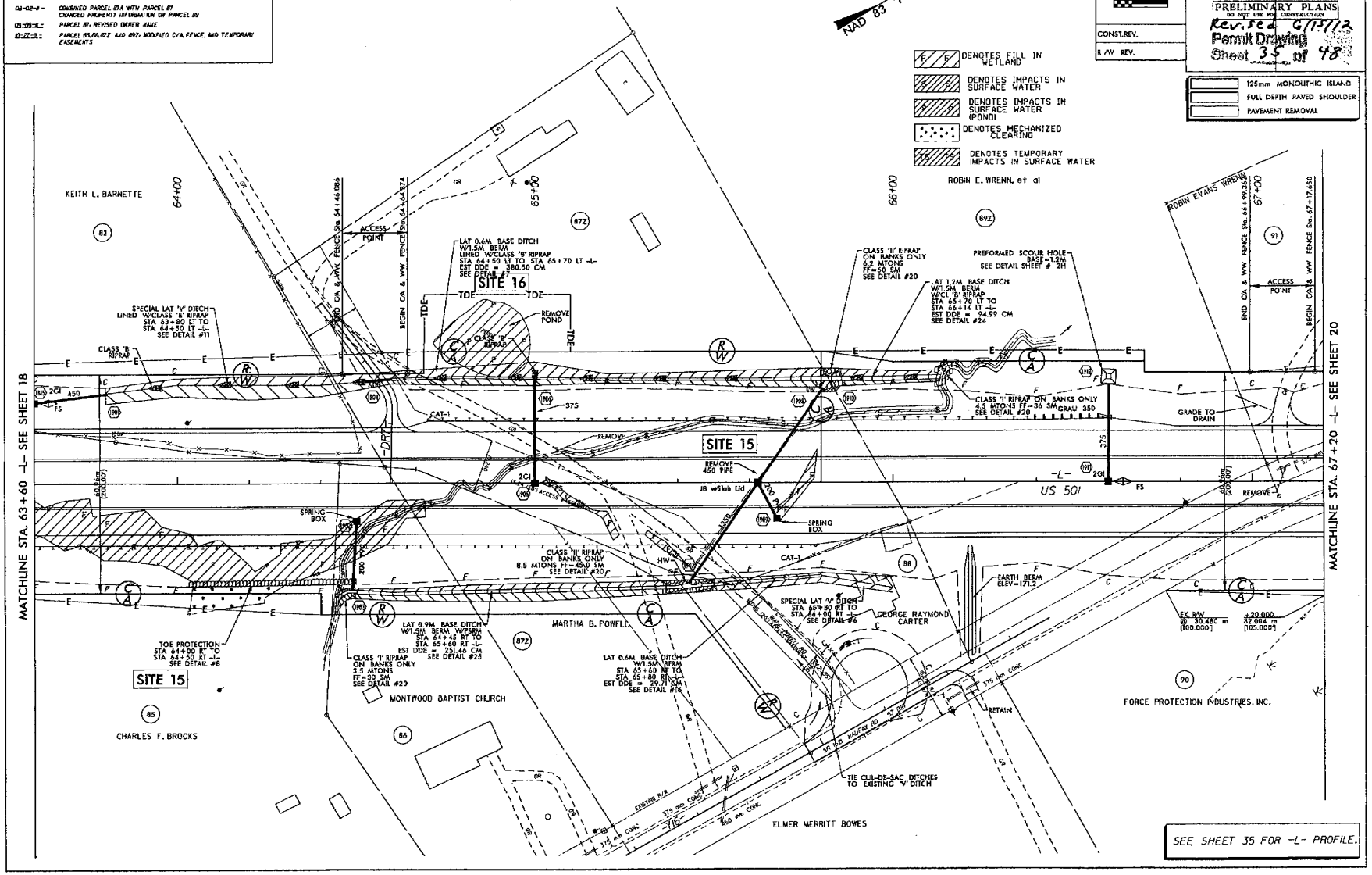
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2247A	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Revised 6/15/12
Permit Drawing
Sheet 35 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER (POND)
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER



SEE SHEET 35 FOR -L- PROFILE.

R-56

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste 200
Charlotte, NC 28208
NC License number: C-0891

REVISIONS

05-01-08 -	NEW PARCEL 87A AND PROPERTY LINE CHANGE ON PARCEL 87
05-01-11 -	PARCEL 85; LOCATED FENCE PARCEL 87A; LOCATED SHED, GARAGE, MOBILE HOME, REVISED PARCEL NAME PARCEL 90; REVISED PARCEL NAME
08-02-11 -	COMBINED PARCEL 87A WITH PARCEL 87 CHANGED PROPERTY INFORMATION ON PARCEL 89
09-09-11 -	PARCEL 87; REVISED OWNER NAME
10-27-11 -	PARCEL 85, 86, 87Z AND 89Z; MODIFIED C/A, FENCE, AND TEMPORARY EASEMENTS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 36 of 48
Revised 04/15/12

CONST. REV.
R/W REV.

DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER (POND)
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 NC GRID

MATCHLINE STA. 63+60 -L- SEE SHEET 18

MATCHLINE STA. 67+20 -L- SEE SHEET 20

KEITH L. BARNETTE

ROBIN E. WRENN, et al

ROBIN EVANS WRENN

SITE 16

SITE 15

SITE 15

ACCESS POINT

REMOVE POND

SPECIAL LAT 'V' DITCH LINED W/CLASS 'B' RIPRAP STA 63+80 LT TO STA 64+50 LT -L- SEE DETAIL #11

CLASS 'B' RIPRAP

LAT 0.6M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 64+50 LT TO STA 65+70 LT -L- EST DDE = 240.50 CM SEE DETAIL #7

CLASS 'II' RIPRAP ON BANKS ONLY 6.2 MTONS FF=50 SM SEE DETAIL #20

PREFORMED SCOUR HOLE BASE=1.2M SEE DETAIL SHEET # 21H

LAT 1.2M BASE DITCH W/1.5M BERM W/CLASS 'B' RIPRAP STA 65+70 LT TO STA 66+14 LT -L- EST DDE = 14.99 CM SEE DETAIL #24

CLASS 'I' RIPRAP ON BANKS ONLY 4.5 MTONS FF=36 SM SEE DETAIL #20

GRAU 350

GRADE TO DRAIN

REMOVE 450 PIPE

JB w/Slab Lid

SPRING BOX

CLASS 'II' RIPRAP ON BANKS ONLY 8.5 MTONS FF=68.0 SM SEE DETAIL #20

SPECIAL LAT 'V' DITCH STA 64+80 RT TO STA 66+00 RT -L- SEE DETAIL #6

EARTH BERM ELEV=171.2

GEORGE RAYMOND CARTER

MARTHA B. POWELL

LAT 0.6M BASE DITCH W/1.5M BERM W/FSM STA 64+45 RT TO STA 65+40 RT -L- EST DDE = 231.36 CM SEE DETAIL #19

TOE PROTECTION STA 64+00 RT TO STA 64+50 RT -L- SEE DETAIL #6

CLASS 'I' RIPRAP ON BANKS ONLY 3.5 MTONS FF=30 SM SEE DETAIL #20

MONTWOOD BAPTIST CHURCH

LAT 0.6M BASE DITCH W/1.5M BERM STA 65+60 RT TO STA 65+88 RT -L- EST DDE = 39.71 CM SEE DETAIL #19

CHARLES F. BROOKS

US 501

EX. R/W @ 30.480 m (100.000') ±20.000 32.004 m (105.000')

FORCE PROTECTION INDUSTRIES, INC.

RETAIN

TIE CUL-DE-SAC DITCHES TO EXISTING 'V' DITCH

ELMER MERRITT BOWES

SEE SHEET 35 FOR -L- PROFILE.

R-57

STV / Ralph Whitehead Associates, Inc.
1000 Westgate Drive, Suite 252
Charlotte, NC 28262
NC License Number F-0891

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

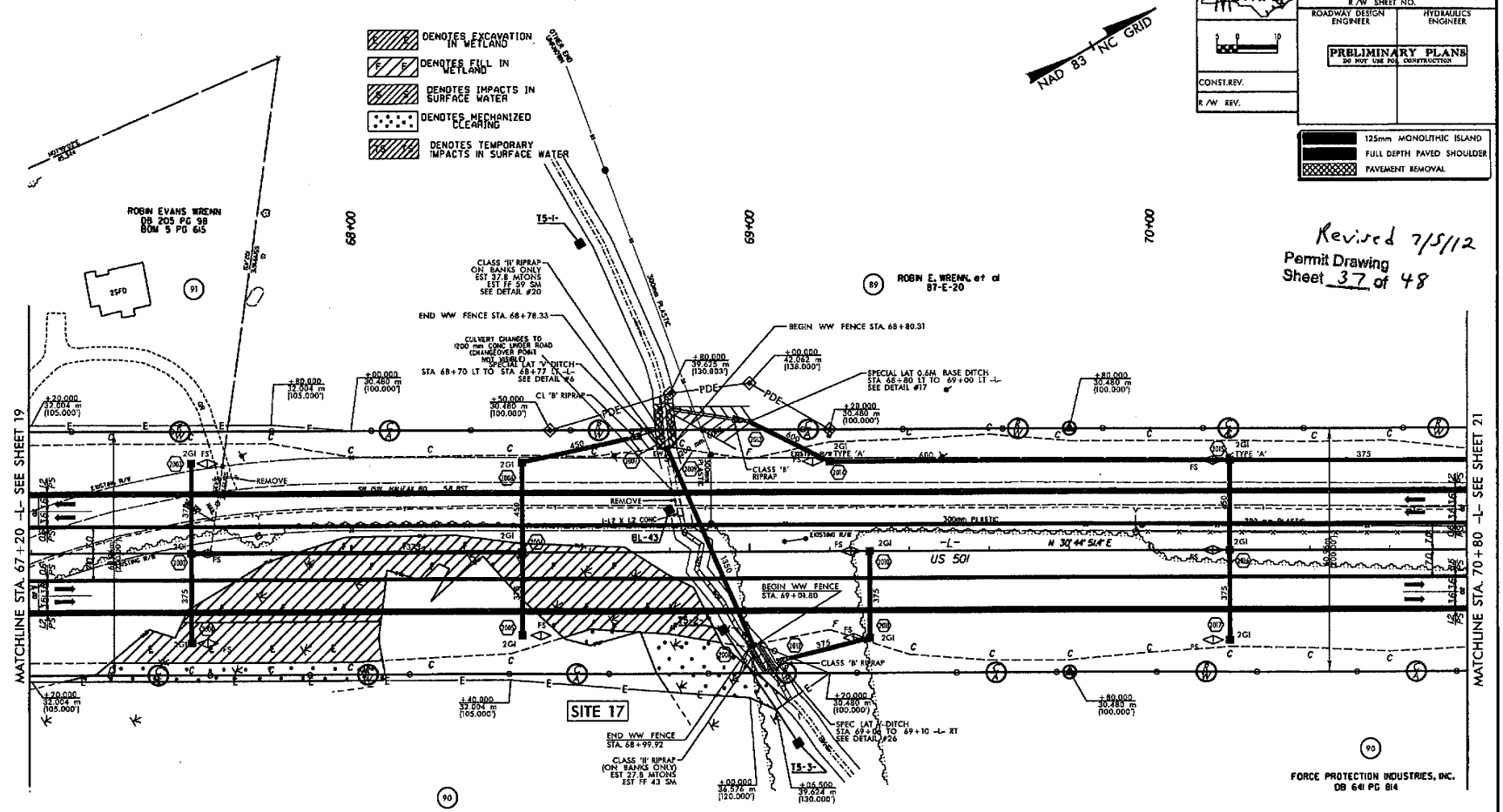
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R/W REV.

METRIC

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

Revised 7/5/12
Permit Drawing
Sheet 37 of 48



SEE SHEET 36 FOR -L- PROFILE

R-58

STV / Ralph Whitehead Associates, Inc.
Raleigh, North Carolina 27604
1600 Atlantic Blvd., Suite 200
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC
5 0 10

CONST. REV.
R/W REV.

DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 NC GRID

Revised 7/31/12
Permit Drawing
Sheet 38 of 48

MATCHLINE STA. 67+20 -L- SEE SHEET 19

MATCHLINE STA. 70+80 -L- SEE SHEET 21

ROBIN EVANS WRENN
DB 205 PG 98
BOM 5 PG 615

ROBIN E. WRENN, et al
87-E-20

FORCE PROTECTION INDUSTRIES, INC.
DB 641 PG 814

US 501

SITE 17

SEE SHEET 36 FOR -L- PROFILE

R-59

STV/Ralph Whitehead Associates, Inc.
1000 Westgate Drive, Suite 200
Raleigh, North Carolina 27609
NC License Number C-0991

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

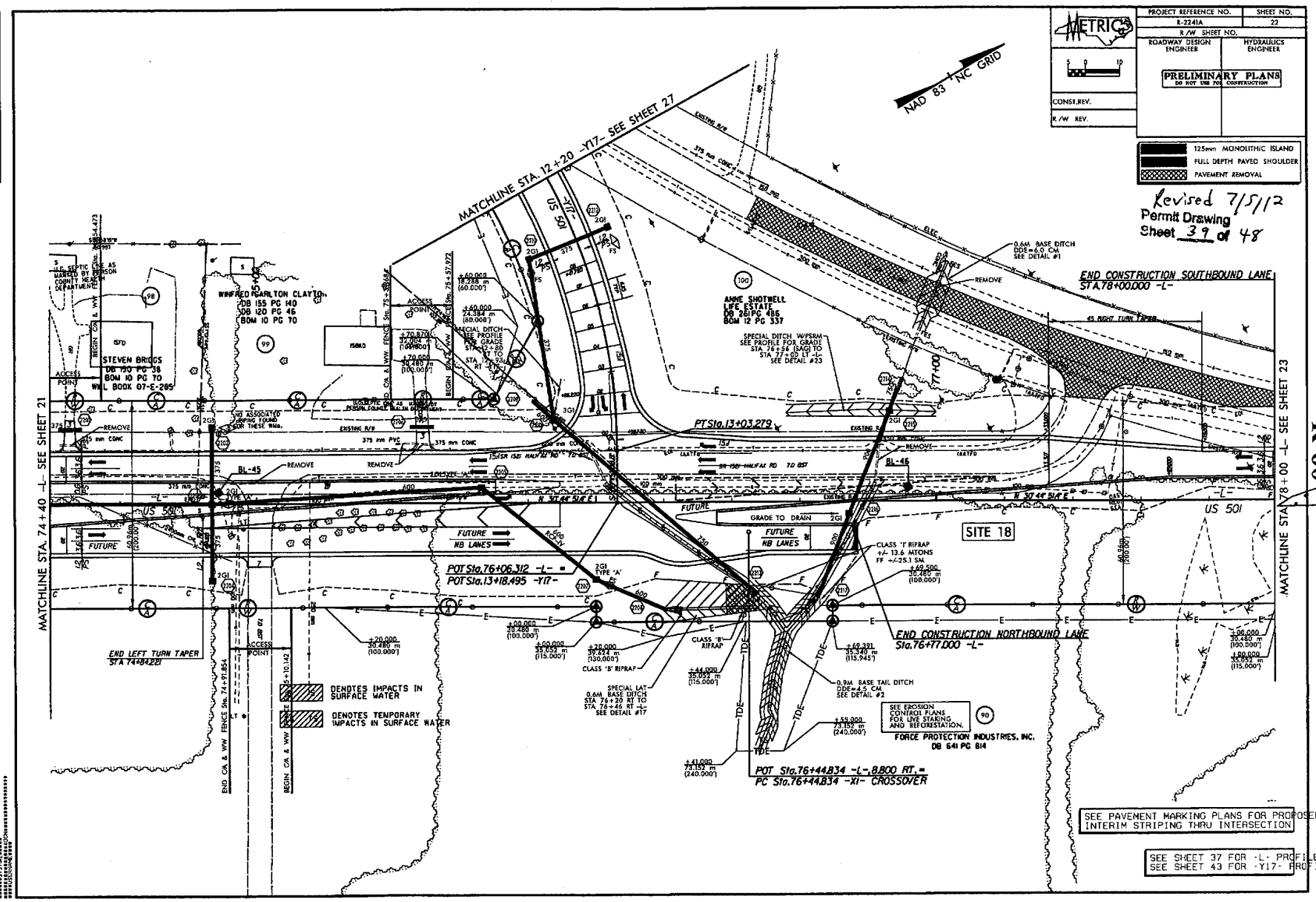
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC
5 0 10

CONST. REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

Revised 7/5/12
Permit Drawing
Sheet 39 of 48



R-60

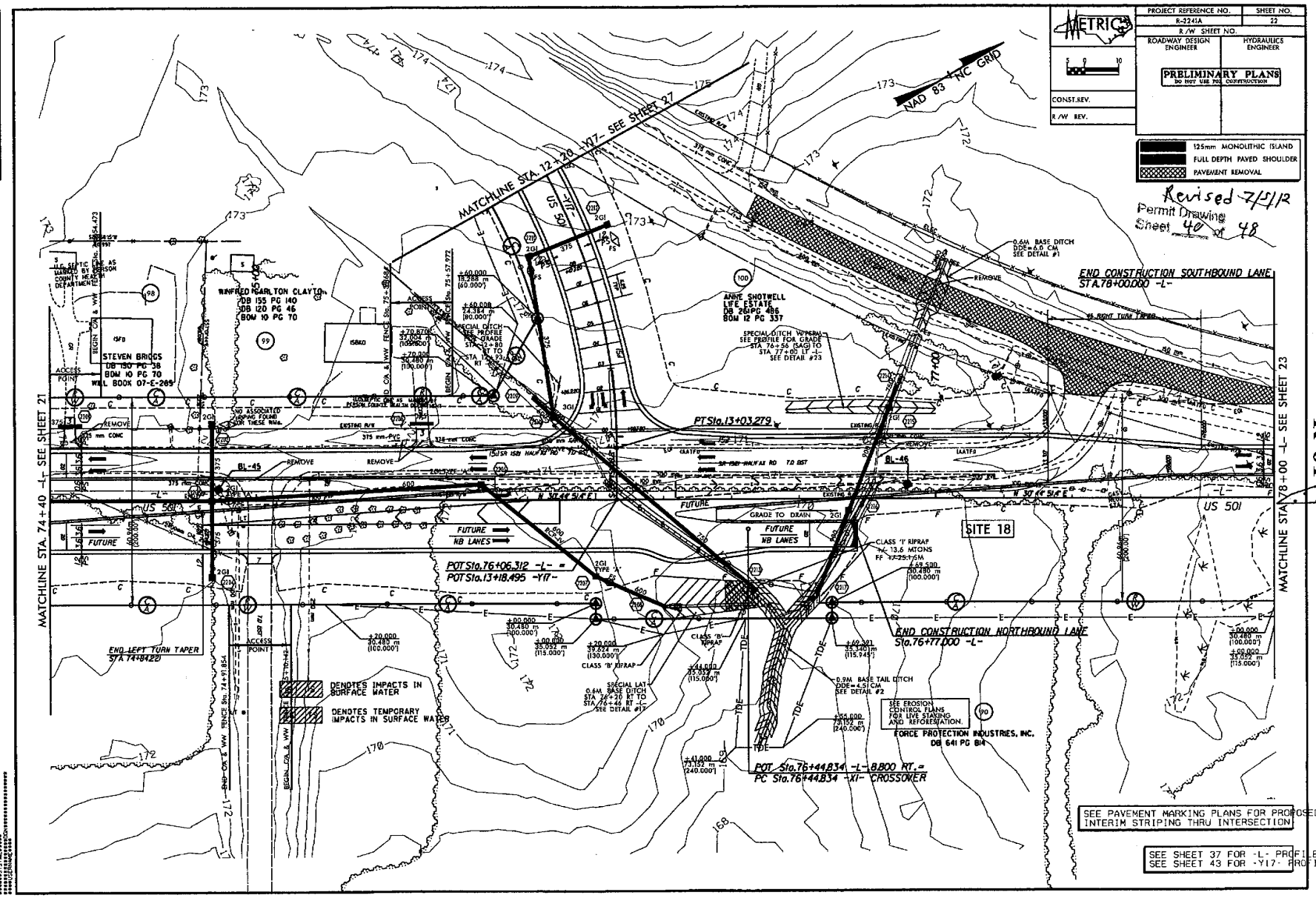
STV/Ralph Whitehead Associates, Inc.
1601 West Morehead St., Ste. 700
Charlotte, N.C. 28208-5891
NC License No. C-0910

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
CONST.REV.	
R/W REV.	

METRIC 5 0 10

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

Revised 7/5/12
Permit Drawing
Sheet 40 of 48



R-61

STV/Ralph Whitehead Associates, Inc.
1000 Wake Forest Rd., Ste. 200
Raleigh, NC 27604
NC License Number: F-0991

REVISIONS	
06-04-08 –	DRIVEWAY RECONNECTION ON PARCELS 101,104,103,105,106,107,108 SHIFTED ACCESS POINT ON PARCEL 107. PROPERTY LINE CHANGES ON PARCELS 106,102,103,104,108 AND NAME CHANGE ON PARCELS 105,103,108
06-24-08 –	PROVIDED ACCESS ON PARCEL 102.
06-21-11 –	PARCEL 90,101 DATED BARBWIRE FENCE.REVISED PARCEL NAME PARCEL 108.REVISED PARCEL NAME
08-02-11 –	CHANGED PROPERTY OWNER INFORMATION ON PARCELS 101,106,108
09-09-11 –	PARCEL 102 & 107; REVISED OWNER NAMES

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.
R/W REV.

Permit Drawing
Sheet 41 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 NC GRID

DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING

MATCHLINE STA. 78+00 -L- SEE SHEET 22

ANNE SHOTWELL LIFE ESTATE (100)
MICHAEL E. VICKERS (105)
CHARLOTTE MELTON et al (104)
BLAKE E. THORNBURG (108)
BESSIE JANE WALKER "HEIRS"
LOUISE S. THOMAS (102)
DAVID N. ALLEN (103)
ANNIE RUTH KENDRICK LIFE ESTATE (101)
ANDREW L. HOLEMAN
FORCE PROTECTION INDUSTRIES, INC. (90)
ADDIE T. WADE (102)

END CONSTRUCTION SOUTHBOUND LANE
BEGIN TEMP SBL
STA.78+00.000 -L- =
STA.78-00.000 -TEMP SBL-

END TEMP SBL
STA 79+69.997 -TEMP SBL- =
STA 79+69.926 -L-

END CONSTRUCTION
STA.80+31.479 -L-

END STATE PROJECT R-2241A
POT Sta.81+63.869 -L-,10.564 LT.

79+00
80+00
81+00

ACCESS POINT
END CA & WW FENCE Sta. 78+79.268
BEGIN CA & WW FENCE Sta. 78+93.574
END CA & WW FENCE Sta. 79+50.026
BEGIN CA & WW FENCE Sta. 79+68.308
END CA & WW FENCE Sta. 79+19.041
BEGIN CA & WW FENCE Sta. 79+36.261
END CA & WW FENCE Sta. 79+59.365
BEGIN CA & WW FENCE Sta. 79+76.585
END CA & WW FENCE Sta. 80+35.079
BEGIN CA & WW FENCE Sta. 80+53.367
END CA & WW FENCE Sta. 81+54.781
BEGIN CA & WW FENCE Sta. 81+59.781

RETAIN
RETAIN DITCH
300 mm CONC
RETAIN DITCH 375 mm CONC
375 mm CONC
375 RCP-18
COLLAR
450 mm CMP
REMOVE
-TEMP SBL-
-L-
N 30°05'06.8" E
N 30°44'51.4" E
US 501 7.4 BST
EXISTING R/W
SITE 19

CURVE X1-1
PI Sta 77+60.175
Δ = 4°24'12.8" (LT)
L = 230.510
T = 115.342
R = 3,000.000

CURVE X1-2
PI Sta 80+12.920
Δ = 4°26'03.6" (RT)
L = 232.182
T = 116.149
R = 3000.000

ALL DRIVEWAY RADII 6M TYP.UNLESS OTHERWISE NOTED

SEE SHEET 37 FOR -L- PROFILE.
SEE SHEET 43 FOR -X1- PROFILE.

R-62

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, North Carolina 28208
NC License Number F-0991

REVISIONS	
06-04-08 -	DRIVEWAY RECONNECTION ON PARCELS 100,101,103,105,106,107,108 SHIFTED ACCESS POINT ON PARCEL 107, PROPERTY LINE CHANGES ON PARCELS 100,102,103,104,108 AND NAME CHANGE ON PARCELS 101,103,108
06-24-08 -	PROVIDED ACCESS ON PARCEL 102.
06-21-10 -	PARCEL 90 LOCATED BARBWIRE FENCE, REVISED PARCEL NAME PARCEL 100, REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCELS 100,106,108
09-09-11 -	PARCEL 102 & 107, REVISED OWNER NAMES

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 42 of 48

CONST. REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING

NAD 83 NC GRID

MATCHLINE STA. 78+00 -L- SEE SHEET 22

END STATE PROJECT R-2241A
POT STA.81+63.869 -L-, 19.564 LT.

END CONSTRUCTION SOUTHBOUND LANE
BEGIN TEMP SBL
STA.78+00.000 -L- =
STA.78-00.000 -TEMP SBL-

END TEMP SBL
STA 79+69.997 -TEMP SBL- =
STA 79+69.986 -L-

END CONSTRUCTION
STA.80+31.479 -L-

ANNE SHOTWELL LIFE ESTATE
MICHAEL E. VICKERS
CHARLOTTE MELTON et al
BLAKE E. THORNBURG
BESSIE JANE WALKER "HEIRS"
LOUISE S. THOMAS
DAVID N. ALLEN
FORCE PROTECTION INDUSTRIES, INC.
ADDIE T. WADE
ANNIE RUTH KENDRICK LIFE ESTATE
ANDREW L. HOLEMAN

SITE 19

N 30°05' 06.8" E
N 30°44' 51.4" E

CURVE XI-1
PI Sta 77+60.175
Δ = 4°24' 12.8" (LT)
L = 230.570
T = 115.342
R = 3,000.000

CURVE XI-2
PI Sta 80+12.920
Δ = 4°26' 03.6" (RT)
L = 232.182
T = 116.149
R = 3000.000

ALL DRIVEWAY RADII 6M, TYP. UNLESS OTHERWISE NOTED

SEE SHEET 37 FOR -L- PROFILE.
SEE SHEET 43 FOR -XI- PROFILE.

R-63

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES		ADDRESSES		
14	Jimmy Lewis Contracting, Inc.		3068 Chub Lake Rd.		
			Roxboro	NC	27574
15	Roxboro Properties LLC		PO Box 190138		
			Dallas	TX	75219
16	Gates,	J.E.	Drawer 720		
	Rosalie Gate		Roxboro	NC	27573
16A	J. E. Gates Trust		PO Box 720		
			Roxboro	NC	27573
16B	J. E. Gates Estate		PO Box 720		
			Roxboro	NC	27573
17	Perkins,	Charles E.	PO Box F		
			Roxboro	NC	27573
33	Wade,	Estelle P.	490 Virgilina Rd		
			Roxboro	NC	27573
35	Woody & Anderson Properties Inc.		112 S. Main St.		
			Roxboro	NC	27573
36	Call,	Nathaniel	570 Virgilina Rd.		
			Roxboro	NC	27573
41	Gentry,	Odelia P.	285 Adcock Rd.		
	Heirs		Lillington	NC	27546
63	Pentecost,	Nellie R.	1065 Providence Rd.		
			Roxboro	NC	27573
64	Smith,	Howard	1031 Providence Rd.		
			Roxboro	NC	27573
66	Smith,	Mary P.	1031 Providence Rd.		
			Roxboro	NC	27573
62	Garrett,	Almeade G.	1899 Virgilina Rd.		
			Roxboro	NC	27573
69	Perkins,	Charles	P.O. Box F		
	Wanda H. Perkins		Roxboro	NC	27573
70Z	Miriam J. Lavelle		525 Mill Hill Rd.		
	Charles F. Sams, Jr.		Roxboro	NC	27574
76	Jeffers,	Charlie V.	1108 Semora Rd.		
			Roxboro	NC	27573
76A	Jeffers,	Charlie V.	1108 Semora Rd.		
	Beverly W. Jeffers		Roxboro	NC	27573

NCDOT

DIVISION OF HIGHWAYS

PERSON COUNTY

PROJECT: 344069.1.1 (R-2241A)

US 501 FROM NC 49

IN ROXBORO TO

SOUTH OF SR 1602

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES		ADDRESSES		
77	Clay,	Austin B.	204 Hill St.		
	Heirs		Roxboro	NC	27573
78	Clay,	John D.	701 Patterson Dr.		
	Heirs		Roxboro	NC	27573
78Z	Ronald E. Thomas, Jr.		948 Semora Rd.		
	Jodi R. Thomas		Roxboro	NC	27574
80	Shotwell, Jr.	James	509 Meherrin Lane		
			Murfreesboro	NC	27855
85	Brooks,	Charles F.	3875 Halifax Rd		
	Wilma Brooks		Roxboro	NC	27574
86	Montwood Baptist Church		4416 Boston Rd.		
			Roxboro	NC	27573
87	Powell,	Roy R.	4431 Halifax Rd		
			Roxboro	NC	27573
87A	Wade,	Racheal D.	124 Wade Powell Rd		
			Roxboro	NC	27574
87Z	Martha B. Powell		150 Wade Powell Rd.		
			Roxboro	NC	27574
89Z	Robin E. Wrenn		8101 Slatesville Rd.		
			Keeling	VA	24566
90	Force Protection Industries, Inc.		9801 Highway 78		
			Ladson	SC	29456
103	Allen,	David N.	33 Kendrick Dr.		
	Elizabeth Allen		Roxboro	NC	27574

NCDOT
DIVISION OF HIGHWAYS
PERSON COUNTY
PROJECT: 344069.1.1 (R-2241A)
US 501 FROM NC 49
IN ROXBORO TO
SOUTH OF SR 1602

SHEET 44 OF 48 11/02/11

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation in Wetlands (ha)	Mechanized Clearing in Wetlands (ha)	Hand Clearing in Wetlands (ha)	Permanent SW impacts (ha)	Temp. SW impacts (ha)	Existing Channel Impacts Permanent (m)	Existing Channel Impacts Temp. (m)	Natural Stream Design (m)
1	13+28/13+62 -L-	3@3mx3m RCBC						0.012	0.002	42	8	
	Stream Bank Stabilization							0.013		38		
2	15+12/15+59 -L- LT	750mm CSP	0.045		0.004	0.025						
3 *	19+21/19+23 -L- RT	Fill						<0.001		7		
4	20+84/20+89 -L-	2@2.4mx2.4m RCBC						0.010	0.005	34	12	
	Stream Bank Stabilization							0.010		18		
5	20+89/21+45 -L-	Fill	0.089			0.023						
6 *	24+98/25+10 -L- RT	900mm RCP						0.001	0.001	7	6	
	Stream Bank Stabilization							0.002		7		
7A	34+93/36+38 -L-	2.7mx1.8m RCBC	0.051			0.002		0.012	0.003	158	33	
	Stream Bank Stabilization							0.007		25		
7B *	35+38/35+51 -L- LT	Fill						0.001		18		
8	37+33/37+55 -L-	1050mm RCP	0.008		0.002	0.012		0.004	0.001	59	11	
	Stream Bank Stabilization							0.001		4		
9	40+05/40+70 -L-	1500mm RCP						0.017	0.002	85	10	
	Stream Bank Stabilization							0.002		5		
10 *	11+55/11+82 -Y13- LT	900mm CSP						0.003	0.002	28	13	
	Stream Bank Stabilization							0.001		6		
11	50+41/51+25 -L-	1200mm RCP	0.001					0.008	0.004	86	26	
	Stream Bank Stabilization							0.003		16		
12	51+47/51+91 -L-	750mm RCP	0.047									
13	53+13/53+79 -L-	900mm RCP	0.070		0.001	0.027		0.005	0.001	75	22	
TOTALS:			0.311		0.007	0.089		0.112	0.021	718	141	

* Note: Stream Impacts are Non-Mitigatable.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PERSON COUNTY
WBS - 34406.1.1 (R-2241A)

SHEET 45 of 48 Rev. 7/16/2012

WHE Revised 5/21/2008

R-66

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation in Wetlands (ha)	Mechanized Clearing in Wetlands (ha)	Hand Clearing in Wetlands (ha)	Permanent SW impacts (ha)	Temp. SW impacts (ha)	Existing Channel Impacts Permanent (m)	Existing Channel Impacts Temp. (m)	Natural Stream Design (m)
14	57+12/57+55 -L-	1200mm RCP	0.036		0.002			0.007	0.001	80	7	
	Stream Bank Stabilization							0.002		4		
15	63+41/66+32 -L-	1350mm RCP	0.144			0.013		0.012	0.001	199	23	
	Stream Bank Stabilization							0.002		4		
16	64+72/64+99 -L- LT	Pond Removal						0.041				
17	67+35/69+11 -L-	1350 RCP	0.191		0.061	0.074		0.005	0.002	45	7	
	Stream Bank Stabilization							0.006		20		
18 *	76+03/76+90 -L-	750mm/900mm RCP						0.009	0.005	108	55	
	Stream Bank Stabilization							<0.001		13		
19	77+72/79+54 -L-	Fill	0.003			0.039						
TOTALS:			0.374		0.063	0.126		0.084	0.009	473	92	
TOTALS:			0.685		0.070	0.215		0.196	0.030	1191	233	

* Note: Stream Impacts are Non-Mitigatable.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PERSON COUNTY
WBS - 34406.1.1 (R-2241A)

SHEET 46 of 48 Rev. 7/16/2012

WHE Revised 5/21/2008

R-67

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	13+28/13+62 -L-	3@3mx3m RCBC						0.03	<0.01	138	26	
	Stream Bank Stabilization							0.03		125		
2	15+12/15+59 -L- LT	750mm CSP	0.11		0.01	0.06						
3 *	19+21/19+23 -L- RT	Fill						<0.01		23		
4	20+84/20+89 -L-	2@2.4mx2.4m RCBC						0.02	0.01	112	39	
	Stream Bank Stabilization							0.02		59		
5	20+89/21+45 -L-	Fill	0.22			0.06						
6 *	24+98/25+10 -L- RT	900mm RCP						<0.01	<0.01	23	20	
	Stream Bank Stabilization							<0.01		23		
7A	34+93/36+38 -L-	2.7mx1.8m RCBC	0.13			<0.01		0.03	0.01	518	108	
	Stream Bank Stabilization							0.02		82		
7B *	35+38/35+51 -L- LT	Fill						<0.01		59		
8	37+33/37+55 -L-	1050mm RCP	0.02		<0.01	0.03		0.01	<0.01	194	36	
	Stream Bank Stabilization							<0.01		13		
9	40+05/40+70 -L-	1500mm RCP						0.04	<0.01	279	33	
	Stream Bank Stabilization							<0.01		16		
10 *	11+55/11+82 -Y13- LT	900mm CSP						0.01	<0.01	92	43	
	Stream Bank Stabilization							<0.01		20		
11	50+41/51+25 -L-	1200mm RCP	<0.01					0.02	0.01	282	85	
	Stream Bank Stabilization							0.01		52		
12	51+47/51+91 -L-	750mm RCP	0.12									
13	53+13/53+79 -L-	900mm RCP	0.17		<0.01	0.07		0.01	<0.01	246	72	
SUB TOTALS:			0.77		0.01	0.21		0.26	0.03	2356	463	

* Note: Stream Impacts are Non-Mitigatable.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PERSON COUNTY
WBS - 34406.1.1 (R-2241A)

SHEET 47 of 48 Rev. 7/16/2012

ATN Revised 3/31/05

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
14	57+12/57+55 -L-	1200mm RCP	0.09		<0.01			0.02	<0.01	262	23	
	Stream Bank Stabilization							<0.01		13		
15	63+41/66+32 -L-	1350mm RCP	0.36			0.03		0.03	<0.01	653	75	
	Stream Bank Stabilization							<0.01		13		
16	64+72/64+99 -L- LT	Pond Removal						0.10				
17	67+35/69+11 -L-	1350 RCP	0.47		0.15	0.18		0.01	<0.01	146	23	
	Stream Bank Stabilization							0.01		67		
18 *	76+03/76+90 -L-	750mm/900mm RCP						0.02	0.01	354	181	
	Stream Bank Stabilization							<0.01		42		
19	77+72/79+54 -L-	Fill	0.01			0.10						
SUB TOTALS:			0.92		0.15	0.31		0.20	0.01	1551	303	
TOTALS:			1.69		0.16	0.53		0.45	0.04	3906	765	

* Note: Stream Impacts are Non-Mitigatable.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PERSON COUNTY
WBS - 34406.1.1 (R-2241A)

SHEET 48 of 48 Rev. 7/16/2012

ATN Revised 3/31/05

UTILITY IMPACTS PERMIT IMPACT SUMMARY Revised 7/6/2012

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	13+50/13+67	10" SEWER									3.000	
1	13+50/13+67	8" WATER									3.000	
1	13+50/13+67	4" GAS MAIN									2.000	
TOTALS:			0.00		0.00	0.00					8	

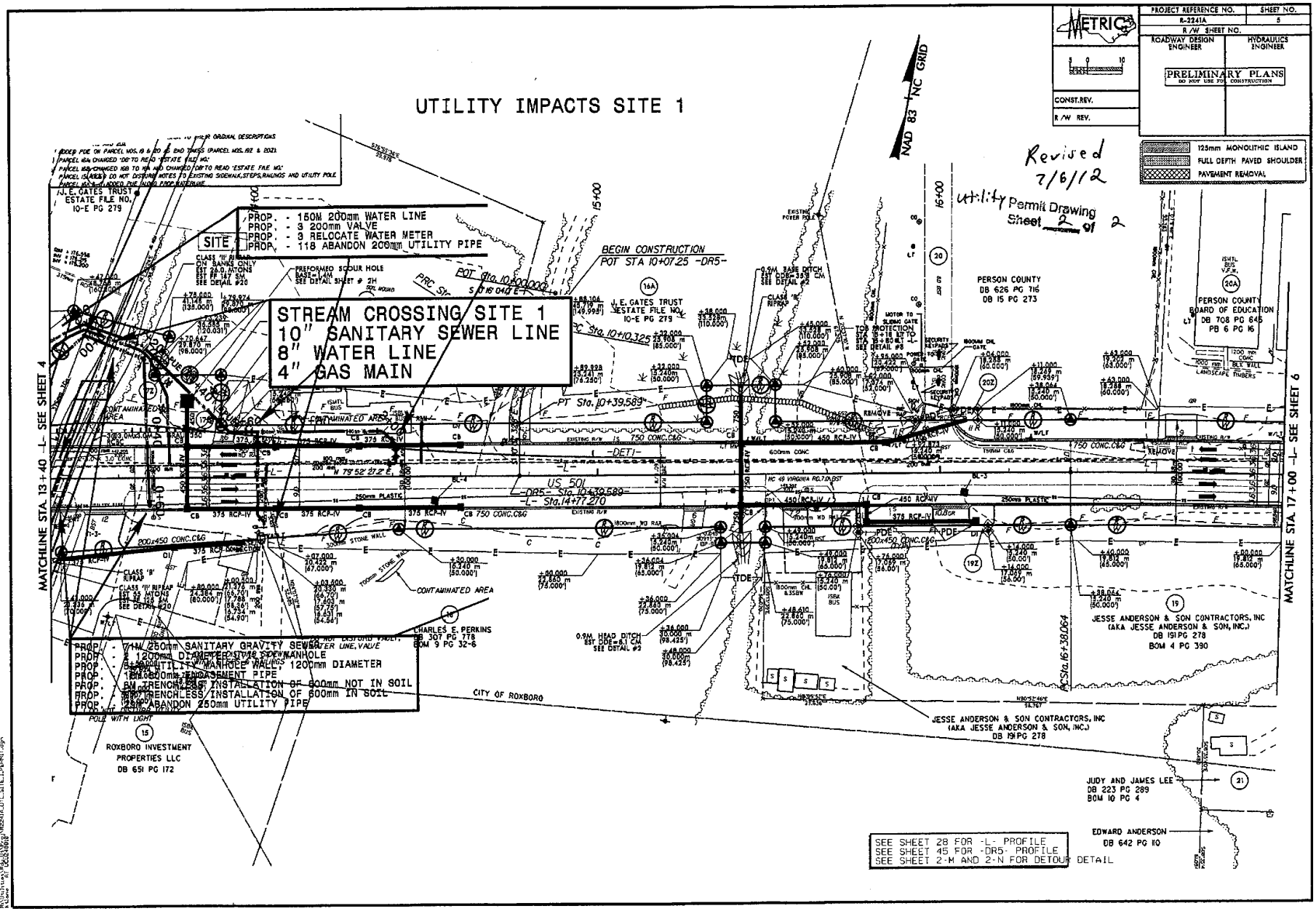
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PERSON COUNTY
WBS - 34406.1.1 (R-2241A)

SHEET 1 of 2 Rev. 7/6/2012

ATN Revised 3/31/05

R-70



REVISED 7/6/2012 ADD GAS MAIN

STV / Ralph Whitehead Associates, Inc.
1600 Wall Mawrwood 35 Sta 200
Charlotte, NC 28202
NC License Number F-0991

06-04-2012 12:28
R:\Utilities\Projects\R2241A_UTL_SITE_1_PERMIT.dgn
Level: RT_CONSTRUCTION

STANDARD SPECIAL PROVISION
AVAILABILITY OF FUNDS – TERMINATION OF CONTRACTS

(5-20-08) Z-2

General Statute 143C-6-11. (h) Highway Appropriation is hereby incorporated verbatim in this contract as follows:

(h) Amounts Encumbered. – Transportation project appropriations may be encumbered in the amount of allotments made to the Department of Transportation by the Director for the estimated payments for transportation project contract work to be performed in the appropriation fiscal year. The allotments shall be multiyear allotments and shall be based on estimated revenues and shall be subject to the maximum contract authority contained in *General Statute 143C-6-11(c)*. Payment for transportation project work performed pursuant to contract in any fiscal year other than the current fiscal year is subject to appropriations by the General Assembly. Transportation project contracts shall contain a schedule of estimated completion progress, and any acceleration of this progress shall be subject to the approval of the Department of Transportation provided funds are available. The State reserves the right to terminate or suspend any transportation project contract, and any transportation project contract shall be so terminated or suspended if funds will not be available for payment of the work to be performed during that fiscal year pursuant to the contract. In the event of termination of any contract, the contractor shall be given a written notice of termination at least 60 days before completion of scheduled work for which funds are available. In the event of termination, the contractor shall be paid for the work already performed in accordance with the contract specifications.

Payment will be made on any contract terminated pursuant to the special provision in accordance with Article 108-13(E), of the *North Carolina Department of Transportation Metric Standard Specifications for Roads and Structures*, dated July 1, 2006.

STANDARD SPECIAL PROVISION
NCDOT GENERAL SEED SPECIFICATION FOR SEED QUALITY

(5-17-11) Z-3

Seed shall be sampled and tested by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory. When said samples are collected, the vendor shall supply an independent laboratory report for each lot to be tested. Results from seed so sampled shall be final. Seed not meeting the specifications shall be rejected by the Department of Transportation and shall not be delivered to North Carolina Department of Transportation warehouses. If seed has been delivered it shall be available for pickup and replacement at the supplier's expense.

Any re-labeling required by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory, that would cause the label to reflect as otherwise specified herein shall be rejected by the North Carolina Department of Transportation.

Seed shall be free from seeds of the noxious weeds Johnsongrass, Balloonvine, Jimsonweed, Witchweed, Itchgrass, Serrated Tussock, Showy Crotalaria, Smooth Crotalaria, Sicklepod, Sandbur, Wild Onion, and Wild Garlic. Seed shall not be labeled with the above weed species on the seed analysis label. Tolerances as applied by the Association of Official Seed Analysts will NOT be allowed for the above noxious weeds except for Wild Onion and Wild Garlic.

Tolerances established by the Association of Official Seed Analysts will generally be recognized. However, for the purpose of figuring pure live seed, the found pure seed and found germination percentages as reported by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory will be used. Allowances, as established by the NCDOT, will be recognized for minimum pure live seed as listed on the following pages.

The specifications for restricted noxious weed seed refers to the number per pound as follows:

Restricted Noxious **Weed**	Limitations per Lb Of Seed	Restricted Noxious **Weed**	Limitations per Lb. of Seed
Blessed Thistle	4 seeds	Cornflower (Ragged Robin)	27 seeds
Cocklebur	4 seeds	Texas Panicum	27 seeds
Spurred Anoda	4 seeds	Bracted Plantain	54 seeds
Velvetleaf	4 seeds	Buckhorn Plantain	54 seeds
Morning-glory	8 seeds	Broadleaf Dock	54 seeds
Corn Cockle	10 seeds	Curly Dock	54 seeds
Wild Radish	12 seeds	Dodder	54 seeds
Purple Nutsedge	27 seeds	Giant Foxtail	54 seeds
Yellow Nutsedge	27 seeds	Horsenettle	54 seeds
Canada Thistle	27 seeds	Quackgrass	54 seeds
Field Bindweed	27 seeds	Wild Mustard	54 seeds
Hedge Bindweed	27 seeds		

Seed of Pensacola Bahiagrass shall not contain more than 7% inert matter, Kentucky Bluegrass, Centipede and Fine or Hard Fescue shall not contain more than 5% inert matter whereas a maximum of 2% inert matter will be allowed on all other kinds of seed. In addition, all seed shall not contain more than 2% other crop seed nor more than 1% total weed seed. The germination rate as tested by the North Carolina Department of Agriculture shall not fall below 70%, which includes both dormant and hard seed. Seed shall be labeled with not more than 7%, 5% or 2% inert matter (according to above specifications), 2% other crop seed and 1% total weed seed.

Exceptions may be made for minimum pure live seed allowances when cases of seed variety shortages are verified. Pure live seed percentages will be applied in a verified shortage situation. Those purchase orders of deficient seed lots will be credited with the percentage that the seed is deficient.

FURTHER SPECIFICATIONS FOR EACH SEED GROUP ARE GIVEN BELOW:

Minimum 85% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 83% pure live seed will not be approved.

Sericea Lespedeza
Oats (seeds)

Minimum 80% pure live seed; maximum 1% total weed seed; maximum 2% total other crop; maximum 144 restricted noxious weed seed per pound. Seed less than 78% pure live seed will not be approved.

Tall Fescue (all approved varieties)
Kobe Lespedeza
Korean Lespedeza
Weeping Lovegrass
Carpetgrass
Bermudagrass
Browntop Millet
German Millet – Strain R
Clover – Red/White/Crimson

Minimum 78% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 76% pure live seed will not be approved.

Common or Sweet Sundangrass

Minimum 76% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 74% pure live seed will not be approved.

Rye (grain; all varieties)
Kentucky Bluegrass (all approved varieties)
Hard Fescue (all approved varieties)
Shrub (bicolor) Lespedeza

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 noxious weed seed per pound. Seed less than 70% pure live seed will not be approved.

Centipedegrass
Crownvetch
Pensacola Bahiagrass
Creeping Red Fescue
Japanese Millet
Reed Canary Grass
Zoysia

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 5% inert matter; maximum 144 restricted noxious weed seed per pound.

Barnyard Grass
Big Bluestem
Little Bluestem
Bristly Locust
Birdsfoot Trefoil
Indiangrass
Orchardgrass
Switchgrass
Yellow Blossom Sweet Clover

STANDARD SPECIAL PROVISION

ERRATA

(7-21-09) ZM-4

Revise the *Metric Standard Specifications for Roads and Structures July 2006* on all projects as follows:

Division 4

Page 4-32 Subarticle 420-17(F) first line, change Subarticle 420-17(B) to ***(B) herein***.

Division 5

Page 5-12, Article 520-11 Measurement and Payment, first paragraph, second line, delete *will be.*

Division 6

Page 6-54, Article 657-1, Description, first sentence, replace PS/AR (hot-poured rubber asphalt with ***hot applied joint sealer***.

Page 6-54, Article 657-2, replace PS/AR (Hot-Poured Rubber Asphalt with the following:

Item	Section
Hot Applied Joint Sealer	***1028-2***

Page 6-55, Article 657-3 Construction Methods, 6th paragraph, replace PS/AR sealant with ***hot applied joint sealer***.

Division 10

Page 10-126, Article 1077-11, first paragraph, change the reference from Subarticle 420-18(B) to Subarticle 420-***17***(B).

Page 10-162, Article 1080-14(B), change ASTM D3350 to ASTM D335***9***

Division 14

Page 14-27, Article 1413-6, first paragraph, first sentence, first line, replace made with ***paid for***.

METRIC ROADWAY STANDARD DRAWINGS

Revise the *Metric Roadway Standard Drawings July 2006* on all projects as follows:

Page 1101.02, sheet 9 of 9, Title on left side only, change the 3rd line, 3rd word of the title to read: **BLOCK**

Page 1145.01, Sheet 1 of 1, drawing on the left for Type III Barricade, first line under its title, change note 3 to note ***2***.

Page 1267.03, Sheet 1 of 3, General Notes, first line, change 1263.02 to 1267.02.

STANDARD SPECIAL PROVISION

PLANT AND PEST QUARANTINES
(Imported Fire Ant, Gypsy Moth, Witchweed, And Other Noxious Weeds)

(3-18-03) Z-04a

Within quarantined area

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

Originating in a quarantined county

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

Contact

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

STANDARD SPECIAL PROVISION

AWARD OF CONTRACT

(6-28-77) Z-6

"The North Carolina Department of Transportation, in accordance with the provisions of *Title VI of the Civil Rights Act of 1964* (78 Stat. 252) and the Regulations of the Department of Transportation (*49 C.F.R., Part 21*), issued pursuant to such act, hereby notifies all bidders that it will affirmatively insure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the ground of race, color, or national origin".

STANDARD SPECIAL PROVISION

MINORITY AND FEMALE EMPLOYMENT REQUIREMENTS

Z-7

NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (*EXECUTIVE NUMBER 11246*)

1. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, see as shown on the attached sheet entitled "Employment Goals for Minority and Female participation".

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The Contractor's compliance with the Executive Order and the regulations in *41 CFR Part 60-4* shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in *41 CFR 60-4.3(a)*, and its effort to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project or the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the executive Order and the regulations *in 41 CFR Part 60-4*. Compliance with the goals will be measured against the total work hours performed.

2. As used in this Notice and in the contract resulting from this solicitation, the "covered area" is the county or counties shown on the cover sheet of the proposal form and contract.

EMPLOYMENT GOALS FOR MINORITY AND FEMALE PARTICIPATION

Economic Areas

Area 023 29.7%
Bertie County
Camden County
Chowan County
Gates County
Hertford County
Pasquotank County
Perquimans County

Area 024 31.7%
Beaufort County
Carteret County
Craven County
Dare County
Edgecombe County
Green County
Halifax County
Hyde County
Jones County
Lenoir County
Martin County
Nash County
Northampton County
Pamlico County
Pitt County
Tyrrell County
Washington County
Wayne County
Wilson County

Area 025 23.5%
Columbus County
Duplin County
Onslow County
Pender County

Area 026 33.5%
Bladen County
Hoke County
Richmond County
Robeson County
Sampson County
Scotland County

Area 027 24.7%
Chatham County
Franklin County
Granville County
Harnett County
Johnston County
Lee County
Person County
Vance County
Warren County

Area 028 15.5%
Alleghany County
Ashe County
Caswell County
Davie County
Montgomery County
Moore County
Rockingham County
Surry County
Watauga County
Wilkes County

Area 029 15.7%
Alexander County
Anson County
Burke County
Cabarrus County
Caldwell County
Catawba County
Cleveland County
Iredell County
Lincoln County
Polk County
Rowan County
Rutherford County
Stanly County

Area 0480 8.5%
Buncombe County
Madison County

Area 030 6.3%
Avery County
Cherokee County
Clay County
Graham County
Haywood County
Henderson County
Jackson County
McDowell County
Macon County
Mitchell County
Swain County
Transylvania County
Yancey County

SMSA Areas

Area 5720 26.6%
Currituck County

Area 9200 20.7%
Brunswick County
New Hanover County

Area 2560 24.2%
Cumberland County

Area 6640 22.8%
Durham County
Orange County
Wake County

Area 1300 16.2%
Alamance County

Area 3120 16.4%
Davidson County
Forsyth County
Guilford County
Randolph County
Stokes County
Yadkin County

Area 1520 18.3%
Gaston County
Mecklenburg County
Union County

Goals for Female

Participation in Each Trade

(Statewide) 6.9%

STANDARD SPECIAL PROVISION

REQUIRED CONTRACT PROVISIONS FEDERAL - AID CONSTRUCTION CONTRACTS

FHWA - 1273 Electronic Version - May 1, 2012 Z-8

I. General
II. Nondiscrimination
III. Nonsegregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Compliance with Governmentwide Suspension and Debarment Requirements
XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

   The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

   Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

   Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).
2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.
3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.
4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are

incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.
b. The contractor will accept as its operating policy the following statement:
"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.
3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
   a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
   b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
   c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.
   d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
   e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.
   a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.
   b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.
   c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.
5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:
   a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
   b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
   c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
   d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.
6. **Training and Promotion:**
   a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.
   b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).
   c The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
   d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:
   a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.
   b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
   c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.
   d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.
8. **Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.
9. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.
   a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.
   b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.
10. **Assurance Required by 49 CFR 26.13(b):**
   a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.
   b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.
11. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.
   a. The records kept by the contractor shall document the following:
      (1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;
      (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and
      (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;
   b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. **Minimum wages**
   a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the

Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. **Withholding.** The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. **Payrolls and basic records**

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the

payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/ wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. **Apprentices and trainees**

a. Apprentices (programs of the USDOL). Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL). Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT). Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. **Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.
6. **Subcontracts.** The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.
7. **Contract termination:** debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
8. **Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.
9. **Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.
10. **Certification of eligibility.**
    a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
    b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
    c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. **Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
2. **Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.
3. **Withholding for unpaid wages and liquidated damages.** The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.
4. **Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).
    a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees

from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:
(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;
(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.
4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.
5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. **Instructions for Certification – First Tier Participants:**
   a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.
   b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
   c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.
   d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
   e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).
   f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
   g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.
   h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.
   i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
   j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

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2. **Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:**
   a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:
      (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;
      (2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
      (3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and
      (4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
   b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.
2. **Instructions for Certification - Lower Tier Participants:**
   (Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)
   a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
   b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).
e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.
g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.
h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

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Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

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XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
   a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
   b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.
3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

STANDARD SPECIAL PROVISION

ON-THE-JOB TRAINING

(10-16-07) (Rev. 7-21-09) Z-10

Description

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

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

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

Minorities and Women

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

Assigning Training Goals

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

Training Classifications

The Contractor shall provide on-the-job training aimed at developing full journeyman level workers in the construction craft/operator positions. Preference shall be given to providing training in the following skilled work classifications:

Equipment Operators	Office Engineers
Truck Drivers	Estimators
Carpenters	Iron / Reinforcing Steel Workers
Concrete Finishers	Mechanics
Pipe Layers	Welders

The Department has established common training classifications and their respective training requirements that may be used by the contractors. However, the classifications established are not all-inclusive. Where the training is oriented toward construction applications, training will be allowed in lower-level management positions such as office engineers and estimators. Contractors shall submit new classifications for specific job functions that their employees are performing. The Department will review and recommend for acceptance to FHWA the new classifications proposed by contractors, if applicable. New classifications shall meet the following requirements:

Proposed training classifications are reasonable and realistic based on the job skill classification needs, and

The number of training hours specified in the training classification is consistent with common practices and provides enough time for the trainee to obtain journeyman level status.

The Contractor may allow trainees to be trained by a subcontractor provided that the Contractor retains primary responsibility for meeting the training and this provision is made applicable to the subcontract. However, only the Contractor will receive credit towards the annual goal for the trainee.

Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training course leading to journeyman level status or in which they have been employed as a journeyman.

Records and Reports

The Contractor shall maintain enrollment, monthly and completion reports documenting company compliance under these contract documents. These documents and any other information as requested shall be submitted to the OJT Program Manager.

Upon completion and graduation of the program, the Contractor shall provide each trainee with a certification Certificate showing the type and length of training satisfactorily completed.

Trainee Interviews

All trainees enrolled in the program will receive an initial and Trainee/Post graduate interview conducted by the OJT program staff.

Trainee Wages

Contractors shall compensate trainees on a graduating pay scale based upon a percentage of the prevailing minimum journeyman wages (Davis-Bacon Act). Minimum pay shall be as follows:

60 percent	of the journeyman wage for the first half of the training period
75 percent	of the journeyman wage for the third quarter of the training period
90 percent	of the journeyman wage for the last quarter of the training period

In no instance shall a trainee be paid less than the local minimum wage. The Contractor shall adhere to the minimum hourly wage rate that will satisfy both the NC Department of Labor (NCDOL) and the Department.

Achieving or Failing to Meet Training Goals

The Contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and who receives training for at least 50 percent of the specific program requirement. Trainees will be allowed to be transferred between projects if required by the Contractor's scheduled workload to meet training goals.

If a contractor fails to attain their training assignments for the calendar year, they may be taken off the NCDOT's Bidders List.

Measurement and Payment

No compensation will be made for providing required training in accordance with these contract documents.

STANDARD SPECIAL PROVISION
MINIMUM WAGES
GENERAL DECISION NC130093 01/04/2013 NC93

Z-93

Date: January 4, 2013

General Decision Number: NC130093 01/04/2013 NC93

Superseded General Decision Numbers: NC20120093

State: North Carolina

Construction Type: HIGHWAY

COUNTIES:

Chatham	Greene	Person
Durham	Nash	Pitt
Edgecombe	Orange	Wayne

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects, railroad construction, bascule, suspension and spandrel arch bridges designed for commercial navigation, bridges involving marine construction, and other major bridges).

Modification Number	Publication Date
0	01/04/2013

SUNC2011-074 09/16/2011

	Rates	Fringes
CARPENTER (Form Work Only)	13.31	
CEMENT MASON/CONCRETE FINISHER	14.02	
IRONWORKER (Reinforcing)	14.88	
LABORER		
Asphalt, Asphalt Distributor, Raker, and Spreader		
Chatham, Durham, Edgecombe, Greene, Nash, Pitt, and Wayne Counties	12.20	
Asphalt, Asphalt Raker, and Spreader		
Orange and Person Counties	12.97	
Common or General		
Chatham, Orange, and Person Counties	10.85	
Durham County	10.93	
Edgecombe and Nash Counties	10.88	
Greene and Pitt Counties	9.30	
Wayne County	9.63	
Concrete Saw	13.52	
Landscape	8.67	
Luteman	12.73	
Mason Tender (Cement/Concrete)	11.43	
Pipelayer	12.07	
Traffic Control (Cone Setter)	11.15	
Traffic Control (Flagger)	9.89	

	Rates	Fringes
POWER EQUIPMENT OPERATORS		
Backhoe/Excavator/Trackhoe		
Chatham, Orange, and Person Counties	14.99	
Durham County	15.24	
Remaining Counties	15.70	
Broom/Sweeper	13.97	
Bulldozer		
Chatham, Durham, Orange, and Person Counties	15.45	
Remaining Counties	15.63	
Crane	20.14	
Curb Machine	14.43	
Distributor	15.65	
Drill	18.28	
Grader/Blade	17.68	
Loader		
Chatham, Durham, Orange, and Person Counties	15.07	
Remaining Counties	14.40	
Mechanic	18.61	
Milling Machine	14.38	
Oiler	14.72	
Paver	15.24	
Roller		
Chatham, Orange, and Person Counties	13.11	
Durham County	13.07	
Remaining Counties	13.10	
Scraper	14.35	
Screed	15.12	
Tractor	14.47	
TRUCK DRIVER		
Distributor	16.75	
Dump Truck	12.50	
Flatbed Truck	15.02	
Lowboy Truck		
Chatham, Durham, Orange, and Person Counties	15.39	
Remaining Counties	15.27	
Off the Road Truck	13.78	
Single Axle Truck	12.13	
Tack Truck	16.51	
Water Truck	13.39	

Welders – Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

County : Person

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
			ROADWAY ITEMS			
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum	L.S.	
0003	0001000000-M	200	CLEARING & GRUBBING .. HECTARE(S)	Lump Sum	L.S.	
0004	0008000000-M	200	SUPPLEMENTARY CLEARING & GRUBBING	1.2 HA		
0005	0015000000-N	205	SEALING ABANDONED WELLS	4 EA		
0006	0036000000-M	225	UNDERCUT EXCAVATION	22,000 M3		
0007	0038000000-M	SP	SHALLOW UNDERCUT	300 M3		
0008	0080000000-M	SP	CLASS IV SUBGRADE STABILIZATION	700 MTN		
0009	0134000000-M	240	DRAINAGE DITCH EXCAVATION	2,240 M3		
0010	0141000000-M	240	BERM DITCH CONSTRUCTION	750 M		
0011	0156000000-M	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	6,380 M2		
0012	0192000000-N	260	PROOF ROLLING	40 HR		
0013	0195000000-M	SP	SELECT GRANULAR MATERIAL	29,500 M3		
0014	0196000000-M	270	FABRIC FOR SOIL STABILIZATION	31,000 M2		
0015	0199000000-M	SP	TEMPORARY SHORING	233.2 M2		
0016	0241000000-M	SP	GENERIC GRADING ITEM GEOTEXTILE FOR PAVEMENT STABILIZATION	16,500 M2		
0017	0255000000-M	SP	GENERIC GRADING ITEM EXCAVATION, HAULING & DISPOSAL OF CONTAMINATED SOIL	2,500 MTN		
0018	0318000000-M	SP	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	2,250 MTN		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0019	0320000000-M	SP	FOUNDATION CONDITIONING FABRIC	6,770 M2		
0020	0335000000-M	SP	***MM DRAINAGE PIPE (200MM)	31.2 M		
0021	0335200000-M	SP	375MM DRAINAGE PIPE	2,202 M		
0022	0335300000-M	SP	450MM DRAINAGE PIPE	676.8 M		
0023	0335400000-M	SP	600MM DRAINAGE PIPE	685.2 M		
0024	0335500000-M	SP	750MM DRAINAGE PIPE	373.2 M		
0025	0335600000-M	SP	900MM DRAINAGE PIPE	229.2 M		
0026	0335700000-M	SP	1050MM DRAINAGE PIPE	54 M		
0027	0335800000-M	SP	1200MM DRAINAGE PIPE	132 M		
0028	0335850000-M	SP	****MM DRAINAGE PIPE ELBOWS (375MM)	7 EA		
0029	0335850000-M	SP	****MM DRAINAGE PIPE ELBOWS (450MM)	6 EA		
0030	0343000000-M	SP	375MM SIDE DRAIN PIPE	268.8 M		
0031	0344000000-M	SP	450MM SIDE DRAIN PIPE	14.4 M		
0032	0345000000-M	SP	600MM SIDE DRAIN PIPE	8.4 M		
0033	0354000000-M	SP	****MM RC PIPE CULVERTS, CLASS ***** (375MM, V)	20.4 M		
0034	0366000000-M	SP	375MM RC PIPE CULVERTS, CLASS III	115.2 M		
0035	0384000000-M	SP	750MM RC PIPE CULVERTS, CLASS III	36 M		
0036	0408000000-M	SP	1350MM RC PIPE CULVERTS, CLASS III	121.2 M		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0037	0448000000-M	SP	****MM RC PIPE CULVERTS, CLASS IV (1500MM)	79.2 M		
0038	0448200000-M	SP	375MM RC PIPE CULVERTS, CLASS IV	1,027.2 M		
0039	0448300000-M	SP	450MM RC PIPE CULVERTS, CLASS IV	462 M		
0040	0448400000-M	SP	600MM RC PIPE CULVERTS, CLASS IV	260.4 M		
0041	0448500000-M	SP	750MM RC PIPE CULVERTS, CLASS IV	45.6 M		
0042	0448600000-M	SP	900MM RC PIPE CULVERTS, CLASS IV	126 M		
0043	0974000000-M	SP	****MM WELDED STEEL PIPE, ****MM THICK, GRADE B (UNDER RR) (600MM, 12MM)	13.2 M		
0044	0986000000-M	SP	GENERIC PIPE ITEM 375MM DUCTILE IRON PIPE	135.6 M		
0045	0992000000-M	SP	GENERIC PIPE ITEM ENERGY DISSIPATOR BASIN	2 EA		
0046	0995000000-M	340	PIPE REMOVAL	869.6 M		
0047	1011000000-N	500	FINE GRADING	Lump Sum	L.S.	
0048	1077000000-M	SP	#57 STONE	60 MTN		
0049	1110000000-M	510	STABILIZER AGGREGATE	500 MTN		
0050	1220000000-M	545	INCIDENTAL STONE BASE	2,000 MTN		
0051	1231000000-M	560	SHOULDER BORROW	9,230 M3		
0052	1275000000-M	600	PRIME COAT	15,531 L		
0053	1330000000-M	607	INCIDENTAL MILLING	980 M2		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0054	1693000000-M	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	100 MTN		
0055	2000000000-N	806	RIGHT OF WAY MARKERS	225 EA		
0056	2022000000-M	SP	SUBDRAIN EXCAVATION	2,070 M3		
0057	2033000000-M	SP	SUBDRAIN FINE AGGREGATE	1,035 M3		
0058	2044000000-M	SP	150MM PERFORATED SUBDRAIN PIPE	2,500 M		
0059	2070000000-N	SP	SUBDRAIN PIPE OUTLETS	17 EA		
0060	2077000000-M	SP	150MM OUTLET PIPE (SUBDRAINS)	34 M		
0061	2143000000-M	818	BLOTTING SAND	10 MTN		
0062	2209000000-M	838	ENDWALLS	40.6 M3		
0063	2220000000-M	838	REINFORCED ENDWALLS	26.7 M3		
0064	2253000000-M	840	PIPE COLLARS	0.29 M3		
0065	2264000000-M	840	PIPE PLUGS	0.22 M3		
0066	2275000000-M	SP	FLOWABLE FILL	23 M3		
0067	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	195 EA		
0068	2297000000-M	840	MASONRY DRAINAGE STRUCTURES	3.1 M3		
0069	2308000000-M	840	MASONRY DRAINAGE STRUCTURES	15.97 M		
0070	2354200000-N	840	FRAME WITH GRATE, STD 840.24	1 EA		
0071	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	10 EA		
0072	2364200000-N	840	FRAME WITH TWO GRATES, STD 840.20	10 EA		
0073	2365000000-N	840	FRAME WITH TWO GRATES, STD 840.22	81 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0074	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	16 EA		
0075	2367000000-N	840	FRAME WITH TWO GRATES, STD 840.29	10 EA		
0076	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	6 EA		
0077	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	32 EA		
0078	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	25 EA		
0079	2396000000-N	840	FRAME WITH COVER, STD 840.54	3 EA		
0080	2440000000-N	852	CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN	3 EA		
0081	2535000000-M	846	*** X ***MM CONCRETE CURB (200MM X 450MM)	350 M		
0082	2549000000-M	846	750MM CONCRETE CURB & GUTTER	3,860 M		
0083	2556000000-M	846	SHOULDER BERM GUTTER	521 M		
0084	2577000000-M	846	CONCRETE EXPRESSWAY GUTTER	70 M		
0085	2612000000-M	848	150MM CONCRETE DRIVEWAY	1,000 M2		
0086	2619000000-M	850	100MM CONCRETE PAVED DITCH	50 M2		
0087	2647000000-M	852	125MM MONOLITHIC CONCRETE IS-LANDS (SURFACE MOUNTED)	1,760 M2		
0088	3030000000-M	862	STEEL BM GUARDRAIL	1,824.99 M		
0089	3045000000-M	862	STEEL BM GUARDRAIL, SHOP CURVED	19.05 M		
0090	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	10 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0091	3210000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	13 EA		
0092	3270000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350	19 EA		
0093	3380000000-M	862	TEMPORARY STEEL BM GUARDRAIL	140.97 M		
0094	3503000000-M	866	WOVEN WIRE FENCE, 1200MM FABRIC	11,330 M		
0095	3509000000-M	866	100MM TIMBER FENCE POSTS, 2.30M LONG	2,310 EA		
0096	3515000000-M	866	125MM TIMBER FENCE POSTS, 2.50M LONG	650 EA		
0097	3533000000-M	866	CHAIN LINK FENCE, ****MM FABRIC (1800MM)	49 M		
0098	3539000000-M	866	METAL LINE POSTS FOR ****MM CHAIN LINK FENCE (1800MM)	14 EA		
0099	3557000000-M	866	ADDITIONAL BARBED WIRE	175 M		
0100	3628000000-M	876	RIP RAP, CLASS I	38 MTN		
0101	3635000000-M	876	RIP RAP, CLASS II	425 MTN		
0102	3649000000-M	876	RIP RAP, CLASS B	1,454 MTN		
0103	3656000000-M	876	FILTER FABRIC FOR DRAINAGE	13,385 M2		
0104	3659000000-N	SP	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	7 EA		
0105	4054000000-M	902	PLAIN CONCRETE SIGN FOUNDATIONS	1 M3		
0106	4060000000-M	903	SUPPORTS, BREAKAWAY STEEL BEAM	250 KG		
0107	4072000000-M	903	SUPPORTS, 4.5-KG STEEL U-CHANNEL	919 M		
0108	4096000000-N	904	SIGN ERECTION, TYPE D	8 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0109	4102000000-N	904	SIGN ERECTION, TYPE E	117 EA		
0110	4108000000-N	904	SIGN ERECTION, TYPE F	37 EA		
0111	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)	2 EA		
0112	4116100000-N	904	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (D)	3 EA		
0113	4116100000-N	904	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)	9 EA		
0114	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	101 EA		
0115	4192000000-N	907	DISPOSAL OF SUPPORT, U-CHANNEL	7 EA		
0116	4400000000-M	1110	WORK ZONE SIGNS (STATIONARY)	314 M2		
0117	4405000000-M	1110	WORK ZONE SIGNS (PORTABLE)	122 M2		
0118	4410000000-M	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	91 M2		
0119	4415000000-N	1115	FLASHING ARROW PANELS, TYPE C	3 EA		
0120	4420000000-N	1120	CHANGEABLE MESSAGE SIGN	2 EA		
0121	4422000000-N	1120	CHANGEABLE MESSAGE SIGN (SHORT TERM)	150 DAY		
0122	4430000000-N	1130	DRUMS	469 EA		
0123	4445000000-M	1145	BARRICADES (TYPE III)	264 M		
0124	4450000000-N	1150	FLAGGER	4,800 HR		
0125	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	9 EA		
0126	4470000000-N	1160	RESET TEMPORARY CRASH CUSHIONS	3 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0127	4480000000-N	1165	TMIA	3 EA		
0128	4485000000-M	1170	PORTABLE CONCRETE BARRIER	143 M		
0129	4490000000-M	1170	PORTABLE CONCRETE BARRIER (ANCHORED)	594 M		
0130	4505000000-M	1170	RESET PORTABLE CONCRETE BARRIER (ANCHORED)	110 M		
0131	4516000000-N	1180	SKINNY DRUM	100 EA		
0132	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	881 EA		
0133	4705000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (400MM, 3.1MM)	79 M		
0134	4710000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (600MM, 3.1MM)	328 M		
0135	4721000000-M	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (3.1MM)	12 EA		
0136	4810000000-M	1205	PAINT PAVEMENT MARKING LINES (100MM)	74,089 M		
0137	4830000000-M	1205	PAINT PAVEMENT MARKING LINES (400MM)	62 M		
0138	4835000000-M	1205	PAINT PAVEMENT MARKING LINES (600MM)	392 M		
0139	4840000000-N	1205	PAINT PAVEMENT MARKING CHARACTER	10 EA		
0140	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	82 EA		
0141	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	5 EA		
0142	4905000000-N	1253	SNOWPLOWABLE PAVEMENT MARKERS	1,491 EA		
0143	4915000000-M	1264	2.1M U-CHANNEL POSTS	8 EA		
0144	4955000000-N	1264	OBJECT MARKERS (END OF ROAD)	8 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0145	5325600000-M	1510	150MM WATER LINE	163 M		
0146	5325800000-M	1510	200MM WATER LINE	465 M		
0147	5326200000-M	1510	300MM WATER LINE	275 M		
0148	5540000000-M	1515	150MM VALVE	7 EA		
0149	5546000000-M	1515	200MM VALVE	11 EA		
0150	5558000000-M	1515	300MM VALVE	3 EA		
0151	5572200000-M	1515	300MM TAPPING VALVE	1 EA		
0152	5648000000-N	1515	RELOCATE WATER METER	23 EA		
0153	5649000000-N	1515	RECONNECT WATER METER	1 EA		
0154	5672000000-N	1515	RELOCATE FIRE HYDRANT	4 EA		
0155	5691200000-M	1520	150MM SANITARY GRAVITY SEWER	12 M		
0156	5691300000-M	1520	200MM SANITARY GRAVITY SEWER	333 M		
0157	5691400000-M	1520	250MM SANITARY GRAVITY SEWER	67 M		
0158	5691600000-M	1520	400MM SANITARY GRAVITY SEWER	75.8 M		
0159	5768000000-N	1520	SANITARY SEWER CLEAN-OUT	6 EA		
0160	5775000000-M	1525	1200MM DIA UTILITY MANHOLE	5 EA		
0161	5776000000-M	1525	1500MM DIA UTILITY MANHOLE	5 EA		
0162	5781000000-M	1525	UTILITY MANHOLE WALL, 1200MM DIA	7.6 M		
0163	5782000000-M	1525	UTILITY MANHOLE WALL, 1500MM DIA	18.6 M		
0164	5798000000-M	1530	ABANDON ***MM UTILITY PIPE (375MM)	71 M		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0165	5801000000-M	1530	ABANDON 200MM UTILITY PIPE	406 M		
0166	5802000000-M	1530	ABANDON 250MM UTILITY PIPE	29 M		
0167	5804000000-M	1530	ABANDON 300MM UTILITY PIPE	146 M		
0168	5816000000-N	1530	ABANDON UTILITY MANHOLE	2 EA		
0169	5836000000-M	1540	600MM ENCASEMENT PIPE	12 M		
0170	5836200000-M	1540	750MM ENCASEMENT PIPE	16 M		
0171	5872200000-M	1550	TRENCHLESS INSTALLATION OF 600MM IN SOIL	6 M		
0172	5872210000-M	1550	TRENCHLESS INSTALLATION OF 600MM NOT IN SOIL	6 M		
0173	5872300000-M	1550	TRENCHLESS INSTALLATION OF 750MM IN SOIL	8 M		
0174	5872310000-M	1550	TRENCHLESS INSTALLATION OF 750MM NOT IN SOIL	8 M		
0175	6000000000-M	1605	TEMPORARY SILT FENCE	14,000 M		
0176	6006000000-M	1610	STONE FOR EROSION CONTROL, CLASS A	12,500 MTN		
0177	6009000000-M	1610	STONE FOR EROSION CONTROL, CLASS B	7,500 MTN		
0178	6012000000-M	1610	SEDIMENT CONTROL STONE	6,250 MTN		
0179	6015000000-M	1615	TEMPORARY MULCHING	60 HA		
0180	6018000000-M	1620	SEED FOR TEMPORARY SEEDING	2,425 KG		
0181	6021000000-M	1620	FERTILIZER FOR TEMPORARY SEED-ING	20.25 MTN		
0182	6024000000-M	1622	TEMPORARY SLOPE DRAINS	1,500 M		
0183	6027000000-N	1622	INLET PROTECTION AT TEMPORARY SLOPE DRAINS	67 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0184	6029000000-M	SP	SAFETY FENCE	50 M		
0185	6030000000-M	1630	SILT EXCAVATION	42,500 M3		
0186	6036000000-M	1631	MATTING FOR EROSION CONTROL	180,000 M2		
0187	6037000000-M	SP	COIR FIBER MAT	1,100 M2		
0188	6038000000-M	SP	PERMANENT SOIL REINFORCEMENT MAT	3,500 M2		
0189	6042000000-M	1632	6.4MM HARDWARE CLOTH	3,250 M		
0190	6046000000-M	SP	TEMPORARY PIPE FOR STREAM CROSSING	50 M		
0191	6069000000-M	1638	STILLING BASINS	40 M3		
0192	6071012000-M	SP	COIR FIBER WATTLE	2,100 M		
0193	6071020000-M	SP	POLYACRYLAMIDE (PAM)	2,200 KG		
0194	6071030000-M	SP	COIR FIBER BAFFLE	4,000 M		
0195	6071050000-M	SP	***MM SKIMMER (38MM)	86 EA		
0196	6084000000-M	1660	SEEDING & MULCHING	40 HA		
0197	6087000000-M	1660	MOWING	20 HA		
0198	6090000000-M	1661	SEED FOR REPAIR SEEDING	1,200 KG		
0199	6093000000-M	1661	FERTILIZER FOR REPAIR SEEDING	4 MTN		
0200	6096000000-M	1662	SEED FOR SUPPLEMENTAL SEEDING	1,000 KG		
0201	6108000000-M	1665	FERTILIZER TOPDRESSING	59 MTN		
0202	6111000000-M	SP	IMPERVIOUS DIKE	275 M		
0203	6114500000-N	SP	SPECIALIZED HAND MOWING	55 MHR		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0204	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	150 EA		
0205	6120000000-M	SP	CULVERT DIVERSION CHANNEL	140 M3		
0206	6123000000-M	1670	REFORESTATION	4 HA		
0207	6126000000-M	SP	STREAMBANK REFORESTATION	0.1 HA		
0208	7060000000-M	1705	SIGNAL CABLE	1,750 M		
0209	7120000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 3 SECTION)	30 EA		
0210	7132000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 4 SECTION)	7 EA		
0211	7144000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 5 SECTION)	6 EA		
0212	7264000000-M	1710	MESSENGER CABLE (9.52MM)	550 M		
0213	7288000000-M	1715	PAVED TRENCHING (**********) (1, 50MM)	20 M		
0214	7300000000-M	1715	UNPAVED TRENCHING (**********) (1, 50MM)	550 M		
0215	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	12 EA		
0216	7360000000-N	1720	WOOD POLE	4 EA		
0217	7372000000-N	1721	GUY ASSEMBLY	8 EA		
0218	7408000000-M	1722	25MM RISER WITH WEATHERHEAD	3 EA		
0219	7420000000-M	1722	50MM RISER WITH WEATHERHEAD	14 EA		
0220	7444000000-M	1725	INDUCTIVE LOOP SAWCUT	1,540 M		
0221	7456000000-M	1726	LEAD-IN CABLE (**********) (14-2)	4,330 M		
0222	7576000000-N	SP	METAL STRAIN SIGNAL POLE	8 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0223	7613000000-N	SP	SOIL TEST	8 EA		
0224	7614100000-M	SP	DRILLED PIER FOUNDATION	50 M3		
0225	7636000000-N	1745	SIGN FOR SIGNALS	2 EA		
0226	7684000000-N	1750	SIGNAL CABINET FOUNDATION	2 EA		
0227	7756000000-N	1751	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)	2 EA		
0228	7780000000-N	1751	DETECTOR CARD (TYPE 2070L)	15 EA		
0229	7990000000-M	SP	GENERIC SIGNAL ITEM UNPAVED TRENCHING FOR TEMPORARY LEAD IN	150 M		
			******* BEGIN SCHEDULE AA ******* ******* (2 ALTERNATES) *******			
0230 AA1	0022000000-M	225	UNCLASSIFIED EXCAVATION	405,000 M3		
0231 AA1	1044000000-M	501	LIME TREATED SOIL (SLURRY METHOD)	39,670 M2		
0232 AA1	1066000000-M	501	LIME FOR LIME TREATED SOIL	440 MTN		
0233 AA1	1121000000-M	520	AGGREGATE BASE COURSE	4,545 MTN		
0234 AA1	1176000000-M	542	SOIL CEMENT BASE	39,670 M2		
0235 AA1	1187000000-M	542	PORTLAND CEMENT FOR SOIL CEMENT BASE	1,191 MTN		
0236 AA1	1198000000-M	SP	AGGREGATE FOR SOIL CEMENT BASE	600 MTN		
0237 AA1	1209000000-M	543	ASPHALT CURING SEAL	53,960 L		
0238 AA1	1489000000-M	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	47,510 MTN		
0239 AA1	1498000000-M	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	31,580 MTN		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0240 AA1	1519000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	32,000 MTN		
0241 AA1	1575000000-M	SP	ASPHALT BINDER FOR PLANT MIX	5,530 MTN		
0242 AA1	2099000000-M	816	SHOULDER DRAIN	5,120 M		
0243 AA1	2110000000-M	816	100MM SHOULDER DRAIN PIPE	5,120 M		
0244 AA1	2121000000-M	816	100MM OUTLET PIPE (SHOULDER DRAINS)	210 M		
0245 AA1	2132000000-N	816	CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET	30 EA		
0246 AA1	4685000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 2.3MM)	25,786 M		
0247 AA1	4686000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 3.1MM)	14,060 M		
0248 AA1	4695000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM)	2,209 M		
0249 AA1	4700000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (300MM, 2.3MM)	703 M		
0250 AA1	4725000000-M	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM)	162 EA		
0251 AA1	4770000000-M	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (100MM) (IV)	644 M		
			*** OR ***			
0252 AA2	0022000000-M	225	UNCLASSIFIED EXCAVATION	400,000 M3		
0253 AA2	1044000000-M	501	LIME TREATED SOIL (SLURRY METHOD)	48,120 M2		
0254 AA2	1066000000-M	501	LIME FOR LIME TREATED SOIL	530 MTN		
0255 AA2	1121000000-M	520	AGGREGATE BASE COURSE	5,017 MTN		
0256 AA2	1176000000-M	542	SOIL CEMENT BASE	48,120 M2		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0257 AA2	1187000000-M	542	PORTLAND CEMENT FOR SOIL CEMENT BASE	1,444 MTN		
0258 AA2	1198000000-M	SP	AGGREGATE FOR SOIL CEMENT BASE	730 MTN		
0259 AA2	1209000000-M	543	ASPHALT CURING SEAL	65,450 L		
0260 AA2	1489000000-M	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	17,700 MTN		
0261 AA2	1498000000-M	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	11,800 MTN		
0262 AA2	1519000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	13,670 MTN		
0263 AA2	1525000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A	6,790 MTN		
0264 AA2	1575000000-M	SP	ASPHALT BINDER FOR PLANT MIX	2,980 MTN		
0265 AA2	1682000000-M	652	PERMEABLE ASPHALT DRAINAGE COURSE, TYPE P-57	14,030 MTN		
0266 AA2	1847000000-M	710	****MM PORT CEM CONC PAVEMENT, THROUGH LANES (WITH DOWELS) (200MM)	80,945 M2		
0267 AA2	1902000000-N	710	SURFACE TESTING CONCRETE PAVEMENT	Lump Sum	L.S.	
0268 AA2	1913000000-M	720	CONCRETE SHOULDERS ADJACENT TO *****MM PAVEMENT (200MM)	14,615 M2		
0269 AA2	1914000000-M	SP	CONCRETE SHOULDERS ADJACENT TO *****MM PAVEMENT (WITH DOWELS) (200MM)	5,570 M2		
0270 AA2	1924000000-N	725	FIELD LABORATORY RENTAL, PORT CEM CONC PAVEMENT	Lump Sum	L.S.	
0271 AA2	2099000000-M	816	SHOULDER DRAIN	8,820 M		
0272 AA2	2110000000-M	816	100MM SHOULDER DRAIN PIPE	8,820 M		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0273 AA2	2121000000-M	816	100MM OUTLET PIPE (SHOULDER DRAINS)	300 M		
0274 AA2	2132000000-N	816	CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET	50 EA		
0275 AA2	4685000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 2.3MM)	7,131 M		
0276 AA2	4686000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 3.1MM)	11,591 M		
0277 AA2	4695000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM)	463 M		
0278 AA2	4700000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (300MM, 2.3MM)	239 M		
0279 AA2	4725000000-M	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM)	115 EA		
0280 AA2	4780000000-M	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (200MM) (II)	39 M		
0281 AA2	4785000000-M	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (300MM) (II)	464 M		
0282 AA2	4805000000-N	1205	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (II)	47 EA		
0283 AA2	4847000000-M	1205	POLYUREA PAVEMENT MARKING LINES (100MM, **********) (HIGHLY REFLECTIVE ELEMENTS)	21,124 M		
0284 AA2	4847110000-M	1205	POLYUREA PAVEMENT MARKING LINES (200MM, **********) (HIGHLY REFLECTIVE ELEMENTS)	1,707 M		

***** END SCHEDULE AA *****

CULVERT ITEMS

0285	8126000000-N	414	CULVERT EXCAVATION, STA ****** (13+43.400-L-)	Lump Sum	L.S.	

County : Person

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0286	8126000000-N	414	CULVERT EXCAVATION, STA ****** (20+86.000-L-)	Lump Sum	L.S.	
0287	8126000000-N	414	CULVERT EXCAVATION, STA ****** (35+56.000-L-)	Lump Sum	L.S.	
0288	8133000000-M	414	FOUNDATION CONDITIONING MATER-IAL, BOX CULVERT	1,016 MTN		
0289	8196000000-M	420	CLASS A CONCRETE (CULVERT)	1,016.2 M3		
0290	8245000000-M	425	REINFORCING STEEL (CULVERT)	100,768 KG		

Vendor 1 of 7: PLT CONSTRUCTION CO., INC. (3123)
Call Order 002 (Proposal: C202960)

Bid Information

County: PERSON
Address: 5676 Thompson Chapel Church Road
Wilson , NC , 27896
Signature Check: Sim_A._Wooten_Jr_3123
Time Bid Received: April 16, 2013 01:49 PM
Amendment Count: 0

Bid Checksum: D7864B25
Bid Total: $21,714,921.38
Items Total: $21,714,921.38
Time Total: $0.00

Bidding Errors:
DBE Warning : DBE Warning: DBE Commitment Goal not met

DBE GOAL SET	12.0
DBE GOAL OBT	11.4

Vendor 1 of 7: PLT CONSTRUCTION CO., INC. (3123)
Call Order 002 (Proposal: C202960)

Bid Bond Information

Projects:		**Bond Maximum:**	
Counties:		**State of Incorporation:**	
Bond ID:	9QJ6-CA5K-GMXK-H8GK	**Agency Execution Date:**	4/16/2013
Paid by Check:	No	**Surety Name:**	SurePathNetwork
Bond Percent:	5%	**Bond Agency Name:**	Fidelity and Deposit Company of Maryland

Vendor 3123's Bid Information for Call 002, Letting L130416, 04/16/13

PLT Construction Company, Inc. (3123)
Call Order 002 (Proposal ID C202960)

LIST OF DBE PARTICIPANTS

VENDOR NUMBER	DBE NAME / ADDRESS	WORK CODE TYPE OF WORK	CERT TYPE	AMOUNT	
12702 WB	NEHRENZ ENTERPRISES 7001 CEDRIC DRIVE , RALEIGH, NC 27603		Sub	493,943.50	Committed
8666 MB	L L & G SERVICES, INC. 3042 MOUNTAIN RD , HALIFAX, VA 24558		Sub	69,700.00	Committed
10129 WB	CONCRETE SPECIALTY CONTRACTORS POST OFFICE BOX 2303 , SHELBY, NC 28151		Sub	390,839.30	Committed
4417 WB	POZZOLANIC CONTRACTING & SUPPLY 2401 ASBURY ROAD , KNOXVILLE, TN 379146408		Sub	565,962.20	Committed
4247 WB	SEAL BROTHERS CONTRACTING LLC 131 W. CLEVE STREET , MOUNT AIRY, NC 27030		Sub	158,096.75	Committed
4898 WB	BULLINGTON CONSTRUCTION INC 417 FOXGLOVE LANE , INDIAN TRAIL, NC 28079		Sub	133,943.30	Committed
3080 WB	CURTIN TRUCKING & DRAINAGE, INC POST OFFICE BOX 38220 , CHARLOTTE, NC 282781003		Sub	251,461.00	Committed
12278 WB	CLIFTON CONSTRUCTION CO., INC. 1435 GIDDENSVILLE ROAD , FAISON, NC 28341		Sub	160,690.00	Committed
4761 WB	TRAFFIC CONTROL SAFETY SERVICES POST OFFICE BOX 24511 , WINSTON-SALEM, NC 27114		Sub	78,225.50	Committed
4761 WB	TRAFFIC CONTROL SAFETY SERVICES POST OFFICE BOX 24511 , WINSTON-SALEM, NC 27114		Sup	70,196.50	Committed
12418 WB	LEVEL CROSS SURVEYING PLLC 668 MARSH COUNTRY LANE , RANDLEMAN, NC 27317		Sub	122,700.00	Committed
			TOTAL:	$2,467,679.45 11.36%	

Vendor 3123's Bid Information for Call 002, Letting L130416, 04/16/13

PLT Construction Company, Inc. (3123)
Call Order 002 (Proposal ID C202960)

Miscelleneous Data Info - Contractor Responses:
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NON-COLLUSION AND DEBARMENT CERTIFICATION

Explanation of the prospective bidder that is unable to certify to any of the statements in this certification:

Explanation:
NOT ANSWERED
NOT ANSWERED
NOT ANSWERED
NOT ANSWERED

AWARD LIMITS ON MULTIPLE PROJECTS

By answering YES to this statement, the bidder acknowleges that they are using the award limits on multiple projects. No

It is the desire of the Bidder to be awarded contracts, the value of which

will not exceed a total of NOT ANSWERED for those
projects indicated herein, for which bids will be opened on (MM/DD/YY)

The Award Limits shall apply to the following projects:

Contract Number	County
NOT ANSWERED	
NOT ANSWERED	
NOT ANSWERED	
NOT ANSWERED	
NOT ANSWERED	
NOT ANSWERED	

Bid Bond Data Info - Contractor Responses:
==========

BondID: 9QJ6-CA5K-GMXK-H8GK
Surety Registry Agency: SurePathNetwork
Verified?: Yes
Surety Agency: Fidelity and Deposit Company of Maryland
Bond Execution Date: 4/16/2013
Bond Amount: $1,085,746.07 (Five Percent of Bid)

State of NC
Dept of Transportation

Date: 03-18-13
Revised:

Contract ID: C202960 Project(s): HPP-0501(25)
Letting Date: 04-16-13 Call Order: 002
Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
Section 0001	ROADWAY ITEMS - NPAR (CITY OF ROXBORO)					
	Alt Group					
0001	0000100000-N MOBILIZATION	LUMP	LUMP		1,079,886.00	
0002	0000400000-N CONSTRUCTION SURVEYING	LUMP	LUMP		270,544.50	
0003	0001000000-M CLEARING & GRUBBING .. HECTARE(S)	LUMP	LUMP		350,000.00	
0004	0008000000-M SUPPLEMENTARY CLEARING & GRUB-BING	1.200 HA	13,600.00000		16,320.00	
0005	0015000000-N SEALING ABANDONED WELLS	4.000 EA	1,617.00000		6,468.00	
0006	0036000000-M UNDERCUT EXCAVATION	22,000.000 M3	5.00000		110,000.00	
0007	0038000000-M SHALLOW UNDERCUT	300.000 M3	11.75000		3,525.00	
0008	0080000000-M CLASS IV SUBGRADE STABILIZA- TION	700.000 MTN	20.50000		14,350.00	
0009	0134000000-M DRAINAGE DITCH EXCAVATION	2,240.000 M3	4.00000		8,960.00	
0010	0141000000-M BERM DITCH CONSTRUCTION	750.000 M	7.00000		5,250.00	
0011	0156000000-M REMOVAL OF EXISTING ASPHALT PAVEMENT	6,380.000 M2	6.75000		43,065.00	

Contract ID: C202960 Project(s): HPP-0501(25)
Letting Date: 04-16-13 Call Order: 002
Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0012	0192000000-N PROOF ROLLING	40.000 HR	231.00000		9,240.00	
0013	0195000000-M SELECT GRANULAR MATERIAL	29,500.000 M3	19.50000		575,250.00	
0014	0196000000-M FABRIC FOR SOIL STABILIZATION	31,000.000 M2	1.75000		54,250.00	
0015	0199000000-M TEMPORARY SHORING	233.200 M2	950.00000		221,540.00	
0016	0241000000-M GENERIC GRADING ITEM GEOTEXTILE FOR PAVEMENT STAB-ILIZATION	16,500.000 M2	2.35000		38,775.00	
0017	0255000000-M GENERIC GRADING ITEM EXCAVATION, HAULING & DISPOSAL OF CONTAMINATED SOIL	2,500.000 MTN	50.00000		125,000.00	
0018	0318000000-M FOUNDATION CONDITIONING MATE- RIAL, MINOR STRS	2,250.000 MTN	21.15000		47,587.50	
0019	0320000000-M FOUNDATION CONDITIONING FABRIC	6,770.000 M2	2.35000		15,909.50	
0020	0335000000-M ***MM DRAINAGE PIPE (200MM)	31.200 M	50.00000		1,560.00	
0021	0335200000-M 375MM DRAINAGE PIPE	2,202.000 M	63.00000		138,726.00	
0022	0335300000-M 450MM DRAINAGE PIPE	676.800 M	75.00000		50,760.00	

Contract ID: C202960 Project(s): HPP-0501(25)
Letting Date: 04-16-13 Call Order: 002
Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0023	0335400000-M 600MM DRAINAGE PIPE	685.200 M	100.00000		68,520.00	
0024	0335500000-M 750MM DRAINAGE PIPE	373.200 M	128.00000		47,769.60	
0025	0335600000-M 900MM DRAINAGE PIPE	229.200 M	165.00000		37,818.00	
0026	0335700000-M 1050MM DRAINAGE PIPE	54.000 M	200.00000		10,800.00	
0027	0335800000-M 1200MM DRAINAGE PIPE	132.000 M	255.00000		33,660.00	
0028	0335850000-M ****MM DRAINAGE PIPE ELBOWS (375MM)	7.000 EA	185.00000		1,295.00	
0029	0335850000-M ****MM DRAINAGE PIPE ELBOWS (450MM)	6.000 EA	225.00000		1,350.00	
0030	0343000000-M 375MM SIDE DRAIN PIPE	268.800 M	63.00000		16,934.40	
0031	0344000000-M 450MM SIDE DRAIN PIPE	14.400 M	75.00000		1,080.00	
0032	0345000000-M 600MM SIDE DRAIN PIPE	8.400 M	100.00000		840.00	
0033	0354000000-M ****MM RC PIPE CULVERTS, CLASS***** (375MM, V)	20.400 M	78.00000		1,591.20	
0034	0366000000-M 375MM RC PIPE CULVERTS, CLASS III	115.200 M	63.00000		7,257.60	

Contract ID: C202960 Project(s): HPP-0501(25)
Letting Date: 04-16-13 Call Order: 002
Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0035	0384000000-M 750MM RC PIPE CULVERTS, CLASS III	36.000 M	128.00000		4,608.00	
0036	0408000000-M 1350MM RC PIPE CULVERTS, CLASSIII	121.200 M	420.00000		50,904.00	
0037	0448000000-M ****MM RC PIPE CULVERTS, CLASSIV (1500MM)	79.200 M	655.00000		51,876.00	
0038	0448200000-M 375MM RC PIPE CULVERTS, CLASS IV	1,027.200 M	66.50000		68,308.80	
0039	0448300000-M 450MM RC PIPE CULVERTS, CLASS IV	462.000 M	81.00000		37,422.00	
0040	0448400000-M 600MM RC PIPE CULVERTS, CLASS IV	260.400 M	107.00000		27,862.80	
0041	0448500000-M 750MM RC PIPE CULVERTS, CLASS IV	45.600 M	138.00000		6,292.80	
0042	0448600000-M 900MM RC PIPE CULVERTS, CLASS IV	126.000 M	180.00000		22,680.00	
0043	0974000000-M ****MM WELDED STEEL PIPE, ****MM THICK, GRADE B (UNDER RR) (600MM, 12MM)	13.200 M	950.00000		12,540.00	
0044	0986000000-M GENERIC PIPE ITEM 375MM DUCTILE IRON PIPE	135.600 M	220.00000		29,832.00	
0045	0992000000-M GENERIC PIPE ITEM ENERGY DISSIPATOR BASIN	2.000 EA	8,422.00000		16,844.00	

Contract ID: C202960 Project(s): HPP-0501(25)
Letting Date: 04-16-13 Call Order: 002
Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0046	0995000000-M PIPE REMOVAL	869.600 M	33.00000		28,696.80	
0047	1011000000-N FINE GRADING	LUMP	LUMP		304,297.00	
0048	1077000000-M #57 STONE	60.000 MTN	32.50000		1,950.00	
0049	1110000000-M STABILIZER AGGREGATE	500.000 MTN	26.50000		13,250.00	
0050	1220000000-M INCIDENTAL STONE BASE	2,000.000 MTN	20.50000		41,000.00	
0051	1231000000-M SHOULDER BORROW	9,230.000 M3	4.75000		43,842.50	
0052	1275000000-M PRIME COAT	15,531.000 L	1.10000		17,084.10	
0053	1330000000-M INCIDENTAL MILLING	980.000 M2	7.00000		6,860.00	
0054	1693000000-M ASPHALT PLANT MIX, PAVEMENT REPAIR	100.000 MTN	129.00000		12,900.00	
0055	2000000000-N RIGHT OF WAY MARKERS	225.000 EA	130.00000		29,250.00	
0056	2022000000-M SUBDRAIN EXCAVATION	2,070.000 M3	29.00000		60,030.00	
0057	2033000000-M SUBDRAIN FINE AGGREGATE	1,035.000 M3	60.00000		62,100.00	

Contract ID: C202960 Project(s): HPP-0501(25)
Letting Date: 04-16-13 Call Order: 002
Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0058	2044000000-M 150MM PERFORATED SUBDRAIN PIPE	2,500.000 M	12.50000		31,250.00	
0059	2070000000-N SUBDRAIN PIPE OUTLETS	17.000 EA	350.00000		5,950.00	
0060	2077000000-M 150MM OUTLET PIPE (SUBDRAINS)	34.000 M	40.00000		1,360.00	
0061	2143000000-M BLOTTING SAND	10.000 MTN	35.00000		350.00	
0062	2209000000-M ENDWALLS	40.600 M3	700.00000		28,420.00	
0063	2220000000-M REINFORCED ENDWALLS	26.700 M3	800.00000		21,360.00	
0064	2253000000-M PIPE COLLARS	0.290 M3	900.00000		261.00	
0065	2264000000-M PIPE PLUGS	0.220 M3	900.00000		198.00	
0066	2275000000-M FLOWABLE FILL	23.000 M3	225.00000		5,175.00	
0067	2286000000-N MASONRY DRAINAGE STRUCTURES	195.000 EA	1,285.00000		250,575.00	
0068	2297000000-M MASONRY DRAINAGE STRUCTURES	3.100 M3	1,300.00000		4,030.00	
0069	2308000000-M MASONRY DRAINAGE STRUCTURES	15.970 M	600.00000		9,582.00	

Contract ID: C202960 Project(s): HPP-0501(25)
Letting Date: 04-16-13 Call Order: 002
Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0070	2354200000-N FRAME WITH GRATE, STD 840.24	1.000 EA	290.00000		290.00	
0071	2364000000-N FRAME WITH TWO GRATES, STD 840.16	10.000 EA	475.00000		4,750.00	
0072	2364200000-N FRAME WITH TWO GRATES, STD 840.20	10.000 EA	450.00000		4,500.00	
0073	2365000000-N FRAME WITH TWO GRATES, STD 840.22	81.000 EA	440.00000		35,640.00	
0074	2366000000-N FRAME WITH TWO GRATES, STD 840.24	16.000 EA	450.00000		7,200.00	
0075	2367000000-N FRAME WITH TWO GRATES, STD 840.29	10.000 EA	460.00000		4,600.00	
0076	2374000000-N FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	6.000 EA	540.00000		3,240.00	
0077	2374000000-N FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	32.000 EA	540.00000		17,280.00	
0078	2374000000-N FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	25.000 EA	540.00000		13,500.00	
0079	2396000000-N FRAME WITH COVER, STD 840.54	3.000 EA	355.00000		1,065.00	
0080	2440000000-N CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN	3.000 EA	995.00000		2,985.00	
0081	2535000000-M *** X ***MM CONCRETE CURB (200MM X 450MM)	350.000 M	45.23000		15,830.50	

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Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0082	2549000000-M 750MM CONCRETE CURB & GUTTER	3,860.000 M	56.00000		216,160.00	
0083	2556000000-M SHOULDER BERM GUTTER	521.000 M	48.10000		25,060.10	
0084	2577000000-M CONCRETE EXPRESSWAY GUTTER	70.000 M	80.45000		5,631.50	
0085	2612000000-M 150MM CONCRETE DRIVEWAY	1,000.000 M2	46.62000		46,620.00	
0086	2619000000-M 100MM CONCRETE PAVED DITCH	50.000 M2	35.62000		1,781.00	
0087	2647000000-M 125MM MONOLITHIC CONCRETE IS-LANDS (SURFACE MOUNTED)	1,760.000 M2	43.62000		76,771.20	
0088	3030000000-M STEEL BM GUARDRAIL	1,824.990 M	49.20000		89,789.51	
0089	3045000000-M STEEL BM GUARDRAIL, SHOP CURVED	19.050 M	52.48000		999.74	
0090	3150000000-N ADDITIONAL GUARDRAIL POSTS	10.000 EA	11.00000		110.00	
0091	3210000000-N GUARDRAIL ANCHOR UNITS, TYPE CAT-1	13.000 EA	425.00000		5,525.00	
0092	3270000000-N GUARDRAIL ANCHOR UNITS, TYPE 350	19.000 EA	1,780.00000		33,820.00	
0093	3380000000-M TEMPORARY STEEL BM GUARDRAIL	140.970 M	26.24000		3,699.05	

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Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0094	3503000000-M WOVEN WIRE FENCE, 1200MM FAB- RIC	11,330.000 M	7.70000		87,241.00	
0095	3509000000-M 100MM TIMBER FENCE POSTS, 2.30M LONG	2,310.000 EA	12.00000		27,720.00	
0096	3515000000-M 125MM TIMBER FENCE POSTS, 2.50M LONG	650.000 EA	18.00000		11,700.00	
0097	3533000000-M CHAIN LINK FENCE, ****MM FABRIC (1800MM)	49.000 M	26.00000		1,274.00	
0098	3539000000-M METAL LINE POSTS FOR ****MM CHAIN LINK FENCE (1800MM)	14.000 EA	65.00000		910.00	
0099	3557000000-M ADDITIONAL BARBED WIRE	175.000 M	0.01000		1.75	
0100	3628000000-M RIP RAP, CLASS I	38.000 MTN	59.50000		2,261.00	
0101	3635000000-M RIP RAP, CLASS II	425.000 MTN	68.25000		29,006.25	
0102	3649000000-M RIP RAP, CLASS B	1,454.000 MTN	54.50000		79,243.00	
0103	3656000000-M FILTER FABRIC FOR DRAINAGE	13,385.000 M2	3.50000		46,847.50	
0104	3659000000-N PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	7.000 EA	656.00000		4,592.00	
0105	4054000000-M PLAIN CONCRETE SIGN FOUNDA- TIONS	1.000 M3	1.00000		1.00	

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0106	4060000000-M SUPPORTS, BREAKAWAY STEEL BEAM	250.000 KG	18.00000		4,500.00	
0107	4072000000-M SUPPORTS, 4.5-KG STEEL U-CHANNEL	919.000 M	16.50000		15,163.50	
0108	4096000000-N SIGN ERECTION, TYPE D	8.000 EA	95.00000		760.00	
0109	4102000000-N SIGN ERECTION, TYPE E	117.000 EA	50.00000		5,850.00	
0110	4108000000-N SIGN ERECTION, TYPE F	37.000 EA	95.00000		3,515.00	
0111	4110000000-N SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)	2.000 EA	285.00000		570.00	
0112	4116100000-N SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (D)	3.000 EA	125.00000		375.00	
0113	4116100000-N SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)	9.000 EA	65.00000		585.00	
0114	4155000000-N DISPOSAL OF SIGN SYSTEM, U- CHANNEL	101.000 EA	1.00000		101.00	
0115	4192000000-N DISPOSAL OF SUPPORT, U-CHANNEL	7.000 EA	1.00000		7.00	
0116	4400000000-M WORK ZONE SIGNS (STATIONARY)	314.000 M2	49.00000		15,386.00	
0117	4405000000-M WORK ZONE SIGNS (PORTABLE)	122.000 M2	433.00000		52,826.00	

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Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0118	4410000000-M WORK ZONE SIGNS (BARRICADE MOUNTED)	91.000 M2	122.00000		11,102.00	
0119	4415000000-N FLASHING ARROW PANELS, TYPE C	3.000 EA	7,449.75000		22,349.25	
0120	4420000000-N CHANGEABLE MESSAGE SIGN	2.000 EA	19,635.00000		39,270.00	
0121	4422000000-N CHANGEABLE MESSAGE SIGN (SHORTTERM)	150.000 DAY	85.00000		12,750.00	
0122	4430000000-N DRUMS	469.000 EA	79.25000		37,168.25	
0123	4445000000-M BARRICADES (TYPE III)	264.000 M	105.00000		27,720.00	
0124	4450000000-N FLAGGER	4,800.000 HR	18.50000		88,800.00	
0125	4465000000-N TEMPORARY CRASH CUSHIONS	9.000 EA	5,500.00000		49,500.00	
0126	4470000000-N RESET TEMPORARY CRASH CUSHIONS	3.000 EA	2,000.00000		6,000.00	
0127	4480000000-N TMIA	3.000 EA	2,500.00000		7,500.00	
0128	4485000000-M PORTABLE CONCRETE BARRIER	143.000 M	69.00000		9,867.00	
0129	4490000000-M PORTABLE CONCRETE BARRIER (ANCHORED)	594.000 M	102.00000		60,588.00	

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0130	4505000000-M RESET PORTABLE CONCRETE BARRIER (ANCHORED)	110.000 M	49.00000		5,390.00	
0131	4516000000-N SKINNY DRUM	100.000 EA	55.00000		5,500.00	
0132	4650000000-N TEMPORARY RAISED PAVEMENT MARKERS	881.000 EA	4.00000		3,524.00	
0133	4705000000-M THERMOPLASTIC PAVEMENT MARKINGLINES (400MM, 3.1MM)	79.000 M	19.69000		1,555.51	
0134	4710000000-M THERMOPLASTIC PAVEMENT MARKINGLINES (600MM, 3.1MM)	328.000 M	26.25000		8,610.00	
0135	4721000000-M THERMOPLASTIC PAVEMENT MARKINGCHARACTER (3.1MM)	12.000 EA	100.00000		1,200.00	
0136	4810000000-M PAINT PAVEMENT MARKING LINES (100MM)	74,089.000 M	0.43000		31,858.27	
0137	4830000000-M PAINT PAVEMENT MARKING LINES (400MM)	62.000 M	6.56000		406.72	
0138	4835000000-M PAINT PAVEMENT MARKING LINES (600MM)	392.000 M	9.84000		3,857.28	
0139	4840000000-N PAINT PAVEMENT MARKING CHARAC-TER	10.000 EA	50.00000		500.00	
0140	4845000000-N PAINT PAVEMENT MARKING SYMBOL	82.000 EA	35.00000		2,870.00	
0141	4875000000-N REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	5.000 EA	35.00000		175.00	

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0142	4905000000-N SNOWPLOWABLE PAVEMENT MARKERS	1,491.000 EA	25.00000		37,275.00	
0143	4915000000-M 2.1M U-CHANNEL POSTS	8.000 EA	50.00000		400.00	
0144	4955000000-N OBJECT MARKERS (END OF ROAD)	8.000 EA	40.00000		320.00	
0145	5325600000-M 150MM WATER LINE	163.000 M	155.00000		25,265.00	
0146	5325800000-M 200MM WATER LINE	465.000 M	175.00000		81,375.00	
0147	5326200000-M 300MM WATER LINE	275.000 M	225.00000		61,875.00	
0148	5540000000-M 150MM VALVE	7.000 EA	800.00000		5,600.00	
0149	5546000000-M 200MM VALVE	11.000 EA	1,050.00000		11,550.00	
0150	5558000000-M 300MM VALVE	3.000 EA	2,000.00000		6,000.00	
0151	5572200000-M 300MM TAPPING VALVE	1.000 EA	6,000.00000		6,000.00	
0152	5648000000-N RELOCATE WATER METER	23.000 EA	1,000.00000		23,000.00	
0153	5649000000-N RECONNECT WATER METER	1.000 EA	875.00000		875.00	

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0154	5672000000-N RELOCATE FIRE HYDRANT	4.000 EA	3,000.00000		12,000.00	
0155	5691200000-M 150MM SANITARY GRAVITY SEWER	12.000 M	80.00000		960.00	
0156	5691300000-M 200MM SANITARY GRAVITY SEWER	333.000 M	120.00000		39,960.00	
0157	5691400000-M 250MM SANITARY GRAVITY SEWER	67.000 M	175.00000		11,725.00	
0158	5691600000-M 400MM SANITARY GRAVITY SEWER	75.800 M	275.00000		20,845.00	
0159	5768000000-N SANITARY SEWER CLEAN-OUT	6.000 EA	1,200.00000		7,200.00	
0160	5775000000-M 1200MM DIA UTILITY MANHOLE	5.000 EA	1,900.00000		9,500.00	
0161	5776000000-M 1500MM DIA UTILITY MANHOLE	5.000 EA	2,400.00000		12,000.00	
0162	5781000000-M UTILITY MANHOLE WALL, 1200MM DIA	7.600 M	656.00000		4,985.60	
0163	5782000000-M UTILITY MANHOLE WALL, 1500MM DIA	18.600 M	820.00000		15,252.00	
0164	5798000000-M ABANDON ***MM UTILITY PIPE (375MM)	71.000 M	35.00000		2,485.00	
0165	5801000000-M ABANDON 200MM UTILITY PIPE	406.000 M	13.00000		5,278.00	

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0166	5802000000-M ABANDON 250MM UTILITY PIPE	29.000 M	17.00000		493.00	
0167	5804000000-M ABANDON 300MM UTILITY PIPE	146.000 M	22.00000		3,212.00	
0168	5816000000-N ABANDON UTILITY MANHOLE	2.000 EA	1,000.00000		2,000.00	
0169	5836000000-M 600MM ENCASEMENT PIPE	12.000 M	300.00000		3,600.00	
0170	5836200000-M 750MM ENCASEMENT PIPE	16.000 M	430.00000		6,880.00	
0171	5872200000-M TRENCHLESS INSTALLATION OF 600MM IN SOIL	6.000 M	550.00000		3,300.00	
0172	5872210000-M TRENCHLESS INSTALLATION OF 600MM NOT IN SOIL	6.000 M	2,299.00000		13,794.00	
0173	5872300000-M TRENCHLESS INSTALLATION OF 750MM IN SOIL	8.000 M	660.00000		5,280.00	
0174	5872310000-M TRENCHLESS INSTALLATION OF 750MM NOT IN SOIL	8.000 M	2,949.00000		23,592.00	
0175	6000000000-M TEMPORARY SILT FENCE	14,000.000 M	5.40000		75,600.00	
0176	6006000000-M STONE FOR EROSION CONTROL, CLASS A	12,500.000 MTN	46.75000		584,375.00	
0177	6009000000-M STONE FOR EROSION CONTROL, CLASS B	7,500.000 MTN	54.50000		408,750.00	

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0178	6012000000-M SEDIMENT CONTROL STONE	6,250.000 MTN	32.25000		201,562.50	
0179	6015000000-M TEMPORARY MULCHING	60.000 HA	995.00000		59,700.00	
0180	6018000000-M SEED FOR TEMPORARY SEEDING	2,425.000 KG	6.50000		15,762.50	
0181	6021000000-M FERTILIZER FOR TEMPORARY SEED-ING	20.250 MTN	725.00000		14,681.25	
0182	6024000000-M TEMPORARY SLOPE DRAINS	1,500.000 M	50.50000		75,750.00	
0183	6027000000-N INLET PROTECTION AT TEMPORARY SLOPE DRAINS	67.000 EA	214.00000		14,338.00	
0184	6029000000-M SAFETY FENCE	50.000 M	5.00000		250.00	
0185	6030000000-M SILT EXCAVATION	42,500.000 M3	2.75000		116,875.00	
0186	6036000000-M MATTING FOR EROSION CONTROL	180,000.000 M2	1.39000		250,200.00	
0187	6037000000-M COIR FIBER MAT	1,100.000 M2	4.25000		4,675.00	
0188	6038000000-M PERMANENT SOIL REINFORCEMENT MAT	3,500.000 M2	5.45000		19,075.00	
0189	6042000000-M 6.4MM HARDWARE CLOTH	3,250.000 M	9.00000		29,250.00	

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0190	6046000000-M TEMPORARY PIPE FOR STREAM CROSSING	50.000 M	40.00000		2,000.00	
0191	6069000000-M STILLING BASINS	40.000 M3	70.00000		2,800.00	
0192	6071012000-M COIR FIBER WATTLE	2,100.000 M	23.00000		48,300.00	
0193	6071020000-M POLYACRYLAMIDE (PAM)	2,200.000 KG	11.00000		24,200.00	
0194	6071030000-M COIR FIBER BAFFLE	4,000.000 M	13.00000		52,000.00	
0195	6071050000-M ***MM SKIMMER (38MM)	86.000 EA	920.00000		79,120.00	
0196	6084000000-M SEEDING & MULCHING	40.000 HA	6,871.83000		274,873.20	
0197	6087000000-M MOWING	20.000 HA	150.00000		3,000.00	
0198	6090000000-M SEED FOR REPAIR SEEDING	1,200.000 KG	21.00000		25,200.00	
0199	6093000000-M FERTILIZER FOR REPAIR SEEDING	4.000 MTN	1,150.00000		4,600.00	
0200	6096000000-M SEED FOR SUPPLEMENTAL SEEDING	1,000.000 KG	7.00000		7,000.00	
0201	6108000000-M FERTILIZER TOPDRESSING	59.000 MTN	880.00000		51,920.00	

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0202	6111000000-M IMPERVIOUS DIKE	275.000 M	175.00000		48,125.00	
0203	6114500000-N SPECIALIZED HAND MOWING	55.000 MHR	35.00000		1,925.00	
0204	6117000000-N RESPONSE FOR EROSION CONTROL	150.000 EA	75.00000		11,250.00	
0205	6120000000-M CULVERT DIVERSION CHANNEL	140.000 M3	70.00000		9,800.00	
0206	6123000000-M REFORESTATION	4.000 HA	1,900.00000		7,600.00	
0207	6126000000-M STREAMBANK REFORESTATION	0.100 HA	10,000.00000		1,000.00	
0208	7060000000-M SIGNAL CABLE	1,750.000 M	4.75000		8,312.50	
0209	7120000000-M VEHICLE SIGNAL HEAD (300MM, 3 SECTION)	30.000 EA	700.00000		21,000.00	
0210	7132000000-M VEHICLE SIGNAL HEAD (300MM, 4 SECTION)	7.000 EA	850.00000		5,950.00	
0211	7144000000-M VEHICLE SIGNAL HEAD (300MM, 5 SECTION)	6.000 EA	1,100.00000		6,600.00	
0212	7264000000-M MESSENGER CABLE (9.52MM)	550.000 M	8.50000		4,675.00	
0213	7288000000-M PAVED TRENCHING (**********) (1, 50MM)	20.000 M	37.00000		740.00	

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0214	7300000000-M UNPAVED TRENCHING (**********) (1, 50MM)	550.000 M	16.50000		9,075.00	
0215	7324000000-N JUNCTION BOX (STANDARD SIZE)	12.000 EA	400.00000		4,800.00	
0216	7360000000-N WOOD POLE	4.000 EA	850.00000		3,400.00	
0217	7372000000-N GUY ASSEMBLY	8.000 EA	375.00000		3,000.00	
0218	7408000000-M 25MM RISER WITH WEATHERHEAD	3.000 EA	650.00000		1,950.00	
0219	7420000000-M 50MM RISER WITH WEATHERHEAD	14.000 EA	600.00000		8,400.00	
0220	7444000000-M INDUCTIVE LOOP SAWCUT	1,540.000 M	18.00000		27,720.00	
0221	7456000000-M LEAD-IN CABLE (**********) (14-2)	4,330.000 M	3.00000		12,990.00	
0222	7576000000-N METAL STRAIN SIGNAL POLE	8.000 EA	5,250.00000		42,000.00	
0223	7613000000-N SOIL TEST	8.000 EA	900.00000		7,200.00	
0224	7614100000-M DRILLED PIER FOUNDATION	50.000 M3	700.00000		35,000.00	
0225	7636000000-N SIGN FOR SIGNALS	2.000 EA	225.00000		450.00	

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0226	7684000000-N SIGNAL CABINET FOUNDATION	2.000 EA	700.00000		1,400.00	
0227	7756000000-N CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)	2.000 EA	14,000.00000		28,000.00	
0228	7780000000-N DETECTOR CARD (TYPE 2070L)	15.000 EA	150.00000		2,250.00	
0229	7990000000-M GENERIC SIGNAL ITEM UNPAVED TRENCHING FOR TEMPOR- ARY LEAD IN	150.000 M	10.50000		1,575.00	
0230 AA1	0022000000-M UNCLASSIFIED EXCAVATION	405,000.000 M3	8.50000		3,442,500.00	
0231 AA1	1044000000-M LIME TREATED SOIL (SLURRY METHOD)	39,670.000 M2	3.10000		122,977.00	
0232 AA1	1066000000-M LIME FOR LIME TREATED SOIL	440.000 MTN	220.00000		96,800.00	
0233 AA1	1121000000-M AGGREGATE BASE COURSE	4,545.000 MTN	21.75000		98,853.75	
0234 AA1	1176000000-M SOIL CEMENT BASE	39,670.000 M2	3.00000		119,010.00	
0235 AA1	1187000000-M PORTLAND CEMENT FOR SOIL CE- MENT BASE	1,191.000 MTN	140.00000		166,740.00	
0236 AA1	1198000000-M AGGREGATE FOR SOIL CEMENT BASE	600.000 MTN	12.74000		7,644.00	

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0237 AA1	1209000000-M ASPHALT CURING SEAL	53,960.000 L	1.12000		60,435.20	
0238 AA1	1489000000-M ASPHALT CONC BASE COURSE, TYPE B25.0B	47,510.000 MTN	35.00000		1,662,850.00	
0239 AA1	1498000000-M ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	31,580.000 MTN	34.50000		1,089,510.00	
0240 AA1	1519000000-M ASPHALT CONC SURFACE COURSE, TYPE S9.5B	32,000.000 MTN	39.10000		1,251,200.00	
0241 AA1	1575000000-M ASPHALT BINDER FOR PLANT MIX	5,530.000 MTN	550.00000		3,041,500.00	
0242 AA1	2099000000-M SHOULDER DRAIN	5,120.000 M	15.75000		80,640.00	
0243 AA1	2110000000-M 100MM SHOULDER DRAIN PIPE	5,120.000 M	4.90000		25,088.00	
0244 AA1	2121000000-M 100MM OUTLET PIPE (SHOULDER DRAINS)	210.000 M	32.80000		6,888.00	
0245 AA1	2132000000-N CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET	30.000 EA	250.00000		7,500.00	
0246 AA1	4685000000-M THERMOPLAST IC PAVEMENT MARKINGLINES (100MM, 2.3MM)	25,786.000 M	1.93000		49,766.98	
0247 AA1	4686000000-M THERMOPLAST IC PAVEMENT MARKINGLINES (100MM, 3.1MM)	14,060.000 M	2.26000		31,775.60	
0248 AA1	4695000000-M THERMOPLAST IC PAVEMENT MARKINGLINES (200MM, 2.3MM)	2,209.000 M	3.28000		7,245.52	

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Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0249 AA1	4700000000-M THERMOPLASTIC PAVEMENT MARKINGLINES (300MM, 2.3MM)	703.000 M	4.92000		3,458.76	
0250 AA1	4725000000-M THERMOPLASTIC PAVEMENT MARKINGSYMBOL (2.3MM)	162.000 EA	95.00000		15,390.00	
0251 AA1	4770000000-M COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (100MM) (IV)	644.000 M	6.11000		3,934.84	
0252 AA2	0022000000-M UNCLASSIFIED EXCAVATION	400,000.000 M3				
0253 AA2	1044000000-M LIME TREATED SOIL (SLURRY METHOD)	48,120.000 M2				
0254 AA2	1066000000-M LIME FOR LIME TREATED SOIL	530.000 MTN				
0255 AA2	1121000000-M AGGREGATE BASE COURSE	5,017.000 MTN				
0256 AA2	1176000000-M SOIL CEMENT BASE	48,120.000 M2				
0257 AA2	1187000000-M PORTLAND CEMENT FOR SOIL CE- MENT BASE	1,444.000 MTN				
0258 AA2	1198000000-M AGGREGATE FOR SOIL CEMENT BASE	730.000 MTN				
0259 AA2	1209000000-M ASPHALT CURING SEAL	65,450.000 L				

Contract ID: C202960 Project(s): HPP-0501(25)
Letting Date: 04-16-13 Call Order: 002
Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0260 AA2	1489000000-M ASPHALT CONC BASE COURSE, TYPE B25.0B	17,700.000 MTN				
0261 AA2	1498000000-M ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	11,800.000 MTN				
0262 AA2	1519000000-M ASPHALT CONC SURFACE COURSE, TYPE S9.5B	13,670.000 MTN				
0263 AA2	1525000000-M ASPHALT CONC SURFACE COURSE, TYPE SF9.5A	6,790.000 MTN				
0264 AA2	1575000000-M ASPHALT BINDER FOR PLANT MIX	2,980.000 MTN				
0265 AA2	1682000000-M PERMEABLE ASPHALT DRAINAGE COURSE, TYPE P-57	14,030.000 MTN				
0266 AA2	1847000000-M ****MM PORT CEM CONC PAVEMENT,THROUGH LANES (WITH DOWELS) (200MM)	80,945.000 M2				
0267 AA2	1902000000-N SURFACE TESTING CONCRETE PAVE-MENT	LUMP	LUMP			
0268 AA2	1913000000-M CONCRETE SHOULDERS ADJACENT TO*****MM PAVEMENT (200MM)	14,615.000 M2				
0269 AA2	1914000000-M CONCRETE SHOULDERS ADJACENT TO*****MM PAVEMENT (WITH DOWELS) (200MM)	5,570.000 M2				
0270 AA2	1924000000-N FIELD LABORATORY RENTAL, PORT CEM CONC PAVEMENT	LUMP	LUMP			

Contract ID: C202960 Project(s): HPP-0501(25)
Letting Date: 04-16-13 Call Order: 002
Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0271 AA2	2099000000-M SHOULDER DRAIN	8,820.000 M				
0272 AA2	2110000000-M 100MM SHOULDER DRAIN PIPE	8,820.000 M				
0273 AA2	2121000000-M 100MM OUTLET PIPE (SHOULDER DRAINS)	300.000 M				
0274 AA2	2132000000-N CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET	50.000 EA				
0275 AA2	4685000000-M THERMOPLAST IC PAVEMENT MARKINGLINES (100MM, 2.3MM)	7,131.000 M				
0276 AA2	4686000000-M THERMOPLAST IC PAVEMENT MARKINGLINES (100MM, 3.1MM)	11,591.000 M				
0277 AA2	4695000000-M THERMOPLAST IC PAVEMENT MARKINGLINES (200MM, 2.3MM)	463.000 M				
0278 AA2	4700000000-M THERMOPLAST IC PAVEMENT MARKINGLINES (300MM, 2.3MM)	239.000 M				
0279 AA2	4725000000-M THERMOPLAST IC PAVEMENT MARKINGSYMBOL (2.3MM)	115.000 EA				
0280 AA2	4780000000-M COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (200MM) (II)	39.000 M				
0281 AA2	4785000000-M COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (300MM) (II)	464.000 M				

Contract ID: C202960 Project(s): HPP-0501(25)
Letting Date: 04-16-13 Call Order: 002
Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0282 AA2	4805000000-N COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (II)	47.000 EA				
0283 AA2	4847000000-M POLYUREA PAVEMENT MARKING LINES (100MM, **********) (HIGHLY REFLECTIVE ELEMENTS)	21,124.000 M				
0284 AA2	4847110000-M POLYUREA PAVEMENT MARKING LINES (200MM, **********) (HIGHLY REFLECTIVE ELEMENTS)	1,707.000 M				
	Section 0001 Total				20,787,798.18	

Section 0002 CULVERT ITEMS

Alt Group

0285	8126000000-N CULVERT EXCAVATION, STA ****** (13+43.400-L-)	LUMP	LUMP		38,000.00	
0286	8126000000-N CULVERT EXCAVATION, STA ****** (20+86.000-L-)	LUMP	LUMP		35,000.00	
0287	8126000000-N CULVERT EXCAVATION, STA ****** (35+56.000-L-)	LUMP	LUMP		40,000.00	
0288	8133000000-M FOUNDATION CONDITIONING MATER-IAL, BOX CULVERT	1,016.000 MTN	55.00000		55,880.00	
0289	8196000000-M CLASS A CONCRETE (CULVERT)	1,016.200 M3	528.00000		536,553.60	
0290	8245000000-M REINFORCING STEEL (CULVERT)	100,768.000 KG	2.20000		221,689.60	

Contract ID: C202960 Project(s): HPP-0501(25)
Letting Date: 04-16-13 Call Order: 002
Bidder: 3123 - PLT Construction Company, Inc.

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
	Section 0002 Total				927,123.20	
	Bid Total				21,714,921.38	

NON-COLLUSION AND DEBARMENT CERTIFICATION

The bidder certifies that neither he, nor any official, agent or employee of the bidder has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with this bid, and that the bidder intends to do the work with its own bonafide employees or subcontractors and is not bidding for the benefit of another contractor. In addition, submitting this electronic bid constitutes the bidder's certification of Status under penalty of perjury under the laws of the United States and in accordance with the Debarment Certification on file with the Department.

By submitting this bid, the bidder certifies to the best of his knowledge and belief that he and his principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records; making false statements; or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph b. of this certification; and

d. Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

Where the prospective bidder is unable to certify to any of the statements in this certification, the bidder shall submit an explanation in the blanks provided herein. The explanation will not necessarily result in denial of participation in a contract.

Explanation:
NOT ANSWERED
NOT ANSWERED
NOT ANSWERED
NOT ANSWERED

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 to the Contract Office prior to submitting the bid.

Failure to furnish a certification or an explanation will be grounds for rejection of a bid

AWARD LIMITS ON MULTIPLE PROJECTS

By answering YES to this statement, the bidder acknowleges that they are using the award limits on multiple projects. No

A bidder who desires to bid on more than one project on which bids are to be opened on the same date, and who also desires to avoid receiving an award of more projects than he is equipped to handle, may bid on any number of projects but may limit the total amount of work awarded to him on selected projects by completing the AWARD LIMITS ON MULTIPLE PROJECTS.

The Award Limits on Multiple Projects must be filled in on each project bid for which the Bidder desires protection.

It is the desire of the Bidder to be awarded contracts, the value of which

will not exceed a total of NOT ANSWERED for those

projects indicated herein, for which bids will be opened on (MM/DD/YY)

The Award Limits shall apply to the following projects:

Contract Number	County
NOT ANSWERED	
NOT ANSWERED	
NOT ANSWERED	
NOT ANSWERED	
NOT ANSWERED	
NOT ANSWERED	

It is agreed that if I am (we are) the low Bidder(s) on indicated projects, the total value of which is more than the above stipulated award limits, the Board of Transportation will award me (us) projects from among those indicated that have a total value not to exceed the award limit and will result in the lowest total bids to the Department of Transportation.

PROPOSAL: C202960
LETTING: L130416 CALL: 002
VENDOR: 3123 PLT Construction Company, Inc.

LINE NO.	ITEM NO.	ITEM DESC.	UNIT TYPE	SUBCONTRACTOR QUANTITY	SUBCONTRACTOR UNIT PRICE	EXTENDED AMOUNT
DBE SUBCONTRACTOR: 12702 NEHRENZ ENTERPRISES						
Will Use Quote: Yes						
0008	0080000000-M	CLASS IV SUB	MTN	196.341	20.50000	4025.00
0013	0195000000-M	SELECT GRANU	M3	6707.744	19.50000	130801.00
0018	0318000000-M	FND CONDIT M	MTN	611.702	21.15000	12937.50
0048	1077000000-M	#57 STONE	MTN	10.615	32.50000	345.00
0049	1110000000-M	STABILIZER A	MTN	108.491	26.50000	2875.00
0050	1220000000-M	INCIDENTAL S	MTN	560.976	20.50000	11500.00
0100	3628000000-M	RIP RAP, CLA	MTN	5.269	59.50000	313.50
0101	3635000000-M	RIP RAP, CLA	MTN	60.714	68.25000	4143.75
0102	3649000000-M	RIP RAP, CLA	MTN	193.422	54.50000	10541.50
0176	6006000000-M	EROS CONTRL	MTN	1804.813	46.75000	84375.00
0177	6009000000-M	EROS CONTRL	MTN	997.706	54.50000	54375.00
0178	6012000000-M	SEDIMENT CON	MTN	1114.341	32.25000	35937.50
0233	1121000000-M	AGGREGATE BA	MTN	1201.552	21.75000	26133.75
0236	1198000000-M	AGGREGATE FO	MTN	270.801	12.74000	3450.00
0230	0022000000-M	UNCLASSIFIED	M3	10694.118	8.50000	90900.00
0051	1231000000-M	SHOULDER BOR	M3	3031.579	4.75000	14400.00
0011	0156000000-M	REMOVAL OF E	M2	1020.741	6.75000	6890.00
		DBE COMMITMENT TOTAL FOR SUBCONTRACTOR:				493,943.50 Committed
		DBE COMMITMENT TOTAL FOR VENDOR (SubContractor)				493,943
DBE SUBCONTRACTOR: 8666 L L & G SERVICES, INC.						
Will Use Quote: Yes						
0238	1489000000-M	ASP CONC BAS	MTN	1991.429	35.00000	69700.00
		DBE COMMITMENT TOTAL FOR SUBCONTRACTOR:				69,700.00 Committed
		DBE COMMITMENT TOTAL FOR VENDOR (SubContractor)				69,700.
DBE SUBCONTRACTOR: 10129 CONCRETE SPECIALTY CONTRACTORS INC.						
Will Use Quote: Yes						
0080	2440000000-N	CONC TRANS S	EA	3.000	995.00000	2985.00
0081	2535000000-M	*** X ***MM	M	350.000	45.23000	15830.50
0082	2549000000-M	750MM CONC C	M	3860.000	56.00000	216160.00
0083	2556000000-M	SHOULDER BER	M	521.000	48.10000	25060.10
0084	2577000000-M	CONC EXPRESS	M	70.000	80.45000	5631.50
0085	2612000000-M	150MM CONC D	M2	1000.000	46.62000	46620.00
0086	2619000000-M	100MM CONC P	M2	50.000	35.62000	1781.00
0087	2647000000-M	125MM MONOLI	M2	1760.000	43.62000	76771.20
		DBE COMMITMENT TOTAL FOR SUBCONTRACTOR:				390,839.30 Committed
		DBE COMMITMENT TOTAL FOR VENDOR (SubContractor)				390,839

LINE NO.	ITEM NO.	ITEM DESC.	UNIT TYPE	SUBCONTRACTOR QUANTITY	SUBCONTRACTOR UNIT PRICE	EXTENDED AMOUNT
DBE SUBCONTRACTOR: 4417 POZZOLANIC CONTRACTING & SUPPLY COMPANY, INC.						
Will Use Quote: Yes						
0231	1044000000-M	LIME TRTD SO	M2	39670.000	3.10000	122977.00
0232	1066000000-M	LIME FOR LIM	MTN	440.000	220.00000	96800.00
0234	1176000000-M	SOIL CEMENT	M2	39670.000	3.00000	119010.00
0235	1187000000-M	PC FOR SOIL	MTN	1191.000	140.00000	166740.00
0237	1209000000-M	ASPHALT CURI	L	53960.000	1.12000	60435.20
DBE COMMITMENT TOTAL FOR SUBCONTRACTOR:						565,962.20 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor)						565,962
DBE SUBCONTRACTOR: 4247 SEAL BROTHERS CONTRACTING LLC						
Will Use Quote: Yes						
0055	2000000000-N	RIGHT OF WAY	EA	225.000	130.00000	29250.00
0094	3503000000-M	WW WIRE FENC	M	11330.000	7.70000	87241.00
0095	3509000000-M	100MM FENCE	EA	2310.000	12.00000	27720.00
0096	3515000000-M	125MM FENCE	EA	650.000	18.00000	11700.00
0097	3533000000-M	CL FENCE ***	M	49.000	26.00000	1274.00
0098	3539000000-M	LINE POST FO	EA	14.000	65.00000	910.00
0099	3557000000-M	ADDITIONAL B	M	175.000	0.01000	1.75
DBE COMMITMENT TOTAL FOR SUBCONTRACTOR:						158,096.75 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor)						158,096
DBE SUBCONTRACTOR: 4898 BULLINGTON CONSTRUCTION INC						
Will Use Quote: Yes						
0088	3030000000-M	STL BM GUARD	M	1824.990	49.20000	89789.51
0089	3045000000-M	SBGR SHOP CU	M	19.050	52.48000	999.74
0090	3150000000-N	ADDIT GUARDR	EA	10.000	11.00000	110.00
0091	3210000000-N	GR ANCHOR TY	EA	13.000	425.00000	5525.00
0092	3270000000-N	GR ANCHOR TY	EA	19.000	1780.00000	33820.00
0093	3380000000-M	TEMP STL BM	M	140.970	26.24000	3699.05
DBE COMMITMENT TOTAL FOR SUBCONTRACTOR:						133,943.30 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor)						133,943
DBE SUBCONTRACTOR: 3080 CURTIN TRUCKING & DRAINAGE, INC.						
Will Use Quote: Yes						
0125	4465000000-N	TEMPORARY CR	EA	9.000	5500.00000	49500.00
0126	4470000000-N	RESET CRASH	EA	3.000	2000.00000	6000.00
0128	4485000000-M	PORT CONC BA	M	143.000	69.00000	9867.00
0129	4490000000-M	PORT CONC BA	M	594.000	102.00000	60588.00
0130	4505000000-M	RESET PORT C	M	110.000	49.00000	5390.00
0242	2099000000-M	SHOULDER DRA	M	5120.000	15.75000	80640.00
0243	2110000000-M	100MM SHLDR	M	5120.000	4.90000	25088.00
0244	2121000000-M	100MM OUTLET	M	210.000	32.80000	6888.00
0245	2132000000-N	CONC PAD SHL	EA	30.000	250.00000	7500.00

LINE NO.	ITEM NO.	ITEM DESC.	UNIT TYPE	SUBCONTRACTOR QUANTITY	SUBCONTRACTOR UNIT PRICE	EXTENDED AMOUNT
						251,461.00

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 251,461.00 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 251,461

DBE SUBCONTRACTOR: 12278 CLIFTON CONSTRUCTION CO., INC.
Will Use Quote: Yes

0056	2022000000-M	SUBDRAIN EXC	M3	2070.000	29.00000	60030.00
0057	2033000000-M	SUBDRAIN FIN	M3	1035.000	60.00000	62100.00
0058	2044000000-M	150MM PERF S	M	2500.000	12.50000	31250.00
0059	2070000000-N	SUBDRN PIPE	EA	17.000	350.00000	5950.00
0060	2077000000-M	150MM OUTLET	M	34.000	40.00000	1360.00

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 160,690.00 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 160,690

DBE SUBCONTRACTOR: 4761 TRAFFIC CONTROL SAFETY SERVICES, INC.
Will Use Quote: Yes

0105	4054000000-M	PLN CL A CON	M3	1.000	1.00000	1.00
0106	4060000000-M	SUPPORT, BRE	KG	250.000	18.00000	4500.00
0107	4072000000-M	SUPPORT, 4.5	M	919.000	16.50000	15163.50
0108	4096000000-N	SIGN ERECTIO	EA	8.000	95.00000	760.00
0109	4102000000-N	SIGN ERECTIO	EA	117.000	50.00000	5850.00
0110	4108000000-N	SIGN ERECTIO	EA	37.000	95.00000	3515.00
0111	4110000000-N	SIGN ERECTIO	EA	2.000	285.00000	570.00
0112	4116100000-N	SIGN ERECT,	EA	3.000	125.00000	375.00
0113	4116100000-N	SIGN ERECT,	EA	9.000	65.00000	585.00
0114	4155000000-N	DISPOSE SIGN	EA	101.000	1.00000	101.00
0115	4192000000-N	DISPOSE SUPP	EA	7.000	1.00000	7.00
0116	4400000000-M	WORK ZONE SI	M2	314.000	49.00000	15386.00
0118	4410000000-M	WORK ZONE SI	M2	46.246	122.00000	5642.00
0121	4422000000-N	CHANGEABLE M	DAY	61.765	85.00000	5250.00
0123	4445000000-M	BARRICADES (	M	188.571	105.00000	19800.00
0143	4915000000-M	2.1M U-CHANN	EA	8.000	50.00000	400.00
0144	4955000000-N	OBJECT MARKE	EA	8.000	40.00000	320.00

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 78,225.50 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 78,225.

DBE SUBCONTRACTOR: 4761 TRAFFIC CONTROL SAFETY SERVICES, INC.
Will Use Quote: Yes

0117	4405000000-M	WORK ZONE SI	M2	19.723	433.00000	8540.00
0119	4415000000-N	FLASHING ARR	EA	1.591	7449.75000	11850.00
0120	4420000000-N	CHANGEABLE M	EA	1.477	19635.00000	29000.00
0122	4430000000-N	DRUMS	EA	227.842	79.25000	18056.50
0131	4516000000-N	SKINNY DRUM	EA	50.000	55.00000	2750.00

LINE NO.	ITEM NO.	ITEM DESC.	UNIT TYPE	SUBCONTRACTOR QUANTITY	SUBCONTRACTOR UNIT PRICE	EXTENDED AMOUNT

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 70,196.50 Committed
DBE COMMITMENT TOTAL FOR VENDOR (Supplier) $42,117

DBE SUBCONTRACTOR: 12418 LEVEL CROSS SURVEYING PLLC
Will Use Quote: Yes

0002	0000400000-N	CONSTRUCTION	LS	0.800	153375.00000	122700.00

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 122,700.00 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 122,700

TOTAL DBE COMMITMENT FOR VENDOR: Entered: 11.36% or 2467679.45
Required: 12.00% or 2605790.57
<GOAL NOT MET>

Contract Item Sheets For C202960

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
			ROADWAY ITEMS			
0001	0000100000-N	800	MOBILIZATION	Lump Sum LS	1,079,886.00	1,079,886.00
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum LS	270,544.50	270,544.50
0003	0001000000-M	200	CLEARING & GRUBBING .. HECTARE(S)	Lump Sum LS	350,000.00	350,000.00
0004	0008000000-M	200	SUPPLEMENTARY CLEARING & GRUBBING	1.2 HA	13,600.00	16,320.00
0005	0015000000-N	205	SEALING ABANDONED WELLS	4 EA	1,617.00	6,468.00
0006	0036000000-M	225	UNDERCUT EXCAVATION	22,000 M3	5.00	110,000.00
0007	0038000000-M	SP	SHALLOW UNDERCUT	300 M3	11.75	3,525.00
0008	0080000000-M	SP	CLASS IV SUBGRADE STABILIZATION	700 MTN	20.50	14,350.00
0009	0134000000-M	240	DRAINAGE DITCH EXCAVATION	2,240 M3	4.00	8,960.00
0010	0141000000-M	240	BERM DITCH CONSTRUCTION	750 M	7.00	5,250.00
0011	0156000000-M	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	6,380 M2	6.75	43,065.00
0012	0192000000-N	260	PROOF ROLLING	40 HR	231.00	9,240.00
0013	0195000000-M	SP	SELECT GRANULAR MATERIAL	29,500 M3	19.50	575,250.00
0014	0196000000-M	270	FABRIC FOR SOIL STABILIZATION	31,000 M2	1.75	54,250.00
0015	0199000000-M	SP	TEMPORARY SHORING	233.2 M2	950.00	221,540.00
0016	0241000000-M	SP	GENERIC GRADING ITEM GEOTEXTILE FOR PAVEMENT STABILIZATION	16,500 M2	2.35	38,775.00
0017	0255000000-M	SP	GENERIC GRADING ITEM EXCAVATION, HAULING & DISPOSAL OF CONTAMINATED SOIL	2,500 MTN	50.00	125,000.00
0018	0318000000-M	SP	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	2,250 MTN	21.15	47,587.50
0019	0320000000-M	SP	FOUNDATION CONDITIONING FABRIC	6,770 M2	2.35	15,909.50

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0020	0335000000-M	SP	***MM DRAINAGE PIPE (200MM)	31.2 M	50.00	1,560.00
0021	0335200000-M	SP	375MM DRAINAGE PIPE	2,202 M	63.00	138,726.00
0022	0335300000-M	SP	450MM DRAINAGE PIPE	676.8 M	75.00	50,760.00
0023	0335400000-M	SP	600MM DRAINAGE PIPE	685.2 M	100.00	68,520.00
0024	0335500000-M	SP	750MM DRAINAGE PIPE	373.2 M	128.00	47,769.60
0025	0335600000-M	SP	900MM DRAINAGE PIPE	229.2 M	165.00	37,818.00
0026	0335700000-M	SP	1050MM DRAINAGE PIPE	54 M	200.00	10,800.00
0027	0335800000-M	SP	1200MM DRAINAGE PIPE	132 M	255.00	33,660.00
0028	0335850000-M	SP	****MM DRAINAGE PIPE ELBOWS (375MM)	7 EA	185.00	1,295.00
0029	0335850000-M	SP	****MM DRAINAGE PIPE ELBOWS (450MM)	6 EA	225.00	1,350.00
0030	0343000000-M	SP	375MM SIDE DRAIN PIPE	268.8 M	63.00	16,934.40
0031	0344000000-M	SP	450MM SIDE DRAIN PIPE	14.4 M	75.00	1,080.00
0032	0345000000-M	SP	600MM SIDE DRAIN PIPE	8.4 M	100.00	840.00
0033	0354000000-M	SP	****MM RC PIPE CULVERTS, CLASS ***** (375MM, V)	20.4 M	78.00	1,591.20
0034	0366000000-M	SP	375MM RC PIPE CULVERTS, CLASS III	115.2 M	63.00	7,257.60
0035	0384000000-M	SP	750MM RC PIPE CULVERTS, CLASS III	36 M	128.00	4,608.00
0036	0408000000-M	SP	1350MM RC PIPE CULVERTS, CLASS III	121.2 M	420.00	50,904.00
0037	0448000000-M	SP	****MM RC PIPE CULVERTS, CLASS IV (1500MM)	79.2 M	655.00	51,876.00

Contract Item Sheets For C202960

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0038	0448200000-M	SP	375MM RC PIPE CULVERTS, CLASS IV	1,027.2 M	66.50	68,308.80
0039	0448300000-M	SP	450MM RC PIPE CULVERTS, CLASS IV	462 M	81.00	37,422.00
0040	0448400000-M	SP	600MM RC PIPE CULVERTS, CLASS IV	260.4 M	107.00	27,862.80
0041	0448500000-M	SP	750MM RC PIPE CULVERTS, CLASS IV	45.6 M	138.00	6,292.80
0042	0448600000-M	SP	900MM RC PIPE CULVERTS, CLASS IV	126 M	180.00	22,680.00
0043	0974000000-M	SP	****MM WELDED STEEL PIPE, ****MM THICK, GRADE B (UNDER RR) (600MM, 12MM)	13.2 M	950.00	12,540.00
0044	0986000000-M	SP	GENERIC PIPE ITEM 375MM DUCTILE IRON PIPE	135.6 M	220.00	29,832.00
0045	0992000000-M	SP	GENERIC PIPE ITEM ENERGY DISSIPATOR BASIN	2 EA	8,422.00	16,844.00
0046	0995000000-M	340	PIPE REMOVAL	869.6 M	33.00	28,696.80
0047	1011000000-N	500	FINE GRADING	Lump Sum LS	304,297.00	304,297.00
0048	1077000000-M	SP	#57 STONE	60 MTN	32.50	1,950.00
0049	1110000000-M	510	STABILIZER AGGREGATE	500 MTN	26.50	13,250.00
0050	1220000000-M	545	INCIDENTAL STONE BASE	2,000 MTN	20.50	41,000.00
0051	1231000000-M	560	SHOULDER BORROW	9,230 M3	4.75	43,842.50
0052	1275000000-M	600	PRIME COAT	15,531 L	1.10	17,084.10
0053	1330000000-M	607	INCIDENTAL MILLING	980 M2	7.00	6,860.00
0054	1693000000-M	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	100 MTN	129.00	12,900.00
0055	2000000000-N	806	RIGHT OF WAY MARKERS	225 EA	130.00	29,250.00

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0056	2022000000-M	SP	SUBDRAIN EXCAVATION	2,070 M3	29.00	60,030.00
0057	2033000000-M	SP	SUBDRAIN FINE AGGREGATE	1,035 M3	60.00	62,100.00
0058	2044000000-M	SP	150MM PERFORATED SUBDRAIN PIPE	2,500 M	12.50	31,250.00
0059	2070000000-N	SP	SUBDRAIN PIPE OUTLETS	17 EA	350.00	5,950.00
0060	2077000000-M	SP	150MM OUTLET PIPE (SUBDRAINS)	34 M	40.00	1,360.00
0061	2143000000-M	818	BLOTTING SAND	10 MTN	35.00	350.00
0062	2209000000-M	838	ENDWALLS	40.6 M3	700.00	28,420.00
0063	2220000000-M	838	REINFORCED ENDWALLS	26.7 M3	800.00	21,360.00
0064	2253000000-M	840	PIPE COLLARS	0.29 M3	900.00	261.00
0065	2264000000-M	840	PIPE PLUGS	0.22 M3	900.00	198.00
0066	2275000000-M	SP	FLOWABLE FILL	23 M3	225.00	5,175.00
0067	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	195 EA	1,285.00	250,575.00
0068	2297000000-M	840	MASONRY DRAINAGE STRUCTURES	3.1 M3	1,300.00	4,030.00
0069	2308000000-M	840	MASONRY DRAINAGE STRUCTURES	15.97 M	600.00	9,582.00
0070	2354200000-N	840	FRAME WITH GRATE, STD 840.24	1 EA	290.00	290.00
0071	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	10 EA	475.00	4,750.00
0072	2364200000-N	840	FRAME WITH TWO GRATES, STD 840.20	10 EA	450.00	4,500.00
0073	2365000000-N	840	FRAME WITH TWO GRATES, STD 840.22	81 EA	440.00	35,640.00
0074	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	16 EA	450.00	7,200.00
0075	2367000000-N	840	FRAME WITH TWO GRATES, STD 840.29	10 EA	460.00	4,600.00

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0076	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	6 EA	540.00	3,240.00
0077	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	32 EA	540.00	17,280.00
0078	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	25 EA	540.00	13,500.00
0079	2396000000-N	840	FRAME WITH COVER, STD 840.54	3 EA	355.00	1,065.00
0080	2440000000-N	852	CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN	3 EA	995.00	2,985.00
0081	2535000000-M	846	*** X ***MM CONCRETE CURB (200MM X 450MM)	350 M	45.23	15,830.50
0082	2549000000-M	846	750MM CONCRETE CURB & GUTTER	3,860 M	56.00	216,160.00
0083	2556000000-M	846	SHOULDER BERM GUTTER	521 M	48.10	25,060.10
0084	2577000000-M	846	CONCRETE EXPRESSWAY GUTTER	70 M	80.45	5,631.50
0085	2612000000-M	848	150MM CONCRETE DRIVEWAY	1,000 M2	46.62	46,620.00
0086	2619000000-M	850	100MM CONCRETE PAVED DITCH	50 M2	35.62	1,781.00
0087	2647000000-M	852	125MM MONOLITHIC CONCRETE IS-LANDS (SURFACE MOUNTED)	1,760 M2	43.62	76,771.20
0088	3030000000-M	862	STEEL BM GUARDRAIL	1,824.99 M	49.20	89,789.51
0089	3045000000-M	862	STEEL BM GUARDRAIL, SHOP CURVED	19.05 M	52.48	999.74
0090	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	10 EA	11.00	110.00
0091	3210000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	13 EA	425.00	5,525.00
0092	3270000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350	19 EA	1,780.00	33,820.00
0093	3380000000-M	862	TEMPORARY STEEL BM GUARDRAIL	140.97 M	26.24	3,699.05

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Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0094	3503000000-M	866	WOVEN WIRE FENCE, 1200MM FAB-RIC	11,330 M	7.70	87,241.00
0095	3509000000-M	866	100MM TIMBER FENCE POSTS, 2.30M LONG	2,310 EA	12.00	27,720.00
0096	3515000000-M	866	125MM TIMBER FENCE POSTS, 2.50M LONG	650 EA	18.00	11,700.00
0097	3533000000-M	866	CHAIN LINK FENCE, ****MM FABRIC (1800MM)	49 M	26.00	1,274.00
0098	3539000000-M	866	METAL LINE POSTS FOR ****MM CHAIN LINK FENCE (1800MM)	14 EA	65.00	910.00
0099	3557000000-M	866	ADDITIONAL BARBED WIRE	175 M	0.01	1.75
0100	3628000000-M	876	RIP RAP, CLASS I	38 MTN	59.50	2,261.00
0101	3635000000-M	876	RIP RAP, CLASS II	425 MTN	68.25	29,006.25
0102	3649000000-M	876	RIP RAP, CLASS B	1,454 MTN	54.50	79,243.00
0103	3656000000-M	876	FILTER FABRIC FOR DRAINAGE	13,385 M2	3.50	46,847.50
0104	3659000000-N	SP	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	7 EA	656.00	4,592.00
0105	4054000000-M	902	PLAIN CONCRETE SIGN FOUNDA-TIONS	1 M3	1.00	1.00
0106	4060000000-M	903	SUPPORTS, BREAKAWAY STEEL BEAM	250 KG	18.00	4,500.00
0107	4072000000-M	903	SUPPORTS, 4.5-KG STEEL U-CHANN EL	919 M	16.50	15,163.50
0108	4096000000-N	904	SIGN ERECTION, TYPE D	8 EA	95.00	760.00
0109	4102000000-N	904	SIGN ERECTION, TYPE E	117 EA	50.00	5,850.00
0110	4108000000-N	904	SIGN ERECTION, TYPE F	37 EA	95.00	3,515.00
0111	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)	2 EA	285.00	570.00

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Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0112	4116100000-N	904	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (D)	3 EA	125.00	375.00
0113	4116100000-N	904	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)	9 EA	65.00	585.00
0114	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	101 EA	1.00	101.00
0115	4192000000-N	907	DISPOSAL OF SUPPORT, U-CHANNEL	7 EA	1.00	7.00
0116	4400000000-M	1110	WORK ZONE SIGNS (STATIONARY)	314 M2	49.00	15,386.00
0117	4405000000-M	1110	WORK ZONE SIGNS (PORTABLE)	122 M2	433.00	52,826.00
0118	4410000000-M	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	91 M2	122.00	11,102.00
0119	4415000000-N	1115	FLASHING ARROW PANELS, TYPE C	3 EA	7,449.75	22,349.25
0120	4420000000-N	1120	CHANGEABLE MESSAGE SIGN	2 EA	19,635.00	39,270.00
0121	4422000000-N	1120	CHANGEABLE MESSAGE SIGN (SHORT TERM)	150 DAY	85.00	12,750.00
0122	4430000000-N	1130	DRUMS	469 EA	79.25	37,168.25
0123	4445000000-M	1145	BARRICADES (TYPE III)	264 M	105.00	27,720.00
0124	4450000000-N	1150	FLAGGER	4,800 HR	18.50	88,800.00
0125	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	9 EA	5,500.00	49,500.00
0126	4470000000-N	1160	RESET TEMPORARY CRASH CUSHIONS	3 EA	2,000.00	6,000.00
0127	4480000000-N	1165	TMIA	3 EA	2,500.00	7,500.00
0128	4485000000-M	1170	PORTABLE CONCRETE BARRIER	143 M	69.00	9,867.00
0129	4490000000-M	1170	PORTABLE CONCRETE BARRIER (ANCHORED)	594 M	102.00	60,588.00
0130	4505000000-M	1170	RESET PORTABLE CONCRETE BARRIER (ANCHORED)	110 M	49.00	5,390.00

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Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0131	4516000000-N	1180	SKINNY DRUM	100 EA	55.00	5,500.00
0132	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	881 EA	4.00	3,524.00
0133	4705000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (400MM, 3.1MM)	79 M	19.69	1,555.51
0134	4710000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (600MM, 3.1MM)	328 M	26.25	8,610.00
0135	4721000000-M	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (3.1MM)	12 EA	100.00	1,200.00
0136	4810000000-M	1205	PAINT PAVEMENT MARKING LINES (100MM)	74,089 M	0.43	31,858.27
0137	4830000000-M	1205	PAINT PAVEMENT MARKING LINES (400MM)	62 M	6.56	406.72
0138	4835000000-M	1205	PAINT PAVEMENT MARKING LINES (600MM)	392 M	9.84	3,857.28
0139	4840000000-N	1205	PAINT PAVEMENT MARKING CHARAC-TER	10 EA	50.00	500.00
0140	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	82 EA	35.00	2,870.00
0141	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	5 EA	35.00	175.00
0142	4905000000-N	1253	SNOWPLOWABLE PAVEMENT MARKERS	1,491 EA	25.00	37,275.00
0143	4915000000-M	1264	2.1M U-CHANNEL POSTS	8 EA	50.00	400.00
0144	4955000000-N	1264	OBJECT MARKERS (END OF ROAD)	8 EA	40.00	320.00
0145	5325600000-M	1510	150MM WATER LINE	163 M	155.00	25,265.00
0146	5325800000-M	1510	200MM WATER LINE	465 M	175.00	81,375.00
0147	5326200000-M	1510	300MM WATER LINE	275 M	225.00	61,875.00
0148	5540000000-M	1515	150MM VALVE	7 EA	800.00	5,600.00
0149	5546000000-M	1515	200MM VALVE	11 EA	1,050.00	11,550.00

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Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0150	5558000000-M	1515	300MM VALVE	3 EA	2,000.00	6,000.00
0151	5572200000-M	1515	300MM TAPPING VALVE	1 EA	6,000.00	6,000.00
0152	5648000000-N	1515	RELOCATE WATER METER	23 EA	1,000.00	23,000.00
0153	5649000000-N	1515	RECONNECT WATER METER	1 EA	875.00	875.00
0154	5672000000-N	1515	RELOCATE FIRE HYDRANT	4 EA	3,000.00	12,000.00
0155	5691200000-M	1520	150MM SANITARY GRAVITY SEWER	12 M	80.00	960.00
0156	5691300000-M	1520	200MM SANITARY GRAVITY SEWER	333 M	120.00	39,960.00
0157	5691400000-M	1520	250MM SANITARY GRAVITY SEWER	67 M	175.00	11,725.00
0158	5691600000-M	1520	400MM SANITARY GRAVITY SEWER	75.8 M	275.00	20,845.00
0159	5768000000-N	1520	SANITARY SEWER CLEAN-OUT	6 EA	1,200.00	7,200.00
0160	5775000000-M	1525	1200MM DIA UTILITY MANHOLE	5 EA	1,900.00	9,500.00
0161	5776000000-M	1525	1500MM DIA UTILITY MANHOLE	5 EA	2,400.00	12,000.00
0162	5781000000-M	1525	UTILITY MANHOLE WALL, 1200MM DIA	7.6 M	656.00	4,985.60
0163	5782000000-M	1525	UTILITY MANHOLE WALL, 1500MM DIA	18.6 M	820.00	15,252.00
0164	5798000000-M	1530	ABANDON ***MM UTILITY PIPE (375MM)	71 M	35.00	2,485.00
0165	5801000000-M	1530	ABANDON 200MM UTILITY PIPE	406 M	13.00	5,278.00
0166	5802000000-M	1530	ABANDON 250MM UTILITY PIPE	29 M	17.00	493.00
0167	5804000000-M	1530	ABANDON 300MM UTILITY PIPE	146 M	22.00	3,212.00
0168	5816000000-N	1530	ABANDON UTILITY MANHOLE	2 EA	1,000.00	2,000.00
0169	5836000000-M	1540	600MM ENCASEMENT PIPE	12 M	300.00	3,600.00

Contract Item Sheets For C202960

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0170	5836200000-M	1540	750MM ENCASEMENT PIPE	16 M	430.00	6,880.00
0171	5872200000-M	1550	TRENCHLESS INSTALLATION OF 600MM IN SOIL	6 M	550.00	3,300.00
0172	5872210000-M	1550	TRENCHLESS INSTALLATION OF 600MM NOT IN SOIL	6 M	2,299.00	13,794.00
0173	5872300000-M	1550	TRENCHLESS INSTALLATION OF 750MM IN SOIL	8 M	660.00	5,280.00
0174	5872310000-M	1550	TRENCHLESS INSTALLATION OF 750MM NOT IN SOIL	8 M	2,949.00	23,592.00
0175	6000000000-M	1605	TEMPORARY SILT FENCE	14,000 M	5.40	75,600.00
0176	6006000000-M	1610	STONE FOR EROSION CONTROL, CLASS A	12,500 MTN	46.75	584,375.00
0177	6009000000-M	1610	STONE FOR EROSION CONTROL, CLASS B	7,500 MTN	54.50	408,750.00
0178	6012000000-M	1610	SEDIMENT CONTROL STONE	6,250 MTN	32.25	201,562.50
0179	6015000000-M	1615	TEMPORARY MULCHING	60 HA	995.00	59,700.00
0180	6018000000-M	1620	SEED FOR TEMPORARY SEEDING	2,425 KG	6.50	15,762.50
0181	6021000000-M	1620	FERTILIZER FOR TEMPORARY SEED-ING	20.25 MTN	725.00	14,681.25
0182	6024000000-M	1622	TEMPORARY SLOPE DRAINS	1,500 M	50.50	75,750.00
0183	6027000000-N	1622	INLET PROTECTION AT TEMPORARY SLOPE DRAINS	67 EA	214.00	14,338.00
0184	6029000000-M	SP	SAFETY FENCE	50 M	5.00	250.00
0185	6030000000-M	1630	SILT EXCAVATION	42,500 M3	2.75	116,875.00
0186	6036000000-M	1631	MATTING FOR EROSION CONTROL	180,000 M2	1.39	250,200.00
0187	6037000000-M	SP	COIR FIBER MAT	1,100 M2	4.25	4,675.00
0188	6038000000-M	SP	PERMANENT SOIL REINFORCEMENT MAT	3,500 M2	5.45	19,075.00

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0189	6042000000-M	1632	6.4MM HARDWARE CLOTH	3,250 M	9.00	29,250.00
0190	6046000000-M	SP	TEMPORARY PIPE FOR STREAM CROSSING	50 M	40.00	2,000.00
0191	6069000000-M	1638	STILLING BASINS	40 M3	70.00	2,800.00
0192	6071012000-M	SP	COIR FIBER WATTLE	2,100 M	23.00	48,300.00
0193	6071020000-M	SP	POLYACRYLAMIDE (PAM)	2,200 KG	11.00	24,200.00
0194	6071030000-M	SP	COIR FIBER BAFFLE	4,000 M	13.00	52,000.00
0195	6071050000-M	SP	***MM SKIMMER (38MM)	86 EA	920.00	79,120.00
0196	6084000000-M	1660	SEEDING & MULCHING	40 HA	6,871.83	274,873.20
0197	6087000000-M	1660	MOWING	20 HA	150.00	3,000.00
0198	6090000000-M	1661	SEED FOR REPAIR SEEDING	1,200 KG	21.00	25,200.00
0199	6093000000-M	1661	FERTILIZER FOR REPAIR SEEDING	4 MTN	1,150.00	4,600.00
0200	6096000000-M	1662	SEED FOR SUPPLEMENTAL SEEDING	1,000 KG	7.00	7,000.00
0201	6108000000-M	1665	FERTILIZER TOPDRESSING	59 MTN	880.00	51,920.00
0202	6111000000-M	SP	IMPERVIOUS DIKE	275 M	175.00	48,125.00
0203	6114500000-N	SP	SPECIALIZED HAND MOWING	55 MHR	35.00	1,925.00
0204	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	150 EA	75.00	11,250.00
0205	6120000000-M	SP	CULVERT DIVERSION CHANNEL	140 M3	70.00	9,800.00
0206	6123000000-M	1670	REFORESTATION	4 HA	1,900.00	7,600.00
0207	6126000000-M	SP	STREAMBANK REFORESTATION	0.1 HA	10,000.00	1,000.00
0208	7060000000-M	1705	SIGNAL CABLE	1,750 M	4.75	8,312.50

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0209	7120000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 3 SECTION)	30 EA	700.00	21,000.00
0210	7132000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 4 SECTION)	7 EA	850.00	5,950.00
0211	7144000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 5 SECTION)	6 EA	1,100.00	6,600.00
0212	7264000000-M	1710	MESSENGER CABLE (9.52MM)	550 M	8.50	4,675.00
0213	7288000000-M	1715	PAVED TRENCHING (**********) (1, 50MM)	20 M	37.00	740.00
0214	7300000000-M	1715	UNPAVED TRENCHING (**********) (1, 50MM)	550 M	16.50	9,075.00
0215	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	12 EA	400.00	4,800.00
0216	7360000000-N	1720	WOOD POLE	4 EA	850.00	3,400.00
0217	7372000000-N	1721	GUY ASSEMBLY	8 EA	375.00	3,000.00
0218	7408000000-M	1722	25MM RISER WITH WEATHERHEAD	3 EA	650.00	1,950.00
0219	7420000000-M	1722	50MM RISER WITH WEATHERHEAD	14 EA	600.00	8,400.00
0220	7444000000-M	1725	INDUCTIVE LOOP SAWCUT	1,540 M	18.00	27,720.00
0221	7456000000-M	1726	LEAD-IN CABLE (**********) (14-2)	4,330 M	3.00	12,990.00
0222	7576000000-N	SP	METAL STRAIN SIGNAL POLE	8 EA	5,250.00	42,000.00
0223	7613000000-N	SP	SOIL TEST	8 EA	900.00	7,200.00
0224	7614100000-M	SP	DRILLED PIER FOUNDATION	50 M3	700.00	35,000.00
0225	7636000000-N	1745	SIGN FOR SIGNALS	2 EA	225.00	450.00
0226	7684000000-N	1750	SIGNAL CABINET FOUNDATION	2 EA	700.00	1,400.00
0227	7756000000-N	1751	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)	2 EA	14,000.00	28,000.00

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0228	7780000000-N	1751	DETECTOR CARD (TYPE 2070L)	15 EA	150.00	2,250.00
0229	7990000000-M	SP	GENERIC SIGNAL ITEM UNPAVED TRENCHING FOR TEMPORARY LEAD IN	150 M	10.50	1,575.00
			******* BEGIN SCHEDULE AA ******* ******* (2 ALTERNATES) *******			
0230 AA1	0022000000-M	225	UNCLASSIFIED EXCAVATION	405,000 M3	8.50	3,442,500.00
0231 AA1	1044000000-M	501	LIME TREATED SOIL (SLURRY METHOD)	39,670 M2	3.10	122,977.00
0232 AA1	1066000000-M	501	LIME FOR LIME TREATED SOIL	440 MTN	220.00	96,800.00
0233 AA1	1121000000-M	520	AGGREGATE BASE COURSE	4,545 MTN	21.75	98,853.75
0234 AA1	1176000000-M	542	SOIL CEMENT BASE	39,670 M2	3.00	119,010.00
0235 AA1	1187000000-M	542	PORTLAND CEMENT FOR SOIL CEMENT BASE	1,191 MTN	140.00	166,740.00
0236 AA1	1198000000-M	SP	AGGREGATE FOR SOIL CEMENT BASE	600 MTN	12.74	7,644.00
0237 AA1	1209000000-M	543	ASPHALT CURING SEAL	53,960 L	1.12	60,435.20
0238 AA1	1489000000-M	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	47,510 MTN	35.00	1,662,850.00
0239 AA1	1498000000-M	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	31,580 MTN	34.50	1,089,510.00
0240 AA1	1519000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	32,000 MTN	39.10	1,251,200.00
0241 AA1	1575000000-M	SP	ASPHALT BINDER FOR PLANT MIX	5,530 MTN	550.00	3,041,500.00
0242 AA1	2099000000-M	816	SHOULDER DRAIN	5,120 M	15.75	80,640.00
0243 AA1	2110000000-M	816	100MM SHOULDER DRAIN PIPE	5,120 M	4.90	25,088.00
0244 AA1	2121000000-M	816	100MM OUTLET PIPE (SHOULDER DRAINS)	210 M	32.80	6,888.00

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0245 AA1	2132000000-N	816	CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET	30 EA	250.00	7,500.00
0246 AA1	4685000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 2.3MM)	25,786 M	1.93	49,766.98
0247 AA1	4686000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 3.1MM)	14,060 M	2.26	31,775.60
0248 AA1	4695000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM)	2,209 M	3.28	7,245.52
0249 AA1	4700000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (300MM, 2.3MM)	703 M	4.92	3,458.76
0250 AA1	4725000000-M	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM)	162 EA	95.00	15,390.00
0251 AA1	4770000000-M	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (100MM) (IV)	644 M	6.11	3,934.84
			*** OR ***			
0252 AA2	0022000000-M	225	UNCLASSIFIED EXCAVATION	400,000 M3		
0253 AA2	1044000000-M	501	LIME TREATED SOIL (SLURRY METHOD)	48,120 M2		
0254 AA2	1066000000-M	501	LIME FOR LIME TREATED SOIL	530 MTN		
0255 AA2	1121000000-M	520	AGGREGATE BASE COURSE	5,017 MTN		
0256 AA2	1176000000-M	542	SOIL CEMENT BASE	48,120 M2		
0257 AA2	1187000000-M	542	PORTLAND CEMENT FOR SOIL CE-MENT BASE	1,444 MTN		
0258 AA2	1198000000-M	SP	AGGREGATE FOR SOIL CEMENT BASE	730 MTN		
0259 AA2	1209000000-M	543	ASPHALT CURING SEAL	65,450 L		
0260 AA2	1489000000-M	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	17,700 MTN		
0261 AA2	1498000000-M	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	11,800 MTN		

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0262 AA2	1519000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	13,670 MTN		
0263 AA2	1525000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A	6,790 MTN		
0264 AA2	1575000000-M	SP	ASPHALT BINDER FOR PLANT MIX	2,980 MTN		
0265 AA2	1682000000-M	652	PERMEABLE ASPHALT DRAINAGE COURSE, TYPE P-57	14,030 MTN		
0266 AA2	1847000000-M	710	****MM PORT CEM CONC PAVEMENT, THROUGH LANES (WITH DOWELS) (200MM)	80,945 M2		
0267 AA2	1902000000-N	710	SURFACE TESTING CONCRETE PAVEMENT	Lump Sum LS		
0268 AA2	1913000000-M	720	CONCRETE SHOULDERS ADJACENT TO *****MM PAVEMENT (200MM)	14,615 M2		
0269 AA2	1914000000-M	SP	CONCRETE SHOULDERS ADJACENT TO *****MM PAVEMENT (WITH DOWELS) (200MM)	5,570 M2		
0270 AA2	1924000000-N	725	FIELD LABORATORY RENTAL, PORT CEM CONC PAVEMENT	Lump Sum LS		
0271 AA2	2099000000-M	816	SHOULDER DRAIN	8,820 M		
0272 AA2	2110000000-M	816	100MM SHOULDER DRAIN PIPE	8,820 M		
0273 AA2	2121000000-M	816	100MM OUTLET PIPE (SHOULDER DRAINS)	300 M		
0274 AA2	2132000000-N	816	CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET	50 EA		
0275 AA2	4685000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 2.3MM)	7,131 M		
0276 AA2	4686000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 3.1MM)	11,591 M		
0277 AA2	4695000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM)	463 M		

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0278 AA2	4700000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (300MM, 2.3MM)	239 M		
0279 AA2	4725000000-M	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM)	115 EA		
0280 AA2	4780000000-M	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (200MM) (II)	39 M		
0281 AA2	4785000000-M	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (300MM) (II)	464 M		
0282 AA2	4805000000-N	1205	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (II)	47 EA		
0283 AA2	4847000000-M	1205	POLYUREA PAVEMENT MARKING LINES (100MM, **********) (HIGHLY REFLECTIVE ELEMENTS)	21,124 M		
0284 AA2	4847110000-M	1205	POLYUREA PAVEMENT MARKING LINES (200MM, **********) (HIGHLY REFLECTIVE ELEMENTS)	1,707 M		

***** END SCHEDULE AA *****

Contract Item Sheets For C202960

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0285	8126000000-N	414	CULVERT EXCAVATION, STA ****** (13+43.400-L-)	Lump Sum LS	38,000.00	38,000.00
0286	8126000000-N	414	CULVERT EXCAVATION, STA ****** (20+86.000-L-)	Lump Sum LS	35,000.00	35,000.00
0287	8126000000-N	414	CULVERT EXCAVATION, STA ****** (35+56.000-L-)	Lump Sum LS	40,000.00	40,000.00
0288	8133000000-M	414	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	1,016 MTN	55.00	55,880.00
0289	8196000000-M	420	CLASS A CONCRETE (CULVERT)	1,016.2 M3	528.00	536,553.60
0290	8245000000-M	425	REINFORCING STEEL (CULVERT)	100,768 KG	2.20	221,689.60

TOTAL AMOUNT OF BID FOR ENTIRE PROJECT $21,714,921.38

Contract No. C202960

County Person

Rev. 5-19-11

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

CORPORATION

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

By submitting this Execution of Contract, Non-Collusion Affidavit and Debarment Certification, the Contractor is certifying his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

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

SIGNATURE OF CONTRACTOR

PLT Construction Co., Inc.

Full name of Corporation

5676 Thompson Chapel Church Wilson, NC 27896

Address as Prequalified

Attest Lisa Stancil

~~Secretary~~/Assistant Secretary

Select appropriate title

By Sim A. Wooten Jr

~~President~~/Vice President/~~Assistant Vice President~~

Select appropriate title

Lisa Stancil

Print or type Signer's name

Sim A. Wooten, Jr.

Print or type Signer's name

CORPORATE SEAL

AFFIDAVIT MUST BE NOTARIZED

Subscribed and sworn to before me this the

20th day of May 2013.

Tiffany A. High

Signature of Notary Public

of Wilson County

State of North Carolina

My Commission Expires: 4/4/15

NOTARY SEAL

TIFFANY A. HIGH
NOTARY PUBLIC
WILSON COUNTY, N.C.

Contract No. C202960
County Person

Rev. 5-19-11

DEBARMENT CERTIFICATION

Conditions for certification:

1. The prequalified bidder shall provide immediate written notice to the Department if at any time the bidder learns that his certification was erroneous when he submitted his debarment certification or explanation filed with the Department, or has become erroneous because of changed circumstances.

2. The terms *covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal,* and *voluntarily excluded,* as used in this provision, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. A copy of the Federal Rules requiring this certification and detailing the definitions and coverages may be obtained from the Contract Officer of the Department.

3. The prequalified bidder agrees by submitting this form, that he will not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in NCDOT contracts, unless authorized by the Department.

4. For Federal Aid projects, the prequalified bidder further agrees that by submitting this form he will include the Federal-Aid Provision titled *Required Contract Provisions Federal-Aid Construction Contract (Form FHWA PR* 1273) provided by the Department, without subsequent modification, in all lower tier covered transactions.

5. The prequalified bidder may rely upon a certification of a participant in a lower tier covered transaction that he is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless he knows that the certification is erroneous. The bidder may decide the method and frequency by which he will determine the eligibility of his subcontractors.

6. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this provision. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

7. Except as authorized in paragraph 6 herein, the Department may terminate any contract if the bidder knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available by the Federal Government.

Contract No. C202960
County Person

Rev. 5-19-11

DEBARMENT CERTIFICATION

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

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records; making false statements; or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph b. of this certification; and

d. Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

e. Will submit a revised Debarment Certification immediately if his status changes and will show in his bid proposal an explanation for the change in status.

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

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

☐ Check here if an explanation is attached to this certification.

1-17-12
Z-140

Contract No. **C202960**

County (ies): **Person**

ACCEPTED BY THE
DEPARTMENT OF TRANSPORTATION

Contract Officer

5/28/13
Date

Execution of Contract and Bonds
Approved as to Form:

Assistant Attorney General

Signature Sheet (Bid - Acceptance by Department)

Bond No. 09120688

Contract No. C202960
County Person

Rev 5-17-11

CONTRACT PAYMENT BOND

Date of Payment Bond Execution	May 17, 2013
Name of Principal Contractor	PLT Construction Company, Inc.
Name of Surety:	Fidelity and Deposit Company of Maryland
Name of Contracting Body:	**North Carolina Department of Transportation**
	Raleigh, North Carolina
Amount of Bond:	($21,714,921.38) Twenty One Million Seven Hundred Fourteen Thousand Nine Hundred Twenty One Dollars and 38/100
Contract ID No.:	C202960
County Name:	Person

KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL CONTRACTOR (hereafter, PRINCIPAL) and SURETY above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the Contracting Body, numbered as shown above and hereto attached:

NOW THEREFORE, if the principal shall promptly make payment to all persons supplying labor and material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Contract No. C202960

County Person

Rev 5-17-11

CONTRACT PAYMENT BOND

Affix Seal of Surety Company

Fidelity and Deposit Company of Maryland
Print or type Surety Company Name

By Kathleen M Moore
Print, stamp or type name of Attorney-in-Fact

Signature of Attorney-in-Fact

Debra S. Ritter, NC Resident Agt

Signature of Witness

John C Stanchina
Print or type Signer's name

1001 Haxall Point, Suite 800

Richmond, VA 23219
Address of Attorney-in-Fact

Contract No. C202960

County Person

Rev 5-17-11

CONTRACT PAYMENT BOND

CORPORATION

SIGNATURE OF CONTRACTOR (Principal)

PLT Construction Company, Inc.

Full name of Corporation

5676 Thompson Chapel Church Road;, Wilson, NC 27896

Address as prequalified

By _____

Signature of ~~President~~, Vice President, ~~Assistant Vice President~~

Select appropriate title

SIM A. WOOTEN, JR

Print or type Signer's name

Affix Corporate Seal

Attest _____

Signature of ~~Secretary~~, Assistant Secretary

Select appropriate title

Lisa Stancil

Print or type Signer's name

Bond No. 09120688

Contract No. C202960

County Person

Executed in Duplicate

Rev 5-17-11

CONTRACT PERFORMANCE BOND

Date of Performance Bond Execution: May 17, 2013

Name of Principal Contractor: PLT Construction Company, Inc.

Name of Surety: Fidelity and Deposit Company of Maryland

Name of Contracting Body: **North Carolina Department of Transportation**

Raleigh, North Carolina

Amount of Bond: ($21,714,921.38) Twenty One Million Seven Hundred Fourteen Thousand Nine Hundred Twenty One Dollars and 38/100

Contract ID No.: C202960

County Name: Person

KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL CONTRACTOR (hereafter, PRINCIPAL) and SURETY above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the Contracting Body, numbered as shown above and hereto attached:

NOW THEREFORE, if the principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the Contracting Body, with or without notice to the Surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Contract No. C202960
County Person

Rev 5-17-11

CONTRACT PERFORMANCE BOND

Affix Seal of Surety Company

Fidelity and Deposit Company of Maryland
Print or type Surety Company Name

By Kathleen M Moore
Print, stamp or type name of Attorney-in-Fact

Signature of Attorney-in-Fact

Debra S. Ritter, NC Resident Agt

Signature of Witness

John C Stanchina
Print or type Signer's name

1001 Haxall Point, Suite 800

Richmond, VA 23219
Address of Attorney-in-Fact

Contract No. C202960
County Person

Rev 5-17-11

CONTRACT PERFORMANCE BOND

CORPORATION

SIGNATURE OF CONTRACTOR (Principal)

PLT Construction Company, Inc.
Full name of Corporation

5676 Thompson Chapel Church Road;, Wilson, NC 27896
Address as prequalified

By
Signature of ~~President~~, Vice President, ~~Assistant Vice President~~
Select appropriate title

SIM A. WOOTEN JR
Print or type Signer's name

Affix Corporate Seal

Attest
Signature of ~~Secretary~~, Assistant Secretary
Select appropriate title

Lisa Stancil
Print or type Signer's name

Bond Number: 09120688

Obligee: NCDOT

ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **Geoffrey Delisio, Vice President,** in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Kathleen M Moore**, its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings,** and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland, in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND,** this 17th day of May, A.D. 2012.

ATTEST:

ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND

By: Gerald F. Haley
Assistant Secretary
Gerald F. Haley

Geoffrey Delisio
Vice President
Geoffrey Delisio

State of Maryland
County of Baltimore

On this 17th day of May, A.D. 2012, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **Geoffrey Delisio, Vice President and Gerald F. Haley, Assistant Secretary** of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposeth and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Constance A. Dunn

Constance A. Dunn, Notary Public
My Commission Expires: July 14, 2015

EXTRACT FROM BY-LAWS OF THE COMPANIES

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify of revoke any such appointment or authority at any time."

CERTIFICATE

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By-Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seals of the said Companies, this 17th day of May, 2013.

Thomas O. McClellan, Vice President