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

C203256

CONTRACT AND
CONTRACT BONDS

FOR CONTRACT NO. C203256

WBS 34962.3.FD1 STP-1820(5)

T.I.P NO. U-3615B

COUNTY OF GUILFORD

THIS IS THE ROADWAY CONTRACT

ROUTE NUMBER SR 1820 LENGTH 3.388 MILES

LOCATION SR-1820 (SKEET CLUB RD) FROM EAST OF SR-1818 (JOHNSON ST) TO WEST OF NC-68 (EASTCHESTER DR) IN HIGH POINT.

CONTRACTOR APAC - ATLANTIC, INC. THOMPSON ARTHUR DIVISION

ADDRESS P.O. BOX 21088
GREENSBORO, NC 27420

BIDS OPENED JANUARY 20, 2015

CONTRACT EXECUTION 2/9/2015

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

PROPOSAL

Includes Addendum No.1 dated January 9, 2015

DATE AND TIME OF BID OPENING: **JANUARY 20, 2015 AT 2:00 PM**

CONTRACT ID	C203256
WBS	34962.3.FD1

FEDERAL-AID NO.	STP-1820(5)
COUNTY	GUILFORD
T.I.P. NO.	U-3615B
MILES	3.388
ROUTE NO.	SR 1820
LOCATION	SR-1820 (SKEET CLUB RD) FROM EAST OF SR-1818 (JOHNSON ST) TO WEST OF NC-68 (EASTCHESTER DR) IN HIGH POINT.
TYPE OF WORK	GRADING, DRAINAGE, PAVING, SIGNALS & STRUCTURES.

NOTICE:

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS $30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOTWITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY FEDERAL - AID FUNDED PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING.

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A ROADWAY PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

_____

PROPOSAL FOR THE CONSTRUCTION OF

CONTRACT No. C203256 IN GUILFORD 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. **C203256**; 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 2012 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. **C203256** in **Guilford County**, for the unit or lump sum prices, as the case may be, bid by the Bidder in his bid and according to the proposal, plans, and specifications prepared by said Department, which proposal, plans, and specifications show the details covering this project, and hereby become a part of this contract.

The published volume entitled *North Carolina Department of Transportation, Raleigh, Standard Specifications for Roads and Structures, January 2012* 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 *Standard Specifications*; otherwise said deposit will be returned to the Bidder.

NORTH CAROLINA PROFESSIONAL SEAL 21076 ENGINEER RANDY A. GARRIS

State Contract Officer

DocuSigned by:

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1/9/2015

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GENERAL

CONTRACT TIME AND LIQUIDATED DAMAGES:

(8-15-00) (Rev. 12-18-07) 108 SP1 G07 A

The date of availability for this contract is **March 2, 2015**, 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 **March 29, 2019**.

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) 108 SP1 G13 A

Except for that work required under the Project Special Provisions entitled *Planting, Reforestation* and/or *Permanent Vegetation Establishment*, 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 **March 2, 2015**.

The completion date for this intermediate contract time is **October 1, 2018**.

The liquidated damages for this intermediate contract time are **Three Thousand Dollars ($ 3000.00)** 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, Reforestation* and/or *Permanent Vegetation Establishment*. 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) 108 SP1 G14 A

The Contractor shall complete the required work of installing, maintaining, and removing the traffic control devices for lane closures and restoring traffic to the existing traffic pattern. The Contractor shall not close or narrow a lane of traffic on **any roadway** during the following time restrictions:

DAY AND TIME RESTRICTIONS

Monday through Friday
7:00 A.M. - 9:00 A.M.
and
4:00 P.M. - 6:00 P.M.

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

HOLIDAY AND HOLIDAY WEEKEND LANE CLOSURE RESTRICTIONS

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

2. For **New Year's Day**, between the hours of **7:00 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 **7:00 A.M.** Thursday and **6:00 P.M.** Monday.

4. For **Memorial Day**, between the hours of **7:00 A.M.** Friday and **6:00 P.M.** Tuesday.

5. For **Independence Day**, between the hours of **7:00 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 **7:00 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 **7:00 A.M.** Friday and **6:00 P.M.** Tuesday.

7. For **Thanksgiving Day**, between the hours of **7:00 A.M.** Tuesday and **6:00 P.M.** Monday.

8. For **Christmas**, between the hours of **7:00 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 **the spring and fall High Point Furniture Market Trade Shows**, between the hours of **7:00 A.M.** the **Wednesday before** the week of the **trade show** and **6:00 P.M.** the following **Monday** after the week of the **trade show**.

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 will not be 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 above and place traffic in the existing traffic pattern.

The liquidated damages are **Five Hundred Dollars ($500.00**) per **15 minute time period.**

INTERMEDIATE CONTRACT TIME NUMBER 3 AND LIQUIDATED DAMAGES:
(2-20-07) (Rev. 6-18-13) 108 SP1 G14 F

The Contractor shall complete the work required of **Phase I - Step 3** as shown on Sheets **TMP-3, TMP-4B, TMP-4O, and TMP-4V** and shall place and maintain traffic on same.

The time of availability for this intermediate contract time is the **Friday** at **6:00 P.M.** that the Contractor elects to begin the work.

The completion time for this intermediate contract time is the following **Monday** at **7:00 A.M.** after the time of availability.

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

INTERMEDIATE CONTRACT TIME NUMBER 4 AND LIQUIDATED DAMAGES:
(2-20-07) (Rev. 6-18-13) 108 SP1 G14 F

The Contractor shall complete the work required of **Phase I - Step 5** as shown on Sheets **TMP-3 and TMP-4Q thru TMP-4T** and shall place and maintain traffic on same.

The time of availability for this intermediate contract time is the **Friday** at **6:00 P.M.** that the Contractor elects to begin the work.

The completion time for this intermediate contract time is the **Monday** at **7:00 A.M.** which is **sixteen (16)** consecutive calendar days after the time of availability.

The liquidated damages are **Two Thousand Dollars ($2,000.00)** per calendar day.

INTERMEDIATE CONTRACT TIME NUMBER 5 AND LIQUIDATED DAMAGES:
(2-20-07) (Rev. 6-18-13) 108 SP1 G14 F

The Contractor shall complete the work required of **Phase II - Step 2** as shown on Sheets **TMP-3A and TMP-5 thru TMP-5E** and shall place and maintain traffic on same.

The time of availability for this intermediate contract time is the **Friday** at **6:00 P.M.** that the Contractor elects to begin the work.

The completion time for this intermediate contract time is the following **Monday** at **7:00 A.M.** after the time of availability.

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

INTERMEDIATE CONTRACT TIME NUMBER 6 AND LIQUIDATED DAMAGES:
(2-20-07) (Rev. 6-18-13) 108 SP1 G14 F

The Contractor shall complete the work required of **Phase II - Step 3** as shown on Sheets **TMP-3A, TMP-5 and TMP-5F thru TMP-5N** and shall place and maintain traffic on same.

The time of availability for this intermediate contract time is the **Friday** at **6:00 P.M.** that the Contractor elects to begin the work.

The completion time for this intermediate contract time is the following **Monday** at **7:00 A.M.** after the time of availability.

The liquidated damages are **Five Hundred Dollars ($500.00)** per **15 minute time period**.

INTERMEDIATE CONTRACT TIME NUMBER 7 AND LIQUIDATED DAMAGES:
(2-20-07) (Rev. 6-18-13) 108 SP1 G14 F

The Contractor shall complete the work required of **Phase III - Step 2** as shown on Sheets **TMP-3B and TMP-6 thru TMP-6O** and shall place and maintain traffic on same.

The time of availability for this intermediate contract time is the **Friday** at **6:00 P.M.** that the Contractor elects to begin the work.

The completion time for this intermediate contract time is the following **Monday** at **7:00 A.M.** after the time of availability.

The liquidated damages are **Five Hundred Dollars ($500.00)** per **15 minute time period**.

INTERMEDIATE CONTRACT TIME NUMBER 8 AND LIQUIDATED DAMAGES:
(2-20-07) (Rev. 6-18-13) 108 SP1 G14 F

The Contractor shall complete the work required of **Phase III - Steps 3 and 4** as shown on Sheets **TMP-3B and TMP-6P** and shall place and maintain traffic on same.

The time of availability for this intermediate contract time is **on** the **Monday immediately following the closure of Kendale Rd.** at **7:00 A.M.** that the Contractor elects to begin the work.

The completion time for this intermediate contract time is the following **Thursday** at **7:00 A.M.** after the time of availability.

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

INTERMEDIATE CONTRACT TIME NUMBER 9 AND LIQUIDATED DAMAGES:
(2-20-07) (Rev. 6-18-13) 108 SP1 G14 F

The Contractor shall complete the work required of **Phase IV - Step 1** as shown on Sheets **TMP-3C and TMP-7 thru TMP-7N** and shall place and maintain traffic on same.

The time of availability for this intermediate contract time is the **Friday** at **6:00 P.M.** that the Contractor elects to begin the work.

The completion time for this intermediate contract time is the following **Monday** at **7:00 A.M.** after the time of availability.

The liquidated damages are **Five Hundred Dollars ($500.00) per 15 minute time period**.

PERMANENT VEGETATION ESTABLISHMENT:
(2-16-12) (Rev. 10-15-13) 104 SP1 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 permanent vegetation on all erodible areas 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 *2012 Standard Specifications*. All work required for initial vegetation planting shall be performed as a part of the work necessary for the completion and acceptance of the Intermediate Contract Time (ICT). Between the time of ICT and Final Project acceptance, or otherwise referred to as the vegetation establishment period, the Department will be responsible for preparing the required National Pollutant Discharge Elimination System (NPDES) inspection records.

Once the Engineer has determined that the permanent vegetation establishment requirement has been achieved at an 80% vegetation density (the amount of established vegetation per given area to stabilize the soil) and no erodible areas exist within the project limits, 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 *2012 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) (Rev. 7-15-14) 108 SP1 G22

The Contractor will not be allowed right of entry to the following parcel(s) prior to the listed date(s) unless otherwise permitted by the Engineer.

Parcel No.	Property Owner	Date
013	Lee Moore et al	1/15/15
017	Kim and Linda Mansfield	1/15/15

MAJOR CONTRACT ITEMS:
(2-19-02) 104 SP1 G28

The following listed items are the major contract items for this contract (see Article 104-5 of the *2012 Standard Specifications*):

Line #	Description
0010 —	Borrow Excavation
0055 —	Asphalt Concrete Base Course, Type B25.0 B
0056 —	Asphalt Concrete Intermediate Course, Type I19.0 B
0057 —	Asphalt Concrete Surface Course, Type S9.5 B

SPECIALTY ITEMS:
(7-1-95)(Rev. 1-17-12) 108-6 SP1 G37

Items listed below will be the specialty items for this contract (see Article 108-6 of the *2012 Standard Specifications*).

Line #	Description
0098 thru 0110	Guardrail
0111 thru 0115	Fencing
0123 thru 0130	Signing
0151 thru 0159 & 0161	Long-Life Pavement Markings
0160 & 0162	Removable Tape
0172 thru 0173	Permanent Pavement Markers
0174 thru 0211	Utility Construction
0212 thru 0243	Erosion Control
0244 thru 0245	Reforestation
0246 thru 0289	Signals/ITS System
0303 thru 0307	Drilled Piers

FUEL PRICE ADJUSTMENT:

(11-15-05) (Rev. 2-18-14) 109-8 SP1 G43

Revise the *2012 Standard Specifications* as follows:

Page 1-83, Article 109-8, Fuel Price Adjustments, add the following:

The base index price for DIESEL #2 FUEL is **$ 2.5028** per gallon. 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 will be as follows:

Description	Units	Fuel Usage Factor Diesel
Unclassified Excavation	Gal/CY	0.29
Borrow Excavation	Gal/CY	0.29
Class IV Subgrade Stabilization	Gal/Ton	0.55
Aggregate Base Course	Gal/Ton	0.55
Sub-Ballast	Gal/Ton	0.55
Asphalt Concrete Base Course, Type ____	Gal/Ton	2.90
Asphalt Concrete Intermediate Course, Type ____	Gal/Ton	2.90
Asphalt Concrete Surface Course, Type ____	Gal/Ton	2.90
Open-Graded Asphalt Friction Course	Gal/Ton	2.90
Permeable Asphalt Drainage Course, Type ____	Gal/Ton	2.90
Sand Asphalt Surface Course, Type ____	Gal/Ton	2.90
Aggregate for Cement Treated Base Course	Gal/Ton	0.55
Portland Cement for Cement Treated Base Course	Gal/Ton	0.55
__" Portland Cement Concrete Pavement	Gal/SY	0.245
Concrete Shoulders Adjacent to __" Pavement	Gal/SY	0.245

SCHEDULE OF ESTIMATED COMPLETION PROGRESS:

(7-15-08) (Rev. 5-20-14) 108-2 SP1 G58

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:

2015	(7/01/14 - 6/30/15)	**13**	% of Total Amount Bid
2016	(7/01/15 - 6/30/16)	**37**	% of Total Amount Bid
2017	(7/01/16 - 6/30/17)	**28**	% of Total Amount Bid
2018	(7/01/17 - 6/30/18)	**19**	% of Total Amount Bid
2019	(7/01/18 - 6/30/19)	**3**	% of Total Amount Bid

The Contractor shall also furnish his own progress schedule in accordance with Article 108-2 of the *2012 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. 12-17-13) 102-15(J) SP1 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. http://connect.ncdot.gov/projects/construction/Construction%20Forms/DBE%20MBE%20WBE%20Replacement%20Request%20Form.pdf

SAF *Subcontract Approval Form* - Form required for approval to sublet the contract. http://connect.ncdot.gov/projects/construction/Construction%20Forms/Subcontract%20Approval%20Form%20Rev.%202012.zip

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. http://connect.ncdot.gov/projects/construction/Construction%20Forms/Joint%20Check%20Notification%20Form.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://connect.ncdot.gov/letting/LetCentral/Letter%20of%20Intent%20to%20Perform%20as%20a%20Subcontractor.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://connect.ncdot.gov/municipalities/Bid%20Proposals%20for%20LGA%20Content/08%20DBE%20Subcontractors%20(Federal).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://connect.ncdot.gov/business/SmallBusiness/Documents/DBE%20Subcontractor%20Quote%20Comparison%20Example.xls

DBE Goal

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

Disadvantaged Business Enterprises **11.0 %**

(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 <u>all</u> 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

(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. **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.

(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 corresponding goal.

(2) *If the DBE goal is zero,* entries on the *Listing of DBE Subcontractors* are not required for the zero goal, however any DBE participation that is achieved during the project shall be reported in accordance with requirements contained elsewhere in the special provision.

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, written notices, use of verifiable electronic means 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.

(1) Where appropriate, break 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.

(2) Negotiate with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be sublet includes potential for DBE participation (2nd and 3rd tier subcontractors).

(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 <u>not</u> 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 102-15(J) of the *2012 Standard Specifications* may be cause to disqualify the Contractor.

CERTIFICATION FOR FEDERAL-AID CONTRACTS:

(3-21-90) SP1 G85

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.

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) 102-14 SP1 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).

U.S. DEPARTMENT OF TRANSPORTATION HOTLINE:
(11-22-94) 108-5 SP1 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) 450 SP1 G112 D

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

LOCATING EXISTING UNDERGROUND UTILITIES:
(3-20-12) 105 SP1 G115

Revise the *2012 Standard Specifications* as follows:

Page 1-43, Article 105-8, line 28, after the first sentence, add the following:

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

RESOURCE CONSERVATION:
(5-21-13) 104-13 SP1 G118

In accordance with North Carolina Executive Order 156, NCGS 130A-309.14(2), and NCGS 136-28.8, it is the policy of the Department to aid in the reduction of materials that become a part of our solid waste stream, to divert materials from landfills, and to find ways to recycle and reuse materials for the benefit of the Citizens of North Carolina.

Initiate, develop and use products and construction methods that incorporate the use of recycled or solid waste products in accordance with Article 104-13 of the *2012 Standard Specifications*. Report the quantities of reused or recycled materials either incorporated in the project or diverted from landfills on the Project Construction Reuse and Recycling Reporting Form.

A location-based tool for finding local recycling facilities and the Project Construction Reuse and Recycling Reporting Form are available at:

http://connect.ncdot.gov/resources/Environmental/Pages/North-Carolina-Recycling-Locations.aspx

DOMESTIC STEEL:
(4-16-13) 106 SP1 G120

Revise the *2012 Standard Specifications* as follows:

P**age 1-49, Subarticle 106-1(B) Domestic Steel, lines 2-7,** 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) (Rev. 8-16-11) 1170-4 SP1 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 *2012 Standard Specifications* have been furnished to the Engineer.

The provisions of Subarticle 109-5(B) of the *2012 Standard Specifications* will apply to the portable concrete barrier.

REMOVABLE PAVEMENT MARKINGS - (Partial Payments for Materials):
(7-1-95) (Rev. 8-16-11) 1205-10 SP1 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 *2012 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 *2012 Standard Specifications* will not apply to removable pavement marking materials.

MAINTENANCE OF THE PROJECT:
(11-20-07) (Rev. 1-17-12) 104-10 SP1 G125

Revise the *2012 Standard Specifications* as follows:

Page 1-35, Article 104-10 Maintenance of the Project, line 25, add the following after the first sentence of the first paragraph:

All guardrail/guiderail within the project limits shall be included in this maintenance.

Page 1-35, Article 104-10 Maintenance of the Project, line 30, add the following as the last sentence of the first paragraph:

The Contractor shall perform weekly inspections of guardrail and guiderail and shall report damages to the Engineer on the same day of the weekly inspection. *Where damaged guardrail or guiderail is repaired or replaced as a result of maintaining the project in* accordance with this article, such repair or replacement shall be performed within 7 consecutive calendar days of such inspection report.

Page 1-35, Article 104-10 Maintenance of the Project, lines 42-44, replace the last sentence of the last paragraph with the following:

The Contractor will not be directly compensated for any maintenance operations necessary, except for maintenance of guardrail/guiderail, as this work will be considered incidental to the work covered by the various contract items. The provisions of Article 104-7, Extra Work, and Article 104-8, Compensation and Record Keeping will apply to authorized maintenance of guardrail/guiderail. Performance of weekly inspections of guardrail/guiderail, and the damage reports required as described above, will be considered to be an incidental part of the work being paid for by the various contract items.

TWELVE MONTH GUARANTEE:

(7-15-03) 108 SP1 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.

GIFTS FROM VENDORS AND CONTRACTORS:

(12-15-09) 107-1 SP1 G152

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

(A) Have a contract with a governmental agency; or
(B) Have performed under such a contract within the past year; or
(C) 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 *N.C.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.

LIABILITY INSURANCE:

(5-20-14) SP1 G160

Revise the *2012 Standard Specifications* as follows:

Page 1-60, Article 107-15 LIABILITY INSURANCE, line 16, add the following as the second sentence of the third paragraph:

Prior to beginning services, all contractors shall provide proof of coverage issued by a workers' compensation insurance carrier, or a certificate of compliance issued by the Department of Insurance for self-insured subcontractors, irrespective of whether having regularly in service fewer than three employees.

EROSION AND SEDIMENT CONTROL/STORMWATER CERTIFICATION:

(1-16-07) (Rev 9-18-12) 105-16, 225-2, 16 SP1 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 0.5 inch that occurs within a 24 hour period.

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

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

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

(f) Maintain a log of turbidity test results as outlined in the Department's Procedure for Monitoring Borrow Pit Discharge.
(g) Provide secondary containment for bulk storage of liquid materials.
(h) Provide training for employees concerning general erosion and sediment control/stormwater awareness, the Department's NPDES Stormwater Permit NCS000250 requirements, and the applicable requirements of the *General Permit, NCG010000*.
(i) Report violations of the NPDES permit to the Engineer immediately who will notify the Division of Water Quality Regional Office within 24 hours of becoming aware of the violation.

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

(a) Follow permit requirements related to the 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 Certified Designer on the erosion and sediment control/stormwater component of all reclamation plans and if applicable, the certification number of the Level III 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 C*ease 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
1536 Mail Service Center
Raleigh, NC 27699-1536

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

The Chief Engineer will hear the appeal and make a decision within 7 days of hearing the appeal. 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) (Rev. 3-19-13) 105-16, 230, 801 SP1 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 *2012 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.gov/doh/operations/dp_chief_eng/roadside/fieldops/downloads/Files/TurbidityReductionOptionSheet.pdf 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) (Rev. 1-17-12) 108, 102 SP1 G184

Revise the *2012 Standard Specifications* as follows:

Page 1-20, Subarticle 102-15(O), delete and replace with the following:

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

Page 1-65, Article 108-5 Character of Workmen, Methods, and Equipment, line 32, delete all of line 32, the first sentence of the second paragraph and the first word of the second sentence of the second paragraph.

STATE HIGHWAY ADMINISTRATOR TITLE CHANGE:
(9-18-12) SP1 G185

Revise the *2012 Standard Specifications* as follows:

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

SUBLETTING OF CONTRACT:
(11-18-2014) 108-6 SP1 G186

Revise the *2012 Standard Specifications* as follows:

Page 1-66, Article 108-6 Subletting of Contract, line 37, add the following as the second sentence of the first paragraph:

All requests to sublet work shall be submitted within 30 days of the date of availability or prior to expiration of 20% of the contract time, whichever date is later, unless otherwise approved by the Engineer.

Page 1-67, Article 108-6 Subletting of Contract, line 7, add the following as the second sentence of the fourth paragraph:

Purchasing materials for subcontractors is not included in the percentage of work required to be performed by the Contractor. If the Contractor sublets items of work but elects to purchase material for the subcontractor, the value of the material purchased will be included in the total dollar amount considered to have been sublet.

PROJECT SPECIAL PROVISIONS

ROADWAY

CLEARING AND GRUBBING - METHOD II:

(9-17-02) (Rev. 1-17-12) 200 SP2 R02A

Perform clearing on this project to the limits established by Method "II" shown on Standard Drawing No. 200.02 of the *2012 Roadway Standard Drawings*.

BURNING RESTRICTIONS:

(7-1-95) 200, 210, 215 SP2 R05

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

TEMPORARY PAVEMENT:

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

After the temporary pavement has served its 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 temporary pavement 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 temporary pavement areas in embankments or dispose of in waste areas furnished by the Contractor.

Aggregate base course and earth material that is removed will be measured and will be paid at the contract unit price per cubic yard for *Unclassified Excavation*. Pavement that is removed will be measured and will be paid at the contract unit price per square yard for *Removal of Existing Pavement*. Pavement that is milled will be measured and paid at the contract unit price per square yard for the applicable milling depth pay item. Pipe culverts removed remain the property of the Contractor. Pipe culverts that are removed will be measured and will be paid at the contract unit price per linear foot for *Pipe Removal*. Payment for the construction of the temporary pavement will be made at the contract unit prices for the various items involved.

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

SHOULDER AND FILL SLOPE MATERIAL:

(5-21-02) 235, 560 SP2 R45 B

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 *2012 Standard Specifications*.

Measurement and Payment

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 Borrow* 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 *2012 Standard Specifications*.

PIPE INSTALLATION:
(11-20-12) 300 SP3 R01

Revise the *2012 Standard Specifications* as follows:

Page 3-1, Article 300-2, Materials, line 23-24, replace sentence with:

Provide foundation conditioning geotextile in accordance with Section 1056 for Type 4 geotextile.

FLOWABLE FILL:
(9-17-02) (Rev 1-17-12) 300, 340, 450, 1000, 1530, 1540, 1550 SP3 R30

Description

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

Materials

Refer to Division 10 of the *2012 Standard Specifications*.

Item	Section
Flowable Fill	1000-6

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 yards and paid as the actual number of cubic yards 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 Yard

REMOVE AND RESET FLARED END SECTIONS:

Description

The Contractor shall remove and reset flared end sections as directed by the Engineer.

Measurement and Payment

Remove & Reset FES will be measured and paid for in units of each. Such price and payment will include all materials, tools, labor, equipment and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Remove & Reset FES	Each

BRIDGE APPROACH FILLS:

(10-19-10) (Rev. 1-17-12) 422 SP4 R02

Description

Bridge approach fills include bridge approach fills for sub regional tier bridges and reinforced bridge approach fills. Construct bridge approach fills in accordance with the contract and Standard Drawing No. 422.10 or 422.11 of the *2012 Roadway Standard Drawings*. Define "geosynthetics" as geotextiles or geomembranes.

Materials

Refer to Division 10 of the *2012 Standard Specifications*.

Item	Section
Anchor Pins	1056-2
Geotextiles	1056
Portland Cement Concrete	1000
Select Material	1016
Subsurface Drainage Materials	1044
Wire Staples	1060-8(D)

For bridge approach fills for sub regional tier bridges, provide Type 1 geotextile for filtration geotextiles. For reinforced bridge approach fills, provide Type 5 geotextile for geotextile reinforcement and Type 1 geotextile and No. 78M stone for drains. Use Class B concrete for concrete pads.

Use Class III or V select material for reinforced bridge approach fills and only Class V select material (standard size No. 78M stone) for bridge approach fills for sub regional tier bridges. Provide PVC pipes, fittings and outlet pipes for subsurface drainage materials. For drains and

PVC pipes behind end bents, use pipes with perforations that meet AASHTO M 278.

Use PVC, HDPE or linear low density polyethylene (LLDPE) geomembranes for reinforced bridge approach fills. For PVC geomembranes, provide grade PVC30 geomembranes that meet ASTM D7176. For HDPE and LLDPE geomembranes, use geomembranes with a nominal thickness of at least 30 mils that meet Geosynthetic Research Institute Standard Specifications GM13 or GM17, respectively. Handle and store geomembranes in accordance with Article 1056-2 of the *2012 Standard Specifications*. Provide material certifications for geomembranes in accordance with Article 1056-3 of the *2012 Standard Specifications*.

Construction Methods

Excavate as necessary for bridge approach fills in accordance with the contract. Notify the Engineer when foundation excavation is complete. Do not place geomembranes or filtration geotextiles until excavation dimensions and foundation material are approved. Attach geomembranes and filtration geotextiles to end bent cap back and wing walls with adhesives, tapes or other approved methods. Glue or weld geomembrane seams to prevent leakage.

For reinforced bridge approach fills, place geotextile reinforcement within 3" of locations shown in Standard Drawing No. 422.10 of the *2012 Roadway Standard Drawings* and in slight tension free of kinks, folds, wrinkles or creases. Install geotextile reinforcement with the orientation, dimensions and number of layers shown in Standard Drawing No. 422.10 of the *2012 Roadway Standard Drawings*. Place first layer of geotextile reinforcement directly on geomembranes with no void or material in between. Install geotextile reinforcement with the machine direction (MD) parallel to the roadway centerline. The MD is the direction of the length or long dimension of the geotextile roll. Do not splice or overlap geotextile reinforcement in the MD so seams are perpendicular to the roadway centerline. Wrap geotextile reinforcement at end bent cap back and wing walls as shown in Standard Drawing No. 422.10 of the *2012 Roadway Standard Drawings* and directed by the Engineer. Extend geotextile reinforcement at least 4 ft back behind end bent cap back and wing walls into select material.

Overlap adjacent geotextiles at least 18" with seams oriented parallel to the roadway centerline. Hold geotextiles in place with wire staples or anchor pins as needed. Contact the Engineer when existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with geosynthetics.

For reinforced bridge approach fills, construct one foot square drains consisting of 4" diameter continuous perforated PVC pipes surrounded by No. 78M stone wrapped in Type 1 geotextiles. Install drains in accordance with Standard Drawing No. 422.10 of the *2012 Roadway Standard Drawings*. For bridge approach fills for sub regional tier bridges, install 4" diameter continuous perforated PVC drain pipes in accordance with Standard Drawing No. 422.11 of the *2012 Roadway Standard Drawings*.

Use solvent cement to connect PVC pipes so joints do not leak. Connect perforated pipes to outlet pipes just behind wing walls. Provide drain pipes and drains with positive drainage towards outlets. Place pipe sleeves in or under wing walls for outlet pipes so positive drainage is

maintained. Use sleeves that can withstand wing wall loads.

Place select material in 8" to 10" thick lifts. Use only hand operated compaction equipment to compact select material for bridge approach fills. Compact Class III select material in accordance with Subarticle 235-3(C) of the *2012 Standard Specifications*. Compact No. 78M stone with a vibratory compactor to the satisfaction of the Engineer. Do not displace or damage geosynthetics, drain pipes or drains when placing and compacting select material. End dumping directly on geosynthetics is not permitted. Do not operate heavy equipment on geosynthetics, drain pipes or drains until they are covered with at least 8" of select material. Replace any damaged geosynthetics, drain pipes or drains to the satisfaction of the Engineer.

Cover open ends of outlet pipes with rodent screens as shown in Standard Drawing No. 815.03 of the *2012 Roadway Standard Drawings*. Connect ends of outlet pipes to concrete pads or existing drainage structures as directed by the Engineer. Construct concrete pads with an Ordinary surface finish that meets Subarticle 825-6(B) of the *2012 Standard Specifications*.

Measurement and Payment

Reinforced Bridge Approach Fill, Station ____ will be paid at the contract lump sum price. The contract lump sum price for *Reinforced Bridge Approach Fill, Station* ____ will be full compensation for labor, tools, equipment and reinforced bridge approach fill materials, excavating, backfilling, hauling and removing excavated materials, compacting select material, connecting outlet pipes to existing drainage structures and supplying select materials, geosynthetics, drains, pipe sleeves and outlet components and any incidentals necessary to construct all reinforced bridge approach fills at each bridge.

Bridge Approach Fill - Sub Regional Tier, Station ____ will be paid at the contract lump sum price. The contract lump sum price for *Bridge Approach Fill - Sub Regional Tier, Station* ____ will be full compensation for labor, tools, equipment and bridge approach fill materials, excavating, backfilling, hauling and removing excavated materials, compacting No. 78M stone, connecting outlet pipes to existing drainage structures and supplying No. 78M stone, filtration geotextiles, drain pipes, pipe sleeves and outlet components and any incidentals necessary to construct all bridge approach fills at each sub regional tier bridge.

Payment will be made under:

Pay Item	**Pay Unit**
Reinforced Bridge Approach Fill, Station ____	Lump Sum
Bridge Approach Fill - Sub Regional Tier, Station ____	Lump Sum

PREPARATION OF SUBGRADE AND BASE:

(1-16-96) 610 SP5 R05

On mainline portions and ramps of this project, prepare the subgrade and base beneath the pavement structure in accordance with the applicable sections of the *2012 Standard Specifications* except use an automatically controlled fine grading machine using 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.

ASPHALT PAVEMENTS - SUPERPAVE:

(6-19-12) (Rev. 10-21-14) 605, 609, 610, 650, 660 SP6 R01

Revise the *2012 Standard Specifications* as follows:

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

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

TABLE 605-1
APPLICATION RATES FOR TACK COAT

Existing Surface	Target Rate (gal/sy)
	Emulsified Asphalt
New Asphalt	0.04 ± 0.01
Oxidized or Milled Asphalt	0.06 ± 0.01
Concrete	0.08 ± 0.01

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

TABLE 605-2
APPLICATION TEMPERATURE FOR TACK COAT

Asphalt Material	Temperature Range
Asphalt Binder, Grade PG 64-22	350 - 400°F
Emulsified Asphalt, Grade RS-1H	130 - 160°F
Emulsified Asphalt, Grade CRS-1	130 - 160°F
Emulsified Asphalt, Grade CRS-1H	130 - 160°F
Emulsified Asphalt, Grade HFMS-1	130 - 160°F
Emulsified Asphalt, Grade CRS-2	130 - 160°F

Page 6-7, Article 609-3 FIELD VERIFICATION OF MIXTURE AND JOB MIX FORMULA ADJUSTMENTS, lines 35-37, delete the second sentence of the second paragraph.

Page 6-18, Article 610-1 DESCRIPTION, lines 40-41, delete the last sentence of the last paragraph.

Page 6-19, Subarticle 610-3(A) Mix Design-General, line 5, add the following as the first paragraph:

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

https://connect.ncdot.gov/resources/Materials/MaterialsResources/Warm%20Mix%20Asphalt%20Approved%20List.pdf

Page 6-21, Subarticle 610-3(C) Job Mix Formula (JMF), replace Table 610-1 with the following:

TABLE 610-1
DESIGN MIXING TEMPERATURE AT THE ASPHALT PLANT[A]

Binder Grade	HMA JMF Temperature	WMA JMF Temperature Range
PG 64-22	300ºF	225 - 275ºF
PG 70-22	315ºF	240 - 290ºF
PG 76-22	335ºF	260 - 310ºF

A. The mix temperature, when checked in the truck at the roadway, shall be within plus 15º and minus 25º of the temperature specified on the JMF.

Page 6-21, Subarticle 610-3(C) Job Mix Formula (JMF), lines 4-6, delete first sentence of the second paragraph. Line 7, in the second sentence of the second paragraph, replace "275ºF" with "275ºF or greater."

Page 6-22, Article 610-4 WEATHER, TEMPERATURE AND SEASONAL LIMITATIONS FOR PRODUCING AND PLACING ASPHALT MIXTURES, lines 15-17, replace the second sentence of the first paragraph with the following:

Do not place asphalt material when the air or surface temperatures, measured at the location of the paving operation away from artificial heat, do not meet Table 610-5.

Page 6-23, Article 610-4 WEATHER, TEMPERATURE AND SEASONAL LIMITATIONS FOR PRODUCING AND PLACING ASPHALT MIXTURES, replace Table 610-5 with the following:

TABLE 610-5 PLACEMENT TEMPERATURES FOR ASPHALT	
Asphalt Concrete Mix Type	**Minimum Surface and Air Temperature**
B25.0B, C	35°F
I19.0B, C, D	35°F
SF9.5A, S9.5B	40°F[A]
S9.5C, S12.5C	45°F[A]
S9.5D, S12.5D	50°F

A. For the final layer of surface mixes containing recycled asphalt shingles (RAS), the minimum surface and air temperature shall be 50ºF.

Page 6-26, Article 610-7 HAULING OF ASPHALT MIXTURE, lines 22-23, in the fourth sentence of the first paragraph replace "so as to overlap the top of the truck bed and" with "to".

Page 6-41, Subarticle 650-3(B) Mix Design Criteria, replace Table 650-1 with the following:

TABLE 650-1 OGAFC GRADATION CRITERIA			
Sieve Size (mm)	*Type FC-1*	*Type FC-1 Modified*	*Type FC-2 Modified*
19.0	-	-	100
12.5	100	100	**80** - 100
9.50	75 - 100	75 - 100	55 - **80**
4.75	25 - 45	25 - 45	15 - **30**
2.36	5 - 15	5 - 15	5 - **15**
0.075	1.0 - 3.0	1.0 - 3.0	2.0 - 4.0

Page 6-50, Table 660-1 MATERIAL APPLICATION RATES AND TEMPERATURES, lines 1-2, replace Note A in Table 660-1 with the following:

A. Use No. 6M, No. 67, No. 5 and No. 78M aggregate for retreatment before an asphalt overlay on existing pavement based on the width of the cracks in the existing pavement. Choose No. 78M for sections of roadway where the average width of existing cracks is 1/4" or less in width, No. 67 for sections of roadway where the average width of existing cracks are 1/4" to 5/8" in width and choose No. 5 for sections of roadway where the existing crack widths are greater than 5/8".

<u>ASPHALT BINDER CONTENT OF ASPHALT PLANT MIXES:</u>

(11-21-00) (Rev. 7-17-12) 609 SP6 R15

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

Asphalt Concrete Base Course	Type B 25.0__	4.4%
Asphalt Concrete Intermediate Course	Type I 19.0__	4.8%
Asphalt Concrete Surface Course	Type S 4.75A	6.8%
Asphalt Concrete Surface Course	Type SA-1	6.8%

Asphalt Concrete Surface Course	Type SF 9.5A	6.7%
Asphalt Concrete Surface Course	Type S 9.5__	6.0%
Asphalt Concrete Surface Course	Type S 12.5__	5.6%

The actual asphalt binder content will be established during construction by the Engineer within the limits established in the *2012 Standard Specifications.*

ASPHALT PLANT MIXTURES:
(7-1-95) 609 SP6 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) 620 SP6 R25

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

The base price index for asphalt binder for plant mix is **$ 598.46** per ton.

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on **December 1, 2014**.

MODIFIED CONCRETE FLUME WITH CONCRETE OUTLET:
(3-19-96)(Rev. 6-17-08) 825 SP8 R10

At locations shown in the plans, construct concrete flumes, concrete curb, and apron in accordance with the details in the plans. Use materials meeting the requirements of Section 825 of the *2012 Standard Specifications* except that the concrete must be Class B or of higher compressive strength.

Each concrete flume, concrete curb, and apron completed and accepted will be paid at the contract unit price per each for *Modified Concrete Flume*. Such price and payment will be full compensation for all materials, labor, equipment, tools, removing and disposing of the temporary slope drains, and any other incidentals necessary to complete the work satisfactorily.

The concrete curb and ditch outside the pay limits of the apron will be measured and paid in accordance with Section 846 and 850 of the *2012 Standard Specifications*.

Payment will be made under:

Pay Item	**Pay Unit**
Modified Concrete Flume	Each

SLUICE GATE:

(7-1-95) (Rev. 3-17-09) 838 SP8 R20

Description

This work consists of the construction of a sluice gate on an endwall in accordance with the details in the plans, the applicable requirements of Section 838 of the *2012 Standard Specifications*, in accordance with the manufacturer's recommendations and as directed by the Engineer.

Materials

Sluice gates shall meet the manufacturer's recommendations for the corresponding pipe size. Due to variations in individual manufacturer's products, a slight variation from the size specified may be allowed. Submit the proposed catalog cut to the Engineer for approval prior to use.

Construction Methods

Provide a gate that forms a watertight seal when closed.

Measurement and Payment

____*" Sluice Gate* will be measured and paid as each for the actual number of sluice gates incorporated into the completed and accepted work. Such prices and payment will be full compensation for all materials, labor, tools, equipment and incidentals necessary to complete the work.

The endwall will be measured and paid in accordance with Article 838-4 of the *2012 Standard Specifications*.

Payment will be made under:

Pay Item	Pay Unit
____" Sluice Gate	Each

HAZARDOUS SPILL RETENTION BASINS:

The Contractor shall construct hazardous spill retention basins in accordance with the details in the plans, at the locations shown in the plans and as directed by the Engineer.

Payment for the work of constructing the hazardous spill retention basins will be made at the contract prices for the various items involved with the construction of the basins.

ENERGY DISSIPATERS:

The Contractor shall construct energy dissipaters in accordance with the details in the plans, at the locations shown in the plans, and as directed by the Engineer.

Payment for the work of constructing energy dissipaters will be made at the contract prices for the various items involved with the construction of the basins.

GUARDRAIL ANCHOR UNITS, TYPE 350:
(4-20-04) (Rev. 8-16-11) 862 SP8 R65

Description

Furnish and install guardrail anchor units in accordance with the details in the plans, the applicable requirements of Section 862 of the *2012 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 Article 106-2 of the *2012 Standard Specifications*.

(B) Certified working drawings and assembling instructions from the manufacturer for each guardrail anchor unit in accordance with Article 105-2 of the *2012 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 Article 1088-3 of the *2012 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 Article 862-6 of the *2012 Standard Specifications*.

Payment will be made under:

Pay Item	**Pay Unit**
Guardrail Anchor Units, Type 350	Each

IMPACT ATTENUATOR UNITS, TYPE 350:

(4-20-04) (Rev. 1-17-12) SP8 R75

Description

Furnish and install impact attenuator units and any components necessary to connect the impact attenuator units in accordance with the manufacturer's requirement, the details in the plans and at locations shown in the plans.

Materials

The Contractor may at his option, furnish any one of the **NON-GATING** impact attenuator units or approved equal:

The impact attenuator unit (QUADGUARD) as manufactured by:

Energy Absorption Systems, Inc.
One East Wacker Drive
Chicago, Illinois 60601-2076
Telephone: 312-467-6750

The impact attenuator unit (TRACC) as manufactured by:

Trinity Industries, Inc.
2525 N. Stemmons Freeway
Dallas, Texas 75207
Telephone: 800-644-7976

The Contractor may at his option, furnish any one of the **GATING** impact attenuator units or approved equal:

The impact attenuator unit (BRAKEMASTER) as manufactured by:

Energy Absorption Systems, Inc.
One East Wacker Drive
Chicago, Illinois 60601-2076
Telephone: 312-467-6750

The impact attenuator unit (CAT) as manufactured by:

Trinity Industries, Inc.
2525 N. Stemmons Freeway
Dallas, Texas 75207
Telephone: 800-644-7976

Prior to installation the Contractor shall submit to the Engineer:

(A) FHWA acceptance letter for each impact attenuator unit certifying it meets the requirements of NCHRP Report 350, Test Level 3, in accordance with Article 106-2 of the *2012 Standard Specifications*.

(B) Certified working drawings and assembling instructions from the manufacturer for each impact attenuator unit in accordance with Article 105-2 of the *2012 Standard Specifications*.

No modifications shall be made to the impact attenuator unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans, and details and assembling instructions furnished by the manufacturer.

Construction Methods

If the median width is 40 feet or less, the Contractor shall supply one of the NON-GATING Impact Attenuator Units listed in the Materials Section herein.

If the median width is greater than 40 feet, the Contractor may use any of the GATING or NON-GATING Impact Attenuator Units listed in the Materials Section herein.

Measurement and Payment

Impact Attenuator Unit, Type 350 will be measured and paid at the contract unit price per each. Such prices and payment will be full compensation for all work covered by this provision including, but not limited to, furnishing, installing and all incidentals necessary to complete the work.

Payment will be made under:

Pay Item	**Pay Unit**
Impact Attenuator Units, Type 350	Each

CHAIN LINK FENCING WITH BARBED WIRE ON EXTENSION ARMS:
(7-1-95) 866 SP8 R100

Description

Provide 72" chain link fencing with barbed wire on extension arms in accordance with the plans, Section 866 of the *2012 Standard Specifications*, and the provisions herein.

Construction Methods

On all 72" 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 12 inches above and approximately 12 inches 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 by the various fencing items in the contract.

PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON:
(10-15-02) (Rev. 10-20-09) 410 SP8 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 synthetic or a combination of coconut and synthetic fibers evenly distributed throughout the mat between a bottom UV stabilized netting and a heavy duty UV stabilized top net. The matting shall be stitched together with UV stabilized polypropylene thread to form a permanent three dimensional structure. The mat shall have the following minimum physical properties:

Property	**Test Method**	**Value Unit**
Light Penetration	ASTM D6567	9 %
Thickness	ASTM D6525	0.40 in
Mass Per Unit Area	ASTM D6566	0.55 lb/sy
Tensile Strength	ASTM D6818	385 lb/ft
Elongation (Maximum)	ASTM D6818	49 %
Resiliency	ASTM D1777	>70 %
UV Stability *	ASTM 4355	≥80 %
Porosity (Permanent Net)	ECTC Guidelines	≥85 %
Maximum Permissible Shear Stress (Vegetated)	Performance Bench Test	≥8.0 lb/ft^2
Maximum Allowable Velocity (Vegetated)	Performance Bench Test	≥16.0 ft/s

*ASTM D1682 Tensile Strength and % strength retention of material after 1,000 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

All areas to be protected with the mat shall be brought to final grade and seeded in accordance with Section 1660 of the *2012 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

Preformed Scour Holes with Level Spreader Aprons will be measured and paid as the actual number 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

DETECTABLE WARNINGS FOR PROPOSED CURB RAMPS:

(6-15-10) (Rev. 8-16-11) 848 SP8 R126

Description

Construct detectable warnings consisting of integrated raised truncated domes on proposed concrete curb ramps in accordance with the *2012 Standard Specifications,* plan details, the requirements of the *28 CFR Part 36 ADA Standards for Accessible Design* and this provision.

Materials

Detectable warning for proposed curb ramps shall consist of integrated raised truncated domes. The description, size and spacing shall conform to Section 848 of the *2012 Standard Specifications.*

Use material for detectable warning systems as shown herein. Material and coating specifications must be stated in the Manufacturers Type 3 Certification and all Detectable Warning systems must be on the NCDOT Approved Products List.

Install detectable warnings created from one of the following materials: precast concrete blocks or bricks, clay paving brick, gray or ductile iron castings, mild steel, stainless steel, and engineered plastics, rubber or composite tile. Only one material type for detectable warning will be permitted per project, unless otherwise approved by the Engineer.

(A) Detectable Warnings shall consist of a base with integrated raised truncated domes, and when constructed of precast concrete they shall conform to the material requirements of Article 848-2 of the *2012 Standard Specifications.*

(B) Detectable Warnings shall consist of a base with integrated raised truncated domes, and may be comprised of other materials including, but not limited, to clay paving brick, gray iron or ductile iron castings, mild steel, stainless steel, and engineered plastics, rubber or composite tile, which are cast into the concrete of the curb ramps. The material shall have an integral color throughout the thickness of the material. The detectable warning shall include fasteners or anchors for attachment in the concrete and shall be furnished as a system from the manufacturer.

Prior to installation, the Contractor shall submit to the Engineer assembling instructions from the manufacturer for each type of system used in accordance with Article 105-2 of the *2012 Standard Specifications*. The system shall be furnished as a kit containing all consumable materials and consumable tools, required for the application. They shall be capable of being affixed to or anchored in the concrete curb ramp, including green concrete (concrete that has set but not appreciably hardened). The system shall be solvent free and contain no volatile organic compounds (VOC). The static coefficient of friction shall be 0.8 or greater when measured on top of the truncated domes and when measured between the domes in accordance with ASTM C1028 (dry and wet). The system shall be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to degradation by motor fuels, lubricants and antifreeze.

(C) When steel or gray iron or ductile iron casting products are provided, only products that meet the requirements of Subarticle 106-1(B) of the *2012 Standard Specifications* may be used. Submit to the Engineer a Type 6 Certification, catalog cuts and installation procedures at least 30 days prior to installation for all.

Construction Methods

(A) Prior to placing detectable warnings in proposed concrete curb ramps, adjust the existing subgrade to the proper grade and in accordance with Article 848-3 of the *2012 Standard Specifications*.

(B) Install all detectable warning in proposed concrete curb ramps in accordance with the manufacturer's recommendations.

Measurement and Payment

Detectable Warnings installed for construction of proposed curb ramps will not be paid for separately. Such payment will be included in the price bid for *Concrete Curb Ramps*.

FOUNDATIONS AND ANCHOR ROD ASSEMBLIES FOR METAL POLES:

(1-17-12) (Rev. 5-21-13) 9, 14, 17 SP9 R05

Description

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

Construct concrete foundations with the required resistances and dimensions and install anchor rod assemblies in accordance with the contract and accepted submittals. Construct drilled piers consisting of cast-in-place reinforced concrete cylindrical sections in excavated holes. Provide

temporary casings or polymer slurry as needed to stabilize drilled pier excavations. Use a prequalified Drilled Pier Contractor to construct drilled piers for metal poles. Define "excavation" and "hole" as a drilled pier excavation and "pier" as a drilled pier.

This provision does not apply to materials and anchor rod assemblies for standard foundations for low level light standards. See Section 1405 of the *2012 Standard Specifications* and Standard Drawing No. 1405.01 of the *2012 Roadway Standard Drawings* for materials and anchor rod assemblies for standard foundations. For construction of standard foundations for low level light standards, standard foundations are considered footings in this provision.

This provision does not apply to foundations for signal pedestals; see Section 1743 of the *2012 Standard Specifications* and Standard Drawing No. 1743.01 of the *2012 Roadway Standard Drawings*.

Materials

Refer to the *2012 Standard Specifications*.

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

Provide Type 3 material certifications in accordance with Article 106-3 of the *2012 Standard Specifications* for conduit, rollers, chairs and anchor rod assemblies. Store steel materials on blocking at least 12" above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign materials. Load, transport, unload and store foundation and anchor rod assembly materials so materials are kept clean and free of damage. Bent, damaged or defective materials will be rejected.

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

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

(A) Straight anchor rods,

(B) Heavy hex top and leveling nuts and flat washers on exposed ends of rods, and

(C) Nuts and either flat plates or washers on the other ends of anchor rods embedded in foundations.

Do not use lock washers. Use steel anchor rods, nuts and washers that meet ASTM F1554 for Grade 55 rods and Grade A nuts. Use steel plates and washers embedded in concrete with a thickness of at least 1/4". Galvanize anchor rods and exposed nuts and washers in accordance with Article 1076-4 of the *2012 Standard Specifications*. It is not necessary to galvanize nuts, plates and washers embedded in concrete.

Construction Methods

Install the required size and number of conduits in foundations in accordance with the plans and accepted submittals. Construct top of piers, footings, pedestals, grade beams and wings flat, level and within 1" of elevations shown in the plans or approved by the Engineer. Provide an Ordinary Surface finish in accordance with Subarticle 825-6(B) of the *2012 Standard Specifications* for portions of foundations exposed above finished grade. Do not remove anchor bolt templates or pedestal or grade beam forms or erect metal poles or upright trusses onto foundations until concrete attains a compressive strength of at least 3,000 psi.

(A) Drilled Piers

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

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

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

Construct drilled piers with the minimum required diameters shown in the plans. Install piers with tip elevations no higher than shown in the plans or approved by the Engineer.

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

Contain and dispose of drilling spoils and waste concrete as directed and in accordance with Section 802 of the *2012 Standard Specifications*. Drilling spoils consist of all materials and fluids removed from excavations.

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

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

Use polymer slurry and additives to stabilize holes in accordance with the slurry manufacturer's recommendations. Provide mixing water and equipment suitable for polymer slurry. Maintain polymer slurry at all times so slurry meets Table 411-3 of the *2012 Standard Specifications* except for sand content.

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

Remove soft and loose material from bottom of holes using augers to the satisfaction of the Engineer. Assemble rebar cages and place cages and Drilled Pier concrete in accordance with Subarticle 411-4(E) of the *2012 Standard Specifications* except for the following:

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

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

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

If drilled piers are questionable, pile integrity testing (PIT) and further investigation may be required in accordance with Article 411-5 of the *2012 Standard Specifications*. A drilled pier will be considered defective in accordance with Subarticle 411-5(D) of the *2012 Standard Specifications* and drilled pier acceptance is based in part on the criteria in Article 411-6 of the *2012 Standard Specifications* except for the top of pier tolerances in Subarticle 411-6(C) of the *2012 Standard Specifications*.

If a drilled pier is under further investigation, do not grout core holes, backfill around the pier or perform any work on the drilled pier until the Engineer accepts the pier. If the drilled pier is accepted, dewater and grout core holes and backfill around the pier with approved material to finished grade. If the Engineer determines a pier is unacceptable, remediation is required in accordance with Article 411-6 of the *2012 Standard Specifications*. No extension of completion date or time will be allowed for remediation of unacceptable drilled piers or post repair testing.

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

(B) Footings, Pedestals, Grade Beams and Wings

Excavate as necessary for footings, grade beams and wings in accordance with the plans, accepted submittals and Section 410 of the *2012 Standard Specifications*. If unstable, caving or sloughing materials are anticipated or encountered, shore foundation excavations as needed with an approved method. Notify the Engineer when foundation excavation is complete. Do not place concrete or reinforcing steel until excavation dimensions and foundation material are approved.

Construct cast-in-place reinforced concrete footings, pedestals, grade beams and wings with the dimensions shown in the plans and in accordance with Section 825 of the *2012 Standard Specifications*. Use forms to construct portions of pedestals and grade beams protruding above finished grade. Provide a chamfer with a 3/4" horizontal width for pedestal and grade beam edges exposed above finished grade. Backfill and fill in accordance with Article 410-8 of the *2012 Standard Specifications*. Proper compaction around footings and wings is critical for foundations to resist uplift and torsion forces. Place concrete against undisturbed soil and do not use forms for standard foundations for low level light standards.

(C) Anchor Rod Assemblies

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

the protrusion of 3 to 5 anchor rod threads above top nuts after tightening and the distance of one nut thickness between top of foundations and bottom of leveling nuts.

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

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

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

(1) Turn leveling nuts onto anchor rods to a distance of one nut thickness between the top of foundation and bottom of leveling nuts. Place washers over anchor rods on top of leveling nuts.

(2) Determine if nuts are level using a flat rigid template on top of washers. If necessary, lower leveling nuts to level the template in all directions or if applicable, lower nuts to tilt the template so the metal pole or upright truss will lean as shown in the plans. If leveling nuts and washers are not in full contact with the template, replace washers with galvanized beveled washers.

(3) Verify the distance between the foundation and leveling nuts is no more than one nut thickness.

(4) Place base plate with metal pole or upright truss over anchor rods on top of washers. High mount luminaires may be attached before erecting metal poles but do not attach cables, mast arms or trusses to metal poles or upright trusses at this time.

(5) Place washers over anchor rods on top of base plate. Lubricate top nut bearing surfaces and exposed anchor rod threads above washers with beeswax, paraffin or other approved lubricant.

(6) Turn top nuts onto anchor rods. If nuts are not in full contact with washers or washers are not in full contact with the base plate, replace washers with galvanized beveled washers.

(7) Tighten top nuts to snug-tight with the full effort of one workman using a 12" wrench. Do not tighten any nut all at once. Turn top nuts in increments. Follow a star pattern cycling through each nut at least twice.

(8) Repeat (7) for leveling nuts.

(9) Replace washers above and below the base plate with galvanized beveled washers if the slope of any base plate face exceeds 1:20 (5%), any washer is not in firm contact with the base plate or any nut is not in firm contact with a washer. If any washers are replaced, repeat (7) and (8).

(10) With top and leveling nuts snug-tight, mark each top nut on a corner at the intersection of 2 flats and a corresponding reference mark on the base plate. Mark top nuts and base plate with ink or paint that is not water-soluble. Use the turn-of-nut method for pretensioning. Do not pretension any nut all at once. Turn top nuts in increments for a total turn that meets the following nut rotation requirements:

NUT ROTATION REQUIREMENTS (Turn-of-Nut Pretensioning Method)	
Anchor Rod Diameter, inch	**Requirement**
≤ 1 1/2	1/3 turn (2 flats)
> 1 1/2	1/6 turn (1 flat)

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

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

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

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

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

(13) Do not grout under base plate.

Measurement and Payment

Foundations and anchor rod assemblies for metal poles and upright trusses will be measured and paid for elsewhere in the contract.

No payment will be made for temporary casings that remain in drilled pier excavations. No payment will be made for PIT. No payment will be made for further investigation of defective piers. Further investigation of piers that are not defective will be paid as extra work in accordance with Article 104-7 of the *2012 Standard Specifications*. No payment will be made for remediation of unacceptable drilled piers or post repair testing.

MATERIALS:

(2-21-12) (Rev. 5-20-14) 1000, 1002, 1005, 1024, 1050, 1056, 1074, 1078, 1080, 1081, 1086, 1084, 1087, 1092 SP10 R01

Revise the *2012 Standard Specifications* as follows:

Page 10-1, Article 1000-1, DESCRIPTION, lines 9-10, replace the last sentence of the first paragraph with the following:

Type IL, IP, IS or IT blended cement may be used instead of Portland cement.

Page 10-1, Article 1000-1, DESCRIPTION, line 14, add the following:

Use materials which do not produce a mottled appearance through rusting or other staining of the finished concrete surface.

Page 10-5, Table 1000-1, REQUIREMENTS FOR CONCRETE, replace with the following:

TABLE 1000-1
REQUIREMENTS FOR CONCRETE

Class of Concrete	Min. Comp. Strength at 28 days	Maximum Water-Cement Ratio				Consistency Max. Slump		Cement Content			
		Air-Entrained Concrete		Non Air-Entrained Concrete		Vibrated	Non-Vibrated	Vibrated		Non- Vibrated	
		Rounded Aggregate	Angular Aggre-gate	Rounded Aggregate	Angular Aggre-gate			Min.	Max.	Min.	Max.
Units	*psi*					*inch*	*inch*	*lb/cy*	*lb/cy*	*lb/cy*	*lb/cy*
AA	4,500	0.381	0.426	-	-	3.5	-	639	715	-	-
AA Slip Form	4,500	0.381	0.426	-	-	1.5	-	639	715	-	-
Drilled Pier	4,500	-	-	0.450	0.450	-	5-7 dry 7-9 wet	-	-	640	800
A	3,000	0.488	0.532	0.550	0.594	3.5	4	564	-	602	-
B	2,500	0.488	0.567	0.559	0.630	2.5	4	508	-	545	-
B Slip Formed	2,500	0.488	0.567	-	-	1.5	-	508	-	-	-
Sand Light-weight	4,500	-	0.420	-	-	4	-	715	-	-	-
Latex Modified	3,000 7 day	0.400	0.400	-	-	6	-	658	-	-	-
Flowable Fill excavatable	150 max. at 56 days	as needed	as needed	as needed	as needed	-	Flow-able	-	-	40	100
Flowable Fill non-excavatable	125	as needed	as needed	as needed	as needed	-	Flow-able	-	-	100	as needed
Pavement	4,500 design, field 650 flexural, design only	0.559	0.559	-	-	1.5 slip form 3.0 hand place	-	526	-	-	-
Precast	See Table 1077-1	as needed	as needed	-	-	6	as needed	as needed	as needed	as needed	as needed
Prestress	per contract	See Table 1078-1	See Table 1078-1	-	-	8	-	564	as needed	-	-

Page 10-1, Article 1000-2, MATERIALS, line 16; Page 10-8, Subarticle 1000-7(A), MATERIALS, line 8; and Page 10-18, Article 1002-2, MATERIALS, line 9, add the following to the table of item references:

Item	**Section**
Type IL Blended Cement	1024-1

Page 10-23, Table 1005-1, AGGREGATE GRADATION-COARSE AGGREGATE, replace with the following:

TABLE 1005-1
AGGREGATE GRADATION - COARSE AGGREGATE

Std. Size #	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4	#8	#10	#16	#40	#200	Remarks
	Percentage of Total by Weight Passing												
4	100	90-100	20-55	0-15	-	0-5	-	-	-	-	-	**A**	Asphalt Plant Mix
467M	100	95-100	-	35-70	-	0-30	0-5	-	-	-	-	**A**	Asphalt Plant Mix
5	-	100	90-100	20-55	0-10	0-5	-	-	-	-	-	**A**	AST, Sediment Control Stone
57	-	100	95-100	-	25-60	-	0-10	0-5	-	-	-	**A**	AST, Str. Concrete, Shoulder Drain, Sediment Control Stone
57M	-	100	95-100	-	25-45	-	0-10	0-5	-	-	-	**A**	AST, Concrete Pavement
6M	-	-	100	90-100	20-55	0-20	0-8	-	-	-	-	**A**	AST
67	-	-	100	90-100	-	20-55	0-10	0-5	-	-	-	**A**	AST, Str. Concrete, Asphalt Plant Mix
78M	-	-	-	100	98-100	75-100	20-45	0-15	-	-	-	**A**	Asphalt Plant Mix, AST, Str. Conc, Weep Hole Drains
14M	-	-	-	-	-	100	35-70	5-20	-	0-8	-	**A**	Asphalt Plant Mix, AST, Weep Hole Drains, Str. Concrete
9	-	-	-	-	-	100	85-100	10-40	-	0-10	-	**A**	AST
ABC	-	100	75-97	-	55-80	-	35-55	-	25-45	-	14-30	4-12[B]	Aggregate Base Course, Aggregate Stabilization
ABC (M)	-	100	75-100	-	45-79	-	20-40	-	0-25	-	-	0-12[B]	Maintenance Stabilization
Light-weight[C]	-	-	-	-	100	80-100	5-40	0-20	-	0-10	-	0-2.5	AST

A. See Subarticle 1005-4(A).
B. See Subarticle 1005-4(B).
C. For Lightweight Aggregate used in Structural Concrete, see Subarticle 1014-2(E)(6).

Page 10-46, Article 1024-1, PORTLAND CEMENT, line 33, add the following as the ninth paragraph:

Use Type IL blended cement that meets AASHTO M 240, except that the limestone content is limited to between 5 and 12% by weight and the constituents shall be interground. Class F fly ash can replace a portion of Type IL blended cement and shall be replaced as outlined in Subarticle 1000-4(I) for Portland cement. For mixes that contain cement with alkali content

between 0.6% and 1.0% and for mixes that contain a reactive aggregate documented by the Department, use a pozzolan in the amount shown in Table 1024-1.

Page 10-65, Article 1050-1, GENERAL, line 41, replace the first sentence with the following:

All fencing material and accessories shall meet Section 106.

Page 10-73, Article 1056-1 DESCRIPTION, lines 7-8, delete the first sentence of the second paragraph and replace with the following:

Use geotextile fabrics that are on the NCDOT Approved Products List.

Page 10-73, Article 1056-2 HANDLING AND STORING, line 17, replace "mechanically stabilized earth (MSE) wall faces" with "temporary wall faces".

Page 10-74, TABLE 1056-1 GEOTEXTILE REQUIREMENTS, replace table with the following:

TABLE 1056-1
GEOTEXTILE REQUIREMENTS

Property	**Requirement (MARV[A])**					**Test Method**
	Type 1	**Type 2**	**Type 3[B]**	**Type 4**	**Type 5[C]**	
Typical Application	*Shoulder Drains*	*Under Rip Rap*	*Temporary Silt Fence*	*Soil Stabilization*	*Temporary Walls*	
Elongation (MD & CD)	≥ 50%	≥ 50%	≤ 25%	< 50%	< 50%	ASTM D4632
Grab Strength (MD & CD)	Table 1[D], Class 3	Table 1[D], Class 1	100 lb	Table 1[D], Class 3	-	ASTM D4632
Tear Strength (MD & CD)			-		-	ASTM D4533
Puncture Strength			-		-	ASTM D6241
Ultimate Tensile Strength (MD & CD)	-	-	-	-	2,400 lb/ft (unless required otherwise in the contract)	ASTM D4595
Permittivity	Table 2[D], 15% to 50% *in Situ* Soil Passing No. 200[E]		Table 7[D]	Table 5[D]	0.20 sec^{-1}	ASTM D4491
Apparent Opening Size					No. 30[E]	ASTM D4751
UV Stability (Retained Strength)					70%	ASTM D4355

A. MARV does not apply to elongation
B. Minimum roll width of 36" required
C. Minimum roll width of 13 ft required
D. AASHTO M 288
E. US Sieve No. per AASHTO M 92

Page 10-115, Subarticle 1074-7(B), Gray Iron Castings, lines 10-11, replace with the first two sentences with the following:

Supply gray iron castings meeting all facets of AASHTO M 306 excluding proof load. Proof load testing will only be required for new casting designs during the design process, and conformance to M306 loading (40,000 lbs.) will be required only when noted on the design documents.

Page 10-126, Table 1078-1, REQUIREMENTS FOR CONCRETE, replace with the following:

TABLE 1078-1
REQUIREMENTS FOR CONCRETE

Property	**28 Day Design Compressive Strength 6,000 psi or less**	**28 Day Design Compressive Strength greater than 6,000 psi**
Maximum Water/Cementitious Material Ratio	0.45	0.40
Maximum Slump without HRWR	3.5"	3.5"
Maximum Slump with HRWR	8"	8"
Air Content (upon discharge into forms)	5 + 2%	5 + 2%

Page 10-151, Article 1080-4 Inspection and Sampling, lines 18-22, replace (B), (C) and (D) with the following:

(B) At least 3 panels prepared as specified in 5.5.10 of AASHTO M 300, Bullet Hole Immersion Test.

(C) At least 3 panels of 4"x6"x1/4" for the Elcometer Adhesion Pull Off Test, ASTM D4541.

(D) A certified test report from an approved independent testing laboratory for the Salt Fog Resistance Test, Cyclic Weathering Resistance Test, and Bullet Hole Immersion Test as specified in AASHTO M 300.

(E) A certified test report from an approved independent testing laboratory that the product has been tested for slip coefficient and meets AASHTO M253, Class B.

Page 10-161, Subarticle 1081-1(A) Classifications, lines 29-33, delete first 3 sentences of the description for Type 2 and replace with the following:

Type 2 - A low-modulus, general-purpose adhesive used in epoxy mortar repairs. It may be used to patch spalled, cracked or broken concrete where vibration, shock or expansion and contraction are expected.

Page 10-162, Subarticle 1081-1(A) Classifications, lines 4-7, delete the second and third sentences of the description for Type 3A. **Lines 16-22,** delete Types 6A, 6B and 6C.

Page 10-162, Subarticle 1081-1(B) Requirements, lines 26-30, replace the second paragraph with the following:

For epoxy resin systems used for embedding dowel bars, threaded rods, rebar, anchor bolts and other fixtures in hardened concrete, the manufacturer shall submit test results showing that the bonding system will obtain 125% of the specified required yield strength of the fixture. Furnish certification that, for the particular bolt grade, diameter and embedment depth required, the anchor system will not fail by adhesive failure and that there is no movement of the anchor bolt. For certification and anchorage, use 3,000 psi as the minimum Portland cement concrete compressive strength used in this test. Use adhesives that meet Section 1081.

List the properties of the adhesive on the container and include density, minimum and maximum temperature application, setting time, shelf life, pot life, shear strength and compressive strength.

Page 10-163, Table 1081-1 Properties of Mixed Epoxy Resin Systems, replace table with the following:

TABLE 1081-1
PROPERTIES OF MIXED EPOXY RESIN SYSTEMS

Property	Type 1	Type 2	Type 3	Type 3A	Type 4A	Type 4B	Type 5
Viscosity-Poises at 77°F ± 2°F	Gel	10-30	25-75	Gel	40-150	40-150	1-6
Spindle No.	-	3	4	--	4	4	2
Speed (RPM)	-	20	20	--	10	10	50
Pot Life (Minutes)	20-50	30-60	20-50	5-50	40-80	40-80	20-60
Minimum Tensile Strength at 7 days (psi)	1,500	2,000	4,000	4,000	1,500	1,500	4,000
Tensile Elongation at 7 days (%)	30 min.	30 min.	2-5	2-5	5-15	5-15	2-5
Min. Compressive Strength of 2". mortar cubes at 24 hours	3,000 (Neat)	4,000-	6,000-	6,000 (Neat)	3,000	3,000	6,000
Min. Compressive Strength of 2" mortar cubes at 7 days	5,000 (Neat)	-	-	-	-	5,000	-
Maximum Water Absorption (%)	1.5	1.0	1.0	1.5	1.0	1.0	1.0
Min. Bond Strength Slant Shear Test at 14 days (psi)	1,500	1,500	2,000	2,000	1,500	1,500	1,500

Page 10-164, Subarticle 1081-1(E) Prequalification, lines 31-33, replace the second sentence of the first paragraph with the following:

Manufacturers choosing to supply material for Department jobs must submit an application through the Value Management Unit with the following information for each type and brand name:

Page 10-164, Subarticle 1081-1(E)(3), line 37, replace this subarticle with the following:

(3) Type of the material in accordance with Articles 1081-1 and 1081-4,

Page 10-165, Subarticle 1081-1(E)(6), line 1, in the first sentence of the first paragraph replace "AASHTO M 237" with "the specifications".

Page 10-165, Subarticle 1081-1(E) Prequalification, line 9-10, delete the second sentence of the last paragraph.

Page 10-165, Subarticle 1081-1(F) Acceptance, line 14, in the first sentence of the first paragraph replace "Type 1" with "Type 3".

Page 10-169, Subarticle 1081-3(G) Anchor Bolt Adhesives, delete this subarticle.

Page 10-170, Article 1081-3 Hot Bitumen, line 9, add the following at the end of Section 1081:

1081-4 EPOXY RESIN ADHESIVE FOR BONDING TRAFFIC MARKINGS

(A) General

This section covers epoxy resin adhesive for bonding traffic markers to pavement surfaces.

(B) Classification

The types of epoxies and their uses are as shown below:

Type I – Rapid Setting, High Viscosity, Epoxy Adhesive. This type of adhesive provides rapid adherence to traffic markers to the surface of pavement.

Type II – Standard Setting, High Viscosity, Epoxy Adhesive. This type of adhesive is recommended for adherence of traffic markers to pavement surfaces when rapid set is not required.

Type III – Rapid Setting, Low Viscosity, Water Resistant, Epoxy Adhesive. This type of rapid setting adhesive, due to its low viscosity, is appropriate only for use with embedded traffic markers.

Type IV – Standard Set Epoxy for Blade Deflecting-Type Plowable Markers.

(C) Requirements

Epoxies shall conform to the requirements set forth in AASHTO M 237.

(D) Prequalification

Refer to Subarticle 1081-1(E).

(E) Acceptance

Refer to Subarticle 1081-1(F).

Page 10-173, Article 1084-2 STEEL SHEET PILES, lines 37-38, replace first paragraph with the following:

Steel sheet piles detailed for permanent applications shall be hot rolled and meet ASTM A572 or ASTM A690 unless otherwise required by the plans. Steel sheet piles shall be coated as required by the plans. Galvanized sheet piles shall be coated in accordance with Section 1076.

Metallized sheet piles shall be metallized in accordance to the Project Special Provision "Thermal Sprayed Coatings (Metallization)" with an 8 mil, 99.9% aluminum alloy coating and a 0.5 mil seal coating. Any portion of the metallized sheet piling encased in concrete shall receive a barrier coat. The barrier coat shall be an approved waterborne coating with a low-viscosity which readily absorbs into the pores of the aluminum thermal sprayed coating. The waterborne coating shall be applied at a spreading rate that results in a theoretical 1.5 mil dry film thickness. The manufacturer shall issue a letter of certification that the resin chemistry of the waterborne coating is compatible with the 99.9% aluminum thermal sprayed alloy and suitable for tidal water applications.

Page 10-174, Subarticle 1086-1(B)(1) Epoxy, lines 18-24, replace this subarticle with the following:

The epoxy shall meet Article 1081-4.

The 2 types of epoxy adhesive which may be used are Type I, Rapid Setting, and Type II, Standard Setting. Use Type II when the pavement temperature is above 60°F or per the manufacturer's recommendations whichever is more stringent. Use Type I when the pavement temperature is between 50°F and 60°F or per the manufacturer's recommendations whichever is more stringent. Epoxy adhesive Type I, Cold Set, may be used to attach temporary pavement markers to the pavement surface when the pavement temperature is between 32°F and 50°F or per the manufacturer's recommendations whichever is more stringent.

Page 10-175, Subarticle 1086-2(E) Epoxy Adhesives, line 27, replace "Section 1081" with "Article 1081-4".

Page 10-177, Subarticle 1086-3(E) Epoxy Adhesives, line 22, replace "Section 1081" with "Article 1081-4".

Page 10-179, Subarticle 1087-4(A) Composition, lines 39-41, replace the third paragraph with the following:

All intermixed and drop-on glass beads shall not contain more than 75 ppm arsenic or 200 ppm lead.

Page 10-180, Subarticle 1087-4(B) Physical Characteristics, line 8, replace the second paragraph with the following:

All intermixed and drop-on glass beads shall comply with NCGS § 136-30.2 and 23 USC § 109(r).

Page 10-181, Subarticle 1087-7(A) Intermixed and Drop-on Glass Beads, line 24, add the following after the first paragraph:

Use X-ray Fluorescence for the normal sampling procedure for intermixed and drop-on beads, without crushing, to check for any levels of arsenic and lead. If any arsenic or lead is detected, the sample shall be crushed and repeat the test using X-ray Fluorescence. If the X-ray Fluorescence test shows more than a LOD of 5 ppm, test the beads using United States Environmental Protection Agency Method 6010B, 6010C or 3052 for no more than 75 ppm arsenic or 200 ppm lead.

Page 10-204, Subarticle 1092-2(A) Performance and Test Requirements, replace **Table 1092-3 Minimum Coefficient of Retroreflection for NC Grade A** with the following:

TABLE 1092-3 MINIMUM COEFFICIENT OF RETROREFLECTION FOR NC GRADE A (Candelas Per Lux Per Square Meter)								
Observation Angle, degrees	**Entrance Angle, degrees**	**White**	**Yellow**	**Green**	**Red**	**Blue**	**Fluorescent Yellow Green**	**Fluorescent Yellow**
0.2	-4.0	525	395	52	95	30	420	315
0.2	30.0	215	162	22	43	10	170	130
0.5	-4.0	310	230	31	56	18	245	185
0.5	30.0	135	100	14	27	6	110	81
1.0	-4.0	**120**	60	8	16	3.6	64	48
1.0	30.0	45	34	4.5	9	2	36	27

HIGH STRENGTH CONCRETE FOR DRIVEWAYS:

(11-21-00) (Rev. 1-17-12) 848 SP10 R02

Use high early strength concrete for all driveways shown in the plans and as directed by the Engineer. Provide high early strength concrete that meets the requirements of Article 1000-5 of the *2012 Standard Specifications*.

Measurement and payment will be in accordance with Section 848 of the *2012 Standard Specifications*.

SELECT MATERIAL, CLASS III, TYPE 3:

(1-17-12) 1016, 1044 SP10 R05

Revise the *2012 Standard Specifications* as follows:

Page 10-39, Article 1016-3, CLASS III, add the following after line 14:

Type 3 Select Material

Type 3 select material is a natural or manufactured fine aggregate material meeting the following gradation requirements and as described in Sections 1005 and 1006:

Percentage of Total by Weight Passing							
3/8"	#4	#8	#16	#30	#50	#100	#200
100	95-100	65-100	35-95	15-75	5-35	0-25	0-8

Page 10-39, Article 1016-3, CLASS III, line 15, replace “either type” with “Type 1, Type 2 or Type 3”.

Page 10-62, Article 1044-1, line 36, delete the sentence and replace with the following:

Subdrain fine aggregate shall meet Class III select material, Type 1 or Type 3.

Page 10-63, Article 1044-2, line 2, delete the sentence and replace with the following:

Subdrain coarse aggregate shall meet Class V select material.

SHOULDER AND SLOPE BORROW:

(3-19-13) 1019 SP10 R10

Use soil in accordance with Section 1019 of the *2012 Standard Specifications*. 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 1019-1A. 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.

pH TEST RESULT	Sandy Soils Additional Rate (lbs. / Acre)	Silt Loam Soils Additional Rate (lbs. / Acre)	Clay Loam Soils Additional Rate (lbs. / Acre)
4.0 - 4.4	1,000	4,000	6,000
4.5 - 4.9	500	3,000	5,000
5.0 - 5.4	NA	2,000	4,000

Note: Limestone application rates shown in this table are in addition to the standard rate of 4000 lbs. / acre required for seeding and mulching.

No direct payment will be made for providing additional lime or acidic amendments for Ph adjustment.

TEMPORARY SHORING:

(2-20-07) (Rev. 5-21-13) SP11 R02

Description

Temporary shoring includes cantilever, braced and anchored shoring and temporary mechanically stabilized earth (MSE) walls. Temporary shoring does not include trench boxes. At the Contractor's option, use any type of temporary shoring unless noted otherwise in the plans or as directed. Design and construct temporary shoring based on actual elevations and shoring dimensions in accordance with the contract and accepted submittals. Construct temporary shoring at locations shown in the plans and as directed. Temporary shoring is required to maintain traffic when a 2:1 (H:V) slope from the top of an embankment or bottom of an excavation will intersect the existing ground line less than 5 ft from the edge of pavement of an open travelway. This provision does not apply to pipe, inlet or utility installation unless noted otherwise in the plans.

Positive protection includes concrete barrier and temporary guardrail. Provide positive protection for temporary shoring at locations shown in the plans and as directed. Positive protection is required if temporary shoring is located in the clear zone in accordance with the *AASHTO Roadside Design Guide*.

(A) Cantilever and Braced Shoring

Cantilever shoring consists of steel sheet piles or H-piles with timber lagging. Braced shoring consists of sheet piles or H-piles with timber lagging and bracing such as beams, plates, walers, struts, rakers, etc. Define "piles" as sheet piles or H-piles.

(B) Anchored Shoring

Anchored shoring consists of sheet piles with walers or H-piles with timber lagging anchored with ground or helical anchors. Driven anchors may be accepted at the discretion of the Engineer. A ground anchor consists of a grouted steel bar or multi-strand tendon with an anchorage. A helical anchor consists of a lead section with a central steel shaft and at least one helix steel plate followed by extensions with only central shafts (no helixes) and an anchorage. Anchorages consist of steel bearing plates with washers and hex nuts for bars or steel wedge plates and wedges for strands. Use a prequalified Anchored Wall Contractor to install ground anchors. Define "anchors" as ground, helical or driven anchors.

(C) Temporary MSE Walls

Temporary MSE walls include temporary geosynthetic and wire walls. Define "temporary wall" as a temporary MSE wall. Define "reinforcement" as geotextile, geogrid, welded wire grid or metallic strip reinforcement.

Temporary geosynthetic walls consist of geotextile or geogrid reinforcement wrapped behind welded wire facing. Define "temporary geotextile wall" as a temporary geosynthetic wall with geotextile reinforcement and "temporary geogrid wall" as a temporary geosynthetic wall with geogrid reinforcement.

Temporary wire walls consist of welded wire grid or metallic strip reinforcement connected to welded wire facing. Define "Wire Wall Vendor" as the vendor supplying the temporary wire wall.

(D) Embedment

Define "embedment" for cantilever, braced and anchored shoring as the pile depth below the grade in front of shoring. Define "embedment" for temporary walls as the wall height below the grade in front of walls.

(E) Positive Protection

Define "unanchored or anchored portable concrete barrier" as portable concrete barrier (PCB) that meets Standard Drawing No. 1170.01 of the *2012 Roadway Standard Drawings*. Define "concrete barrier" as unanchored or anchored PCB or an approved equal. Define "temporary guardrail" as temporary steel beam guardrail that meets Standard Drawing No. 862.02 of the *2012 Roadway Standard Drawings*.

Materials

Refer to the *2012 Standard Specifications*.

Item	**Section**
Anchor Pins	1056-2
Concrete Barrier Materials	1170-2
Flowable Fill, Excavatable	1000-6
Geotextiles	1056
Neat Cement Grout	1003
Portland Cement Concrete	1000
Select Material	1016
Steel Beam Guardrail Materials	862-2
Steel Plates	1072-2
Steel Sheet Piles and H-Piles	1084
Untreated Timber	1082-2
Welded Wire Reinforcement	1070-3
Wire Staples	1060-8(D)

Provide Type 6 material certifications for shoring materials in accordance with Article 106-3 of the *2012 Standard Specifications*. Use Class IV select material (standard size No. ABC) for temporary guardrail. Use nonshrink neat cement grout or Class A concrete that meets Article 450-2 of the *2012 Standard Specifications* for drilled-in piles. Use untreated timber with a thickness of at least 3" and a bending stress of at least 1,000 psi for timber lagging. Provide steel bracing that meets ASTM A36.

(A) Shoring Backfill

Use Class II, Type 1, Class III, Class V or Class VI select material or material that meets AASHTO M 145 for soil classification A-2-4 with a maximum PI of 6 for shoring backfill except do not use A-2-4 soil for backfill around culverts.

(B) Anchors

Store anchor materials on blocking a minimum of 12" above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign materials. Load, transport, unload and store anchor materials so materials are kept clean and free of damage. Bent,

damaged or defective materials will be rejected.

(1) Ground Anchors

Use high-strength deformed steel bars that meet AASHTO M 275 or seven-wire strands that meet ASTM A886 or Article 1070-5 of the *2012 Standard Specifications*. Splice bars in accordance with Article 1070-9 of the *2012 Standard Specifications*. Do not splice strands. Use bondbreakers, spacers and centralizers that meet Article 6.3.5 of the *AASHTO LRFD Bridge Construction Specifications*.

(2) Helical Anchors

Use helical anchors with an ICC Evaluation Service, Inc. (ICC-ES) report. Helical anchors without an ICC-ES report may be approved at the discretion of the Engineer. Provide couplers, thread bar adapters and bolts recommended by the Anchor Manufacturer to connect helical anchors together and to piles.

(3) Anchorages

Provide steel plates for bearing plates and steel washers, hex nuts, wedge plates and wedges recommended by the Anchor Manufacturer.

(C) Temporary Walls

(1) Welded Wire Facing

Use welded wire reinforcement for welded wire facing, struts and wires. For temporary wire walls, provide welded wire facing supplied by the Wire Wall Vendor or a manufacturer approved or licensed by the vendor. For temporary wire walls with separate reinforcement and facing components, provide connectors (e.g., bars, clamps, plates, etc.) and fasteners (e.g., bolts, nuts, washers, etc.) required by the Wire Wall Vendor.

(2) Geotextiles

Provide Type 2 geotextile for separation and retention geotextiles. Provide Type 5 geotextile for geotextile reinforcement with ultimate tensile strengths in accordance with the accepted submittals.

(3) Geogrid Reinforcement

Handle and store geogrids in accordance with Article 1056-2 of the *2012 Standard Specifications*. Define “machine direction” (MD) and “cross-machine direction” (CD) for geogrids in accordance with ASTM D4439.

Use geogrids with a roll width of at least 4 ft and an "approved" or "approved for provisional use" status code. The list of approved geogrids is available from: connect.ncdot.gov/resources/Materials/Pages/SoilsLaboratory.aspx

Provide geogrids for geogrid reinforcement with design strengths in accordance with the accepted submittals. Geogrids are typically approved for ultimate tensile strengths in the MD and CD or short-term design strengths for a 3-year design life in the MD based on material type. Define material type from the website above for shoring backfill as follows:

Material Type	Shoring Backfill
Borrow	A-2-4 Soil
Fine Aggregate	Class II, Type 1 or Class III Select Material
Coarse Aggregate	Class V or VI Select Material

(4) Welded Wire Grid and Metallic Strip Reinforcement

Provide welded wire grid and metallic strip reinforcement supplied by the Wire Wall Vendor or a manufacturer approved or licensed by the vendor. Use welded wire grid reinforcement ("mesh", "mats" and "ladders") that meet Article 1070-3 of the *2012 Standard Specifications* and metallic strip reinforcement ("straps") that meet ASTM A572 or A1011.

Preconstruction Requirements

(A) Concrete Barrier

Define "clear distance" behind concrete barrier as the horizontal distance between the barrier and edge of pavement. The minimum required clear distance for concrete barrier is shown in the plans. At the Contractor's option or if the minimum required clear distance is not available, set concrete barrier next to and up against traffic side of temporary shoring except for barrier above temporary walls. Concrete barrier with the minimum required clear distance is required above temporary walls.

(B) Temporary Guardrail

Define "clear distance" behind temporary guardrail as the horizontal distance between guardrail posts and temporary shoring. At the Contractor's option or if clear distance for cantilever, braced and anchored shoring is less than 4 ft, attach guardrail to traffic side of shoring as shown in the plans. Place ABC in clear distance and around guardrail posts instead of pavement. Do not use temporary guardrail above temporary walls.

(C) Temporary Shoring Designs

Before beginning temporary shoring design, survey existing ground elevations in the vicinity of shoring locations to determine actual design heights (H). Submit 8 copies of

working drawings and 3 copies of design calculations and a PDF copy of each for temporary shoring designs in accordance with Article 105-2 of the *2012 Standard Specifications*. Submit working drawings showing plan views, shoring profiles, typical sections and details of temporary shoring design and construction sequence. Do not begin shoring construction until a design submittal is accepted.

Have cantilever and braced shoring designed, detailed and sealed by an engineer licensed in the state of North Carolina. Use a prequalified Anchored Wall Design Consultant to design anchored shoring. Provide anchored shoring designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for an Anchored Wall Design Consultant. Include details in anchored shoring working drawings of anchor locations and lock-off loads, unit grout/ground bond strengths for ground anchors or minimum installation torque and torsional strength rating for helical anchors and if necessary, obstructions extending through shoring or interfering with anchors. Include details in the anchored shoring construction sequence of pile and anchor installation, excavation and anchor testing.

Use a prequalified MSE Wall Design Consultant to design temporary walls. Provide temporary wall designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for the MSE Wall Design Consultant. Include details in temporary wall working drawings of geotextile and reinforcement types, locations and directions and obstructions extending through walls or interfering with reinforcement.

(1) Soil Parameters

Design temporary shoring for the assumed soil parameters and groundwater elevations shown in the plans. Assume the following soil parameters for shoring backfill:

(a) Unit weight (γ) = 120 lb/cf;

(b)

Friction Angle (ϕ)	**Shoring Backfill**
30°	A-2-4 Soil
34°	Class II, Type 1 or Class III Select Material
38°	Class V or VI Select Material

(c) Cohesion (c) = 0 lb/sf.

(2) Traffic Surcharge

Design temporary shoring for a traffic surcharge of 250 lb/sf if traffic will be above and within H of shoring. This traffic surcharge does not apply to construction traffic. Design temporary shoring for any construction surcharge if construction traffic will be above and within H of shoring. For LRFD shoring designs, apply traffic (live load) surcharge in accordance with Figure C11.5.5-3 of the *AASHTO LRFD Bridge Design Specifications*.

(3) Cantilever, Braced and Anchored Shoring Designs

Use shoring backfill for fill sections and voids between cantilever, braced and anchored shoring and the critical failure surface. Use concrete or grout for embedded portions of drilled-in H-piles. Do not use drilled-in sheet piles.

Define "top of shoring" for cantilever, braced and anchored shoring as where the grade intersects the back of sheet piles or H-piles and timber lagging. Design cantilever, braced and anchored shoring for a traffic impact load of 2,000 lb/ft applied 18" above top of shoring if concrete barrier is above and next to shoring or temporary guardrail is above and attached to shoring. For anchored shoring designs, apply traffic impact load as horizontal load (P_{H1}) in accordance with Figure 3.11.6.3-2(a) of the AASHTO LRFD specifications.

Extend cantilever, braced and anchored shoring at least 32" above top of shoring if shoring is designed for traffic impact. Otherwise, extend shoring at least 6" above top of shoring.

Design cantilever, braced and anchored shoring for a maximum deflection of 3" if the horizontal distance to the closest edge of pavement or structure is less than H. Otherwise, design shoring for a maximum deflection of 6". Design cantilever and braced shoring in accordance with the plans and *AASHTO Guide Design Specifications for Bridge Temporary Works*.

Design anchored shoring in accordance with the plans and Article 11.9 of the *AASHTO LRFD Bridge Design Specifications*. Use a resistance factor of 0.80 for tensile resistance of anchors with bars, strands or shafts. Extend the unbonded length for ground anchors and the shallowest helix for helical anchors at least 5 ft behind the critical failure surface. Do not extend anchors beyond right-of-way or easement limits. If existing or future obstructions such as foundations, guardrail posts, pavements, pipes, inlets or utilities will interfere with anchors, maintain a clearance of at least 6" between obstructions and anchors.

(4) Temporary Wall Designs

Use shoring backfill in the reinforced zone of temporary walls. Separation geotextiles are required between shoring backfill and backfill, natural ground or culverts along the sides of the reinforced zone perpendicular to the wall face. For Class V or VI select material in the reinforced zone, separation geotextiles are also required between shoring backfill and backfill or natural ground on top of and at the back of the reinforced zone.

Design temporary walls in accordance with the plans and Article 11.10 of the *AASHTO LRFD Bridge Design Specifications*. Embed temporary walls at least 18" except for walls on structures or rock as determined by the Engineer. Use a uniform reinforcement length throughout the wall height of at least 0.7H or 6 ft,

whichever is greater. Extend the reinforced zone at least 6" beyond end of reinforcement. Do not locate the reinforced zone outside right-of-way or easement limits.

Use the simplified method for determining maximum reinforcement loads in accordance with the AASHTO LRFD specifications. For geotextile reinforcement, use geotextile properties approved by the Department or default values in accordance with the AASHTO LRFD specifications. For geogrid reinforcement, use approved geogrid properties available from the website shown elsewhere in this provision. If the website does not list a short-term design strength for an approved geogrid, use a short-term design strength equal to the ultimate tensile strength divided by 3.5 for the geogrid reinforcement. Use geosynthetic properties for the direction reinforcement will be installed, a 3-year design life and shoring backfill to be used in the reinforced zone.

Do not use more than 4 different reinforcement strengths for each temporary geosynthetic wall. Design temporary geotextile walls for a reinforcement coverage ratio (R_c) of 1.0 and temporary geogrid walls for an R_c of at least 0.8. For geogrid reinforcement with an R_c of less than 1.0, use a maximum horizontal clearance between geogrids of 3 ft and stagger reinforcement so geogrids are centered over gaps in the reinforcement layer below.

For temporary geosynthetic walls, use “L” shaped welded wire facing with 18" to 24" long legs. Locate geotextile or geogrid reinforcement so reinforcement layers are at the same level as the horizontal legs of welded wire facing. Use vertical reinforcement spacing equal to facing height. Wrap geotextile or geogrid reinforcement behind welded wire facing and extend reinforcement at least 3 ft back behind facing into shoring backfill.

For temporary wire walls with separate reinforcement and facing components, attach welded wire grid or metallic strip reinforcement to welded wire facing with a connection approved by the Department. For temporary geogrid and wire walls, retain shoring backfill at welded wire facing with retention geotextiles and extend geotextiles at least 3 ft back behind facing into backfill.

(D) Preconstruction Meeting

The Engineer may require a shoring preconstruction meeting to discuss the construction, inspection and testing of the temporary shoring. If required, schedule this meeting after all shoring submittals have been accepted. The Resident, District or Bridge Maintenance Engineer, Bridge or Roadway Construction Engineer, Geotechnical Operations Engineer, Contractor and Shoring Contractor Superintendent will attend this preconstruction meeting.

Construction Methods

Control drainage during construction in the vicinity of shoring. Direct run off away from shoring and shoring backfill. Contain and maintain backfill and protect material from erosion.

Install positive protection in accordance with the contract and accepted submittals. Use PCB in accordance with Section 1170 of the *2012 Standard Specifications* and Standard Drawing No. 1170.01 of the *2012 Roadway Standard Drawings*. Use temporary guardrail in accordance with Section 862 of the *2012 Standard Specifications* and Standard Drawing No. 862.01, 862.02 and 862.03 of the *2012 Roadway Standard Drawings*.

(A) Tolerances

Construct shoring with the following tolerances:

(1) Horizontal wires of welded wire facing are level in all directions,

(2) Shoring location is within 6" of horizontal and vertical alignment shown in the accepted submittals, and

(3) Shoring plumbness (batter) is not negative and within 2° of vertical.

(B) Cantilever, Braced and Anchored Shoring Installation

If overexcavation behind cantilever, braced or anchored shoring is shown in the accepted submittals, excavate before installing piles. Otherwise, install piles before excavating for shoring. Install cantilever, braced or anchored shoring in accordance with the construction sequence shown in the accepted submittals. Remove piles and if applicable, timber lagging when shoring is no longer needed.

(1) Pile Installation

Install piles with the minimum required embedment and extension in accordance with Subarticles 450-3(D) and 450-3(E) of the *2012 Standard Specifications* except that a pile driving equipment data form is not required. Piles may be installed with a vibratory hammer as approved by the Engineer.

Do not splice sheet piles. Use pile excavation to install drilled-in H-piles. After filling holes with concrete or grout to the elevations shown in the accepted submittals, remove any fluids and fill remaining portions of holes with flowable fill. Cure concrete or grout at least 7 days before excavating.

Notify the Engineer if refusal is reached before pile excavation or driven piles attain the minimum required embedment. When this occurs, a revised design submittal may be required.

(2) Excavation

Excavate in front of piles from the top down in accordance with the accepted submittals. For H-piles with timber lagging and braced and anchored shoring, excavate in staged horizontal lifts with a maximum height of 5 ft. Remove flowable fill and material in between H-piles as needed to install timber lagging. Position lagging with at least 3" of contact in the horizontal direction between the lagging and pile flanges. Do not excavate the next lift until timber lagging for the current lift is installed and if applicable, bracing and anchors for the current lift are accepted. Backfill behind cantilever, braced or anchored shoring with shoring backfill.

(3) Anchor Installation

If applicable, install foundations located behind anchored shoring before installing anchors. Fabricate and install ground anchors in accordance with the accepted submittals, Articles 6.4 and 6.5 of the *AASHTO LRFD Bridge Construction Specifications* and the following unless otherwise approved:

(a) Materials in accordance with this provision are required instead of materials conforming to Articles 6.4 and 6.5.3 of the AASHTO LRFD Specifications,

(b) Encapsulation-protected ground anchors in accordance with Article 6.4.1.2 of the AASHTO LRFD specifications are not required, and

(c) Corrosion protection for unbonded lengths of ground anchors and anchorage covers are not required.

Install helical anchors in accordance with the accepted submittals and Anchor Manufacturer's instructions. Measure torque during installation and do not exceed the torsional strength rating of the helical anchor. Attain the minimum required installation torque and penetration before terminating anchor installation. When replacing a helical anchor, embed last helix of the replacement anchor at least 3 helix plate diameters past the location of the first helix of the previous anchor.

(4) Anchor Testing

Proof test and lock-off anchors in accordance with the accepted submittals and Article 6.5.5 of the *AASHTO LRFD Bridge Construction Specifications* except for the acceptance criteria in Article 6.5.5.5. For the AASHTO LRFD specifications, "ground anchor" refers to a ground or helical anchor and "tendon" refers to a bar, strand or shaft.

(a) Anchor Acceptance

Anchor acceptance is based in part on the following criteria.

(i) For ground and helical anchors, total movement is less than 0.04" between the 1 and 10 minute readings or less than 0.08" between the 6 and 60 minute readings.

(ii) For ground anchors, total movement at maximum test load exceeds 80% of the theoretical elastic elongation of the unbonded length.

(b) Anchor Test Results

Submit 2 copies of anchor test records including movement versus load plots for each load increment within 24 hours of completing each row of anchors. The Engineer will review the test records to determine if the anchors are acceptable.

If the Engineer determines an anchor is unacceptable, revise the anchor design or installation methods. Submit a revised anchored shoring design for acceptance and provide an acceptable anchor with the revised design or installation methods. If required, replace the anchor or provide additional anchors with the revised design or installation methods.

(C) Temporary Wall Installation

Excavate as necessary for temporary walls in accordance with the plans and accepted submittals. If applicable, install foundations located in the reinforced zone before placing shoring backfill or reinforcement unless otherwise approved. Notify the Engineer when foundation excavation is complete. Do not place shoring backfill or reinforcement until excavation dimensions and foundation material are approved.

Erect welded wire facing so the wall position is as shown in the plans and accepted submittals. Set welded wire facing adjacent to each other in the horizontal and vertical direction to completely cover the wall face with facing. Stagger welded wire facing to create a running bond by centering facing over joints in the row below.

Wrap geotextile reinforcement and retention geotextiles behind welded wire facing as shown in the plans and accepted submittals and cover geotextiles with at least 3" of shoring backfill. Overlap adjacent geotextile reinforcement and retention and separation geotextiles at least 18" with seams oriented perpendicular to the wall face. Hold geotextiles in place with wire staples or anchor pins as needed.

Place reinforcement within 3" of locations shown in the plans and accepted submittals and in slight tension free of kinks, folds, wrinkles or creases. Install reinforcement with the direction shown in the plans and accepted submittals. For temporary wire walls with separate reinforcement and facing components, attach welded wire grid or metallic strip

reinforcement to welded wire facing as shown in the accepted submittals. Do not splice or overlap reinforcement so seams are parallel to the wall face. Contact the Engineer when unanticipated existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with reinforcement.

Place shoring backfill in the reinforced zone in 8" to 10" thick lifts. Compact A-2-4 soil and Class II, Type 1 and Class III select material in accordance with Subarticle 235-3(C) of the *2012 Standard Specifications*. Use only hand operated compaction equipment to compact backfill within 3 ft of welded wire facing. At a distance greater than 3 ft, compact shoring backfill with at least 4 passes of an 8 ton to 10 ton vibratory roller in a direction parallel to the wall face. Smooth wheeled or rubber tired rollers are also acceptable for compacting backfill. Do not use sheepsfoot, grid rollers or other types of compaction equipment with feet. Do not displace or damage reinforcement when placing and compacting shoring backfill. End dumping directly on geotextile or geogrid reinforcement is not permitted. Do not operate heavy equipment on reinforcement until it is covered with at least 8" of shoring backfill. Replace any damaged reinforcement to the satisfaction of the Engineer.

Backfill for temporary walls outside the reinforced zone in accordance with Article 410-8 of the *2012 Standard Specifications*. Bench temporary walls into the sides of excavations where applicable. For temporary geosynthetic walls with top of wall within 5 ft of finished grade, remove top facing and incorporate top reinforcement layer into fill when placing fill in front of wall. Temporary walls remain in place permanently unless otherwise required.

Measurement and Payment

Temporary Shoring will be measured and paid in square feet. Temporary walls will be measured as the square feet of exposed wall face area. Cantilever, braced or anchored shoring will be measured as the square feet of exposed shoring face area with the shoring height equal to the difference between the top and bottom of shoring elevations. Define “top of shoring” as where the grade intersects the back of sheet piles or H-piles and timber lagging. Define “bottom of shoring” as where the grade intersects front of sheet piles or H-piles and timber lagging. No measurement will be made for any embedment, shoring extension above top of shoring or pavement thickness above temporary walls.

The contract unit price for *Temporary Shoring* will be full compensation for providing shoring designs, submittals and materials, excavating, backfilling, hauling and removing excavated materials and supplying all labor, tools, equipment and incidentals necessary to construct temporary shoring.

No payment will be made for temporary shoring not shown in 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 shoring locations shown in the plans or estimated quantities shown in the bid item sheets as a result of actual field measurements or site conditions.

PCB will be measured and paid in accordance with Section 1170 of the *2012 Standard Specifications*. No additional payment will be made for anchoring PCB for temporary shoring. Costs for anchoring PCB will be incidental to temporary shoring.

Temporary guardrail will be measured and paid for in accordance with Section 862 of the *2012 Standard Specifications*.

Payment will be made under:

Pay Item	**Pay Unit**
Temporary Shoring	Square Foot

TRUCK MOUNTED CHANGEABLE MESSAGE SIGNS:

(8-21-12) 1101.02 SP11 R10

Revise the *2012 Roadway Standard Drawings* as follows:

Drawing No. 1101.02, Sheet 12, TEMPORARY LANE CLOSURES, replace General Note #11 with the following:

11- TRUCK MOUNTED CHANGEABLE MESSAGE SIGNS (TMCMS) USED ON SHADOW VEHICLES FOR "IN LANE" ACTIVITIES SHALL BE A MINIMUM OF 43" X 73". THE DISPLAY PANEL SHALL HAVE FULL MATRIX CAPABILITY WITH THE CAPABILITY TO PROVIDE 2 MESSAGE LINES WITH 7 CHARACTERS PER LINE WITH A MINIMUM CHARACTER HEIGHT OF 18". FOR ADDITIONAL MESSAGING, CONTACT THE WORK ZONE TRAFFIC CONTROL SECTION.

12- TMCMS USED FOR ADVANCED WARNING ON VEHICLES LOCATED ON THE SHOULDER MAY BE SMALLER THAN 43" X 73". THE DISPLAY PANEL SHALL HAVE THE CAPABILITY TO PROVIDE 2 MESSAGE LINES WITH 7 CHARACTERS PER LINE WITH A MINIMUM CHARACTER HEIGHT OF 18". FOR ADDITIONAL MESSAGING, CONTACT THE WORK ZONE TRAFFIC CONTROL SECTION.

Drawing No. 1101.02, Sheet 13, TEMPORARY LANE CLOSURES, replace General Note #12 with the following:

12- TRUCK MOUNTED CHANGEABLE MESSAGE SIGNS (TMCMS) USED ON SHADOW VEHICLES FOR "IN LANE" ACTIVITIES SHALL BE A MINIMUM OF 43" X 73". THE DISPLAY PANEL SHALL HAVE FULL MATRIX CAPABILITY WITH THE CAPABILITY TO PROVIDE 2 MESSAGE LINES WITH 7 CHARACTERS PER LINE WITH A MINIMUM CHARACTER HEIGHT OF 18". FOR ADDITIONAL MESSAGING, CONTACT THE WORK ZONE TRAFFIC CONTROL SECTION.

13- TMCMS USED FOR ADVANCED WARNING ON VEHICLES LOCATED ON THE SHOULDER MAY BE SMALLER THAN 43" X 73". THE DISPLAY PANEL SHALL HAVE THE CAPABILITY TO PROVIDE 2 MESSAGE LINES WITH 7 CHARACTERS PER LINE

WITH A MINIMUM CHARACTER HEIGHT OF 18". FOR ADDITIONAL MESSAGING, CONTACT THE WORK ZONE TRAFFIC CONTROL SECTION.

PERMANENT SEEDING AND MULCHING:
(7-1-95) 1660 SP16 R02

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 in the *2012 Standard Specifications* 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.

CONCRETE PAVED DITCH LEVEL SPREADER:
(3-18-03) (Rev 7-18-06) SP8 R110

Description

Construct and maintain level spreaders at the locations shown on the plans and in accordance with the details in the plans. The purpose of the level spreader is to collect stormwater discharged from a drainage system and to direct the stormwater into the buffer areas in a sheet flow condition. Work includes excavation, concrete, 2” PVC pipe, No. 57 Stone and shaping, furnishing and placing permanent soil reinforcement matting.

Materials

Item	Section
Concrete paved ditch	850

Provide permanent erosion control reinforcement mat constructed of 100% coconut fiber stitch, bonded between heavy duty UV stabilized cuspated (crimped) netting, overlaid with heavy duty UV stabilized top net. Stitch together three nettings on 1.5-inch centers using UV stabilized polyester thread to form a permanent three dimensional structure. The mat shall have the following physical properties:

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

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

Submit certification (Type 1, 2, or 3) from the manufacturer showing:
(A) Chemical and physical properties of the mat used, and
(B) Conformance of the mat with this specification

Soil Preparation

Bring areas to be protected with the mat to final grade and seed in accordance with section 1660. Work surface of the soil so that is smooth, firm, stable and free of rocks, clods, roots or other obstructions which would prevent the mat from lying in direct contact with the soil surface. Areas where the mat is to be placed will not need to be mulched.

Measurement and Payment

Permanent Soil Reinforcement Matting will be measured and paid for as the actual number of square yards that have been incorporated into the completed and accepted work.

No. 57 Stone will be measured and paid for as the actual number of tons of stone that have been incorporated into the completed and accepted work.

2" PVC pipe will not be measured or paid for separately and it is considered incidental to the other pay items associated with this work.

Concrete Paved Ditch and *Drainage Ditch Excavation* will be measured and paid for in accordance with Sections 850 and 240 of the *Standard Specifications*.

Payment will be made under:

Pay Item	**Pay Unit**
Permanent Soil Reinforcement Matting	Square Yards
No. 57 Stone	Tons
4” Concrete Paved Ditch	Square Yards
Drainage Ditch Excavation	Cubic Yard

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 Subarticle 108-13(E) of the *2012 Standard Specifications*.

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

(1-17-12) (Rev. 11-18-14) Z-4

Revise the *2012 Standard Specifications* as follows:

Division 2

Page 2-7, line 31, Article 215-2 Construction Methods, replace "Article 107-26" with "Article 107-25".

Page 2-17, Article 226-3, Measurement and Payment, line 2, delete "pipe culverts,".

Page 2-20, Subarticle 230-4(B), Contractor Furnished Sources, change references as follows: Line 1, replace "(4) Buffer Zone" with "(c) Buffer Zone"; **Line 12,** replace "(5) Evaluation for Potential Wetlands and Endangered Species" with "(d) Evaluation for Potential Wetlands and Endangered Species"; and **Line 33,** replace "(6) Approval" with "(4) Approval".

Division 3

Page 3-1, after line 15, Article 300-2 Materials, replace "1032-9(F)" with "1032-6(F)".

Division 4

Page 4-77, line 27, Subarticle 452-3(C) Concrete Coping, replace "sheet pile" with "reinforcement".

Division 6

Page 6-7, line 31, Article 609-3 Field Verification of Mixture and Job Mix Formula Adjustments, replace "30" with "45".

Page 6-10, line 42, Subarticle 609-6(C)(2), replace "Subarticle 609-6(E)" with "Subarticle 609-6(D)".

Page 6-11, Table 609-1 Control Limits, replace "Max. Spec. Limit" for the Target Source of $P_{0.075}/P_{be}$ Ratio with "1.0".

Page 6-40, Article 650-2 Materials, replace "Subarticle 1012-1(F)" with "Subarticle 1012-1(E)"

Division 8

Page 8-23, line 10, Article 838-2 Materials, replace "Portland Cement Concrete, Class B" with "Portland Cement Concrete, Class A".

Division 10

Page 10-166, Article 1081-3 Hot Bitumen, replace "Table 1081-16" with "Table 1081-2", replace "Table 1081-17" with "Table 1081-3", and replace "Table 1081-18" with "Table 1081-4".

Division 12

Page 12-7, Table 1205-3, add "FOR THERMOPLASTIC" to the end of the title.
Page 12-8, Subarticle 1205-5(B), line 13, replace "Table 1205-2" with "Table 1205-4".
Page 12-8, Table 1205-4 and 1205-5, replace "THERMOPLASTIC" in the title of these tables with "POLYUREA".
Page 12-9, Subarticle 1205-6(B), line 21, replace "Table 1205-4" with "Table 1205-6".
Page 12-11, Subarticle 1205-8(C), line 25, replace "Table 1205-5" with "Table 1205-7".

Division 15

Page 15-4, Subarticle 1505-3(F) Backfilling, line 26, replace "Subarticle 235-4(C)" with "Subarticle 235-3(C)".
Page 15-6, Subarticle 1510-3(B), after line 21, replace the allowable leakage formula with the following: $\mathbf{W=LD\sqrt{P} \div 148{,}000}$
Page 15-6, Subarticle 1510-3(B), line 32, delete "may be performed concurrently or" and replace with "shall be performed".
Page 15-17, Subarticle 1540-3(E), line 27, delete "Type 1".

Division 17

Page 17-26, line 42, Subarticle 1731-3(D) Termination and Splicing within Interconnect Center, delete this subarticle.

Revise the *2012 Roadway Standard Drawings* as follows:

1633.01 Sheet 1 of 1, English Standard Drawing for Matting Installation, replace "1633.01" with "1631.01".

STANDARD SPECIAL PROVISION

PLANT AND PEST QUARANTINES
(Imported Fire Ant, Gypsy Moth, Witchweed, And Other Noxious Weeds)

(3-18-03) (Rev. 10-15-13) 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.gov/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.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
   a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
   b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.
3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

STANDARD SPECIAL PROVISION

ON-THE-JOB TRAINING

(10-16-07) (Rev. 5-21-13) 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.ncbowd.com/section/on-the-job-training.

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.

General Decision Number: NC20140101

State: North Carolina

Construction Type: Highway

Counties: Alamance, Anson, Cabarrus, Chatham, Davie, Durham, Forsyth, Gaston, Guilford, Mecklenburg, Orange, Person, Randolph, Rockingham, Stokes, Union and Yadkin Counties in North Carolina.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Modification Number	Publication Date
0	N/A

SUNC2014-003 11/14/2014

	Rates	Fringes
BLASTER	$ 18.64	
CARPENTER	$ 13.68	.05
CEMENT MASON/CONCRETE FINISHER	$ 13.93	
ELECTRICIAN		
Electrician	$ 18.79	2.72
Telecommunications Technician	$ 15.19	1.25
IRONWORKER	$ 13.30	
LABORER		
Asphalt Raker and Spreader	$ 12.78	
Asphalt Screed/Jackman	$ 14.50	
Carpenter Tender	$ 12.51	.27
Cement Mason/Concrete Finisher Tender	$ 11.04	
Common or General	$ 10.40	.01
Guardrail/Fence Installer	$ 13.22	
Pipelayer	$ 12.43	
Traffic Signal/Lighting Installer	$ 15.65	.24
PAINTER		
Bridge	$ 23.77	
POWER EQUIPMENT OPERATOR		
Asphalt Broom Tractor	$ 10.00	
Bulldozer Fine	$ 16.13	
Bulldozer Rough	$ 14.36	
Concrete Grinder/Groover	$ 17.92	
Crane Boom Trucks	$ 18.19	
Crane Other	$ 19.83	
Crane Rough/All-Terrain	$ 19.10	
Drill Operator Rock	$ 14.28	
Drill Operator Structure	$ 20.89	
Excavator Fine	$ 16.95	
Excavator Rough	$ 13.63	
Grader/Blade Fine	$ 19.84	
Grader/Blade Rough	$ 15.47	
Loader 2 Cubic Yards or Less	$ 13.31	
Loader Greater Than 2 Cubic Yards	$ 16.19	
Material Transfer Vehicle (Shuttle Buggy)	$ 15.44	
Mechanic	$ 17.51	
Milling Machine	$ 15.22	
Off-Road Hauler/Water		

Tanker.....$ 11.83
Pavement Marking Equipment..$ 12.05
Paver Asphpalt.....$ 15.97
Paver Concrete.....$ 18.20
Roller Asphalt Breakdown....$ 12.79
Roller Asphalt Finish.....$ 13.76
Roller Other.....$ 12.08
Scraper Finish.....$ 12.65
Scraper Rough.....$ 11.50
Slip Form Machine.....$ 19.60
Tack Truck/Distributor
Operator.....$ 14.82

TRUCK DRIVER
GVWR of 26,000 or Less.....$ 11.45
GVWR of 26,001 Lbs or
Greater.....$ 13.57 .03

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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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 (29CFR 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 majority 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, DC 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, DC 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, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

PROJECT SPECIAL PROVISIONS

GEOTECHNICAL

ROCK EMBANKMENTS (1/17/2012)	GT-1.1	-	GT-1.2
STANDARD SHORING (11/19/2013)	GT-2.1	-	GT-2.4
MSE RETAINING WALLS (11/19/2013)	GT-3.1	-	GT-3.10
SEGMENTAL GRAVITY RETAINING WALLS (11/19/2013)	GT-4.1	-	GT-4.5
SOLDIER PILE RETAINING WALLS (11/19/2013)	GT-5.1	-	GT-5.8
CONTROL OF VIBRATION (SPECIAL)	GT-6.1	-	GT-6.2

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ROCK EMBANKMENTS: **(1-17-12)**

Description

Construct rock embankments in accordance with the contract. Use core material as necessary or required where piles will be driven through rock embankments and as shown in the plans. Rock embankments are required to construct embankments in water at locations shown in the plans and as directed.

Materials

Refer to Division 10 of the *Standard Specifications*.

Item	Section
Geotextile for Rock Embankments, Type 2	1056
Select Material	1016

Provide Type 2 geotextile for filtration geotextiles. Use Class VII select material for rock embankments. Use Class VI select material (standard size No. 57) for core material and over Class VII.

Construction Methods

Construct rock embankments in accordance with the slopes, dimensions and elevations shown in the plans and Section 235 of the *Standard Specifications*. If piles will be installed through rock embankments, place Class VII so there will be at least 5 ft between rock and piles. Place Class VII so smaller rocks are uniformly distributed throughout rock embankments. Provide a uniform surface free of obstructions, debris and groups of large rocks that could cause voids in embankments. When placing Class VII in lifts, place core material to top of the current lift before placing the next lift of Class VII.

Place and compact a layer of No. 57 stone at least 12" thick over rock embankments and core material. Install filtration geotextiles on top of No. 57 stone in accordance with Article 270-3 of the *Standard Specifications* before placing embankment fill material.

Measurement and Payment

Rock Embankments and *#57 Stone* will be measured and paid in tons. Select material will be measured by weighing material in trucks in accordance with Article 106-7 of the *Standard Specifications*. The contract unit prices for *Rock Embankments* and *#57 Stone* will be full compensation for providing, hauling, handling, placing, compacting and maintaining select material.

Geotextile for Rock Embankments will be measured and paid in square yards. Geotextiles will be measured along the top of the No. 57 stone layer as the square yards of exposed geotextiles before placing embankment fill. No measurement will be made for overlapping geotextiles. The contract unit price for *Geotextile for Rock Embankments* will be full compensation for providing, transporting and placing geotextiles.

Payment will be made under:

Pay Item	Pay Unit
Rock Embankments	Ton
#57 Stone	Ton

U-3615B **GT-1.2** Guilford County

Geotextile for Rock Embankments Square Yard

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10/10/2014

STANDARD SHORING: **(11-19-13)**

Description

Standard shoring includes standard temporary shoring and standard temporary mechanically stabilized earth (MSE) walls. At the Contractor's option, use standard shoring as noted in the plans or as directed. When using standard shoring, a temporary shoring design submittal is not required. Construct standard shoring based on actual elevations and shoring dimensions in accordance with the contract and Standard Drawing No. 1801.01 or 1801.02.

Define "standard temporary shoring" as cantilever shoring that meets the standard temporary shoring drawing (Standard Drawing No. 1801.01). Define "standard temporary wall" as a temporary MSE wall with geotextile or geogrid reinforcement that meets the standard temporary wall drawing (Standard Drawing No. 1801.02). Define "standard temporary geotextile wall" as a standard temporary wall with geotextile reinforcement and "standard temporary geogrid wall" as a standard temporary wall with geogrid reinforcement. Define "geosynthetics" as geotextiles or geogrids.

Provide positive protection for standard shoring at locations shown in the plans and as directed. See *Temporary Shoring* provision for positive protection types and definitions.

Materials

Refer to the *Standard Specifications*.

Item	**Section**
Anchor Pins	1056-2
Concrete Barrier Materials	1170-2
Flowable Fill, Excavatable	1000-6
Geotextiles	1056
Neat Cement Grout	1003
Portland Cement Concrete	1000
Select Material	1016
Steel Beam Guardrail Materials	862-2
Steel Sheet Piles and H-Piles	1084
Untreated Timber	1082-2
Welded Wire Reinforcement	1070-3
Wire Staples	1060-8(D)

Provide Type 6 material certifications for shoring materials. Use Class IV select material (standard size No. ABC) for temporary guardrail.

For drilled-in H-piles, use nonshrink neat cement grout or Class A concrete that meets Article 1000-4 of the *Standard Specifications* except as modified herein. Provide concrete with a slump of 6" to 8". Use an approved high-range water reducer to achieve this slump.

Based on actual shoring height, positive protection, groundwater elevation, slope or surcharge case and traffic impact at each standard temporary shoring location, use sheet piles with the minimum required section modulus or H-piles with the sizes shown in Standard Drawing No. 1801.01. Use untreated timber with a thickness of at least 3" and a bending stress of at least 1,000 psi for timber lagging.

(A) Shoring Backfill

Use Class II, Type 1, Class III, Class V or Class VI select material or material that meets AASHTO M 145 for soil classification A-2-4 with a maximum PI of 6 for shoring backfill except do not use the following:

(1) A-2-4 soil for backfill around culverts,

(2) A-2-4 soil in the reinforced zone of standard temporary walls with a back slope and

(3) Class VI select material in the reinforced zone of standard temporary geotextile walls.

(B) Standard Temporary Walls

Use welded wire reinforcement for welded wire facing, struts and wires with the dimensions and minimum wire sizes shown in Standard Drawing No. 1801.02. Provide Type 2 geotextile for separation and retention geotextiles. Define "machine direction" (MD) and "cross-machine direction" (CD) for geosynthetics in accordance with ASTM D4439. Do not use more than 4 different reinforcement strengths for each standard temporary wall.

(1) Geotextile Reinforcement

Provide Type 5 geotextile for geotextile reinforcement with a mass per unit area of at least 8 oz/sy in accordance with ASTM D5261. Based on actual wall height, groundwater elevation, slope or surcharge case and shoring backfill to be used in the reinforced zone at each standard temporary geotextile wall location, provide geotextiles with ultimate tensile strengths as shown in Standard Drawing No. 1801.02.

(2) Geogrid Reinforcement

Handle and store geogrids in accordance with Article 1056-2 of the *Standard Specifications*. Use geogrids with a roll width of at least 4 ft and an "approved" or "approved for provisional use" status code. The list of approved geogrids is available from:
connect.ncdot.gov/resources/Materials/Pages/SoilsLaboratory.aspx

Based on actual wall height, groundwater elevation, slope or surcharge case and shoring backfill to be used in the reinforced zone at each standard temporary geogrid wall location, provide geogrids for geogrid reinforcement with short-term design strengths as shown in Standard Drawing No. 1801.02. Geogrids are typically approved for ultimate tensile strengths in the MD and CD or short-term design strengths for a 3-year design life in the MD based on material type. Define material type from the website above for shoring backfill as follows:

Material Type	Shoring Backfill
Borrow	A-2-4 Soil
Fine Aggregate	Class II, Type 1 or Class III Select Material
Coarse Aggregate	Class V or VI Select Material

If the website does not list a short-term design strength for an approved geogrid, use a short-term design strength equal to the ultimate tensile strength divided by 3.5 for the geogrid reinforcement.

Preconstruction Requirements

(A) Concrete Barrier

Define "clear distance" behind concrete barrier as the horizontal distance between the barrier and edge of pavement. The minimum required clear distance for concrete barrier is shown in the plans. At the Contractor's option or if the minimum required clear distance is not available, set concrete barrier next to and up against traffic side of standard shoring except for barrier above standard temporary walls. Concrete barrier with the minimum required clear distance is required above standard temporary walls.

(B) Temporary Guardrail

Define "clear distance" behind temporary guardrail as the horizontal distance between guardrail posts and standard shoring. At the Contractor's option or if clear distance for standard temporary shoring is less than 4 ft, attach guardrail to traffic side of shoring as shown in the plans. Place ABC in clear distance and around guardrail posts instead of pavement. Do not use temporary guardrail above standard temporary walls.

(C) Standard Shoring Selection Forms

Before beginning standard shoring construction, survey existing ground elevations in the vicinity of standard shoring locations to determine actual shoring or wall heights (H). Submit a standard shoring selection form for each location at least 7 days before starting standard shoring construction. Standard shoring selection forms are available from: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx

(D) Preconstruction Meeting

The Engineer may require a shoring preconstruction meeting to discuss the construction and inspection of the standard shoring. If required, schedule this meeting after all standard shoring selection forms have been submitted. The Resident, District or Bridge Maintenance Engineer, Bridge or Roadway Construction Engineer, Geotechnical Operations Engineer, Contractor and Shoring Contractor Superintendent will attend this preconstruction meeting.

Construction Methods

Construct standard shoring in accordance with the *Temporary Shoring* provision.

(A) Standard Temporary Shoring Installation

Based on actual shoring height, positive protection, groundwater elevation, slope or surcharge case and traffic impact at each standard temporary shoring location, install piles with the minimum required embedment and extension for each shoring section in accordance with Standard Drawing No. 1801.01. For concrete barrier above and next to standard temporary shoring and temporary guardrail above and attached to standard temporary shoring, use "surcharge case with traffic impact" in accordance with Standard Drawing No. 1801.01. Otherwise, use "slope or surcharge case with no traffic impact" in accordance with Standard Drawing No. 1801.01. If refusal is reached before driven piles

attain the minimum required embedment, use drilled-in H-piles with timber lagging for standard temporary shoring.

(B) Standard Temporary Walls Installation

Based on actual wall height, groundwater elevation, slope or surcharge case, geotextile or geogrid reinforcement and shoring backfill in the reinforced zone at each standard temporary wall location, construct walls with the minimum required reinforcement length and number of reinforcement layers for each wall section in accordance with Standard Drawing No. 1801.02. For standard temporary walls with pile foundations in the reinforced zone, drive piles through reinforcement after constructing temporary walls.

For standard temporary walls with interior angles less than 90°, wrap geosynthetics at acute corners as directed by the Engineer. Place geosynthetics as shown in Standard Drawing No. 1801.02. Place separation geotextiles between shoring backfill and backfill, natural ground or culverts along the sides of the reinforced zone perpendicular to the wall face. For Class V or VI select material in the reinforced zone, place separation geotextiles between shoring backfill and backfill or natural ground on top of and at the back of the reinforced zone.

Measurement and Payment

Standard shoring will be measured and paid in accordance with the *Temporary Shoring* provision.

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN

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10/10/2014

MECHANICALLY STABILIZED EARTH RETAINING WALLS (11-19-13)

1.0 GENERAL

Construct mechanically stabilized earth (MSE) retaining walls consisting of steel or geosynthetic reinforcement in the reinforced zone connected to vertical facing elements. The facing elements may be precast concrete panels or segmental retaining wall (SRW) units unless required otherwise in the plans or the *NCDOT Policy for Mechanically Stabilized Earth Retaining Walls* prohibits the use of SRW units. At the Contractor's option, use coarse or fine aggregate in the reinforced zone of MSE retaining walls except do not use fine aggregate for walls subject to scour, walls that support or are adjacent to railroads or walls with design heights greater than 35 ft or internal acute corners less than 45°. Provide reinforced concrete coping as required. Design and construct MSE retaining walls based on actual elevations and wall dimensions in accordance with the contract and accepted submittals. Use a prequalified MSE Wall Installer to construct MSE retaining walls.

Define "MSE wall" as a mechanically stabilized earth retaining wall and "MSE Wall Vendor" as the vendor supplying the chosen MSE wall system. Define a "segmental retaining wall" as an MSE wall with SRW units. Define an "abutment wall" as an MSE wall with bridge foundations in any portion of the reinforced zone or an MSE wall connected to an abutment wall. Even if bridge foundations only penetrate a small part of the reinforced zone, the entire MSE wall is considered an abutment wall.

Define "reinforcement" as steel or geosynthetic reinforcement and "geosynthetics" as geosynthetic grids (geogrids) or strips (geostrips). Define "aggregate" as coarse or fine aggregate. Define "panel" as a precast concrete panel and "coping" as precast or cast-in-place concrete coping.

Use an approved MSE wall system in accordance with the plans, NCDOT MSE wall policy and any NCDOT restrictions for the chosen system. Value engineering proposals for other MSE wall systems will not be considered. Do not use segmental retaining walls or MSE wall systems with an "approved for provisional use" status code for critical walls or MSE walls connected to critical walls. Critical walls are defined in the NCDOT MSE wall policy. The list of approved MSE wall systems and NCDOT MSE wall policy are available from:
connect.ncdot.gov/resources/Geological/Pages/Products.aspx

2.0 MATERIALS

Refer to the *Standard Specifications*.

Item	Section
Aggregate	1014
Anchor Pins	1056-2
Curing Agents	1026
Geotextiles, Type 2	1056
Joint Materials	1028

Portland Cement Concrete, Class A	1000
Precast Retaining Wall Coping	1077
Reinforcing Steel	1070
Retaining Wall Panels	1077
Segmental Retaining Wall Units	1040-4
Shoulder Drain Materials	816-2
Wire Staples	1060-8(D)

Provide Type 2 geotextile for filtration and separation geotextiles. Use Class A concrete for cast-in-place coping, leveling concrete and pads.

Use panels and SRW units from producers approved by the Department and licensed by the MSE Wall Vendor. Unless required otherwise in the contract, produce panels with a smooth flat final finish that meets Article 1077-11 of the *Standard Specifications*. Accurately locate and secure reinforcement connectors in panels and maintain required concrete cover. Produce panels within 1/4" of the panel dimensions shown in the accepted submittals.

Damaged panels or SRW units with excessive discoloration, chips or cracks as determined by the Engineer will be rejected. Do not damage reinforcement connection devices or mechanisms in handling or storing panels and SRW units.

Store steel materials on blocking at least 12" above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign materials. Handle and store geosynthetics in accordance with Article 1056-2 of the *Standard Specifications*. Load, transport, unload and store MSE wall materials so materials are kept clean and free of damage. Bent, damaged or defective materials will be rejected.

A. Aggregate

Use standard size No. 57, 57M, 67 or 78M that meets Table 1005-1 of the *Standard Specifications* for coarse aggregate except do not use No. 57 or 57M stone in the reinforced zone of MSE walls with geosynthetic reinforcement. Use the following for fine aggregate:

1. Standard size No. 1S, 2S, 2MS or 4S that meets Table 1005-2 of the *Standard Specifications* or
2. Gradation that meets Class III, Type 3 select material in accordance with Article 1016-3 of the *Standard Specifications*.

Fine aggregate is exempt from mortar strength in Subarticle 1014-1(E) of the *Standard Specifications*. Provide fine aggregate that meets the following requirements:

FINE AGGREGATE REQUIREMENTS					
Reinforcement or Connector Material	**pH**	**Resistivity**	**Chlorides**	**Sulfates**	**Organics**
Steel	5-10	$\geq 3{,}000\ \Omega \cdot cm$	$\leq$ 100 ppm	$\leq$ 200 ppm	$\leq$ 1%

Polyester Type (PET) Geogrid	5-8	N/A*	N/A*	N/A*	≤ 1%
Geostrip or Polyolefin Geogrid	4.5-9	N/A*	N/A*	N/A*	≤ 1%

* Resistivity, chlorides and sulfates are not applicable to geosynthetics.

Use fine aggregate from a source that meets the *Mechanically Stabilized Earth Wall Fine Aggregate Sampling and Testing Manual*. Perform organic content tests in accordance with AASHTO T 267 instead of Subarticle 1014-1(D) of the *Standard Specifications*. Perform electrochemical tests in accordance with the following test procedures:

Property	**Test Method**
pH	AASHTO T 289
Resistivity	AASHTO T 288
Chlorides	AASHTO T 291
Sulfates	AASHTO T 290

B. Reinforcement

Provide steel or geosynthetic reinforcement supplied by the MSE Wall Vendor or a manufacturer approved or licensed by the vendor. Use approved reinforcement for the chosen MSE wall system. The list of approved reinforcement for each MSE wall system is available from the website shown elsewhere in this provision.

1. Steel Reinforcement

Provide Type 1 material certifications in accordance with Article 106-3 of the *Standard Specifications* for steel reinforcement. Use welded wire grid reinforcement (“mesh”, “mats” and “ladders”) that meet Article 1070-3 of the *Standard Specifications* and metallic strip reinforcement (“straps”) that meet ASTM A572 or A1011. Galvanize steel reinforcement in accordance with Section 1076 of the *Standard Specifications*.

2. Geosynthetic Reinforcement

Define “machine direction” (MD) for geosynthetics in accordance with ASTM D4439. Provide Type 1 material certifications for geosynthetic strengths in the MD in accordance with Article 1056-3 of the *Standard Specifications*. Test geosynthetics in accordance with ASTM D6637.

C. Bearing Pads

For MSE walls with panels, use bearing pads that meet Section 3.6.1.a of the *FHWA Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume I* (Publication No. FHWA-NHI-10-024). Provide bearing pads that meet the following requirements:

BEARING PAD THICKNESS REQUIREMENTS

Panel Facing Area (A)	Minimum Pad Thickness After Compression (based on 2 times panel weight above pads)
A ≤ 30 sf	1/2"
30 sf < A ≤ 75 sf	3/4"

D. Miscellaneous Components

Miscellaneous components may include connectors (e.g., anchors, bars, clamps, pins, plates, ties, etc.), fasteners (e.g., bolts, nuts, washers, etc.) and any other MSE wall components not included above. Galvanize steel components in accordance with Section 1076 of the *Standard Specifications*. Provide approved miscellaneous components for the chosen MSE wall system. The list of approved miscellaneous components for each MSE wall system is available from the website shown elsewhere in this provision.

3.0 PRECONSTRUCTION REQUIREMENTS

A. MSE Wall Surveys

The Retaining Wall Plans show a plan view, typical sections, details, notes and an elevation or profile view (wall envelope) for each MSE wall. Before beginning MSE wall design, survey existing ground elevations shown in the plans and other elevations in the vicinity of MSE wall locations as needed. Based on these elevations, finished grades and actual MSE wall dimensions and details, submit revised wall envelopes for acceptance. Use accepted wall envelopes for design.

B. MSE Wall Designs

Submit 11 copies of working drawings and 3 copies of design calculations and a PDF copy of each for MSE wall designs at least 30 days before the preconstruction meeting. Note name and NCDOT ID number of the panel or SRW unit production facility on the working drawings. Do not begin MSE wall construction until a design submittal is accepted.

Use a prequalified MSE Wall Design Consultant to design MSE walls. Provide designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for the MSE Wall Design Consultant.

Design MSE walls in accordance with the plans, *AASHTO LRFD Bridge Design Specifications* and any NCDOT restrictions for the chosen MSE wall system unless otherwise required. Design MSE walls for seismic if walls are located in seismic zone 2 based on Figure 2-1 of the *Structure Design Manual*. Use a uniform reinforcement length throughout the wall height of at least 0.7H with H as defined for the embedment requirements in this provision or 6 ft, whichever is greater, unless shown otherwise in the plans. Extend the reinforced zone at least 6" beyond end of reinforcement. Do not locate drains, the reinforced zone or leveling pads outside right-of-way or easement limits.

Use the simplified method for determining maximum reinforcement loads and approved design parameters for the chosen MSE wall system or default values in accordance with the AASHTO LRFD specifications. Design steel components including reinforcement and connectors for the design life noted in the plans and aggregate type in the reinforced zone. Use corrosion loss rates for galvanizing in accordance with the AASHTO LRFD specifications for nonaggressive backfill and carbon steel corrosion rates in accordance with the following:

CARBON STEEL CORROSION RATES	
Aggregate Type (in the reinforced zone)	**Corrosion Loss Rate (after zinc depletion)**
Coarse	0.47 mil/year
Fine (except abutment walls)	0.58 mil/year
Fine (abutment walls)	0.70 mil/year

For geosynthetic reinforcement and connectors, use approved geosynthetic properties for the design life noted in the plans and aggregate type in the reinforced zone.

When noted in the plans, design MSE walls for a live load (traffic) surcharge of 250 lb/sf in accordance with Figure C11.5.6-3(b) of the AASHTO LRFD specifications. For steel beam guardrail with 8 ft posts or concrete barrier rail above MSE walls, analyze top 2 reinforcement layers for traffic impact loads in accordance with Section 7.2 of the FHWA MSE wall manual shown elsewhere in this provision except use the following for geosynthetic reinforcement rupture:

$$\phi\, T_{al}\, R_c \geq T_{max} + (T_I / RF_{CR})$$

Where,

ϕ = resistance factor for tensile resistance in accordance with Section 7.2.1 of the FHWA MSE wall manual,

T_{al} = long-term geosynthetic design strength approved for chosen MSE wall system,

R_c = reinforcement coverage ratio = 1 for continuous geosynthetic reinforcement,

T_{max} = factored static load in accordance with Section 7.2 of the FHWA MSE wall manual,

T_I = factored impact load in accordance with Section 7.2 of the FHWA MSE wall manual and

RF_{CR} = creep reduction factor approved for chosen MSE wall system.

If existing or future obstructions such as foundations, guardrail, fence or handrail posts, moment slabs, pavements, pipes, inlets or utilities will interfere with reinforcement, maintain a clearance of at least 3" between obstructions and reinforcement unless otherwise approved. Locate reinforcement layers so all of reinforcement length is within 3" of corresponding connection elevations.

Use 6" thick cast-in-place unreinforced concrete leveling pads beneath panels and SRW units that are continuous at steps and extend at least 6" in front of and behind bottom

row of panels or SRW units. Unless required otherwise in the plans, embed top of leveling pads in accordance with the following requirements:

EMBEDMENT REQUIREMENTS		
Front Slope[1] (H:V)	**Minimum Embedment Depth[2] (whichever is greater)**	
6:1 or flatter (except abutment walls)	H/20	1 ft for H ≤ 10 ft 2 ft for H > 10 ft
6:1 or flatter (abutment walls)	H/10	2 ft
> 6:1 to < 3:1	H/10	2 ft
3:1 to 2:1	H/7	2 ft

1. Front slope is as shown in the plans.
2. Define "H" as the maximum design height plus embedment per wall with the design height and embedment as shown in the plans.

When noted in the plans, locate a continuous aggregate shoulder drain along base of reinforced zone behind aggregate. Provide wall drainage systems consisting of drains and outlet components in accordance with Standard Drawing No. 816.02 of the *Roadway Standard Drawings*.

For MSE walls with panels, place at least 2 bearing pads in each horizontal panel joint so the final horizontal joint opening is between 5/8" and 7/8". Additional bearing pads may be required for panels wider than 5 ft as determined by the Engineer. Cover joints at back of panels with filtration geotextiles at least 12" wide.

For segmental retaining walls, fill SRW unit core spaces with coarse aggregate and between and behind SRW units with coarse aggregate for a horizontal distance of at least 18".

Separation geotextiles are required between aggregate and overlying fill or pavement sections except when concrete pavement, full depth asphalt or cement treated base is placed directly on aggregate. Separation geotextiles may also be required between coarse aggregate and backfill or natural ground as determined by the Engineer.

Unless required otherwise in the plans, use reinforced concrete coping at top of walls. Use coping dimensions shown in the plans and cast-in-place concrete coping for segmental retaining walls and when noted in the plans. When shown in the plans and at the Contractor's option, connect cast-in-place concrete coping to panels and SRW units with dowels or extend coping down back of MSE walls. Also, connect cast-in-place leveling concrete for precast concrete coping to panels with dowels. When concrete barrier rail is required above MSE walls, use concrete barrier rail with moment slab as shown in the plans.

Submit working drawings and design calculations for acceptance in accordance with Article 105-2 of the *Standard Specifications*. Submit working drawings showing plan views, wall profiles with required resistances, typical sections with reinforcement and

connection details, aggregate locations and types, geotextile locations and details of leveling pads, panels or SRW units, coping, bin walls, slip joints, etc. If necessary, include details on working drawings for concrete barrier rail with moment slab, reinforcement splices if allowed for the chosen MSE wall system, reinforcement connected to end bent caps and obstructions extending through walls or interfering with reinforcement, leveling pads, barriers or moment slabs. Submit design calculations for each wall section with different surcharge loads, geometry or material parameters. At least one analysis is required for each wall section with different reinforcement lengths. When designing MSE walls with computer software other than MSEW, use MSEW version 3.0 with update 14.93 or later, manufactured by ADAMA Engineering, Inc. to verify the design. At least one MSEW analysis is required per 100 ft of wall length with at least one MSEW analysis for the wall section with the longest reinforcement. Submit electronic MSEW input files and PDF output files with design calculations.

C. Preconstruction Meeting

Before starting MSE wall construction, hold a preconstruction meeting to discuss the construction and inspection of the MSE walls. Schedule this meeting after all MSE wall submittals have been accepted. The Resident or Bridge Maintenance Engineer, Bridge Construction Engineer, Geotechnical Operations Engineer, Contractor and MSE Wall Installer Superintendent will attend this preconstruction meeting.

4.0 CORROSION MONITORING

Corrosion monitoring is required for MSE walls with steel reinforcement. The Engineer will determine the number of monitoring locations and where to install the instrumentation. Contact the Materials and Tests (M&T) Unit before beginning wall construction. M&T will provide the corrosion monitoring instrumentation kits and if necessary, assistance with installation.

5.0 SITE ASSISTANCE

Unless otherwise approved, provide an MSE Wall Vendor representative to assist and guide the MSE Wall Installer on-site for at least 8 hours when the first panels or SRW units and reinforcement layer are placed. If problems are encountered during construction, the Engineer may require the vendor representative to return to the site for a time period determined by the Engineer.

6.0 CONSTRUCTION METHODS

Control drainage during construction in the vicinity of MSE walls. Direct run off away from MSE walls, aggregate and backfill. Contain and maintain aggregate and backfill and protect material from erosion.

Excavate as necessary for MSE walls in accordance with the accepted submittals. If applicable and at the Contractor's option, use temporary shoring for wall construction instead of temporary slopes to construct MSE walls. Define "temporary shoring for wall construction" as temporary shoring not shown in the plans or required by the Engineer

including shoring for OSHA reasons or the Contractor's convenience.

Unless required otherwise in the plans, install foundations located in the reinforced zone before placing aggregate or reinforcement. Notify the Engineer when foundation excavation is complete. Do not place leveling pad concrete, aggregate or reinforcement until excavation dimensions and foundation material are approved.

Construct cast-in-place concrete leveling pads at elevations and with dimensions shown in the accepted submittals and in accordance with Section 420 of the *Standard Specifications*. Cure leveling pads at least 24 hours before placing panels or SRW units.

Erect and support panels and stack SRW units so the final wall position is as shown in the accepted submittals. Place SRW units with a maximum vertical joint width of 3/8".

Set panels with a vertical joint width of 3/4". Place bearing pads in horizontal panel joints and cover all panel joints with filtration geotextiles as shown in the accepted submittals. Attach filtration geotextiles to back of panels with adhesives, tapes or other approved methods.

Stagger panels and SRW units to create a running bond by centering panels or SRW units over joints in the row below as shown in the accepted submittals. Construct MSE walls with the following tolerances:

A. SRW units are level from front to back and between units when checked with a 3 ft long level,

B. Final wall face is within 3/4" of horizontal and vertical alignment shown in the accepted submittals when measured along a 10 ft straightedge and

C. Final wall plumbness (batter) is not negative and within 0.5° of vertical unless otherwise approved.

Place reinforcement at locations and elevations shown in the accepted submittals and within 3" of corresponding connection elevations. Install reinforcement with the direction shown in the accepted submittals. Place reinforcement in slight tension free of kinks, folds, wrinkles or creases. Reinforcement may be spliced once per reinforcement length if shown in the accepted submittals. Use reinforcement pieces at least 6 ft long. Contact the Engineer when unanticipated existing or future obstructions such as foundations, guardrail, fence or handrail posts, pavements, pipes, inlets or utilities will interfere with reinforcement. To avoid obstructions, deflect, skew or modify reinforcement as shown in the accepted submittals.

Place aggregate in the reinforced zone in 8" to 10" thick lifts. Compact fine aggregate in accordance with Subarticle 235-3(C) of the *Standard Specifications*. Use only hand operated compaction equipment to compact aggregate within 3 ft of panels or SRW units. At a distance greater than 3 ft, compact aggregate with at least 4 passes of an 8 ton to 10 ton vibratory roller in a direction parallel to the wall face. Smooth wheeled or rubber tired rollers are also acceptable for compacting aggregate. Do not use sheepsfoot, grid rollers or other types of compaction equipment with feet. Do not displace or damage

reinforcement when placing and compacting aggregate. End dumping directly on geosynthetics is not permitted. Do not operate heavy equipment on reinforcement until it is covered with at least 8" of aggregate. Replace any damaged reinforcement to the satisfaction of the Engineer.

Backfill for MSE walls outside the reinforced zone in accordance with Article 410-8 of the *Standard Specifications*. If a drain is required, install wall drainage systems as shown in the accepted submittals and in accordance with Section 816 of the *Standard Specifications*.

Place and construct coping and leveling concrete as shown in the accepted submittals. Construct leveling concrete in accordance with Section 420 of the *Standard Specifications*. Construct cast-in-place concrete coping in accordance with Subarticle 452-3(C) of the *Standard Specifications*. When single faced precast concrete barrier is required in front of and against MSE walls, stop coping just above barrier so coping does not interfere with placing barrier up against wall faces.

When separation geotextiles are required, overlap adjacent geotextiles at least 18" and hold separation geotextiles in place with wire staples or anchor pins as needed. Seal joints above and behind MSE walls between coping and concrete slope protection with silicone sealant.

7.0 MEASUREMENT AND PAYMENT

MSE Retaining Wall No. __ will be measured and paid in square feet. MSE walls will be measured as the square feet of wall face area with the pay height equal to the difference between top of wall and top of leveling pad elevations. Define “top of wall” as top of coping or top of panels or SRW units for MSE walls without coping.

The contract unit price for *MSE Retaining Wall No.* __ will be full compensation for providing designs, submittals, labor, tools, equipment and MSE wall materials, excavating, backfilling, hauling and removing excavated materials and supplying site assistance, leveling pads, panels, SRW units, reinforcement, aggregate, wall drainage systems, geotextiles, bearing pads, coping, miscellaneous components and any incidentals necessary to construct MSE walls. The contract unit price for *MSE Retaining Wall No.* __ will also be full compensation for reinforcement connected to and aggregate behind end bent caps in the reinforced zone, if required.

No separate payment will be made for temporary shoring for wall construction. Temporary shoring for wall construction will be incidental to the contract unit price for *MSE Retaining Wall No.* __.

The contract unit price for *MSE Retaining Wall No.* __ does not include the cost for ditches, fences, handrails, barrier or guardrail associated with MSE walls as these items will be paid for elsewhere in the contract.

Where it is necessary to provide backfill material behind the reinforced zone from sources other than excavated areas or borrow sources used in connection with other work in the contract, payment for furnishing and hauling such backfill material will be paid as extra

work in accordance with Article 104-7 of the *Standard Specifications*. Placing and compacting such backfill material is not considered extra work but is incidental to the work being performed.

Payment will be made under:

Pay Item	**Pay Unit**
MSE Retaining Wall No. __	Square Foot

DocuSigned by:
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10/13/2014

SEGMENTAL GRAVITY RETAINING WALLS (11-19-13)

1.0 GENERAL

Construct segmental gravity retaining walls consisting of segmental retaining wall (SRW) units supported by aggregate footings. Provide cast-in-place concrete slope protection as required. If the plans do not include Standard Drawing No. 453.02 or 453.03, design and construct segmental gravity retaining walls based on actual elevations, wall dimensions and batter in accordance with the contract and accepted submittals. Otherwise, construct segmental gravity retaining walls based on actual elevations, wall dimensions and batter in accordance with the contract, accepted submittals and Standard Drawing No. 453.02 or 453.03.

Define “block wall” as a segmental gravity retaining wall and “standard block wall” as a block wall that meets a standard segmental gravity retaining wall drawing (Standard Drawing No. 453.02 or 453.03). Define “blocks” as SRW units, “cap blocks” as SRW cap units and “Block Vendor” as the vendor licensing the block producer. Define “slope protection” as cast-in-place concrete slope protection.

2.0 MATERIALS

Refer to the *Standard Specifications*.

Item	Section
Anchor Pins	1056-2
Curing Agents	1026
Geotextiles, Type 2	1056
Joint Filler	1028-1
Portland Cement Concrete, Class B	1000
Segmental Retaining Wall Units	1040-4
Select Material, Class VI	1016
Subsurface Drainage Materials	815-2
Wire Staples	1060-8(D)

Provide Type 2 geotextile for separation geotextiles. Use Class VI select material for No. 57 stone and Class B concrete for slope protection. Provide PVC pipes, fittings, outlet pipes and concrete pads for subsurface drainage materials. For PVC pipes behind block walls, use pipes with perforations that meet AASHTO M 278.

Use blocks from producers approved by the Department and licensed by the Block Vendor. Notify the Engineer of the name and NCDOT ID number of the SRW unit production facility before beginning block production. Unless required otherwise in the plans, provide blocks with a depth (front to back) of at least 12" and cap blocks with a depth of at least 8".

Use approved SRW units for standard block walls. Blocks for standard block walls are approved for either 2 ft or 4 ft maximum design heights with the design height as shown in Standard Drawing No. 453.02 or 453.03. The list of approved SRW units with maximum design heights is available from:

connect.ncdot.gov/resources/Geological/Pages/Products.aspx

Do not mix blocks from different Block Vendors on the same block wall. Damaged blocks with excessive discoloration, chips or cracks as determined by the Engineer will be rejected.

Provide adhesives recommended by the Block Vendor. Store adhesives in accordance with the manufacturer's instructions. Load, transport, unload and store block wall materials so materials are kept clean and free of damage.

3.0 PRECONSTRUCTION REQUIREMENTS

A. Block Wall Surveys

The plans typically show a plan view, typical sections, details, notes and an elevation or profile view (wall envelope) for each block wall. Before beginning block wall design or construction, survey existing ground elevations along wall face locations and other elevations in the vicinity of block wall locations as needed. Based on these elevations, finished grades and actual block wall dimensions, details and batter, submit wall envelopes for acceptance. Use accepted wall envelopes for design, if required, and construction.

B. Block Wall Designs

If the plans do not include Standard Drawing No. 453.02 or 453.03, submit 11 copies of working drawings and 3 copies of design calculations and a PDF copy of each for block wall designs at least 30 days before starting block wall construction. Do not begin block wall construction until a design submittal is accepted.

Design block walls in accordance with the plans and Article 11.11 of the *AASHTO LRFD Bridge Design Specifications* unless otherwise required. Design block walls for the wall batter required by the Block Vendor and clearances shown in the plans. Do not locate blocks or footings outside right-of-way or easement limits.

Use No. 57 stone for aggregate footings beneath blocks. Use 10" thick footings that are continuous at steps and extend at least 6" in front of and at least 9" behind bottom row of blocks. Unless required otherwise in the plans, embed bottom of footings at least 18" below bottom of walls shown in the plans. When noted in the plans, locate a 4" diameter continuous perforated PVC drain pipe in the No. 57 stone in back of footings.

Fill block core spaces with No. 57 stone and between and behind blocks with No. 57 stone for a horizontal distance of at least 12" so stone is continuous in all directions. Assume a unit weight of 100 lb/cf for No. 57 stone. Separation geotextiles are required between No. 57 stone and backfill or natural ground and between stone and overlying fill or pavement section except when concrete pavement, full depth asphalt or cement treated base is placed directly on stone.

Use cap blocks at top of walls. Step top of walls as shown in the plans and double

stack cap blocks at steps so cap blocks are continuous at steps. Extend top of walls 4" to 12" above where finished grade intersects back of blocks or cap blocks. When single faced precast concrete barrier is required in front of and against block walls, fill voids between barrier and wall faces with No. 57 stone.

Submit working drawings and design calculations for acceptance in accordance with Article 105-2 of the *Standard Specifications*. Submit working drawings showing plan views, wall profiles with required resistances, typical sections, No. 57 stone and geotextile locations and details of footings, blocks, cap blocks, etc. If necessary, include details on working drawings for slope protection and obstructions extending through walls or interfering with footings. Submit design calculations for each wall section with different geometry or material parameters. When designing block walls with computer software, a hand calculation is required for the tallest wall section. Provide block wall designs sealed by an engineer licensed in the state of North Carolina.

4.0 CONSTRUCTION METHODS

Control drainage during construction in the vicinity of block walls. Direct run off away from block walls, No. 57 stone and backfill. Contain and maintain stone and backfill and protect material from erosion.

Excavate as necessary for block walls in accordance with the plans and accepted submittals. Notify the Engineer when foundation excavation is complete. Do not place No. 57 stone for footings until excavation dimensions and foundation material are approved.

Construct aggregate footings at elevations and with dimensions shown in the plans and accepted submittals. If a drain is required, install wall drainage systems consisting of drains and outlet components as shown in the plans and accepted submittals and in accordance with Section 815 of the *Standard Specifications*. Compact No. 57 stone for footings with a vibratory compactor to the satisfaction of the Engineer.

Stack blocks with no negative wall batter (wall face leaning forward) so the final wall position is as shown in the plans and accepted submittals. Place blocks with a maximum vertical joint width of 3/8". Stagger blocks to create a running bond by centering blocks over joints in the row below as shown in the plans and accepted submittals. Construct block walls with the following tolerances:

A. Blocks are level from front to back and between blocks when checked with a 3 ft long level,

B. Final wall face is within 2" of horizontal and vertical alignment shown in the plans and accepted submittals, and

C. Wall batter is within 2° of batter required by the Block Vendor.

Overlap adjacent separation geotextiles at least 18" at seams and hold geotextiles in place

with wire staples or anchor pins as needed. Place No. 57 stone between and behind blocks in 8" to 10" thick lifts. Compact stone with hand operated compaction equipment to the satisfaction of the Engineer. Backfill for block walls behind No. 57 stone in accordance with Article 410-8 of the *Standard Specifications*.

Set cap blocks with a 1/2" to 1-1/2" overhang as shown in the plans and accepted submittals. Place cap blocks using adhesive in accordance with the manufacturer's instructions. Do not place cap blocks if surfaces caps will be attached to are wet or frozen or the air temperature measured at the wall location in the shade away from artificial heat is below 40°F. Before applying adhesive, clean surfaces cap blocks will adhere to and ensure surfaces are dry and free of oil, grease, dust and debris.

Pave slopes above and behind block walls with slope protection as shown in the plans and accepted submittals and in accordance with Article 462-3 of the *Standard Specifications*. Construct slope protection joints at a spacing of 10 ft. Make 1/2" thick expansion joints that meet Article 420-10 of the *Standard Specifications* for every third joint and 1/2" deep grooved contraction joints that meet Subarticle 825-10(B) for the remaining joints.

5.0 MEASUREMENT AND PAYMENT

Segmental Gravity Retaining Walls will be measured and paid in square feet. Block walls will be measured as the square feet of wall face area with the pay height equal to the difference between top of wall and top of footing elevations. Define "top of wall" as top of cap blocks.

The contract unit price for *Segmental Gravity Retaining Walls* will be full compensation for providing designs, if required, submittals, labor, tools, equipment and block wall materials, excavating, backfilling, hauling and removing excavated materials and supplying footings, blocks, No. 57 stone, wall drainage systems, geotextiles, cap blocks, slope protection and any incidentals necessary to construct block walls.

The contract unit price for *Segmental Gravity Retaining Walls* does not include the cost for ditches, fences, handrails, barrier or guardrail associated with block walls as these items will be paid for elsewhere in the contract.

Where it is necessary to provide backfill material behind No. 57 stone from sources other than excavated areas or borrow sources used in connection with other work in the contract, payment for furnishing and hauling such backfill material will be paid as extra work in accordance with Article 104-7 of the *Standard Specifications*. Placing and compacting such backfill material is not considered extra work but is incidental to the work being performed.

Payment will be made under:

Pay Item	**Pay Unit**
Segmental Gravity Retaining Walls	Square Foot

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10/13/2014

SOLDIER PILE RETAINING WALLS **(11-19-13)**

1.0 GENERAL

Construct soldier pile retaining walls consisting of driven or drilled-in steel H-piles with either precast concrete panels in between piles or a cast-in-place reinforced concrete face attached to front of piles unless required otherwise in the plans. Timber lagging is typically used for temporary support of excavations during construction. Provide cast-in-place reinforced concrete coping as required. Design and construct soldier pile retaining walls based on actual elevations and wall dimensions in accordance with the contract and accepted submittals. Use a prequalified Cantilever Wall Contractor to construct soldier pile retaining walls. Define "soldier pile wall" as a soldier pile retaining wall. Define "panel" as a precast concrete panel and "concrete facing" as a cast-in-place reinforced concrete face. Define "pile" as a steel H-pile and "coping" as cast-in-place concrete coping.

2.0 MATERIALS

Refer to the *Standard Specifications*.

Item	Section
Anchor Pins	1056-2
Curing Agents	1026
Flowable Fill, Excavatable	1000-6
Geosynthetics	1056
Joint Materials	1028
Masonry	1040
Neat Cement Grout, Nonshrink	1003
Portland Cement Concrete	1000
Reinforcing Steel	1070
Retaining Wall Panels	1077
Select Material, Class VI	1016
Shoulder Drain Materials	816-2
Steel H-Piles	1084-1
Untreated Timber	1082-2
Welded Stud Shear Connectors	1072-6
Wire Staples	1060-8(D)

Provide Type 2 geotextile for separation geotextiles and Class VI select material (standard size No. 57 stone) for leveling pads and backfilling. Use Class A concrete for concrete facing and coping and Class A concrete that meets Article 450-2 of the *Standard Specifications* for drilled-in piles. Use untreated timber with a thickness of at least 3" and a bending stress of at least 1,000 psi for timber lagging.

Unless required otherwise in the contract, produce panels with a smooth flat final finish that meets Article 1077-11 of the *Standard Specifications*. When noted in the plans, produce panels with an exposed aggregate finish that meets Article 1077-12 of the *Standard Specifications*. Produce panels within 1/4" of the panel dimensions shown in the accepted submittals. Damaged panels with excessive discoloration, chips or cracks as

determined by the Engineer will be rejected.

For soldier pile walls with panels, galvanize piles in accordance with Section 1076 of the *Standard Specifications*. When noted in the plans, paint galvanized piles in accordance with Article 442-12 of the *Standard Specifications*. Apply the following system to paint galvanized piles gray with waterborne paints that meet Article 1080-11 of the *Standard Specifications*. For painting galvanized piles other colors, contact the Materials and Tests (M&T) Unit for an appropriate paint system.

GRAY PAINT SYSTEM FOR GALVANIZED PILES			
Coat	**Color**	**Dry/Wet Film Thickness (Mils)**	
		Min.	**Max.**
Intermediate	Brown	3.0 DFT	5.0 DFT
Stripe	White	4.0 WFT	7.0 WFT
Topcoat	Gray	2.0 DFT	4.0 DFT
Total		**5.0 DFT**	**9.0 DFT**

Store steel materials on blocking at least 12" above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign materials. Load, transport, unload and store soldier pile wall materials so materials are kept clean and free of damage. Bent, damaged or defective materials will be rejected.

3.0 PRECONSTRUCTION REQUIREMENTS

A. Soldier Pile Wall Surveys

The Retaining Wall Plans show a plan view, typical sections, details, notes and an elevation or profile view (wall envelope) for each soldier pile wall. Before beginning soldier pile wall design, survey existing ground elevations shown in the plans and other elevations in the vicinity of soldier pile wall locations as needed. Based on these elevations, finished grades and actual soldier pile wall dimensions and details, submit revised wall envelopes for acceptance. Use accepted wall envelopes for design.

B. Soldier Pile Wall Designs

Submit 11 copies of working drawings and 3 copies of design calculations and a PDF copy of each for soldier pile wall designs at least 30 days before the preconstruction meeting. Do not begin soldier pile wall construction until a design submittal is accepted.

Use a prequalified Cantilever Wall Design Consultant to design soldier pile walls. Provide designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for the Cantilever Wall Design Consultant.

Design soldier pile walls in accordance with the plans and Article 11.8 of the *AASHTO LRFD Bridge Design Specifications* unless otherwise required. Design soldier pile

walls for seismic if walls are located in seismic zone 2 based on Figure 2-1 of the *Structure Design Manual*. Design soldier pile walls for a maximum deflection of 2" or 1.5% of H, whichever is less, with H as shown in the plans.

When noted in the plans, design soldier pile walls for a live load (traffic) surcharge of 250 lb/sf in accordance with Article 11.5.6 of the AASHTO LRFD specifications. For steel beam guardrail with 8 ft posts above soldier pile walls, analyze walls for a horizontal load (P_{H1}) of 300 lb/ft of wall in accordance with Figure 3.11.6.3-2(a) of the AASHTO LRFD specifications. For concrete barrier rail above soldier pile walls, analyze walls for a P_{H1} of 500 lb/ft of wall in accordance with Figure 3.11.6.3-2(a).

Use a maximum H-pile spacing of 10 ft. At the Contractor's option, use driven or drilled-in piles for soldier pile walls with concrete facing unless otherwise required. For soldier pile walls with panels, use drilled-in piles unless noted otherwise in the plans. Use concrete or grout for embedded portions of drilled-in piles. Install drilled-in piles by excavating holes with diameters that will result in at least 3" of clearance all around piles.

Provide temporary support of excavations for excavations more than 4 ft deep and timber lagging in accordance with the *AASHTO Guide Design Specifications for Bridge Temporary Works*. At the Contractor's option and when noted in the plans, provide temporary slopes instead of temporary support of excavations. Do not extend temporary slopes outside right-of-way or easement limits. Except for fill sections or when using temporary slopes, backfill voids behind panels, lagging and piles with No. 57 stone. Place separation geotextile between No. 57 stone and overlying fill or pavement sections except when concrete pavement, full depth asphalt or cement treated base is placed directly on stone.

At the Contractor's option, use panels or concrete facing unless required otherwise in the plans. Design panels and concrete facing in accordance with the plans and Section 5 of the *AASHTO LRFD Bridge Design Specifications*. Provide reinforcing steel of sufficient density to satisfy Article 5.7.3.4 of the AASHTO LRFD specifications. Use panels or concrete facing with the dimensions shown in the plans and attach facing to front of H-piles with welded stud shear connectors.

Use No. 57 stone for aggregate leveling pads. Use 6" thick leveling pads beneath panels and concrete facing. Unless required otherwise in the plans, embed top of leveling pads at least 12" below bottom of walls shown in the plans.

Provide wall drainage systems consisting of geocomposite drain strips, drains and outlet components. Place drain strips with a horizontal spacing of no more than 10 ft and center strips between adjacent piles. Attach drain strips to front of timber lagging or back of panels or concrete facing and connect strips to leveling pads. Locate a continuous aggregate shoulder drain along the base of panels or concrete facing in front of piles and leveling pads. Provide drains and outlet components in accordance with Standard Drawing No. 816.02 of the *Roadway Standard Drawings*.

Unless required otherwise in the plans, use cast-in-place reinforced concrete coping at top of soldier pile walls with panels. Use coping dimensions shown in the plans and at the Contractor's option, connect coping to panels with dowels or extend coping down back of panels. When concrete barrier rail is required above soldier pile walls, use concrete barrier rail with moment slab as shown in the plans.

Submit working drawings and design calculations for acceptance in accordance with Article 105-2 of the *Standard Specifications*. Submit working drawings showing plan views, wall profiles with pile locations, typical sections and details of piles, drainage, temporary support, leveling pads, panels and concrete facing. If necessary, include details on working drawings for coping, concrete barrier rail with moment slab and obstructions extending through walls or interfering with piles, barriers or moment slabs. Submit design calculations including deflection calculations for each wall section with different surcharge loads, geometry or material parameters. Include analysis of temporary conditions in design calculations. When designing soldier pile walls with computer software, a hand calculation is required for the tallest wall section.

C. Soldier Pile Wall Construction Plan

Submit 4 copies and a PDF copy of a soldier pile wall construction plan at least 30 days before the preconstruction meeting. Do not begin soldier pile wall construction until the construction plan submittal is accepted. Provide project specific information in the soldier pile wall construction plan including a detailed construction sequence. For driven piles, submit proposed pile driving methods and equipment in accordance with Subarticle 450-3(D)(2) of the *Standard Specifications*. For drilled-in piles, submit installation details including drilling equipment and methods for stabilizing and filling holes. Provide details in the construction plan of excavations including temporary support and any other information shown in the plans or requested by the Engineer.

If alternate construction procedures are proposed or necessary, a revised soldier pile wall construction plan submittal may be required. If the work deviates from the accepted submittal without prior approval, the Engineer may suspend soldier pile wall construction until a revised plan is accepted.

D. Preconstruction Meeting

Before starting soldier pile wall construction, hold a preconstruction meeting to discuss the construction and inspection of the soldier pile walls. Schedule this meeting after all soldier pile wall submittals have been accepted. The Resident or Bridge Maintenance Engineer, Bridge Construction Engineer, Geotechnical Operations Engineer, Contractor and Cantilever Wall Contractor Superintendent will attend this preconstruction meeting.

4.0 CONSTRUCTION METHODS

Control drainage during construction in the vicinity of soldier pile walls. Direct run off away from soldier pile walls and areas above and behind walls. Contain and maintain No. 57 stone and backfill and protect material from erosion.

Notify the Engineer before blasting in the vicinity of soldier pile walls. Perform blasting in accordance with the contract. Unless required otherwise in the plans, install foundations located behind soldier pile walls before beginning wall construction if the horizontal distance to the closest foundation is less than the height of the tallest wall section.

Install soldier pile walls in accordance with the accepted submittals and as directed. Do not excavate behind soldier pile walls unless a temporary slope is shown in the accepted submittals. If overexcavation occurs and is not approved, repair walls with an approved method and a revised soldier pile wall design or construction plan may be required.

A. Piles

If a temporary slope is shown in the accepted submittals, excavate the slope before installing piles. Otherwise, install piles before excavating for soldier pile walls. Weld stud shear connectors to piles in accordance with Article 1072-6 of the *Standard Specifications*.

Install piles within 1" of horizontal and vertical alignment shown in the accepted submittals and with no negative batter (piles leaning forward). Minimize alignment variations between piles for soldier pile walls with concrete facing since variations can result in thicker concrete facing in some locations in order to provide the minimum required facing thickness elsewhere. Locate piles so the minimum required concrete facing thickness, if applicable, and roadway clearances are maintained for variable pile alignments.

Install piles with the minimum required embedment in accordance with Subarticles 450-3(D) and 450-3(E) of the *Standard Specifications*. Piles may be installed with a vibratory hammer as approved by the Engineer. Do not splice piles. If necessary, cut off piles at elevations shown in the accepted submittals along a plane normal to the pile axis.

Use pile excavation to install drilled-in piles. If overexcavation occurs, fill to required elevations with No. 57 stone before setting piles. After filling holes with concrete or grout to the elevations shown in the accepted submittals, remove any fluids and fill remaining portions of holes with flowable fill. Cure concrete or grout at least 7 days before excavating.

Notify the Engineer if refusal is reached before pile excavation or driven piles attain the minimum required embedment. When this occurs, a revised soldier pile wall design or construction plan submittal may be required.

B. Excavation

If a temporary slope is shown in the accepted submittals, excavate the slope as shown. Otherwise, excavate in front of piles from the top down in accordance with the accepted submittals. Excavate in staged horizontal lifts with a maximum height of 5 ft. Use timber lagging or an alternate approved method for temporary support of excavations in accordance with the accepted submittals.

Install temporary support within 24 hours of excavating each lift unless otherwise approved. The installation may be delayed if it can be demonstrated that delays will not adversely affect excavation stability. If excavation faces will be exposed for more than 24 hours, use polyethylene sheets anchored at top and bottom of lifts to protect excavation faces from changes in moisture content.

If an excavation becomes unstable at any time, suspend soldier pile wall construction and temporarily stabilize the excavation by immediately placing an earth berm up against the unstable excavation face. When this occurs, repair walls with an approved method and a revised soldier pile wall design or construction plan may be required.

Remove flowable fill and material in between piles as necessary to install timber lagging. Position lagging with at least 3" of contact in the horizontal direction between the lagging and pile flanges. Do not excavate the next lift until temporary support for the current lift is accepted.

C. Wall Drainage Systems

Install wall drainage systems as shown in the accepted submittals and in accordance with Section 816 of the *Standard Specifications*. Place geocomposite drain strips with the geotextile side facing away from wall faces. Secure drain strips so strips are in continuous contact with surfaces to which they are attached and allow for full flow the entire height of soldier pile walls. Discontinuous drain strips are not allowed. If splices are needed, overlap drain strips at least 12" so flow is not impeded. Connect drain strips to leveling pads by embedding strip ends at least 4" into No. 57 stone.

D. Leveling Pads, Panels, Coping and Concrete Facing

Construct aggregate leveling pads at elevations and with dimensions shown in the accepted submittals. Compact leveling pads with a vibratory compactor to the satisfaction of the Engineer.

Set panels against pile flanges as shown in the accepted submittals. Position panels with at least 2" of contact in the horizontal direction between the panels and pile flanges. If contact cannot be maintained, remove panels, fill gaps with joint filler and reset panels. Securely support panels until enough No. 57 stone or backfill is placed to hold panels in place.

Construct coping as shown in the accepted submittals and Subarticle 452-3(C) of the *Standard Specifications*. When single faced precast concrete barrier is required in front of and against soldier pile walls, stop coping just above barrier so coping does not interfere with placing barrier up against wall faces.

Construct concrete facing in accordance with the accepted submittals and Section 420 of the *Standard Specifications*. Do not remove forms until concrete attains a compressive strength of at least 2,400 psi. Unless required otherwise in the plans, provide a Class 2 surface finish for concrete facing that meets Subarticle 420-17(F) of the *Standard Specifications*. Construct concrete facing joints at a spacing of 10 ft to 12

ft unless required otherwise in the plans. Make 1/2" thick expansion joints that meet Article 420-10 of the *Standard Specifications* for every third joint and 1/2" deep grooved contraction or sawed joints that meet Subarticle 825-10(B) or 825-10(E) respectively for the remaining joints. Stop reinforcing steel for concrete facing 2" on either side of expansion joints.

If a brick veneer is required, construct brick masonry in accordance with Section 830 of the *Standard Specifications*. Anchor brick veneers to soldier pile walls with approved brick to concrete type anchors in accordance with the manufacturer's instructions. Space anchors no more than 16" apart in the vertical direction and no more than 32" apart in the horizontal direction with each row of anchors staggered 16" from the row above and below.

Seal joints above and behind soldier pile walls between coping or concrete facing and concrete slope protection with silicone sealant.

E. Backfill

For fill sections or if a temporary slope is shown in the accepted submittals, backfill behind piles, panels and concrete facing in accordance with Article 410-8 of the *Standard Specifications*. Otherwise, backfill voids behind panels, lagging and piles with No. 57 stone as shown in the accepted submittals. Ensure all voids between panels and lagging and between piles, lagging and excavation faces are filled with No. 57 stone. Compact stone to the satisfaction of the Engineer. When separation geotextiles are required, overlap adjacent geotextiles at least 18" and hold separation geotextiles in place with wire staples or anchor pins as needed.

F. Pile Coatings

For soldier pile walls with panels, clean exposed galvanized or painted surfaces of piles with a 2,500 psi pressure washer after wall construction is complete. Repair galvanized surfaces that are exposed and damaged in accordance with Article 1076-7 of the *Standard Specifications*. Repair painted surfaces that are exposed and damaged by applying 4.0 to 7.0 mils wet film thickness of a topcoat to damaged areas with brushes or rollers. Use the same paint for damaged areas that was used for the topcoat when painting piles initially. Feather or taper topcoats in damaged areas to be level with surrounding areas.

5.0 MEASUREMENT AND PAYMENT

Soldier Pile Retaining Walls will be measured and paid in square feet. Soldier pile walls will be measured as the square feet of wall face area with the pay height equal to the difference between top of wall and top of leveling pad elevations. Define "top of wall" as top of coping or top of panels or concrete facing for soldier pile walls without coping.

The contract unit price for *Soldier Pile Retaining Walls* will be full compensation for providing designs, submittals, labor, tools, equipment and soldier pile wall materials, installing piles, excavating, backfilling, hauling and removing excavated materials and

supplying temporary support of excavations, wall drainage systems, leveling pads, panels, concrete facing, No. 57 stone, geotextiles and any incidentals necessary to construct soldier pile walls. The contract unit price for *Soldier Pile Retaining Walls* will also be full compensation for coping, pile coatings and brick veneers, if required. No additional payment will be made and no extension of completion date or time will be allowed for repairing overexcavations or unstable excavations or thicker concrete facing.

The contract unit price for *Soldier Pile Retaining Walls* does not include the cost for ditches, fences, handrails, barrier or guardrail associated with soldier pile walls as these items will be paid for elsewhere in the contract.

Where it is necessary to provide backfill material behind soldier pile walls from sources other than excavated areas or borrow sources used in connection with other work in the contract, payment for furnishing and hauling such backfill material will be paid as extra work in accordance with Article 104-7 of the *Standard Specifications*. Placing and compacting such backfill material is not considered extra work but is incidental to the work being performed.

Payment will be made under:

Pay Item	**Pay Unit**
Soldier Pile Retaining Walls	Square Foot

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Scott A. Hidden
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10/13/2014

CONTROL OF VIBRATION **(SPECIAL)**

1.0 GENERAL

Control of vibration is required during construction of the project. It is the responsibility of the Contractor to utilize construction methods and equipment to avoid damage to the existing pipelines, utilities, and structures. The Contractor shall pay special attention to construction induced vibrations to the 36" diameter and 40" diameter gasoline pipelines within and near the project site.

The Engineer will monitor construction induced vibrations using vibration monitoring devices (engineering seismographs with geophones) at locations determined by the Engineer. These devices will have been calibrated within the twelve months prior to the start of construction and at 12 month intervals thereafter until completion of the project. These devices will be capable of recording vibrations in the three perpendicular axes: vertical, transverse, and longitudinal, and also be capable of recording the full vibration waveform. Peak particle velocity (PPV) is defined in this provision as the maximum ground vibration velocity measured in each of the three individual perpendicular axes.

Provide access to the Engineer for placement of devices and vibration monitoring. Notify the Engineer a minimum of three (3) working days before beginning any of the following construction activities:

Pile excavation
Pile driving
Demolition of existing bridge
Drilled pier excavation
Compaction or excavation within 50 feet of gasoline pipe lines
Paving
Other activities that may cause significant ground vibration that warrants monitoring

Construction induced vibrations shall not exceed a peak particle velocity of one (1) inch per second at the ground above the pipe line or structures at any time. If construction vibrations recorded show a peak particle velocity exceeding one (1) inch per second, cease all work immediately and furnish the Engineer with an alternative method of construction. The Engineer will review the proposed alternative method of construction and respond to the Contractor within three (3) working days from the time the submittal is received. If construction vibration recorded exceeding a peak particle velocity of one (1) inch per second has damaged any pipe line or structures, the Contractor shall repair the damage or compensate the property owner for the damage at no additional cost to the North Carolina Department of Transportation.

Vibration monitoring by the Engineer of construction induced vibration does not relieve the Contractor of responsibility for damage or liability. Attention is directed to Articles 107-12 and 107-15 of the Standard Specifications.

2.0 MEASUREMENT AND PAYMENT

No measurement or payment will be made for control of vibration. Any work or change in construction technique needed to conform to the requirements of this provision will be considered incidental to the overall project's cost. No contract time extension or additional compensation is granted to the contractor for delays due to noncompliance with this provision.

NORTH CAROLINA PROFESSIONAL SEAL PE18899 ENGINEER James R. Batts, Jr.

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James R. Batts, Jr.
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10/9/2014

PROJECT SPECIAL PROVISIONS
GEOENVIRONMENTAL

CONTAMINATED SOIL (11/26/2013)

The Contractor's attention is directed to the fact that soil contaminated with petroleum hydrocarbon compounds exist within the project area. The known areas of contamination are indicated on corresponding plans sheets. Information relating to these contaminated areas, sample locations, and investigation reports are available at the following web address by navigating to the correct letting year and month then selecting, "Plans and Proposals", "U-3615B Guilford", "GeoEnvironmental":

http://dotw-xfer01.dot.state.nc.us/dsplan/

Petroleum contaminated soil may be encountered during any earthwork activities on the project. The Contractor shall only excavate those soils that 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 stockpile all contaminated soil excavated from the project in a location approved by the Engineer.

The stockpile shall be created within the property boundaries of the source material and in accordance with the Stockpile Detail found in the plans. Stockpiling contaminated soil will be incidental to the project. The Engineer will notify the GeoEnvironmental Section of the stockpile and the GeoEnvironmental Section will arrange for the testing and disposal of the contaminated stockpile within two weeks of notification.

NORTH CAROLINA PROFESSIONAL SEAL 31499 ENGINEER CYRUS F. PARKER

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Cyrus Parker
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1/10/2014

WORK ZONE TRAFFIC CONTROL
Project Special Provisions

Law Enforcement:
(05/14/2013)

Description

Furnish Law Enforcement Officers and marked Law Enforcement vehicles to control traffic in lane closures and direct traffic through intersections in accordance with the contract.

Construction Methods

Use uniformed Law Enforcement Officers and marked Law Enforcement vehicles equipped with blue lights mounted on top of the vehicle, and Law Enforcement vehicle emblems to direct or control traffic as required by the plans or by the Engineer.

Measurement and Payment

Law Enforcement will be measured and paid for in the actual number of hours that each Law Enforcement Officer is provided during the life of the project as approved by the Engineer. There will be no direct payment for marked Law Enforcement vehicles as they are considered incidental to the pay item.

Payment will be made under:

Pay Item	**Pay Unit**
Law Enforcement	Hour

NORTH CAROLINA PROFESSIONAL SEAL 30864 ENGINEER DAVID W. BISSETTE

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David Bissette
ECDC908C875348C...
1/10/2014

PROJECT SPECIAL PROVISIONS
Utility Construction

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NORTH CAROLINA PROFESSIONAL SEAL 28457 ENGINEER ANDREW P. LARRICK

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Andrew P. Larrick
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10/14/2014

Revise the 2012 Standard Specifications as follows:

Page 10-58, Sub-article 1036-1 General
Add the following sentence:

All materials in contact with potable water shall be in conformance with Section 1417 of the Safe Drinking Water Act.

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 High Point. For work involving High Point's facilities, the Contractor shall contact the City of High Point Public Services Dept. at (336) 883-3215, and the City of High Point Engineering Services Dept. at (336) 883-3194.

A representative from the City of High Point shall witness all tests performed on their water and sewer facilities. Test results shall be provided to the City of High Point for any tests involving their facilities.

Page 15-2, Sub-article 1500-9 Placing Pipelines into Service
Add the following sentence:

Obtain approval from the NCDENR-Public Water Supply Section prior to placing a new water line into service. Use backflow prevention assemblies for temporary connections to isolate new water lines from existing water line.

Page 15-6, Sub-article 1510-3 (B), Testing and Sterilization
Change the allowable leakage formula to:

$$W = LD\sqrt{P} \div 148,000$$

Page 15-6, Sub-article 1510-3 (B), Testing and Sterilization, sixth paragraph:
Replace the paragraph with the following:

Sterilize water lines in accordance with Section 1003 of The Rules Governing Public Water supply and AWWA C651 Section 4.4.3, the Continuous Feed Method. Provide a chlorine

solution with between 50 parts per million and 100 parts per million in the initial feed. If the chlorine level drops below 10 parts per million during a 24 hour period, then flush, refill with fresh chlorine solution, and repeat for 24 hours. Provide certified bacteriological and contaminant test results from a state-approved or state-certified laboratory. Operate all valves and controls to assure thorough sterilization.

Page 15-6, Sub-article 1510-3 (B), Testing and Sterilization, seventh paragraph:
Delete the words "may be performed concurrently or consecutively."
and replace with "shall be performed consecutively."

Page 15-7, sub-article 1515-2 Materials,
Replace paragraph beginning "Double check valves…" with the following:

Double Check valves (DCV) and Reduced Pressure Zone principal (RPZ) backflow prevention assemblies shall be listed on the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research list of approved backflow devices.

Page 15-8, Sub-article 1515-3 (F), Air Release Valves:
Add the following:

Precast concrete manholes for air release valves shall conform to the requirements listed on Page 15-13, Sub-article 1525-2. In addition, an epoxy coating shall be applied to all interior concrete surfaces of air release valve manholes. The epoxy coating shall be specifically designed for corrosion protection of concrete where hydrogen sulfide gas could be present. The epoxy coating shall be applied in accordance with the recommendations of the coating manufacturer, to produce a minimum dry film thickness of 40 mils. Calcium aluminate mortar linings will not be accepted. The cost for interior epoxy coating of air release valves shall be incidental to the contract.

Page 15-10, Sub-article 1520-2, Materials:
After Line 9, add the following:

Where specified on the Utility Construction plans, the interior of force main sewer pipe shall have a factory-applied ceramic epoxy coating with a minimum dry film thickness of 40 mils. Calcium aluminate mortar linings will not be accepted. The cost for interior ceramic epoxy coating for ductile iron force main sewer pipe, where noted on the plans, shall be incidental to the contract.

Page 15-11, Sub-article 1520-3(A)(2) Testing, line 5,
Replace the second paragraph with the following:

Test all 24" and smaller gravity sewer lines for leakage using infiltration, exfiltration, or air test. Perform visual inspection on gravity sewer lines larger than 24". Perform line and grade testing and deflection testing on all gravity sewer lines.

PROJECT SPECIAL PROVISIONS
Utility Construction

Compensation

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

1. SUPPORT EXISTING WATER LINE DURING CULVERT INSTALLATION

The contractor shall design, construct, and eventually remove a temporary support system for an existing 16” ductile iron water main with push-on joints located at -Y30- STA. 18+60. Two (2) proposed 66” culvert pipes will be installed underneath the existing 16” water line, and the existing water line is not expected to be in conflict with the proposed culvert pipes. The water line will be exposed while the culvert pipes are being installed, and the contractor shall support the water line in place during this installation to ensure that the water main remains in service, with no leaks, throughout this process.

This item shall be paid for at the contract unit price per each for "Support Existing Water Line During Culvert Installation". Such price and payment will be full compensation for design, labor, excavation, backfilling, installation and removal of the temporary pipe support system, including joint restraints and any other incidentals deemed necessary to complete the work as required.

2. RELOCATE FIRE WATER METER IN VAULT

The existing fire water meter in vault that is to be relocated shall be installed at the location shown on the utility plans, or as directed by the Engineer.

The relocation of the water meter in vault shall consist of the removal and installation at the appropriate location of the water meter, piping, and valves inside the existing meter vault, as well as relocating the existing meter vault. Any pipe and fittings necessary to reconnect the relocated meter to the existing water line shall be considered incidental to this pay item.

All work shall conform with applicable plumbing codes, and shall be performed as shown on the plans or as directed by the Engineer.

The relocated meter vault shall be placed with the top of the vault flush with finished grade at the designated location.

This item shall be paid for at the contract unit price per each for "Relocate Fire Water Meter in Vault". Such price and payment will be full compensation for all labor, excavation, relocating and reconnecting the meter and appurtenances, relocating the existing meter vault, pipe and fittings, backfilling, and incidentals necessary to complete the work as required.

PROJECT SPECIAL PROVISIONS
Utility Construction

3. ADJUSTMENT OF WATER METER VAULT TOP

The top of the existing water meter vault shall be adjusted vertically as noted on the plans, or as directed by the Engineer. The top of the vault shall be adjusted so that it is approximately flush with finished grade at the designated location.

Adjustment of the water meter vault top shall consist of the removal of the concrete vault top, raising the walls of the vault using brick masonry, block masonry, or Portland cement concrete on existing walls, and re-setting the concrete vault top of the adjusted wall section. Construction methods and materials shall generally meet the requirements described in Sections 840 and 858 of the Standard Specifications.

This item shall be paid for at the contract unit price per each for "Adjustment of Water Meter Vault Top". Such price and payment will be full compensation for all labor, excavation, adjusting the walls of the vault, removal and re-setting the vault top, backfilling, and incidentals necessary to complete the work as required.

KCI TECHNOLOGIES
ENGINEERS | PLANNERS | SCIENTISTS | CONSTRUCTION MANAGERS

General:

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

A. Duke Energy – Power (Distribution)
B. City of High Point – Power (Distribution)
C. City of High Point – Power (Transmission)
D. North State Communications – Communications
E. Time Warner – Communications
F. Level 3 – Communications
G. Piedmont Natural Gas – Natural Gas Distribution
H. Colonial Pipeline Company – Petroleum
I. Plantation Pipeline Company - Petroleum

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 owners. 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:

Utility relocations are shown on the Utility by Others Plans.

A) Duke Energy – Power (Distribution)
Contact Information: Larry Robinson
Duke Energy
2500 Fairfax Road
Greensboro, NC 27407
Office- (336) 209-6631
Larry.Robinson@duke-energy.com

1) See Utilities by Others Plans.
2) Duke Energy will complete all relocation work including temporary line and new locations by July 1, 2015. This is all relocation work including the temporary lines at the new bridge locations.

3) Permanent relocation work at the bridges will begin upon the completion of the new bridges and other areas on UBO- 9 & 10. The Contractor shall give Duke a two week notice prior to completion of the bridges, and 21 weeks to complete this work.
4) The City of High Point and North State crews will be responsible for installing Duke's hardware and pulling their wire where Duke will be joint use on poles.

B) City of High Point – Power (Distribution)
Contact Information: Scott Foster
PO Box 230
High Point, NC 27261
Office- (336) 883-3133
Scott.foster@highpointnc.gov

1. See Utilities by Others Plans.
2. The City of High Point time frame for relocation of Distribution facilities is incorporated into Transmission below.

C) City of High Point – Power (Transmission)
Contact Information: (SCE is completing design for Distribution & Transmission)
Jerry Ford, SCE Inc.
600 Minuet Lane
Charlotte, NC 28217
Office- (704) 523-6045
jerry@scepower.com

1. See Utilities by Others Plans.
2. The City of High Point will begin relocating facilities in conjunction with North State, prior to completion of installation of poles.
3. The City of High Point will relocate Transmission and Distribution facilities between Barrow Road and Eastchester Road by July 1, 2015.
4. The City of High Point will relocate Transmission and Distribution facilities between Johnson Street and Barrow Road by December 1, 2015 except in areas of bridges.
5. Prior to completion of the new bridges, the Contractor shall give the City a two week notice and 21 weeks to complete permanent lines in these areas.

D) North State Communications – Poles, Copper and Fiber Optic Cables
Contact Information: Brad Wright
PO Box 2326
High Point, NC 27261-2326
Office- (336) 886-3968

Brad.wright@nscom.com

1. See Utilities by Others Plans.
2. North State will set and own the majority of the poles for this project. Duke and the City of High Point Distribution Electric system will attach by joint use agreement to North State's poles.
3. North State will begin installing poles no later than January 1, 2015.
4. North State will require 14 months to complete all relocation work of their facilities. Anticipated completion date for North State for all relocation work is April 1, 2016.
5. Rough grading to cut/fill line will need to be completed within the following areas prior to North State beginning work in these areas:
   From Station 185+00 to 188+50
   At Station 194+00
   From Station 208+00 to 209+00
   From Station 302+50 to 307+50
   From Station 313+00 to 318+00
   From Station 332+00 to 336+00
   Y35 Axis From station 12+00 to 13+50

   North State will require a two week notice prior to completion of rough grading in these areas.
6. North State's buried communication cable will be adjusted as necessary. The Contractor shall give North State two week notice and one week to make adjustments at each location.
7. North State has work they can do prior to rough grading.
8. North state will need the City to clear trees before they can begin. Duke will also be doing some clearing work in area.

E) Time Warner – CATV
Contact Information: Roger Stanfield
721 N. Regional Road
Greensboro, NC 27409
Office- (336) 217-3460
Roger.Stanfield@twcable.com

1. See Utilities by Others Plans.
2. All Time Warner's aerial CATV lines will be in joint use with North State Communications, Duke Power and City of High Point Electric.
3. Time Warner will require 4 weeks to complete their relocation work once new joint use poles are set and power lines are installed in all locations.
4. Anticipated completion date for Time Warner's relocation work is May 1, 2016.

F) Level 3 Communications – Mike Brooks and Chris Kennedy with Telic is completing Design for Level 3

Contact Information:

Karl Michaelson
4021 Rose Lake Drive
Charlotte, NC 28217
Office- 704-533-5211
Karl.michaelson@level3.com

Daniel Horton
4021 Rose Lake Drive
Charlotte, NC 28217
Office – 336-689-9469
Dan.howerton@level3.com

Joseph "JP" Mahaffey
4021 Rose Lake Drive
Charlotte, NC 28217
Office – 704-733-3230
Cell – 434-546-0960
Joseph.mahaffey@level3.com

1. See Utilities by Others Plans.
2. All work will be completed by May 1, 2015.
3. Contractor is to take extreme care in locating and protecting this facility throughout the project limits.

G) Piedmont Natural Gas – Gas Distribution

Contact Information:

David Robertson
2300 Lowery Street
Winston Salem, NC 27101
P 336.726.7769
M 336.462.0246
F 336.725.5858
david.robertson@piedmontng.com

1. See Utilities by Others Plans.
2. Before Fill & Cut completed, relocations for Piedmont will be as follows:
   a. Sta 179+82.78 thru 205+37.61 Right
   b. Sta 211+00.00 thru 253+00.00 Right
   c. Work will be completed by August 1, 2015.
3. After Rough Grade but before Final Grade
   a. Sta 205+37.61 thru 211+00.00 Right

b. Sta 253+00.00 thru 338+50.00 Right
c. The contractor shall give Piedmont Natural Gas a two week notice prior to completion of rough grading in these areas and 6 months to complete the work.

4. Contractor and NCDOT to coordinate with Piedmont Natural Gas for protective measures required while working near and around their existing facilities.

H) Colonial Pipeline Company – Petroleum

Contact Information: Tom West
411 Gallimore Dairy Road
Greensboro, NC 27409
Office- (336) 931-6039
TWest@colpipe.com

Bruce Shipman
411 Gallimore Dairy Road
Greensboro, NC 27409
Office – 336-451-9976
jshipman@colpipe.com

1. See Utilities by Others Plans.
2. Colonial Pipeline Company will remain in place.
3. Extensive measures have been taken to avoid relocation of Colonial's facilities.
4. Colonial Pipeline stated that a skimmer basin is located within 3 feet of the 36" pipeline centerline northwest of the intersection of Skeet Club Rd and Kendale Rd. NCDOT has shifted the basin to accommodate the 36" pipeline and provided a timber matting for protection over the pipeline during construction.
5. Contractor is to coordinate with Colonial Pipeline Company for protective measures required while working near and around their existing facilities.
6. Colonial Pipeline requires that a representative must be on site at all times when any work is being performed around Colonials lines.

I) Plantation Pipeline Company – Petroleum
Contact Information: Jimmy Stamen
PO Box 18306
Greensboro, NC 27419
Office- (336) 547-3673
Jimmy_Stamey@kindermorgan.com

Bryant Moore

1100 Alderman Drive, Suite 200
Alpharetta, GA 30005
Phone 770-751-4273
Cell 678-492-3307
Bryant_moore@kindermorgan.com

Terry Walker
336-601-2215
Terry_walker@kindermorgan.com

1. See Utilities by Others Plans.
2. Plantation Pipeline Company will remain in place.
3. Extensive measures have been taken to avoid relocation of Plantation's facilities.
4. Contractor is to coordinate with Plantation Pipeline Company for protective measures required while working near and around their existing facilities.
5. Plantation Pipeline requires that a representative must be on site at all times when any work is being performed around Plantations lines.

Project Special Provisions
Erosion Control

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 10 ft. or less
- Slopes 3:1 or flatter, with a slope of length of 50 ft. 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 pounds per acre.

All Roadway Areas

March 1 - August 31		**September 1 - February 28**	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		**September 1 - February 28**	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of 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 5 pounds per acre and add 20# 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 (West)

Native Grass Seeding and Mulching shall be performed on the disturbed areas of wetlands and riparian areas, and adjacent to Stream Relocation and/or trout stream construction within a 50 foot 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 pounds per acre.

August 1 - June 1		**May 1 – September 1**	
18#	Creeping Red Fescue	18#	Creeping Red Fescue
8#	Big Bluestem	8#	Big Bluestem
6#	Indiangrass	6#	Indiangrass
4#	Switchgrass	4#	Switchgrass
35#	Rye Grain	25#	German or Browntop Millet
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	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 400 pounds and seeded at the rate of 50 pounds per acre. 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 grade and shall be applied at the rate of 500 pounds per acre. 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 500 pounds per acre. 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 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

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 ¾" 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.

REFORESTATION:

Description

Reforestation will be planted in 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 12"-18" 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 16-foot 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	LF
1606	Special Sediment Control Fence	LF/TON
1615	Temporary Mulching	ACR
1620	Seed - Temporary Seeding	LB
1620	Fertilizer - Temporary Seeding	TN
1631	Matting for Erosion Control	SY
SP	Coir Fiber Mat	SY
1640	Coir Fiber Baffles	LF
SP	Permanent Soil Reinforcement Mat	SY
1660	Seeding and Mulching	ACR
1661	Seed - Repair Seeding	LB
1661	Fertilizer - Repair Seeding	TON
1662	Seed - Supplemental Seeding	LB
1665	Fertilizer Topdressing	TON

SP	Safety/Highly Visible Fencing	LF
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

<u>ENVIRONMENTALLY SENSITIVE AREAS:</u>

Description

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

The Environmentally Sensitive Area shall be defined as a 50-foot buffer zone on both sides of the stream or depression measured from top of streambank or center of depression.

Construction Methods

(A) Clearing and Grubbing

In areas identified as Environmentally Sensitive Areas, the Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations as described in Article 200-1 of the *Standard Specifications*. Only clearing operations (not grubbing) shall be allowed in this buffer zone until immediately prior to beginning grading operations. Erosion control devices shall be installed immediately following the clearing operation.

(B) Grading

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

(C) Temporary Stream Crossings

Any crossing of streams within the limits of this project shall be accomplished in accordance with the requirements of Subarticle 107-12 of the *Standard Specifications*.

(D) Seeding and Mulching

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

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

(E) Stage Seeding

The work covered by this section shall consist of the establishment of a vegetative cover on cut and fill slopes as grading progresses. Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measured along the slope, or greater than 2 acres in area. Each stage shall not exceed the limits stated above.

Additional payments will not be made for the requirements of this section, as the cost for this work shall be included in the contract unit prices for the work involved.

MINIMIZE REMOVAL OF VEGETATION:

The Contractor shall minimize removal of vegetation within project limits to the maximum extent practicable. Vegetation along stream banks and adjacent to other jurisdictional resources outside the construction limits shall only be removed upon approval of Engineer. No additional payment will be made for this minimization work.

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.

All offsite Staging Areas, Borrow and Waste sites shall be in accordance with "Borrow and Waste Site Reclamation Procedures for Contracted Projects" located at:

http://www.ncdot.gov/doh/operations/dp_chief_eng/roadside/fieldops/downloads/Files/ContractedReclamationProcedures.pdf

All forms and documents referenced in the "Borrow and Waste Site Reclamation Procedures for Contracted Projects" shall be included with the reclamation plans for offsite staging areas, and borrow and waste sites.

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*.

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 5 ft. in length with a minimum nominal 2" x 2” cross section. Steel posts shall be at least 5 ft. in length, and have a minimum weight of 0.85 lb/ft of length.

(B) Boundary Flagging

Wooden stakes shall be 4 feet in length with a minimum nominal 3/4” x 1-3/4” cross section. The flagging shall be at least 1” 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 10 ft., 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 2" 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 25 feet maximum intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 6" 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 25 feet maximum intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 6" 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)(5) 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 Foot

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 a combination of coconut and synthetic fibers evenly distributed throughout the mat between a bottom UV stabilized netting and a heavy duty UV stabilized top net. The matting shall be stitched together with UV stabilized polypropylene thread to form a permanent three-dimensional structure. The mat shall have the following minimum physical properties:

Property	**Test Method**	**Value**	**Unit**
Light Penetration	ASTM D6567	9	%
Thickness	ASTM D6525	0.40	in
Mass Per Unit Area	ASTM D6566	0.55	lb/sy
Tensile Strength	ASTM D6818	385	lb/ft
Elongation (Maximum)	ASTM D6818	49	%
Resiliency	ASTM D1777	>70	%
UV Stability *	ASTM D4355	≥80	%
Porosity (Permanent Net)	ECTC Guidelines	≥85	%
Maximum Permissible Shear Stress (Vegetated)	Performance Bench Test	≥8.0	lb/ft^2
Maximum Allowable Velocity (Vegetated)	Performance Bench Test	≥16.0	ft/s

*ASTM D1682 Tensile Strength and % strength retention of material after 1000 hours of exposure.

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 yards 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 Yard

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 skimmer, providing and placing stone pad on bottom of basin underneath skimmer device, providing and placing a geotextile spillway liner, providing coir fiber mat stabilization for the skimmer outlet, disposing of excess materials, removing temporary slope drain, coir fiber baffles, geotextile 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
Geotextile 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
Coir Fiber Mat	1060-14
Temporary Slope Drain	1622-2
Coir Fiber Baffle	1640

Provide appropriately sized and approved skimmer device.

Provide Schedule 40 PVC pipe with a length of 6 ft. to attach to the skimmer and the coupling connection to serve as the arm pipe. For skimmer sizes of 2.5 in. and smaller, the arm pipe diameter shall be 1.5 inches. For skimmer sizes of 3 in. and larger, refer to manufacturer recommendation.

Provide 4” diameter Schedule 40 PVC pipe to attach to coupling connection of skimmer to serve as the barrel pipe through the earthen dam.

Anchors: Staples, stakes, or reinforcement bars shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes 12"- 24" long with a 2" x 2" 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 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" nominal length. The bars shall have a 4" diameter bend at one end with a 4" straight section at the tip to catch and secure the coir fiber mat.

Staples:

Provide staples made of 0.125" diameter new steel wire formed into a *u* shape not less than 12" in length with a throat of 1" 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 primary 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 geotextile as directed. Construct the coir fiber baffles according to *Roadway Standard Drawings* No. 1640.01 and Section 1640 of the *Standard Specifications*.

Install skimmer device according to manufacturer recommendations. Install 4” Schedule 40 PVC pipe into dam on the lower side of basin 1 ft. from the bottom of the basin and according to the detail, and extend the pipe so the basin will drain. Attach a 6 ft. arm pipe to the coupling connection and 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 12” in height, and shall have a minimum cross sectional area of 4 ft. by 4 ft.

Line primary spillway with geotextile unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury edges of geotextile in a trench at least 5" deep and tamp firmly. If geotextile for the primary spillway is not one continuous piece of material, make horizontal overlaps a minimum of 18" with upstream geotextile overlapping the downstream geotextile. Secure geotextile with eleven gauge wire staples shaped into a *u* shape with a length of not less than 12" and a throat not less than 1" in width. Place staples along outer edges and throughout the geotextile a maximum of 3 ft. horizontally and vertically. Geotextile shall be placed to the bottom and across the entire width of the basin according to the Skimmer Basin with Baffles detail. Place sealant inside basin around barrel pipe on top of geotextile with a minimum width of 6 in.

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 1 ft. apart. Place anchors along the outer edges and down the center of the matting 3 ft. 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 Article 1631-3 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.

Geotextile 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 in accordance with Article 1640-4 of the *Standard Specifications*.

__" Skimmer will be measured in units of each. *__” 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 *__” Skimmer* is considered incidental to the measurement of the quantity of *__” Skimmer* and no separate payment will be made. No separate payment shall be made if *__” Skimmer*, barrel and/or arm pipe(s) are damaged by ice accumulation.

Coir Fiber Mat will be measured and paid for as the actual number of square yards measured along the surface of the ground over which coir fiber mat is installed and accepted.

Temporary Slope Drain 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**
__" Skimmer	Each
Coir Fiber Mat	Square Yard

<u>COIR FIBER WATTLES WITH POLYACRYLAMIDE (PAM):</u>

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	12 in.
Minimum Density	3.5 lb/ft^3 +/- 10%
Net Material	Coir Fiber
Net Openings	2 in. x 2 in.
Net Strength	90 lbs.
Minimum Weight	2.6 lbs./ft. +/- 10%

Anchors: Stakes shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes a minimum of 2-ft. long with a 2 in. x 2 in. 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 0.125" diameter new steel wire formed into a *u* shape not less than 12" in length with a throat of 1" 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 1 linear foot 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 2 linear feet 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 10 in. with no more than 2 in. 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 6 in.

Installation of matting shall be in accordance with the detail provided in the plans, and in accordance with Article 1631-3 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 2 ounces per wattle, and 1 ounce 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 0.50 in.

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 feet 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 pounds 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)	Pound
Coir Fiber Wattle	Linear Foot

<u>TEMPORARY ROCK SILT CHECK TYPE A WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM):</u>

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 4 ounces 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 0.50 in.

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 pounds 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)	Pound

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 geotextile liner, maintaining the diversion area in an acceptable condition, removing geotextile 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**
Geotextile 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 geotextile unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury top of slope geotextile edge in a trench at least 5" deep and tamp securely. Make vertical overlaps a minimum of 18" with upstream geotextile overlapping the downstream geotextile.

Secure geotextile with eleven gauge wire staples shaped into a *u* shape with a length of not less than 6" and a throat not less than 1" in width. Place staples along outer edges and throughout the geotextile a maximum of 3 ft. horizontally and vertically.

Measurement and Payment

Culvert Diversion Channel will be measured and paid for as the actual number of cubic yards excavated, as calculated from the typical section throughout the length of the diversion channel as shown on the final approved plans.

Geotextile 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 Yard

<u>IMPERVIOUS DIKE:</u>

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 geotextile.

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 feet 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 Foot

<u>COIR FIBER MAT:</u>

Description

Furnish material, install and maintain coir fiber mat in locations shown on the plans or in locations as directed. Work includes providing all materials, excavating and backfilling, and placing and securing coir fiber mat with stakes, steel reinforcement bars or staples as directed.

Materials

Item	**Section**
Coir Fiber Mat	1060-14

Anchors: Stakes, reinforcement bars, or staples shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes 12"- 24" long with a 2" x 2" 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 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" nominal length. The bars shall have a 4" diameter bend at one end with a 4" straight section at the tip to catch and secure the coir fiber mat.

Staples:

Provide staples made of 0.125" diameter new steel wire formed into a *u* shape not less than 12" in length with a throat of 1" in width.

Construction Methods

Place the coir fiber mat immediately upon final grading. Provide a smooth soil surface free from stones, clods, or debris that will prevent the contact of the mat with the soil. Unroll the mat and apply without stretching such that it will lie smoothly but loosely on the soil surface.

For stream relocation applications, take care to preserve the required line, grade, and cross section of the area covered. Bury the top slope end of each piece of mat in a narrow trench at

least 6 in. deep and tamp firmly. Where one roll of matting ends and a second roll begins, overlap the end of the upper roll over the buried end of the second roll so there is a 6 in. overlap. Construct check trenches at least 12 in. deep every 50 ft. longitudinally along the edges of the mat or as directed. Fold over and bury mat to the full depth of the trench, close and tamp firmly. Overlap mat at least 6 in. where 2 or more widths of mat are installed side by side.

Place anchors across the mat at the ends approximately 1 ft. apart. Place anchors along the outer edges and down the center of the mat 3 ft. apart.

Adjustments in the trenching or anchoring requirements to fit individual site conditions may be required.

Measurement and Payment

Coir Fiber Mat will be measured and paid for as the actual number of square yards measured along the surface of the ground over which coir fiber mat is installed and accepted.

No measurement will be made for anchor items.

Payment will be made under:

Pay Item	**Pay Unit**
Coir Fiber Mat	Square Yard

FLOATING TURBIDITY CURTAIN:

Description

This work consists of furnishing a *Floating Turbidity Curtain* to deter silt suspension and movement of silt particles during construction. The floating turbidity curtain shall be constructed at locations as directed.

Materials

The curtain material shall be made of a tightly woven nylon, plastic or other non-deteriorating material meeting the following specifications:

Property	**Value**
Grab tensile strength	*md-370 lbs *cd-250 lbs
Mullen burst stength	480 psi
Trapezoid tear strength	*md-100 lbs *cd-60 lbs
Apparent opening size	70 US standard sieve
Percent open area	4% permittivity 0.28 sec-1

*md - machine direction
*cd - cross machine direction

In the event that more than one width of fabric is required, a 6" overlap of the material shall also be required.

The curtain material shall be supported by a flotation material having over 29 lbs/ft buoyancy. The floating curtain shall have a 5/16" galvanized chain as ballast and dual 5/16" galvanized wire ropes with a heavy vinyl coating as load lines.

Construction Methods

The Contractor shall maintain the *Floating Turbidity Curtain* in a satisfactory condition until its removal is requested by the Engineer. The curtain shall extend to the bottom of the jurisdictional resource. Anchor the curtain according to manufacturer recommendations.

Measurement and Payment

Floating Turbidity Curtain will be measured and paid for as the actual number of square yards of curtain furnished as specified and accepted. Such price and payment will be full compensation for the work as described in this section including but not limited to furnishing all materials, tools, equipment, and all incidentals necessary to complete the work.

Payment will be made under:

Pay Item	**Pay Unit**
Floating Turbidity Curtain	Square Yard

CONTRACTOR REQUIREMENTS FOR STREAM RELOCATIONS, RESTORATIONS, AND ENHANCEMENTS:

If the successful bidder has not completed two stream relocation, restoration, or enhancement projects a minimum length of 1500 linear feet each, that included channel reconstruction or relocation based upon natural geomorphic designs incorporating in-stream structures (i.e., rock cross vanes, rock vanes, j-hook vanes and rootwads), they will be required to sublet such work to a contractor who has the experience in this type of work. Documentation of past experience, in a format of the contractor's choice, must be submitted to the Resident Engineer before any work begins on the stream relocation, restoration or enhancement.

If the Resident Engineer deems that the qualified contractor is performing unsatisfactory work, the Resident Engineer reserves the right to request another qualified contractor to complete the work.

STREAM CHANNEL RELOCATION LIMITATIONS:

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

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

The Contractor shall perform seeding and mulching and install erosion control matting to all cut/fill slopes adjacent to stream relocations in accordance with the contract.

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

Approx. Sta. 197+70 to 205+40

STREAMBANK REFORESTATION:

Description

Streambank Reforestation will be planted in areas 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

Item	Section
Coir Fiber Mat	1060-14

Live Stakes:

Type I Streambank Reforestation shall be live stakes, planted along both streambanks. Live stakes shall be ½"- 2" in diameter. Stakes shall also be 2 ft. - 3 ft. 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.

Staples, stakes, or reinforcement bars shall be used as anchors and shall meet the following requirements:

Wooden Stakes:

Provide hardwood stakes 12"- 24" long with a 2" x 2" 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 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" nominal length. The bars shall have a 4" diameter bend at one end with a 4" straight section at the tip to catch and secure the coir fiber mat.

Staples:

Provide staples made of 0.125" diameter new steel wire formed into a *u* shape not less than 12" in length with a throat of 1" in width.

Bare Root Seedlings:

Type II Streambank Reforestation shall be bare root seedlings 12"-18" 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 6" deep and tamp firmly. Where one roll of matting ends and a second roll begins, overlap the end of the upper roll over the buried end of the second roll so there is a 6" overlap. Construct check trenches at least 12" deep every 50 ft. 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 6" 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 1 ft. apart. Place anchors down the center of each strip of matting 3 ft. apart. Place anchors along all lapped edges 1 ft. 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 4 ft. 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.

1"- 2" 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 acres 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	Acre

STRUCTURE STONE:

Description

This work consists of furnishing, stockpiling, placing and maintaining approved stone used to construct rock cross-vanes, rock vanes, j-hook vanes, w-rock cross vanes, log vanes, root wad/log vanes, log cross vanes, root wad structures, rock cross vanes for step pools, channel blocks, double wing deflectors, single wing deflectors, stream crossings, rock energy dissipaters, constructed riffles, and for use in other locations as directed.

The quantity of stone to be installed will be affected by the actual conditions that occur during the construction of the project. The quantity of stone 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
Riprap, Class A, B, 1, and 2	1042
Geotextile for Drainage, Type 2	1056

Boulders shall meet the requirements of Section 1042 of the *Standard Specifications*. Boulders of minimum dimension 48" x 36" x 24" shall be individually picked for use in the structures. Boulders shall be relatively flat on either side in the same dimension, preferably the long dimension.

Construction Methods

The Contractor shall place geotextile and stone in locations and to the thickness, widths, and lengths as shown on the plans or as directed. All stone shall be placed to form a sediment and erosion control device, an in-stream structure, or a channel lining neatly and uniformly with an even surface in accordance with the contract and shall meet the approval of the Engineer.

Measurement and Payment

No. 57 Stone will be measured and paid as the actual number of tons that have been incorporated into the work, or have been delivered to and stockpiled on the project as directed. No. 57 stone that has been stockpiled will not be measured a second time.

Riprap, Class __ will be measured and paid for in accordance with Article 876-4 of the *Standard Specifications*.

Geotextile for Drainage will be measured and paid for in accordance with Article 876-4 of the *Standard Specifications*.

Boulders will be measured and paid for as the actual number of tons that have been incorporated into the work, or have been delivered to and stockpiled on the project as directed. Stone that has been stockpiled will not be measured a second time.

Such price and payment will be full compensation for all work covered by this section, including but not limited to furnishing, weighing, stockpiling, re-handling, placing, and maintaining the stone and disposal of any materials not incorporated into the project.

Payment will be made under:

Pay Item	**Pay Unit**
No. 57 Stone	Ton
Boulder	Ton

ROCK CROSS VANE:

Description

This work consists of the construction and maintenance of physical barriers placed in and along the stream at locations designated on the plans to direct the stream flow (thalweg) toward the center of the channel and to provide grade control.

The quantity of rock cross vanes to be installed will be affected by the actual conditions that occur during the construction of the project. The quantity of rock cross vanes 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**
Boulder	1042 and SP for Structure Stone
No. 57 Stone	1005
Riprap, Class A	1042-1
Geotextile for Drainage, Type 2	1056

Boulders shall be used as header and footer rocks for this device.

Construction Methods

Rock cross vanes shall be constructed in accordance with the Rock Cross Vane Detail shown in the plans or as directed. Two vanes, each approximately 1/3 of the stream channel's bankfull width, will form a 20°– 30° angle out from the streambank toward upstream. The top elevation of both vanes will decrease from bankfull elevation toward the center of the channel at a slope of 4 to 20 percent. A vane running perpendicular to the stream's flow will connect the two outside vanes on the upstream end. Install header and footer rocks according to the detail and plate the upstream side with Type 2 geotextile and No. 57 stone. Voids between the header and footer rocks can be filled with hand-placed Class A riprap as directed. Footer rocks shall be placed such that the header rock is at streambed elevation. The rock cross vane shall be keyed into the bank at the downstream end as shown on the Rock Cross Vane Detail.

Measurement and Payment

Boulders will be measured and paid for as provided elsewhere in this contract.

No. 57 Stone will be measured and paid for as provided elsewhere in this contract.

Riprap, Class __ will be measured and paid for in accordance with Article 876-4 of the *Standard Specifications*.

Geotextile for Drainage will be measured and paid for in accordance with Article 876-4 of the *Standard Specifications*.

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 rock cross vanes.

CONSTRUCTED RIFFLE:

Description

This work consists of the construction and maintenance of physical barriers placed in and along the stream at locations designated on the plans to provide grade control.

The quantity of constructed riffles to be installed will be affected by the actual conditions that occur during the construction of the project. The quantity of constructed riffles 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

Item	**Section**
Boulder	1042 and SP for Structure Stone
No. 57 Stone	Section 1005
Riprap, Class A and B	Section 1042-1
Geotextile for Drainage, Type 2	1056

Construction Methods

Constructed riffles shall be constructed according to the Constructed Riffle Detail shown on the plans or as directed.

Measurement and Payment

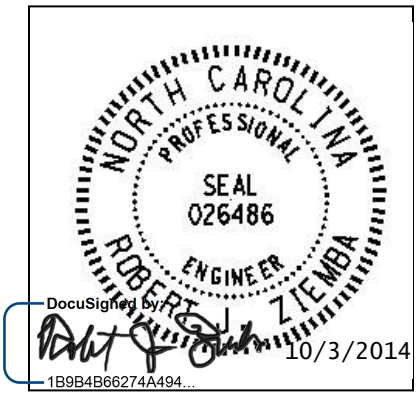
Boulders will be measured and paid for as provided elsewhere in this contract.

No. 57 Stone will be measured and paid for as provided elsewhere in this contract.

Riprap, Class __ will be measured and paid for in accordance with Article 876-4 of the *Standard Specifications*.

Geotextile for Drainage will be measured and paid for in accordance with Article 876-4 of the *Standard Specifications*.

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 constructed riffles.



U-3615B

Signals and Intelligent Transportation Systems Project Special Provisions

(Version 12.4)

Prepared By: iou
3-Oct-14

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1. 2012 STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES

The 2012 Standard Specifications are revised as follows:

1.1. Polymer Concrete (PC) Junction Boxes (1091-5(B))

Page 10-202, revise paragraph starting on line 9 to read "Provide polymer concrete (PC) boxes which have bolted covers and open bottoms. Provide vertical extensions of 6" to 12" as required by project special provisions."

Page 10-202, revise sentence beginning on line 14 to read "Other thermoplastic materials may be used for components which are not normally exposed to sunlight."

1.2. Submittal Requirements (1098-1(B))

Page 10-208, replace paragraph on line 34 with the following:

Submit for approval catalog cuts and/or shop drawings for materials proposed for use on the project. Allow 40 days for review of each submittal. Do not fabricate or order material until receipt of Engineer's approval.

Submit 4 copies of each catalog cut and/or drawing and show for each component the material description, brand name, stock-number, size, rating, manufacturing specification and the intended use (identified by labeling all components with the corresponding contract line item number). Present the submittals neatly arranged in the same order as the contract bid items. Electronic submittals of catalog cuts and drawings may be accepted in lieu of hard copies.

One hard copy and an electronic (PDF) copy of reviewed submittals will be returned to the Engineer from the ITS and Signals Unit.

1.3. Junction Boxes (1098-5)

Page 10-212, sub-Section 1098-5(C) Oversized Junction Boxes

Revise sentence to read, "Provide oversized junction boxes and covers with minimum inside dimensions of 28"(l) x 15"(w) x 22"(h)."

1.4. Controllers with Cabinets – Material (1751-2)

Page 17-37, Section 1751-2 Material

Add the following paragraph:

When the plans or specifications require a Type 2070L controller, contractor may provide a Type 2070E controller. Unless otherwise allowed by the Engineer, provide controllers of only one type.

1.5. Pedestals (1743)

Page 17-34, Add the following new sub-Section:

1743-4 - Screw-In Helical Foundation Anchor Assembly

Description:

Furnish and install screw-in helical foundation as an alternative to the standard reinforced concrete foundation specified in Article 1743 "Pedestals" of the Standard Specifications, for supporting Type I and Type II Pedestals. Do not use for Type III Pedestals.

Materials for Type I – Pedestrian Pushbutton Post:

Fabricate pipe assembly consisting of a 4" diameter x 56" long pipe, single helical blade and square fixed attachment plate. Furnish pipe in accordance with ASTM A-53 ERW Grade B and include a 2" x 3" cable opening in the pipe at 18" below the attachment plate. Furnish steel attachment plate and

helical blade in accordance with ASTM A-36. Include (4) slotted mounting holes in the attachment plate to fit bolt circles ranging from 7-3/4” to 14-3/4" diameter. Furnish additional 3/4” keyholes at slotted holes to permit anchor bolt installation and replacement from top surface. Include combination bolt-head retainer and dirt scrapers at the attachment plate underside to allow for a level or flush-mount plate installation with respect to the finished grade. Galvanize pipe assembly components in accordance with AASHTO M 111 or an approved equivalent.

Furnish (4) 3/4"-10NC x 3” square head anchor bolts to meet the requirements of ASTM 325. Provide (4) 3/4” plain flat galvanized washers, (4) 3/16” thick galvanized plate washers and (4) 3/4" galvanized hex nuts. Galvanize in accordance with AASHTO M 111 or an approved equivalent.

Construction Methods for Type I – Pedestrian Pushbutton Post:

Advance or mechanically screw foundation into soil up until top of attachment plate is level with finished grade. Slide the anchor bolt heads through the keyhole openings and under the attachment plate with threads pointing up. Bolt the pedestal base to the foundation attachment plate. For further construction methods, see manufacturer’s installation drawings.

Materials for Type II – Normal-Duty Pedestal:

Fabricate pipe assembly consisting of a 6” diameter x 60” long, single helical blade, 1-1/4” diameter stinger rod and square fixed attachment plate. Furnish pipe in accordance with ASTM A-53 ERW Grade B using schedule 40 wall thickness and include a 2” x 3” cable opening in the pipe at 18” below the attachment plate. Furnish steel attachment plate, helical blade and stinger rod in accordance with ASTM A-36. Include (4) slotted mounting holes in the attachment plate to fit bolt circles ranging from 10” to 15" diameter. Furnish additional 1-1/4” keyholes at slotted holes to permit anchor bolt installation and replacement from top surface. Include combination bolt-head retainer and dirt scrapers at the attachment plate underside to allow for a level or flush-mount plate installation with respect to the finished grade. Galvanize pipe assembly components in accordance with AASHTO M 111 or an approved equivalent.

Furnish (4) 1"-8NC x 4” galvanized Grade 5 square head anchor bolts. Provide (4) 1” plain flat galvanized washers and (4) 1" galvanized hex nuts. Galvanize in accordance with AASHTO M 111 or an approved equivalent.

Construction Methods for Type II – Normal-Duty Pedestal:

Advance or mechanically screw foundation into soil up until top of attachment plate is level with finished grade. Slide the anchor bolt heads through the keyhole openings and under the attachment plate with threads pointing up. Bolt the pedestal base to the foundation attachment plate.

For further construction methods, see manufacturer’s installation drawings.

Page 17-34, revise Measurement and Payment to sub-Section 1743-5.
Revise the last paragraph to read:

No measurement will be made for pedestal foundations, pedestal screw-in helical foundations, grounding systems and any peripheral pedestal mounting hardware as these are incidental to furnishing and installing pedestals.

2. SIGNAL HEADS

2.1. MATERIALS

A. General:

Fabricate vehicle signal head housings and end caps from die-cast aluminum. Fabricate 16-inch pedestrian 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.”

Where required, provide polycarbonate signal heads and visors that comply with the provisions pertaining to the aluminum signal heads listed on the QPL with the following exceptions:

Fabricate signal head housings, end caps, and visors from virgin polycarbonate material. Provide UV stabilized polycarbonate plastic with a minimum thickness of 0.1 ± 0.01 inches that is highway yellow (Federal Standard 595C, Color Chip 13538). Ensure the color is incorporated into the plastic material before molding the signal head housings and end caps. Ensure the plastic formulation provides the following physical properties in the assembly (tests may be performed on separately molded specimens):

Test	**Required**	**Method**
Specific Gravity	1.17 minimum	ASTM D 792
Flammability	Self-extinguishing	ASTM D 635
Tensile Strength, yield, PSI	8500 minimum	ASTM D 638
Izod impact strength, ft-lb/in [notched, 1/8 inch]	12 minimum	ASTM D 256

For pole mounting, provide side of pole mounting assemblies with framework and all other hardware necessary to make complete, watertight connections of the signal heads to the poles and pedestals. Fabricate the mounting assemblies and frames from aluminum with all necessary hardware, screws, washers, etc. to be stainless steel. Provide mounting fittings that match the positive locking device on the signal head with the serrations integrally cast into the brackets. Provide upper and lower pole plates that have a 1 ¼-inch vertical conduit entrance hubs with the hubs capped on the lower plate and 1 ½-inch horizontal hubs. Ensure that the assemblies provide rigid attachments to poles and pedestals so as to allow no twisting or swaying of the signal heads. Ensure that all raceways are free of sharp edges and protrusions, and can accommodate a minimum of ten Number 14 AWG conductors.

For pedestal mounting, provide a post-top slipfitter mounting assembly that matches the positive locking device on the signal head with serrations integrally cast into the slipfitter. Provide stainless steel hardware, screws, washers, etc. Provide a minimum of six 3/8 X 3/4-inch long square head bolts for attachment to pedestal. Provide a center post for multi-way slipfitters.

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 –Light Emitting Diode (LED) 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.

For mast-arm mounting, provide rigid vehicle signal head mounting brackets and all other hardware necessary to make complete, watertight connections of the vehicle signal heads to the mast arms and to provide a means for vertically adjusting the vehicle signal heads to proper alignment. Fabricate the mounting assemblies from aluminum, and provide serrated rings made of aluminum. Provide stainless steel cable attachment assemblies to secure the brackets to the mast arms. Ensure all fastening hardware and fasteners are fabricated 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 ITE "Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement" dated June 27, 2005 (hereafter referred to as VTCSH Circular 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.

3. LED U-Turn Arrow Signal Modules:

Provide modules in the following configurations: 12-inch left u-turn arrow signals.

Modules are not required to be listed on the ITS and Signals Qualified Products List. Provide manufacturer's certification in accordance with Article 106-3 of the *Standard Specifications,* that each module meets or exceeds the ITE "Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement" dated June 27, 2005 (hereafter referred to as VTCSH Circular Supplement) and other requirements stated in this specification.

Provide modules that have minimum maintained luminous intensity values that are not less than 16% of the values calculated using the method described in section 4.1 of the VTCSH Circular Supplement.

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 u-turn arrow	17	11
12-inch green u-turn arrow	15	15

For yellow u-turn arrow signal modules, provide modules tested under the procedures outlined in the VTCSH Circular Supplement to ensure power required at 77° F is 22 Watts or less.

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.

C. Pedestrian Signal Heads:

Provide pedestrian signal heads with international symbols that meet the MUTCD. Do not provide letter indications.

Comply with the ITE standard for "Pedestrian Traffic Control Signal Indications" and the following sections of the ITE standard for "Vehicle Traffic Control Signal Heads" in effect on the date of advertisement:

- Section 3.00 - "Physical and Mechanical Requirements"
- Section 4.01 - "Housing, Door, and Visor: General"
- Section 4.04 - "Housing, Door, and Visor: Materials and Fabrication"
- Section 7.00 - "Exterior Finish"

Provide a double-row termination block with three empty terminals and number 10 screws for field wiring. Provide barriers between the terminals that accommodate a spade lug sized for number 10 terminal screws. Mount the termination block in the hand section. Wire all signal sections to the terminal block.

Where required by the plans, provide 16-inch pedestrian signal heads with traditional three-sided, rectangular visors, 6 inches long.

Provide 2-inch diameter pedestrian push-buttons with weather-tight housings fabricated from die-cast aluminum and threading in compliance with the NEC for rigid metal conduit. Provide a weep hole in the housing bottom and ensure that the unit is vandal resistant.

Provide push-button housings that are suitable for mounting on flat or curved surfaces and that will accept 1/2-inch conduit installed in the top. Provide units that have a heavy duty push-button assembly with a sturdy, momentary, normally-open switch. Have contacts that are electrically insulated from the housing and push-button. Ensure that the push-buttons are rated for a minimum of 5 mA at 24 volts DC and 250 mA at 12 volts AC.

Provide standard R10-3 signs with mounting hardware that comply with the MUTCD in effect on the date of advertisement. Provide R10-3E signs for countdown pedestrian heads and R10-3B for non-countdown pedestrian heads.

Design the LED pedestrian traffic signal modules (hereafter referred to as modules) for installation into standard pedestrian traffic signal sections that do not contain the incandescent signal section reflector, lens, eggcrate visor, gasket, or socket. Provide modules that consist of an assembly that uses LEDs as the light source in lieu of an incandescent lamp. Use LEDs that are of the latest aluminum indium gallium phosphorus (AlInGaP) technology for the Portland Orange hand and countdown displays. Use LEDs that are of the latest indium gallium nitride (InGaN) technology for the Lunar White walking man displays. 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.

Design all modules to operate using a standard 3 - wire field installation. Provide spade terminals crimped to the lead wires and sized for a #10 screw connection to the existing terminal block in a standard pedestrian signal housing. 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.

Provide modules in the following configuration: 16-inch displays which have the solid hand/walking man overlay on the left and the countdown on the right. 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 ITE "Pedestrian Traffic Control Signal Indicators - Light Emitting Diode (LED) Signal Modules" dated August 04, 2010 (hereafter referred to as PTCSI Pedestrian Standard) and other requirements stated in this specification.

Provide modules that meet the following requirements when tested under the procedures outlined in the PTCSI Pedestrian Standard:

Module Type	Max. Wattage at 165° F	Nominal Wattage at 77° F
Hand Indication	16	13
Walking Man Indication	12	9
Countdown Indication	16	13

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.

Provide module lens that is hard coated or otherwise made to comply with the material exposure and weathering effects requirements of the Society of Automotive Engineers (SAE) J576. Ensure all exposed components of the module are suitable for prolonged exposure to the environment, without appreciable degradation that would interfere with function or appearance.

Ensure the countdown display continuously monitors the traffic controller to automatically learn the pedestrian phase time and update for subsequent changes to the pedestrian phase time.

Ensure the countdown display begins normal operation upon the completion of the preemption sequence and no more than one pedestrian clearance cycle.

D. 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.

3. MICROWAVE VEHICLE DETECTOR – SINGLE ZONE

3.1. DESCRIPTION

Furnish and install a microwave vehicle detection unit and manufacturer recommended cables and hardware in accordance with the plans and specifications.

3.2. MATERIALS

Furnish material, equipment, and hardware under this section that is pre-approved on the ITS and Signals QPL.

Provide a detector for either side-fire or forward-fire configuration. Ensure the detector will detect vehicle in sunny, cloudy, rainy, snowy, and foggy weather conditions with self-tuning to auto-adjust in changing environmental conditions. Ensure the detector can operate from the voltage supplied by a NEMA and Type-170 traffic signal cabinet. Ensure the detector can provide detection calls to the traffic signal controller within a NEMA and Type-170 cabinet. Ensure the detector will put out a constant call in the event of a component failure or loss of power. Ensure the detector has an operating temperature range of -20 to 150 degrees F. Ensure a water resistant housing for the detector.

For advance pulse detection, ensure the detector senses vehicles in motion at a range of 200 feet with an operating frequency of 10.525 GHz +/- 25MHz.

For stop bar presence detection, ensure the detector outputs a constant call while a vehicle is in the detection zone. Ensure the presence detection unit can cover a detection zone as shown on the plans and has an effective range of at least 75 feet from the detector unit to the aim point on the road surface.

For units without an integrated card rack interface, provide Form C output relay contacts rated a minimum of 3A, 24VDC.

3.3. CONSTRUCTION METHODS

Install the microwave vehicle detector in accordance with the manufacturer's recommendations.

Monitor and maintain the detector unit during construction to ensure microwave vehicle detector is functioning properly and aimed for the detection zone shown in the plans. Refer to Subarticle

1700-3 (D) Maintenance and Repair of Materials of the *Standard Specifications* for failure to maintain the microwave detection system.

3.4. MEASUREMENT AND PAYMENT

Actual number of microwave vehicle detector units furnished, installed, and accepted.

No measurement will be made of cables or hardware, as these will be considered incidental to furnishing and installing microwave vehicle detectors.

Payment will be made under:

Microwave Vehicle Detector – Single Zone..... Each

4. MICROWAVE VEHICLE DETECTION SYSTEM - MULTIPLE DETECTION ZONES

4.1. DESCRIPTION

Design, furnish and install a microwave vehicle detection system with the manufacturer recommended cables and hardware in accordance to the plans and specifications. Ensure the detection system provides multiple detection zones.

4.2. MATERIALS

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

Obtain the Engineer's approval before furnishing microwave vehicle detection system. The contractor is responsible for the final design of microwave vehicle detection system. Review and acceptance of the designs by the Department does not relieve the contractor from the responsibility to provide fully functional systems and to ensure that the required detection zones can be provided. With the exception of contractor-furnished poles, mast arms, and luminaire arms, furnish material, equipment, and hardware under this section that is pre-approved on the ITS and Signals QPL. Submit and obtain Engineer's approval of shop drawings for any poles, mast arms, and luminaire arms provided by the contractor prior to ordering from manufacturer.

Provide a detector for either side-fire or forward-fire configuration. Ensure the detector will detect vehicles in sunny, cloudy, rainy, snowy, and foggy weather conditions. Ensure the detector can operate from the voltage supplied by a NEMA TS-1/TS-2 or Type 332 or 336 traffic signal cabinet. Ensure the detector can provide detection calls to the traffic signal controller within a NEMA TS-1/TS-2 or Type 332 or 336 cabinet. Ensure the detection system provides a constant call in the event of a component failure or loss of power. Ensure the detector has an operating temperature range of -30 to 165 degrees F and operates within the frequency range of 10 to 25 GHz. Ensure the detector is provided with a water-tight housing offering NEMA 4X protection and operates properly in up to 95% relative humidity, non-condensing.

Provide each detector unit to allow the placement of at least 8 detection zones with a minimum of 8 detection channel outputs. When the microwave vehicle detection system requires an integrated

card rack interface(s), provide only enough interface cards to implement the vehicle detection shown on the signal plans. Provide a means acceptable to the Engineer to configure traffic lanes and detection zones. Provide each channel output with a programmable means to delay the output call upon activation of a detection zone that is adjustable in one second increments (maximum) over the range of 0 to 25 seconds. Provide each channel output with a programmable means to extend the output call that is adjustable in one second increments (maximum) over the range of 0 to 25 seconds. Ensure both delay and extend timing can be set for the same channel output.

For advance detection system, ensure the detector senses vehicles in motion at a range of 50 to 400 feet from the detector unit for forward-fire configuration and a range of 50 to 200 feet from the detector unit for side-fire configuration with an accuracy of 95% for both configurations. Ensure the advance detection system provides each channel output call of at least 100 ms in duration.

For stop bar presence detection system, ensure the detector outputs a constant call while a vehicle is in the detection zone and removes the call after all vehicles exit the detection zone. Ensure the presence detector unit can cover a detection zone as shown on the plans and has an effective range of 10 to 120 feet from the detector unit.

For units without an integrated card rack interface, provide Form C output relay contacts rated a minimum of 3A, 24VDC.

If a laptop is used to adjust detector settings, ensure that software is licensed for use by the Department and by any other agency responsible for maintaining or operating the microwave detection system. Provide the Department with a license to duplicate and distribute the software as necessary for design and maintenance support.

After initial detector configuration and installation, ensure routine adjustments or calibration are not needed to maintain acceptable performance.

4.3. CONSTRUCTION METHODS

Install the microwave vehicle detection system in accordance with the manufacturer's recommendations.

Monitor and maintain each detector unit during construction to ensure microwave vehicle detection system is functioning properly and aimed for the detection zone shown in the plans. Refer to Subarticle 1700-3 (D) Maintenance and Repair of Materials of the *Standard Specifications* for failure to maintain the microwave detection system.

4.4. MEASUREMENT AND PAYMENT

Actual number of microwave vehicle detection systems – multiple zones furnished, installed, and accepted.

No measurement will be made of cables or hardware, as these will be considered incidental to furnishing and installing microwave vehicle detection systems.

Payment will be made under:

Microwave Vehicle Detection System – Multiple Zones ..... Each

5. TRAFFIC SIGNAL SUPPORTS

5.1. METAL TRAFFIC SIGNAL SUPPORTS – ALL POLES

A. General:

Furnish and install metal strain poles and metal poles with mast arms, 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* 5th Edition, 2009 (hereafter called 5th 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 holes should be deburred, non grommeted, and oversized to fit around the 2” diameter 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 properly located to drain molten zinc during the 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 1076-7

Standard Drawings for Metal Poles are available that supplement these project special provisions. These drawings are located on the Department’s website:

https://connect.ncdot.gov/resources/safety/pages/ITS-Design-Resources.aspx

Comply with article 1098-1B of the *2012 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 detail drawing only, 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 article 1098-1A of the *Standard Specifications* for Qualified Products List (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	Show NCDOT inventory number(s), contractor's name and relevant revision number in the title block. All drawings must have a unique drawing number for each project and identified for multiple pages.
Standard Pole Shop Drawings (from the QPL)	4 sets	1 set	Submit drawings on 11" x 17" format media. Show NCDOT inventory number(s), contractor's name and relevant revision number in the title block. All drawings must have a unique drawing number for each project and identified for multiple pages.
Structure Calculations	1 set	1 set	Not required for Standard QPL Poles
Standard Pole Foundation Drawings	1 set	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. Show NCDOT inventory number(s), contractor's name and relevant revision number in the title block. All drawings must have a unique drawing number for each project and identified for multiple pages. If QPL Poles are used, include the corresponding QPL pole shop drawings with this submittal.
Foundation Calculations	1	1	**Submit copies of LPILE input, output and pile tip deflection graph per Section 11.4 of this specification for each foundation.** 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, hammer efficiency, soil bearing pressure, soil density, 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 drawings 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. The Reviewer has the right to request additional analysis and copies of the calculations to expedite the approval process.

B. Materials:

Fabricate metal pole and arm shaft from coil or plate steel to meet the requirements of ASTM A 595 Grade A tubes. For structural steel shapes, plates and bars use A572 Gr 50 min or ASTM A709 Gr 50 min. 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 or an approved equivalent.

Use the submerged arc process or other NCDOT previously approved process suitable for pole shaft and arms to continuously weld pole shafts and arm shafts along their entire length. The longitudinal seam weld will be finished flush to the outside contour of 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 1072-18 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 through M5 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 Gr 36 or an approved equivalent. Conform to the applicable bolt pattern and orientation as shown on Metal Pole Standard Drawing Sheet M2.

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.

Provide a minimum of four (4) 1-1/2" diameter high strength bolts for connection between arm plate and pole plate. Increase number of bolts to six (6) 1-1/2" diameter high strength bolts when arm lengths are greater than 50’-0” long.

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 for both plates.

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 1076-7 “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.

5.2. METAL POLE UPRIGHTS (VERTICAL MEMBERS)

A. Materials:

- Provide tapered tubular shafts and fabricated of steel conforming to ASTM A-595 Grade A or an approved equivalent.
- Hot-dip galvanize poles in accordance with AASHTO M 111 or an approved equivalent.
- 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 1072-18 of the *Standard Specification* except that no field welding on any part of the pole will be permitted.
- Have Shafts with no circumferential welds except at the lower end joining the shaft to the base.
- 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.

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 liquid tight flexible metal conduit (Type LFMC), liquid tight 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 unacceptable with the exception of 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.

Provide four anchor nuts and four washers for each anchor bolt. 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 #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.

5.3. STRAIN POLE SHAFTS

Provide 2 messenger cable (span wire) clamps and associated hardware for attachment of messenger cable. Ensure that diameter of the clamp is appropriate to its location on the pole and 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.

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. Provide galvanized threaded plugs for all unused couplings at pole entrance points. Refer to Metal Pole Standard Drawing Sheet M3 for fabrication details.

Ensure that allowable pole deflection does not exceed that allowed per 5th Edition AASHTO. Ensure maximum deflection at the top of the pole does not exceed 2.5 percent of the pole height.

5.4. MAST ARM POLE SHAFTS

Ensure that allowable pole deflection does not exceed that allowed per 5th Edition AASHTO. Ensure that maximum angular rotation of the top of the mast arm pole does not exceed 1 degree 40 minutes (1°40').

A. 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 1 degree 40 minutes (1°40') of vertical. Install poles with the manufacturer's recommended "rake." Use threaded leveling nuts to establish rake if required.

5.5. MAST ARMS

Provide pole plates and associated gussets and fittings for attachment of required mast arms. As part of each mast arm attachment, provide a cable passage hole in the pole to allow passage of signal cables from the pole to the arm.

Ensure that allowable mast arm deflection does not exceed that allowed per 5th Edition AASHTO. Also when arm is fully loaded, tip of the arm shall not go below the arm attachment point with the pole for all load conditions per 5th Edition AASHTO.

Furnish all arm plates and necessary attachment hardware, including bolts and brackets.

Provide two extra bolts for each arm.

Provide grommet holes on the arms to accommodate cables for the signals.

Provide arms with weatherproof connections for attaching to the shaft of the pole.

Provide hardware that is galvanized steel, stainless steel, or corrosive-resistant aluminum.

Provide a removable end cap with stainless steel attachment screws for the end of each mast arm. Ensure that the cap is cast aluminum conforming to Aluminum Association Alloy 356.0F. Furnish cap attached to the arm 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 arm end opening when the cap is removed.

Comply with the following for Steel Luminaire Arms:

- In addition to tapered tube, luminaire arms may be standard weight black steel pipe conforming to ASTM A 53-90a, Type E or Type S, Grade B or an approved equivalent.
- Conform to the welding requirements of the steel poles.
- After all fabricating, cutting, punching, and welding are completed, luminaire arms should be hot-dipped galvanized inside and outside.
- In accordance with the National Electrical Code (NEC) Article 230.2(E), provide identification of the electrical source provider for the luminaire feeder circuit with contact information on a permanent label located in the pole hand hole in the vicinity of the feeder circuit raceway.

A. Materials:

After all fabricating, cutting, punching, and welding are completed, hot-dip galvanize the structure in accordance with the AASHTO M 111 or an approved equivalent.

B. Construction Methods:

Install horizontal-type arms with sufficient manufactured rise to keep arm from deflecting below the arm attachment height.

Attach cap to the mast arm with a sturdy chain or cable. Ensure that the chain or cable is long enough to permit the cap to hang clear of the arm opening when the cap is removed.

For mast arm poles, use full penetration welds with back-up ring at the pole base and at the arm base connection.

5.6. DRILLED PIER FOUNDATIONS FOR METAL TRAFFIC SIGNAL POLES

Analysis procedures and formulas shall be based on AASHTO 5th Edition, latest ACI code and the *Drilled Shafts: Construction Procedures and Design Methods* FHWA-IF99-025 manual. 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.

For lateral analysis, use LPILE Plus V6.0 or later. Inputs, results and corresponding graphs are to be submitted with the design calculations.

Skin Friction is to be calculated using the α-method for cohesive soils and the β-method for cohesion-less soils (**Broms method will not be accepted**). Detailed descriptions of the “α” and “β” methods can be found in *FHWA-IF-99-025*.

Omit first 2.5ft for cohesive soils when calculating skin friction.

When extreme loading and poor soil conditions are encountered, the one diameter length omitted from the shaft depth calculations (per FHWA-1F-99-025) may be added back in for Torsion calculations (with prior NCDOT approval).

When hammer efficiency is not provided, assume a value of 0.70.

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 shear, axial and 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.

Have the contractor notify the engineer if the proposed foundation is to be installed on a slope other than 8H: 1V or flatter.

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 Standard Drawings and Section B7 (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, hammer efficiency, depth of water table and a general description of the soil types encountered using the AASHTO Classification System.

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-6.0 or later manufactured by Ensoft, Inc. to analyze drilled piers. Use the computer software gINT V8i 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.

5.7. CUSTOM DESIGN OF TRAFFIC SIGNAL SUPPORTS

A. General:

Design traffic signal supports with foundations consisting of metal strain poles or metal poles with mast arms.

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 5th 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. For natural wind fatigue stress calculations, utilize a drag coefficient (C_d) computed for 11.2 mph wind velocity and not the basic wind speed velocity.
- 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 (17.0 ft^2 without back plate)
- 4-section, 12-inch, Surface area: 32.0 ft^2 (21.0 ft^2 without back plate)
- 5-section, 12-inch, Surface area: 42.0 ft^2 (29.0 ft^2 without back plate)

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 NCDOT 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 mast arm poles, provide designs with provisions for pole plates and associated gussets and fittings for mast arm attachment. As part of each mast arm attachment, provide a grommeted 2" diameter hole on the shaft side of the connection to allow passage of the signal cables from the pole to the arm.

Where ice is present, assume wind loads as shown in Figure 3-5 of the 5th 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 1'-6" 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.

C. Mast Arms:

Design all arm plates and necessary attachment hardware, including bolts and brackets as required by the plans.

Design for grommeted holes on the arms to accommodate the cables for the signals if specified.

Design arms with weatherproof connections for attaching to the shaft of the pole.

Always use a full penetration groove weld with a backing ring to connect the mast arm to the pole. Refer to Metal Pole Standard Drawing Sheet M5.

Capacity of tapped flange plate must be sufficient to develop the full capacity of the connecting bolts. In all cases the flange plate of both arm and shaft must be at least as thick as the arm connecting bolts are in diameter.

5.8. POLE NUMBERING SYSTEM

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”.

5.9. MEASUREMENT AND PAYMENT

Actual number of metal strain signal poles (without regard to height or load capacity) furnished, installed and accepted.

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

Actual number of soil tests with SPT borings drilled furnished and accepted.

Actual volume of concrete poured in cubic yards of drilled pier foundation furnished, installed and accepted.

Actual number of designs for mast arms with metal poles furnished 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
Metal Pole with Single Mast Arm .....Each
Soil Test .....Each
Drilled Pier Foundation.....Cubic Yard
Mast Arm with Metal Pole Design .....Each

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)
  - Note: Configure the Field I/O Module to disable both the External WDT Shunt/Toggle Switch and SP3 (SP3 active indicator is “off”)
- 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.

For each master location and central control center, furnish a U.S. Robotics V.92 or approved equivalent auto-dial/auto-answer external modem to accomplish the interface to the Department-furnished microcomputers. Include all necessary hardware to ensure telecommunications.

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 336S pole mounted cabinets configured for 8 vehicle phases, 4 pedestrian phases, and 6 overlaps. Do not reassign load switches to accommodate overlaps unless shown on electrical details. Provide 336S pole mounted cabinets that are 46" high with 40" high internal rack assemblies.

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 -40º F to +185º 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

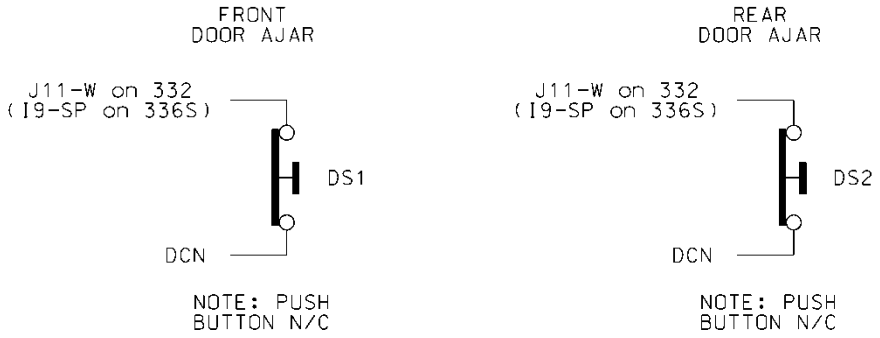
Provide a 120 VAC signal surge suppressor for each AC+ interconnect signal input. Ensure the device meets the following specifications:

- 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

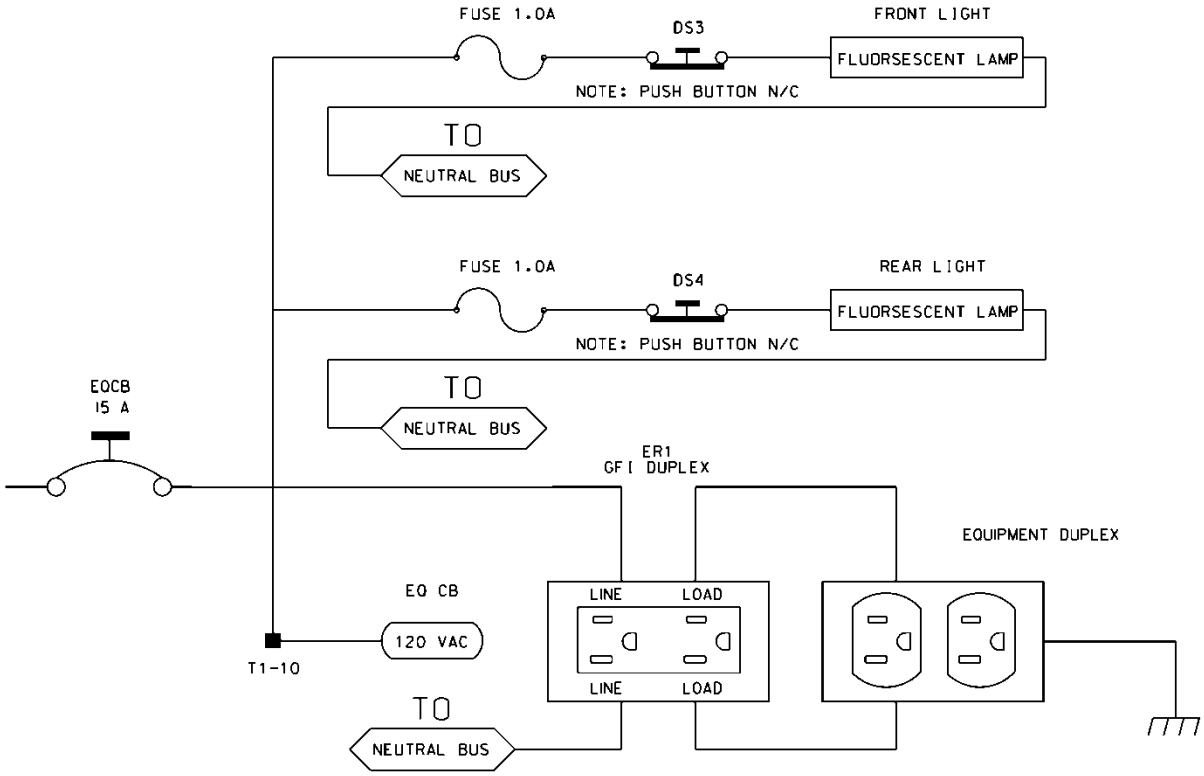
Provide conductors for surge protection wiring that are of sufficient size (ampacity) to withstand maximum overcurrents which could occur before protective device thresholds are attained and current flow is interrupted.

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:

332 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

Do not provide the P20 terminal assembly (red monitor board) or red interface ribbon cable as specified in LA Specification No. 54-053-08.

Provide a P20 connector that mates with and is compatible with the red interface connector mounted on the front of the conflict monitor. Ensure that the P20 connector and the red interface connector on the conflict monitor are center polarized to ensure proper connection. Ensure that removal of the P20 connector will cause the conflict monitor to recognize a latching fault condition and place the cabinet into flashing operation.

Wire the P20 connector to the output file and auxiliary output file using 22 AWG stranded wires. Ensure the length of these wires is a minimum of 42 inches in length. Provide a durable braided sleeve around the wires to organize and protect the wires.

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. Provide a wire for special function 1. Terminate the unused wires with ring type lugs, insulated, and bundled for optional use.

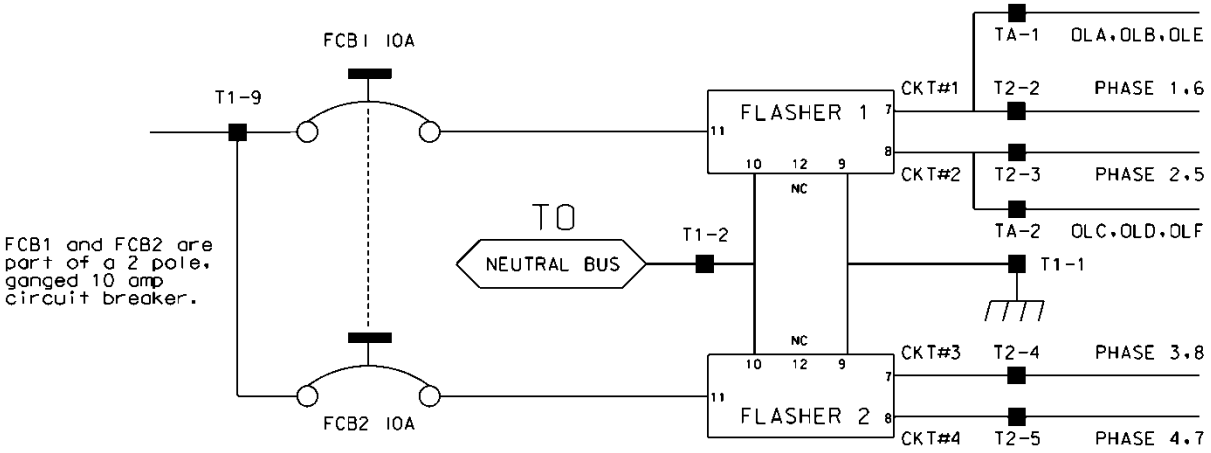
	P20 Connector				
PIN	FUNCTION	CONN TO	PIN	FUNCTION	CONN TO
1	Channel 15 Red	119	2	Channel 16 Red	110
3	Channel 14 Red	104	4	Chassis GND	01-9
5	Channel 13 Red	113	6	N/C	
7	Channel 12 Red	AUX 101	8	Spec Function 1	
9	Channel 10 Red	AUX 124	10	Channel 11 Red	AUX 114
11	Channel 9 Red	AUX 121	12	Channel 8 Red	107
13	Channel 7 Red	122	14	Channel 6 Red	134
15	Channel 5 Red	131	16	Channel 4 Red	101
17	Channel 3 Red	116	18	Channel 2 Red	128
19	Channel 1 Red	125	20	Red Enable	01-14

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.

Do not wire pin 12 of the load switch sockets.

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 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. Model 2018 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).

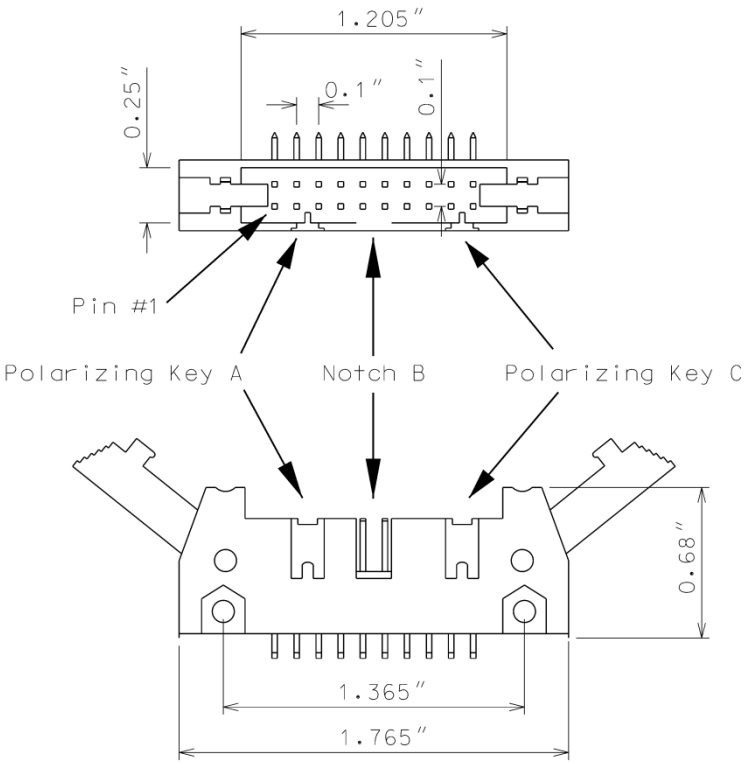
Provide a switch to set the Watchdog fault timing. Ensure that when the switch is in the ON position the Watchdog fault timing value is set to 1.0 +/- 0.1s (2018 mode). Ensure that when the switch is in the OFF position the Watchdog fault timing value is set to 1.5 +/- 0.1s (210 mode).

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, center polarized, 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 removal of the P20 cable connector will cause the conflict 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.

For conflict monitors used within an Ethernet communications system, provide a conflict monitor with an Ethernet 10/100 Mbps, RJ-45 port for data communication access to the monitor by a local notebook computer and remotely via a workstation or notebook computer device connected to the signal system local area network. The Ethernet port shall be electrically isolated from the conflict monitor's electronics and shall provide a minimum of 1500 Vrms isolation. Integrate monitor with Ethernet network in cabinet. Provide software to retrieve the time and date from a network server in order to synchronize the on-board times between the conflict monitor and the

controller. Furnish and install the following Windows based, graphic user interface software on workstations and notebook computers where the signal system client software is installed: 1) software to view and retrieve all event log information, 2) software that will search and display a list of conflict monitor IP addresses and IDs on the network, and 3) software to change the conflict monitor's network parameters such as IP address and subnet mask.

For non-Ethernet connected monitors, 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 (2070). Furnish and connect a serial cable from the conflict monitor's DB-9 connector to Comm Port 1 of the 2070 controller. Ensure conflict monitor communicates with the controller. 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

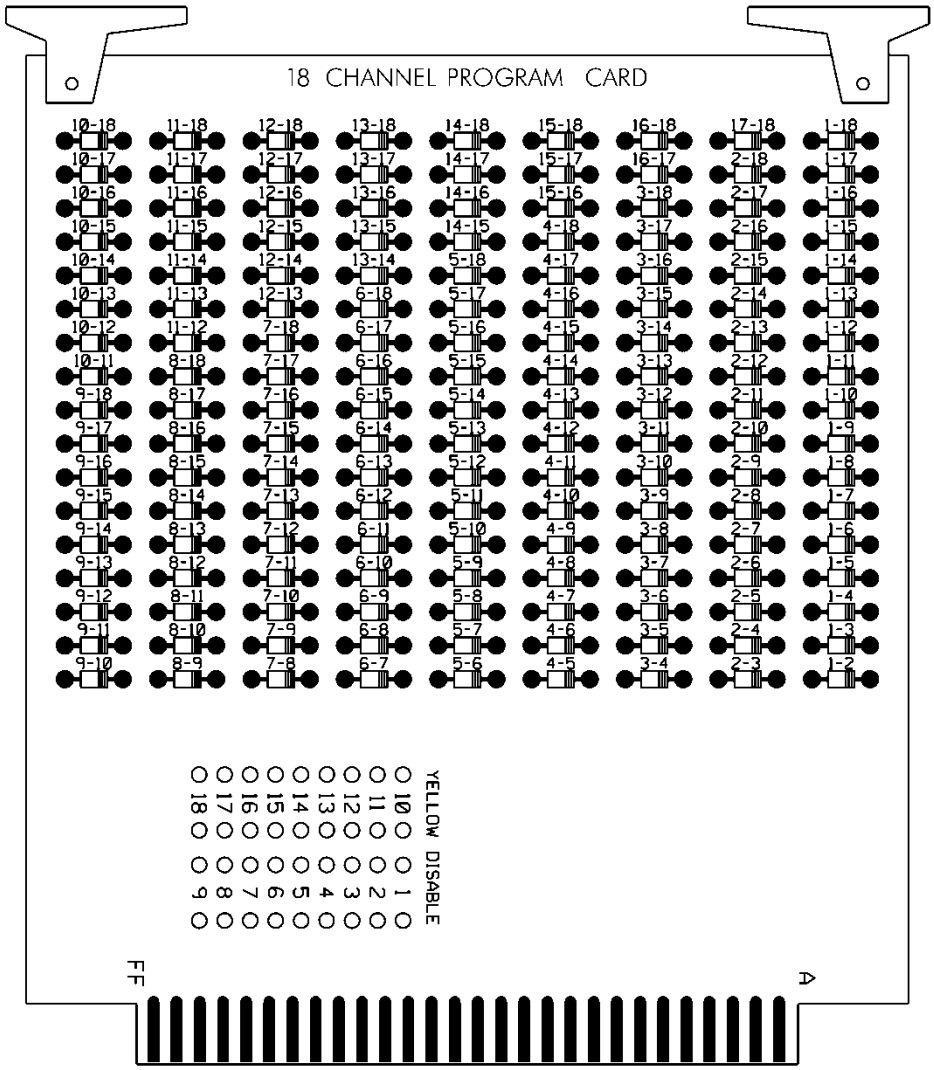
Pin #	Function (Back Side)	Pin #	Function (Component Side)
1	Channel 2 Green	A	Channel 2 Yellow
2	Channel 13 Green	B	Channel 6 Green
3	Channel 6 Yellow	C	Channel 15 Green
4	Channel 4 Green	D	Channel 4 Yellow
5	Channel 14 Green	E	Channel 8 Green
6	Channel 8 Yellow	F	Channel 16 Green
7	Channel 5 Green	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



E. Preemption and Sign Control Box

Provide preemption and sign control box to operate in a Model 332 and Model 336S cabinet. Provide hardware to mount the box to the cage of the cabinet to ensure the front side is facing the opposite side of the cabinet. Furnish the material of the box from a durable finished metallic or thermoplastic case. Ensure the size of the box is not greater than 7(l) x 5(w) x 5(d) inches. Ensure that no modification is necessary to mount the box on the cabinet cage.

Provide the following components in the preemption and sign control box: relays, fuses, terminal blocks, MOVs, resistor, RC network, lamp, and push button switch.

Provide UL Listed or Recognized relay K1 as a DPDT enclosed relay (120 VAC, 60 Hz coil) with an 8-pin octal-style plug and associated octal base. Provide contact material made of AgCdO with a 10 amp, 240 VAC rating. Ensure the relay has a specified pickup voltage of 102 VAC.

Provide relay SSR1 as a Triac SPST normally open solid state relay that is rated for 120 VAC input and zero-crossing (resistive load) 25 amp @ 120 VAC output. Ensure the relay turns on at 90 Vrms within 10 ms and turns off at 10 Vrms within 40 ms. Ensure the relay has physical

characteristics as shown in the wiring detail in Figure 1. Provide 4 terminal screws with saddle clamps.

Provide fuses F1 and F2 as a UL Listed ¼″ x 1-1/4″ glass tube rated at 250 volts with a 10kA interrupting rating. Ensure F1 non-delay (fast-acting) and F2 slow-blow (time-delay) fuses have a maximum opening times of 60 minutes and 120 seconds for currents of 135 and 200 percent of the ampere rating, respectively. Ensure F2 slow-blow (time-delay) fuses have a minimum opening times of 12 seconds at 200 percent of the ampere rating. Provide fuse holders that are UL Recognized panel-mounted holders rated 250V, 15 ampere minimum with bayonet-type knobs which accept ¼″ x 1-1/4″ glass tube fuses.

Provide terminal blocks that are rated for 300V and are made of electrical grade thermoplastic or thermosetting plastic. Ensure each terminal block is of closed back design and has recessed-screw terminals with molded barriers between terminals. Ensure each terminal block is labeled with a block designation. Ensure each terminal is labeled with the function and a number.

Provide 3/4-inch diameter radial lead UL-recognized metal oxide varistors (MOVs) that have electrical performance as 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 resistor R1 as a 2K ohm, 12 watt, wirewound resistor with tinned terminals and attaching leads. Ensure the resistor is spaced apart from surrounding wires.

Provide a LED or incandescent lamp that has a voltage rating of 120 VAC with a minimum life rating at 50,000 hours.

Wire the preemption and sign control box as shown in Figure 1.

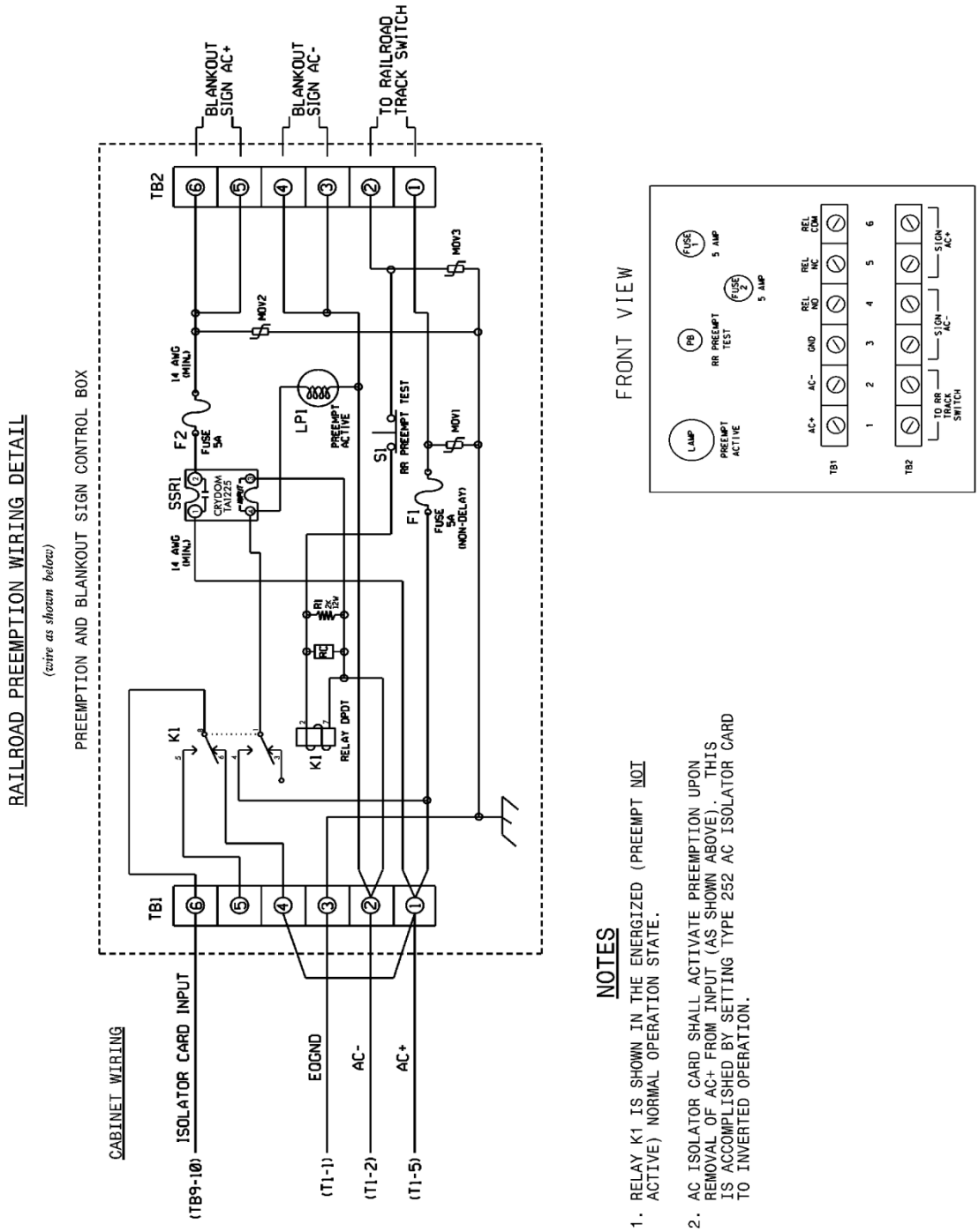

RAILROAD PREEMPTION WIRING DETAIL
(wire as shown below)
PREEMPTION AND BLANKOUT SIGN CONTROL BOX
CABINET WIRING
ISOLATOR CARD INPUT
(TB9-10)
(T1-1)
(T1-2)
(T1-5)
EQGND
AC-
AC+
TB1
TB2
K1
RELAY DPDT
R1
R2
SSR1
CRYDOM
14 AWG (MIN.)
F2
FUSE 5A
LP1
PREEMPT ACTIVE
S1
RR PREEMPT TEST
F1
FUSE 5A (NON-DELAY)
MOV1
MOV2
MOV3
BLANKOUT SIGN AC+
BLANKOUT SIGN AC-
TO RAILROAD TRACK SWITCH
FRONT VIEW
LAMP
PREEMPT ACTIVE
PB
RR PREEMPT TEST
FUSE 1
5 AMP
FUSE 2
5 AMP
AC+
AC-
GND
REL NO
REL NC
REL COM
TO RR TRACK SWITCH
SIGN AC-
SIGN AC+
NOTES
1. RELAY K1 IS SHOWN IN THE ENERGIZED (PREEMPT NOT ACTIVE) NORMAL OPERATION STATE.
2. AC ISOLATOR CARD SHALL ACTIVATE PREEMPTION UPON REMOVAL OF AC+ FROM INPUT (AS SHOWN ABOVE). THIS IS ACCOMPLISHED BY SETTING TYPE 252 AC ISOLATOR CARD TO INVERTED OPERATION.

Figure 1

6.4. MATERIALS – TYPE 2070E CONTROLLERS

Conform to CALTRANS *Transportation Electrical Equipment Specifications* (TEES) (dated March 12, 2009, plus Errata 1 dated January 21, 2010) except as required herein.

Furnish Model 2070E 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 2070E 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 2070-1E, CPU Module, Single Board, with 8Mb Datakey (blue in color)
- MODEL 2070-2A or approved MODEL 2070-2E, Field I/O Module (FI/O)
  - Note: Configure the Field I/O Module to disable both the External WDT Shunt/Toggle Switch and SP3 (SP3 active indicator is "off")
- MODEL 2070-3B, Front Panel Module (FP), Display B (8x40)
- MODEL 2070-4, 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.

For each master location and central control center, furnish a U.S. Robotics V.92 or approved equivalent auto-dial/auto-answer external modem to accomplish the interface to the Department-furnished microcomputers. Include all necessary hardware to ensure telecommunications.

7. BACK PULL FIBER OPTIC CABLE

7.1. DESCRIPTION

Back pull and store or back pull and reinstall existing communications cable.

7.2. CONSTRUCTION

During project construction where instructed to back pull existing aerial sections of fiber optic communications cable, de-lash the cable from the messenger cable and back pull the cable to a point where it can be stored or re-routed as shown on the plans. If instructed, remove and discard the existing messenger cable and pole mounting hardware once the cable is safely out of harm's way.

During project construction where instructed to back pull existing underground sections of fiber optic communications cable, back pull the cable to a point where it can be stored or re-routed as shown on the plans. If instructed, remove abandoned junction boxes and backfill with a suitable material to match the existing grade. Leave abandoned conduits in place unless otherwise noted.

Where instructed, re-pull the fiber optic cable back along messenger cable or through conduit systems.

7.3. MEASUREMENT AND PAYMENT

Back Pull Fiber Optic Cable will be paid for as the actual linear feet of fiber optic cable back pulled and either stored or back pulled and rerouted. Payment is for the actual linear feet of cable back pulled.

No payment will be made for removing messenger cable and pole mounting hardware or removing junction boxes and back filling to match the surrounding grade as these items of work will be considered incidental to back pulling the fiber optic cable.

Payment will be made under:

Back Pull Fiber Optic Cable ..... Linear Feet

ST-1

Project U-3615B **Guilford Co.**

Project Special Provisions
Structures

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For MSE Retaining Walls, Segmental Gravity Retaining Walls, Soldier Pile Retaining Walls, and Control of Vibration, see Geotechnical special provisions.

10/15/2014

NORTH CAROLINA PROFESSIONAL SEAL 022506 ENGINEER JESSE McARTHUR BAILEY

DocuSigned by:
J. M. Bailey
9026554D952B471...

PROJECT SPECIAL PROVISIONS
STRUCTURES

PROJECT U-3615B **GUILFORD COUNTY**

CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 238+33.00 -L- **(12-12-13)**

1.0 GENERAL

Construct, maintain, and remove the temporary access required to provide the working area necessary for construction of the new bridge, construction of the temporary detour structure, or for the removal of an existing bridge, as applicable. Temporary access may involve the use of a rock causeway [workpad], a work bridge, or other methods; however, all types of temporary access are required to meet the requirements of all permits, the Standard Specifications, and this Special Provision.

2.0 TEMPORARY ROCK CAUSEWAY [WORKPAD]

At the contractor's option, construction of a temporary rock causeway [workpad] within the limits shown on the plans is permitted. Build the causeway [workpad] with Class II riprap topped by a layer of Class B riprap or as otherwise designated on the plans or approved by the Engineer. If desired, recycle the Class II riprap used in the causeway [workpad] for placement in the final riprap slope protection as directed by the Engineer. No payment will be made for recycled riprap as this material is considered incidental to the causeway [workpad] placement and removal. If this option is exercised, no adjustment in contract bid price will be allowed due to an underrun in the quantity of "Rip Rap Class II (2'-0" Thick)".

Completely remove all causeway [workpad] material including pipes and return the entire causeway [workpad] footprint to the original contours and elevations within 90 days of the completion of the deck slab or as otherwise required by permits.

For sites affected by moratoriums or restrictions on in-stream work: Do not construct or remove causeway [workpad] during the moratorium period shown on the permit. If the completion of the deck slab falls within the prohibitive dates for causeway [workpad] construction or removal, begin causeway [workpad] removal immediately following the prohibitive dates.

3.0 TEMPORARY WORK BRIDGE

At the contractor's option, construction of a temporary work bridge in lieu of the causeway(s) [workpad] is acceptable, provided the temporary work bridge satisfies all permits. Submit details of the temporary work bridge to the Engineer prior to constructing the work bridge to ensure conformance with the plans and all permits. Completely remove the temporary bridge prior to final acceptance or as otherwise required by the permits.

4.0 BASIS OF PAYMENT

The lump sum price bid for "Construction, Maintenance and Removal of Temporary Access at Station _____" will be full compensation for the above work, or other methods of access, including all material, pipes, work bridge components, equipment, tools, labor, disposal, and incidentals necessary to complete the work.

PLACING LOAD ON STRUCTURE MEMBERS (11-27-12)

The 2012 Standard Specifications shall be revised as follows:
In **Section 420-20 – Placing Load on Structure Members** replace the first sentence of the fifth paragraph with the following:

Do not place vehicles or construction equipment on a bridge deck until the deck concrete develops the minimum specified 28 day compressive strength and attains an age of at least 7 curing days.

STEEL REINFORCED ELASTOMERIC BEARINGS (11-27-12)

The 2012 Standard Specifications shall be revised as follows:
In **Section 1079-1 – Preformed Bearing Pads** add the following after the second paragraph:

Internal holding pins are required for all shim plates when the contract plans indicate the structure contains the necessary corrosion protection for a corrosive site.

Repair laminated (reinforced) bearing pads utilizing external holding pins via vulcanization. Submit product data for repair material and a detailed application procedure to the Materials and Tests Unit for approval before use and annually thereafter.

THERMAL SPRAYED COATINGS (METALLIZATION) (9-30-11)

1.0 DESCRIPTION

Apply a thermal sp rayed coating (TSC) and sealer to metal surfaces as specified herein when called for on the plans or by other Special Provisions, or when otherwise approved by the Engineer in accordance with the SSPC-CS 23.00/AWS C2.23/NACE No. 12 Specification. Only Arc Sprayed application methods are used to apply TSC coatings, the Engineer must approve other methods of application.

2.0 QUALIFICATIONS

Only use NCDOT approved TSC Contractors meeting the following requirements:

1. The capability of blast cleaning steel surfaces to SSPC SP-5 and SP-10 Finishes.

2. Employ Spray Operator(s) qualified in accordance with AWS C.16/C2.16M2002 and Quality Control Inspector(s) who have documented training in the applicable test procedures of ASTM D-3276 and SSPC-CS 23.00.

A summary of the contractor's related work experience and the documents verifying each Spray Operator's and Quality Control Inspector's qualifications are submitted to the Engineer before any work is performed.

3.0 MATERIALS

Provide wire in accordance with the metallizing equipment manufacturer's recommendations. Use the wire alloy specified on the plans which meets the requirements in Annex **C** of the SSPC-CS 23.00 Specification. Have the contractor provide a certified analysis (NCDOT Type 2 Certification) for each lot of wire material.

Apply an approved sealer to all metallized surfaces in accordance with Section 9 of SSPC-CS 23. The sealer must either meet SSPC Paint 27 or is an alternate approved by the Engineer.

4.0 SURFACE PREPARATION AND TSC APPLICATION

Grind flame cut edges to remove the carbonized surface prior to blasting. Bevel all flame cut edges in accordance with Article 442-10(D) regardless of included angle. Blast clean surfaces to be metallized with grit or mineral abrasive in accordance with Steel Structures Painting Council SSPC SP-5/10(as specified) to impart an angular surface profile of 2.5 - 4.0 mils. Surface preparation hold times are in accordance with Section 7.32 of SSPC-CS 23. If flash rusting occurs prior to metallizing, blast clean the metal surface again. Apply the thermal sprayed coating only when the surface temperature of the steel is at least 5°F above the dew point.

At the beginning of each work period or shift, conduct bend tests in accordance with Section 6.5 of SSPC-CS 23.00. Any disbonding or delamination of the coating that exposes the substrate requires corrective action, additional testing, and the Engineer's approval before resuming the metallizing process.

Apply TSC with the alloy to the thickness specified on the plans or as provided in the table below. All spot results (the average of 3 to 5 readings) must meet the minimum requirement. No additional tolerance (as allowed by SSPC PA-2) is permitted. (For Steel Beams: For pieces with less than 200 ft^2 measure 2 spots/surface per piece and for pieces greater than 200 ft^2 add 1 additional spots/surface for each 500 ft^2).

Application	Thickness	Alloy	Seal Coat
Pot Bearings	8 mil	85/15 Zinc (W-Zn-Al-2)	0.5 mil
Armored Joint Angles	8 mil	85/15 Zinc (W-Zn-Al-2)	0.5 mil
Modular Joints	8 mil	99.99% Zn (W-Zn-1)	0.5 mil
Expansion Joint Seals	8 mil	99.99% Zn (W-Zn-1)	0.5 mil
Optional Disc Bearings	8 mil	85/15 Zinc (W-Zn-Al-2)	0.5 mil

When noted on the plans or as specified in the above chart, apply the sealer to all metallized surfaces in accordance with the manufacturer's recommendations and these provisions. Apply the seal coat only when the air temperature is above 40°F and the surface temperature of the steel is at least 5°F above the dew point. If the sealer is not applied within eight hours after the final application of TSC, the applicator verifies acceptable TSC surfaces and obtains approval from the Engineer before applying the sealer.

5.0 INSPECTION FREQUENCY

The TSC Contractor must conduct the following tests at the specified frequency and the results documented in a format approved by the Engineer.

Test/Standard	Location	Frequency	Specification
Ambient Conditions	Site	Each Process	5°F above the dew point
Abrasive Properties	Site	Each Day	Size, angularity, cleanliness
Surface Cleanliness SSPC Vis 1	All Surfaces	Visual All Surfaces	SSPC-SP-10 Atmospheric Service SSPC-SP - 5 Immersion Service
Surface Profile ASTM D-4417 Method C	Random Surfaces	3 per 500 ft^2	2.5 - 4.0 mils
Bend Test SSPC-CS 23.00	Site	5 per shift	Pass Visual
Thickness SSPC PA-2R SSPC-CS 23.00	Each Surface	Use the method in PA-2 Appendix 3 for Girders and Appendix 4 for frames and miscellaneous steel. See Note 1.	Zn - 8 mils minimum Al - 8 mils minimum Zn Al - 8 mils minimum Areas with more than twice the minimum thickness are inspected for compliance to the adhesion and cut testing requirements of this specification.
Adhesion ASTM 4541	Random Surfaces Splice Areas	1 set of 3 per 500 ft^2	Zn > 500 psi Al > 1000 psi Zn Al > 750 psi
Cut Test - SSPC-CS 23.00	Random Surfaces	3 sets of 3 per 500 ft^2	No peeling or delamination
Job Reference Std. SSPC-CS 23.00	Site	1 per job	Meets all the above requirements

6.0 REPAIRS

All Repairs are to be performed in accordance with the procedures below, depending on whether the repair surface is hidden or exposed. As an exception to the following, field welded splices on joint angles and field welding bearing plates to girders may be repaired in accordance with the procedures for hidden surfaces.

For hidden surfaces (including but not limited to interior girders, interior faces of exterior girders, and below-grade sections of piles):

1. Welding of metallized surfaces may be performed only if specifically permitted by the Engineer. Remove metallizing at the location of field welds by blast cleaning (SSPC SP-6 finish), or hand (SSPC SP-2 finish) or power tool cleaning (SSPC SP-3 finish) just prior to welding. Clean sufficiently to prevent contamination of the weld. All repairs to welded connections are metallized in accordance with SSPC CS 23.00.
2. Minor areas less than or equal to 0.1 ft^2 exposing the substrate are metallized in accordance with SSPC CS 23.00 or painted in accordance with ASTM A780, "Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings."
3. Large areas greater than 0.1 ft^2 exposing the substrate are metallized in accordance with SSPC CS 23.00.
4. Damaged (burnished) areas not exposing the substrate with less than the specified coating thickness are metallized in accordance with SSPC CS 23.00 or painted in accordance with ASTM A780, "Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings."
5. Damaged (burnished) areas not exposing the substrate with more than the specified coating thickness are not repaired.
6. Defective coating is repaired by either method 2 or 3 depending on the area of the defect.

For Exposed Surfaces (including but not limited to exterior faces of exterior girders and above-grade sections of piles):

1. Welding of metallized surfaces may be performed only if specifically permitted by the Engineer. Remove metallization at the location of field welds by blast cleaning (SSPC SP-6 finish), or hand (SSPC SP-2 finish) or power tool cleaning (SSPC SP-3 finish) just prior to welding. Clean sufficiently to prevent contamination of the weld. All repairs to welded connections are metallized in accordance with SSPC CS 23.00.
2. All areas exposing the substrate are metallized in accordance with SSPC CS 23.00
3. Defective coating is repaired by either method 2 or 3 depending on the area of the defect.

7.0 TWELVE MONTH OBSERVATION PERIOD

The contractor maintains responsibility for the coating system for a twelve (12) month observation period beginning upon the satisfactory completion of all the work required in the plans or as directed by the engineer. The contractor must guarantee the coating system under the payment and performance bond (refer to Article 109-10). To successfully

complete the observation period, the coating system must meet the following requirements after twelve(12) months service:

- No visible rust, contamination or application defect is observed in any coated area.
- Painted surfaces have a uniform color and gloss.
- Surfaces have an adhesion of no less than 500 psi when tested in accordance with ASTM D-4541.

8.0 BASIS OF PAYMENT

The contract price bid for the bridge component to which the coating is applied will be full compensation for the thermal sprayed coating.

CONCRETE WEARING SURFACE (9-30-11)

1.0 GENERAL

This Special Provision governs materials, forming, and all other related work in the construction of a reinforced concrete wearing surface in accordance with applicable parts of the Standard Specifications, the details shown on the plans, and as outlined in these Special Provisions.

2.0 MATERIALS

Unless otherwise noted on the plans, use class AA concrete and a coarse aggregate gradation of 78M. The Class AA concrete shall contain fly ash or ground granulated blast furnace slag at the substitution rate specified in Article 1024-1 and in accordance with Articles 1024-5 and 1024-6 of the Standard Specifications. Place the wearing surface according to the grades, thicknesses and cross sections shown on the plans.

3.0 PREPARATION OF SURFACE

Prepare all surfaces to be overlayed using the equipment specified herein and prior to placing the epoxy coated reinforcing steel. Additionally, clean the surface within 48 hours prior to placing the overlay unless otherwise approved.

Thoroughly soak the cleaned surface for at least 12 hours prior to placing the concrete wearing surface. While soaking the surface, cover it with a layer of white opaque polyethylene film that is at least 4 mils thick. Immediately prior to placing the concrete wearing surface, remove standing water from the surface.

4.0 EQUIPMENT

Prior to beginning any work, obtain approval for all equipment to be used for deck preparation, placing, finishing, and curing the concrete wearing surface.

For surface preparation, use sandblasting or pressure washing equipment capable of removing all foreign matter. If using high pressure water blast, a minimum nozzle pressure of 3000 psi is required.

5.0 PLACING AND FINISHING

Follow the placing, finishing, and curing requirements of Article 420-14 (A) and (B). Construction Joints other than those shown on the plans are not permitted.

6.0 LIMITATIONS OF OPERATIONS

The requirements of Article 420-20 will apply to placing vehicles and construction equipment on the finished concrete wearing surface.
Use insulation that meets the requirements of Article 420-7(C), and if required, place it on the concrete wearing surface as soon as the initial set permits.

7.0 METHOD OF MEASUREMENT

The quantity of concrete wearing surface to be paid for is the actual number of square feet of concrete wearing surface as provided on the plans.

8.0 BASIS OF PAYMENT

The quantity for which payment is made will be that quantity shown in square feet on the plans. Where the plans have been revised, the quantity to be paid for will be the quantity shown on the revised plans.

The unit bid per square foot will be full compensation for all work covered by this Special Provision and applicable parts of the Standard Specifications, but not limited to furnishing and placing concrete, epoxy coated reinforcing steel, joint filler and sealer, deck drains, bridge scuppers, and any other material; erecting and removing all forms, curing concrete, protecting concrete in wind, rain, low humidity, high temperatures or other unfavorable weather.

Payment will be made under:
Concrete Wearing Surface ..... Square Foot

OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT AT STATIONS 266+36.00 -L- (12-12-13)

1.0 GENERAL

This Special Provision covers the design, fabrication and construction of precast reinforced concrete box culverts intended for the conveyance of storm water.

If the option is indicated on the plans, the submittal for a precast reinforced box culvert in lieu of a cast-in-place culvert is permitted. Design the precast culvert sections in accordance with ASTM C1577 or the current edition of the AASHTO LRFD Bridge Design Specifications. Rate all sizes of precast reinforced concrete box culverts in accordance with the current edition of the AASHTO Manual for Bridge Evaluation. Ensure the culvert rates for the AASHTO design loads and North Carolina's legal loads (see Section 2.0 for North Carolina's legal loads). Provide the size and number of barrels

as indicated on the plans. Detail the culvert with cast-in-place wings walls and footings. Precast wing walls and footings will not be allowed. Provide a precast box culvert that meets the requirements of Section 1077 and any other applicable parts of the Standard Specifications.

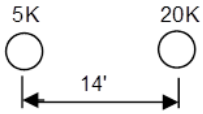
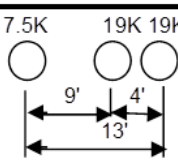
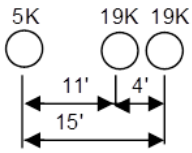
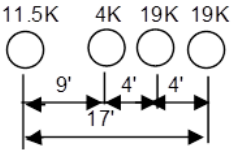
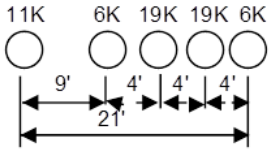
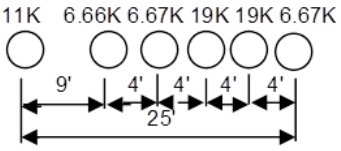
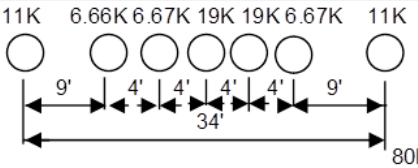
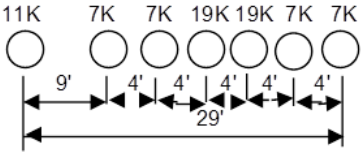
The design and rating of the precast and cast-in-place members is the responsibility of the Contractor and is subject to review, comments and approval. Submit two sets of detailed plans and rating sheets for review. Include all details in the plans, including the size and spacing of the required reinforcement necessary to build the precast box and cast-in-place members. Have a North Carolina Registered Professional Engineer check and seal the plans, rating sheets and design calculations. After the plans, rating sheets and design calculations are reviewed and, if necessary, the corrections made, submit one set of plans and rating sheets on 22" x 34" sheets to become part of the contract plans.

If the span, rise and design earth cover for the precast reinforced concrete box culvert are identical to a previously approved submittal, the Contractor may request the previously approved design calculations and plans be considered as the submittal for review and approval. However, a set of plans and rating sheets will need to be submitted to become part of the contract plans.

2.0 NORTH CAROLINA'S LEGAL LOADS

Apply the following legal loads to all structures carrying interstate traffic:

SINGLE VEHICLE(SV)

REF. #	SCHEMATIC
SH	 25K 12.5 TON
S3A	 45.5K 22.75 TON
S3C	 43K 21.5 TON
S4A	 53.5K 26.75 TON
S5A	 61K 30.5 TON
S6A	 69K 34.5 TON
S7A	 80K 40 TON
S7B	 77K 38.5 TON

TRUCK TRACTOR SEMI-TRAILER(TTST)

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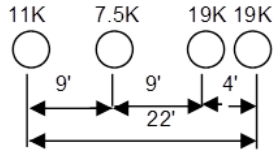
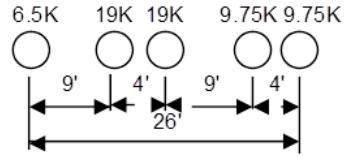
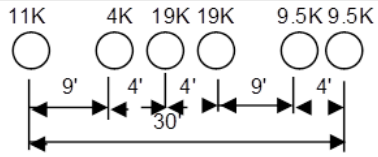
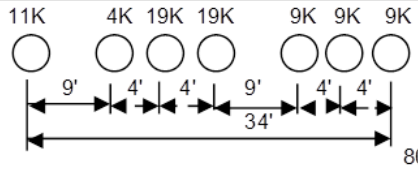
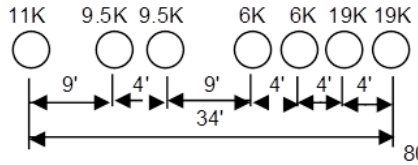
T4A	 56.5K 28.25 TON
T5B	 64K 32 TON
T6A	 72K 36 TON
T7A	 80K 40 TON
T7B	 80K 40 TON

ST-11

U-3615B **Guilford County**

Apply the following legal loads to all structures carrying non-interstate traffic:

SINGLE VEHICLE (SV)		TRUCK TRACTOR SEMI-TRAILER (TTST)	
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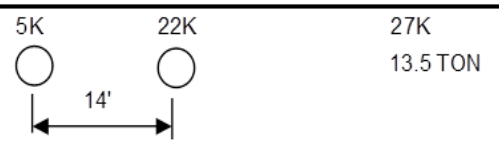
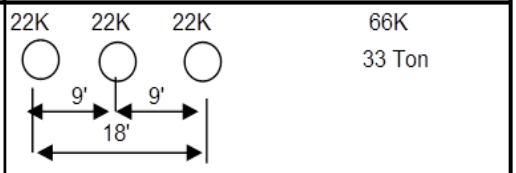
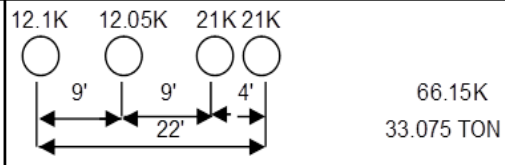
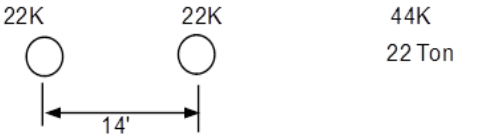
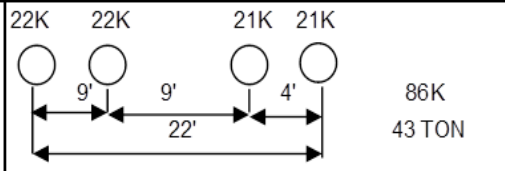
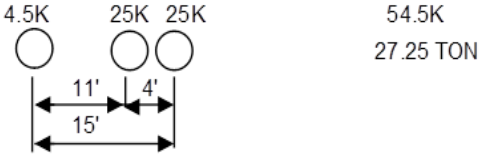
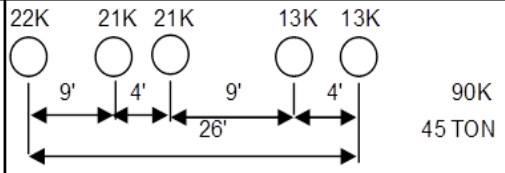
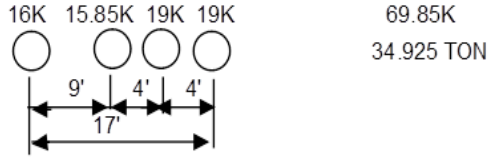
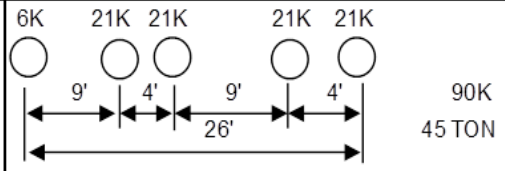
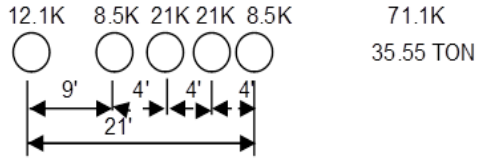
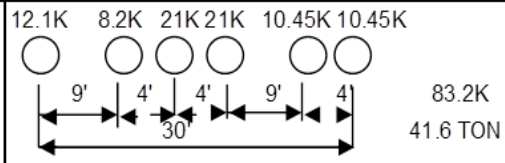
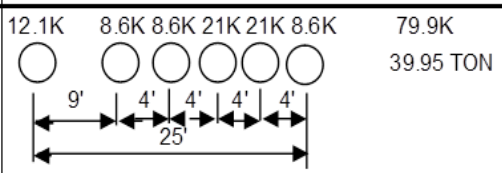
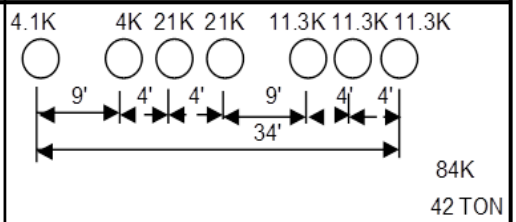
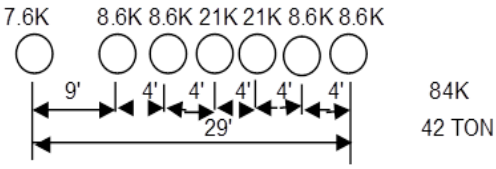
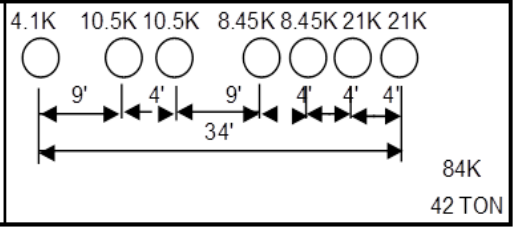
SNSH		**TNAGRIT3**	
SNGARBS2		**TNT4A**	
SNAGRIS2		**TNAGRIT4**	
SNCOTTS3		**TNAGT5A**	
SNAGGRS4		**TNAGT5B**	
SNS5A		**TNT6A**	
SNS6A		**TNT7A**	
SNS7B		**TNT7B**	

3.0 PRECAST REINFORCED CONCRETE BOX SECTIONS

The precast reinforced concrete box culvert sections shall match the size and hydraulic opening indicated in the contract plans.

A. Design

1. Design Fill – The design earth cover is reported on the plans as the elevation difference between the point of maximum fill and the bottom of the top slab.

2. Placement of Reinforcement – Provide a 1 inch concrete cover over the reinforcement subject to the provisions of Section F. Extend the inside reinforcement into the tongue portion of the joint and the outside reinforcement into the groove portion of the joint. Detail the clear distance of the end wires so it is not less than 1/2 inch or more than 2 inches from the ends of the box section. Assemble reinforcement per the requirements of ASTM C1577 or the approved design. 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 transverse reinforcement. Detail the transverse wires so that the center to center spacing is not less than 2 inches or more than 4 inches. Do not detail the longitudinal wires with a center to center spacing of more than 8 inches.

B. Joints

1. Produce the precast reinforced concrete box section with tongue and groove 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 tongue and groove 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 conforming to ASTM C877 that is at least 12 inches 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 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 pieces, as indicated on Figure 1 below:

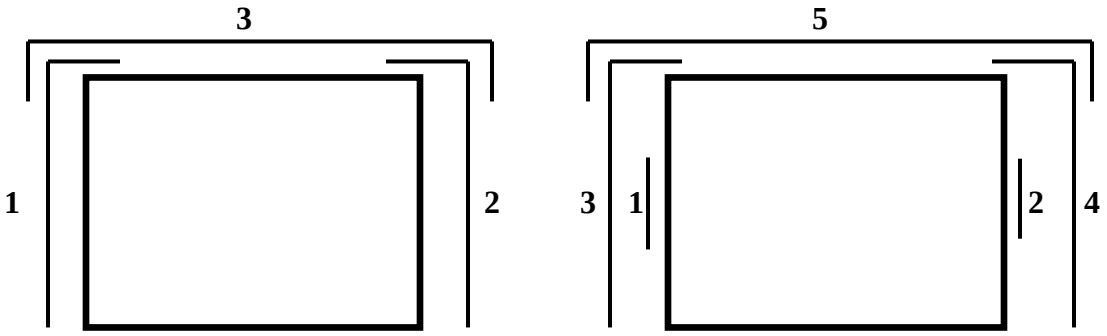


Figure 1

Cover the external joint sealer with a 3 foot 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. 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.

C. Manufacture

Manufacture precast reinforced concrete box culvert sections 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 of portland cement.

2. Strength – Concrete shall develop a minimum 28-day compressive strength of 5000 psi. 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 placing. 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.

D. Physical Requirements

Acceptability of precast culvert sections is based on concrete cylinders made and tested in accordance with ASTM C31 and ASTM C39.

E. 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 in 8 feet.

2. Internal Dimensions – Produce sections so that the internal and haunch dimensions do not vary more than 1/4 inch from the plan dimensions.

3. Adjacent Sections - Internal, external, and haunch dimensions for connecting sections shall not vary more than 1/2 inch.

4. Length of Tongue and Groove – The minimum length of the tongue shall be 4 inches. The minimum length of the groove shall be 4 inches. The dimensions of the tongue and groove shall not vary more than 1/4 inch 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, 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 ASTM C1577, 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 in any box section.

8. Position of Reinforcement – Produce sections so that the maximum variation in the position of the reinforcement is ±3/8 inch for slab and wall thicknesses of 5 inches or less and ±1/2 inch for slab and wall thicknesses greater than 5 inches. Produce sections so that the concrete cover is never less than 5/8 inch 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.

F. 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, the Department will verify assembly of the first five adjacent sections or 20% of the total culvert length, whichever is greater, 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. The producer shall document the GO-NO-GO dimensional measurements of each box culvert section produced through the post-pour inspection process.

2. Clearly mark each section of the box culvert in accordance with ASTM C1577, Section 15. The information requirements of Section 15.1 shall be clearly marked on the inner surface of each section.

G. Construction

1. Pre-installation Meeting – 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. 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 when the foundation material is placed and fabric wrapped on top. Perpendicular sections of fabric shall be continuous. A minimum lap of 2 feet shall be provided between sections of fabric.

3. 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.

4. Backfill – Complete backfill in accordance with Section 414 of the Standard Specifications.

4.0 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 (4-5-12)

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.

As an option for the Contractor, overhang falsework hangers may be uniformly spaced, at a maximum of 36 inches, provided the following conditions are met:

Member Type (PCG)	Member Depth, (inches)	Max. Overhang Width, (inches)	Max. Slab Edge Thickness, (inches)	Max. Screed Wheel Weight, (lbs.)	Bracket Min. Vertical Leg Extension, (inches)
II	36	39	14	2000	26
III	45	42	14	2000	35
IV	54	45	14	2000	44
MBT	63	51	12	2000	50
MBT	72	55	12	1700	48

Overhang width is measured from the centerline of the girder to the edge of the deck slab.

For Type II, III & IV prestressed concrete girders (PCG), 45-degree cast-in-place half hangers and rods must have a minimum safe working load of 6,000 lbs.

For MBT prestressed concrete girders, 45-degree angle holes for falsework hanger rods shall be cast through the girder top flange and located, measuring along the top of the member, 1'-2 ½" from the edge of the top flange. Hanger hardware and rods must have a minimum safe working load of 6,000 lbs.

The overhang bracket provided for the diagonal leg shall have a minimum safe working load of 3,750 lbs. The vertical leg of the bracket shall extend to the point that the heel bears on the girder bottom flange, no closer than 4 inches from the bottom of the member. However, for 72-inch members, the heel of the bracket shall bear on the web, near the bottom flange transition.

Provide adequate overhang falsework and determine the appropriate adjustments for deck geometry, equipment, casting procedures and casting conditions.

If the optional overhang falsework spacing is used, indicate this on the falsework submittal and advise the girder producer of the proposed details. Failure to notify the Engineer of hanger type and hanger spacing on prestressed concrete girder casting drawings may delay the approval of those drawings.

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. 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 above ground	Pressure, lb/ft^2 for Indicated Wind Velocity, mph				
	70	80	90	100	110
0 to 30	15	20	25	30	35
30 to 50	20	25	30	35	40
50 to 100	25	30	35	40	45
over 100	30	35	40	45	50

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)	COUNTY	25 YR (mph)	COUNTY	25 YR (mph)
Alamance	70	Franklin	70	Pamlico	100
Alexander	70	Gaston	70	Pasquotank	100
Alleghany	70	Gates	90	Pender	100
Anson	70	Graham	80	Perquimans	100
Ashe	70	Granville	70	Person	70
Avery	70	Greene	80	Pitt	90
Beaufort	100	Guilford	70	Polk	80
Bertie	90	Halifax	80	Randolph	70
Bladen	90	Harnett	70	Richmond	70
Brunswick	100	Haywood	80	Robeson	80
Buncombe	80	Henderson	80	Rockingham	70
Burke	70	Hertford	90	Rowan	70
Cabarrus	70	Hoke	70	Rutherford	70
Caldwell	70	Hyde	110	Sampson	90
Camden	100	Iredell	70	Scotland	70
Carteret	110	Jackson	80	Stanley	70
Caswell	70	Johnston	80	Stokes	70
Catawba	70	Jones	100	Surry	70
Cherokee	80	Lee	70	Swain	80
Chatham	70	Lenoir	90	Transylvania	80
Chowan	90	Lincoln	70	Tyrell	100
Clay	80	Macon	80	Union	70
Cleveland	70	Madison	80	Vance	70
Columbus	90	Martin	90	Wake	70
Craven	100	McDowell	70	Warren	70
Cumberland	80	Mecklenburg	70	Washington	100
Currituck	100	Mitchell	70	Watauga	70
Dare	110	Montgomery	70	Wayne	80
Davidson	70	Moore	70	Wilkes	70
Davie	70	Nash	80	Wilson	80
Duplin	90	New Hanover	100	Yadkin	70
Durham	70	Northampton	80	Yancey	70
Edgecombe	80	Onslow	100		
Forsyth	70	Orange	70		

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. 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 (8-9-13)

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 Structures Engineer
North Carolina Department
of Transportation
Structures Management 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 Structures Engineer
North Carolina Department
of Transportation
Structures Management 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)

jlbolden@ncdot.gov (James Bolden)

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. Eric Williams, 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. Eric Williams, 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) 707 – 6407
(919) 250 – 4082 facsimile
plambert@ncdot.gov

Secondary Structures Contacts: James Gaither (919) 707 – 6409
James Bolden (919) 707 – 6408

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):

Eric Williams (704) 455 – 8902
(704) 455 – 8912 facsimile
ewilliams@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
Foam Joint Seals [6]	9	0	"Foam 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 1072-8
Miscellaneous Metalwork [4,5]	7	0	Article 1072-8
Optional Disc Bearings [4]	8	0	"Optional Disc Bearings"
Overhead and Digital Message Signs (DMS) (metalwork and foundations)	13	0	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 ___"
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 (precast items)	10	0	Article 1077-2 & "Sound Barrier Wall"
Sound Barrier Wall Steel Fabrication Plans [5]	7	0	Article 1072-8 & "Sound Barrier Wall"
Structural Steel [4]	2, then 7	0	Article 1072-8
Temporary Detour Structures	10	2	Article 400-3 & "Construction, Maintenance and Removal of Temporary Structure at Station ____"
TFE Expansion Bearings [4]	8	0	Article 1072-8

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. 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 1072-8 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	Subarticle 411-3(A)
Crosshole Sonic Logging (CSL) Reports [2]	1	0	Subarticle 411-5(A)(2)
Pile Driving Equipment Data Forms [2,3]	1	0	Subarticle 450-3(D)(2)
Pile Driving Analyzer (PDA) Reports [2]	1	0	Subarticle 450-3(F)(3)
Retaining Walls [4]	8 drawings, 2 calculations	2 drawings	Applicable Provisions
Temporary Shoring [4]	5 drawings, 2 calculations	2 drawings	"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. Subarticles 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 appropriate Geotechnical Engineering Unit regional office. Electronic submission is preferred.

3. The Pile Driving Equipment Data Form is available from:
https://connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
See second page of form for submittal instructions.

4. Electronic copy of submittal is 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 (9-30-11)

1.0 DESCRIPTION

This special provision addresses grout for use in pile blockouts, grout pockets, shear keys, dowel holes and recesses for structures. This provision does not apply to grout placed in post-tensioning ducts for bridge beams, girders, or decks. Mix and place grout in accordance with the manufacturer's recommendations, the applicable sections of the Standard Specifications and this provision.

2.0 MATERIAL REQUIREMENTS

Use a Department approved pre-packaged, non-shrink, non-metallic grout. Contact the Materials and Tests Unit for a list of approved pre-packaged grouts and consult the manufacturer to determine if the pre-packaged grout selected is suitable for the required application.

When using an approved pre-packaged grout, a grout mix design submittal is not required.

The grout shall be free of soluble chlorides and contain less than one percent soluble sulfate. Supply water in compliance with Article 1024-4 of the Standard Specifications.

Aggregate may be added to the mix only where recommended or permitted by the manufacturer and Engineer. The quantity and gradation of the aggregate shall be in accordance with the manufacturer's recommendations.

Admixtures, if approved by the Department, shall be used in accordance with the manufacturer's recommendations. The manufacture date shall be clearly stamped on each container. Admixtures with an expired shelf life shall not be used.

The Engineer reserves the right to reject material based on unsatisfactory performance.

Initial setting time shall not be less than 10 minutes when tested in accordance with ASTM C266.

Test the expansion and shrinkage of the grout in accordance with ASTM C1090. The grout shall expand no more than 0.2% and shall exhibit no shrinkage. Furnish a Type 4 material certification showing results of tests conducted to determine the properties listed in the Standard Specifications and to assure the material is non-shrink.

Unless required elsewhere in the contract the compressive strength at 3 days shall be at least 5000 psi. Compressive strength in the laboratory shall be determined in accordance with ASTM C109 except the test mix shall contain only water and the dry manufactured material. Compressive strength in the field will be determined by molding and testing 4" x 8" cylinders in accordance with AASHTO T22. Construction loading and traffic loading shall not be allowed until the 3 day compressive strength is achieved.

When tested in accordance with ASTM C666, Procedure A, the durability factor of the grout shall not be less than 80.

3.0 SAMPLING AND PLACEMENT

Place and maintain components in final position until grout placement is complete and accepted. Concrete surfaces to receive grout shall be free of defective concrete, laitance, oil, grease and other foreign matter. Saturate concrete surfaces with clean water and remove excess water prior to placing grout.

Do not place grout if the grout temperature is less than 50°F or more than 90°F or if the air temperature measured at the location of the grouting operation in the shade away from artificial heat is below 45°F.

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.

The Engineer will determine the locations to sample grout and the number and type of samples collected for field and laboratory testing. 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.

4.0 BASIS OF PAYMENT

No separate payment will be made for "Grout for Structures". The cost of the material, equipment, labor, placement, and any incidentals necessary to complete the work shall be considered incidental to the structure item requiring grout.

SELECT MATERIAL, CLASS V (SPECIAL)

Select Material Class V shall be placed as shown on the plans and in accordance with applicable parts of Section 1016 of the Standard Specifications.

Payment for the above work will be included in the pay item for:
Select Material, Class V ……..Tons

PROJECT SPECIAL PROVISION

(10-18-95) (Rev. 10-15-13) 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
Buffer Certification	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 107-13 of the *2012 Standard Specifications* and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the Engineer to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.

DEPARTMENT OF THE ARMY PERMIT

Permittee: **NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**
ATTN: MR. PHILLIP S. HARRIS, III, PE

Permit No.: **SAW-1999-21179**

Issuing Office: **CESAW-RG-R**

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: The NCDOT project is the widening SR 1003 (North Main Street) – SR 1820 (Skeet Club Road) from the existing 5-lane, curb-and-gutter section north of US 311 to the existing 5-lane, curb-and –gutter section just west of Eastchester Drive (NC 68) in Guilford County, North Carolina. The estimated length of the project is 6.3 miles. This project is included in the North Carolina Department of Transportation's Transportation Improvement Program (TIP U-3615). The project would permanently impact 2538 linear feet of jurisdictional stream channel, an additional 150 linear feet of temporary stream channel impact, permanently impact 0.82 acre of jurisdictional wetlands, and 0.04 acre of open water. For construction purposes this project has been divided into two sections: U-3615A - SR 1003 (North Main Street) and SR 1820 (Skeet Club Road) between US 311 and east of SR 1818 (Johnston Street) and U-3615B- SR 1820 (Skeet Club Road) from west of SR 1818 (Johnson Street) to NC 68 (East Chester Drive).

Permit drawings for the proposed project have been prepared based on final design for U-3615B and preliminary design for U-3615A. The NCDOT will apply for any relevant permit modifications for U-3615A when final design is complete for that section. Construction will not commence on U-3615A until permit modifications have been received based on final designs.

Project Location: The proposed site is an existing linear 2 lane road (SR 1003 [North Main Street] and SR 1820 [Skeet Club Road]) form US 311 to NC 68 in High Point, Guilford County, North Carolina.

Project Area (acres):	230	Nearest Town: High Point
Nearest Waterway:	West Fork Deep River	River Basin: Cape Fear
Latitude and Longitude:	36. 036792 N, -80.019581 W	

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **December 31, 2023**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit,

Special Conditions:

SEE 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.

*U.S. GOVERNMENT PRINTING OFFICE: 1986 - 717-425

3. **Limits of Federal Liability.** In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. **Reliance on Applicant's Data:** The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. **Reevaluation of Permit Decision.** This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. **Extensions.** General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

*U.S. GOVERNMENT PRINTING OFFICE: 1986 - 717-425

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

09/12/2013

(PERMITTEE) NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ATTN: MR. PHILLIP S. HARRIS, III. PE

(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

20 Sep 2013

(DISTRICT COMMANDER) 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-1999-21179
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION – TIP-U-3615

Failure to institute and carry out the details of the following special conditions below (listed as a-w) will result in a directive to cease all ongoing and permitted work within waters of the United States, including wetlands, associated with the permitted project, or such other remedies and/or fines as the U.S. Army Corps of Engineers District Commander or his authorized representatives may seek.

a) The North Carolina Division of Water Quality (DWQ) permit/certification number WQC003966 was issued for this project on August 29, 2013. Special conditions were issued associated with this water quality permit/certification and a copy of these conditions is attached as Exhibit A. These referenced conditions are hereby incorporated as special conditions of this permit.

b) All work authorized by this permit must be performed in strict compliance with the attached plans which were received on April 30, 2013. These plans are a part of this permit and identified as Exhibit B. Any modification to these plans must be approved by the US Army Corps of Engineers (USACE) prior to implementation.

*c) The permittee shall schedule a preconstruction meeting between its representatives, the contractor's representatives, and the Corps of Engineers, Raleigh Regulatory Field Office, NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all of the terms and conditions contained within this Department of the Army Permit. The permittee shall provide the USACE, Raleigh Regulatory Field Office, NCDOT Regulatory Project Manager, with a copy of the final plans at least two weeks prior to the preconstruction meeting along with a description of any changes that have been made to the project's design, construction methodology or construction timeframe. The permittee shall schedule the preconstruction meeting for a time when the USACE and North Carolina Division of Water Quality (NCDWQ) Project Managers can attend. The permittee shall invite the Corps and NCDWQ Project Managers a minimum of thirty (30) days in advance of the scheduled meeting in order to provide those individuals with ample opportunity to schedule and participate in the required meeting.

d) 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.

SPECIAL CONDITIONS
ACTION ID SAW-1999-21179
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION – TIP-U-3615

e) 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.

* f) Compensatory mitigation requirements for U-3615B are summarized below in Table 1. Due to the status of Section U-3615A being unfunded and letting more than 5 years out, NCDOT is not proposing mitigation for Section U-3615A at this time. The U-3615B section will permanently impact a total of 2,099 feet of warm water streams. Of these 2,099 feet, there are 111 feet of bank stabilization that does not require mitigation, resulting in 1,988 feet of stream impacts requiring mitigation. The total buffer impacts will be 104,501 square feet (Zone 1) and 72,093 square feet (Zone 2).

The Corps is requiring 2:1 mitigation for 452 feet of perennial stream impacts and 1:1 mitigation for 1,536 feet of intermittent stream impacts. NCDOT is providing onsite mitigation of 760 feet of warm water stream by relocating a section of UT at site 3-3. The remaining mitigation requirement of 1,680 feet of permanent warm water stream impacts will be provided by the North Carolina Ecosystem Enhancement Program (NCEEP), as outlined in the letter dated April 23, 2013, from James B. Stanfill, EEP Asst. Management Supervisor. In order to compensate for this wetland impact associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the attached Compensatory Mitigation Responsibility Transfer Form. The requirements of this form, including any special conditions listed on this form, are herby incorporated as special conditions of this permit authorization. NCEEP will also provide mitigation for the 0.82 acres (2:1 ratio) of permanent riparian wetland impacts resulting from roadway fill, excavation, and mechanized clearing. The on-site mitigation will be constructed and in compliance with the attached U-3615B Stream Mitigation Plan dated January 12, 2013. (Identified as exhibit C)

NCDOT is also providing onsite mitigation of 75,639 square feet (45,810: Zone 1 and 29,829: Zone 2) of buffers by relocating a section of UT 3-3 at Site 3. The remaining buffer mitigation requirements for the 58,691 square feet in Zone 1 and 42, 264 square feet in Zone 2 impacts will be provided by the NCEEP for U-3615B.

SPECIAL CONDITIONS
ACTION ID SAW-1999-21179
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION – TIP-U-3615

Table 1 U-3515B USACE Required Compensatory Mitigation Summary M'ftg

	Stream Impacts in Length (ft)	Riparian Wetland Impacts (ac)	Buffer Zone 1 Impacts (sq ft)	Buffer Zone 2 Impacts (sq ft)
Impacts Requiring Mitigation	1,988	0.82	104,501	72,093
Onsite Mitigation Credits	760@ 1:1		45,810	29,829
Total Mitigable Impacts Less Onsite Mitigation	1228	0.82	58,691	42,264
Required Mitigation	452@ 2:1 776@ 1:1	0.82@ 2:1	58,691 @3:1	42,264 @ 1.5:1
Total Mitigation	1,680	1.64	176,073	63,396

SPECIAL CONDITIONS
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION – TIP-U-3615

g) 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 1-(800)-858-0368 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act will be followed.

h) 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.

i) 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.

j) The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions, shall be available at the project site during construction and maintenance of this project.

k) 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).

l) The permittee shall remove all sediment and erosion control measures placed in wetlands or waters, and shall restore natural grades in those areas, prior to project completion.

m) During the clearing phase of the project, heavy equipment must not be operated in surface waters or stream channels. Temporary stream crossings will be used to access the opposite sides of stream channels. All temporary diversion channels and stream crossings

SPECIAL CONDITIONS
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION – TIP-U-3615

will be constructed of non-erodable materials. Grubbing of riparian vegetation will not occur until immediately before construction begins on a given segment of stream channel.

n) No fill or excavation for the purposes of sedimentation and erosion control shall occur within jurisdictional waters, including wetlands, unless it is included on the plan drawings and specifically authorized by this permit.

o) 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.

p) 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.

*q) The permittee will ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Written verification shall be provided that the final construction drawings comply with the attached permit drawings prior to any active construction in waters of the United States, including wetlands. Any deviation in the construction design plans will be brought to the attention of the Corps of Engineers, Raleigh Regulatory Field Office prior to any active construction in waters or wetlands.

r) Prior to commencing construction within jurisdictional waters of the United States for any portion of the proposed project, the permittee shall forward the latest version of project construction drawings to the Corps of Engineers, Raleigh Regulatory Field Office NCDOT Regulatory Project Manager. Half-size drawings will be acceptable.

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

SPECIAL CONDITIONS
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION – TIP-U-3615

t) Measures will be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a pipe or culvert should not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed opening should be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gauge data, if available. In the absence of such data, bankfull flow can be used as a comparable level.

u) Culverts greater than 48 inches in diameter will be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter or less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain the existing channel slope. The bottom of the culvert must be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions. Destabilizing the channel and head cutting upstream should be considered in the placement of the culvert. A waiver from the depth specifications in this condition may be requested in writing. The waiver will be issued if it can be demonstrated that the proposal would result in the least impacts to the aquatic environment.

v) To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent wetlands and streams, except as authorized by this permit, the permittee shall require its contractors and/or agents to identify all areas to be used to borrow material, or to dispose of dredged, fill, or waste material. The permittee shall provide the USACE with appropriate maps indicating the locations of proposed borrow or waste sites as soon as the permittee has that information. The permittee will coordinate with the USACE before approving any borrow or waste sites that are within 400 feet of any streams or wetlands.

w) If the permittee discovers any previously unknown historic or archaeological sites while accomplishing the authorized work, he shall immediately stop work and notify the Corps of Engineers, Raleigh Regulatory Field Office NCDOT Regulatory Project Manager who will initiate the required State/Federal coordination.

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF

December 15, 2014

Regulatory Division/1200A

Action ID: SAW-1999-21179 TIP U-3615

Mr. Richard W. Hancock, P.E.
Environmental Management Director, PDEA
NC Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Hancock:

Reference is made to your Department of the Army (DA) permit issued on September 20, 2013, that authorized permanent discharge of fill impacts to 2538 linear feet of jurisdictional stream channels, an additional 150 linear feet of temporary stream channel impact, permanently impact 0.82 acre of jurisdictional wetlands, and 0.04 acre of open water adjacent to tributaries of West Fork Deep River, associated with the proposed widening of SR 1003 (North Main Street) & SR 1820 (Skeet Club Road) from US 311 to NC 68 in Guilford County, North Carolina.

Reference also your written request of November 20, 2014, for a modification to your DA permit to authorize changes to impacts to jurisdictional waters as defined by plans included in your request associated with proposed construction changes for Site 2a, 5a, and 6. These changes include reducing open water fill impacts at 2a and 5a form 0.04 acre to 0.01 acre and reducing mechanized clearing of wetlands impacts at site 6 by 0.01 acre. (New permanent impact, 0.81 acre of jurisdictional wetlands and 0.01 acre of open water)

We have determined that the proposed changes/modifications to the construction plans including temporary/permanent impacts to jurisdictional waters are minor. Therefore, a supplemental public notice is not necessary. The permit is hereby modified to include the change in impacts to jurisdictional waters as described in the referenced provided construction plans included with your November 20, 2014, modification request. It is understood that all other conditions of the original permit and previous modifications remain applicable, including the permit expiration date of December 31, 2023.

If the permitted work is not completed on or before the date herein specified, the authorization, if not previously revoked or specifically further extended, will cease and become null and void. If additional time is required to complete the project, you should contact this office with a request for an additional time extension.

Printed on Recycled Paper

Should you have questions, please contact Mr. John Thomas, Raleigh Regulatory Field Office, telephone (919) 554-4884 extension 25.

Sincerely,

Kevin P. Landers Sr.
Colonel, U.S. Army
District Commander

Printed on Recycled Paper

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Water Resources

Pat McCrory
Governor

Thomas A. Reeder
Director

John E. Skvarla, III
Secretary

RECEIVED
SEP 11 2013
OFFICE OF NATURAL ENVIRONMENT

August 29, 2013

Dr. Greg Thorpe, PhD., Manager
Project Development and Environmental Analysis
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina, 27699-1598

Subject: REISSUE: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and RANDLEMAN BUFFER RULES with ADDITIONAL CONDITIONS for Proposed widening form SR 1003 (North Main Street) and SR 1820 (Skeet Club Road) to NC 68 in High Point, Guilford County, Federal Aid Project No. STP-1820(2); WBS Element No. 34962.1.1, TIP U-3615. NCDWR Project No. 2013-0477.

Dear Dr. Thorpe:

Attached hereto is a copy of Certification No. 3966 issued to The North Carolina Department of Transportation (NCDOT) dated July xx, 2013 originally issued on June 28, 2013.

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

Sincerely,

Thomas A. Reeder

Attachments

cc: Jerry Parker, Division 7 Environmental Officer (electronic copy only)
Chris Militscher, Environmental Protection Agency (electronic copy only)
Travis Wilson, NC Wildlife Resources Commission (electronic copy only)
Jason Elliott, NCDOT, Roadside Environmental Unit (electronic copy only)
Beth Harmon, Ecosystem Enhancement Program (electronic copy only)
Amy Euliss, NCDWR Winston Salem Regional Office (electronic copy only)
File Copy

Transportation and Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1650
Location: 512 N. Salisbury St. Raleigh, North Carolina 27604
Phone: 919-807-6300 \ FAX: 919-807-6488
Internet: www.ncwaterquality.org

An Equal Opportunity \ Affirmative Action Employer

One NorthCarolina Naturally

401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and RANDLEMAN BUFFER RULES 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 Resources (NCDWR) Regulations in 15 NCAC 2H .0500 and 15A NCAC 2B .0250. This certification authorizes the NCDOT to impact 2688 linear feet of jurisdictional streams, 0.85 acres of jurisdictional wetlands, 0.04 acres of open water, and 232798 square feet of protected riparian buffers in Guilford County. The project shall be constructed pursuant to the application dated received May 2, 2013 with additional information dated received June 20, 2013 and August 29, 2013. The authorized impacts are as described below:

Stream Impacts in the Cape Fear River Basin for U3615A

Site	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
2			148	10	158	0
3	132	13			145	0
4	159	10			169	0*
TOTAL	**291**	**23**	**148**	**10**	**472**	**0**

*FONSI approved and 4A reached prior to Intermittent Stream Mitigation Policy effective October 16, 2009.

Total Stream Impact for U-3615A Project: 472 linear feet

Stream Impacts in the Cape Fear River Basin for U3615B

Site	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
1			119	16	135	0
2			594	10	604	594
3			699	10	709	699
3A			38	10	48	0
3B			119	4	123	0
3C			63		63	0
5	131	16			147	0
7	49	19			68	0
8			287	32	319	287
TOTAL	**180**	**35**	**1919**	**82**	**2216**	**1580**

Total Stream Impact for U-3615B Project: 2216 linear feet

Wetland Impacts in the Cape Fear River Basin for U-3615B

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Total Wetland Impact (ac)	Impacts Requiring Mitigation (ac)
3C			0.67			0.67	0.00
4	0.13		0.01			0.14	0.00
5	0.01			0.01		0.02	0.00
6	0.01			0.01		0.02	0.00
Total	**0.15**	**0.00**	**0.68**	**0.02**	**0.00**	**0.85**	**0.00**

Total Wetland Impact for Project: 0.85 acres.

Open Water Impacts in the Cape Fear River Basin for U-3519B

Site	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
2A	0.02		0.02
5A	0.02		0.02
TOTAL	**0.04**	**0.00**	**0.04**

Total Open Water Impact for U-3615B Project: 0.04 acres.

Randleman Riparian Buffer Impacts for U-3615A

Site	Zone 1 Impact (sq ft)	*minus* Wetlands in Zone 1 (sq ft)	= Zone 1 Buffers (not wetlands) (sq ft)	Zone 1 Buffer Mitigation Required (3:1 ratio)	Zone 2 Impact (sq ft)	*minus* Wetlands in Zone 2 (sq ft)	= Zone 2 Buffers (not wetlands) (sq ft)	Zone 2 Buffer Mitigation Required (1.5:1 ratio)
1	2370		2370	0	1792		1792	0
2	6278		6278	0	3988		3988	0
3	10201		10201	30603	5639		5639	8458.5
4 (road crossing)	7174		7174	21522	3536		3536	5304
4 (parallel)	5898		5898	17694	3605		3605	5407.5
TOTAL	**31921**	**0**	**31921**	**69819**	**18560**	**0**	**18560**	**19170**

Total Buffer Impact for U-3615A Project: 50481square feet.

Randleman Riparian Buffer Impacts for U-3615B

Site	Zone 1 Impact (sq ft)	*minus* Wetlands in Zone 1 (sq ft)	= Zone 1 Buffers (not wetlands) (sq ft)	Zone 1 Buffer Mitigation Required (3:1 ratio)	Zone 2 Impact (sq ft)	*minus* Wetlands in Zone 2 (sq ft)	= Zone 2 Buffers (not wetlands) (sq ft)	Zone 2 Buffer Mitigatio Requirec (1.5:1 rati
1	3854		3854	0	1931		1931	0
2 (road crossing)	4787		4787	0	2292		2292	0
2 (parallel)	36705		36705	110115	22604		22604	33906
2A	1369		1369	4107	9662		9662	14493
2B	0		0	0	51		51	0
3*	52487		52487	157461	31125		31125	46687.5
3A	2216		2216	0	623		623	0
3B	6967		6967	0	4638		4638	0
3C	0		0	0	64		64	0
4	1166		1166	0	998		998	0
5 (road crossing)	8784		8784	0	5141		5141	0
5 (parallel)	175		175	525	877		877	1315.5
6	3478		3478	0	1674		1674	0
6A	1271		1271	0	834		834	0
7	3933		3933	0	2411		2411	0
8	8902		8902	26706	4658		4658	6987
8A (bypass)	1226		1226	0	2536		2536	0
8A(parallel)	1385		1385	4155	1493		1493	2239.5
TOTAL	**138705**	**0**	**138705**	**303069**	**93612**	**0**	**93612**	**105629**

Total Buffer Impact for U-3615B Project: 232317 square feet.

The application provides adequate assurance that the discharge of fill material into the waters of the Cape Fear River Basin in conjunction with the proposed development will not result in a violation of applicable Water Quality

Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your application dated received May 2, 2013 with additional information dated received June 20, 2013. Should your project change, you are required to notify the NCDWR 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). Additional buffer impacts may require compensatory mitigation as described in 15A NCAC .0248. 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.

Condition(s) of Certification:

Project Specific Conditions

1. All stormwater runoff shall be directed as sheetflow through stream buffers at nonerosive velocities, unless otherwise approved by this certification.

2. All riparian buffers impacted by the placement of temporary fill or clearing activities shall be restored to the preconstruction contours and revegetated. Maintained buffers shall be permanently revegetated with non-woody species by the end of the growing season following completion of construction. For the purpose of this condition, maintained buffer areas are defined as areas within the transportation corridor that will be subject to regular NCDOT maintenance activities including mowing. The area with non-maintained buffers shall be permanently revegetated with native woody species before the next growing season following completion of construction.

3. Pursuant to 15A NCAC 2B .0250, sediment and erosion control devices shall not be placed in Zone 1 of any Randleman Buffer without prior approval by NCDWR. At this time, NCDWR has approved no sediment and erosion control devices in Zone 1, outside of the approved project impacts, anywhere on this project. Moreover, sediment and erosion control devices shall be allowed in Zone 2 of the buffers provided that Zone 1 is not compromised and that discharge is released as diffuse flow.

*4. The NCDOT Division Environmental Officer or Environmental Assistant will conduct a pre-construction meeting with all appropriate staff to ensure that the project supervisor and essential staff understand the potential issues with stream and pipe alignment at the permitted site. NCDWR staff shall be invited to the pre-construction meeting.

*5. Two copies of the final construction drawings shall be furnished to NCDWR Central Office prior to the pre-construction meeting. The permittee shall provide written verification that the final construction drawings comply with the permit drawings contained in the application dated May 2, 2013 with additional information dated received June 20, 2013. Any deviations from the approved drawings are not authorized unless approved by the NC Division of Water Quality.

6. Channel relocations not for credit shall be completed and stabilized, and approved by DWR staff, prior to diverting water into the new channel. Stream banks shall be matted with coir-fiber matting. Vegetation used for bank stabilization shall be limited to native riparian vegetation, and should include establishment of a vegetated buffer on both sides of the relocated channel to the maximum extent practical. Also, rip-rap may be allowed if it is necessary to maintain the physical integrity of the stream, but the applicant must provide written justification and any calculations used to determine the extent of rip-rap coverage requested. Once the stream has been turned into the new channel, it may be necessary to relocate stranded fish to the new channel to prevent fish kills.

7. For the 150 linear feet of streams being impacted due to site dewatering activities, the site shall be graded to its preconstruction contours and revegetated with appropriate native species.

8. Strict adherence to the most recent version of NCDOT's Best Management Practices For Bridge Demolition and Removal approved by the US Army Corps of Engineers is a condition of the 401 Water Quality Certification.

9. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to the most current version of *Stormwater Best Management Practices.*

10. Bridge piles and bents shall be constructed using driven piles (hammer or vibratory) or drilled shaft construction methods. More specifically, jetting or other methods of pile driving are prohibited without prior written approval from NCDWR first.

11. No drill slurry or water that has been in contact with uncured concrete shall be allowed to enter surface waters. This water shall be captured, treated, and disposed of properly.

12. A turbidity curtain will be installed in Oak Hollow Lake if driving or drilling activities occur within the lake, on the bank, or within 5 feet of the top of bank. This condition can be waived with prior approval from DWR.

13. All bridge construction shall be performed from the existing bridge, temporary work bridges, temporary causeways, or floating or sunken barges. If work conditions require barges, they shall be floated into position and then sunk. The barges shall not be sunk and then dragged into position. Under no circumstances should barges be dragged along the bottom of the surface water.

14. 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.

15. 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.

16. 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.

17. NCDOT shall be in compliance with the NCS00250 issued to the NCDOT, including the applicable requirements of the NCG01000. Please note the extra protections for the sensitive watersheds.

18. Tall fescue shall not be used in the establishment of temporary or permanent groundcover within riparian areas. For the establishment of permanent herbaceous cover, erosion control matting shall be used in conjunction with an appropriate native seed mix on disturbed soils within the riparian area and on disturbed steep slopes with the following exception. Erosion control matting is not necessary if the area is contained by perimeter erosion control devices such as silt fence, temporary sediment ditches, basins, etc. Matting should be secured in place with staples, stakes, or wherever possible, live stakes of native trees. Erosion control matting placed in riparian areas shall not contain a nylon mesh grid, which can impinge and entrap small animals. For the establishment of temporary groundcover within riparian areas, hydroseeding along with wood or cellulose based hydro mulch applied from a fertilizer- and limestone-free tank is allowable at the appropriate rate in conjunction with the erosion control measures. Discharging hydroseed mixtures and wood or cellulose mulch into surface waters in prohibited. Riparian areas are defined as a distance 25 feet landward from top of stream bank.

19. NCDOT shall design, construct, and operate and maintain hazardous spill catch basins (HSCBs) at stream and lake crossing within the WS CA watershed. The HSCBs shall be located at Station numbers 183+00 – L-(Rt), 191+50-L-(Lt), 202+00-L-(Lt), 222+00-L-(Rt), 234+50-L-(Rt), 242+00-L-(Rt), 267+00-L-(Lt), 272+00-L-(Lt), 306+00-L-(Rt), and 314+50-L-(Rt).

20. Compensatory mitigation for impacts to 1580 linear feet of streams at a replacement ratio of 1:1 is required for U-3615B. Compensatory mitigation for impacts to jurisdictional streams shall be provided by onsite stream relocations of 760 linear feet of UT 3-3West Fork of Deep River. The onsite stream relocation shall be constructed in accordance with the design submitted in your May 2, 2013 application. All on-site mitigation sites shall be protected in perpetuity by a conservation easement or through NCDOT fee simple acquisition and recorded in the NCDOT Natural Environment Unit mitigation geodatabase. Please be reminded that as-builts for the completed streams shall be submitted to the North Carolina Division of Water Quality 401 Wetlands Unit with the as-builts for the rest of the project. If the parameters of this condition are not met, then the permittee shall supply additional stream mitigation for the 760 linear feet of impacts. All channel relocations will be constructed in a dry work area, will be completed and stabilized, and must be approved on site by NCDWR staff, prior to diverting water into the new channel. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. All stream relocations shall have a 50-foot wide native wooded buffer planted on both sides of the stream unless otherwise authorized by this Certification. A transitional phase incorporating rolled erosion control product (RECP) and appropriate temporary ground cover is allowable.

*21. The permittee shall visually monitor the vegetative plantings to assess and ensure complete stabilization of the mitigation stream segments. Riparian area success shall be determined by conducting stem counts to ensure a tree survival rate of 320 stems/acre. The monitoring shall be conducted annually for a minimum of 3 years after final planting. Photo documentation shall be utilized to document the success of the riparian vegetation and submitted to NCDWR in a final report within sixty (60) days after completing monitoring. After 3 years the NCDOT shall contact NCDWR to schedule a site visit to "close out" the mitigation site.

*22. Compensatory mitigation for 820 linear feet of impact to streams is required (excluding 760 linear feet to be mitigated for on-site). 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 April 23, 2013 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.

23. Compensatory mitigation for impacts to 101023 square feet of protected riparian buffers in Zone 1 (303069 square feet of mitigation) and 70419 square feet of protected riparian buffers in Zone 2 (105629 square feet of mitigation) shall be required for U3615B. In accordance with 15A NCAC 02B .0252, riparian vegetation reestablishment shall include a minimum of at least 2 native hardwood tree species planted at a density sufficient to provide 320 trees per acre at maturity. All on-site mitigation sites shall be protected in perpetuity by a conservation easement or through NCDOT fee simple acquisition and recorded in the NCDOT Natural Environment Unit mitigation geodatabase.

*24. The permittee shall monitor the buffer mitigation site. Monitoring shall consist of stem counts. An annual report shall be submitted to NCDWR for a period of 5 years showing monitoring results, survival rate/ success of tree and vegetation establishment, and that diffuse flow through the riparian buffer has been maintained. The first annual report shall be submitted within one year of final planting. Failure to achieve a buffer density of 320 trees per acre after 5 years will require the annual report to provide appropriate remedial actions to be implemented and a schedule for implementation. Approval of the final annual report, and a formal "close out" of the mitigation site by NCDWR is required.

25. Compensatory mitigation for 303069 square feet of riparian buffers in Zone 1 and 105629 square feet in riparian buffer Zone 2 shall be required for U3615B. We understand that 45810 square feet of protected riparian buffer in zone 1 and 29829 square feet of protected riparian buffer in zone 2 are being performed on-site. We understand that you have chosen to perform compensatory mitigation for the remaining 257259 square feet of riparian buffer in zone 1 and 75800 square feet of riparian buffer in zone 2 to protected buffers through use of the North Carolina Ecosystem Enhancement Program (EEP). Mitigation for unavoidable impacts to Randleman Riparian Buffers shall be provided in the Cape Fear River Basin and done in accordance with 15A NCAC 2B .0252. EEP has indicated in a letter dated August 20, 2013 that they will assume responsibility for satisfying the compensatory mitigation requirements for the above-referenced project, in accordance with EEP's Mitigation Banking Instrument signed July 28, 2010.

*26. When final design plans are completed for U-3615A, a modification to the 401 Water Quality Certification and the Randleman River Riparian Buffer Certification shall be submitted with fees to the NC Division of Water Quality. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands, streams, surface waters, or buffers located in U-3615A shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification and the Randleman River Riparian Buffer Authorization from the NC Division of Water Quality.

General Conditions

27. 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 down stream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWR for guidance on how to proceed and to determine whether or not a permit modification will be required.

28. 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.

29. 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.

30. 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.

31. 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.

*32. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval.

33. Prior to commencing ground disturbing activities, an acceptable monitoring and mitigation plan for the presence of sulfide-bearing rock must be approved by DWR.

34. 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.

35. 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.

36. 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.

37. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification.

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

39. 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 NCDWR 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, NCDWR may reevaluate and modify this certification.

40. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification.

41. 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.

42. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification.

43. 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.

44. The Permittee shall report any violations of this certification to the Division of Water Quality within 24 hours of discovery.

*45. 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 NCDWR when all work included in the 401 Certification has been completed.

46. Native riparian vegetation 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.

47. 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.

48. 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.

49. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made

conditions of the Federal 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)-431-3000, Facsimile: (919)-431-3100

A copy of the petition must also be served on DENR as follows:

Mr. Lacy Presnell, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center

This the 29th day of August 2013

DIVISION OF WATER RESOURCES

Thomas A. Reeder

WQC No. 3966

NCDENR
North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

December 8, 2014

Mr. Richard W. Hancock, P.E., Manager
Project Development and Environmental Analysis
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina, 27699-1598

Subject: Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and Randleman Lake Watershed Buffer Rules, with Additional Conditions for proposed improvements and widening from SR 1003 (North Main Street) and SR 1820 (Skeet Club Road) to NC 68 in High Point, Guilford County, Division 7; Federal Aid Project No. STP-1820(2), TIP No. U-3615B. NCDWR Project No. 2013-0477 v.3

Dear Mr. Hancock:

Attached hereto is a modification of Certification No. 3966 issued to The North Carolina Department of Transportation (NCDOT) originally dated June 28, 2013 and subsequently modified and dated August 29, 2013.

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

Sincerely,

Thomas A. Reeder, Director
Division of Water Resources

Attachments

Electronic copy only distribution:
Dave Bailey, US Army Corps of Engineers, Raleigh Field Office
Jerry Parker, Division 7 Environmental Officer
Colin Mellor, NC Department of Transportation
Rachelle Beauregard, NC Department of Transportation
Dr. Cynthia Van Der Wiele, US Environmental Protection Agency
Gary Jordan, US Fish and Wildlife Service
Travis Wilson, NC Wildlife Resources Commission
Jason Elliott, NCDOT, Natural Environment Section
Beth Harmon, Ecosystem Enhancement Program
Dave Wanucha, NC Division of Water Resources Winston Salem Regional Office
File Copy

Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and RANDLEMAN BUFFER RULES 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 Resources (NCDWR) Regulations in 15 NCAC 2H .0500 and 15A NCAC 2B .0250 for Randleman. This certification authorizes the NCDOT to modify impacts to jurisdictional wetlands, open waters and protected riparian buffers in Guilford County. The project shall be constructed pursuant to the modification dated November 20, 2014. The authorized impact modifications are as described below for U-3615B.

Table 1. Modified Wetland Impacts in the Cape Fear River Basin for U-3615B.

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Total Wetland Impact (ac)
Original approved impacts at Site 5	<0.01	-	-	0.01	-	0.01
Modified impacts with this approval at Site 5	<0.01	-	-	0.01	-	0.01
Original approved impacts at Site 6	<0.01	-	-	<0.01	-	<0.01
Modified impacts with this approval at Site 6	0.00	-	-	0.00	-	0.00

Total Wetland Impact for all Sites plus Modification: 0.81 acres (originally 0.82 acres).

Table 2. Modified Open Water Impacts in the Cape Fear River Basin for U-3615B.

Site	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
Original approved impacts at Site 5A	0.02	-	0.02
New additional impacts with this approval at Site 5A	0.01	-	0.01
Total	0.03	-	0.03

Total Open Water Impact for all Sites plus Modification: 0.03 acres (originally 0.04 acres).

Table 3. Modified Randleman Riparian Buffer Impacts for U-3615B.

Site	Zone 1 Buffer Impacts (sq ft)	Zone 1 Buffer Mitigation Required (using 3:1 ratio)		Zone 2 Buffer Impacts (sq ft)	Zone 2 Buffer Mitigation Required (using 1.5:1 ratio)
Site 1, Originally approved impacts	3,854	0		1,931	0
Site 1, Modified impacts	5,869	0		1,671	0
Site 2, Originally approved impacts	4,787	0		2,292	0
Site 2, Modified impacts	3,975	0		2,546	0
Site 2 (parallel), Originally approved impacts	36,705	110,115		22,604	33,906
Site 2 (parallel), Modified impacts	31,061	93,183		13,632	20,448
Site 2A, Originally approved impacts	1,369	4,107		9,662	14,493
Site 2A, Modified impacts	2,456	7,368		5,717	8,575.5
Site 5, Originally approved impacts	8,784	0		5,141	0
Site 5, Modified impacts	8,562	0		4,228	0
Site 5 (parallel), Originally approved impacts	175	525		877	1,315.5
Site 5 (parallel), Modified impacts	0	0		0	0
Totals for Modification (change from original)	-3,751	-14,196		-14,713	-20,691
Totals for all sites plus this Modification	134,594	-		78,899	-

Total Buffer Impact for U-3615B for all Sites plus Modification: 213,493 square feet.

Table 4. Total Modified Mitigable Buffer Impacts for U-3615B.

	Zone 1 Buffer (sq ft)	Zone 2 Buffer (sq ft)
All sites including this modification	96,291	56,625

The application provides adequate assurance that the discharge of fill material into the waters of the Cape 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 modified application dated received November 20, 2014. All the authorized activities and conditions of certification associated with the original Water Quality Certification dated June 28, 2013 and August 29, 2013 still apply except where superceded by this certification. Should your project change, you are required to notify the NCDWR 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). Additional buffer impacts may require compensatory mitigation as described in 15A NCAC 2B .0248. 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.

Condition(s) of Certification:

1. This modification is applicable only to the additional proposed activities. All of the authorized activities and conditions of certification associated with the original Water Quality Certification dated June 28, 2013 and subsequent modification dated August 29, 2013 still apply except where superseded by this certification.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 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)-431-3000, Facsimile: (919)-431-3100

A copy of the petition must also be served on DENR as follows:

Mr. John Evans, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center

This the 8th day of December, 2014

DIVISION OF WATER RESOURCES

Thomas A. Reeder, Director
Division of Water Resources

WQC No. 3966

EXHIBIT C

RECEIVED
APR 30 2013
RALEIGH REGULATORY
FIELD OFFICE

Skeet Club Road Stream Mitigation Plan
Widening of Skeet Club Road from West of Johnson Street to NC 68
Guilford County, NC

U-3615B
34962.1.1
ONE ID# 041-018

01/12/2013

1.0 Baseline

The North Carolina Department of Transportation (NCDOT) will perform onsite mitigation for stream impacts associated with State Transportation Improvement Project (STIP) U-3615B, in Guilford County. The widening of Skeet Club Road will impact 699 feet of an unnamed tributary (UT) to West Fork Deep River. NCDOT will relocate the UT using natural stream design north of the existing stream location. The existing UT runs parallel to Skeet Club Road within a low density residential area. The UT has an unstable, incised G4/C channel with a sparse buffer consisting mainly of small trees and blackberry. All stream work will take place within the Hydrologic Cataloging Unit (HUC) 03030003 within the Cape River Basin in sub basin (03-06-08). Channel dimensions, substrate type and stream type are listed below in Table 1. Additional information can be acquired from the NRTR dated March 9, 2001.

Table 1

Stream Reach	Stream Channel Width	Channel Depth	Channel Substrate	Jurisdictional Status
UT 3-3 UT W Fork Deep R.	6 feet	2 feet	Silt, sand	Perennial

2.0 Site Selection

STIP U-3615B involves the widening and improvements of North Main Street (Old US 311/SR 1003) from the existing 5-lane, curb-and-gutter section north of US 311 to Skeet Club Road. Skeet Club Road will also be widened from North Main Street to the existing 5-lane, curb-and-gutter section just west of Eastchester Drive (NC 68). Permanent stream impacts

associated with this project are 2120 linear feet. These impacts include 699 feet of UT to West Fork Deep River that will be filled during construction and therefore will be relocated. The stream relocation will vary from 30 to 100 feet north of the existing location. The mitigation site is located between -L- Sta. 197+70 to Sta. 205+40. The stream between Sta. 200+25 and Sta. 200+65 is not included in the proposed mitigation due to an access to existing dwelling (see Appendix A)

3.0 Site Protection Instrument

The mitigation area is located within the NCDOT Right of Way that was acquired for the U-3515B. NCDOT will manage the proposed mitigation site to prohibit all use inconsistent with its use as mitigation property, including any activity that would materially alter the biological integrity or functional and educational value of the site, consistent with this mitigation plan. The site will be placed on the NES mitigation geodatabase, have annual field visits during the monitoring period, and then be placed in the NCDOT Stewardship Program for long term maintenance and protection.

4.0 Objectives

The project involves the relocation of 699 feet of the UT to West Fork Deep River, resulting in 760 feet of natural stream design to mitigate for impacts associated with STIP U-3615B. The functional restoration of the stream will be accomplished using natural stream design and buffer restoration. Buffer restoration will consist of planting trees over an area a minimum of 50 feet on both sides of the relocated channel (approximately 76,000 square feet total). NCDOT proposes a 1:1 mitigation ratio for the 760 foot UT to West Fork Deep River stream relocation and for the 76,000 square feet of buffer restoration.

5.0 Mitigation Work Plan

The mitigation site will be constructed in conjunction with STIP U-3615B. Construction activities related to the mitigation site involve floodplain excavation, stream channel grading, structure installation, and native vegetation planting. The design involves the relocation of an unstable, incised channel (G4C stream type) with the Rosgen Priority Level II approach, in which a new stream channel (B4C stream type) will be constructed through a newly established floodplain. In-stream structures will consist of (9) rock cross vanes to provide stability (See Appendix B). The stream banks and adjacent floodplain areas will be planted with native vegetation that are moderately to highly tolerant of flooded conditions.

Following the successful completion of site grading and stabilization, the vegetation plan for the site includes the planting of live stake trees along the face of the stream banks. A minimum 50

foot buffer (from top of bank) will also be established using bare root trees. Tree species commonly found in the piedmont area will be planted across the site No less than four native species appropriate for the site conditions, such as river birch (*Betula nigra*), green ash (*Fraxinus pennsylvanica*), sycamore (*Platanus occidentalis*), and overcup oak (*Quercus lyrata*), will be used. Final species selection will be based on availability.

Two small areas within the buffer restoration area will be planted with low growing shrubs such as silky dogwood (*Cornus amomum*) and button bush (*Cephalanthus occid*entalis*)* because of existing utility easements.

Native grass seeding and mulching will be performed on any disturbed areas along the stream relocation for stabilization purposes according to the guidance and standard procedures of NCDOT's Roadside Environmental Unit. An as-built report will be submitted within 60 days of completion of the project.

6.0 Performance Standards

Buffer vegetation success criteria are based on the survival of at least 260 stems per acre at year five. Stream channel relocation success will be based on channel stability, vegetation survival, and placement of structures.

* **7.0 Monitoring Requirements**

NCDOT will visually monitor the stream relocation as well as established vegetation plots. These monitoring activities will be conducted bi-annually for a five year period and documented in an annual report distributed to the regulatory agencies.

8.0 Other Information

No additional pertinent information available.

9.0 Determination of Credits

Per NCDOT plans and 401/404 permit application for STIP U-3615B; NCDOT proposes to relocate 699 feet of UT West Fork Deep River. The proposed mitigation will result in 760 linear feet of stream relocation to be used as on-site mitigation for associated stream impacts for U-3615B at a 1:1 ratio. An as-built report will be submitted within 60 days of completion of the project to verify actual linear feet constructed and buffer acreage planted. The success of the mitigation area and determination of final credits will be based upon successful completion of the mitigation plan and closeout of the monitoring period.

9.1 Credit Release Schedule

NCDOT proposes immediate, full release of the proposed 760 feet of stream at a 1:1 ratio as on-site mitigation for the impacts associated with STIP U-3615B.

10.0 Geographic Service Area

The proposed geographic Service Area (GSA) for the mitigation is composed of the 8 digit Hydrologic Cataloging Unit (HUC) 03030003. It is anticipated that the entire 760 linear feet will be used on-site at a 1:1 ratio to offset stream impacts associated with U-3615B.

11.0 Maintenance Plan

The site will be held by NCDOT and placed on the NES mitigation geodatabase. Once monitoring is completed and the site is closed out, it will be placed in the NCDOT Stewardship Program for long term maintenance and protection.

If an appropriate third party recipient is identified in the future, then the transfer of the property will include a conservation easement or other measure to protect the natural features and mitigation value of the site in perpetuity.

12.0 Long Term Adaptive Management Plan

The site will be managed by NCDOT according to the mitigation plan. In the event that unforeseen issues arise that affect the management of the site, any remediation will be addressed by NCDOT in coordination with the Interagency Review Team.

13.0 Financial Assurances

The site will be managed by NCDOT with its own distinct cost center number within the NCDOT budgeting and financial tracking system. Therefore, all accounting for revenues, contract encumbrances, fund transfers, and expenses will be performed and reported independently from other capital budget or operating budget accounting.

EXHIBIT B

TIP: U-3615A

CONTRACT:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3615A	1	

W.B. NO.	F.A. PROJ. NO.	DESCRIPTION
34962.1.1	STP-1820(2)	P.E.
34962.2.2	STP-1820(4)	R/W & UTILITIES

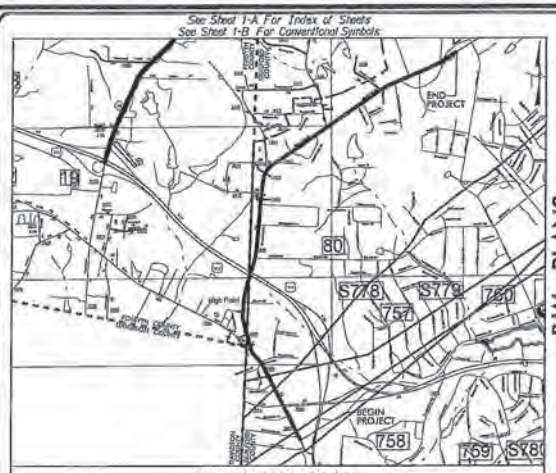
RECEIVED
APR 30 2013
RALEIGH REGULATORY FIELD OFFICE

Permit Drawing
Sheet 1 of 14

LOCATION: SR 1003 (NORTH MAIN STREET) AND SR 1820 (SKEET CLUB ROAD) BETWEEN US 311 AND SR 1818 (JOHNSON STREET).

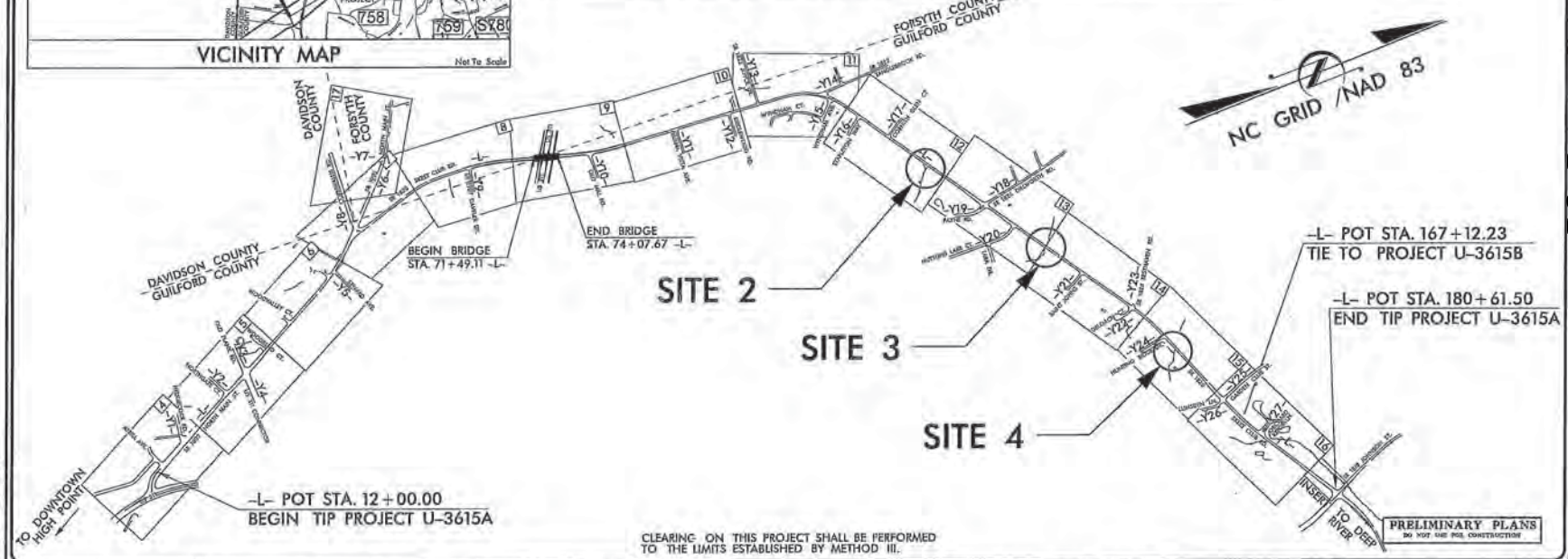
TYPE OF WORK: GRADING, PAVING, DRAINAGE, GUARDRAIL, STRUCTURE, SIGNING AND SIGNALS

WETLAND/SURFACE WATER PERMIT DRAWING



VICINITY MAP

R/W PLANS



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

GRAPHIC SCALES

50 25 0 50 100 — PLANS

50 25 0 50 100 — PROFILE (HORIZONTAL)

10 5 0 10 20 — PROFILE (VERTICAL)

DESIGN DATA

ADT 2015 = 18,100
ADT 2035 = 29,800
DHV = 10 %
D = 55 %
T = 3 % *
V = 50 MPH
* TTST 1 % DUAL 2 %
FUNCTIONAL CLASS: MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3615A = 3.144mi.
LENGTH STRUCTURE TIP PROJECT U-3615A = 0.049mi.
TOTAL LENGTH TIP PROJECT U-3615A = 3.193mi.

NCDOT CONTACT: CATHY HOUSER, PE — PROJECT ENGINEER, ROADWAY DESIGN UNIT

Prepared in the Office of: STEWART ENGINEERING, INC.
FOR: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCT 18, 2013

LETTING DATE: OCT 20, 2015

DAVID RUGGLES, PE — PROJECT ENGINEER

DREW BAIRD, PE — PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER — SIGNATURE: P.E.

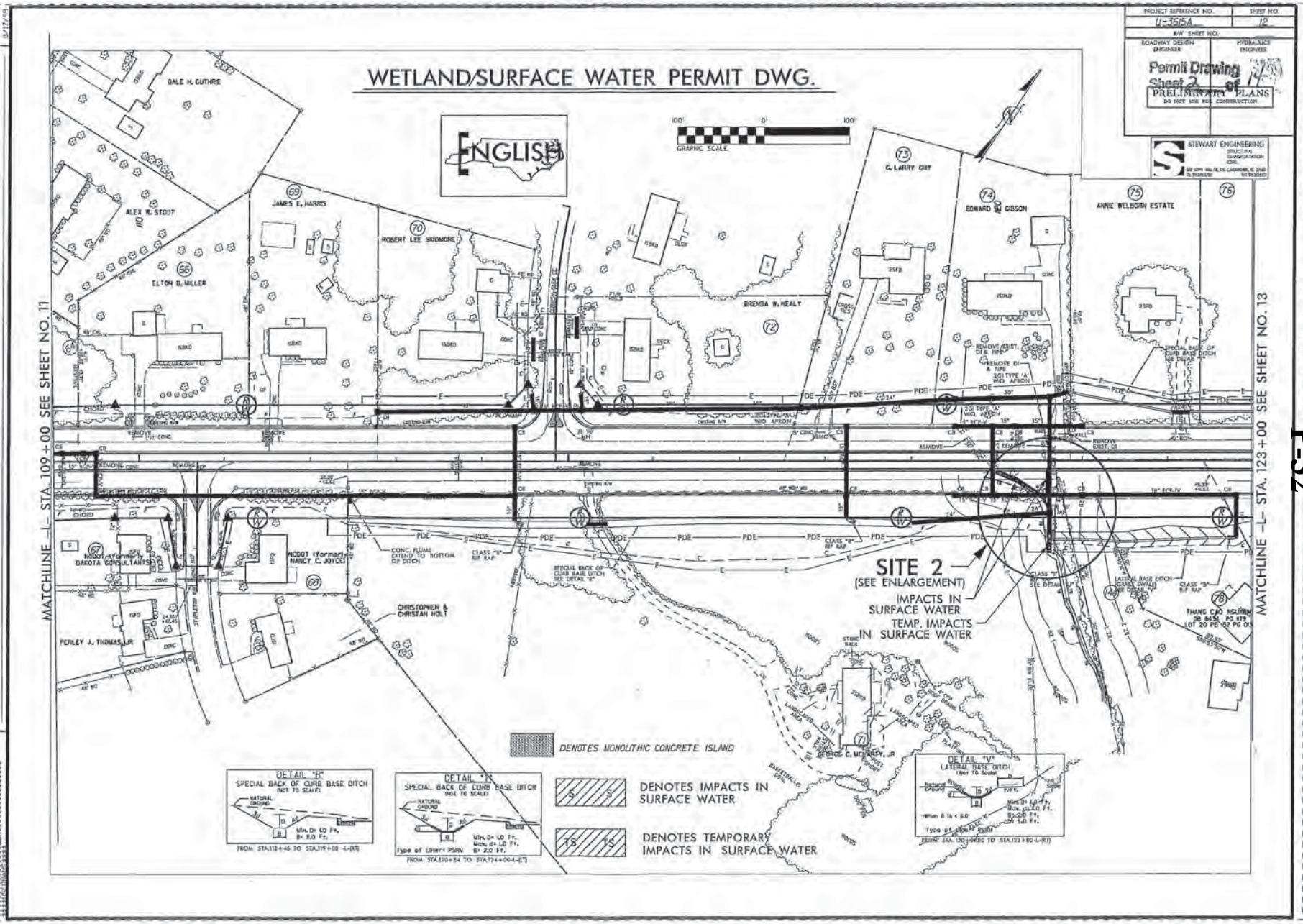
ROADWAY DESIGN ENGINEER — SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER — P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR — DATE


WETLAND/SURFACE WATER PERMIT DWG.
PROJECT REFERENCE NO. U-3615A
SHEET NO. 12
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing Sheet 2 of 14
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
STEWART ENGINEERING
ENGLISH
GRAPHIC SCALE
MATCHLINE -L- STA. 109+00 SEE SHEET NO. 11
MATCHLINE -L- STA. 123+00 SEE SHEET NO. 13
GALE H. GUTHRIE
ALEX W. STOUT
JAMES E. HARRIS
ROBERT LEE SHUMORE
ELTON D. MILLER
BRENDA W. HEALY
G. LARRY GUY
EDWARD W. GIBSON
ANNIE WELBORN ESTATE
NCDOT (formerly DAKOTA CONSULTANTS)
NCDOT (formerly NANCY C. JOYCE)
CHRISTOPHER & CHRISTAN HOLT
PERLEY A. THOMAS, JR.
GEORGE C. MCNAIRY, JR.
THANG CAO NGUYEN
SITE 2
(SEE ENLARGEMENT)
IMPACTS IN SURFACE WATER
TEMP. IMPACTS IN SURFACE WATER
DENOTES MONOLITHIC CONCRETE ISLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DETAIL "R"
SPECIAL BACK OF CURB BASE DITCH
(NOT TO SCALE)
DETAIL "S"
SPECIAL BACK OF CURB BASE DITCH
(NOT TO SCALE)
DETAIL "V"
LATERAL BASE DITCH
(NOT TO SCALE)
REVISIONS

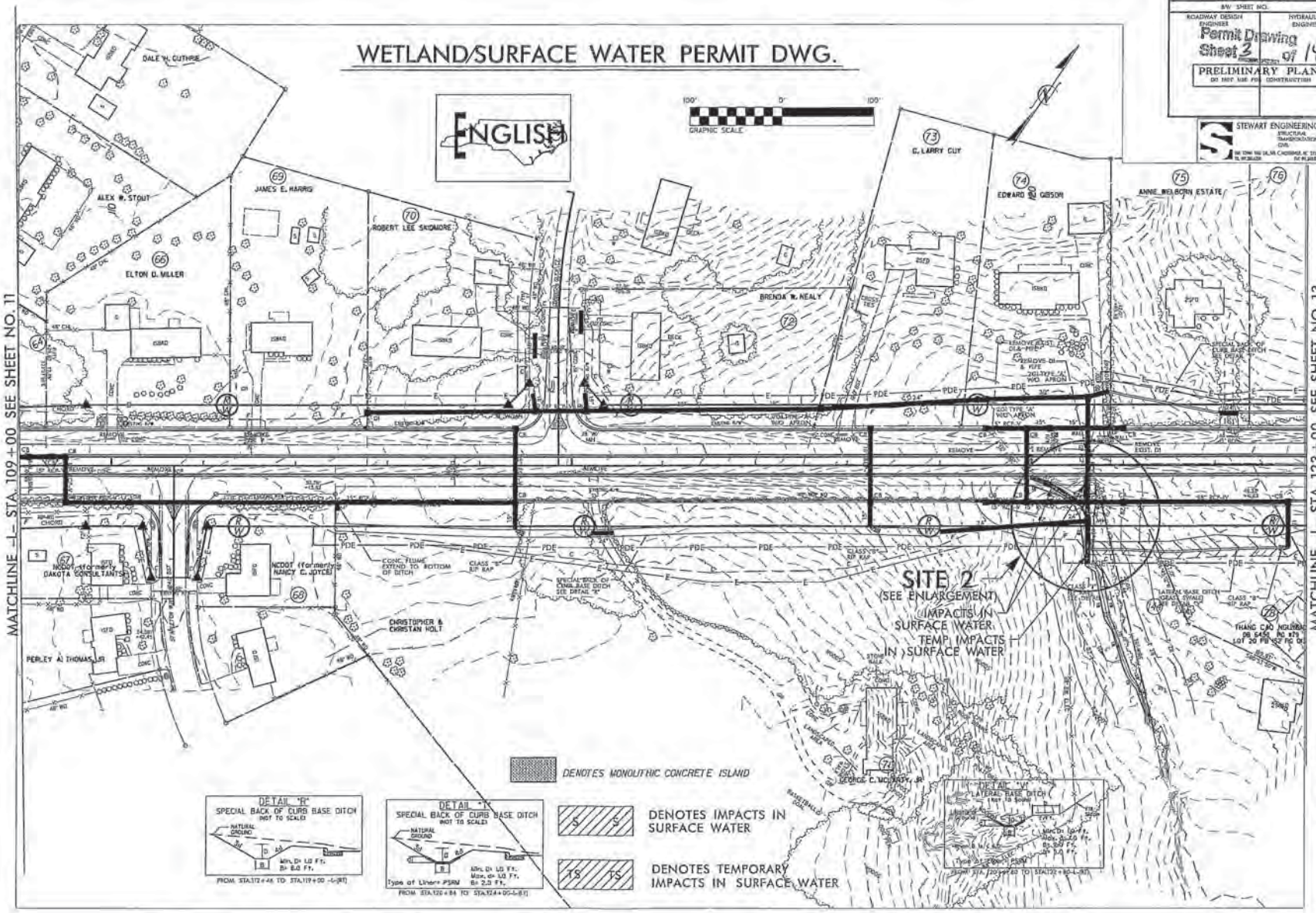
PROJECT REFERENCE NO.	SHEET NO.
U-3615A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Permit Drawing
Sheet 2 of 14

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STEWART ENGINEERING
STRUCTURAL TRANSPORTATION CIVIL

WETLAND/SURFACE WATER PERMIT DWG.



P-33

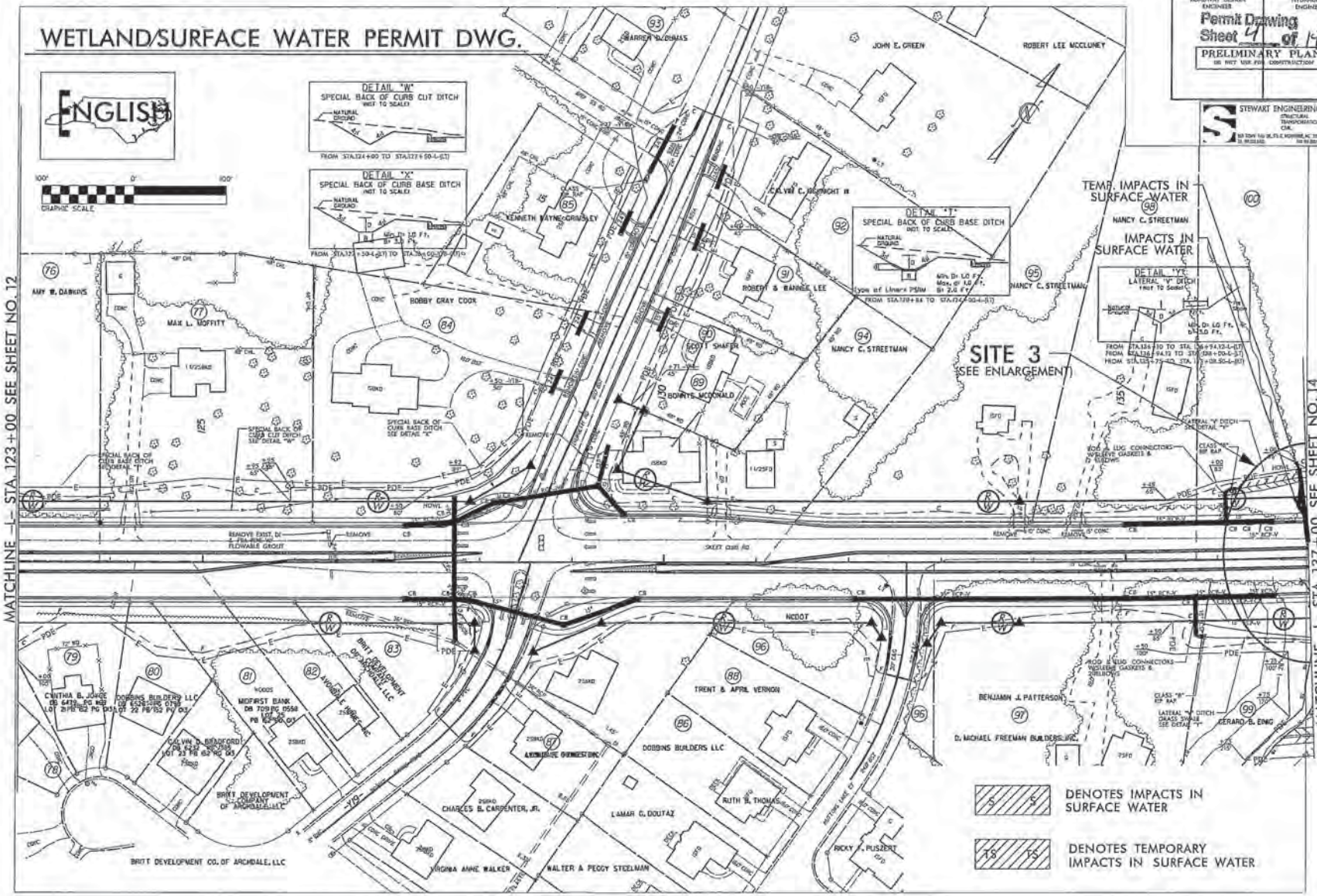
PROJECT REFERENCE NO.	SHEET NO.
U-3615A	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

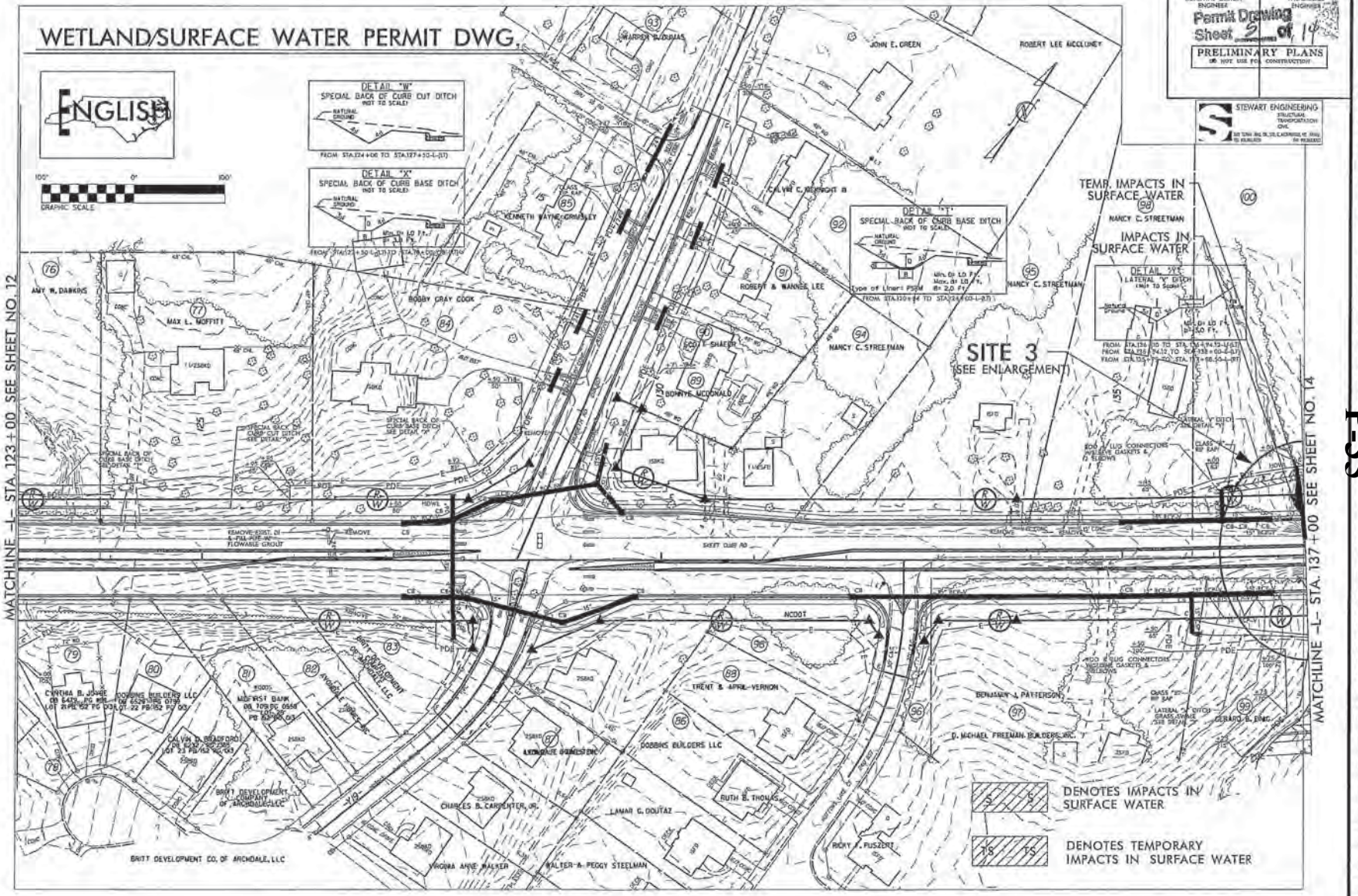
Permit Drawing
Sheet 4 of 14

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STEWART ENGINEERING
STRUCTURAL TRANSPORTATION CSE.

WETLAND/SURFACE WATER PERMIT DWG.

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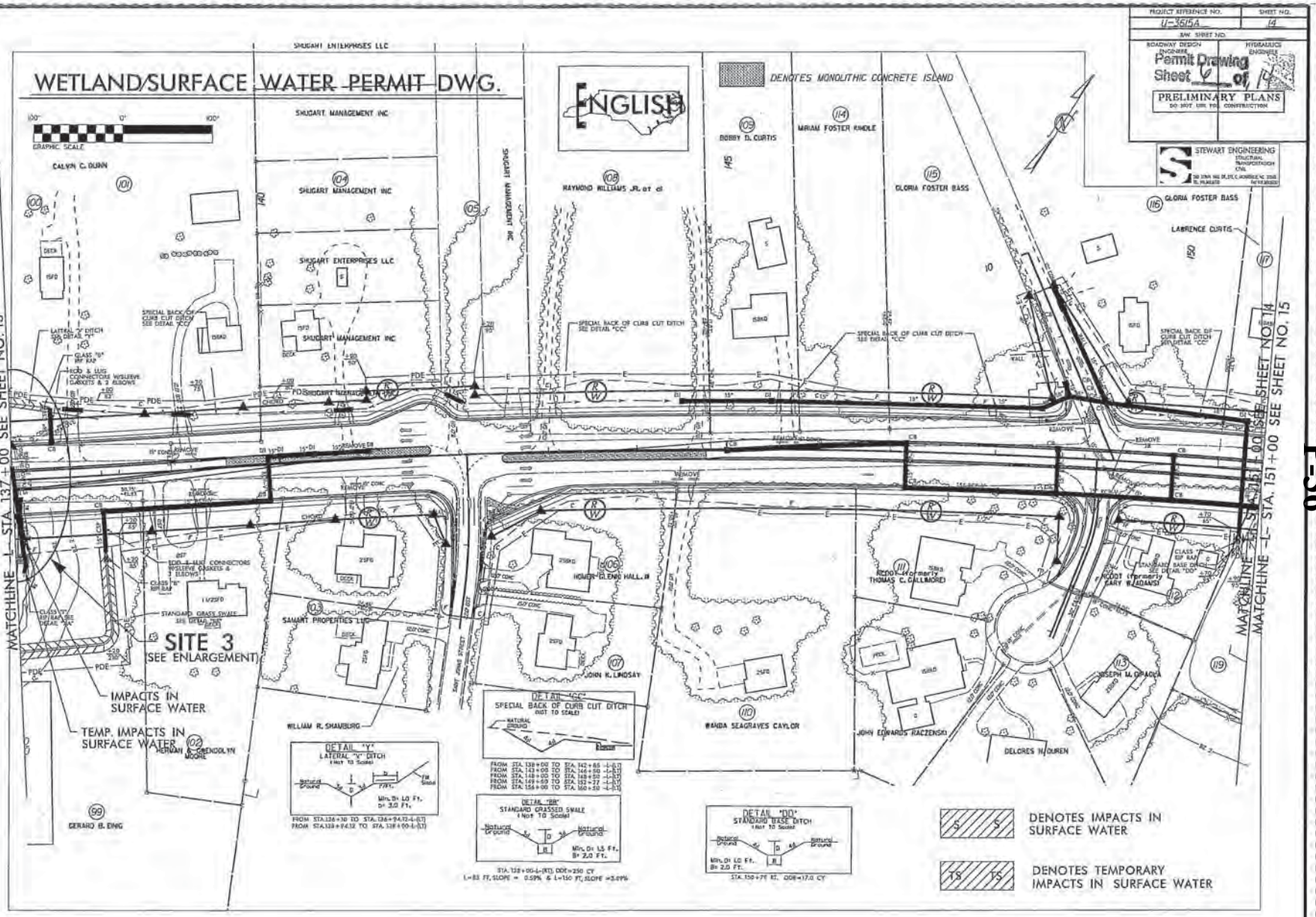
PROJECT REFERENCE NO. U-3615A
SHEET NO. 13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing Sheet 9 of 14
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
STEWART ENGINEERING
ENGLISH
GRAPHIC SCALE
DETAIL "W" SPECIAL BACK OF CURB CUT DITCH (NOT TO SCALE)
DETAIL "X" SPECIAL BACK OF CURB BASE DITCH (NOT TO SCALE)
DETAIL "T" SPECIAL BACK OF CURB BASE DITCH (NOT TO SCALE)
DETAIL "Y" LATERAL "V" DITCH (NOT TO SCALE)
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER
SITE 3 (SEE ENLARGEMENT)
MATCHLINE -L- STA. 123+00 SEE SHEET NO. 12
MATCHLINE -L- STA. 137+00 SEE SHEET NO. 14
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
JOHN E. GREEN
ROBERT LEE MCCLUNEY
NANCY C. STREETMAN
ROBERT & NANNIE LEE
BOBBY GRAY COOK
MAX L. MOFFITT
AMY W. DAWKINS
BONNIE MCDONALD
TRENT & APRIL VERNON
DOBBINS BUILDERS LLC
BENJAMIN J. PATTERSON
D. MICHAEL FREEMAN BUILDERS INC.
RUTH B. THOMAS
LAMAR G. DOUTAZ
RICKY A. PUSZERT
CHARLES B. CARPENTER, JR.
VIRGINIA ANNE WALKER
WALTER & PEGGY STEELMAN
BRITT DEVELOPMENT CO. OF ARCHDALE, LLC
CALVIN D. BRADFORD
CYNTHIA B. JONES
NCDOT
SHEET CLAY RD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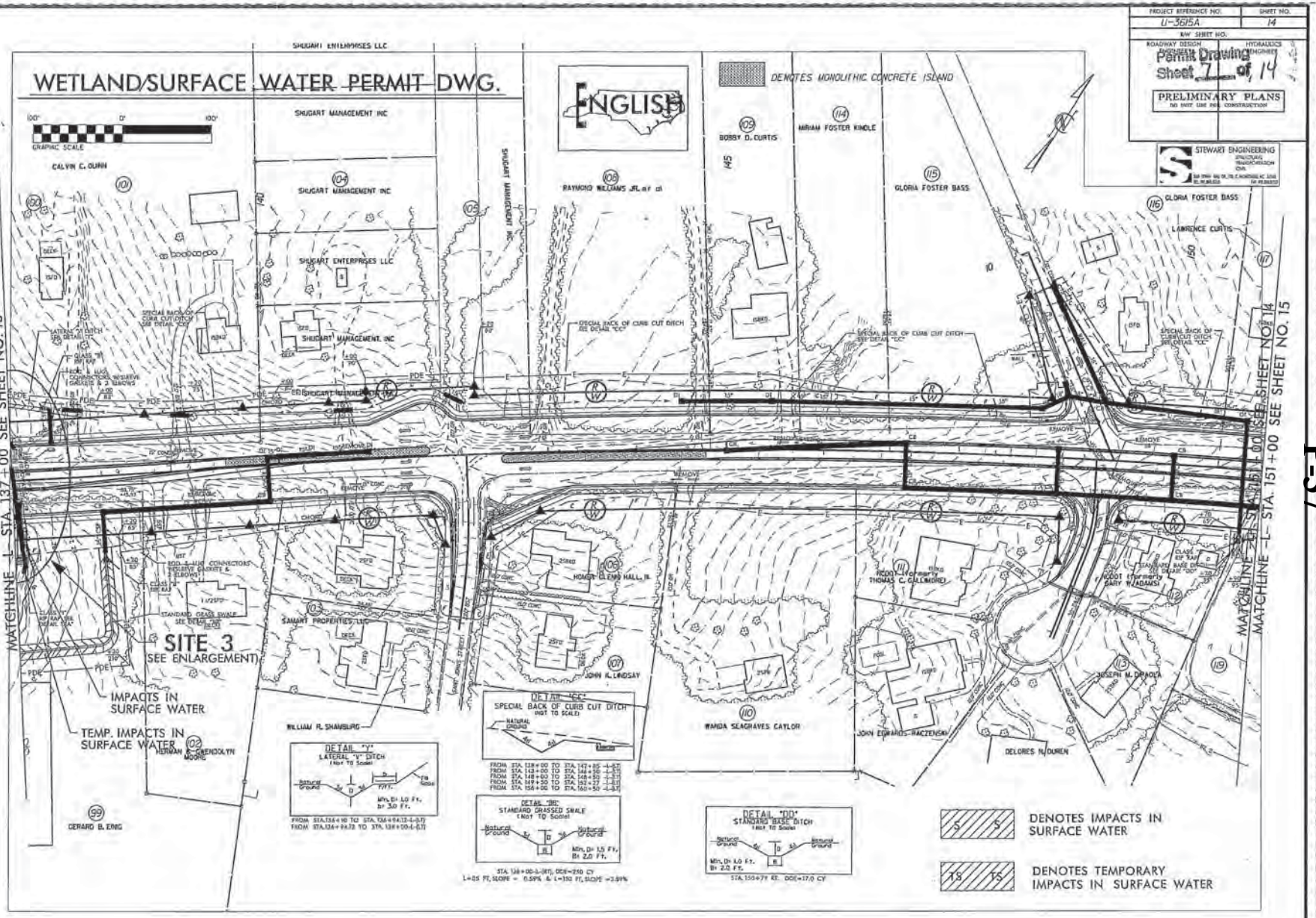
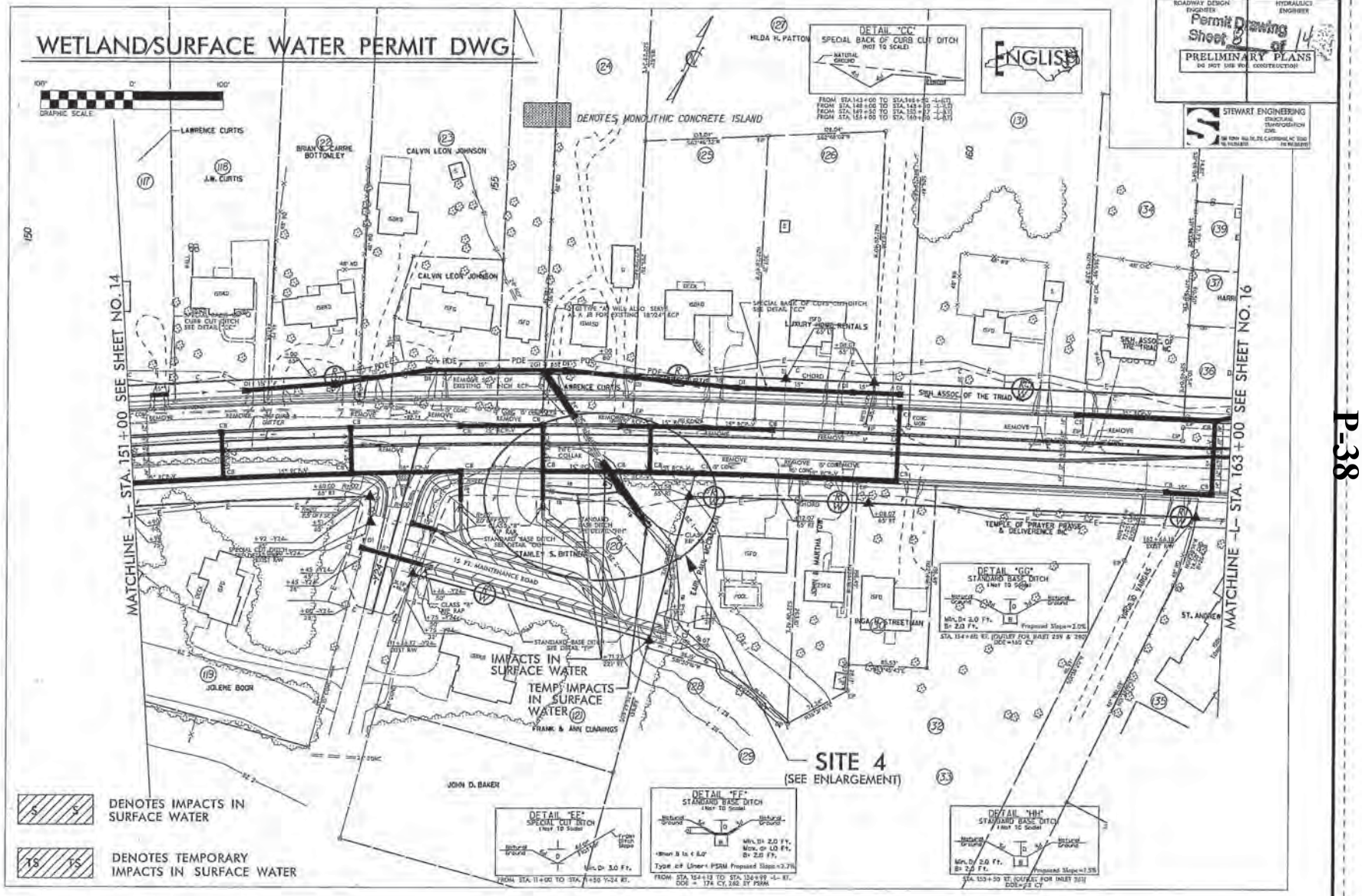
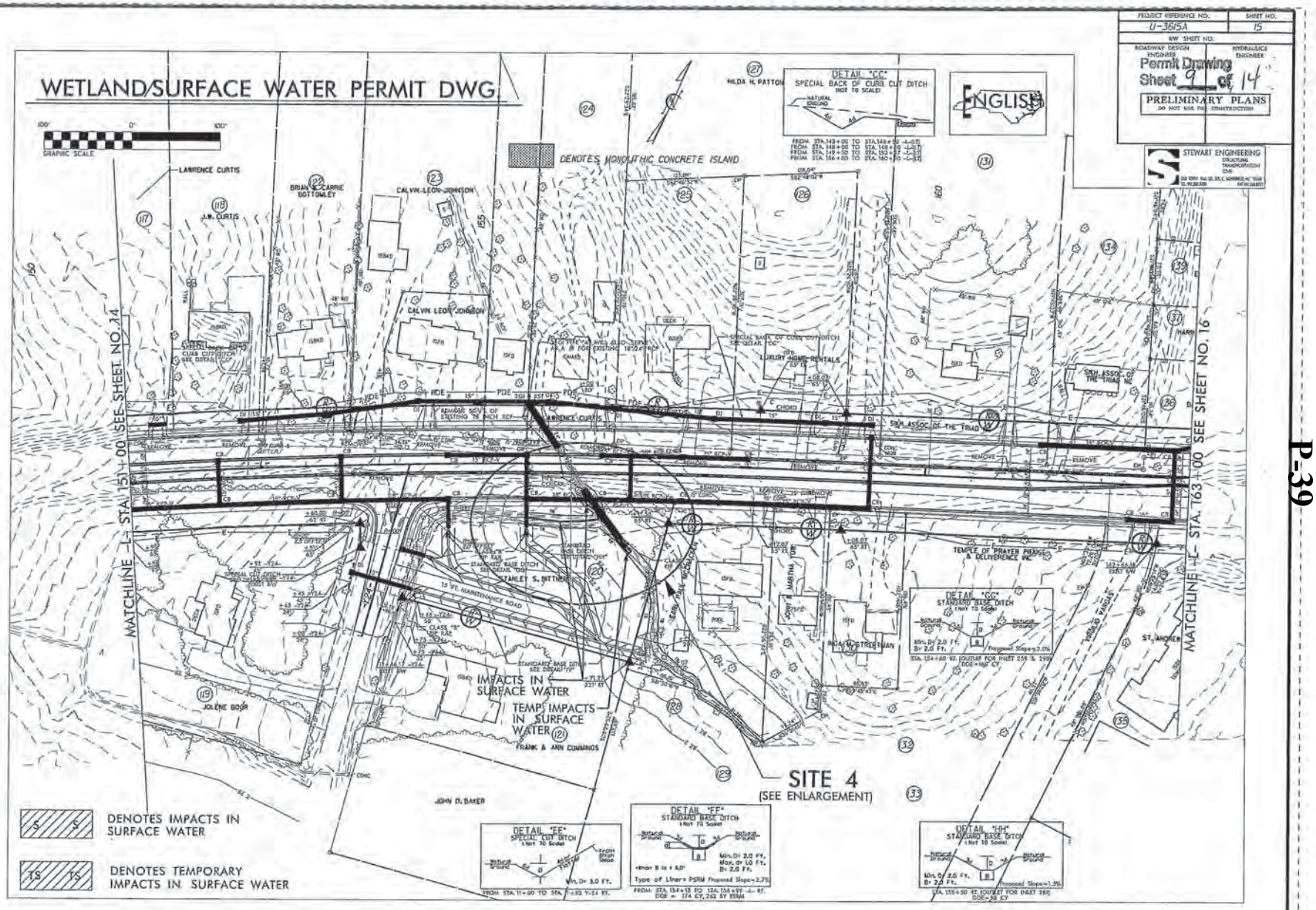
PROJECT REFERENCE NO. U-3615A
SHEET NO. 14
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing Sheet 6 of 14
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
STEWART ENGINEERING
DENOTES MONOLITHIC CONCRETE ISLAND
ENGLISH
GRAPHIC SCALE
SHUGART ENTERPRISES LLC
SHUGART MANAGEMENT INC
CALVIN C. DUNN
BOBBY D. CURTIS
MIRIAM FOSTER KINDLE
RAYMOND WILLIAMS JR. et al
GLORIA FOSTER BASS
LABRENCE CURTIS
MATCHLINE -L- STA. 137+00 SEE SHEET NO. 13
MATCHLINE -L- STA. 151+00 SEE SHEET NO. 15
SITE 3 (SEE ENLARGEMENT)
IMPACTS IN SURFACE WATER
TEMP. IMPACTS IN SURFACE WATER
HERMAN & GWENDOLYN MOORE
GERARD B. ENG
SAMANT PROPERTIES LLC
WILLIAM R. SHAMBURG
HOMER GLENN HALL, III
JOHN K. LINDSAY
WANDA SEAGRAVES CAYLOR
THOMAS C. GALLIMORE
JOHN EDWARDS RACZENSKI
DELORES N. DUREN
JOSEPH M. GRADICA
SAINT JOHN STREET
DETAIL "Y" LATERAL "Y" DITCH (Not To Scale)
DETAIL "CC" SPECIAL BACK OF CURB CUT DITCH (NOT TO SCALE)
DETAIL "BR" STANDARD GRASSED SWALE (Not To Scale)
DETAIL "DD" STANDARD BASE DITCH (Not To Scale)
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
REVISIONS

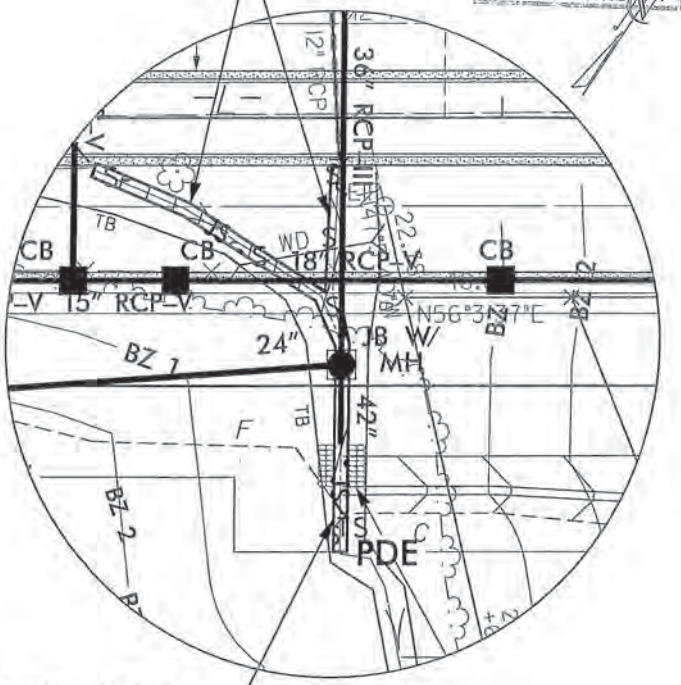

WETLAND/SURFACE WATER PERMIT DWG.
ENGLISH
DENOTES MONOLITHIC CONCRETE ISLAND
PROJECT REFERENCE NO. U-3615A
SHEET NO. 14
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing Sheet 7 of 14
PRELIMINARY PLANS
NO RIGHT OF WAY OR CONSTRUCTION
STEWART ENGINEERING
SHUGART ENTERPRISES LLC
SHUGART MANAGEMENT INC
CALVIN C. QUINN
BOBBY D. CURTIS
MIRIAM FOSTER KINOLE
RAYMOND WILLIAMS JR. et al
GLORIA FOSTER BASS
LAWRENCE CURTIS
MATCHLINE -L- STA. 137+00 SEE SHEET NO. 13
MATCHLINE -L- STA. 151+00 SEE SHEET NO. 15
SITE 3
(SEE ENLARGEMENT)
IMPACTS IN SURFACE WATER
TEMP. IMPACTS IN SURFACE WATER
HERMAN & GRENDOLYN MOORE
GERARD B. ENG
WILLIAM R. SHAWBURG
SAMANT PROPERTIES, LLC
JOHN R. LINDSAY
HONOR D. EVAN HALL, JR.
WANDA SEAGRAVES CAYLOR
JOHN EDWARDS-WACZENSKI
DELORES N. DUREN
JOSEPH M. DRAGOLA
DETAIL "CC"
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)
DETAIL "Y"
LATERAL "Y" DITCH
(Not To Scale)
DETAIL "BB"
STANDARD GRASSED SWALE
(Not To Scale)
DETAIL "DD"
STANDARD BASE DITCH
(Not To Scale)
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

P-37


WETLAND/SURFACE WATER PERMIT DWG.
PROJECT REFERENCE NO. U-3615A
SHEET NO. 15
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing Sheet 8 of 14
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
STEWART ENGINEERING
ENGLISH
GRAPHIC SCALE
DENOTES MONOLITHIC CONCRETE ISLAND
DETAIL "CC" SPECIAL BACK OF CURB CUT DITCH
LAWRENCE CURTIS
J.W. CURTIS
BRIAN & CARRIE BOTTOMLEY
CALVIN LEON JOHNSON
HILDA H. PATTON
LUXURY RENTALS
SBH ASSOC. OF THE TRIAD
TEMPLE OF PRAYER PRAISE & DELIVERENCE INC.
MATCHLINE -L- STA. 151+00 SEE SHEET NO. 14
MATCHLINE -L- STA. 163+00 SEE SHEET NO. 16
STANLEY S. BITTNER
15 FT. MAINTENANCE ROAD
IMPACTS IN SURFACE WATER
TEMP. IMPACTS IN SURFACE WATER
FRANK & ANN CLEMMINGS
JOLENE BOOR
JOHN D. BAKER
INGA M. STREETMAN
ST. ANDREW
SITE 4
(SEE ENLARGEMENT)
DETAIL "GG" STANDARD BASE DITCH
DETAIL "EE" SPECIAL CUT DITCH
DETAIL "FF" STANDARD BASE DITCH
DETAIL "HH" STANDARD BASE DITCH
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER


WETLAND/SURFACE WATER PERMIT DWG.
PROJECT REFERENCE NO.
U-3615A
SHEET NO.
15
Permit Drawing
Sheet 9 of 14
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
STEWART ENGINEERING
ENGLISH
DENOTES MONOLITHIC CONCRETE ISLAND
DETAIL "CC"
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)
LAWRENCE CURTIS
BRIAN & CARRIE BOTTOMLEY
CALVIN LEON JOHNSON
J.W. CURTIS
HILDA H. PATTON
LUXURY HOME RENTALS
SOUL ASSOC. OF THE TRIAD
TEMPLE OF PRAYER PRAISE & DELIVERENCE INC.
ST. ANDREW
MATCHLINE -L- STA. 151+00 SEE SHEET NO. 14
MATCHLINE -L- STA. 163+00 SEE SHEET NO. 16
STANLEY S. BITTNER
15 FT. MAINTENANCE ROAD
IMPACTS IN SURFACE WATER
TEMP. IMPACTS IN SURFACE WATER
FRANK & ANN CUMMINGS
JOLENE BOOR
JOHN D. BAKER
SITE 4
(SEE ENLARGEMENT)
DETAIL "EE"
SPECIAL CUT DITCH
(NOT TO SCALE)
DETAIL "FF"
STANDARD BASE DITCH
(NOT TO SCALE)
DETAIL "GG"
STANDARD BASE DITCH
(NOT TO SCALE)
DETAIL "HH"
STANDARD BASE DITCH
(NOT TO SCALE)
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
REVISIONS

RECEIVED
APR 30 2013
RALEIGH REGULATORY
FIELD OFFICE



SITE 2 ENLARGEMENT

S S DENOTES IMPACTS IN SURFACE WATER

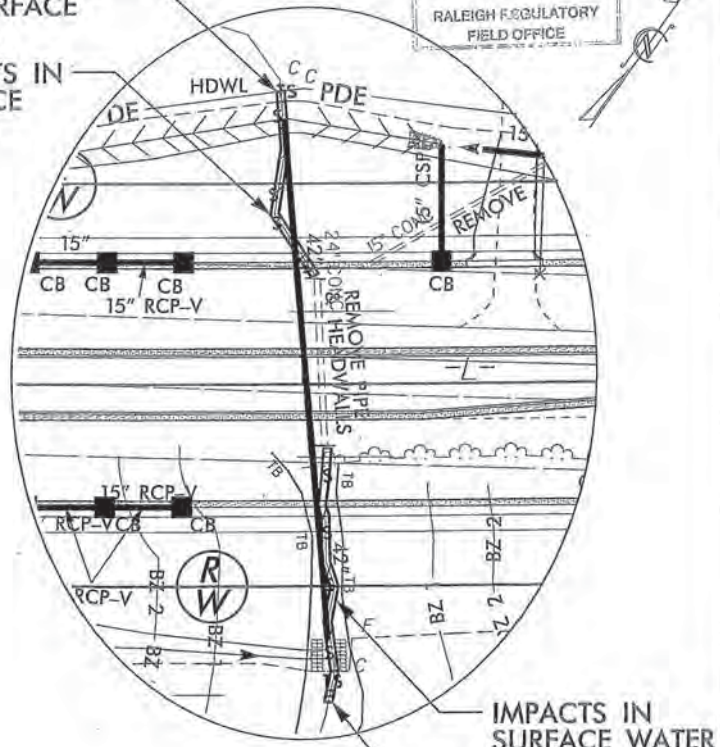
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

30' 0' 30'
GRAPHIC SCALE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 8.2494701 (U-3615A)
SR 1003 (NORTH MAIN STREET)
AND SR 1820 (SKEET CLUB ROAD)
BETWEEN US 311 AND
SR 1818 (JOHNSON STREET)

SHEET 10 OF 14 9/24/12

RECEIVED
APR 30 2013
RALEIGH REGULATORY
FIELD OFFICE



SITE 3 ENLARGEMENT

S S DENOTES IMPACTS IN SURFACE WATER

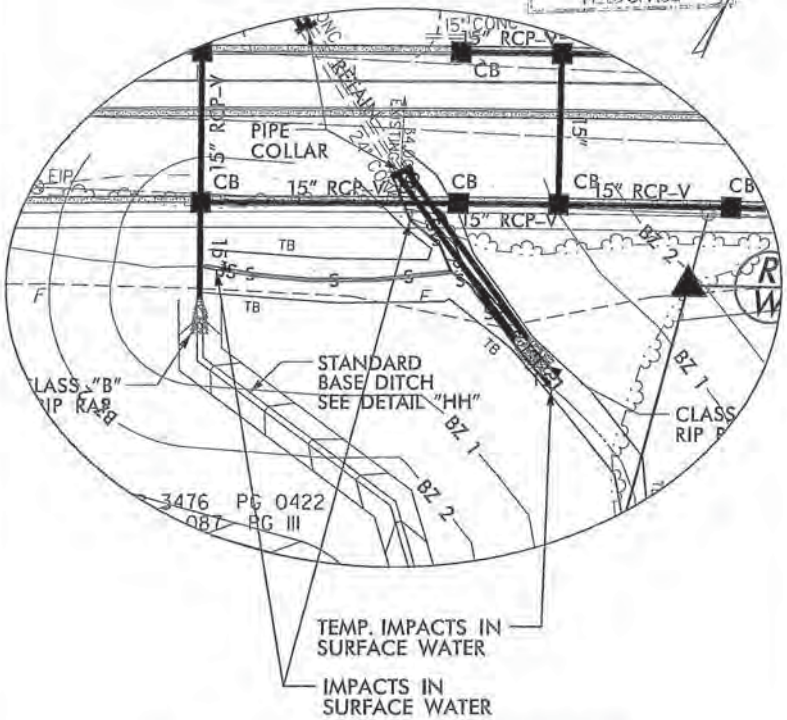
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

40' 0' 40'
GRAPHIC SCALE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 8.2494701 (U-3615A)
SR 1003 (NORTH MAIN STREET)
AND SR 1820 (SKEET CLUB ROAD)
BETWEEN US 311 AND
SR 1818 (JOHNSON STREET)

SHEET 11 OF 14 10/16/01

RECEIVED
APR 30 2013
RALEIGH REGULATORY
FIELD OFFICE



SITE 4 ENLARGEMENT

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

40' 0' 40'
GRAPHIC SCALE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 8.2494701 (U-3615A)
SR 1003 (NORTH MAIN STREET)
AND SR 1820 (SKEET CLUB ROAD)
BETWEEN US 311 AND
SR 1818 (JOHNSON STREET)

SHEET 12 OF 14 9/24/12

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
71	McLarty, George C., Jr.	716 Skeet Club Rd., High Point, NC 27265
99	Einig, Gerard B.	3817 Langdale Dr., High Point, NC 27265
100	Boykin, Judy G.	3311 Hillside Dr., High Point, NC 27265
120	Bittner, Stanley S.	3612 Huntingridge Dr., High Point, NC 27265

WETLAND PERMIT DRAWING

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 8.2494701 (U-3615A)
SR 1003 (NORTH MAIN STREET)
AND SR 1820 (SKEET CLUB ROAD)
BETWEEN US 311 AND
SR 1818 (JOHNSON STREET)

SHEET 13 OF 14 9/24/12

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)
2	-L- STA. 120+50 RT.	36" RCP						0.01	<0.01	148	10	
3	-L- STA. 137+00 LT & RT.	48" RCP						0.01	<0.01	132	13	
4	-L- STA. 156+00 RT.	24" RCP						0.01	<0.01	159	10	
TOTALS:			0.00	0.00	0.00	0.00	0.00	0.03	<0.01	439	33	0.00

ATN Revised 3/31/00

RECEIVED
APR 30 2013
RALEIGH REGULATORY
FIELD OFFICE

N.C.D.O.T.
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 8.2494701 (U-3615A)
SR 1003 (NORTH MAIN STREET)
AND SR 1820 (SKEET CLUB ROAD)
BETWEEN US 311 AND
SR 1818 (JOHNSON STREET)

SHEET 14 OF 14 (9/19/2012)

TIP: U-3615A

CONTRACT:

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols

VICINITY MAP

Not To Scale

R/W PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

LOCATION: SR 1003 (NORTH MAIN STREET) AND SR 1820 (SKEET CLUB ROAD) BETWEEN US 311 AND SR 1818 (JOHNSON STREET).

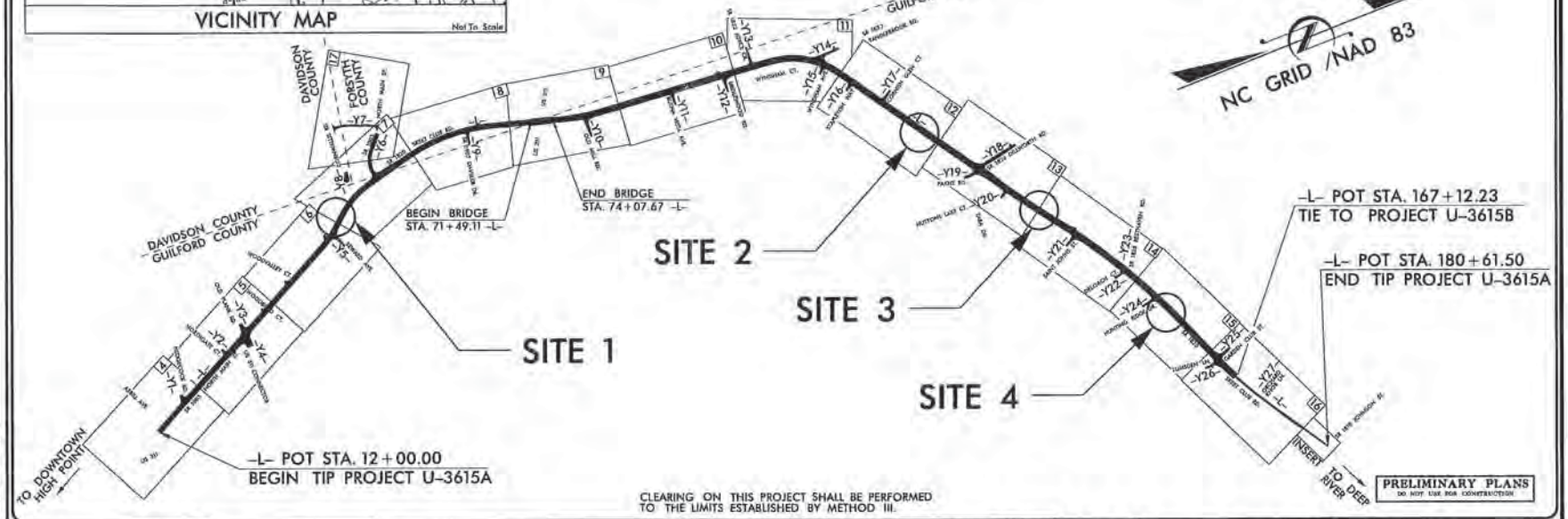
TYPE OF WORK: GRADING, PAVING, DRAINAGE, GUARDRAIL, STRUCTURE, SIGNING AND SIGNALS

BUFFER PERMIT DRAWING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3615A	1	

TIP NO.	F.A. PROJ. NO.	DESCRIPTION
34962.1.1	STP-1820(2)	P.E.
34962.2.2	STP-1820(4)	R/W & UTILITIES

Buffer Drawing Sheet 1 of 9



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

GRAPHIC SCALES

50 25 0 50 100 — PLANS

50 25 0 50 100 — PROFILE (HORIZONTAL)

10 5 0 10 20 — PROFILE (VERTICAL)

DESIGN DATA

ADT 2015 = 18,100
ADT 2035 = 29,800
DHV = 10 %
D = 55 %
T = 3 % *
V = 50 MPH
* TTST 1 % DUAL 2 %
FUNCTIONAL CLASS: MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3615A = 3.144mi.
LENGTH STRUCTURE TIP PROJECT U-3615A = 0.049mi.
TOTAL LENGTH TIP PROJECT U-3615A = 3.193mi.

NCDOT CONTACT: CATHY HOUSER, PE
PROJECT ENGINEER, ROADWAY DESIGN UNIT

Prepared in the Office of: STEWART ENGINEERING, INC.
FOR: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCT 18, 2013

LETTING DATE: OCT 20, 2015

DAVID RUGGLES, PE
PROJECT ENGINEER

DREW BAIRD, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

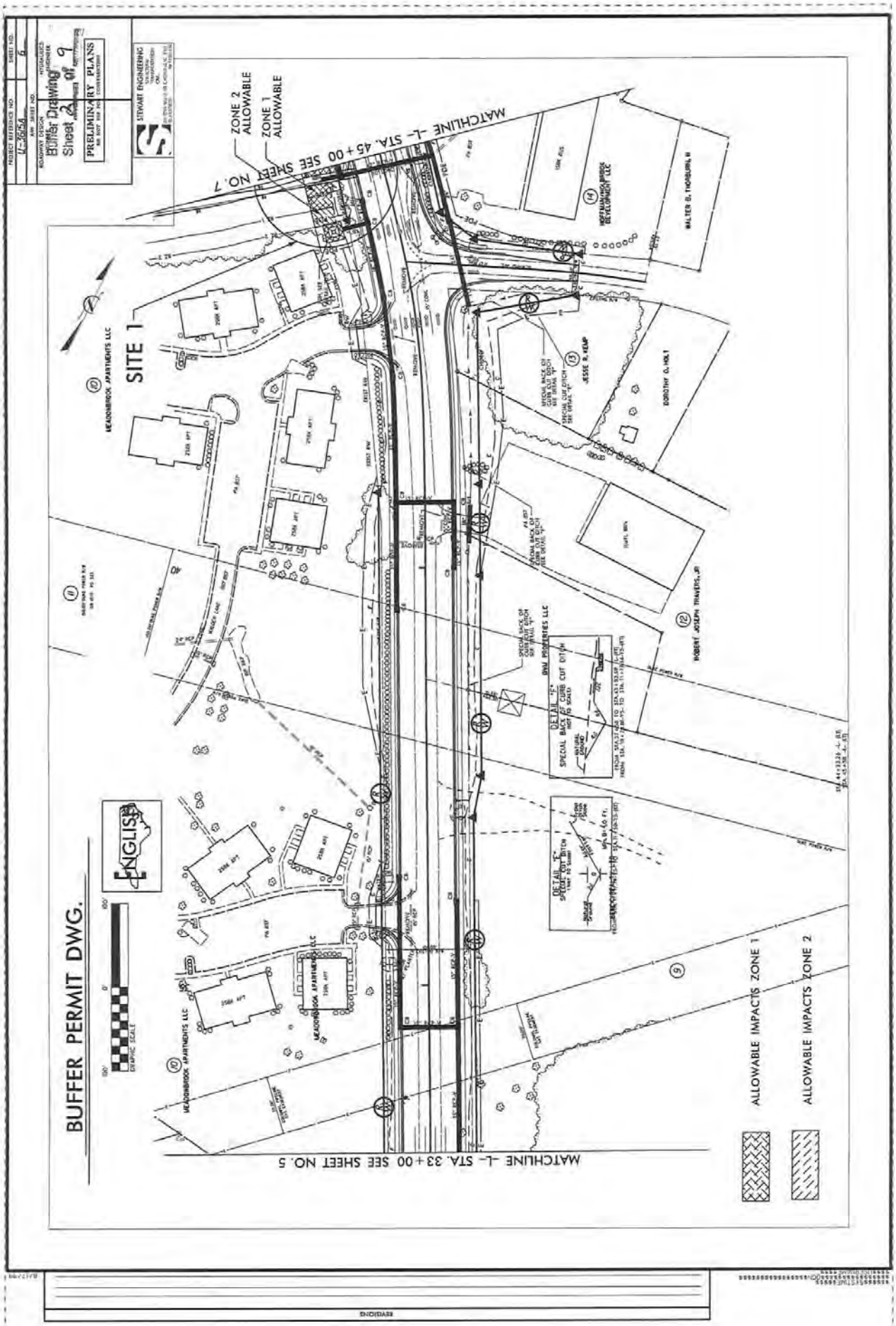
SIGNATURE: P.E.

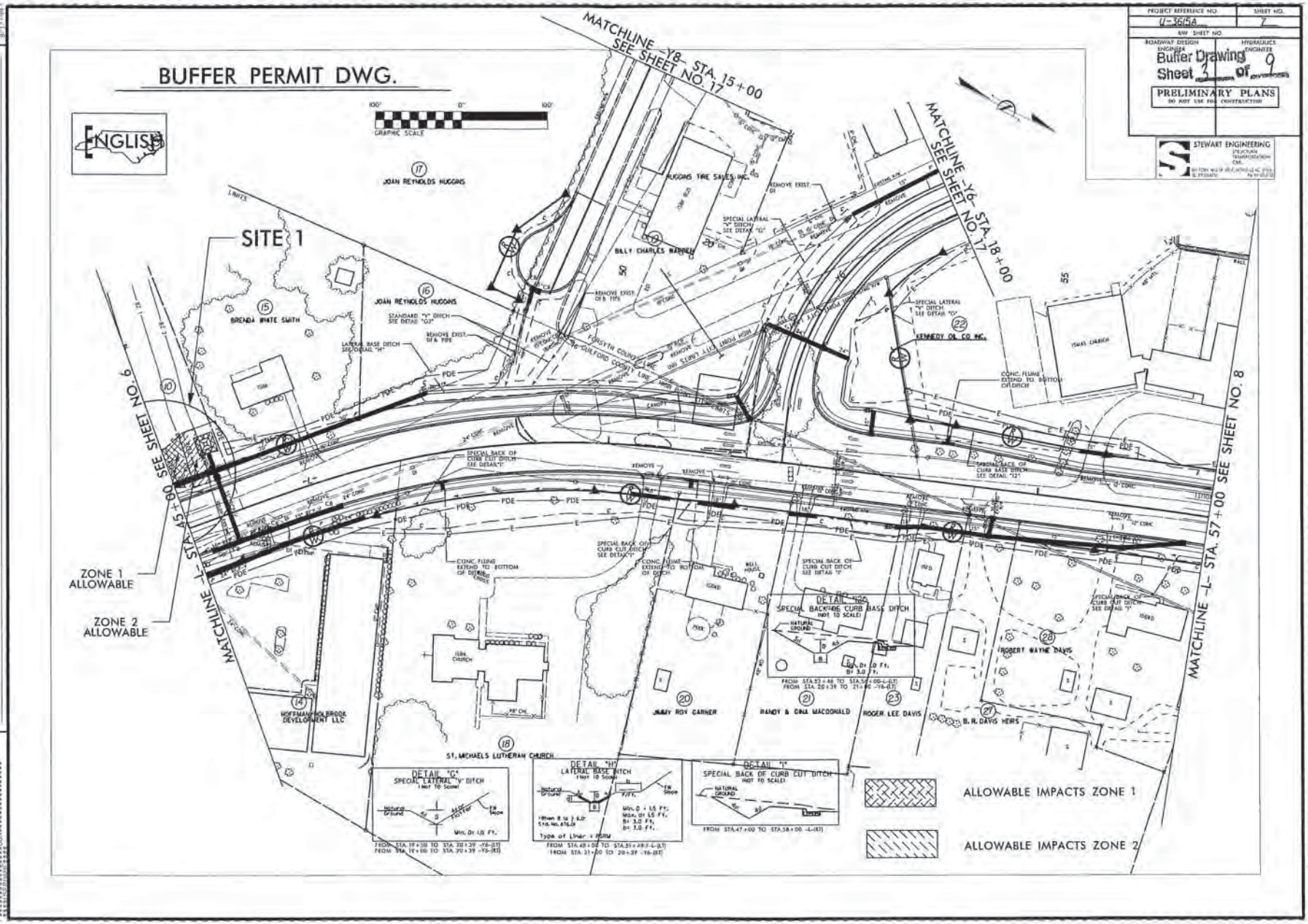
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

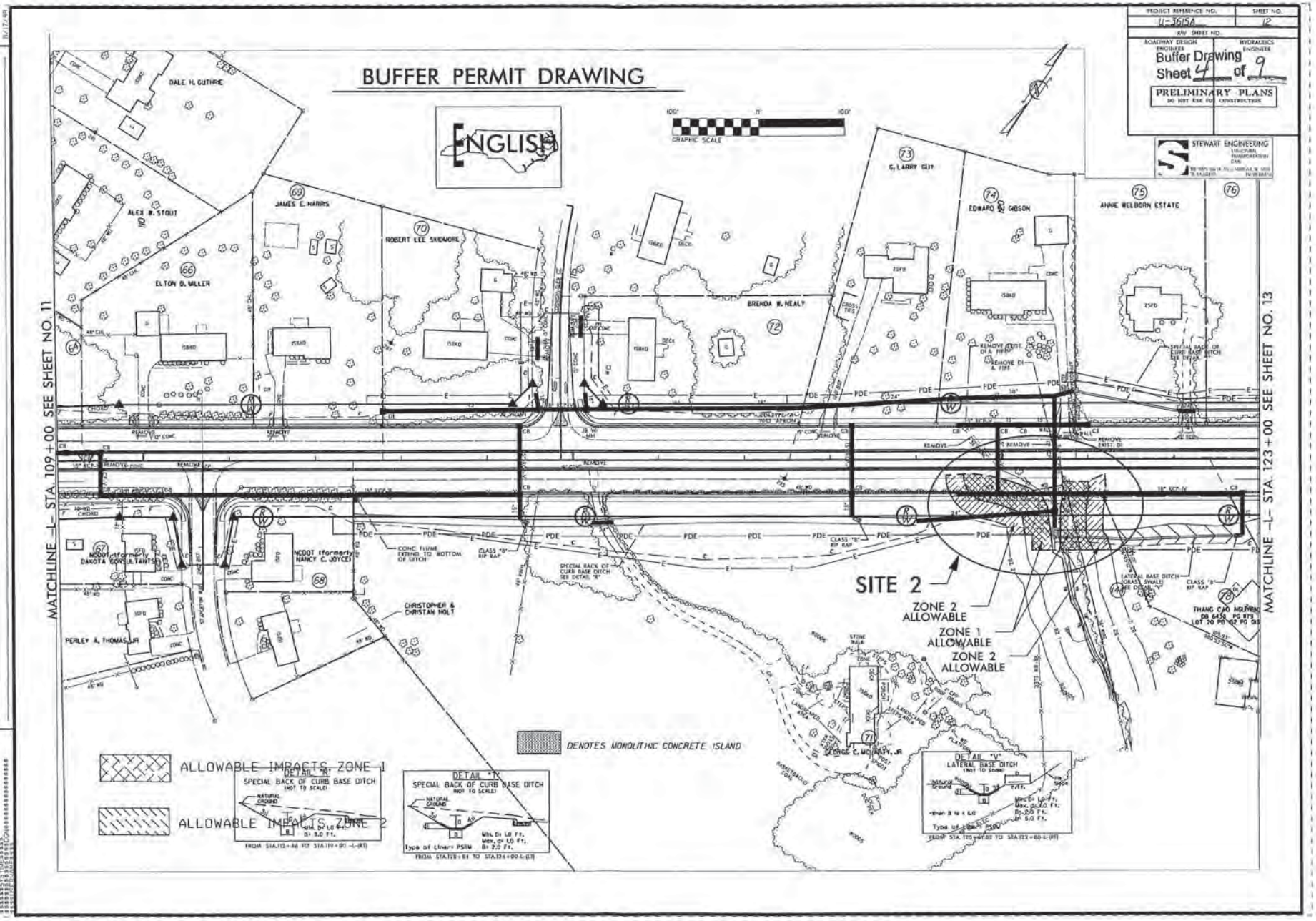
P.E.
STATE DESIGN ENGINEER

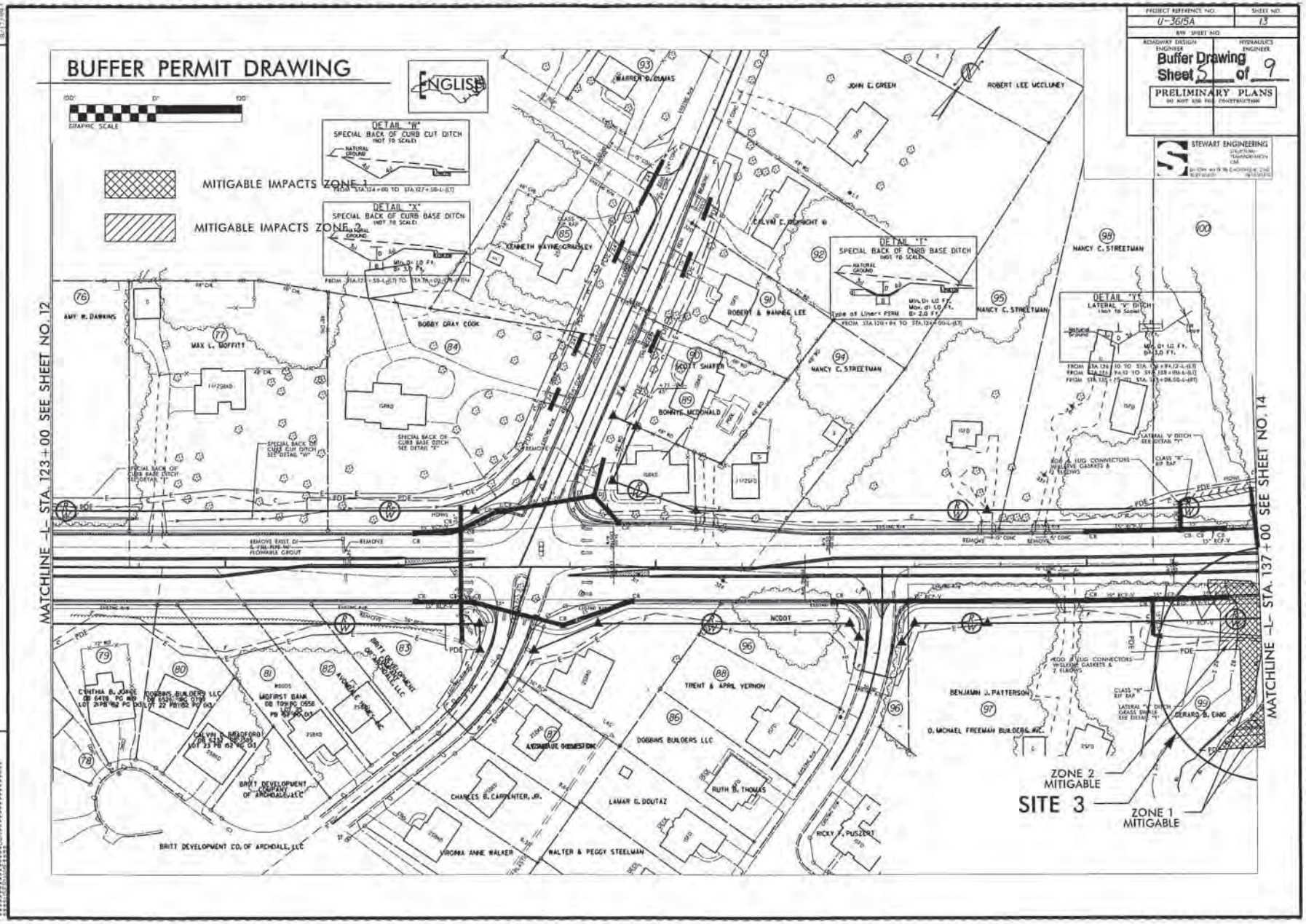
DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

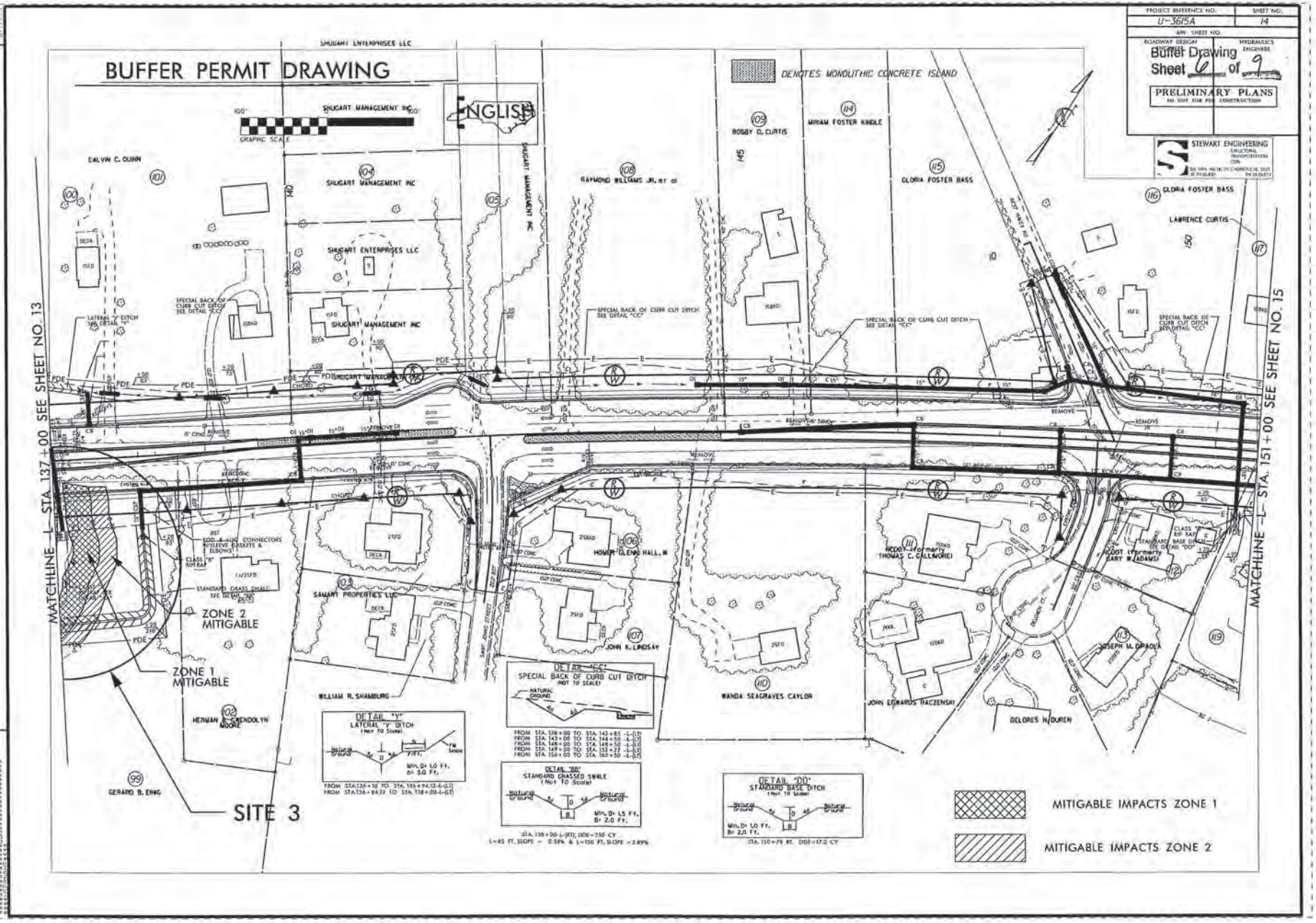
APPROVED
DIVISION ADMINISTRATOR DATE

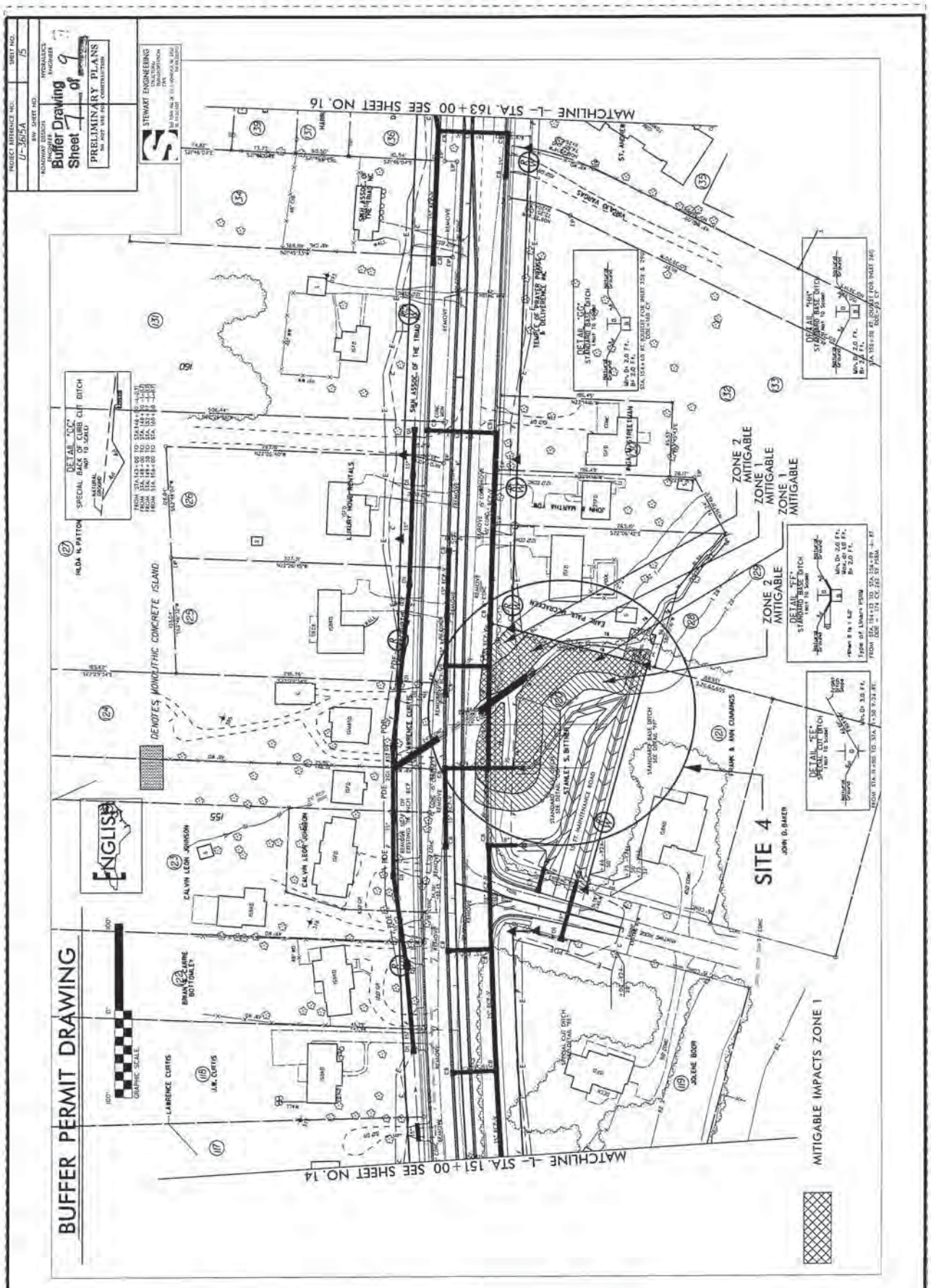

BUFFER PERMIT DWG.
SITE 1
MATCHLINE -L- STA. 33+00 SEE SHEET NO. 5
MATCHLINE -L- STA. 45+00 SEE SHEET NO. 7
ZONE 2 ALLOWABLE
ZONE 1 ALLOWABLE
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
MEADOWBROOK APARTMENTS LLC
HOFFMANN/HOLBROOK DEVELOPMENT LLC
WALTER G. THOMBURN III
JESSE R. KEMP
DOROTHY G. HOLT
ROBERT JOSEPH TRAVERS, JR
BNM PROPERTIES LLC
DETAIL "E" SPECIAL BACK OF CURB CUT DITCH
DETAIL "F" SPECIAL CUT DITCH
ENGLISH
GRAPHIC SCALE
PRELIMINARY PLANS
Buffer Drawing
Sheet 2 of 9
STEWART ENGINEERING


BUFFER PERMIT DWG.
PROJECT REFERENCE NO.
U-3615A
SHEET NO.
7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Buffer Drawing
Sheet 3 of 9
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
STEWART ENGINEERING
ENGLISH
GRAPHIC SCALE
SITE 1
ZONE 1 ALLOWABLE
ZONE 2 ALLOWABLE
MATCHLINE -Y8- STA. 15+00 SEE SHEET NO. 17
MATCHLINE -Y8- STA. 18+00 SEE SHEET NO. 17
MATCHLINE -L- STA. 45+00 SEE SHEET NO. 9
MATCHLINE -L- STA. 57+00 SEE SHEET NO. 8
JOAN REYNOLDS HUGGINS
BRENDA WHITE SMITH
HUGGINS TIRE SALES INC.
BILLY CHARLES WARREN
KENNEDY OIL CO INC.
HOFFMAN HOLBROOK DEVELOPMENT LLC
ST. MICHAELS LUTHERAN CHURCH
JIMMY ROY GARNER
RANDY & DINA MACDONALD
ROGER LEE DAVIS
B. R. DAVIS HEIRS
ROBERT WAYNE DAVIS
DETAIL "G" SPECIAL LATERAL "Y" DITCH
DETAIL "H" LATERAL BASE DITCH
DETAIL "I" SPECIAL BACK OF CURB CUT DITCH
DETAIL "J" SPECIAL BACK OF CURB BASE DITCH
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2


BUFFER PERMIT DRAWING
PROJECT REFERENCE NO. U-3615A
SHEET NO. 12
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Buffer Drawing Sheet 4 of 9
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
STEWART ENGINEERING
GRAPHIC SCALE
MATCHLINE -L- STA. 109+00 SEE SHEET NO. 11
MATCHLINE -L- STA. 123+00 SEE SHEET NO. 13
DALE H. GUTHRIE
ALEX W. STOUT
ELTON D. MILLER
JAMES E. HARRIS
ROBERT LEE SKIDMORE
BRENDA W. HEALY
G. LARRY GUY
EDWARD W. GIBSON
ANNIE WELBORN ESTATE
NCDOT (formerly DAKOTA CONSULTANTS)
NCDOT (formerly NANCY C. JOYCE)
CHRISTOPHER & CHRISTAN HOLT
PERLEY A. THOMAS JR.
GEORGE C. MCNALLY, JR.
THANG CAO NGUYEN
SITE 2
ZONE 2 ALLOWABLE
ZONE 1 ALLOWABLE
ZONE 2 ALLOWABLE
DENOTES MONOLITHIC CONCRETE ISLAND
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
DETAIL "A" SPECIAL BACK OF CURB BASE DITCH (NOT TO SCALE)
DETAIL "Y" SPECIAL BACK OF CURB BASE DITCH (NOT TO SCALE)
DETAIL "V" LATERAL BASE DITCH (Not To Scale)
CONC FLUME EXTEND TO BOTTOM OF DITCH
CLASS "B" RIP RAP
SPECIAL BACK OF CURB BASE DITCH SEE DETAIL "B"
LATERAL BASE DITCH GRASS SWALE SEE DETAIL "Y"
REMOVE EXIST. DI & PIPE
REMOVE EXIST. DI
REMOVE
REVISIONS


BUFFER PERMIT DRAWING
ENGLISH
GRAPHIC SCALE
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
DETAIL "W"
SPECIAL BACK OF CURB CUT DITCH
DETAIL "X"
SPECIAL BACK OF CURB BASE DITCH
DETAIL "Y"
SPECIAL BACK OF CURB BASE DITCH
DETAIL "Y1"
LATERAL "V" DITCH
PROJECT REFERENCE NO.
U-3615A
SHEET NO.
13
Buffer Drawing
Sheet 5 of 9
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
STEWART ENGINEERING
MATCHLINE -L- STA. 123+00 SEE SHEET NO. 12
MATCHLINE -L- STA. 137+00 SEE SHEET NO. 14
ZONE 2 MITIGABLE
SITE 3
ZONE 1 MITIGABLE
NCDOT
WARREN D. DUMAS
JOHN E. GREEN
ROBERT LEE MCCLUNEY
KENNETH WAYNE CRAWLEY
CALVIN C. WRIGHT
ROBERT & WANNEE LEE
NANCY C. STREETMAN
AMY W. DAWKINS
MAX L. MOFFITT
BOBBY GRAY COOK
SCOTT SHAFER
BONNIE MCDONALD
CYNTHIA B. JONES
DOBBINS BUILDERS LLC
WOFIRST BANK
CALVIN D. BRADFORD
BRITT DEVELOPMENT COMPANY OF ARCHDALE, LLC
BRITT DEVELOPMENT CO. OF ARCHDALE, LLC
CHARLES B. CARPENTER, JR.
LAMAR G. DOUTAZ
RUTH B. THOMAS
TRENT & APRIL VERNON
BENJAMIN J. PATTERSON
O. MICHAEL FREEMAN BUILDERS, INC.
GERARD B. ENG
RICKY F. PUSZERT
WALTER & PEGGY STEELMAN
VIRGINIA ANNE WALKER


BUFFER PERMIT DRAWING
ENGLISH
GRAPHIC SCALE
DENOTES MONOLITHIC CONCRETE ISLAND
PROJECT REFERENCE NO. U-3615A
SHEET NO. 14
Buffer Drawing Sheet 6 of 9
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
STEWART ENGINEERING
MATCHLINE -L- STA. 137+00 SEE SHEET NO. 13
MATCHLINE -L- STA. 151+00 SEE SHEET NO. 15
SHUGART MANAGEMENT INC
SHUGART ENTERPRISES LLC
CALVIN C. QUINN
RAYMOND WILLIAMS JR. et al
BOBBY D. CURTIS
MIRIAM FOSTER KINDLE
GLORIA FOSTER BASS
LAWRENCE CURTIS
SAMANI PROPERTIES LLC
HOWER D. ENG HALL, III
JOHN K. LINDSAY
WANDA SEAGRAVES CAYLOR
JOHN EDWARDS RACZENSKI
DELORES H. DUREN
JOSEPH M. GRADOLA
WILLIAM R. SHAMBURG
HERMAN & GWENDOLYN MOORE
GERARD B. ENG
ZONE 2 MITIGABLE
ZONE 1 MITIGABLE
SITE 3
DETAIL "Y" LATERAL "Y" DITCH (Not To Scale)
DETAIL "CC" SPECIAL BACK OF CURB CUT DITCH (NOT TO SCALE)
DETAIL "BB" STANDARD GRASSED SWALE (Not To Scale)
DETAIL "DD" STANDARD BASE DITCH (Not To Scale)
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2


PROJECT REFERENCE NO.
U-3615A
SHEET NO.
15
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Buffer Drawing
Sheet 7 of 9
PRELIMINARY PLANS
NO RIGHT OF WAY OR CONSTRUCTION
STEWART ENGINEERING
BUFFER PERMIT DRAWING
ENGLISH
GRAPHIC SCALE
MATCHLINE -L- STA. 163+00 SEE SHEET NO. 16
MATCHLINE -L- STA. 151+00 SEE SHEET NO. 14
DENOTES MONOLITHIC CONCRETE ISLAND
SPECIAL BACK OF CURB CUT DITCH
DETAIL "CC" STANDARD BASE DITCH
DETAIL "DD" STANDARD BASE DITCH
DETAIL "EE" STANDARD BASE DITCH
DETAIL "FF" SPECIAL CUT DITCH
ZONE 2 MITIGABLE
ZONE 1 MITIGABLE
ZONE 1 MITIGABLE
ZONE 2 MITIGABLE
SITE 4
MITIGABLE IMPACTS ZONE 1
CALVIN LEON JOHNSON
LAWRENCE CURTIS
BRIAN LAURIE BOTTOMLEY
J.W. CURTIS
JOLENE BOOR
JOHN D. BAKER
FRANK & ANN CLAMMES
STANLEY S. BITTNER
HILDA N. PATTON
LUXURY MOBILE RENTALS
JOHN & MARTHA FOX
REV. W. STRETTMAN
SALV. ASSOC. OF THE TRIAD
TEMPLE OF PRAYER PENTECOSTAL
ST. ANDREW
155
150

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
10	Meadowbrook Apt.'s LLC	338 N Elm St., Ste 108, Greensboro, NC 27401
71	McLarty, George C. Jr.	716 Skeet Club Rd., High Point, NC 27265
78	Nguyen, Thang Cao	587 Camden Park Ct., High Point, NC 27265
99	Einig, Gerard B.	3817 Langdale Dr., High Point, NC 27265
120	Bittner, Stanley S.	3612 Huntingridge Dr., High Point, NC 27265
128	McCracken, Earl Paul	920 Skeet Club Rd., High Point, NC 27265
144	Britt Development Co of Archdale LLC	PO Box 4587, High Point, NC 27263

BUFFER PERMIT DRAWING

NCDOT

DIVISION OF HIGHWAYS

GUILFORD COUNTY

PROJECT: 8.2494701 (U-3615A)

SR 1003 (NORTH MAIN STREET)

AND SR 1820 (SKEET CLUB ROAD)

BETWEEN US 311 AND

SR 1818 (JOHNSON STREET)

SHEET 8 OF 9 9/24/12

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	48" RCP	-L- STA. 45+00 LT.	X			2370	1792	4162					
2	42" RCP	-L- STA. 120+50 RT.	X			6278	3988	10266					
3	42" RCP	-L- STA. 137+00 RT.	X						10201	5639	15840		
4	2 @ 24" RCP	-L- STA. 156+00 RT.	X						7174	3536	10710		
4	2 @ 24" RCP	-L- STA. 156+00 RT.			X				5898	3605	9503		
TOTAL:						8648	5780	14428	23273	12780	36053		

N.C.D.O.T.
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 8.2494701 (U-3615A)
SR 1003 (NORTH MAIN STREET)
AND SR 1820 (SKEET CLUB ROAD)
BETWEEN US 311 AND
SR 1818 (JOHNSON STREET)

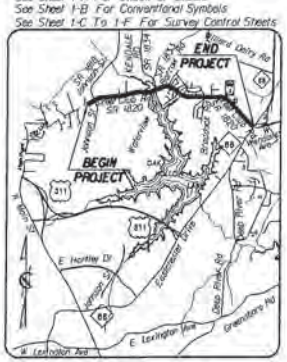
SHEET 9 OF 9 (9/19/2012)

Rev. May 2006

TIP PROJECT: U-3615B

CONTRACT: C203256

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols
See Sheet 1-C To 1-F For Survey Control Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3615B	1	

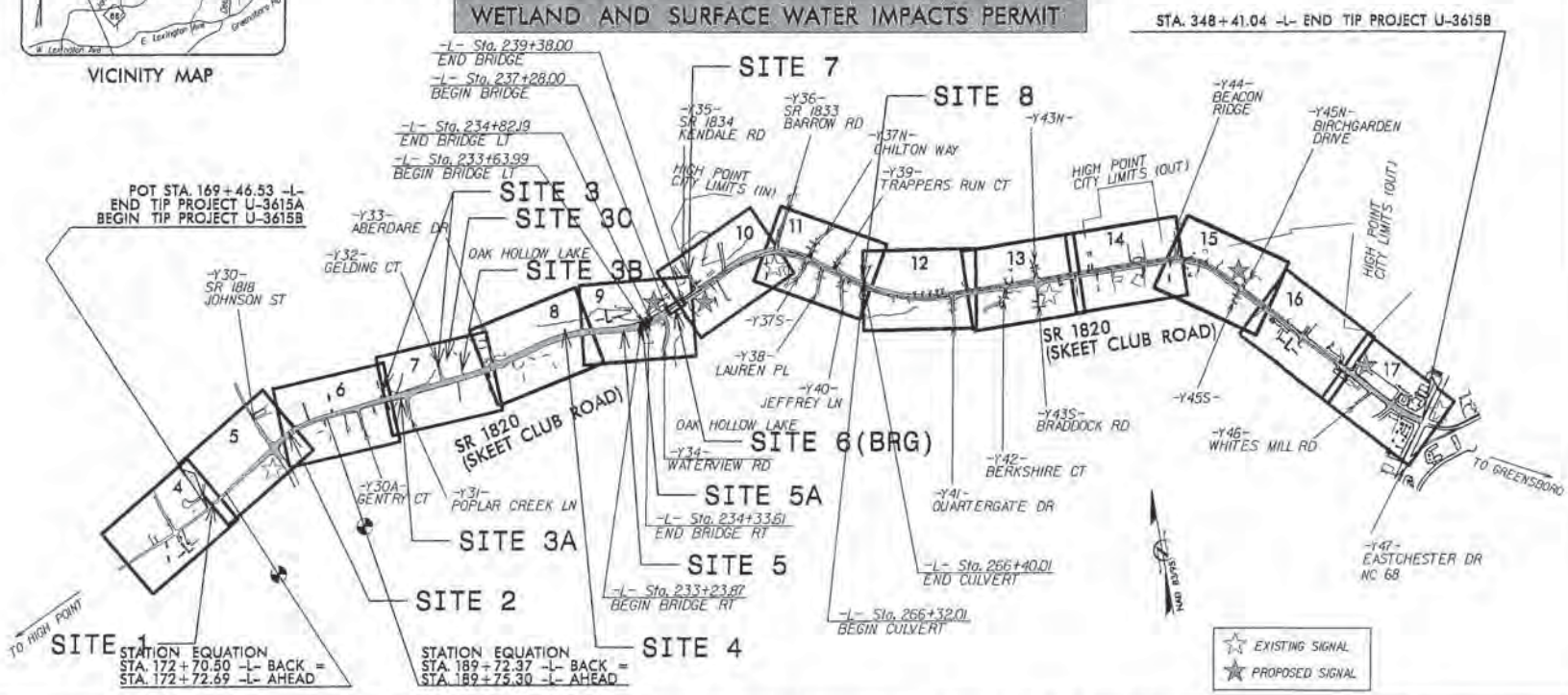
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34962.1.1	STP-1820(2)	P.E.
34962.2.3	STP-1820(5)	RW, UTL
34962.3.FD1	STP-1820(5)	CONST.

Permit Drawing
Sheet 1 of 27
Revised 10/28/14

LOCATION: HIGH POINT - SR 1820 (SKEET CLUB ROAD) FROM EAST OF SR 1818 (JOHNSON STREET) TO WEST OF NC 68 (EASTCHESTER DRIVE).

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, STRUCTURES, CULVERT, RETAINING WALLS

WETLAND AND SURFACE WATER IMPACTS PERMIT



GRAPHIC SCALES

50 25 0 50 100 — PLANS

50 25 0 50 100 — PROFILE (HORIZONTAL)

10 5 0 10 20 — PROFILE (VERTICAL)

DESIGN DATA

ADT 2015 = 24540
ADT 2035 = 34700
K = 10 %
D = 60 %
T = 5 % *
V = 50 MPH
* (TTST =2%+ DUAL 3%)
FUNC CLASS =
URBAN MINOR ARTERIAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3615B = 3.326 MI
LENGTH STRUCTURE TIP PROJECT U-3615B = 0.062 MI
TOTAL LENGTH OF TIP PROJECT U-3615B = 3.388 MI

WETHERILL ENGINEERING

Prepared for the North Carolina Department of Transportation in the Office of:
[illegible]

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 27, 2009

LETTING DATE: JANUARY 20, 2015

NCDOT CONTACT:

EDWARD G. WETHERILL, PE — PROJECT ENGINEER

GREG S. PURVIS, PE — PROJECT DESIGN ENGINEER

BRENDA L. MOORE, PE — ROADWAY DESIGN ENGINEERING COORDINATION SECTION PROJECT ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 012575 ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022999 ENGINEER

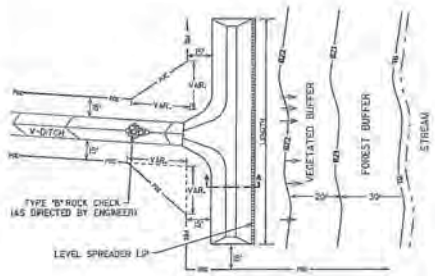
SIGNATURE: P.E.

U-3615B	2-2

Permit Drawing
Sheet 2 of 27

LEVEL SPREADER

(NOT TO SCALE)

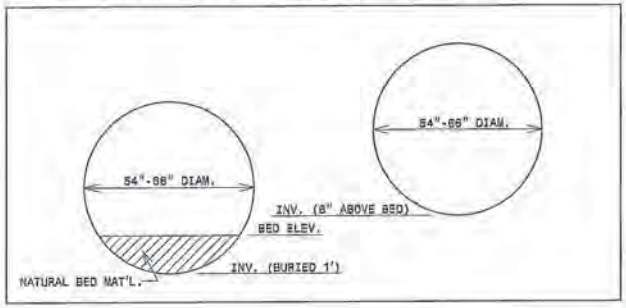


DIMENSIONS

BASIN NO.	PROJECT STATION (-L-)	LENGTH	DEPTH	LIP ELEV. (APPROX.)
2	202+00 (LT)	70'	2'	822.5
3	222+00 (LT)	65'	2'	809.0
5	242+00 (RT)	50'	2'	807.5
6	267+00 (LT)	75'	2'	813.0
7	272+00 (RT)	120'	2'	820.0

CONCRETE ENDWALL FOR DOUBLE PIPE CULVERTS

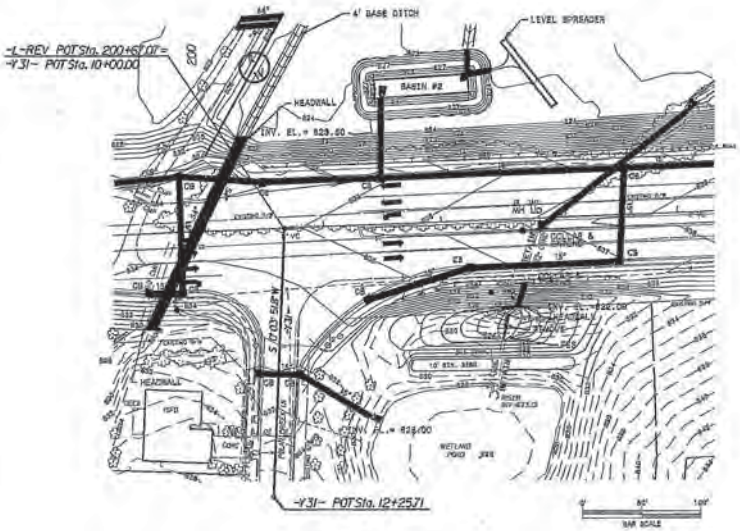
SEE NCDOT STANDARD DRAWINGS 838.22, 838.28 & 838.34 FOR STRUCTURAL DETAILS.



(NOT TO SCALE)

GRADING PLAN AT OUTLET OF WETLAND POND

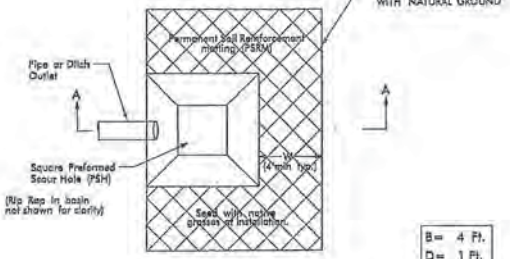
-L- STA. 202+50+/- (RT.)



PREFORMED SCOUR HOLE

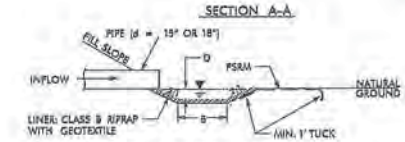
*NOT TO SCALE

PLAN VIEW



B= 4 Ft.
D= 1 Ft.
W= 4 Ft.

SECTION A-A



LOCATIONS: -Y30- STA. 17+95 (LT.)
-L- STA. 178+40 (LT.)
-Y34- STA. 11+34 (LT.)
-L- STA. 242+81 (RT.)
-Y35- STA. 13+15 (LT.)

DESIGN SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

DETAILS

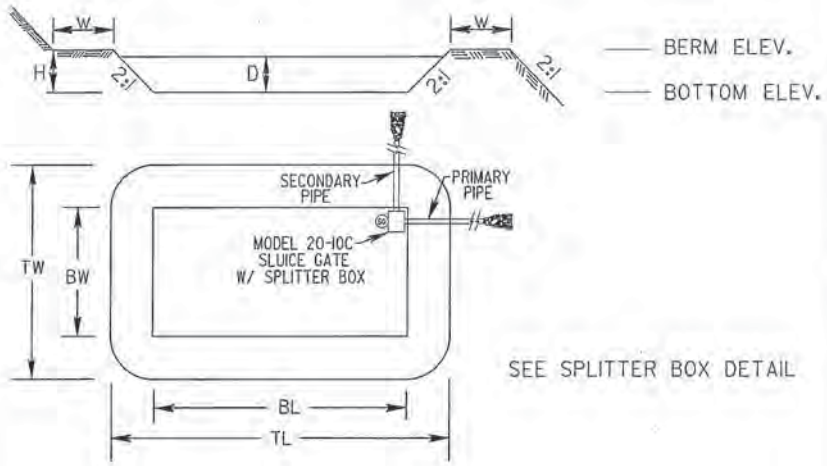
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

P-53

U-3615B	2-F

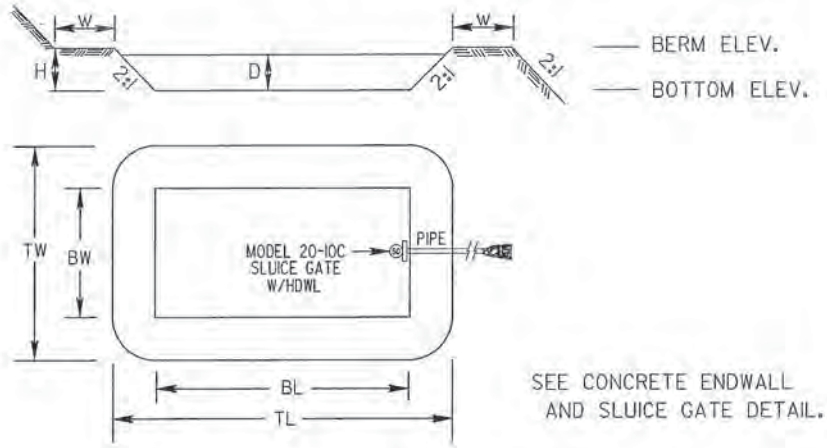
Permit Drawing
Sheet 3 of 27

DETAIL A
HAZARDOUS SPILL RETENTION BASIN
(WITH SLUICE GATE AND SPLITTER BOX)



SEE SPLITTER BOX DETAIL

DETAIL B
HAZARDOUS SPILL RETENTION BASIN
(WITH SLUICE GATE AND HEADWALL)



SEE CONCRETE ENDWALL AND SLUICE GATE DETAIL.

DIMENSIONS

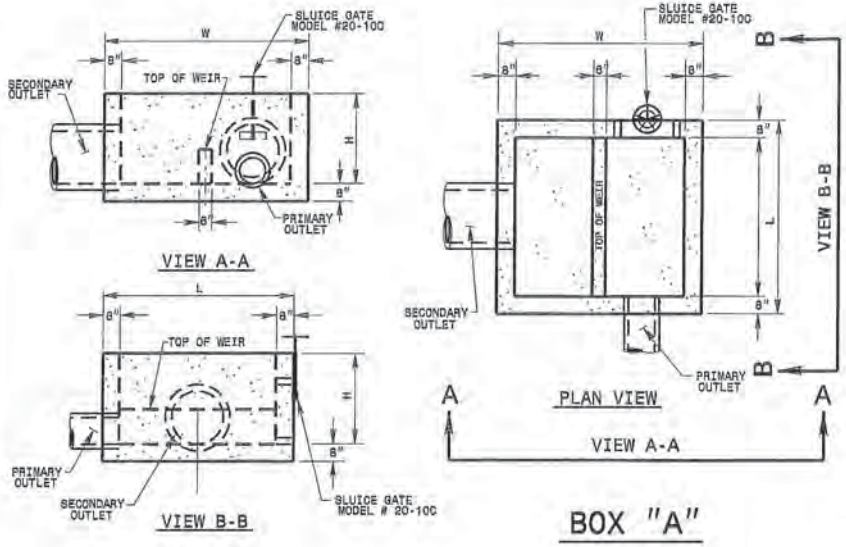
BASIN NO.	PROJECT STATION (-L-)	DETAIL	CAPACITY REQUIRED (c.f.)	CAPACITY PROVIDED (c.f.)	DEPTH (D)	HEIGHT (H)	BERM WIDTH (W)	BOTTOM LENGTH (BL)	BOTTOM WIDTH (BW)	TOP LENGTH (TL)	TOP WIDTH (TW)	BOTTOM ELEV.	BERM ELEV.
1	183+00 (RT)	B	5120	7650	8.0'	4.5'	5'	80'	20'	131'	69'	836.96	844.96
2	202+00 (LT)	A	6560	8700	3.5'	4.5'	5'	80'	15'	96'	33'	823.5	828.0
3	222+00 (LT)	A	7240	7320	3.5'	4.5'	5'	66'	15'	106'	33'	810.0	814.5
4	234+50 (RT)	B	4000	4120	3.5'	4.5'	5'	40'	18'	58'	36'	814.5	819.0
5	242+00 (RT)	A	6910	7350	3.0'	4.0'	5'	70'	35'	82'	47'	808.5	812.5
6	267+00 (LT)	A	6500	6590	3.5'	4.5'	5'	50'	25'	88'	44'	814.9	819.4
7	272+00 (RT)	A	8060	8070	3.5'	4.5'	5'	85'	25'	83'	43'	825.5	830.0
8	306+00 (RT)	B	6530	6620	3.5'	4.5'	5'	52'	25'	70'	43'	861.0	865.5
9	314+50 (RT)	B	3350	3390	3.5'	4.5'	5'	35'	18'	53'	34'	863.5	868.0
10	191+50 (LT)	B	2293	2300	2.3'	3.0'	5'	100'	10'	121'	29'	832.0	835.0

DESIGN SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

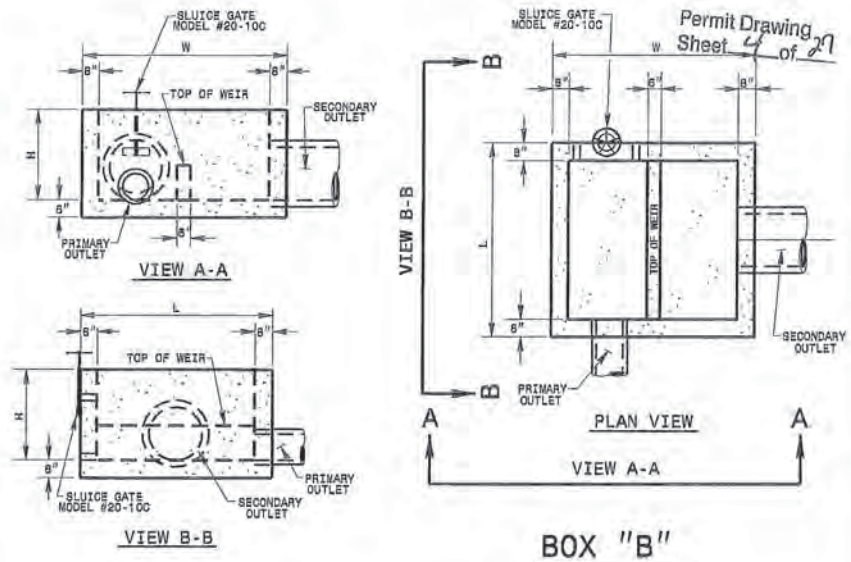
HAZARDOUS SPILL RETENTION BASIN DETAILS

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

Permit Drawing Sheet 4 of 27



BOX "A"



BOX "B"

DIMENSIONS

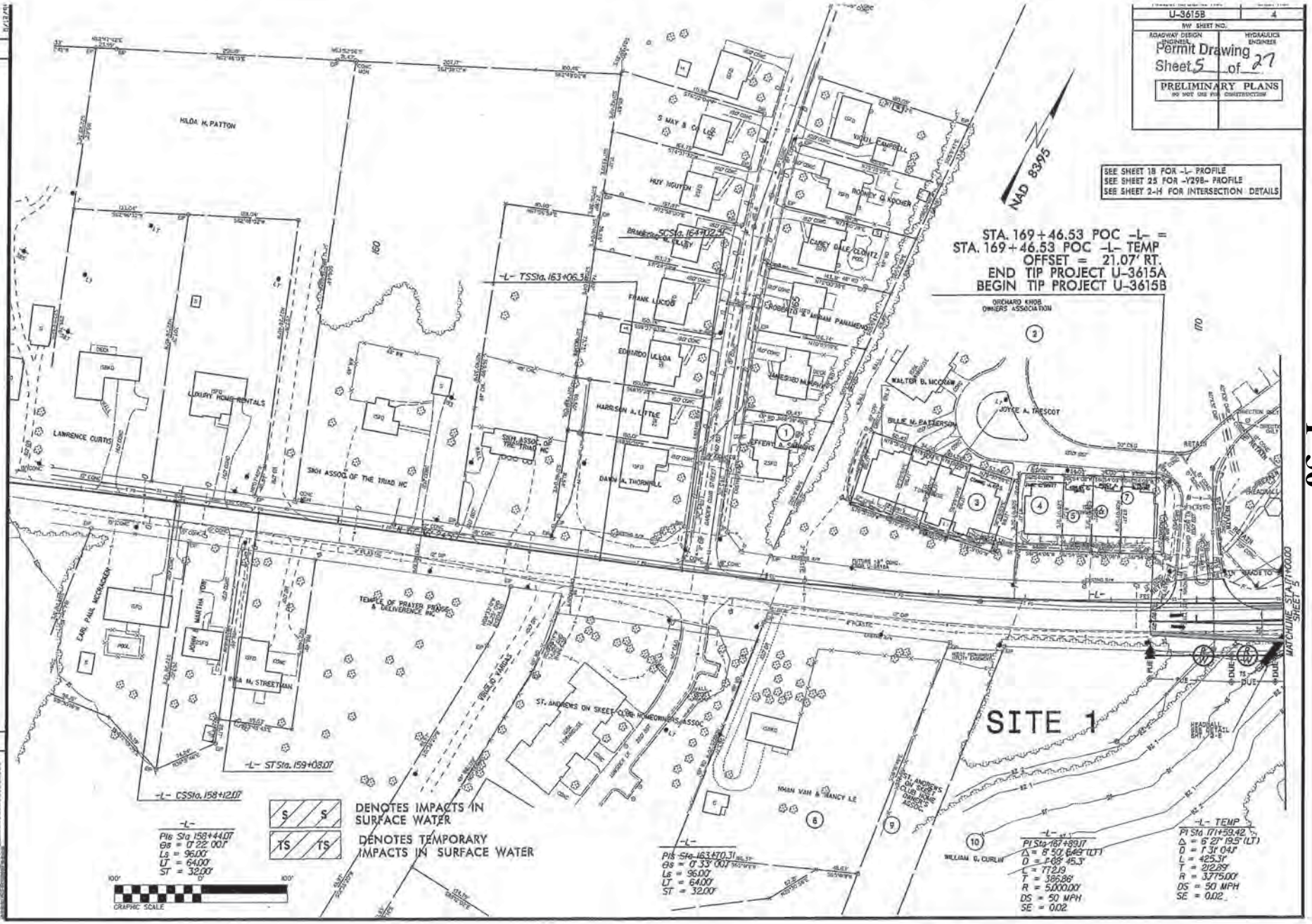
BASIN NO.	PROJECT STATION	BOX DETAIL	PRIMARY OUTLET	SECONDARY OUTLET	INLET DIAMETER	SLUICE GATE DIAMETER	WEIR WIDTH	WEIR HEIGHT	WEIR LENGTH	H	W	L
2	202+00 (LT)	B	12"	24"	24"	32"	0.5'	1.5'	6.0' min.	3.5'	8.0'	7.5'
3	222+00 (LT)	B	12"	30"	24"	32"	0.5'	1.5'	6.0' min.	3.5'	8.0'	7.5'
5	242+00 (RT)	A	12"	18"	24"	32"	0.5'	1.7'	6.0' min.	3.0'	7.5'	7.5'
6	267+00 (LT)	B	12"	24"	24"	32"	0.5'	1.5'	6.0' min.	3.5'	8.0'	7.5'
7	272+00 (RT)	B	15"	24"	30"	36¾"	0.5'	1.4'	6.0' min.	3.5'	9.0'	7.5'

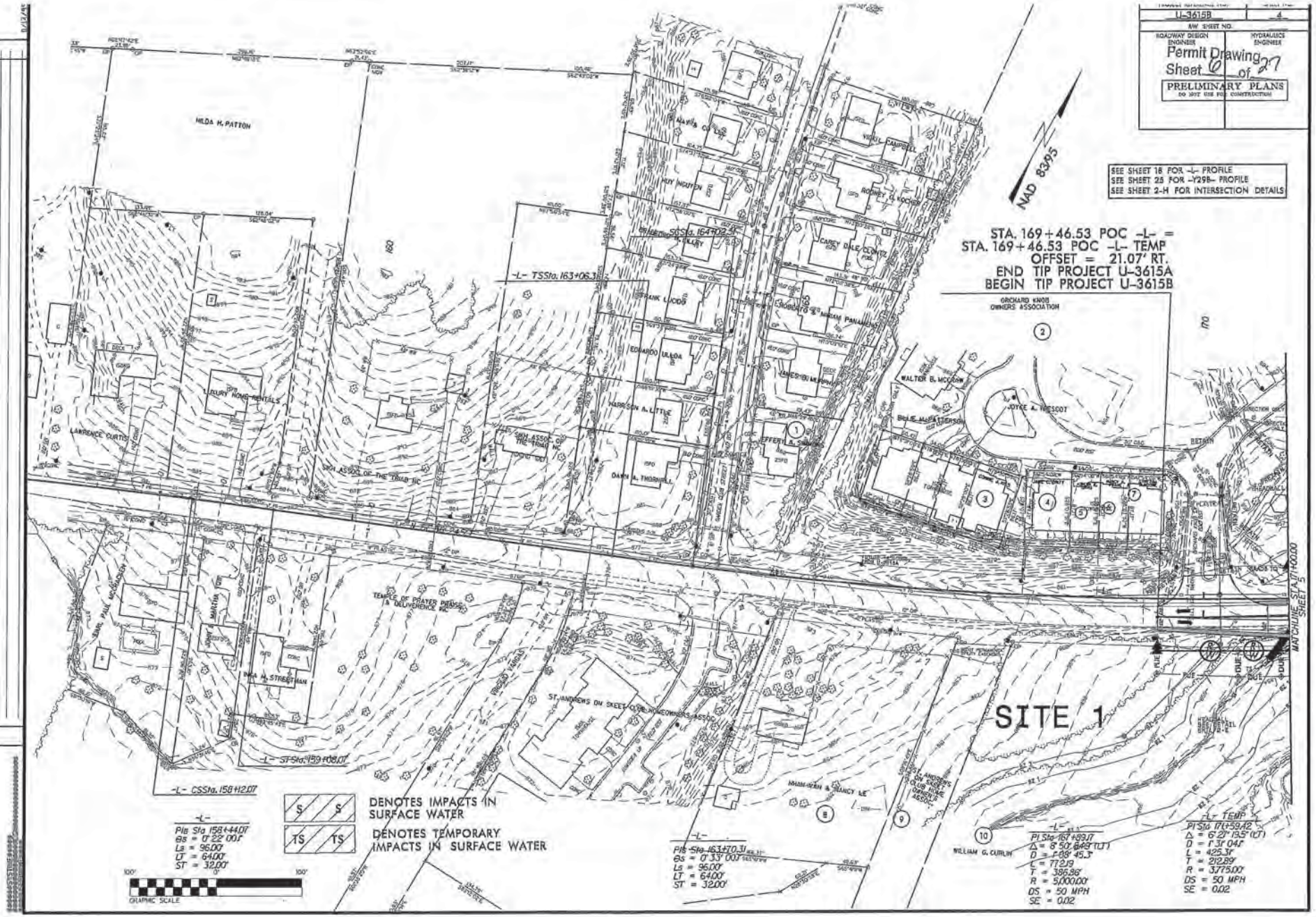
NOTE: HEIGHT OF BOX LISTED IS INSIDE DIMENSION. LENGTH AND WIDTH ARE OUTSIDE DIMENSIONS.
BASE ELEVATION OF SPLITTER BOX EQUALS BOTTOM ELEVATION OF HAZARDOUS SPILL RETENTION BASIN (SEE DETAIL 2-F).

DESIGN SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SPLITTER BOX DETAILS

ORIGINAL BY: DATE:
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:


U-3615B
4
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing
Sheet 5 of 27
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SEE SHEET 1B FOR -L- PROFILE
SEE SHEET 2S FOR -Y298- PROFILE
SEE SHEET 2-H FOR INTERSECTION DETAILS
NAD 83/95
STA. 169+46.53 POC -L- =
STA. 169+46.53 POC -L- TEMP
OFFSET = 21.07' RT.
END TIP PROJECT U-3615A
BEGIN TIP PROJECT U-3615B
ORCHARD KNOB OWNERS ASSOCIATION
HILDA H. PATTON
LUXURY HOME RENTALS
LAWRENCE CURTIS
SNH ASSOC. OF THE TRIAD HC
SNH ASSOC. THE TRIAD
HUY NGUYEN
FRANK LUCAS
EDWARDO ULLOA
HARRISON A. LITTLE
DAWN A. THORNHILL
EFFENY A. SAMUDIS
RODNEY G. KOCHER
CAREY DALE CLONTZ
WALTER B. MCCRAW
BILLIE M. PATTERSON
JOYCE A. TRESCOT
EARL PAUL MCCRACKEN
MARTHA FOX
ELSIE M. STREETMAN
TEMPLE OF PRAYER PRAISE & DELIVERENCE INC.
ST. ANDREWS ON SKEET CLUB HOMEOWNERS ASSOC.
KHAN VAN & NANCY LE
WILLIAM G. CURLIN
-L- TSSta. 163+06.31
-L- CSSta. 158+12.07
-L- ST Sta. 159+08.07
-L-
PIs Sta. 158+44.07
θs = 0°22'00.1"
Ls = 96.00'
LT = 64.00'
ST = 32.00'
-L-
PIs Sta. 163+70.31
θs = 0°33'00.1"
Ls = 96.00'
LT = 64.00'
ST = 32.00'
-L-
PI Sta. 167+89.17
Δ = 8°50'64.9" (LT)
D = 1°08'45.3"
L = 772.19
T = 386.86'
R = 5,000.00'
DS = 50 MPH
SE = 0.02
-L- TEMP
PI Sta. 171+59.42
Δ = 6°27'19.5" (LT)
D = 1°31'04.1"
L = 425.31'
T = 212.89'
R = 3,775.00'
DS = 50 MPH
SE = 0.02
S
TS
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPHIC SCALE
100'
SITE 1
MATCHLINE STA. 171+00.00 SHEET 5
REVISIONS
02/09/09 RW REVISION: REVISED LABEL OFFSETS FOR EXISTING RIGHT OF WAY TO ACTUAL DISTANCES.
02/13/09 RW REVISION: CHANGED NAME ON PARCEL 002 TO ORCHARD KNOB OWNERS ASSOCIATION



REVISIONS

9/29/09 RW REVISION: REVISED LARGE OFFSETS FOR EXISTING RIGHT OF WAY TO ACTUAL DISTANCES.
12/10/09 RW REVISION: REMOVED ~~PROPOSED PERMANENT DRAINAGE EASEMENT FROM PARCEL 10 & REMOVED PERMANENT DRAINAGE EASEMENT FROM PARCEL 10 ONLY~~
5/26/12 RW REVISION: CHANGED NAME ON PARCEL 002 TO ORCHARD KNOB OWNERS ASSOCIATION, INC.

P-57

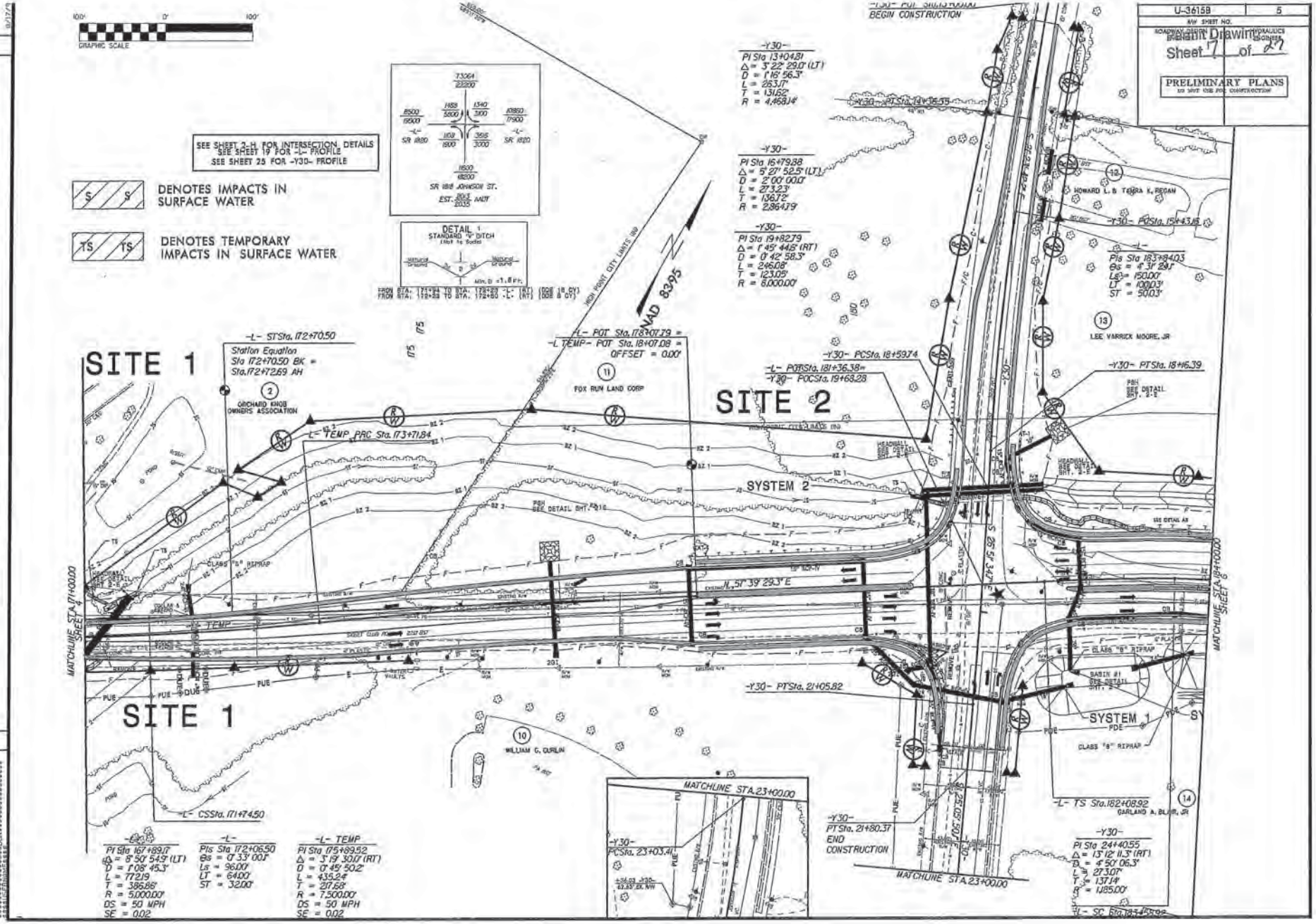
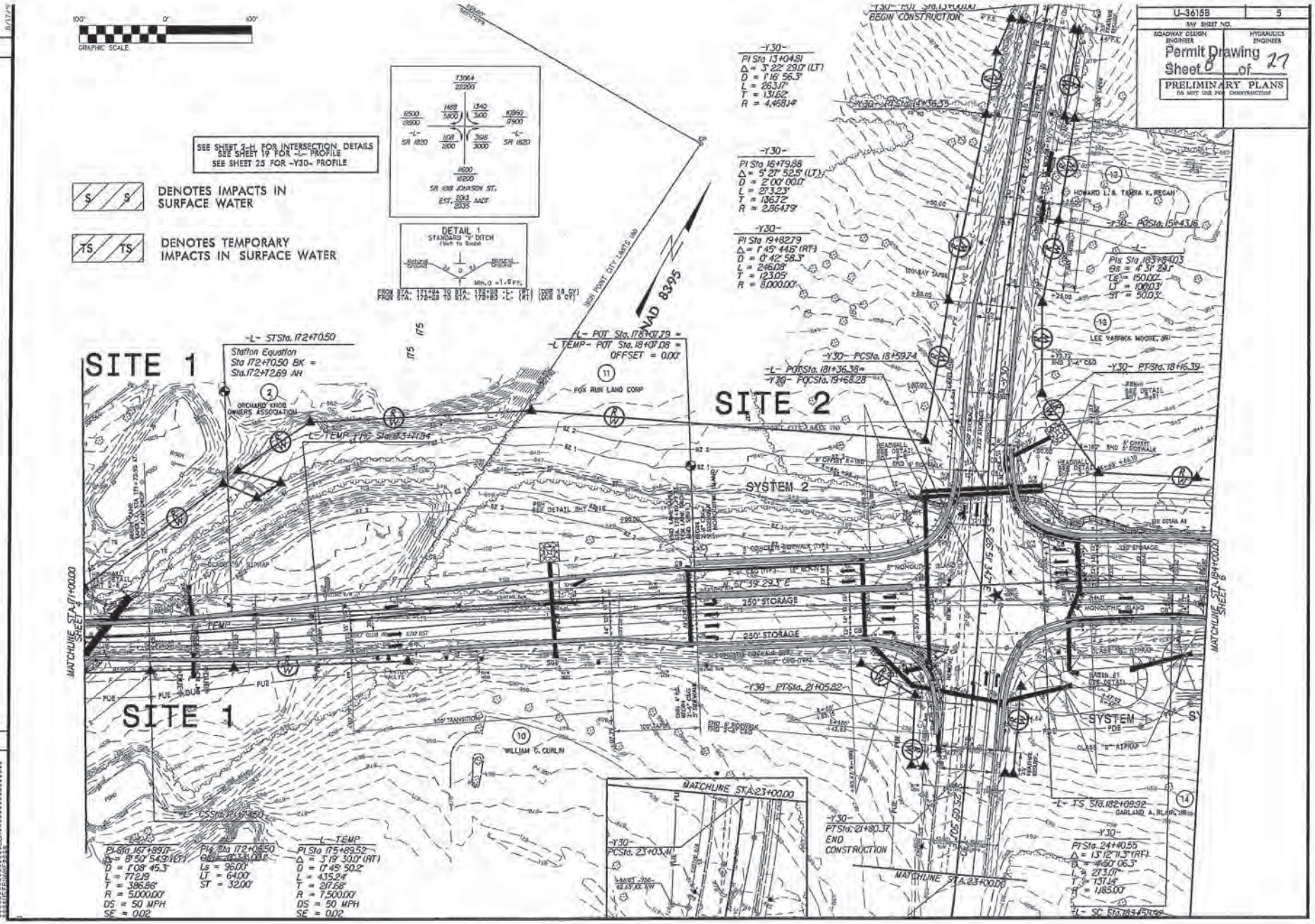
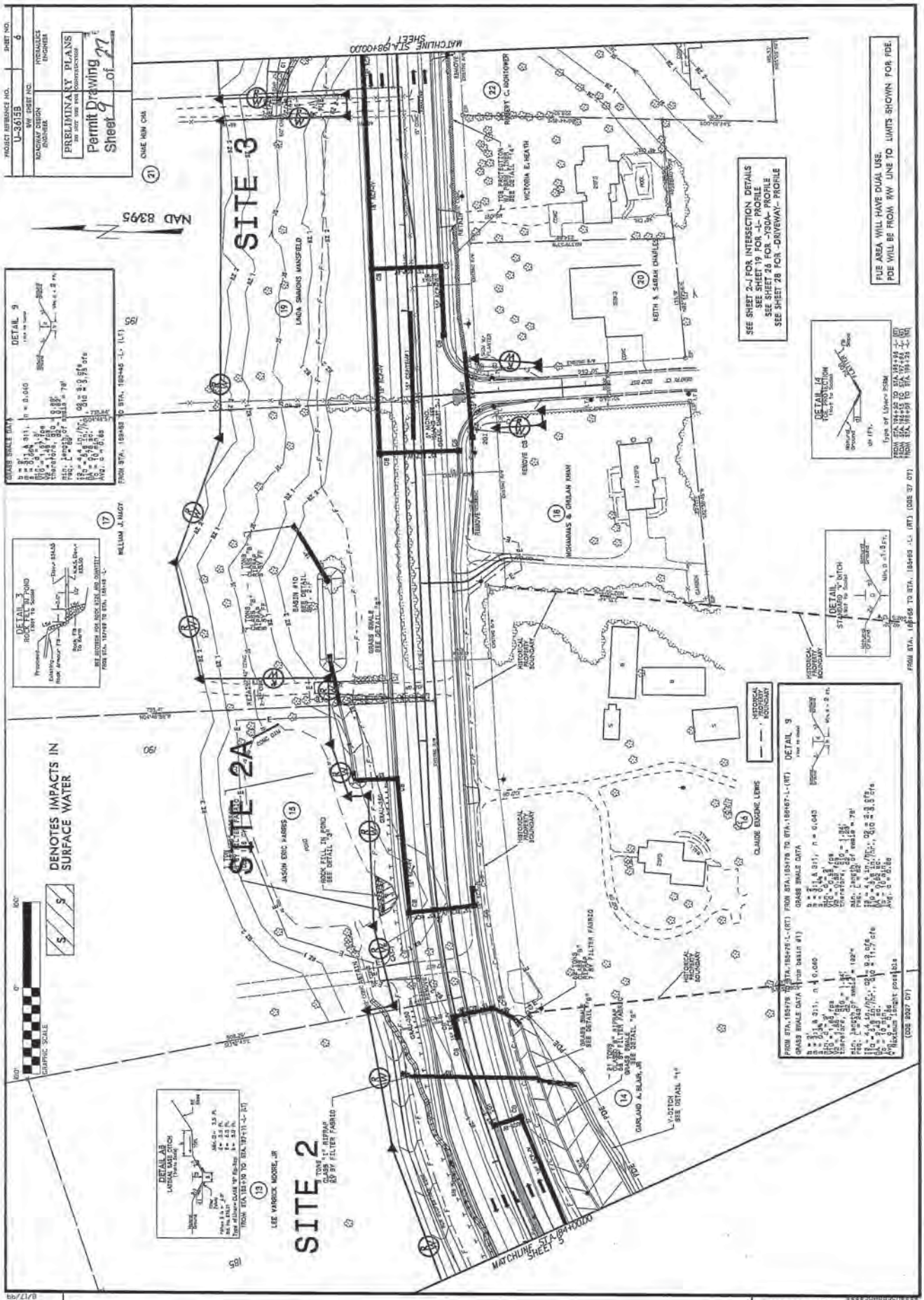


Exhibit Drawing

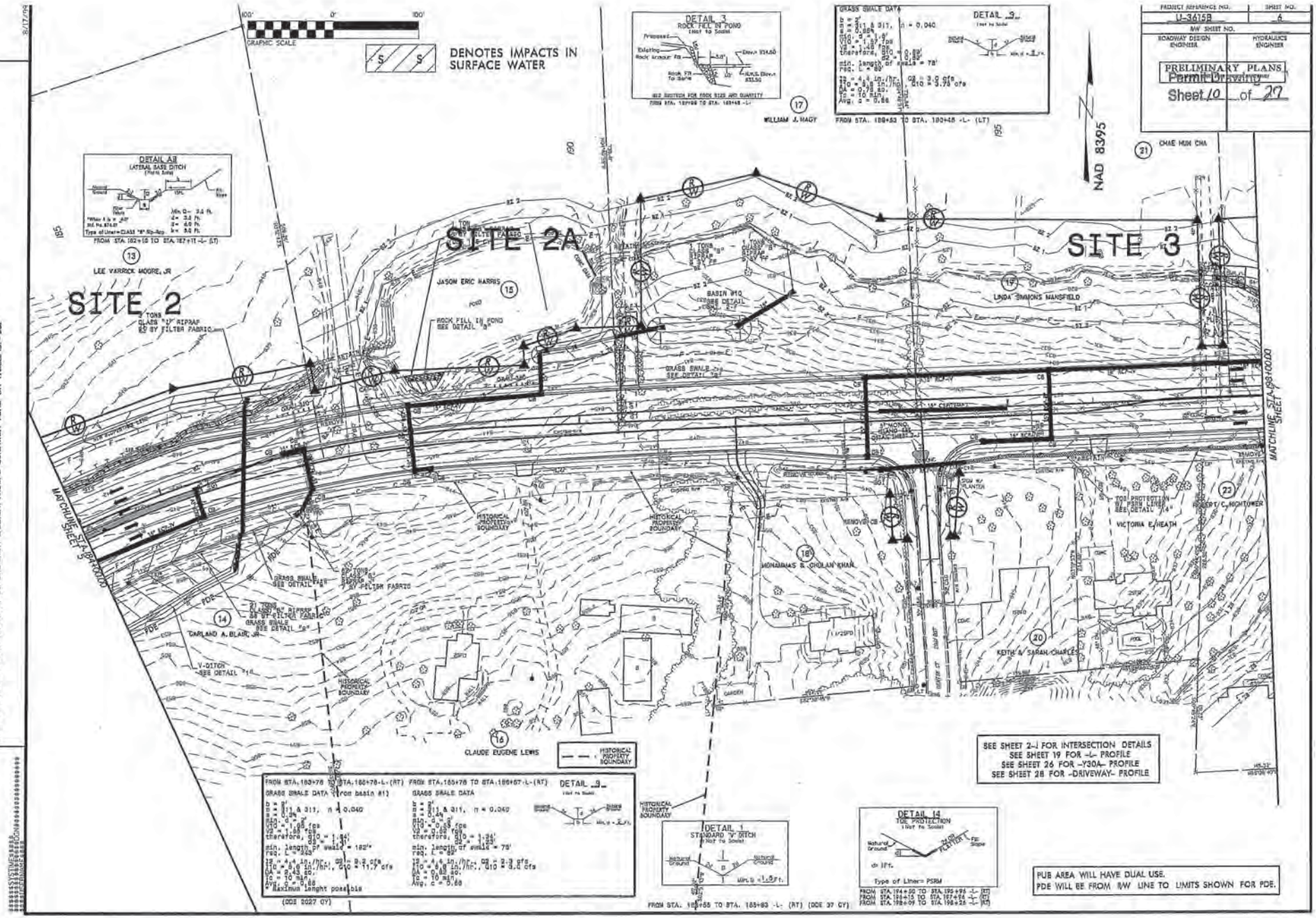

U-3615B
5
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing
Sheet 8 of 27
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
REVISIONS
8/17/12 RW REVISION: CHANGED NAME ON PARCEL 002 TO ORCHARD KNOB OWNERS ASSOCIATION - SLK
GRAPHIC SCALE
SEE SHEET 2-H FOR INTERSECTION DETAILS
SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 25 FOR -Y30- PROFILE
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DETAIL 1
STANDARD "V" DITCH
SR 1818 JOHNSON ST.
EST. 2013 AADT
2035
NAD 83/95
HIGH POINT CITY LIMITS
SITE 1
SITE 2
-L- ST Sta. 172+70.50
Station Equation
Sta 172+70.50 BK =
Sta.172+72.69 AH
ORCHARD KNOB OWNERS ASSOCIATION
FOX RUN LAND CORP
-L- TEMP PRC Sta. 173+71.34
-L- POT Sta. 178+07.79 =
-L TEMP- POT Sta. 178+07.08 =
OFFSET = 0.00'
-Y30-
PI Sta 13+04.81
Δ = 3° 22' 29.0" (LT)
D = 1° 16' 56.3"
L = 263.17'
T = 131.62'
R = 4,463.14'
-Y30-
PI Sta 16+79.88
Δ = 5° 27' 52.5" (LT)
D = 2° 00' 00.0"
L = 273.23'
T = 136.72'
R = 2,864.79'
-Y30-
PI Sta 19+82.79
Δ = 1° 45' 44.6" (RT)
D = 0° 42' 58.3"
L = 246.08'
T = 123.05'
R = 8,000.00'
-Y30- PC Sta. 18+59.74
-L- POT Sta. 181+36.39 =
-Y30- PC Sta. 19+68.28
-Y30- PT Sta. 18+16.39
-Y30- PT Sta. 21+05.82
-Y30-
PT Sta. 21+80.37
END
CONSTRUCTION
-Y30-
PC Sta. 23+03.41
MATCHLINE STA. 23+00.00
MATCHLINE STA. 19+00.00
SHEET 6
MATCHLINE STA. 21+00.00
SHEET 4
SYSTEM 2
SYSTEM 1
250' STORAGE
250' STORAGE
HOWARD L. & TAMRA K. REGAN
LEE VARBRICK MOORE, JR.
GARLAND A. BLAIR, JR.
WILLIAM C. CURLIN
-L- TEMP
PI Sta 172+06.50
Ls = 96.00'
LT = 64.00'
ST = 32.00'
-L- TEMP
PI Sta 175+89.52
Δ = 3° 19' 30.0" (RT)
D = 0° 45' 50.2"
L = 435.24'
T = 217.68'
R = 7,500.00'
DS = 50 MPH
SE = 0.02
-L- SC Sta. 183+84.09

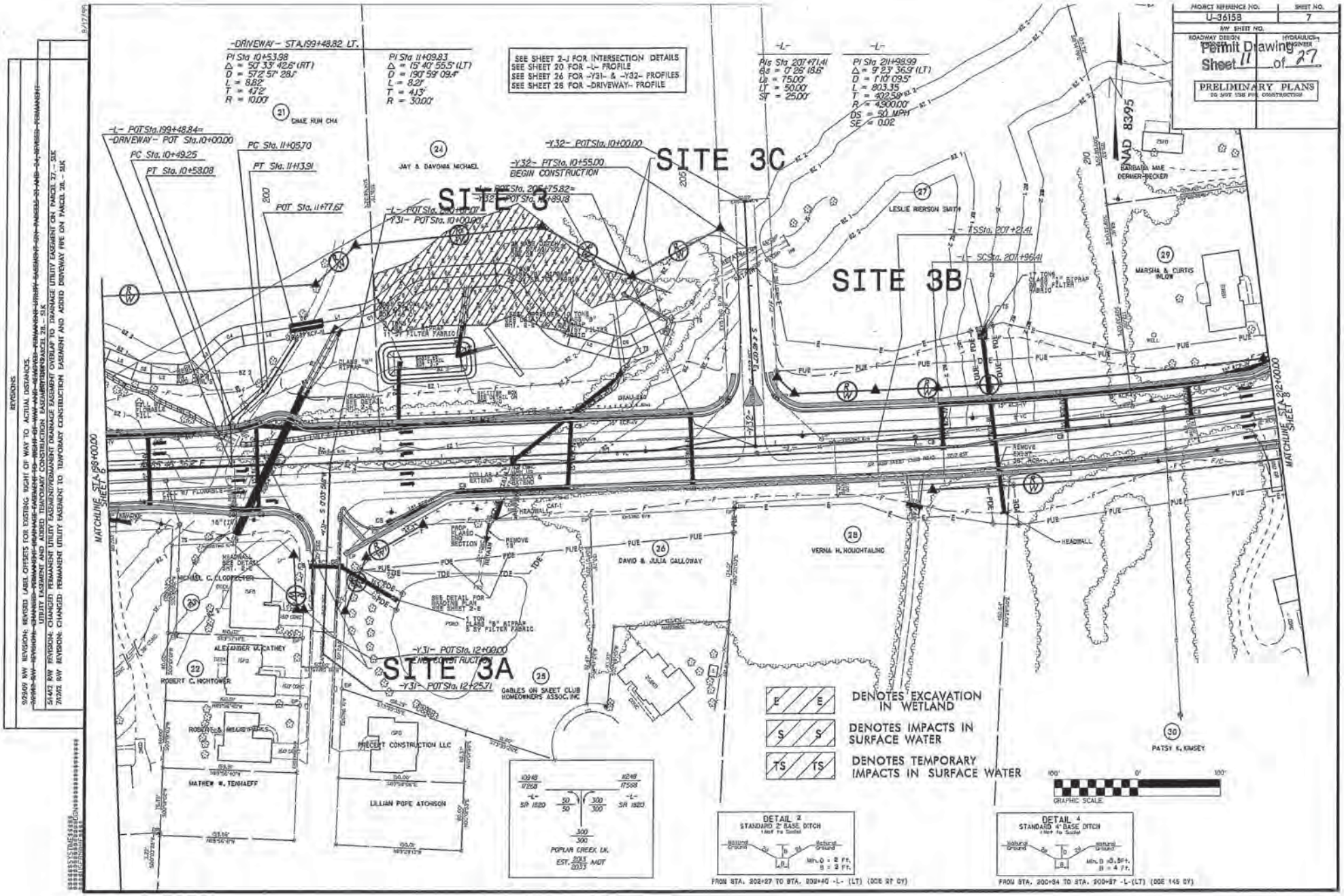


8/17/99

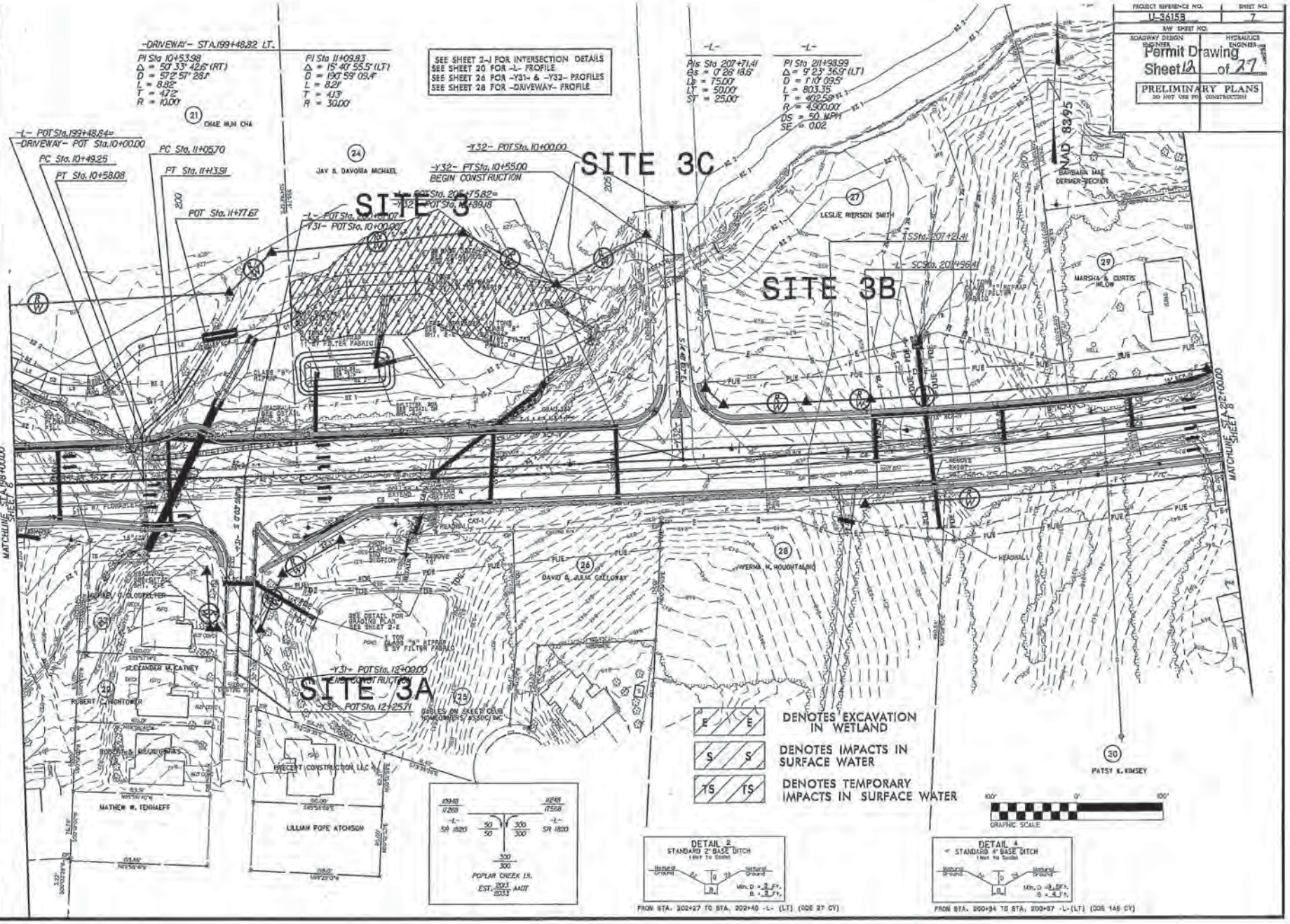
REVISIONS

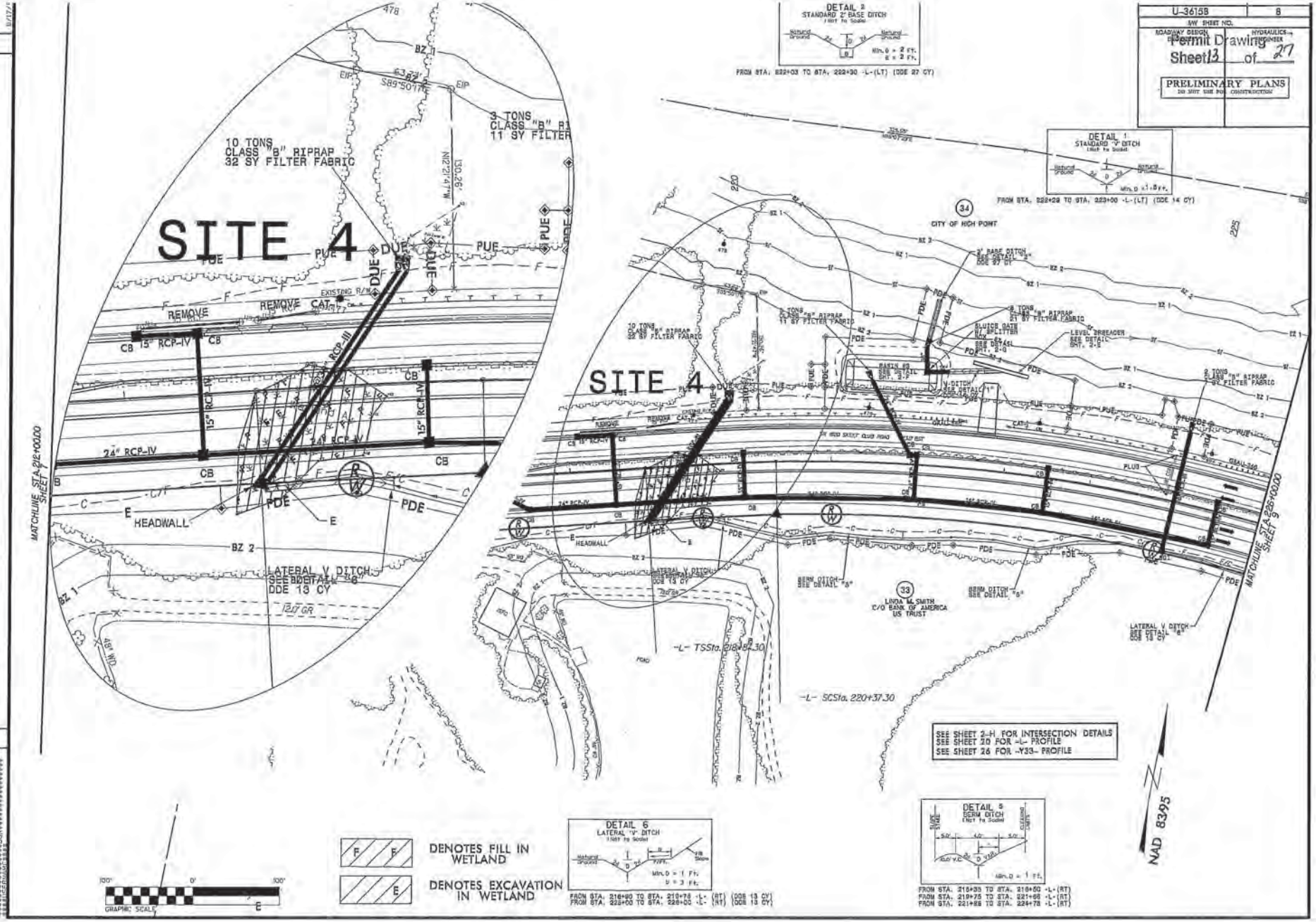
9/29/99 RW REVISION: REVISED LABEL OFFSETS FOR DISTING RIGHT OF WAY TO ACTUAL DISTANCES.
3/29/12 RW REVISION: REMOVED PERMANENT DRAINAGE EASEMENT AND REVISED RIGHT OF WAY ON PARCEL 13; REMOVED PERMANENT DRAINAGE EASEMENT AND ADDED RIGHT OF WAY AND TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 15; CHANGED PERMANENT DRAINAGE EASEMENT TO RIGHT OF WAY AND REMOVED PERMANENT UTILITY EASEMENT ON PARCEL 17, 19, AND 21; - SJK
4/9/13 RW REVISION: ADDED TEMPORARY CONSTRUCTION EASEMENT AROUND DETENTION POND ON PARCEL 15. - SJK

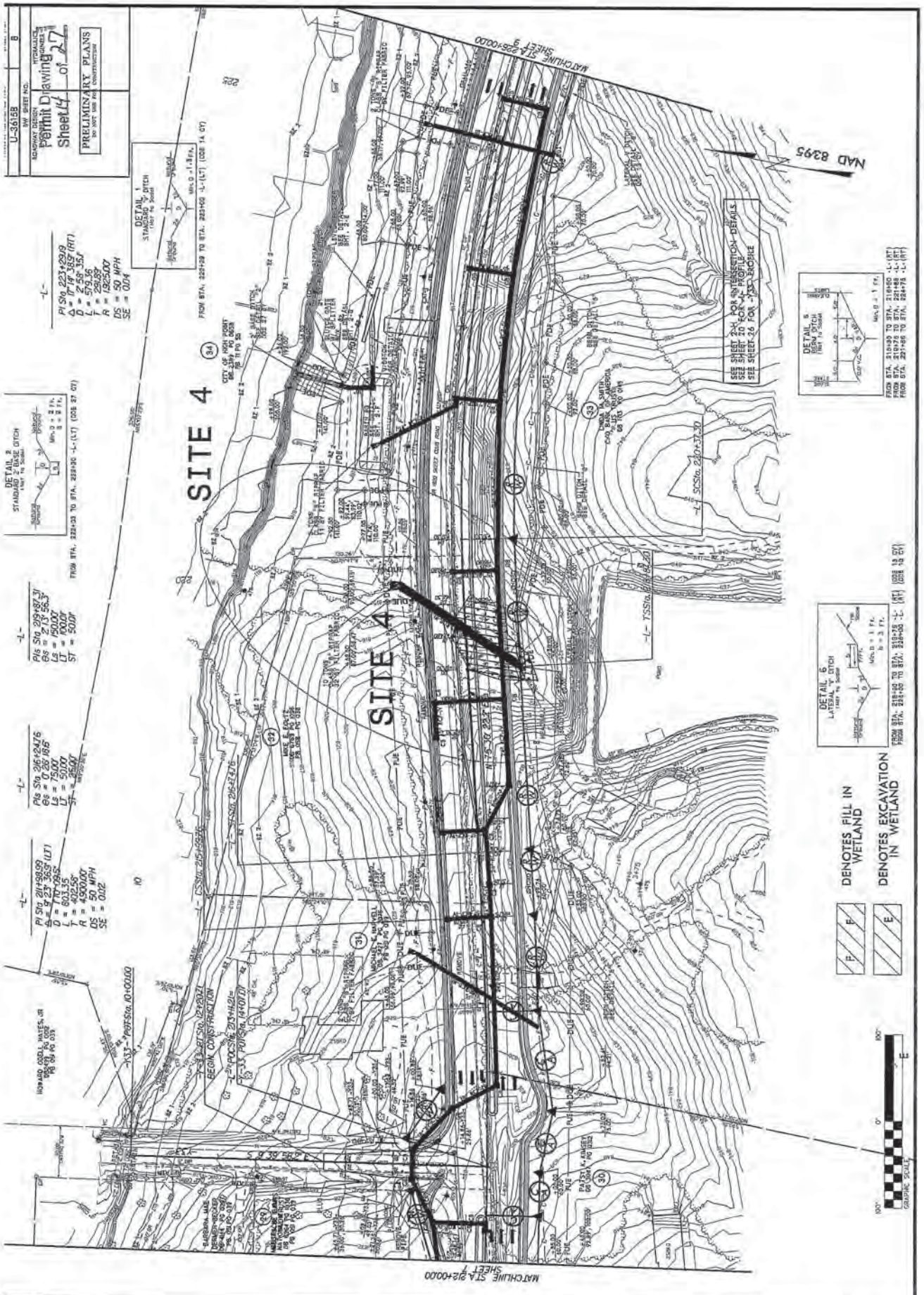

PROJECT REFERENCE NO. U-3615B
SHEET NO. 6
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
Permit Drawing
Sheet 10 of 27
GRAPHIC SCALE
DENOTES IMPACTS IN SURFACE WATER
NAD 83/95
SITE 2
SITE 2A
SITE 3
LEE VARRICK MOORE, JR
JASON ERIC HARRIS
WILLIAM J. HAGY
CHAE HUN CHA
LINDA SIMMONS MANSFIELD
CARLAND A. BLAIR, JR.
CLAUDE EUGENE LEWIS
MOHAMMAD & GHOLAM KHAN
KEITH & SARAH CHARLES
VICTORIA E. HEATH
MATCHLINE SHEET 5 OF 10
MATCHLINE SHEET 7 OF 10
DETAIL 3
ROCK FILL IN POND
DETAIL 9
GRASS SWALE DATA
DETAIL 1
STANDARD "V" DITCH
DETAIL 14
TOE PROTECTION
DETAIL A2
LATERAL BASE DITCH
HISTORICAL PROPERTY BOUNDARY
SEE SHEET 2-I FOR INTERSECTION DETAILS
SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 26 FOR -Y30A- PROFILE
SEE SHEET 28 FOR -DRIVEWAY- PROFILE
PUB AREA WILL HAVE DUAL USE.
PDE WILL BE FROM R/W LINE TO LIMITS SHOWN FOR PDE.
REVISIONS
9/29/07 RW REVISION: REVISED LABEL OFFSETS FOR EXISTING RIGHT OF WAY TO ACTUAL DISTANCES.
2/25/12 RW REVISION: REMOVED PERMANENT DRAINAGE EASEMENT AND REVISED RIGHT OF WAY ON PARCEL 13; REMOVED PERMANENT DRAINAGE EASEMENT AND ADDED RIGHT OF WAY ON PARCEL 14; REMOVED PERMANENT DRAINAGE EASEMENT AND ADDED RIGHT OF WAY ON PARCEL 15; CHANGED PERMANENT DRAINAGE EASEMENT TO RIGHT OF WAY AND REMOVED PERMANENT UTILITY EASEMENT ON PARCEL 17, 19 AND 20 - SHEET 6.
4/9/13 RW REVISION: ADDED TEMPORARY CONSTRUCTION EASEMENT AROUND DETENTION POND ON PARCEL 15. - SHE

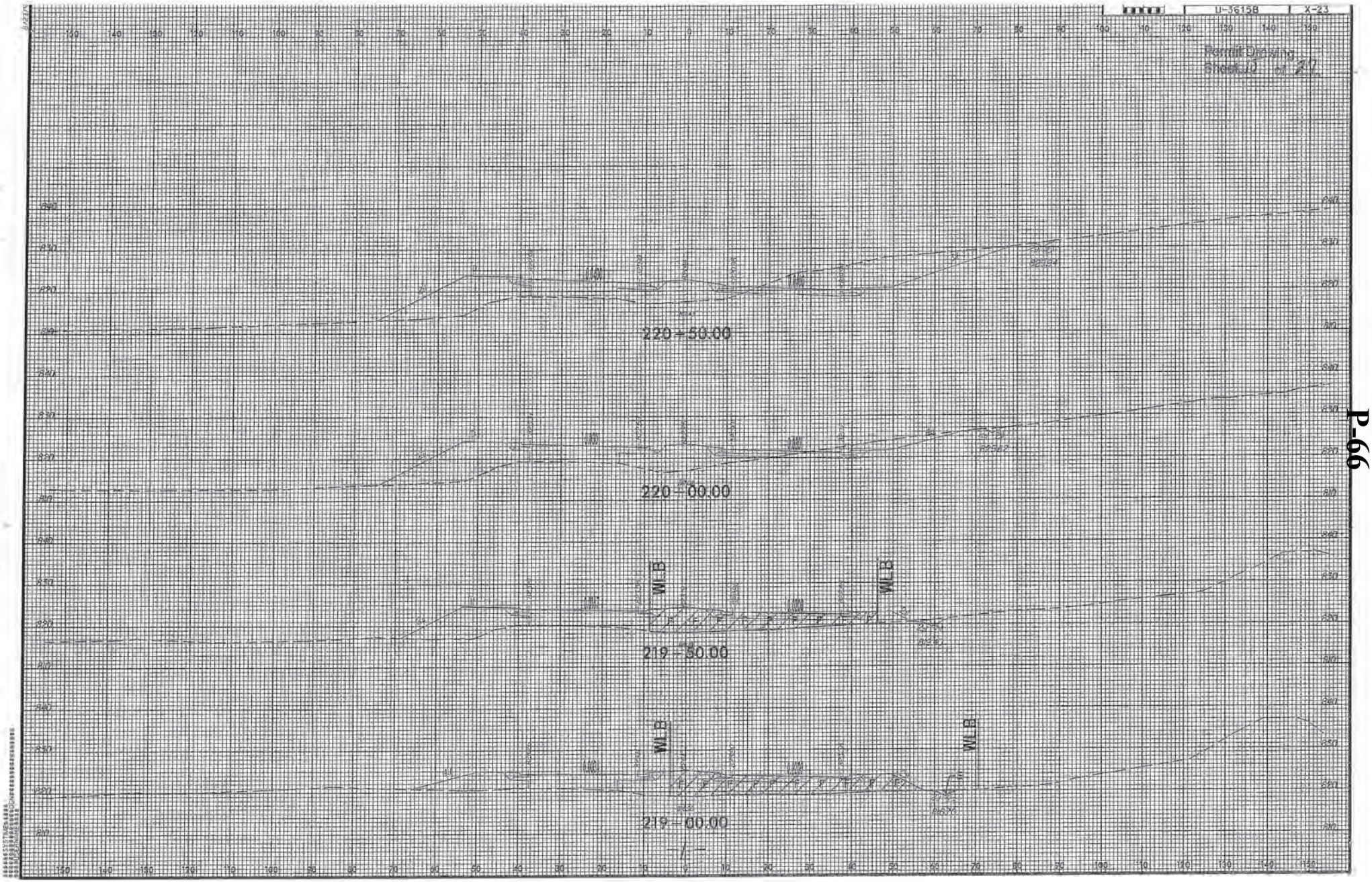

PROJECT REFERENCE NO.
U-3615B
SHEET NO.
7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing
Sheet 11 of 27
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SITE 3
SITE 3A
SITE 3B
SITE 3C
SEE SHEET 2-J FOR INTERSECTION DETAILS
SEE SHEET 20 FOR -L- PROFILE
SEE SHEET 26 FOR -Y31- & -Y32- PROFILES
SEE SHEET 26 FOR -DRIVEWAY- PROFILE
-DRIVEWAY- STA.199+48.82 LT.
PI Sta 10+53.98
Δ = 50° 33' 42.6" (RT)
D = 57° 57' 28.1"
L = 88.82'
T = 47.2'
R = 10.00'
PI Sta 11+09.83
Δ = 15° 40' 55.5" (LT)
D = 190° 59' 09.4"
L = 8.21'
T = 4.13'
R = 30.00'
-L-
PIs Sta 207+71.41
Δs = 0° 26' 18.6"
Ls = 75.00'
LT = 50.00'
ST = 25.00'
-L-
PI Sta 211+98.99
Δ = 9° 23' 36.9" (LT)
D = 1° 10' 09.5"
L = 803.35'
T = 402.50'
R = 4900.00'
DS = 50 MPH
SE = 0.02
-L- POT Sta.199+48.84=
-DRIVEWAY- POT Sta.10+00.00
PC Sta. 10+49.25
PT Sta. 10+53.08
PC Sta. 11+05.70
PT Sta. 11+13.91
POT Sta. 11+77.67
-Y32- POT Sta. 10+00.00
-Y32- PT Sta. 10+55.00
BEGIN CONSTRUCTION
-L- POT Sta. 205+75.82=
-Y32- POT Sta. 11+89.18
-L- POT Sta. 10+00.00
-Y31- POT Sta. 10+00.00
-L- TS Sta. 207+21.41
-L- SC Sta. 207+96.41
-Y31- POT Sta. 12+00.00
END CONSTRUCTION
-Y31- POT Sta. 12+25.71
MATCHLINE STA. 198+00.00 SHEET 6
MATCHLINE STA. 212+00.00 SHEET 8
NAD 8395
21 CHAE RUN CHA
24 JAY & DAVONNA MICHAEL
27 LESLIE RIERSON SMITH
29 MARSHA & CURTIS BLOW
BARBARA MAE DERMER-BECKER
28 VERNA H. HOUGHTALING
26 DAVID & JULIA GALLOWAY
25 GABLES ON SKEET CLUB HOMEOWNERS ASSOC. INC
30 PATSY K. KIMSEY
22 ROBERT C. HIGHTOWER
ALEXANDER U. CATHEY
MICHAEL C. CLODFELTER
PRECEPT CONSTRUCTION LLC
LILLIAN POPE ATCHISON
MATHEW W. TENGIAEFF
POPLAR CREEK LN.
EST. 2021 ADT
2033
DENOTES EXCAVATION IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPHIC SCALE
DETAIL 2
STANDARD 2' BASE DITCH
FROM STA. 202+27 TO STA. 202+40 -L- (LT) (DOE 27 CY)
DETAIL 4
STANDARD 4' BASE DITCH
FROM STA. 200+34 TO STA. 200+87 -L-(LT) (DOE 145 CY)
REVISIONS
9/23/09 RW REVISION: REVISED LABEL OFFSETS FOR EXISTING RIGHT OF WAY TO ACTUAL DISTANCES.
5/14/13 RW REVISION: CHANGED PERMANENT DRAINAGE EASEMENT ON PARCEL 27 - SIK
7/10/13 RW REVISION: CHANGED PERMANENT UTILITY EASEMENT TO TEMPORARY CONSTRUCTION EASEMENT AND ADDED DRIVEWAY PIPE ON PARCEL 28 - SIK

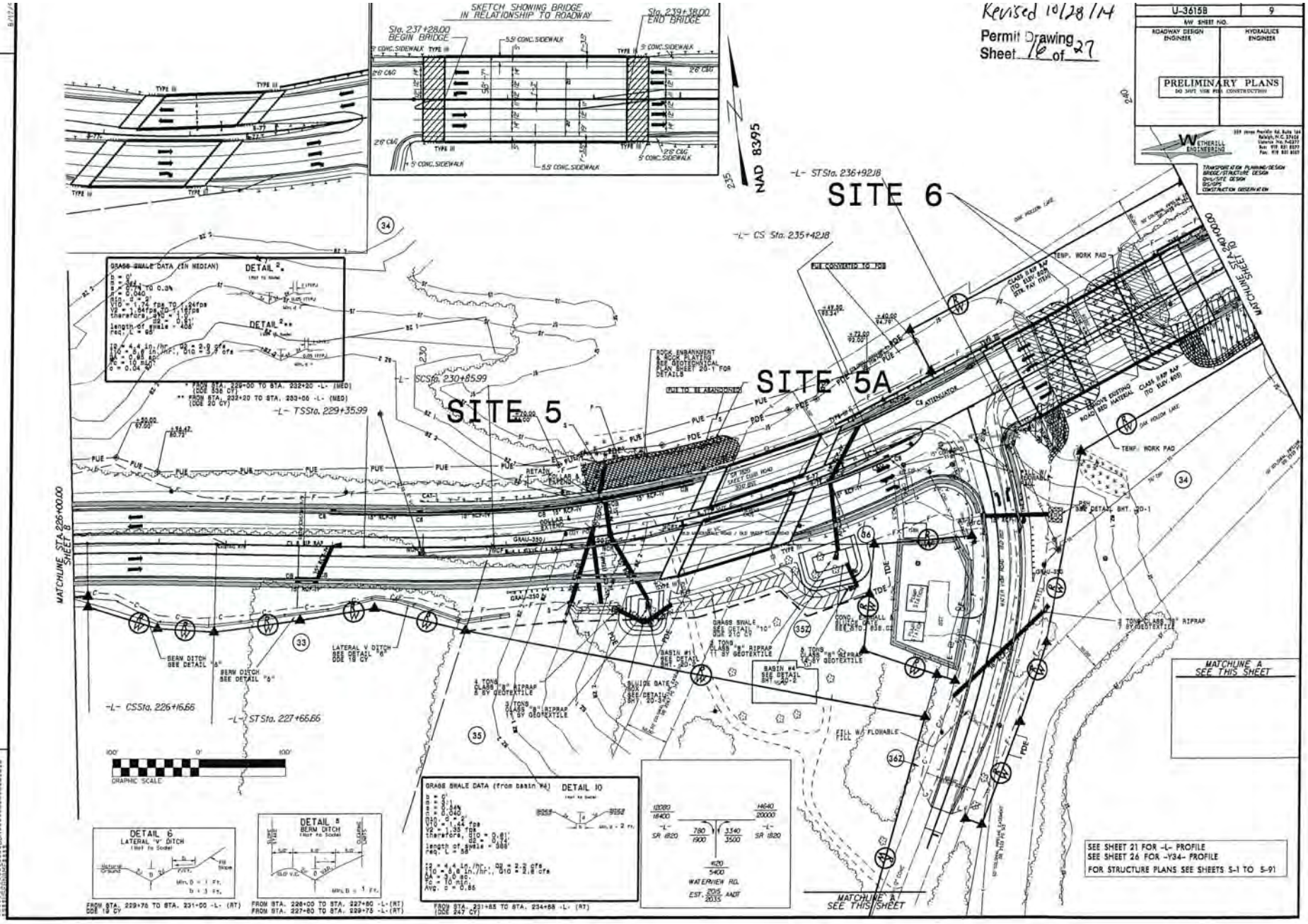
P-62

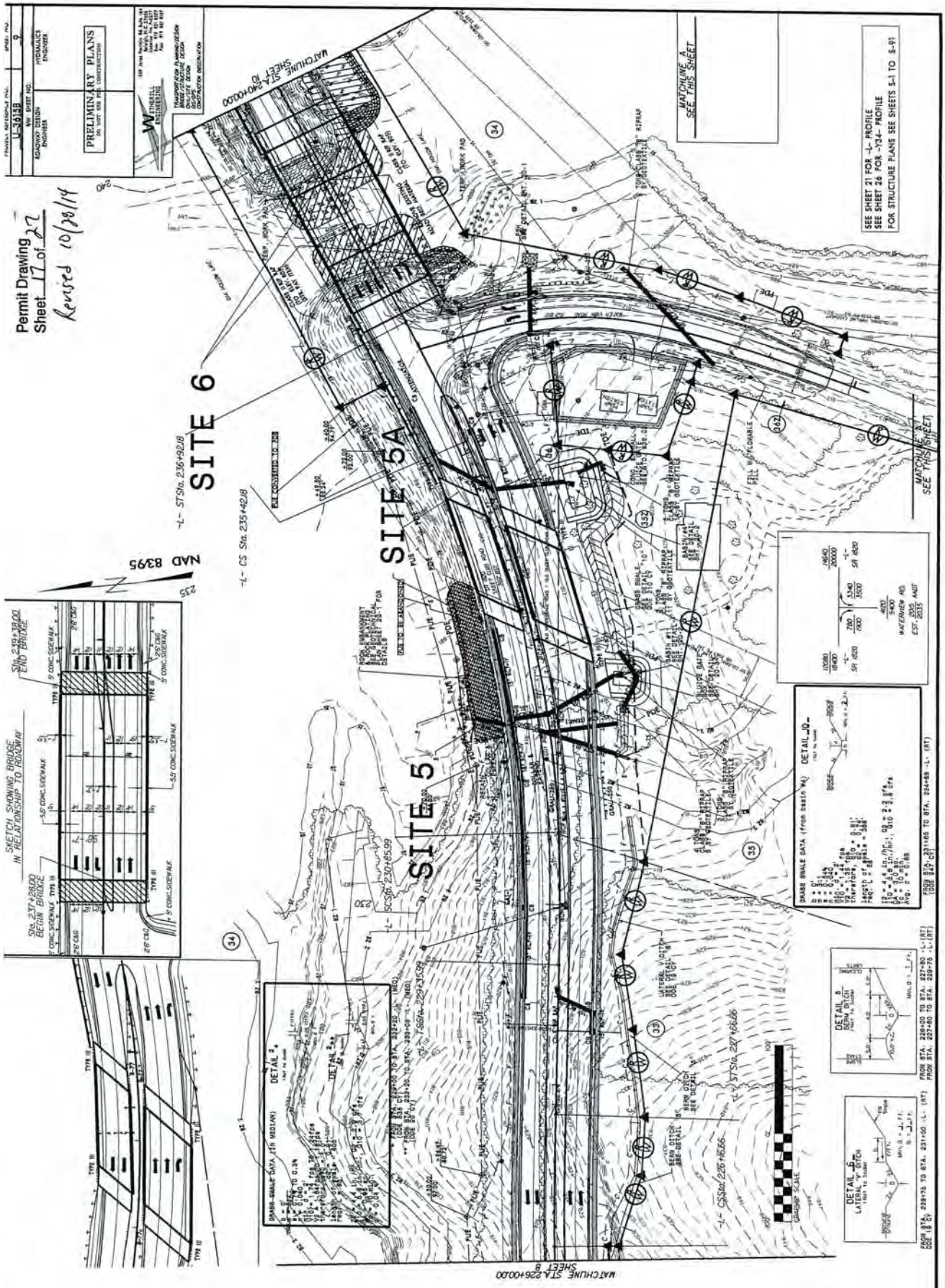

PROJECT REFERENCE NO. U-3615B
SHEET NO. 7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing
Sheet 12 of 27
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SEE SHEET 2-J FOR INTERSECTION DETAILS
SEE SHEET 20 FOR -L- PROFILE
SEE SHEET 26 FOR -Y31- & -Y32- PROFILES
SEE SHEET 28 FOR -DRIVEWAY- PROFILE
SITE 3
SITE 3C
SITE 3B
SITE 3A
DENOTES EXCAVATION IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPHIC SCALE
DETAIL 2
STANDARD 2' BASE DITCH
DETAIL 4
STANDARD 4' BASE DITCH
FROM STA. 202+27 TO STA. 202+40 -L- (LT) (ODE 27 CY)
FROM STA. 200+94 TO STA. 200+57 -L- (LT) (ODE 146 CY)
MATCHLINE STA. 198+00.00 SHEET 8
MATCHLINE STA. 202+00.00 SHEET 8
-DRIVEWAY- STA.199+48.82 LT.
PI Sta 10+53.98
Δ = 50° 33' 42.6" (RT)
D = 57° 57' 28.1"
L = 8.82'
T = 4.72'
R = 10.00'
PI Sta 11+09.83
Δ = 15° 40' 55.5" (LT)
D = 190° 59' 09.4"
L = 8.21'
T = 4.13'
R = 30.00'
-L- POT Sta.199+48.84=
-DRIVEWAY- POT Sta.10+00.00
PC Sta. 10+49.25
PT Sta. 10+58.08
PC Sta. 11+05.70
PT Sta. 11+13.91
POT Sta. 11+77.67
-Y32- POT Sta. 10+00.00
-Y32- PT Sta. 10+55.00
BEGIN CONSTRUCTION
-Y31- POT Sta. 10+00.00
-Y31- POT Sta. 12+25.71
PI Sta 20T+71.41
Δs = 0° 26' 18.6"
Ls = 75.00'
LT = 50.00'
ST = 25.00'
PI Sta 21+38.99
Δ = 9° 23' 36.9" (LT)
D = 1° 10' 09.5"
L = 803.35'
T = 402.50'
R = 4,900.00'
DS = 50 MPH
SE = 0.02
-L- TS Sta. 20T+21.41
-L- SC Sta. 20T+96.41
CHAE HUN CHA
JAY & DAVONNA MICHAEL
LESLIE RIERSON SMITH
BARBARA MAE DERMER-BECKER
MARSHA & CURTIS MLOW
DAVID & JULIE GALLOWAY
IVERNA M. HOUGHTALING
ASHLEY O. CLODFELTER
ALEXANDER M. CATHEY
ROBERT L. WHITTOWER
BOBBY & BRUCE MYERS
MATHEW W. TENNHAEFF
LILLIAN POPE ATCHISON
HIGGENS CONSTRUCTION LLC
EAGLES ON SKEET CLUB HOMEOWNERS ASSOC. INC.
PATSY K. KIMSEY
POPLAR CREEK LN.
EST. 2011 AADT 1033
REVISIONS
8/17/99
9/28/09 R/W REVISION: REVISED LABEL OFFSETS FOR EXISTING RIGHT OF WAY TO ACTUAL DISTANCES.
6/28/13 R/W REVISION: CHANGED PERMANENT DRAINAGE EASEMENT TO RIGHT OF WAY AND REMOVED PERMANENT DRAINAGE EASEMENT ON PARCEL 21 AND 24, REVISED PERMANENT UTILITY EASEMENT AND ADDED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 37 - SLK
3/14/12 R/W REVISION: CHANGED PERMANENT UTILITY EASEMENT/PERMANENT DRAINAGE EASEMENT OVERLAP TO DRAINAGE UTILITY EASEMENT ON PARCEL 37 - SLK
7/13/12 R/W REVISION: CHANGED PERMANENT UTILITY EASEMENT TO TEMPORARY CONSTRUCTION EASEMENT AND ADDED DRIVEWAY PIPE ON PARCEL 26 - SLK

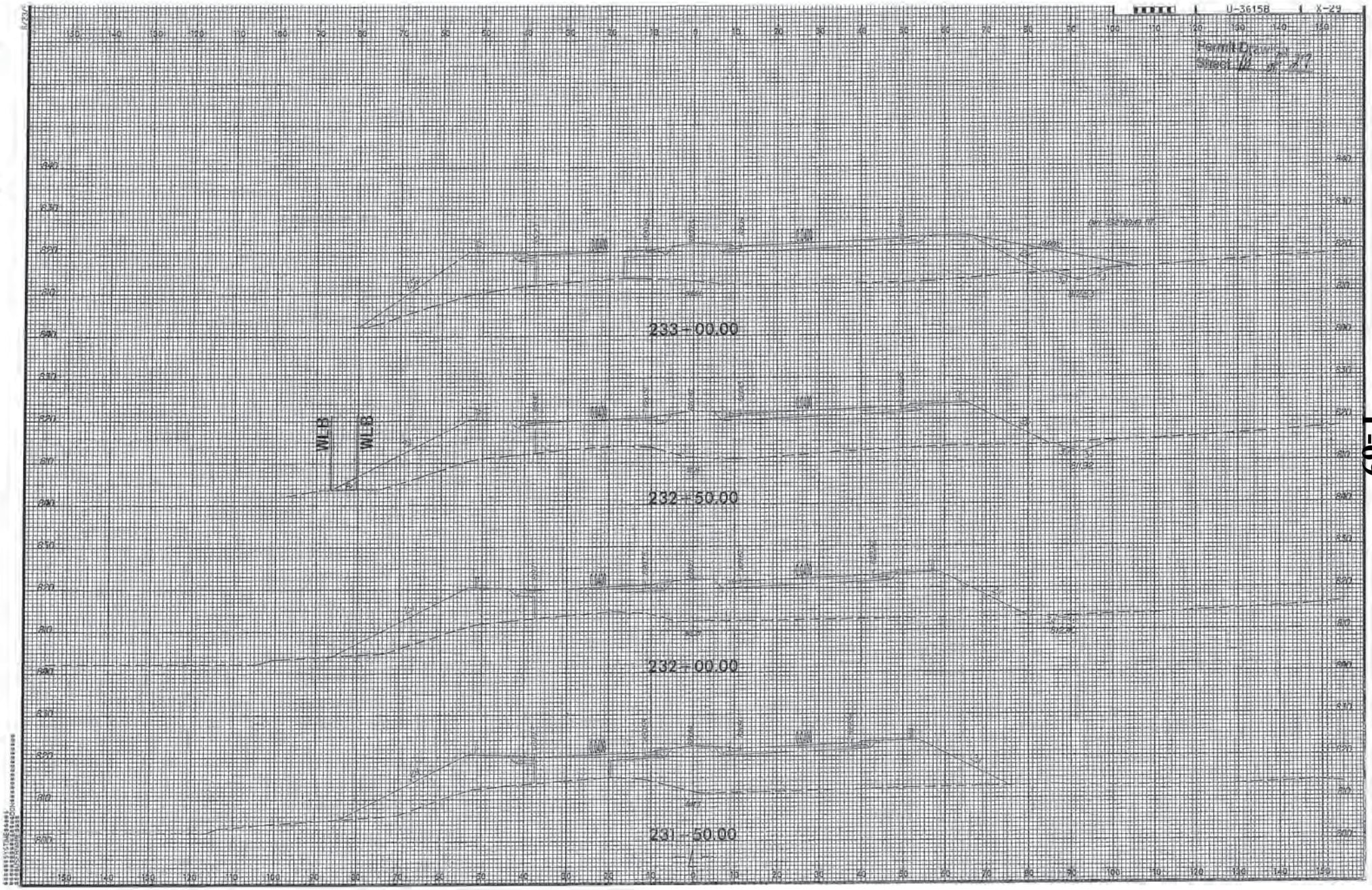

U-3615B
8
SW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing
Sheet 13 of 27
PRELIMINARY PLANS
NOT FOR CONSTRUCTION
DETAIL 2
STANDARD 2' BASE DITCH
(Not To Scale)
FROM STA. 222+03 TO STA. 222+30 -L-(LT) (DDE 27 CY)
DETAIL 1
STANDARD "V" DITCH
(Not To Scale)
FROM STA. 222+29 TO STA. 223+00 -L-(LT) (DDE 14 CY)
SITE 4
10 TONS CLASS "B" RIPRAP 32 SY FILTER FABRIC
3 TONS CLASS "B" RIPRAP 11 SY FILTER
REMOVE
REMOVE CAT
EXISTING R/W
15" RCP-IV
24" RCP-IV
HEADWALL
LATERAL V DITCH SEE DETAIL "B" DDE 13 CY
MATCHLINE STA. 218+00.00 SHEET 1
MATCHLINE STA. 226+00.00 SHEET 3
CITY OF HIGH POINT
LINDA M. SMITH C/O BANK OF AMERICA US TRUST
BERM DITCH SEE DETAIL "B"
-L- TSSta. 218+82.30
-L- SCSta. 220+37.30
SEE SHEET 2-H FOR INTERSECTION DETAILS
SEE SHEET 20 FOR -L- PROFILE
SEE SHEET 26 FOR -Y33- PROFILE
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
DETAIL 6
LATERAL "V" DITCH
(Not To Scale)
FROM STA. 216+80 TO STA. 219+75 -L- (RT) (DDE 13 CY)
FROM STA. 223+00 TO STA. 226+00 -L- (RT) (DDE 13 CY)
DETAIL 5
BERM DITCH
(Not To Scale)
FROM STA. 218+35 TO STA. 219+50 -L-(RT)
FROM STA. 219+75 TO STA. 221+66 -L-(RT)
FROM STA. 221+85 TO STA. 224+78 -L-(RT)
NAD 83/95
GRAPHIC SCALE
REVISIONS
1. REVISED LABEL OFFSETS FOR EXISTING RIGHT OF WAY TO ACTUAL DISTANCES. 9/25/07
2. CHANGED FILL AREA ON PARCEL 29 AND 32.
3. NAME CHANGE ON PARCELS 29 AND 32.
4. CHANGE PUE TO DUE — CLOSED CLAIM ON PARCEL 32.
5. ADDED 3 – CURB CUTS ON PARCEL 32.
6. CHANGE PDE TO DUE ON PARCEL 31. (9-10-12) S.L.K.

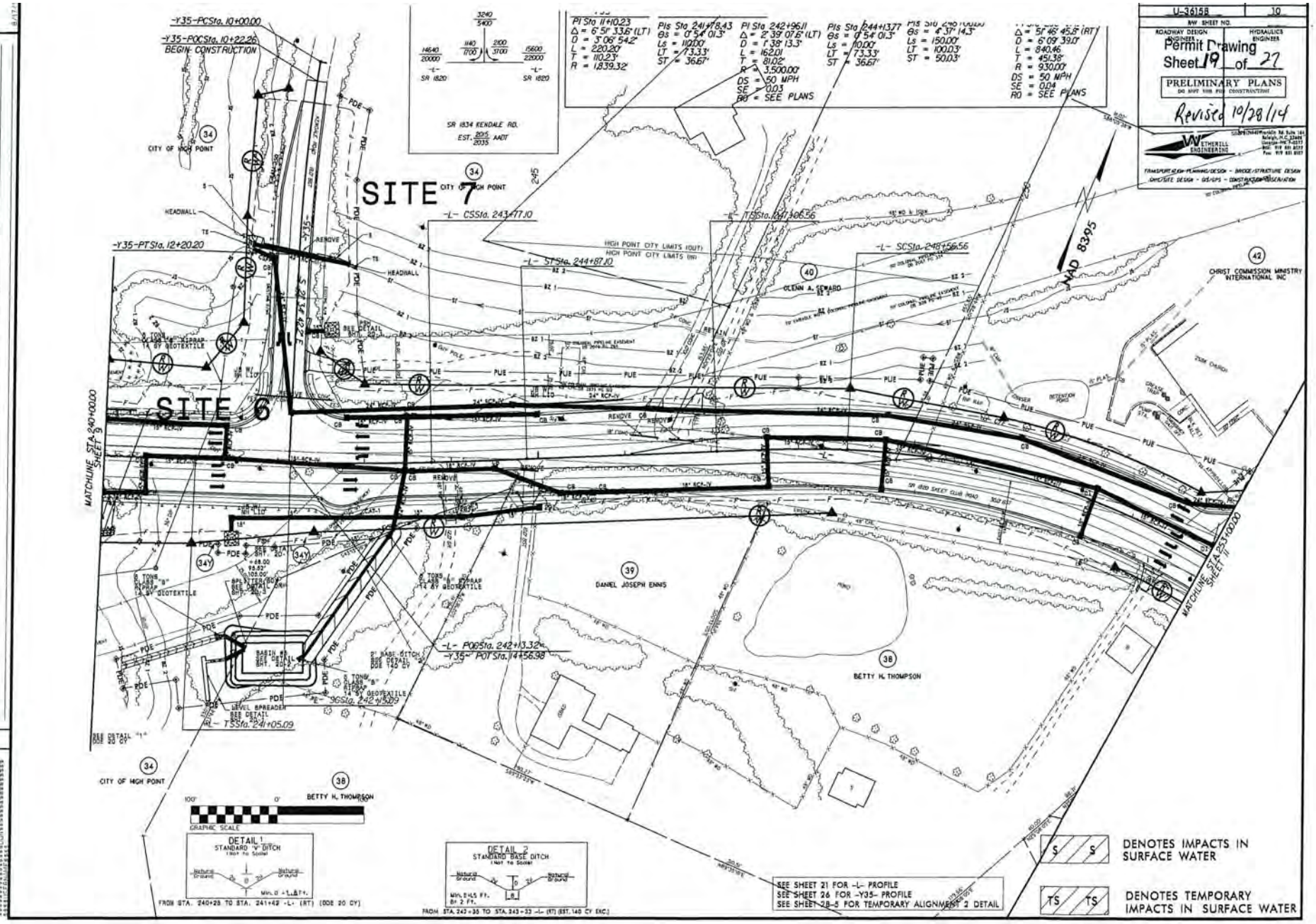

U-3658
Permit Drawing
Sheet 4 of 27
PRELIMINARY PLANS
SITE 4
SITE 4
NAD 83/95
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
MATCHLINE STA 212+00.00
MATCHLINE STA 228+00.00
BEGIN CONSTRUCTION
GRAPHIC SCALE

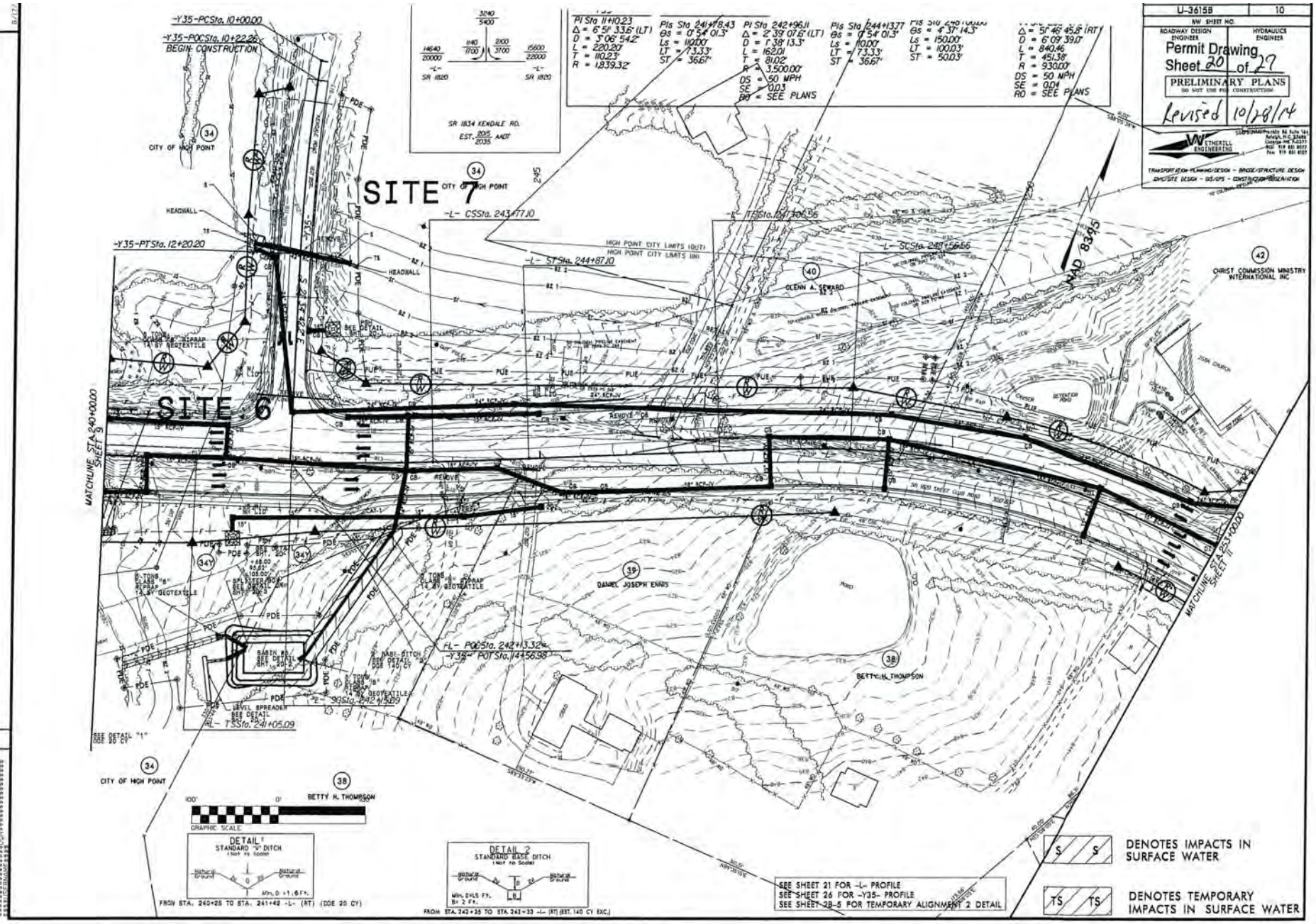

U-36158
X-23
Permit Drawing
Sheet 10 of 27
220+50.00
220+00.00
219+50.00
219+00.00
WLB
WLB
WLB
WLB


Revised 10/28/14
Permit Drawing Sheet 16 of 27
U-3615B
9
PRELIMINARY PLANS
WETHERILL ENGINEERING
SKETCH SHOWING BRIDGE IN RELATIONSHIP TO ROADWAY
Sta. 237+28.00 BEGIN BRIDGE
Sta. 239+38.00 END BRIDGE
NAD 83/95
SITE 6
SITE 5A
SITE 5
-L- ST Sta. 236+92.18
-L- CS Sta. 235+42.18
-L- SCS Sta. 230+85.99
-L- TS Sta. 229+35.99
-L- CS Sta. 226+16.66
-L- ST Sta. 227+66.66
MATCHLINE STA. 226+00.00 SHEET 8
MATCHLINE STA. 240+00.00 SHEET 10
MATCHLINE A SEE THIS SHEET
GRASS SWALE DATA (IN MEDIAN)
DETAIL 2
GRASS SWALE DATA (from basin #4)
DETAIL 10
DETAIL 6 LATERAL "V" DITCH
DETAIL 8 BERM DITCH
GRAPHIC SCALE
SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 26 FOR -Y34- PROFILE
FOR STRUCTURE PLANS SEE SHEETS S-1 TO S-91
REVISIONS

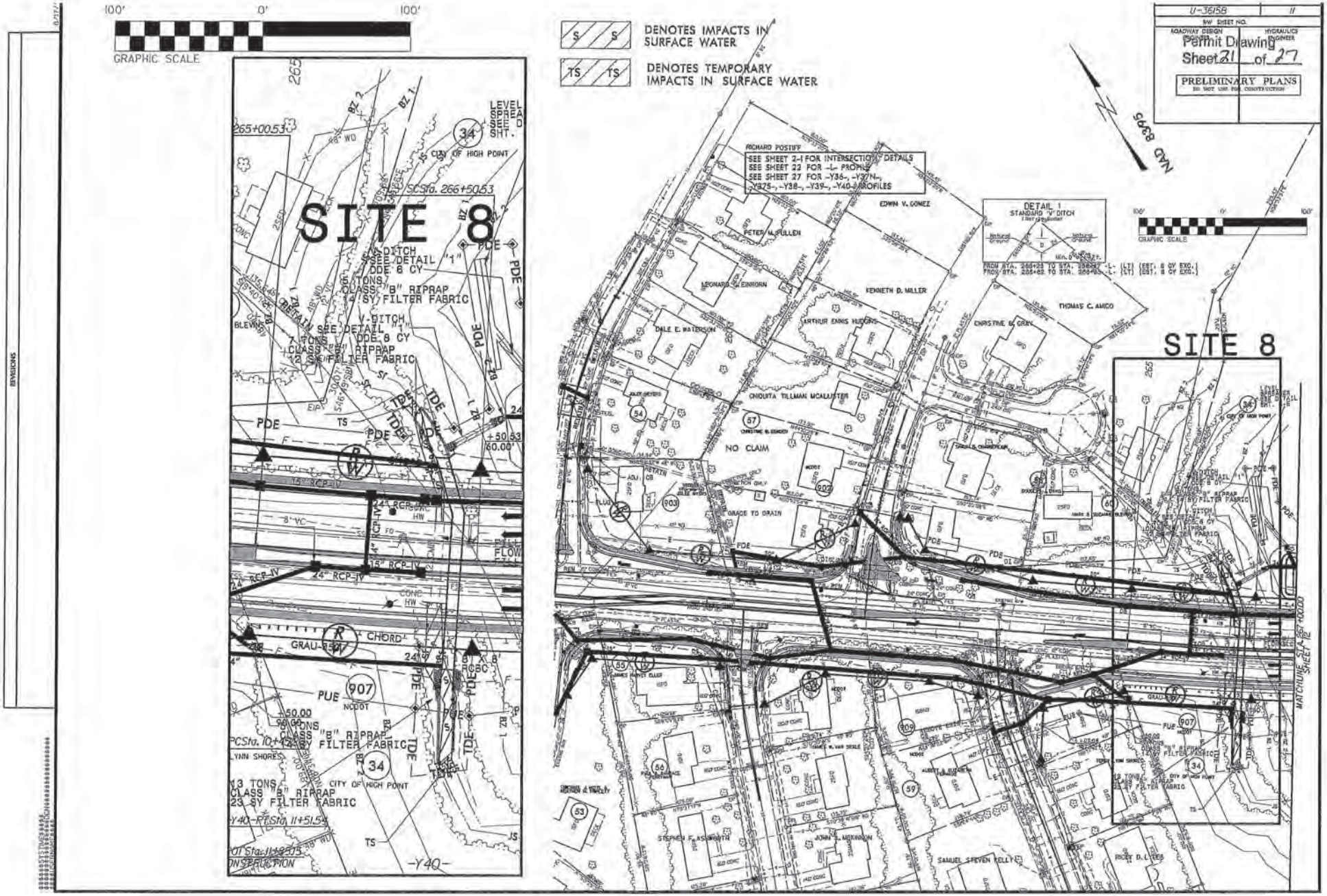

U-3618
PRELIMINARY PLANS
Permit Drawing
Sheet 17 of 27
Revised 10/28/14
SITE 6
SITE 5A
SITE 5
NAD 83/95
SKETCH SHOWING BRIDGE IN RELATIONSHIP TO ROADWAY
WATCHLINE STA 240+00.00
WATCHLINE STA 226+00.00
MATCHLINE A SEE THIS SHEET
SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 26 FOR -Y34- PROFILE
FOR STRUCTURE PLANS SEE SHEETS S-1 TO S-91
DETAIL 2
DETAIL 3
DETAIL 8
DETAIL 9
DRAINAGE DATA (from basin 94)
DRAINAGE DATA (FOR WEDGE)
GRAPHIC SCALE

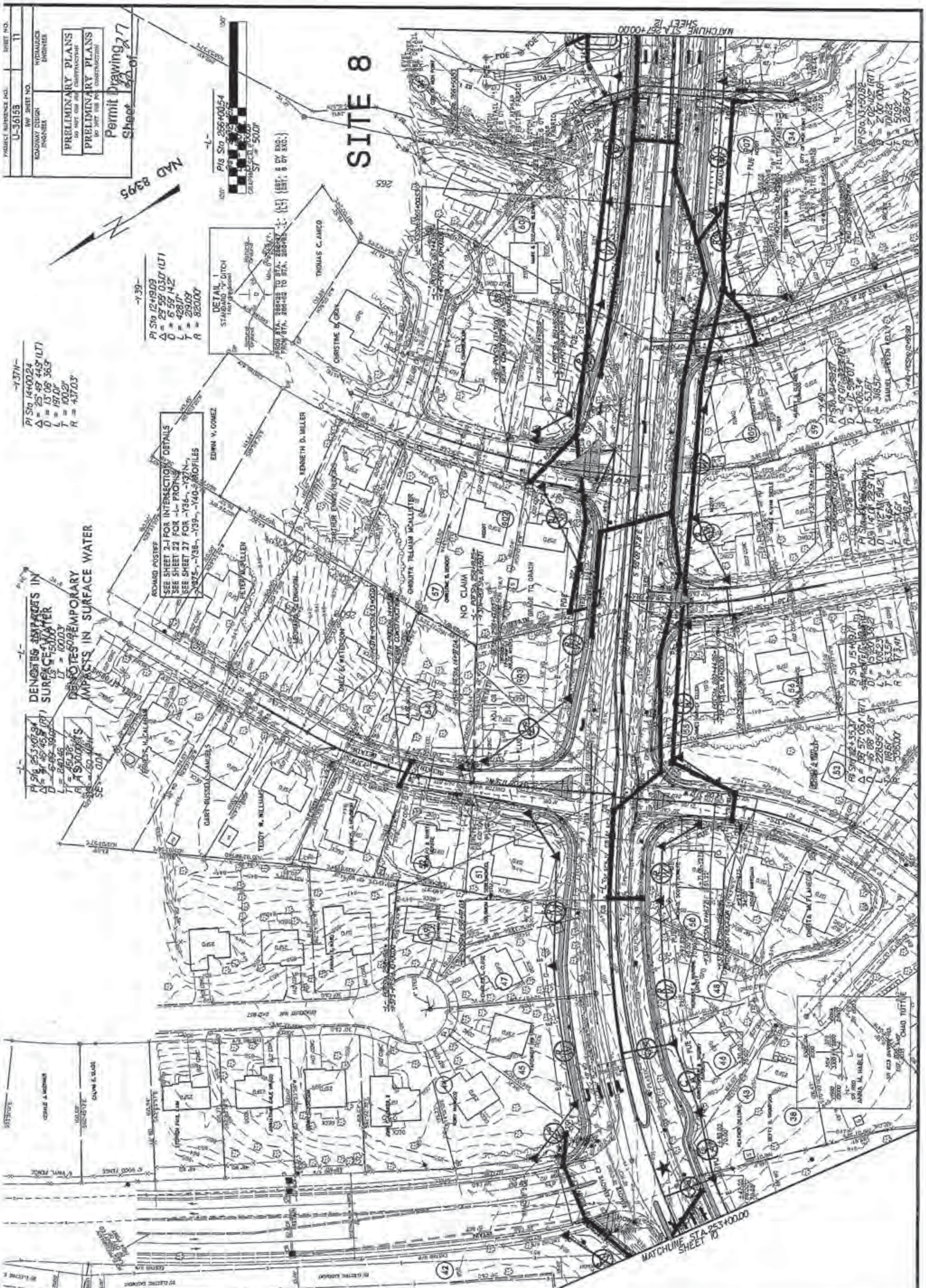

U-3615B
X-29
Permit Drawing
Sheet
233+00.00
232+50.00
232+00.00
231+50.00
WL-B
WL-B

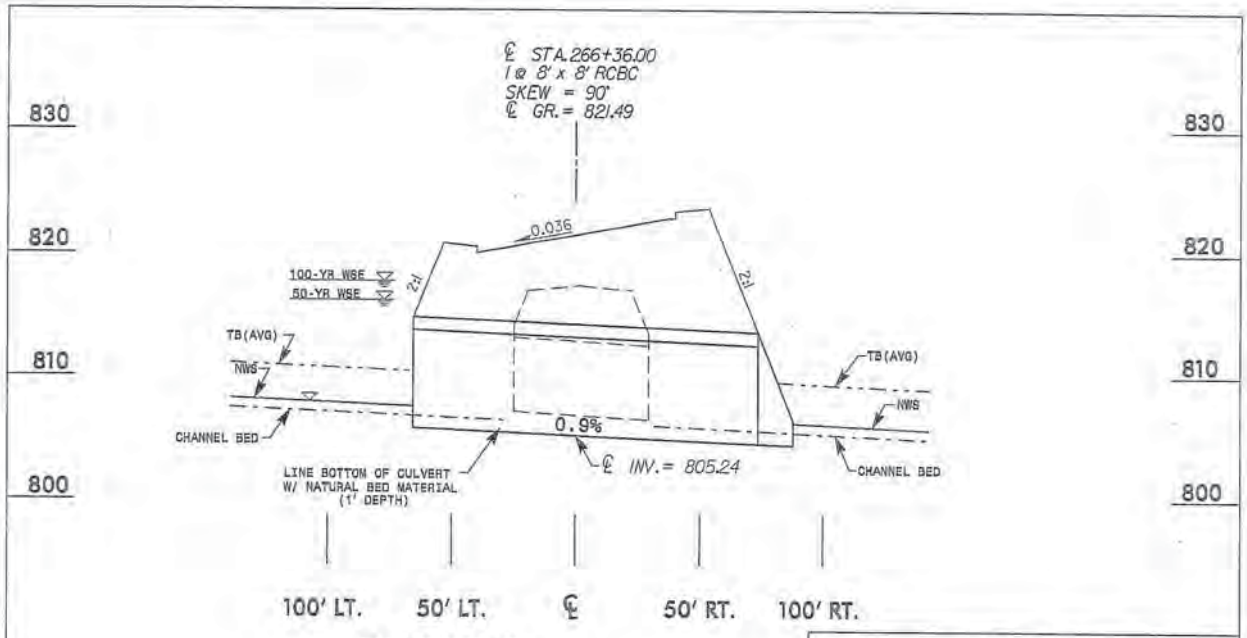

U-3615B
NW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing
Sheet 19 of 27
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Revised 10/28/14
WETHERILL ENGINEERING
SITE 7
SITE 6
-Y35-PCSta. 10+00.00
-Y35-POCSta. 10+22.26
BEGIN CONSTRUCTION
-Y35-PTSta. 12+20.20
-L- CSSta. 243+77.10
-L- STSta. 244+87.10
-L- SCSta. 248+56.56
-L- TSSta. 241+05.09
-L- POCSta. 242+13.32
-Y35- POTSta. 14+56.98
-L- SCSta. 242+15.09
MATCHLINE STA. 240+00.00 SHEET 9
MATCHLINE STA. 250+00.00 SHEET 11
CITY OF HIGH POINT
GLENN A. SEWARD
CHRIST COMMISSION MINISTRY INTERNATIONAL INC
DANIEL JOSEPH ENNIS
BETTY H. THOMPSON
SR 1834 KENDALE RD.
EST. 2015 / 2035 AADT
SR 1820
HIGH POINT CITY LIMITS (OUT)
HIGH POINT CITY LIMITS (IN)
NAD 83/95
GRAPHIC SCALE
DETAIL 1
STANDARD 'V' DITCH
FROM STA. 240+28 TO STA. 241+42 -L- (RT) (DOE 20 CY)
DETAIL 2
STANDARD BASE DITCH
FROM STA. 242+35 TO STA. 243+33 -L- (RT) (EST. 140 CY EXC.)
SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 26 FOR -Y35- PROFILE
SEE SHEET 2B-5 FOR TEMPORARY ALIGNMENT 2 DETAIL
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER


U-3615B
10
NW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing
Sheet 20 of 27
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Revised 10/28/14
ETHERIDGE ENGINEERING
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
ENVIRONMENTAL DESIGN - OS/OPS - CONSTRUCTION/IMPLEMENTATION
-Y35-PCSta. 10+00.00
-Y35-POCSta. 10+22.26
BEGIN CONSTRUCTION
SR 1834 KENDALE RD.
EST. 2015 2035 ADT
SITE 7
SITE 6
-L- CSSta. 243+77.10
-Y35-PTSta. 12+20.20
-L- ST Sta. 244+87.10
-L- SCSta. 245+56.66
HIGH POINT CITY LIMITS (OUT)
HIGH POINT CITY LIMITS (IN)
MATCHLINE STA. 240+00.00 SHEET 9
MATCHLINE STA. 255+00.00 SHEET 11
CITY OF HIGH POINT
GLENN A. SEWARD
CHRIST COMMISSION MINISTRY INTERNATIONAL INC
DANIEL JOSEPH ENNIS
BETTY H. THOMPSON
-L- TSSta. 241+05.09
-L- PCSta. 242+13.32
-Y35- POT Sta. 14+56.98
-L- 99Sta. 242+95.09
GRAPHIC SCALE
DETAIL 1
STANDARD "V" DITCH
FROM STA. 240+28 TO STA. 241+42 -L- (RT) (DDE 20 CY)
DETAIL 2
STANDARD BASE DITCH
FROM STA. 242+35 TO STA. 243+33 -L- (RT) (EST. 140 CY EXC.)
SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 26 FOR -Y35- PROFILE
SEE SHEET 28-5 FOR TEMPORARY ALIGNMENT 2 DETAIL
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

P-71


GRAPHIC SCALE
100' 0' 100'
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
U-3615B
SW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing
Sheet 21 of 27
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/95
SITE 8
SITE 8
RICHARD POSTIFF
SEE SHEET 2-I FOR INTERSECTION DETAILS
SEE SHEET 22 FOR -L- PROFILE
SEE SHEET 27 FOR -Y36-, -Y37-, -Y37A-, -Y38-, -Y39-, -Y40- PROFILES
DETAIL 1
STANDARD "V" DITCH
EDWIN V. GOMEZ
PETER W. FULLER
LEONARD W. EINHORN
KENNETH D. MILLER
THOMAS C. AMICO
DALE E. WATERSON
ARTHUR ENNIS HUGGINS
CHRISTINE B. GRAY
CHIQUITA TILLMAN MCALLISTER
NO CLAIM
GRADE TO DRAIN
STEPHEN F. ASHWORTH
JOHN L. MERRIMON
SAMUEL STEVEN KELLY
RICKY D. LYONS
LEVEL SPREADER SEE DETAIL SHT.
CL OF HIGH POINT
SCSta. 266+50.53
V-DITCH SEE DETAIL "1" DDE 8 CY 5 TONS CLASS "B" RIPRAP 4 SY FILTER FABRIC
V-DITCH SEE DETAIL "1" DDE 8 CY 7 TONS CLASS "B" RIPRAP 12 SY FILTER FABRIC
13 TONS CLASS "B" RIPRAP 23 SY FILTER FABRIC
CITY OF HIGH POINT
LYNN SHORES
-Y40-
MATCHLINE -L- 267+00.00 SHEET 12


U-3615B
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
SITE 8
NAD 83/95
MATCHLINE STA 257+00.00
SHEET 12
MATCHLINE STA 253+00.00
SHEET 10
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
SEE SHEET 2-J FOR INTERSECTION DETAILS
SEE SHEET 22 FOR -L- PROFILE
NO CLAIM
DETAIL 1
STANDARD "V" DITCH
REVISIONS
1. REVISED LABEL OFFSETS FOR EXISTING RIGHT OF WAY TO ACTUAL DISTANCES, 9/29/09
2. NAME CHANGE ON PARCELS 43, 44, 45, 46, 48, 49, 51, 52, 53, 56, 59 AND 60
3. PDE LINE SHIFT ON PARCEL 58.
5. REVISION: REMOVED TEMPORARY CONSTRUCTION EASEMENT AND CLAIM ON PARCEL 57, CHANGED THE NAME ON PARCEL 57, SLK



PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
WBS: 34962.1.1 (U-3615B)
WIDEN SR 1003-1008 (SKEET CLUB RD.)
EAST OF SR 1818 (JOHNSON ST.) TO WEST
OF NC 68 (EASTCHESTER DRIVE)

SHEET 23 OF 27 11/05/12

RECEIVED
APR 30 2013
RALEIGH REGULATORY
FIELD OFFICE

PROPERTY OWNERS

Site	Last Name	First Name	Address	City/Town	State	Zip Code
1	CURLIN	WILLIAM G.	PO Box 10	Wilson	NC	27894-0010
1	ORCHARDS KNOB OWNERS ASSOCIATION		UNKNOWN			
2	FOX RUN LAND CORP		4144 Johnson Street	High Point	NC	27265
2	LEE VARRICK MOORE, JR.		4302 Johnson Street	High Point	NC	27265
2 & 2A	HARRIS	JASON E.	P.O. Box 1550	Jamestown	NC	27282
3	MANSFIELD	LINDA S.	1121 Skeet Club Road	High Point	NC	27265
3	BRODD	RANDALL & ELIZABETH	UNKNOWN			
3 & 3A	CHA HUN CHAE		1127 Skeet Club Road	High Point	NC	27265
3B	SMITH	LESLIE R.	4302 Gelding Court	High Point	NC	27265
4	SMITH	LINDA M.	380 Knollwood St, Ste 201	Winston Salem	NC	27103

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
WBS - 34962.1.1 (U-3615B)

SHEET 24 of 27 11/5/2012

RECEIVED
APR 30 2013
RALEIGH REGULATORY
FIELD OFFICE

PROPERTY OWNERS

Site	Last Name	First Name	Address	City/Town	State	Zip Code
5	ALLRED	W.G.	1256 Skeet Club Road	High Point	NC	27265
5 & 5A	CITY OF HIGH POINT		P.O. Box 230	High Point	NC	27261
6 & 6A	CITY OF HIGH POINT		P.O. Box 230	High Point	NC	27261
7	CITY OF HIGH POINT		P.O. Box 230	High Point	NC	27261
8	CITY OF HIGH POINT		P.O. Box 230	High Point	NC	27261
8A	HORNE	DAVID S.	1426 Skeet Club Road	High Point	NC	27265
8A & 9	SHERWOOD HOA INC.		P.O. Box 24961	Winston Salem	NC	27114

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
WBS - 34962.1.1 (U-3615B)

SHEET 25 of 27 11/5/2012

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	170+67 -L-	2@66" RCP						0.01	<0.01	119	16	
2	180+59/188+46 -L-	RELOCATE CHANNEL						2.20		594	10	
~~2A~~	~~187+00/188+46 -L-~~	~~ROCK FILL IN POND~~						~~0.02~~				
3	197+50/204+26-L-	NAT. STREAM DESIGN								699	10	760
3A	199+27/199+95 -L-	2@54" RCP						<0.01	<0.01	38	10	
3B	208+63 -L-	48" RCP						<0.01	<0.01	109	4	
		BANK STABILIZATION								10		
3C	201+27/204+76 -L-	NAT. STREAM DESIGN			0.67			<0.01		63		
4	218+72/219+72 -L-	2@30" RCP	0.13		<0.01							
5	231+60/232+27-L-	30" RCP	<0.01			0.01		<0.01		131	16	
5A	232+87/236+40 -L-	ROCK FILL IN LAKE						0.01				
6	237+28/239+38 -L-	BRIDGE						0.19	0.29			
SUBTOTALS:			0.13		0.67	0.01		2.45	0.30	1763	66	760

Note: Site 2A has been eliminated due to Roadway Design eliminating two travel lanes and median.

Revised 10/28/14

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILDFORD COUNTY

WBS - 34962.1.1 (U-3615B)

SHEET 26 of 27 Rev.'d 10/28/14 4/9/2013

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)
7	12+20 -Y35-	42" RCP						<0.01	<0.01	49	19	
8	266+36 -L-	8'X8' RCBC						0.03	<0.01	186	32	
		BANK STABILIZATION								101		
	SHEET 1	SUBTOTALS:	0.13		0.67	0.01		2.45	0.30	1763	66	760
SHEET 2 SUBTOTALS:								0.03	<0.01	336	51	
TOTALS:			**0.13**		**0.67**	**0.01**		**2.48**	**0.31**	**2099**	**117**	**760**

BRIDGE SURFACE WATER TEMPORARY IMPACTS = 0.29 a.c. (Work Pads)

Revised 10/28/14

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILDFORD COUNTY

WBS - 34962.1.1 (U-3615B)

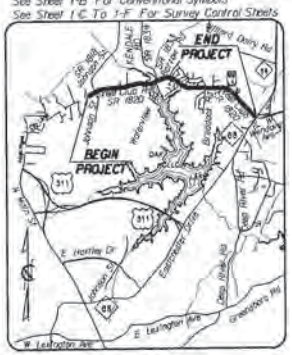
SHEET 27 of 27 Rev.'d 10/28/14 4/9/2013

ATN Revised 3/31/05

TIP PROJECT: U-3615B

CONTRACT: C203256

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols
See Sheet 1-C To 1-F For Survey Control Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

Revised 10/28/14

Buffer Drawing Sheet 1 of 13

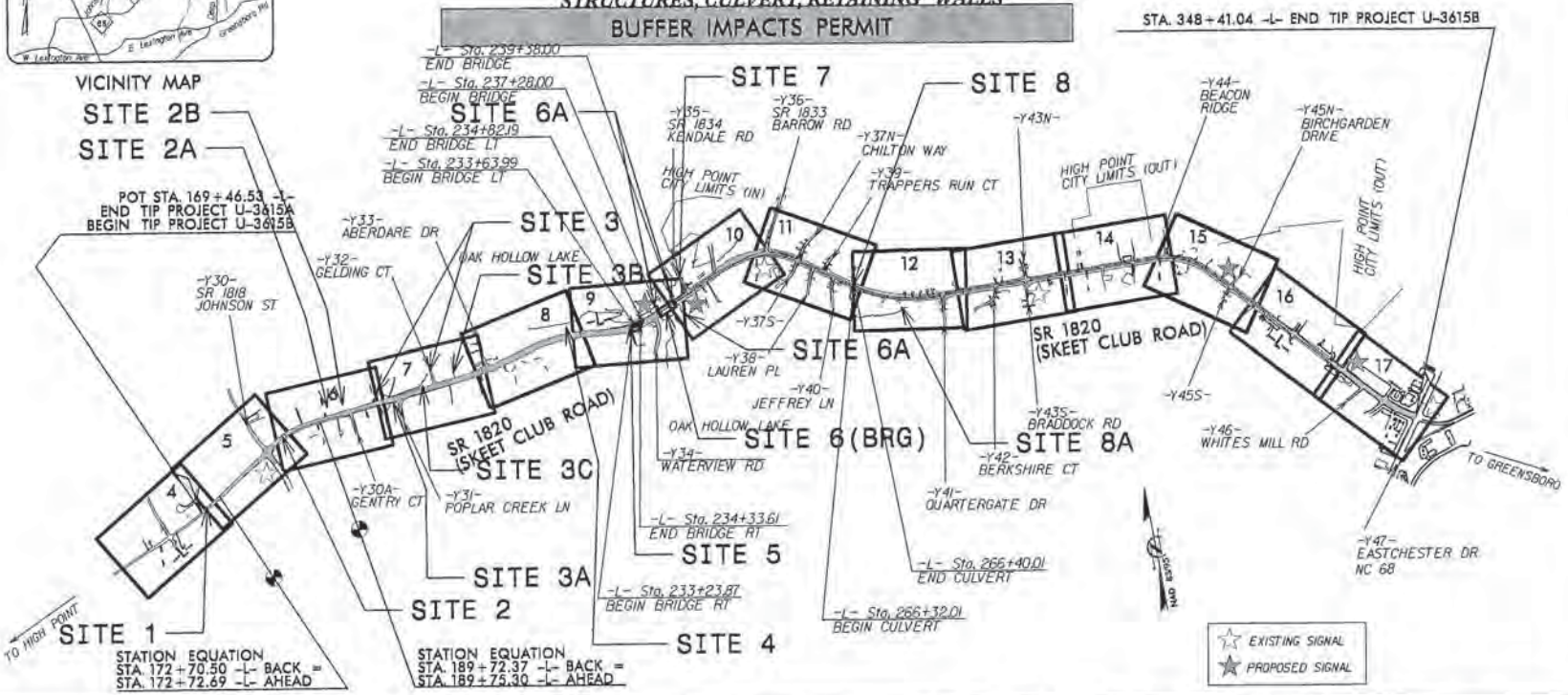
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3615B	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34962.1.1	STP-1820(2)	P.E.
34962.2.3	STP-1820(5)	R/W, UTL.
34962.3.PD1	STP-1820(5)	CONST.

LOCATION: HIGH POINT – SR 1820 (SKEET CLUB ROAD) FROM EAST OF SR 1818 (JOHNSON STREET) TO WEST OF NC 68 (EASTCHESTER DRIVE).

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, STRUCTURES, CULVERT, RETAINING WALLS

BUFFER IMPACTS PERMIT



GRAPHIC SCALES

50 25 0 50 100 — PLANS

50 25 0 50 100 — PROFILE (HORIZONTAL)

10 5 0 10 20 — PROFILE (VERTICAL)

DESIGN DATA

ADT 2015 = 24540
ADT 2035 = 34700
K = 10 %
D = 60 %
T = 5 % *
V = 50 MPH
* (TTST = 2% + DUAL 3%)
FUNC CLASS = URBAN MINOR ARTERIAL SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3615B = 3.326 MI
LENGTH STRUCTURE TIP PROJECT U-3615B = 0.062 MI
TOTAL LENGTH OF TIP PROJECT U-3615B = 3.388 MI

WETHERILL ENGINEERING

Prepared for the North Carolina Department of Transportation in the Office of:

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 27, 2009

LETTING DATE: JANUARY 20, 2015

NCDOT CONTACT:

EDWARD G. WETHERILL, PE — PROJECT ENGINEER

GREG S. PURVIS, PE — PROJECT DESIGN ENGINEER

BRENDA L. MOORE, PE — ROADWAY DESIGN ENGINEERING COORDINATION SECTION PROJECT ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 012575 ENGINEER

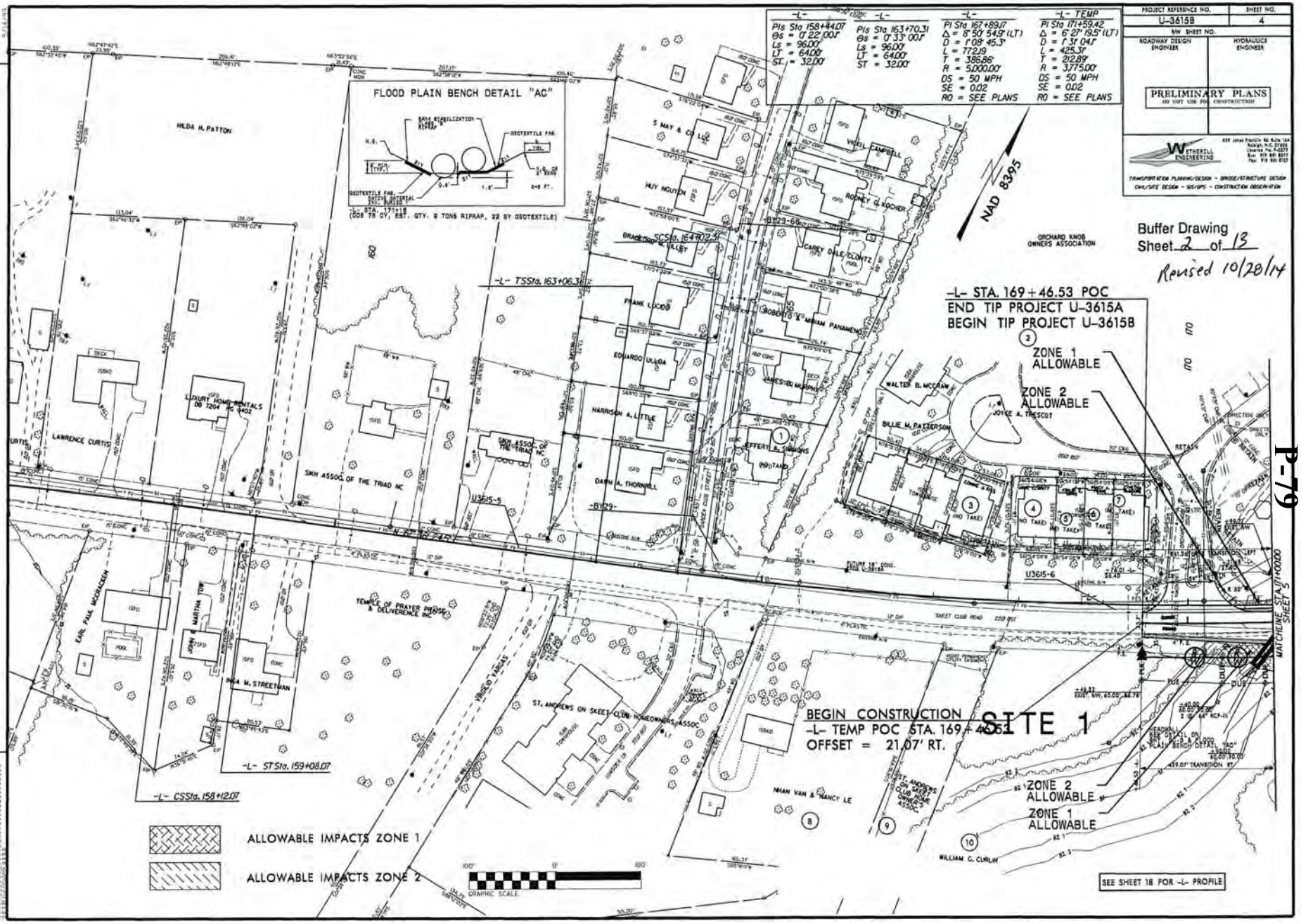
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

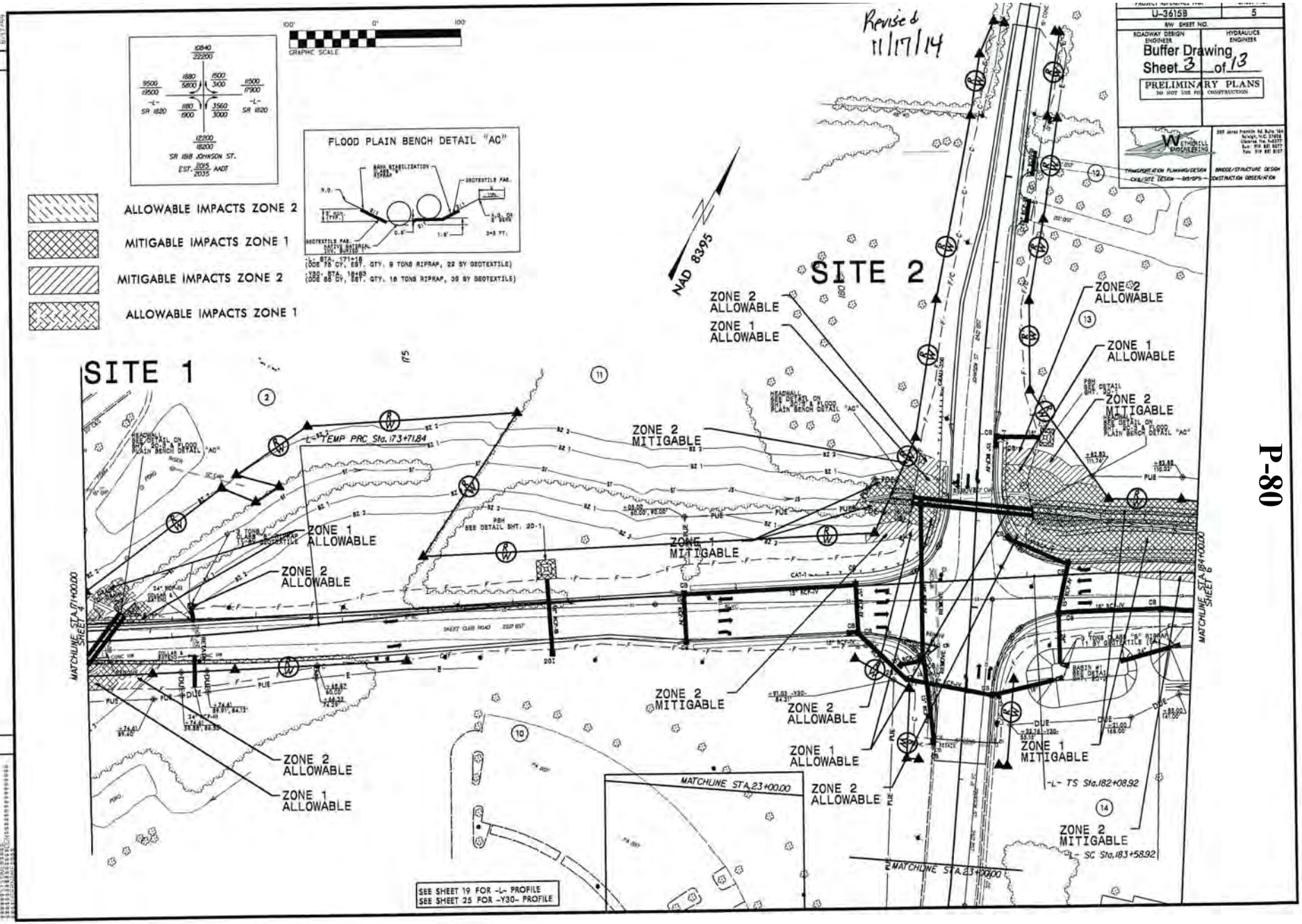
NORTH CAROLINA PROFESSIONAL SEAL 022999 ENGINEER

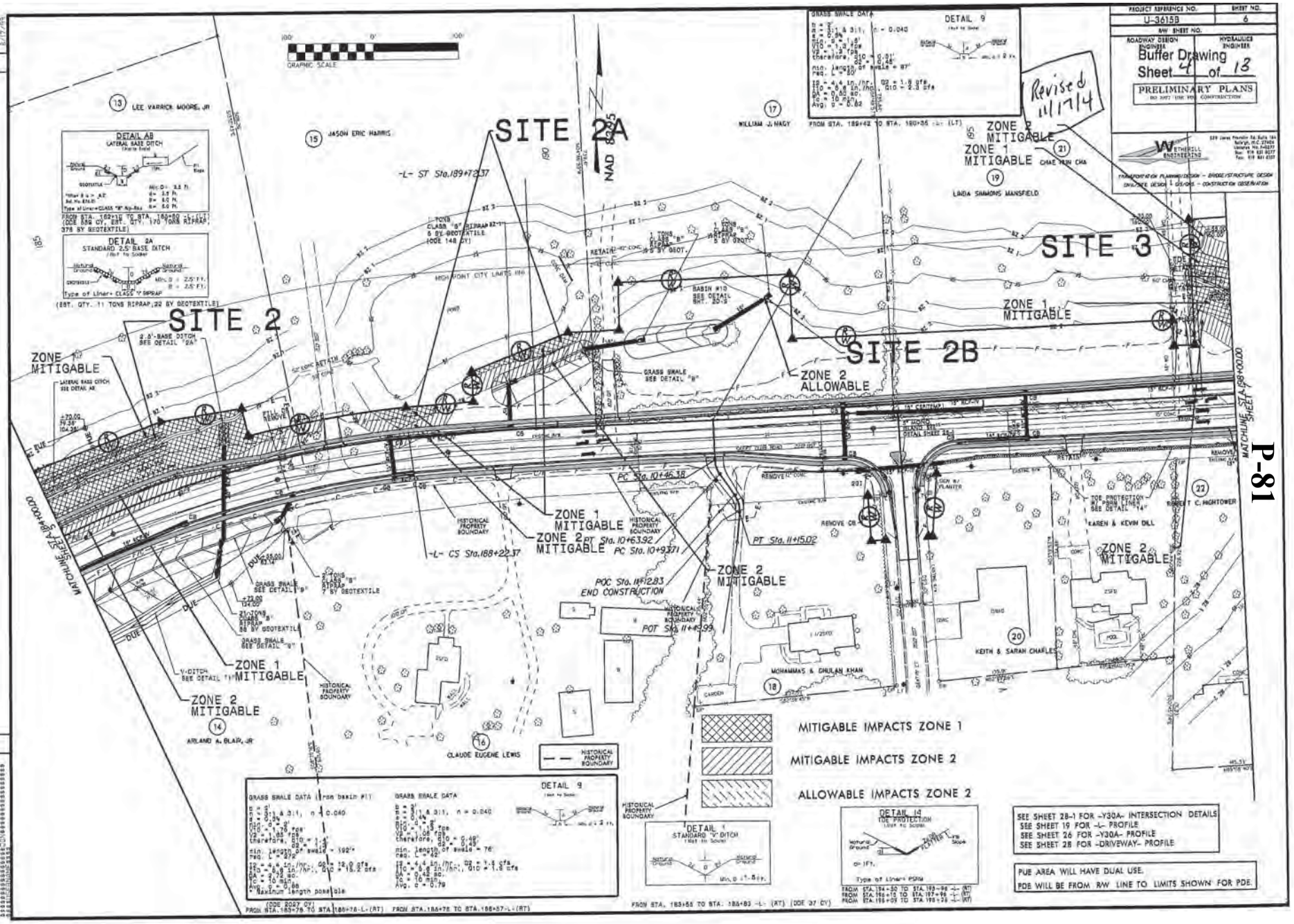
SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

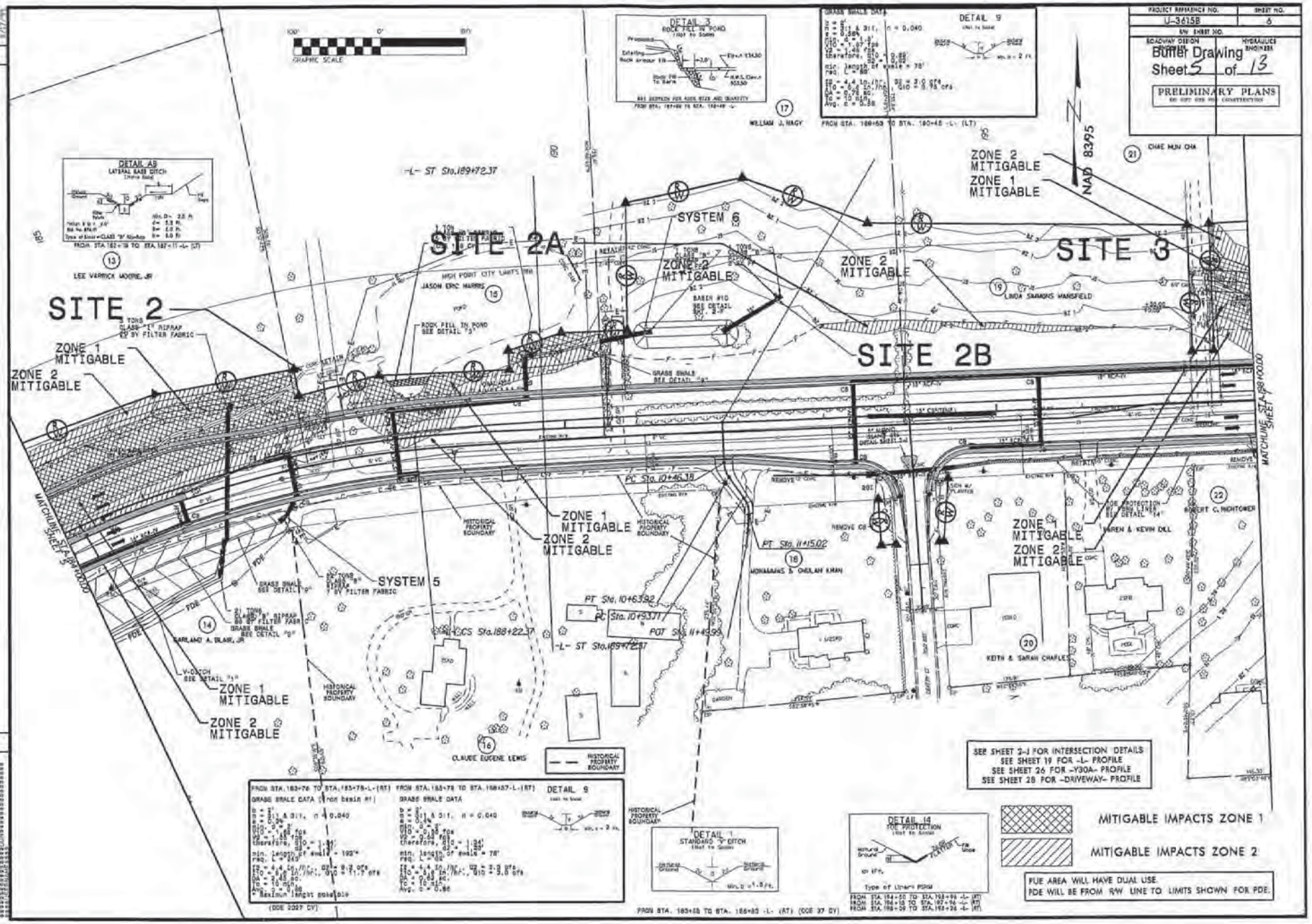

PROJECT REFERENCE NO.
U-3615B
SHEET NO.
4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
WETHERILL ENGINEERING
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - SIGNS/GPS - CONSTRUCTION OBSERVATION
-L-
PIs Sta 158+44.07
Θs = 0° 22' 00.0"
Ls = 96.00'
LT = 64.00'
ST = 32.00'
-L-
PIs Sta 163+70.31
Θs = 0° 33' 00.0"
Ls = 96.00'
LT = 64.00'
ST = 32.00'
-L-
PI Sta 167+89.17
Δ = 8° 50' 54.5" (LT)
D = 1° 08' 45.3"
L = 772.29'
T = 386.86'
R = 5,000.00'
DS = 50 MPH
SE = 0.02
RO = SEE PLANS
-L- TEMP
PI Sta 171+59.42
Δ = 6° 27' 19.5" (LT)
D = 1° 31' 04.1"
L = 425.31'
T = 212.89'
R = 3,775.00'
DS = 50 MPH
SE = 0.02
RO = SEE PLANS
FLOOD PLAIN BENCH DETAIL "AC"
(DOE 75 CY, EST. QTY. 9 TONS RIPRAP, 22 SY GEOTEXTILE)
NAD 83/95
Buffer Drawing
Sheet 2 of 13
Revised 10/20/14
-L- STA. 169 + 46.53 POC
END TIP PROJECT U-3615A
BEGIN TIP PROJECT U-3615B
ZONE 1 ALLOWABLE
ZONE 2 ALLOWABLE
BEGIN CONSTRUCTION
-L- TEMP POC STA. 169 + 46.53
OFFSET = 21.07' RT.
SITE 1
ZONE 2 ALLOWABLE
ZONE 1 ALLOWABLE
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
GRAPHIC SCALE
SEE SHEET 1B FOR -L- PROFILE
MATCHLINE STA. 171+00.00 SHEET 3
-L- TSSta. 163+06.38
-L- CSSta. 158+12.07
-L- STSta. 159+08.07
HILDA H. PATTON
LAWRENCE CURTIS
LUXURY HOME RENTALS
S MAY & CO LLC
HUY NGUYEN
BRADFORD W. TILLEY
FRANK LUCIDO
EDUARDO ULLOA
HARRISON A. LITTLE
DAWN A. THORNELL
SKH ASSOC. OF THE TRIAD INC
TEMPLE OF PRAYER PRAISE & DELIVERENCE INC
ST. ANDREWS ON SKEET CLUB HOMEOWNERS ASSOC
ORCHARD KNOB OWNERS ASSOCIATION
WALTER B. MCCRAW
BILLIE M. PATTERSON
JOYCE A. TRESCOT
NHAN VAN & NANCY LE
WILLIAM G. CURLIN
EARL PAUL MCCRACKEN
MAGA M. STREETMAN
SKEET CLUB ROAD
U3615-5
U3615-6
REVISIONS

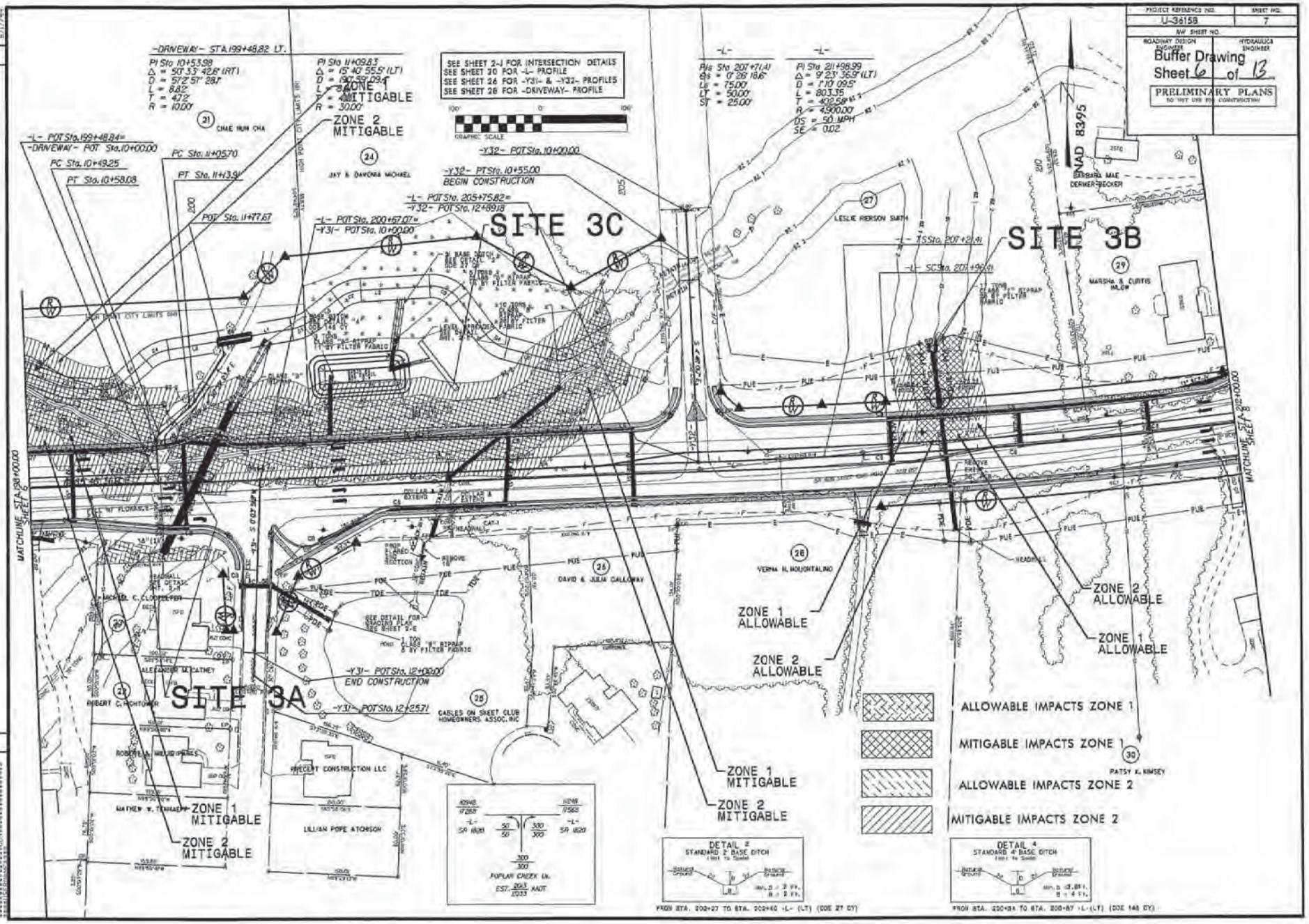
P-79


Revised 11/17/14
U-3615B
5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Buffer Drawing
Sheet 3 of 13
PRELIMINARY PLANS
NOT FOR CONSTRUCTION
WETHERILL ENGINEERING
TRANSPORTATION PLANNING/DESIGN
BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN
CONSTRUCTION OBSERVATION
GRAPHIC SCALE
100' 0' 100'
SR 1818 JOHNSON ST.
EST. 2015 2035 AADT
ALLOWABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
ALLOWABLE IMPACTS ZONE 1
FLOOD PLAIN BENCH DETAIL "AC"
NAD 83/95
SITE 1
SITE 2
-L- TEMP PRC Sta. 173+71.84
ZONE 2 ALLOWABLE
ZONE 1 ALLOWABLE
ZONE 2 MITIGABLE
ZONE 1 MITIGABLE
MATCHLINE STA. 171+00.00 SHEET 4
MATCHLINE STA. 184+00.00 SHEET 6
MATCHLINE STA. 23+00.00
-L- TS Sta. 182+08.92
-L- SC Sta. 183+58.92
SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 25 FOR -Y30- PROFILE
REVISIONS
REVISIONS

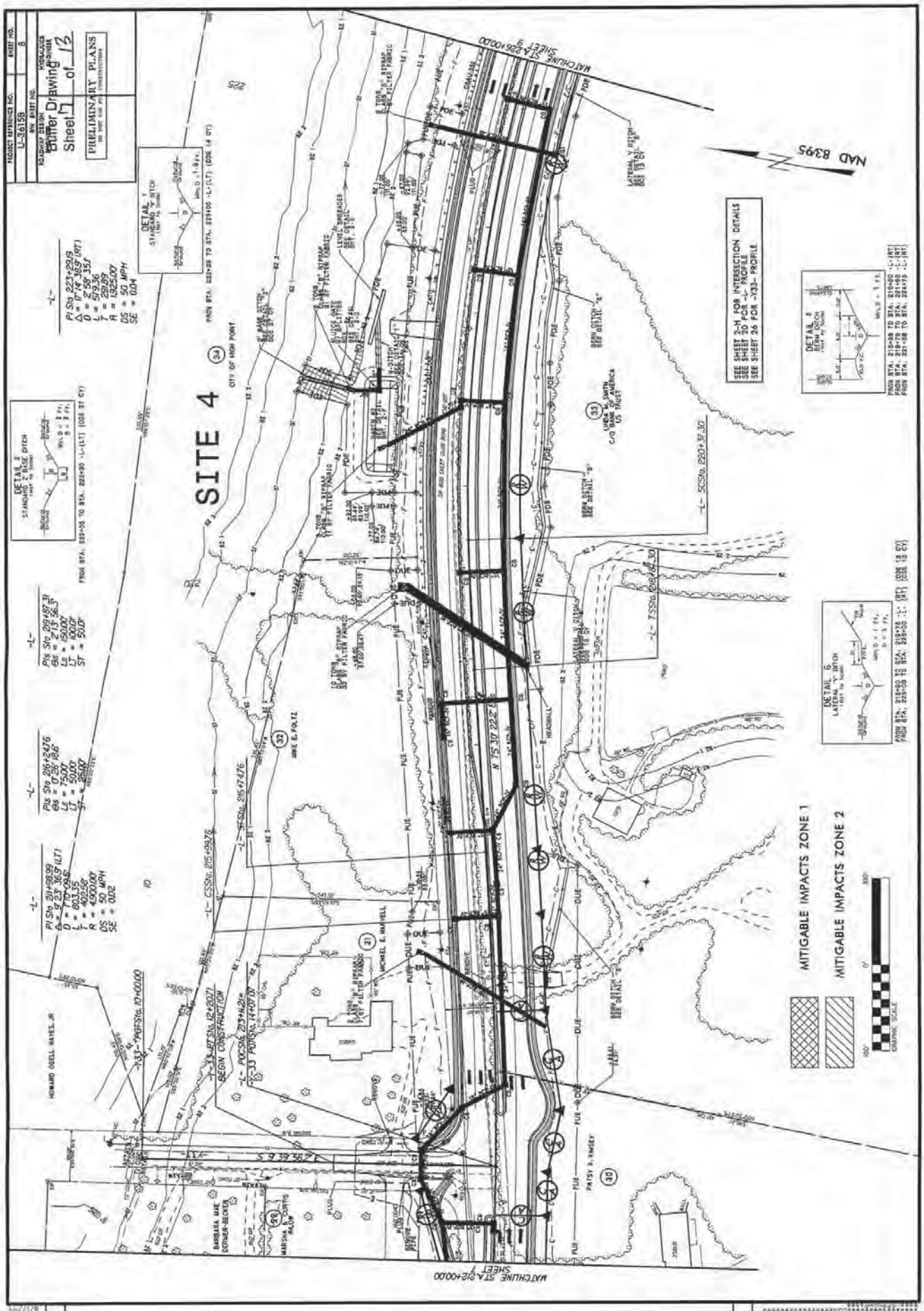

PROJECT REFERENCE NO.
U-3615B
SHEET NO.
6
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Buffer Drawing
Sheet 4 of 13
PRELIMINARY PLANS
NOT FOR CONSTRUCTION
WETHERILL ENGINEERING
Revised 11/17/14
SITE 2A
SITE 2
SITE 2B
SITE 3
ZONE 1 MITIGABLE
ZONE 2 MITIGABLE
ZONE 2 ALLOWABLE
LEE VARRICK MOORE, JR
JASON ERIC HARRIS
WILLIAM J. NAGY
CHAE HUN CHA
LINDA SIMMONS MANSFIELD
ARLAND A. BLAIR, JR
CLAUDE EUGENE LEWIS
MOHAMMAD & GHULAN KHAN
KEITH & SARAH CHARLES
KAREN & KEVIN DILL
ROBERT C. HIGHTOWER
-L- ST Sta.189+72.37
-L- CS Sta.188+22.37
PC Sta. 10+46.38
PT Sta. 10+63.92
PC Sta. 10+93.71
PT Sta. 11+15.02
POC Sta. 11+12.83
END CONSTRUCTION
POT Sta. 11+43.99
HIGH POINT CITY LIMITS
HISTORICAL PROPERTY BOUNDARY
MATCHLINE STA.198+00.00 SHEET 7
MATCHLINE STA.184+00.00 SHEET 5
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
ALLOWABLE IMPACTS ZONE 2
DETAIL 9
DETAIL 1
STANDARD "V" DITCH
DETAIL 14
TOE PROTECTION
DETAIL AB
LATERAL BASE DITCH
DETAIL 2A
STANDARD 2.5' BASE DITCH
SEE SHEET 28-1 FOR -Y30A- INTERSECTION DETAILS
SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 26 FOR -Y30A- PROFILE
SEE SHEET 28 FOR -DRIVEWAY- PROFILE
PUE AREA WILL HAVE DUAL USE.
PDE WILL BE FROM R/W LINE TO LIMITS SHOWN FOR PDE.
FROM STA. 183+55 TO STA. 186+83 -L- (RT) (DOE 37 CY)
(DOE 2027 CY)
FROM STA.183+79 TO STA.188+78-L-(RT) FROM STA.188+78 TO STA.188+57-L-(RT)

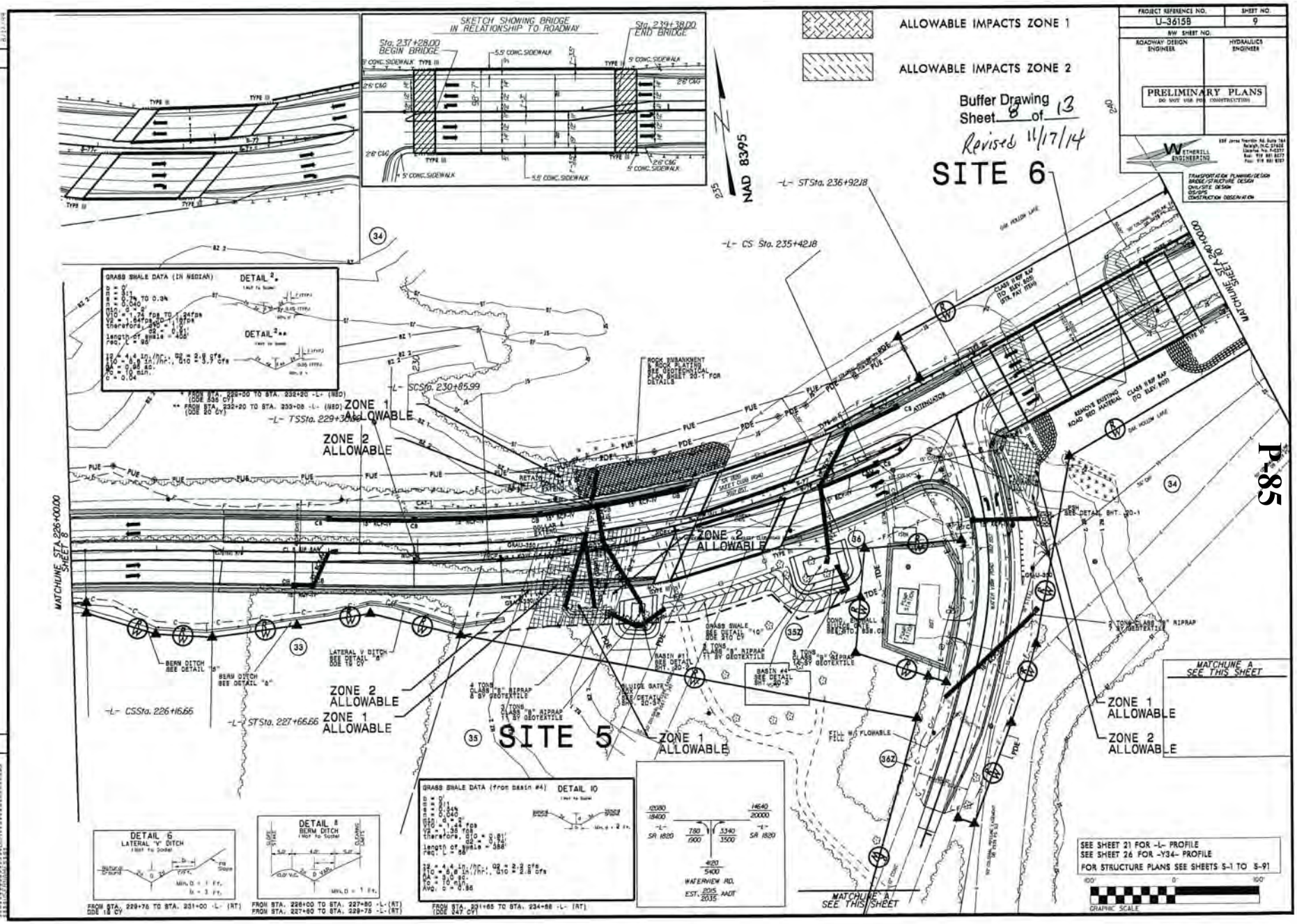
P-81


PROJECT REFERENCE NO.
U-3615B
SHEET NO.
6
R/W SHEET NO.
ROADWAY DESIGN
HYDRAULICS ENGINEER
Butler Drawing
Sheet 5 of 13
PRELIMINARY PLANS
NAD 83/95
SITE 2
SITE 2A
SITE 2B
SITE 3
ZONE 1 MITIGABLE
ZONE 2 MITIGABLE
SYSTEM 5
SYSTEM 6
-L- ST Sta.189+72.37
PC Sta.10+46.38
PT Sta.11+15.02
PT Sta.10+63.92
PC Sta.10+93.31
POT Sta.11+43.99
-L- CCS Sta.188+22.37
-L- ST Sta.189+72.37
MATCHLINE STA.89+00.00 SHEET 5
MATCHLINE STA.89+00.00 SHEET 7
GRAPHIC SCALE
DETAIL 3
ROCK FILL IN POND
DETAIL 9
DETAIL A8
LATERAL BARE DITCH
DETAIL 1
STANDARD "V" DITCH
DETAIL 14
TOE PROTECTION
LEE VARNICK MOORE, JR
JASON ERIC HARRIS
WILLIAM J. NAGY
LINDA SIMMONS MANSFIELD
GARLAND A. BLAIR, JR
CLAUDE EUGENE LEWIS
MONAMARA & GHELAN KHAN
KEITH & SARAH CHAPLES
KAREN & KEVIN DILL
ROBERT C. NIGHTOWER
CHAE MUN CHA
HISTORICAL PROPERTY BOUNDARY
SEE SHEET 2-J FOR INTERSECTION DETAILS
SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 26 FOR -Y30A- PROFILE
SEE SHEET 28 FOR -DRIVEWAY- PROFILE
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
FUE AREA WILL HAVE DUAL USE.
PDE WILL BE FROM R/W LINE TO LIMITS SHOWN FOR PDE.
REVISIONS:
9/29/99 RW REVISION: REVISED LABEL OFFSETS FOR EXISTING RIGHT OF WAY TO ACTUAL DISTANCE.
6/9/03 RW REVISION: ADDED TEMPORARY CONSTRUCTION EASEMENT AROUND DETENTION POND ON PARCEL 15 - SUE

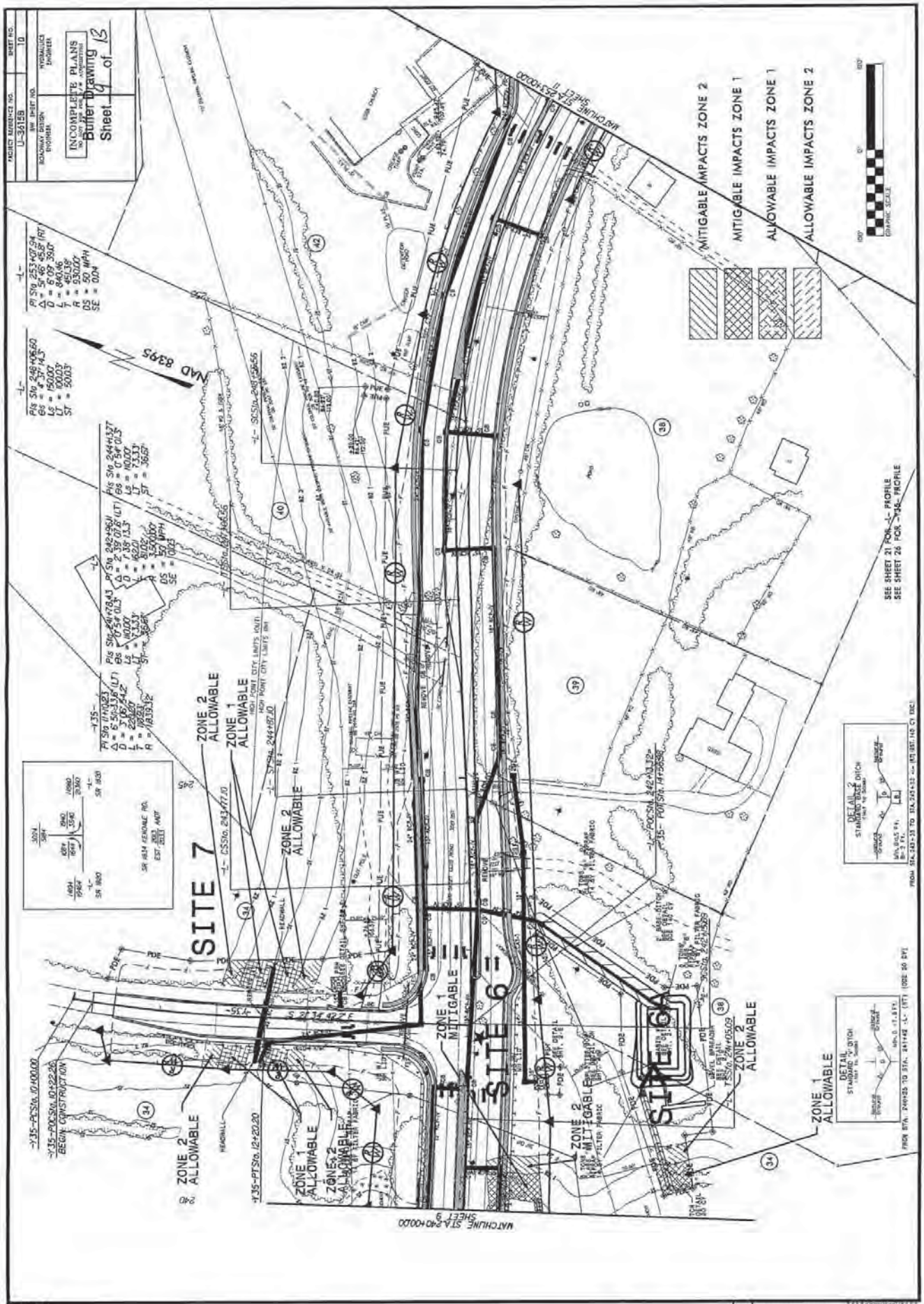

PROJECT REFERENCE NO. U-3615B
SHEET NO. 7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Buffer Drawing
Sheet 6 of 13
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/95
SITE 3A
SITE 3B
SITE 3C
ZONE 1 MITIGABLE
ZONE 2 MITIGABLE
ZONE 1 ALLOWABLE
ZONE 2 ALLOWABLE
ALLOWABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 2
SEE SHEET 2-J FOR INTERSECTION DETAILS
SEE SHEET 2D FOR -L- PROFILE
SEE SHEET 2E FOR -Y31- & -Y32- PROFILES
SEE SHEET 2B FOR -DRIVEWAY- PROFILE
GRAPHIC SCALE
-DRIVEWAY- STA.199+48.82 LT.
PI Sta 10+53.98
Δ = 50° 33' 42.8" (RT)
D = 57° 21' 28.1"
L = 88.2'
T = 47.2'
R = 10.00'
PI Sta 11+09.83
Δ = 15° 40' 55.5" (LT)
D = 190° 59' 09.4"
L = 80.00'
T = 40.11'
R = 30.00'
-L- POT Sta.199+48.84= -DRIVEWAY- POT Sta.10+00.00
PC Sta. 10+49.25
PT Sta. 10+58.08
PC Sta. 11+05.70
PT Sta. 11+13.91
POT Sta. 11+77.67
-L- POT Sta. 200+67.07= -Y31- POT Sta. 10+00.00
-L- POT Sta. 205+75.82= -Y32- POT Sta. 12+89.18
-Y32- POT Sta. 10+00.00
-Y32- PT Sta. 10+55.00 BEGIN CONSTRUCTION
-Y31- POT Sta. 12+09.00 END CONSTRUCTION
-Y31- POT Sta. 12+25.71
-L-
PI Sta 207+71.41
Δ = 0° 26' 18.6"
Ls = 75.00'
LT = 50.00'
ST = 25.00'
-L-
PI Sta 211+98.99
Δ = 9° 23' 36.9" (LT)
D = 1° 10' 09.5"
L = 803.35
T = 402.58'
R = 4,900.00'
DS = 50 MPH
SE = 0.02
-L- TS Sta. 207+21.41
-L- SC Sta. 207+96.41
MATCHLINE STA. 98+00.00 SHEET 8
MATCHLINE STA. 202+00.00 SHEET 8
DETAIL 2
STANDARD 2' BASE DITCH
DETAIL 4
STANDARD 4' BASE DITCH
FROM STA. 202+27 TO STA. 202+40 -L- (LT) (DOE 27 CY)
FROM STA. 200+84 TO STA. 200+87 -L- (LT) (DOE 148 CY)
POPLAR CREEK LN.
EST. 2013 / 2033 AADT
JAY & DAVONNA MICHAEL
LESLIE PIERSON SMITH
BARBARA MAE DERMER-BECKER
MARSHA & CURTIS INLOW
VERNA H. HOUGHTALING
DAVID & JULIA GALLOWAY
CABLES ON SHEET CLUB HOMEOWNERS ASSOC. INC
PRECEDENT CONSTRUCTION LLC
LILLIAN POPE ATKINSON
PATSY K. KINSEY
ALEXANDER M. CATHEY
ROBERT C. HIGHTOWER
MICHAEL C. CLOUSE-FER
MATHEW W. TOWNSEND
ROBERTA WELLS JONES

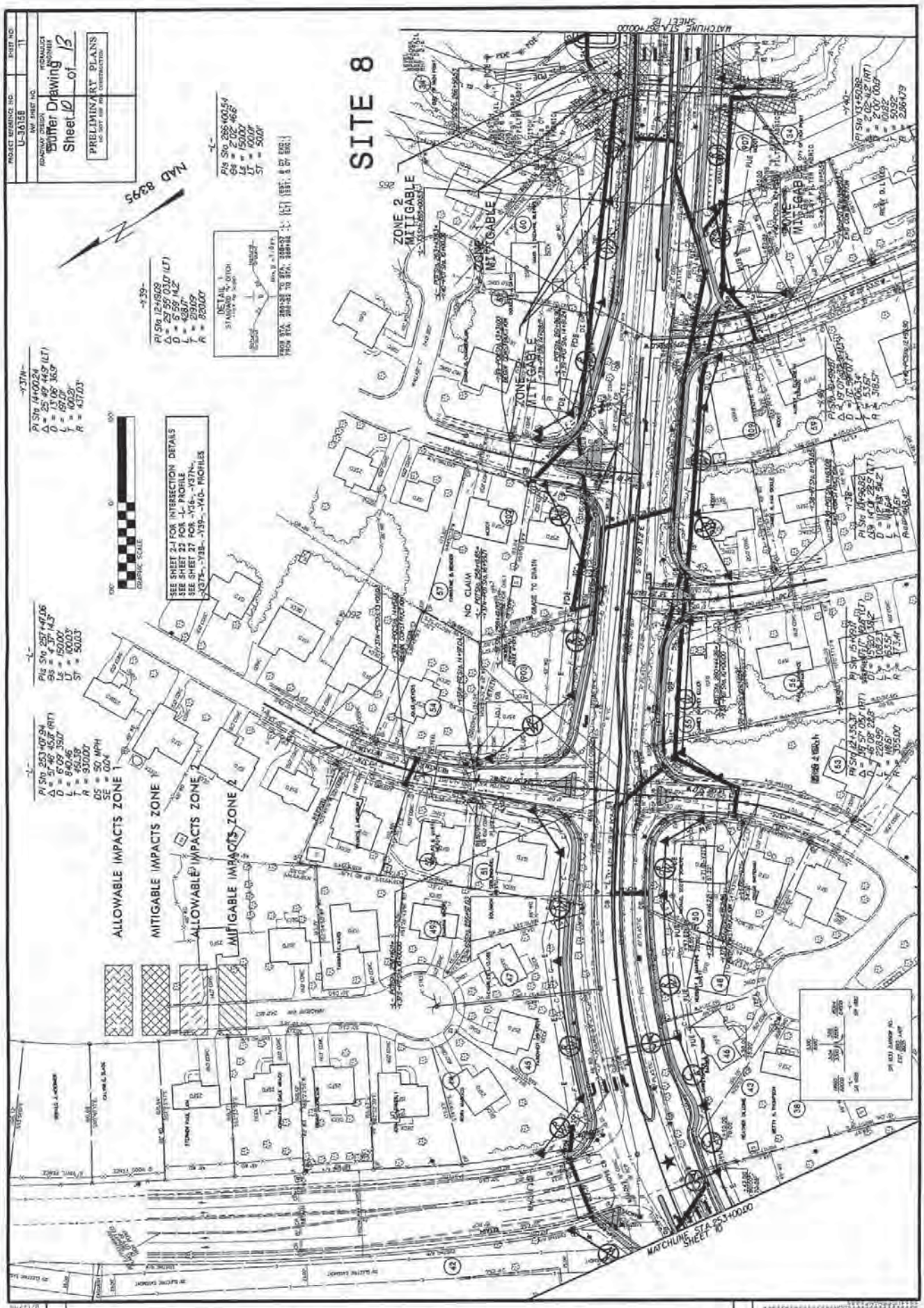
P-83

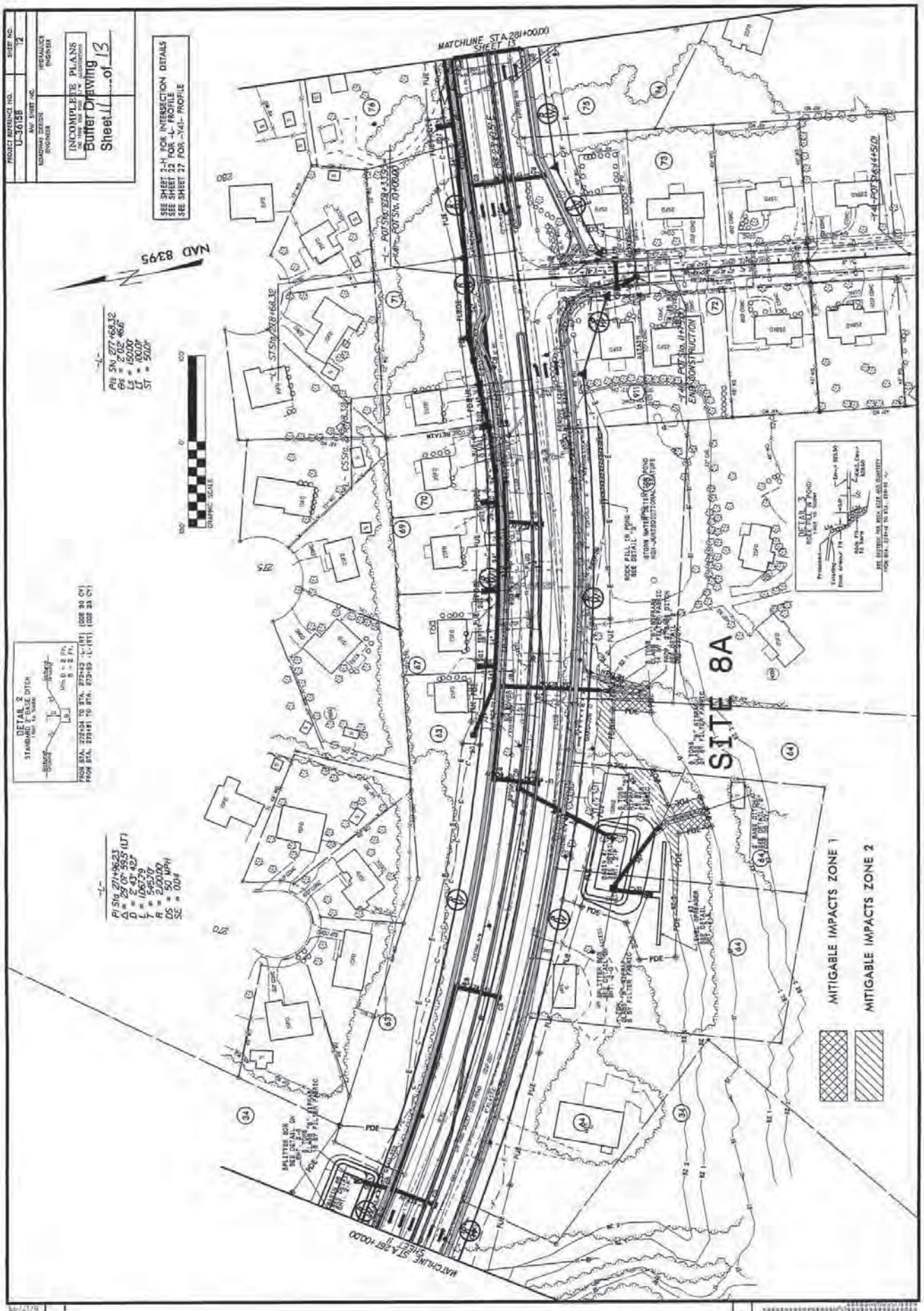

SITE 4
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
NAD 83/95
PRELIMINARY PLANS
Sheet 7 of 12
MATCHLINE STA 212+00.00 SHEET 9
MATCHLINE STA 215+00.00 SHEET 7
BEGIN CONSTRUCTION
SEE SHEET 24 FOR -J- PROFILE
SEE SHEET 26 FOR -J33- PROFILE
DETAIL 1
DETAIL 2
DETAIL 5
DETAIL 8
HOWARD ODELL HAYES, JR
BARBARA MAE DEFNER-BECKER
MARSHA A. CURTIS
MICHAEL E. MAXWELL
PATSY A. HAGGEY
LINDA M. SMITH C/O BANK OF AMERICA
CITY OF HIGH POINT
GRAPHIC SCALE


ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
Buffer Drawing Sheet 8 of 13
Revised 11/17/14
SITE 6
SITE 5
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
U-3615B
SHEET NO. 9
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
ETHERELL ENGINEERING
SKETCH SHOWING BRIDGE IN RELATIONSHIP TO ROADWAY
Sta. 237+28.00 BEGIN BRIDGE
Sta. 239+38.00 END BRIDGE
NAD 83/95
-L- ST Sta. 236+92.18
-L- CS Sta. 235+42.18
-L- SC Sta. 230+85.99
-L- TS Sta. 229+30.00
-L- CS Sta. 226+16.66
-L- ST Sta. 227+66.66
ZONE 1 ALLOWABLE
ZONE 2 ALLOWABLE
MATCHLINE STA. 226+00.00 SHEET 8
MATCHLINE STA. 240+00.00 SHEET 10
MATCHLINE A SEE THIS SHEET
GRASS SWALE DATA (IN MEDIAN)
DETAIL 2
DETAIL 6 LATERAL 'V' DITCH
DETAIL 8 BERM DITCH
DETAIL 10
GRASS SWALE DATA (from basin #4)
WATERVIEW RD.
EST. 2006 2035 ADT
SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 26 FOR -Y34- PROFILE
FOR STRUCTURE PLANS SEE SHEETS S-1 TO S-91
GRAPHIC SCALE

P-85


INCOMPLETE PLANS
Buffer Drawing
Sheet 4 of 13
MITIGABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
SITE 7
SITE 6
SITE 5
ZONE 2 ALLOWABLE
ZONE 1 ALLOWABLE
ZONE 1 MITIGABLE
ZONE 2 MITIGABLE
NAD 83/95
SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 26 FOR -Y35- PROFILE
DETAIL 2
STANDARD BASE DITCH
DETAIL
STANDARD "V" DITCH
MATCHLINE STA 253+00.00
MATCHLINE STA 240+00.00
BEGIN CONSTRUCTION
REVISIONS


PROJECT REFERENCE NO.
U-3615B
SHEET NO.
11
ROADWAY DESIGN
HYDRAULICS ENGINEER
Buffer Drawing
Sheet 10 of 13
PRELIMINARY PLANS
NOT FOR CONSTRUCTION
NAD 83/95
SITE 8
ZONE 2
MITIGABLE
ZONE 1
MITIGABLE
ZONE 2
MITIGABLE
ALLOWABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 2
NO CLAIM
SEE SHEET 2-1 FOR INTERSECTION DETAILS
SEE SHEET 22 FOR -L- PROFILE
SEE SHEET 27 FOR -Y16-, -Y37N-, -Y37S-, -Y38-, -Y39-, -Y40- PROFILES
GRAPHIC SCALE
DETAIL 1
STANDARD "L" DITCH
MATCHLINE STA 253+00.00
SHEET 10
MATCHLINE STA 257+00.00
SHEET 12


PROJECT REFERENCE NO.
U-3615B
SHEET NO.
12
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR CONSTRUCTION
Buffer Drawing
Sheet 11 of 13
SEE SHEET 21-H FOR INTERSECTION DETAILS
SEE SHEET 22 FOR -L- PROFILE
SEE SHEET 27 FOR -Y41- PROFILE
NAD 83/95
DRAWING SCALE
MATCHLINE STA 281+00.00
SHEET 13
SITE 8A
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
DETAIL 2
STANDARD 2' BASE DITCH
DETAIL 3
ROCK FILL IN POND
SPLITTER BOX
SEE DETAIL
EMBANKMENT CONSTRUCTION
ROCK FILL IN POND
SEE DETAIL
STORM WATER POND
NON-JURISDICTIONAL WETLANDS
PI Sta 271+96.23
Δ = 29° 09' 59.5" (LT)
D = 2° 43' 42.2"
L = 1067.29
T = 548.79
R = 2100.00
DS = 50 MPH
SE = 0.04
PI Sta 277+68.32
Δ = 7° 02' 46.6"
L = 150.00
LT = 100.00
ST = 50.00
FROM STA. 272+04 TO STA. 272+43 -L- (LT) (DOE 30 CY)
FROM STA. 279+61 TO STA. 279+99 -L- (LT) (DOE 33 CY)
REVISIONS
1. REVISED LABEL OFFSETS FOR EXISTING RIGHT OF WAY TO ACTUAL DISTANCES. 9/29/09
2. MADE CHANGES ON SHEETS 13, 17, 18, 20, 21, 46 TO 71 AND 75
3. ADDED EXISTING DRIVE OPEN ON PARCEL 65
4. MADE CHANGE OF PARCELS 76 AND DRAE BETWEEN CHANGE
5. MADE CHANGE ON PARCEL 911 TO NCDOT.
55412 NW REVISION: COMBINED PARCELS 064, 065, AND 066 INTO ONE PARCEL AS 064 - SIX
REVISIONS

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STATION (FROM/TO)	STRUCTURE SIZE / TYPE	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	170+02/172+39 -L-	2 @66" RCP & 24"RCP	X			5869	1671						
2	180+10/187+26 -L-(LT)	RELOCATE CHANNEL	X		X	3975	2546		31061	13632			
2A	187+61/190+55-L-(LT)	ROADWAY FILL & GRASS SWALE			X				2456	5717			
2B	192+48 -L-(LT)	RIPRAP PAD			X		51						
3	197+50/205+22-L-(LT)	NAT. STREAM DESIGN			X				52487	31125		45810	29829
3A	198+75/200+23 -L-(RT)	2@54" RCP	X			2216	623						
3B	208+02/209+14 -L-(LT)	48" RCP	X			6967	4638						
3C	202+96-L-(LT)	LEVEL SPREADER			X		64						
4	221+87 /223+01-L-(LT)	2' BASE DITCH(BYPASS)			X	1166	998						
5	231+05/232+65-L-(LT&RT)	30" RCP	X			8562	4228						
SUBTOTALS=:						28755	14819		86004	50474		45810	29829

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
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BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STATION (FROM/TO)	STRUCTURE SIZE / TYPE	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
6	237+28 /239+38-L-	BRIDGE APPROACH	X			3478	1674						
6A	240+18/240+81 -L-(RT)	"V" DITCH (BYPASS)			X	1271	834						
7	11+52/12+86-L-(LT&RT)	42" RCP	X			3933	2411						
8	265+24/266+91-L-(LT&RT)	8'X8' RCBC	X						8902	4658			
8A	271+16/273+92 -L-(RT)	30" & 24" RCP	X			1226	2536		1385	1493			
SUBTOTALS=:	THIS SHEET					9908	7455		10287	6151			
SUBTOTALS=:	SHEET 1					28755	14819		86004	50474		45810	29829
TOTALS=:						**38663**	**22274**		**96291**	**56625**		**45810**	**29829**

N.C. DEPT. OF TRANSPORTATION
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GUILFORD COUNTY
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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-E	200	CLEARING & GRUBBING .. ACRE(S)	Lump Sum	L.S.	
0004	0008000000-E	200	SUPPLEMENTARY CLEARING & GRUB-BING	2 ACR		
0005	0022000000-E	225	UNCLASSIFIED EXCAVATION	52,900 CY		
0006	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ********** (233+87.56 -L- LT)	Lump Sum	L.S.	
0007	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ********** (233+87.56 -L- RT)	Lump Sum	L.S.	
0008	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ********** (238+33.00 -L-)	Lump Sum	L.S.	
0009	0036000000-E	225	UNDERCUT EXCAVATION	2,250 CY		
0010	0106000000-E	230	BORROW EXCAVATION	205,600 CY		
0011	0134000000-E	240	DRAINAGE DITCH EXCAVATION	6,630 CY		
0012	0141000000-E	240	BERM DITCH CONSTRUCTION	1,000 LF		
0013	0156000000-E	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	22,700 SY		
0014	0177000000-E	250	BREAKING OF EXISTING ASPHALT PAVEMENT	33,000 SY		
0015	0195000000-E	265	SELECT GRANULAR MATERIAL	2,500 CY		
0016	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZA-TION	14,050 SY		
0017	0199000000-E	SP	TEMPORARY SHORING	6,444 SF		
0018	0220000000-E	SP	ROCK EMBANKMENTS	1,700 TON		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0019	0222000000-E	SP	GEOTEXTILE FOR ROCK EMBANK-MENTS	1,130 SY		
0020	0223000000-E	275	ROCK PLATING	880 SY		
0021	0318000000-E	300	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRUCTURES	3,979 TON		
0022	0320000000-E	300	FOUNDATION CONDITIONING GEO-TEXTILE	15,014 SY		
0023	0335100000-E	305	12" DRAINAGE PIPE	76 LF		
0024	0335200000-E	305	15" DRAINAGE PIPE	2,252 LF		
0025	0335300000-E	305	18" DRAINAGE PIPE	440 LF		
0026	0335400000-E	305	24" DRAINAGE PIPE	1,860 LF		
0027	0335500000-E	305	30" DRAINAGE PIPE	756 LF		
0028	0343000000-E	310	15" SIDE DRAIN PIPE	20 LF		
0029	0366000000-E	310	15" RC PIPE CULVERTS, CLASS III	100 LF		
0030	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	728 LF		
0031	0378000000-E	310	24" RC PIPE CULVERTS, CLASS III	52 LF		
0032	0384000000-E	310	30" RC PIPE CULVERTS, CLASS III	788 LF		
0033	0396000000-E	310	42" RC PIPE CULVERTS, CLASS III	296 LF		
0034	0402000000-E	310	48" RC PIPE CULVERTS, CLASS III	208 LF		
0035	0408000000-E	310	54" RC PIPE CULVERTS, CLASS III	344 LF		
0036	0420000000-E	310	66" RC PIPE CULVERTS, CLASS III	568 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0037	0448200000-E	310	15" RC PIPE CULVERTS, CLASS IV	15,432 LF		
0038	0448300000-E	310	18" RC PIPE CULVERTS, CLASS IV	3,332 LF		
0039	0448400000-E	310	24" RC PIPE CULVERTS, CLASS IV	4,140 LF		
0040	0448500000-E	310	30" RC PIPE CULVERTS, CLASS IV	276 LF		
0041	0448700000-E	310	42" RC PIPE CULVERTS, CLASS IV	40 LF		
0042	0576000000-E	310	**" CS PIPE CULVERTS, *****" THICK (72", 0.139")	200 LF		
0043	0582000000-E	310	15" CS PIPE CULVERTS, 0.064" THICK	244 LF		
0044	0594000000-E	310	24" CS PIPE CULVERTS, 0.064" THICK	68 LF		
0045	0992000000-E	SP	GENERIC PIPE ITEM REMOVE & RESET FES	1 EA		
0046	0995000000-E	340	PIPE REMOVAL	4,585 LF		
0047	1011000000-N	500	FINE GRADING	Lump Sum	L.S.	
0048	1077000000-E	SP	#57 STONE	1,690 TON		
0049	1099500000-E	505	SHALLOW UNDERCUT	4,343 CY		
0050	1099700000-E	505	CLASS IV SUBGRADE STABILIZA-TION	9,140 TON		
0051	1110000000-E	510	STABILIZER AGGREGATE	1,000 TON		
0052	1121000000-E	520	AGGREGATE BASE COURSE	8,800 TON		
0053	1220000000-E	545	INCIDENTAL STONE BASE	1,000 TON		
0054	1275000000-E	600	PRIME COAT	4,530 GAL		
0055	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	42,100 TON		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0056	1498000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	31,700 TON		
0057	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	32,200 TON		
0058	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	5,310 TON		
0059	1693000000-E	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	1,610 TON		
0060	2022000000-E	815	SUBDRAIN EXCAVATION	168 CY		
0061	2033000000-E	815	SUBDRAIN FINE AGGREGATE	84 CY		
0062	2044000000-E	815	6" PERFORATED SUBDRAIN PIPE	500 LF		
0063	2070000000-N	815	SUBDRAIN PIPE OUTLET	1 EA		
0064	2077000000-E	815	6" OUTLET PIPE	6 LF		
0065	2209000000-E	838	ENDWALLS	28 CY		
0066	2220000000-E	838	REINFORCED ENDWALLS	77 CY		
0067	2253000000-E	840	PIPE COLLARS	15.3 CY		
0068	2264000000-E	840	PIPE PLUGS	1.96 CY		
0069	2275000000-E	SP	FLOWABLE FILL	613.1 CY		
0070	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	324 EA		
0071	2297000000-E	840	MASONRY DRAINAGE STRUCTURES	15 CY		
0072	2308000000-E	840	MASONRY DRAINAGE STRUCTURES	134 LF		
0073	2354200000-N	840	FRAME WITH GRATE, STD 840.24	1 EA		
0074	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	16 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0075	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	20 EA		
0076	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	33 EA		
0077	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	106 EA		
0078	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	113 EA		
0079	2396000000-N	840	FRAME WITH COVER, STD 840.54	25 EA		
0080	2440000000-N	852	CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN	41 EA		
0081	2451000000-N	852	CONCRETE TRANSITIONAL SECTION FOR DROP INLET	5 EA		
0082	2462000000-E	SP	**" SLUICE GATE (15")	3 EA		
0083	2462000000-E	SP	**" SLUICE GATE (18")	1 EA		
0084	2462000000-E	SP	**" SLUICE GATE (24")	5 EA		
0085	2462000000-E	SP	**" SLUICE GATE (30")	2 EA		
0086	2538000000-E	846	**'-**" CONCRETE CURB & GUTTER (2'-9")	5,455 LF		
0087	2542000000-E	846	1'-6" CONCRETE CURB & GUTTER	16,570 LF		
0088	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	34,775 LF		
0089	2570000000-N	SP	MODIFIED CONCRETE FLUME	5 EA		
0090	2591000000-E	848	4" CONCRETE SIDEWALK	18,210 SY		
0091	2605000000-N	848	CONCRETE CURB RAMP	75 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0092	2612000000-E	848	6" CONCRETE DRIVEWAY	1,722 SY		
0093	2655000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)	2,300 SY		
0094	2657000000-E	852	**" MONOLITHIC CONCRETE MEDIAN (*****) (7", KEYED IN)	25 SY		
0095	2800000000-N	858	ADJUSTMENT OF CATCH BASINS	1 EA		
0096	2845000000-N	858	ADJUSTMENT OF METER BOXES OR VALVE BOXES	2 EA		
0097	2905000000-N	859	CONVERT EXISTING DROP INLET TO JUNCTION BOX	3 EA		
0098	3000000000-N	SP	IMPACT ATTENUATOR UNIT, TYPE 350	1 EA		
0099	3030000000-E	862	STEEL BM GUARDRAIL	4,675 LF		
0100	3045000000-E	862	STEEL BM GUARDRAIL, SHOP CURVED	325 LF		
0101	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	10 EA		
0102	3195000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE AT-1	3 EA		
0103	3210000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	12 EA		
0104	3215000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE III	8 EA		
0105	3270000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350	14 EA		
0106	3317000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE B-77	3 EA		
0107	3360000000-E	863	REMOVE EXISTING GUARDRAIL	2,844 LF		
0108	3380000000-E	862	TEMPORARY STEEL BM GUARDRAIL	237.5 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0109	3387000000-N	862	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE ********** (CAT-1)	1 EA		
0110	3389100000-N	SP	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE 350	1 EA		
0111	3533000000-E	866	CHAIN LINK FENCE, **" FABRIC (72")	254 LF		
0112	3539000000-E	866	METAL LINE POSTS FOR **" CHAIN LINK FENCE (72")	22 EA		
0113	3545000000-E	866	METAL TERMINAL POSTS FOR **" CHAIN LINK FENCE (72")	10 EA		
0114	3557000000-E	866	ADDITIONAL BARBED WIRE	100 LF		
0115	3564000000-E	866	SINGLE GATES, **" HIGH, **' WIDE, **' OPENING (72", 4', 4')	2 EA		
0116	3628000000-E	876	RIP RAP, CLASS I	35 TON		
0117	3635000000-E	876	RIP RAP, CLASS II	135 TON		
0118	3642000000-E	876	RIP RAP, CLASS A	415 TON		
0119	3649000000-E	876	RIP RAP, CLASS B	520 TON		
0120	3651000000-E	SP	BOULDERS	260 TON		
0121	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	8,565 SY		
0122	3659000000-N	SP	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	5 EA		
0123	4072000000-E	903	SUPPORTS, 3-LB STEEL U-CHANNEL	2,805 LF		
0124	4096000000-N	904	SIGN ERECTION, TYPE D	10 EA		
0125	4102000000-N	904	SIGN ERECTION, TYPE E	166 EA		
0126	4108000000-N	904	SIGN ERECTION, TYPE F	10 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0127	4116100000-N	904	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)	6 EA		
0128	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	109 EA		
0129	4192000000-N	907	DISPOSAL OF SUPPORT, U-CHANNEL	5 EA		
0130	4238000000-N	907	DISPOSAL OF SIGN, D, E OR F	5 EA		
0131	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	1,368 SF		
0132	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	768 SF		
0133	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	141 SF		
0134	4415000000-N	1115	FLASHING ARROW BOARD	3 EA		
0135	4420000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN	7 EA		
0136	4430000000-N	1130	DRUMS	2,000 EA		
0137	4435000000-N	1135	CONES	20 EA		
0138	4445000000-E	1145	BARRICADES (TYPE III)	1,632 LF		
0139	4450000000-N	1150	FLAGGER	9,600 HR		
0140	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	6 EA		
0141	4470000000-N	1160	RESET TEMPORARY CRASH CUSHION	7 EA		
0142	4480000000-N	1165	TMA	4 EA		
0143	4485000000-E	1170	PORTABLE CONCRETE BARRIER	2,825 LF		
0144	4490000000-E	1170	PORTABLE CONCRETE BARRIER (ANCHORED)	1,260 LF		
0145	4500000000-E	1170	RESET PORTABLE CONCRETE BARRIER	1,460 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0146	4507000000-E	1170	WATER FILLED BARRIER	1,375 LF		
0147	4508000000-E	1170	RESET WATER FILLED BARRIER	1,670 LF		
0148	4510000000-N	SP	LAW ENFORCEMENT	1,320 HR		
0149	4516000000-N	1180	SKINNY DRUM	50 EA		
0150	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	1,319 EA		
0151	4685000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	10,060 LF		
0152	4686000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	36,545 LF		
0153	4695000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	3,175 LF		
0154	4697000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)	3,439 LF		
0155	4700000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)	760 LF		
0156	4710000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)	1,185 LF		
0157	4721000000-E	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)	48 EA		
0158	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	259 EA		
0159	4770000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (II)	2,439 LF		
0160	4770000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)	3,012 LF		
0161	4805000000-N	1205	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (II)	9 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0162	4805000000-N	1205	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (IV)	7 EA		
0163	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	513,936 LF		
0164	4820000000-E	1205	PAINT PAVEMENT MARKING LINES (8")	38,751 LF		
0165	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	5,112 LF		
0166	4840000000-N	1205	PAINT PAVEMENT MARKING CHARAC-TER	8 EA		
0167	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	233 EA		
0168	4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	50,201 LF		
0169	4860000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (8")	4,060 LF		
0170	4870000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (24")	500 LF		
0171	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	25 EA		
0172	4900000000-N	1251	PERMANENT RAISED PAVEMENT MARKERS	33 EA		
0173	4905000000-N	1253	SNOWPLOWABLE PAVEMENT MARKERS	1,447 EA		
0174	5325800000-E	1510	8" WATER LINE	95 LF		
0175	5326200000-E	1510	12" WATER LINE	2,299 LF		
0176	5546000000-E	1515	8" VALVE	1 EA		
0177	5558000000-E	1515	12" VALVE	5 EA		
0178	5571600000-E	1515	6" TAPPING VALVE	3 EA		
0179	5589200000-E	1515	2" AIR RELEASE VALVE	4 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0180	5648000000-N	1515	RELOCATE WATER METER	48 EA		
0181	5656100000-E	1515	RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (1 1/2")	4 EA		
0182	5656100000-E	1515	RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (1")	1 EA		
0183	5656100000-E	1515	RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (2")	2 EA		
0184	5656100000-E	1515	RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (3/4")	1 EA		
0185	5666000000-E	1515	FIRE HYDRANT	1 EA		
0186	5672000000-N	1515	RELOCATE FIRE HYDRANT	33 EA		
0187	5679200000-E	1515	16" LINE STOP	4 EA		
0188	5691300000-E	1520	8" SANITARY GRAVITY SEWER	257 LF		
0189	5691400000-E	1520	10" SANITARY GRAVITY SEWER	167 LF		
0190	5691500000-E	1520	12" SANITARY GRAVITY SEWER	946 LF		
0191	5709700000-E	1520	16" FORCE MAIN SEWER	9,247 LF		
0192	5768000000-N	1520	SANITARY SEWER CLEAN-OUT	72 EA		
0193	5775000000-E	1525	4' DIA UTILITY MANHOLE	10 EA		
0194	5781000000-E	1525	UTILITY MANHOLE WALL, 4' DIA	106 LF		
0195	5801000000-E	1530	ABANDON 8" UTILITY PIPE	614 LF		
0196	5802000000-E	1530	ABANDON 10" UTILITY PIPE	492 LF		
0197	5804000000-E	1530	ABANDON 12" UTILITY PIPE	1,190 LF		
0198	5810000000-E	1530	ABANDON 16" UTILITY PIPE	3,795 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0199	5816000000-N	1530	ABANDON UTILITY MANHOLE	5 EA		
0200	5828000000-N	1530	REMOVE UTILITY MANHOLE	5 EA		
0201	5836000000-E	1540	24" ENCASEMENT PIPE	416 LF		
0202	5836200000-E	1540	30" ENCASEMENT PIPE	390 LF		
0203	5871700000-E	1550	TRENCHLESS INSTALLATION OF 12" IN SOIL	120 LF		
0204	5871710000-E	1550	TRENCHLESS INSTALLATION OF 12" NOT IN SOIL	120 LF		
0205	5872200000-E	1550	TRENCHLESS INSTALLATION OF 24" IN SOIL	208 LF		
0206	5872210000-E	1550	TRENCHLESS INSTALLATION OF 24" NOT IN SOIL	208 LF		
0207	5872300000-E	1550	TRENCHLESS INSTALLATION OF 30" IN SOIL	195 LF		
0208	5872310000-E	1550	TRENCHLESS INSTALLATION OF 30" NOT IN SOIL	195 LF		
0209	5882000000-N	SP	GENERIC UTILITY ITEM ADJUSTMENT OF WATER METER VAULT TOP	1 EA		
0210	5882000000-N	SP	GENERIC UTILITY ITEM RELOCATE FIRE WATER METER IN VAULT	1 EA		
0211	5882000000-N	SP	GENERIC UTILITY ITEM SUPPORT EXISTING WATER LINE DURING CULVERT INSTALL	1 EA		
0212	6000000000-E	1605	TEMPORARY SILT FENCE	31,600 LF		
0213	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	2,440 TON		
0214	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	7,000 TON		
0215	6012000000-E	1610	SEDIMENT CONTROL STONE	7,000 TON		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0216	6015000000-E	1615	TEMPORARY MULCHING	55 ACR		
0217	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	3,700 LB		
0218	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEED-ING	18.5 TON		
0219	6024000000-E	1622	TEMPORARY SLOPE DRAINS	6,080 LF		
0220	6029000000-E	SP	SAFETY FENCE	7,100 LF		
0221	6030000000-E	1630	SILT EXCAVATION	24,820 CY		
0222	6036000000-E	1631	MATTING FOR EROSION CONTROL	52,000 SY		
0223	6037000000-E	SP	COIR FIBER MAT	2,900 SY		
0224	6038000000-E	SP	PERMANENT SOIL REINFORCEMENT MAT	1,685 SY		
0225	6042000000-E	1632	1/4" HARDWARE CLOTH	16,660 LF		
0226	6048000000-E	SP	FLOATING TURBIDITY CURTAIN	1,200 SY		
0227	6070000000-N	1639	SPECIAL STILLING BASINS	30 EA		
0228	6071012000-E	SP	COIR FIBER WATTLE	950 LF		
0229	6071020000-E	SP	POLYACRYLAMIDE (PAM)	1,400 LB		
0230	6071030000-E	1640	COIR FIBER BAFFLE	6,455 LF		
0231	6071050000-E	SP	**" SKIMMER (1-1/2")	35 EA		
0232	6071050000-E	SP	**" SKIMMER (2")	4 EA		
0233	6071050000-E	SP	**" SKIMMER (2-1/2")	2 EA		
0234	6084000000-E	1660	SEEDING & MULCHING	55 ACR		

County : Guilford

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0235	6087000000-E	1660	MOWING	27 ACR		
0236	6090000000-E	1661	SEED FOR REPAIR SEEDING	700 LB		
0237	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	2.5 TON		
0238	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	1,425 LB		
0239	6108000000-E	1665	FERTILIZER TOPDRESSING	42.5 TON		
0240	6111000000-E	SP	IMPERVIOUS DIKE	75 LF		
0241	6114500000-N	1667	SPECIALIZED HAND MOWING	30 MHR		
0242	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	100 EA		
0243	6120000000-E	SP	CULVERT DIVERSION CHANNEL	52 CY		
0244	6123000000-E	1670	REFORESTATION	5 ACR		
0245	6126000000-E	SP	STREAMBANK REFORESTATION	1.85 ACR		
0246	7048500000-E	1705	PEDESTRIAN SIGNAL HEAD (16", 1 SECTION W/COUNTDOWN)	40 EA		
0247	7060000000-E	1705	SIGNAL CABLE	24,975 LF		
0248	7120000000-E	1705	VEHICLE SIGNAL HEAD (12", 3 SECTION)	107 EA		
0249	7132000000-E	1705	VEHICLE SIGNAL HEAD (12", 4 SECTION)	11 EA		
0250	7144000000-E	1705	VEHICLE SIGNAL HEAD (12", 5 SECTION)	16 EA		
0251	7252000000-E	1710	MESSENGER CABLE (1/4")	19,300 LF		
0252	7264000000-E	1710	MESSENGER CABLE (3/8")	5,300 LF		
0253	7279000000-E	1715	TRACER WIRE	730 LF		

County : Guilford

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0254	7300000000-E	1715	UNPAVED TRENCHING (**********) (1, 2")	4,890 LF		
0255	7300000000-E	1715	UNPAVED TRENCHING (**********) (2, 2")	500 LF		
0256	7300100000-E	1715	UNPAVED TRENCHING FOR TEMP-ORARY LEAD-IN	4,525 LF		
0257	7301000000-E	1715	DIRECTIONAL DRILL (**********) (2, 2")	430 LF		
0258	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	55 EA		
0259	7348000000-N	1716	JUNCTION BOX (OVER-SIZED, HEA-VY DUTY)	12 EA		
0260	7360000000-N	1720	WOOD POLE	14 EA		
0261	7372000000-N	1721	GUY ASSEMBLY	47 EA		
0262	7408000000-E	1722	1" RISER WITH WEATHERHEAD	4 EA		
0263	7420000000-E	1722	2" RISER WITH WEATHERHEAD	29 EA		
0264	7430000000-N	1722	HEAT SHRINK TUBING RETROFIT KIT	1 EA		
0265	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	20,175 LF		
0266	7456000000-E	1726	LEAD-IN CABLE (**********) (14-2)	42,255 LF		
0267	7516000000-E	1730	COMMUNICATIONS CABLE (**FIBER) (48)	21,550 LF		
0268	7528000000-E	1730	DROP CABLE	1,150 LF		
0269	7540000000-N	1731	SPLICE ENCLOSURE	7 EA		
0270	7552000000-N	1731	INTERCONNECT CENTER	7 EA		
0271	7564000000-N	1732	FIBER-OPTIC TRANSCEIVER, DROP & REPEAT	7 EA		

County : Guilford

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0272	7566000000-N	1733	DELINEATOR MARKER	10 EA		
0273	7575160000-E	1734	REMOVE EXISTING COMMUNICATIONS CABLE	18,575 LF		
0274	7575180000-N	1735	CABLE TRANSFER	3 EA		
0275	7576000000-N	SP	METAL STRAIN SIGNAL POLE	28 EA		
0276	7588000000-N	SP	METAL POLE WITH SINGLE MAST ARM	2 EA		
0277	7613000000-N	SP	SOIL TEST	30 EA		
0278	7614100000-E	SP	DRILLED PIER FOUNDATION	180 CY		
0279	7631000000-N	SP	MAST ARM WITH METAL POLE DE-SIGN	2 EA		
0280	7636000000-N	1745	SIGN FOR SIGNALS	18 EA		
0281	7642100000-N	1743	TYPE I POST WITH FOUNDATION	18 EA		
0282	7642200000-N	1743	TYPE II PEDESTAL WITH FOUND-ATION	19 EA		
0283	7684000000-N	1750	SIGNAL CABINET FOUNDATION	7 EA		
0284	7756000000-N	1751	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)	7 EA		
0285	7780000000-N	1751	DETECTOR CARD (TYPE 2070L)	42 EA		
0286	7901000000-N	1753	CABINET BASE EXTENDER	7 EA		
0287	7980000000-N	SP	GENERIC SIGNAL ITEM MICROWAVE VEHICLE DETECTION SYSTEM - MULTIPLE ZONE	1 EA		
0288	7980000000-N	SP	GENERIC SIGNAL ITEM MICROWAVE VEHICLE DETECTOR-SINGLE ZONE	1 EA		
0289	7990000000-E	SP	GENERIC SIGNAL ITEM BACK PULL FIBER OPTIC CABLE	2,050 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0330	2619000000-E	850	4" CONCRETE PAVED DITCH	83 SY		
			CULVERT ITEMS			
0290	8126000000-N	414	CULVERT EXCAVATION, STA ****** (266+36.00 -L-)	Lump Sum	L.S.	
0291	8133000000-E	414	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	105 TON		
0292	8196000000-E	420	CLASS A CONCRETE (CULVERT)	146.6 CY		
0293	8245000000-E	425	REINFORCING STEEL (CULVERT)	20,800 LB		
			WALL ITEMS			
0294	8801000000-E	SP	MSE RETAINING WALL NO **** (1)	1,870 SF		
0295	8801000000-E	SP	MSE RETAINING WALL NO **** (2)	680 SF		
0296	8801000000-E	SP	MSE RETAINING WALL NO **** (6)	385 SF		
0297	8802014000-E	SP	SOLDIER PILE RETAINING WALLS	830 SF		
0298	8802030000-E	SP	SEGMENTAL GRAVITY RETAINING WALLS	150 SF		
			STRUCTURE ITEMS			
0299	8017000000-N	SP	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP ACCESS AT STA ********** (238+33.00 -L-)	Lump Sum	L.S.	

County : Guilford

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0300	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ********** (238+33.00 -L-)	Lump Sum	L.S.	
0301	8096000000-E	450	PILE EXCAVATION IN SOIL	1,466 LF		
0302	8097000000-E	450	PILE EXCAVATION NOT IN SOIL	179 LF		
0303	8105540000-E	411	3'-6" DIA DRILLED PIERS IN SOIL	207 LF		
0304	8105640000-E	411	3'-6" DIA DRILLED PIERS NOT IN SOIL	75 LF		
0305	8111400000-E	411	PERMANENT STEEL CASING FOR 3'-6" DIA DRILLED PIER	209.8 LF		
0306	8113000000-N	411	SID INSPECTIONS	2 EA		
0307	8115000000-N	411	CSL TESTING	2 EA		
0308	8121000000-N	412	UNCLASSIFIED STRUCTURE EXCAVA-TION AT STATION ******** (238+33.00 -L-)	Lump Sum	L.S.	
0309	8147000000-E	420	REINFORCED CONCRETE DECK SLAB	20,702 SF		
0310	8156000000-E	SP	CONCRETE WEARING SURFACE	8,310 SF		
0311	8161000000-E	420	GROOVING BRIDGE FLOORS	28,401 SF		
0312	8175000000-E	420	CLASS AA CONCRETE (BRIDGE)	82.3 CY		
0313	8182000000-E	420	CLASS A CONCRETE (BRIDGE)	421.1 CY		
0314	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ********** (233+87.56 -L- LT LN)	Lump Sum	L.S.	
0315	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ********** (233+87.56 -L- RT LN)	Lump Sum	L.S.	
0316	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ********** (238+33.00 -L-)	Lump Sum	L.S.	

County : Guilford

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0317	8217000000-E	425	REINFORCING STEEL (BRIDGE)	71,811 LB		
0318	8224000000-E	425	EPOXY COATED REINFORCING STEEL (BRIDGE)	3,359 LB		
0319	8238000000-E	425	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	7,857 LB		
0320	8265000000-E	430	54" PRESTRESSED CONCRETE GIR-DERS	2,478 LF		
0321	8364000000-E	450	HP12X53 STEEL PILES	1,850 LF		
0322	8391000000-N	450	STEEL PILE POINTS	28 EA		
0323	8482000000-E	460	THREE BAR METAL RAIL	603.46 LF		
0324	8503000000-E	460	CONCRETE BARRIER RAIL	219.2 LF		
0325	8608000000-E	876	RIP RAP CLASS II (2'-0" THICK)	775 TON		
0326	8622000000-E	876	GEOTEXTILE FOR DRAINAGE	850 SY		
0327	8657000000-N	430	ELASTOMERIC BEARINGS	Lump Sum	L.S.	
0328	8748000000-E	SP	SELECT MATERIAL, CLASS ** (V)	13.3 TON		
0329	8753200000-E	430	3'-0" X 3'-3" PRESTRESSED CONC BOX BEAMS	3,388 LF		

Vendor 1 of 7: APAC - ATLANTIC, INC. THOMPSON ARTHUR DIVISION (4315)
Call Order 010 (Proposal: C203256)

Bid Information

Proposal County: GUILFORD
Vendor Address: P.O. Box 21088
Greensboro , NC , 27420
Signature Check: Clarence_O_Brickey_4315
Time Bid Received: January 20, 2015 01:45 PM
Amendment Count: 1

Bid Checksum: 4A82D279
Bid Total: $30,898,017.15
Items Total: $30,898,017.15
Time Total: $0.00

Bidding Errors:
None.

DBE Goal Set 11.0
DBE Goal Met 11.0

Vendor 1 of 7: APAC - ATLANTIC, INC. THOMPSON ARTHUR DIVISION (4315)
Call Order 010 (Proposal: C203256)

Bid Bond Information

Projects:		**Bond Maximum:**	
Counties:		**State of Incorporation:**	
Bond ID:	SNC15551343	**Agency Execution Date:**	1/16/2015 6
Paid by Check:	No	**Surety Name:**	surety2000
Bond Percent:	5%	**Bond Agency Name:**	Liberty Mutual Insurance Company

Vendor 4315's Bid Information for Call 010, Letting L150120, 01/20/15

APAC-Atlantic, Inc. Thompson-Arthur Division (4315)
Call Order 010 (Proposal ID C203256)

LIST OF DBE PARTICIPANTS

VENDOR NUMBER	DBE NAME / ADDRESS	WORK CODE	TYPE OF WORK	CERT TYPE	AMOUNT	
11572	CRUZ BROTHERS CONCRETE, INC. 1572 PAYNE ROAD/LOT 75 LOT 75 , GRAHAM, NC 27253			Sub	1,448,979.21	Committed
4877	ABACHI TRANSPORT, INC. DBA S&B 4719 MILLPOINT RD. , GREENSBORO, NC 27406			Sub	891,350.00	Committed
12418	LEVEL CROSS SURVEYING PLLC 668 MARSH COUNTRY LANE , RANDLEMAN, NC 27317			Sub	140,000.00	Committed
12802	NICKELSTON INDUSTRIES, INC. POST OFFICE BOX 133 , LAWSONVILLE, NC 27022			Sub	132,036.30	Committed
3346	LINEBERRY, INC. POST OFFICE BOX 307 , CLIMAX, NC 27233			Sub	316,459.00	Committed
4247	SEAL BROTHERS CONTRACTING LLC 131 W. CLEVE STREET , MOUNT AIRY, NC 27030			Sub	75,575.50	Committed
1991	MCCAIN STRIPING SERVICE, INC. 5711 CRAVEN ROAD , BROWNS SUMMIT, NC 27214			Sub	249,101.07	Not Committed
4761	TRAFFIC CONTROL SAFETY SERVICES POST OFFICE BOX 24511 , WINSTON-SALEM, NC 27114			Sub	256,585.80	Committed
3538	BONN-J CONTRACTING, INC. OF FLO 2596 CURRYVILLE ROAD , CHULUOTA, FL 32766			Sub	102,725.00	Committed
4434	LONG BROTHERS OF SUMMERFIELD, I PO BOX 35048 , GREENSBORO, NC 27425			Sub	53,100.00	Committed
				TOTAL:	$3,416,810.81 11.06%	

Vendor 4315's Bid Information for Call 010, Letting L150120, 01/20/15

APAC-Atlantic, Inc. Thompson-Arthur Division (4315)
Call Order 010 (Proposal ID C203256)

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: SNC15551343
Surety Registry Agency: surety2000
Verified?: Yes
Surety Agency: Liberty Mutual Insurance Company
Bond Execution Date: 1/16/2015 6
Bond Amount: $1,544,900.86 (Five Percent of Bid)

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

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 HIGH POINT)					
	Alt Group					
0001	0000100000-N MOBILIZATION	LUMP	LUMP		1,500,000.00	
0002	0000400000-N CONSTRUCTION SURVEYING	LUMP	LUMP		300,000.00	
0003	0001000000-E CLEARING & GRUBBING .. ACRE(S)	LUMP	LUMP		920,000.00	
0004	0008000000-E SUPPLEMENTARY CLEARING & GRUB-BING	2.000 ACR	100.00000		200.00	
0005	0022000000-E UNCLASSIFIED EXCAVATION	52,900.000 CY	31.00000		1,639,900.00	
0006	0029000000-N REINFORCED BRIDGE APPROACH FILL, STATION ********** (233+87.56 -L- LT)	LUMP	LUMP		75,000.00	
0007	0029000000-N REINFORCED BRIDGE APPROACH FILL, STATION ********** (233+87.56 -L- RT)	LUMP	LUMP		75,000.00	
0008	0029000000-N REINFORCED BRIDGE APPROACH FILL, STATION ********** (238+33.00 -L-)	LUMP	LUMP		94,800.00	
0009	0036000000-E UNDERCUT EXCAVATION	2,250.000 CY	8.50000		19,125.00	
0010	0106000000-E BORROW EXCAVATION	205,600.000 CY	5.45000		1,120,520.00	

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0011	0134000000-E DRAINAGE DITCH EXCAVATION	6,630.000 CY	6.50000		43,095.00	
0012	0141000000-E BERM DITCH CONSTRUCTION	1,000.000 LF	4.00000		4,000.00	
0013	0156000000-E REMOVAL OF EXISTING ASPHALT PAVEMENT	22,700.000 SY	3.00000		68,100.00	
0014	0177000000-E BREAKING OF EXISTING ASPHALT PAVEMENT	33,000.000 SY	3.00000		99,000.00	
0015	0195000000-E SELECT GRANULAR MATERIAL	2,500.000 CY	22.00000		55,000.00	
0016	0196000000-E GEOTEXTILE FOR SOIL STABILIZA-TION	14,050.000 SY	1.70000		23,885.00	
0017	0199000000-E TEMPORARY SHORING	6,444.000 SF	26.00000		167,544.00	
0018	0220000000-E ROCK EMBANKMENTS	1,700.000 TON	38.00000		64,600.00	
0019	0222000000-E GEOTEXTILE FOR ROCK EMBANK- MENTS	1,130.000 SY	2.25000		2,542.50	
0020	0223000000-E ROCK PLATING	880.000 SY	70.00000		61,600.00	
0021	0318000000-E FOUNDATION CONDITIONING MATE- RIAL, MINOR STRUCTURES	3,979.000 TON	27.65000		110,019.35	
0022	0320000000-E FOUNDATION CONDITIONING GEO-TEXTILE	15,014.000 SY	1.70000		25,523.80	

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0023	0335100000-E 12" DRAINAGE PIPE	76.000 LF	53.80000		4,088.80	
0024	0335200000-E 15" DRAINAGE PIPE	2,252.000 LF	34.25000		77,131.00	
0025	0335300000-E 18" DRAINAGE PIPE	440.000 LF	37.00000		16,280.00	
0026	0335400000-E 24" DRAINAGE PIPE	1,860.000 LF	43.75000		81,375.00	
0027	0335500000-E 30" DRAINAGE PIPE	756.000 LF	53.75000		40,635.00	
0028	0343000000-E 15" SIDE DRAIN PIPE	20.000 LF	30.00000		600.00	
0029	0366000000-E 15" RC PIPE CULVERTS, CLASS III	100.000 LF	44.60000		4,460.00	
0030	0372000000-E 18" RC PIPE CULVERTS, CLASS III	728.000 LF	48.50000		35,308.00	
0031	0378000000-E 24" RC PIPE CULVERTS, CLASS III	52.000 LF	73.00000		3,796.00	
0032	0384000000-E 30" RC PIPE CULVERTS, CLASS III	788.000 LF	61.75000		48,659.00	
0033	0396000000-E 42" RC PIPE CULVERTS, CLASS III	296.000 LF	107.00000		31,672.00	
0034	0402000000-E 48" RC PIPE CULVERTS, CLASS III	208.000 LF	107.00000		22,256.00	

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0035	0408000000-E 54" RC PIPE CULVERTS, CLASS III	344.000 LF	128.00000		44,032.00	
0036	0420000000-E 66" RC PIPE CULVERTS, CLASS III	568.000 LF	250.00000		142,000.00	
0037	0448200000-E 15" RC PIPE CULVERTS, CLASS IV	15,432.000 LF	35.00000		540,120.00	
0038	0448300000-E 18" RC PIPE CULVERTS, CLASS IV	3,332.000 LF	40.85000		136,112.20	
0039	0448400000-E 24" RC PIPE CULVERTS, CLASS IV	4,140.000 LF	50.50000		209,070.00	
0040	0448500000-E 30" RC PIPE CULVERTS, CLASS IV	276.000 LF	73.00000		20,148.00	
0041	0448700000-E 42" RC PIPE CULVERTS, CLASS IV	40.000 LF	180.00000		7,200.00	
0042	0576000000-E **" CS PIPE CULVERTS, *****" THICK (72", 0.139")	200.000 LF	282.00000		56,400.00	
0043	0582000000-E 15" CS PIPE CULVERTS, 0.064" THICK	244.000 LF	53.50000		13,054.00	
0044	0594000000-E 24" CS PIPE CULVERTS, 0.064" THICK	68.000 LF	88.00000		5,984.00	
0045	0992000000-E GENERIC PIPE ITEM REMOVE & RESET FES	1.000 EA	800.00000		800.00	
0046	0995000000-E PIPE REMOVAL	4,585.000 LF	10.00000		45,850.00	

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0047	1011000000-N FINE GRADING	LUMP	LUMP		417,000.00	
0048	1077000000-E #57 STONE	1,690.000 TON	29.50000		49,855.00	
0049	1099500000-E SHALLOW UNDERCUT	4,343.000 CY	8.50000		36,915.50	
0050	1099700000-E CLASS IV SUBGRADE STABILIZA- TION	9,140.000 TON	24.85000		227,129.00	
0051	1110000000-E STABILIZER AGGREGATE	1,000.000 TON	26.00000		26,000.00	
0052	1121000000-E AGGREGATE BASE COURSE	8,800.000 TON	28.35000		249,480.00	
0053	1220000000-E INCIDENTAL STONE BASE	1,000.000 TON	24.50000		24,500.00	
0054	1275000000-E PRIME COAT	4,530.000 GAL	2.75000		12,457.50	
0055	1489000000-E ASPHALT CONC BASE COURSE, TYPE B25.0B	42,100.000 TON	40.00000		1,684,000.00	
0056	1498000000-E ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	31,700.000 TON	40.65000		1,288,605.00	
0057	1519000000-E ASPHALT CONC SURFACE COURSE, TYPE S9.5B	32,200.000 TON	41.65000		1,341,130.00	
0058	1575000000-E ASPHALT BINDER FOR PLANT MIX	5,310.000 TON	616.50000		3,273,615.00	

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0059	1693000000-E ASPHALT PLANT MIX, PAVEMENT REPAIR	1,610.000 TON	120.00000		193,200.00	
0060	2022000000-E SUBDRAIN EXCAVATION	168.000 CY	15.00000		2,520.00	
0061	2033000000-E SUBDRAIN FINE AGGREGATE	84.000 CY	70.00000		5,880.00	
0062	2044000000-E 6" PERFORATED SUBDRAIN PIPE	500.000 LF	3.00000		1,500.00	
0063	2070000000-N SUBDRAIN PIPE OUTLET	1.000 EA	300.00000		300.00	
0064	2077000000-E 6" OUTLET PIPE	6.000 LF	50.00000		300.00	
0065	2209000000-E ENDWALLS	28.000 CY	900.00000		25,200.00	
0066	2220000000-E REINFORCED ENDWALLS	77.000 CY	1,325.00000		102,025.00	
0067	2253000000-E PIPE COLLARS	15.300 CY	600.00000		9,180.00	
0068	2264000000-E PIPE PLUGS	1.960 CY	1,500.00000		2,940.00	
0069	2275000000-E FLOWABLE FILL	613.100 CY	152.00000		93,191.20	
0070	2286000000-N MASONRY DRAINAGE STRUCTURES	324.000 EA	1,325.00000		429,300.00	

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0071	2297000000-E MASONRY DRAINAGE STRUCTURES	15.000 CY	1,200.00000		18,000.00	
0072	2308000000-E MASONRY DRAINAGE STRUCTURES	134.000 LF	285.00000		38,190.00	
0073	2354200000-N FRAME WITH GRATE, STD 840.24	1.000 EA	800.00000		800.00	
0074	2364000000-N FRAME WITH TWO GRATES, STD 840.16	16.000 EA	500.00000		8,000.00	
0075	2366000000-N FRAME WITH TWO GRATES, STD 840.24	20.000 EA	800.00000		16,000.00	
0076	2374000000-N FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	33.000 EA	580.00000		19,140.00	
0077	2374000000-N FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	106.000 EA	610.00000		64,660.00	
0078	2374000000-N FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	113.000 EA	615.00000		69,495.00	
0079	2396000000-N FRAME WITH COVER, STD 840.54	25.000 EA	500.00000		12,500.00	
0080	2440000000-N CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN	41.000 EA	600.00000		24,600.00	
0081	2451000000-N CONCRETE TRANSITIONAL SECTION FOR DROP INLET	5.000 EA	550.00000		2,750.00	
0082	2462000000-E **" SLUICE GATE (15")	3.000 EA	2,878.00000		8,634.00	

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0083	2462000000-E **" SLUICE GATE (18")	1.000 EA	3,300.00000		3,300.00	
0084	2462000000-E **" SLUICE GATE (24")	5.000 EA	3,680.00000		18,400.00	
0085	2462000000-E **" SLUICE GATE (30")	2.000 EA	5,200.00000		10,400.00	
0086	2538000000-E **'-**" CONCRETE CURB & GUTTER (2'-9")	5,455.000 LF	13.25000		72,278.75	
0087	2542000000-E 1'-6" CONCRETE CURB & GUTTER	16,570.000 LF	10.00000		165,700.00	
0088	2549000000-E 2'-6" CONCRETE CURB & GUTTER	34,775.000 LF	13.00000		452,075.00	
0089	2570000000-N MODIFIED CONCRETE FLUME	5.000 EA	1,500.00000		7,500.00	
0090	2591000000-E 4" CONCRETE SIDEWALK	18,210.000 SY	26.35000		479,833.50	
0091	2605000000-N CONCRETE CURB RAMP	75.000 EA	950.00000		71,250.00	
0092	2612000000-E 6" CONCRETE DRIVEWAY	1,722.000 SY	39.35000		67,760.70	
0093	2655000000-E 5" MONOLITHIC CONCRETE ISLANDS(KEYED IN)	2,300.000 SY	43.00000		98,900.00	

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Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0094	2657000000-E **" MONOLITHIC CONCRETE MEDIAN(*****) (7", KEYED IN)	25.000 SY	64.00000		1,600.00	
0095	2800000000-N ADJUSTMENT OF CATCH BASINS	1.000 EA	800.00000		800.00	
0096	2845000000-N ADJUSTMENT OF METER BOXES OR VALVE BOXES	2.000 EA	1,200.00000		2,400.00	
0097	2905000000-N CONVERT EXISTING DROP INLET TOJUNCTION BOX	3.000 EA	2,000.00000		6,000.00	
0098	3000000000-N IMPACT ATTENUATOR UNIT, TYPE 350	1.000 EA	13,500.00000		13,500.00	
0099	3030000000-E STEEL BM GUARDRAIL	4,675.000 LF	14.00000		65,450.00	
0100	3045000000-E STEEL BM GUARDRAIL, SHOP CURVED	325.000 LF	14.00000		4,550.00	
0101	3150000000-N ADDITIONAL GUARDRAIL POSTS	10.000 EA	1.00000		10.00	
0102	3195000000-N GUARDRAIL ANCHOR UNITS, TYPE AT-1	3.000 EA	300.00000		900.00	
0103	3210000000-N GUARDRAIL ANCHOR UNITS, TYPE CAT-1	12.000 EA	400.00000		4,800.00	
0104	3215000000-N GUARDRAIL ANCHOR UNITS, TYPE III	8.000 EA	1,465.00000		11,720.00	

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0105	3270000000-N GUARDRAIL ANCHOR UNITS, TYPE 350	14.000 EA	1,650.00	00	23,100.00	
0106	3317000000-N GUARDRAIL ANCHOR UNITS, TYPE B-77	3.000 EA	1,500.00	00	4,500.00	
0107	3360000000-E REMOVE EXISTING GUARDRAIL	2,844.000 LF	0.20	00	568.80	
0108	3380000000-E TEMPORARY STEEL BM GUARDRAIL	237.500 LF	5.00	00	1,187.50	
0109	3387000000-N TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE ********** (CAT-1)	1.000 EA	350.00	00	350.00	
0110	3389100000-N TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE 350	1.000 EA	1,400.00	00	1,400.00	
0111	3533000000-E CHAIN LINK FENCE, **" FABRIC (72")	254.000 LF	15.00	00	3,810.00	
0112	3539000000-E METAL LINE POSTS FOR **" CHAINLINK FENCE (72")	22.000 EA	50.00	00	1,100.00	
0113	3545000000-E METAL TERMINAL POSTS FOR **" CHAIN LINK FENCE (72")	10.000 EA	100.00	00	1,000.00	
0114	3557000000-E ADDITIONAL BARBED WIRE	100.000 LF	2.00	00	200.00	
0115	3564000000-E SINGLE GATES, **" HIGH, **' WIDE, **' OPENING (72", 4', 4')	2.000 EA	800.00	00	1,600.00	

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0116	3628000000-E RIP RAP, CLASS I	35.000 TON	80.00000		2,800.00	
0117	3635000000-E RIP RAP, CLASS II	135.000 TON	85.00000		11,475.00	
0118	3642000000-E RIP RAP, CLASS A	415.000 TON	45.00000		18,675.00	
0119	3649000000-E RIP RAP, CLASS B	520.000 TON	47.00000		24,440.00	
0120	3651000000-E BOULDERS	260.000 TON	80.00000		20,800.00	
0121	3656000000-E GEOTEXTILE FOR DRAINAGE	8,565.000 SY	2.20000		18,843.00	
0122	3659000000-N PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	5.000 EA	2,500.00000		12,500.00	
0123	4072000000-E SUPPORTS, 3-LB STEEL U-CHANNEL	2,805.000 LF	3.50000		9,817.50	
0124	4096000000-N SIGN ERECTION, TYPE D	10.000 EA	85.00000		850.00	
0125	4102000000-N SIGN ERECTION, TYPE E	166.000 EA	50.00000		8,300.00	
0126	4108000000-N SIGN ERECTION, TYPE F	10.000 EA	85.00000		850.00	
0127	4116100000-N SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)	6.000 EA	50.00000		300.00	

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0128	4155000000-N DISPOSAL OF SIGN SYSTEM, U- CHANNEL	109.000 EA	1.00	00	109.00	
0129	4192000000-N DISPOSAL OF SUPPORT, U-CHANNEL	5.000 EA	1.00	00	5.00	
0130	4238000000-N DISPOSAL OF SIGN, D, E OR F	5.000 EA	1.00	00	5.00	
0131	4400000000-E WORK ZONE SIGNS (STATIONARY)	1,368.000 SF	4.10	00	5,608.80	
0132	4405000000-E WORK ZONE SIGNS (PORTABLE)	768.000 SF	7.75	00	5,952.00	
0133	4410000000-E WORK ZONE SIGNS (BARRICADE MOUNTED)	141.000 SF	5.00	00	705.00	
0134	4415000000-N FLASHING ARROW BOARD	3.000 EA	2,500.00	00	7,500.00	
0135	4420000000-N PORTABLE CHANGEABLE MESSAGE SIGN	7.000 EA	8,500.00	00	59,500.00	
0136	4430000000-N DRUMS	2,000.000 EA	46.00	00	92,000.00	
0137	4435000000-N CONES	20.000 EA	44.25	00	885.00	
0138	4445000000-E BARRICADES (TYPE III)	1,632.000 LF	15.15	00	24,724.80	
0139	4450000000-N FLAGGER	9,600.000 HR	19.50	00	187,200.00	

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0140	4465000000-N TEMPORARY CRASH CUSHIONS	6.000 EA	4,100.00000		24,600.00	
0141	4470000000-N RESET TEMPORARY CRASH CUSHION	7.000 EA	1,200.00000		8,400.00	
0142	4480000000-N TMA	4.000 EA	3,500.00000		14,000.00	
0143	4485000000-E PORTABLE CONCRETE BARRIER	2,825.000 LF	17.50000		49,437.50	
0144	4490000000-E PORTABLE CONCRETE BARRIER (ANCHORED)	1,260.000 LF	34.50000		43,470.00	
0145	4500000000-E RESET PORTABLE CONCRETE BARRIER	1,460.000 LF	4.00000		5,840.00	
0146	4507000000-E WATER FILLED BARRIER	1,375.000 LF	48.50000		66,687.50	
0147	4508000000-E RESET WATER FILLED BARRIER	1,670.000 LF	3.25000		5,427.50	
0148	4510000000-N LAW ENFORCEMENT	1,320.000 HR	30.00000		39,600.00	
0149	4516000000-N SKINNY DRUM	50.000 EA	55.50000		2,775.00	
0150	4650000000-N TEMPORARY RAISED PAVEMENT MARKERS	1,319.000 EA	4.00000		5,276.00	
0151	4685000000-E THERMOPLASTIC PAVEMENT MARKINGLINES (4", 90 MILS)	10,060.000 LF	0.55000		5,533.00	

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0152	4686000000-E THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	36,545.000 LF	0.66000		24,119.70	
0153	4695000000-E THERMOPLASTIC PAVEMENT MARKINGLINES (8", 90 MILS)	3,175.000 LF	3.00000		9,525.00	
0154	4697000000-E THERMOPLASTIC PAVEMENT MARKINGLINES (8", 120 MILS)	3,439.000 LF	3.00000		10,317.00	
0155	4700000000-E THERMOPLASTIC PAVEMENT MARKINGLINES (12", 90 MILS)	760.000 LF	6.00000		4,560.00	
0156	4710000000-E THERMOPLASTIC PAVEMENT MARKINGLINES (24", 120 MILS)	1,185.000 LF	15.00000		17,775.00	
0157	4721000000-E THERMOPLASTIC PAVEMENT MARKINGCHARACTER (120 MILS)	48.000 EA	125.00000		6,000.00	
0158	4725000000-E THERMOPLASTIC PAVEMENT MARKINGSYMBOL (90 MILS)	259.000 EA	125.00000		32,375.00	
0159	4770000000-E COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (II)	2,439.000 LF	1.75000		4,268.25	
0160	4770000000-E COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)	3,012.000 LF	1.75000		5,271.00	
0161	4805000000-N COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (II)	9.000 EA	250.00000		2,250.00	

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0162	4805000000-N COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (IV)	7.000 EA	250.00000		1,750.00	
0163	4810000000-E PAINT PAVEMENT MARKING LINES (4")	513,936.000 LF	0.10000		51,393.60	
0164	4820000000-E PAINT PAVEMENT MARKING LINES (8")	38,751.000 LF	0.30000		11,625.30	
0165	4835000000-E PAINT PAVEMENT MARKING LINES (24")	5,112.000 LF	4.00000		20,448.00	
0166	4840000000-N PAINT PAVEMENT MARKING CHARAC-TER	8.000 EA	50.00000		400.00	
0167	4845000000-N PAINT PAVEMENT MARKING SYMBOL	233.000 EA	50.00000		11,650.00	
0168	4850000000-E REMOVAL OF PAVEMENT MARKING LINES (4")	50,201.000 LF	0.35000		17,570.35	
0169	4860000000-E REMOVAL OF PAVEMENT MARKING LINES (8")	4,060.000 LF	0.50000		2,030.00	
0170	4870000000-E REMOVAL OF PAVEMENT MARKING LINES (24")	500.000 LF	3.00000		1,500.00	
0171	4875000000-N REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	25.000 EA	25.00000		625.00	
0172	4900000000-N PERMANENT RAISED PAVEMENT MARKERS	33.000 EA	4.00000		132.00	

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0173	4905000000-N SNOWPLOWABLE PAVEMENT MARKERS	1,447.000 EA	23.00	00	33,281.00	
0174	5325800000-E 8" WATER LINE	95.000 LF	54.95	00	5,220.25	
0175	5326200000-E 12" WATER LINE	2,299.000 LF	94.15	00	216,450.85	
0176	5546000000-E 8" VALVE	1.000 EA	1,600.00	00	1,600.00	
0177	5558000000-E 12" VALVE	5.000 EA	2,800.00	00	14,000.00	
0178	5571600000-E 6" TAPPING VALVE	3.000 EA	3,900.00	00	11,700.00	
0179	5589200000-E 2" AIR RELEASE VALVE	4.000 EA	6,400.00	00	25,600.00	
0180	5648000000-N RELOCATE WATER METER	48.000 EA	1,275.00	00	61,200.00	
0181	5656100000-E RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (1 1/2")	4.000 EA	2,000.00	00	8,000.00	
0182	5656100000-E RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (1")	1.000 EA	1,000.00	00	1,000.00	
0183	5656100000-E RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (2")	2.000 EA	2,200.00	00	4,400.00	

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0184	5656100000-E RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (3/4")	1.000 EA	1,000.00000		1,000.00	
0185	5666000000-E FIRE HYDRANT	1.000 EA	3,970.00000		3,970.00	
0186	5672000000-N RELOCATE FIRE HYDRANT	33.000 EA	2,950.00000		97,350.00	
0187	5679200000-E 16" LINE STOP	4.000 EA	17,000.00000		68,000.00	
0188	5691300000-E 8" SANITARY GRAVITY SEWER	257.000 LF	78.00000		20,046.00	
0189	5691400000-E 10" SANITARY GRAVITY SEWER	167.000 LF	93.20000		15,564.40	
0190	5691500000-E 12" SANITARY GRAVITY SEWER	946.000 LF	212.00000		200,552.00	
0191	5709700000-E 16" FORCE MAIN SEWER	9,247.000 LF	87.45000		808,650.15	
0192	5768000000-N SANITARY SEWER CLEAN-OUT	72.000 EA	1,800.00000		129,600.00	
0193	5775000000-E 4' DIA UTILITY MANHOLE	10.000 EA	2,400.00000		24,000.00	
0194	5781000000-E UTILITY MANHOLE WALL, 4' DIA	106.000 LF	225.00000		23,850.00	

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0195	5801000000-E ABANDON 8" UTILITY PIPE	614.000 LF	4.00000		2,456.00	
0196	5802000000-E ABANDON 10" UTILITY PIPE	492.000 LF	6.20000		3,050.40	
0197	5804000000-E ABANDON 12" UTILITY PIPE	1,190.000 LF	8.00000		9,520.00	
0198	5810000000-E ABANDON 16" UTILITY PIPE	3,795.000 LF	13.85000		52,560.75	
0199	5816000000-N ABANDON UTILITY MANHOLE	5.000 EA	800.00000		4,000.00	
0200	5828000000-N REMOVE UTILITY MANHOLE	5.000 EA	1,800.00000		9,000.00	
0201	5836000000-E 24" ENCASEMENT PIPE	416.000 LF	105.00000		43,680.00	
0202	5836200000-E 30" ENCASEMENT PIPE	390.000 LF	145.00000		56,550.00	
0203	5871700000-E TRENCHLESS INSTALLATION OF 12"IN SOIL	120.000 LF	370.00000		44,400.00	
0204	5871710000-E TRENCHLESS INSTALLATION OF 12"NOT IN SOIL	120.000 LF	720.00000		86,400.00	
0205	5872200000-E TRENCHLESS INSTALLATION OF 24"IN SOIL	208.000 LF	519.00000		107,952.00	
0206	5872210000-E TRENCHLESS INSTALLATION OF 24"NOT IN SOIL	208.000 LF	849.00000		176,592.00	

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0207	5872300000-E TRENCHLESS INSTALLATION OF 30"IN SOIL	195.000 LF	559.00000		109,005.00	
0208	5872310000-E TRENCHLESS INSTALLATION OF 30"NOT IN SOIL	195.000 LF	899.00000		175,305.00	
0209	5882000000-N GENERIC UTILITY ITEM ADJUSTMENT OF WATER METER VAULT TOP	1.000 EA	1,000.00000		1,000.00	
0210	5882000000-N GENERIC UTILITY ITEM RELOCATE FIRE WATER METER IN VAULT	1.000 EA	12,000.00000		12,000.00	
0211	5882000000-N GENERIC UTILITY ITEM SUPPORT EXISTING WATER LINE DURING CULVERT INSTALL	1.000 EA	10,000.00000		10,000.00	
0212	6000000000-E TEMPORARY SILT FENCE	31,600.000 LF	1.50000		47,400.00	
0213	6006000000-E STONE FOR EROSION CONTROL, CLASS A	2,440.000 TON	43.00000		104,920.00	
0214	6009000000-E STONE FOR EROSION CONTROL, CLASS B	7,000.000 TON	44.00000		308,000.00	
0215	6012000000-E SEDIMENT CONTROL STONE	7,000.000 TON	40.00000		280,000.00	
0216	6015000000-E TEMPORARY MULCHING	55.000 ACR	450.00000		24,750.00	
0217	6018000000-E SEED FOR TEMPORARY SEEDING	3,700.000 LB	3.00000		11,100.00	

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0218	6021000000-E FERTILIZER FOR TEMPORARY SEED-ING	18.500 TON	1,200.00000		22,200.00	
0219	6024000000-E TEMPORARY SLOPE DRAINS	6,080.000 LF	9.50000		57,760.00	
0220	6029000000-E SAFETY FENCE	7,100.000 LF	1.15000		8,165.00	
0221	6030000000-E SILT EXCAVATION	24,820.000 CY	5.45000		135,269.00	
0222	6036000000-E MATTING FOR EROSION CONTROL	52,000.000 SY	1.20000		62,400.00	
0223	6037000000-E COIR FIBER MAT	2,900.000 SY	4.40000		12,760.00	
0224	6038000000-E PERMANENT SOIL REINFORCEMENT MAT	1,685.000 SY	5.40000		9,099.00	
0225	6042000000-E 1/4" HARDWARE CLOTH	16,660.000 LF	3.25000		54,145.00	
0226	6048000000-E FLOATING TURBIDITY CURTAIN	1,200.000 SY	25.00000		30,000.00	
0227	6070000000-N SPECIAL STILLING BASINS	30.000 EA	380.00000		11,400.00	
0228	6071012000-E COIR FIBER WATTLE	950.000 LF	7.75000		7,362.50	
0229	6071020000-E POLYACRYLAMIDE (PAM)	1,400.000 LB	7.50000		10,500.00	

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0230	6071030000-E COIR FIBER BAFFLE	6,455.000 LF	3.10000		20,010.50	
0231	6071050000-E **" SKIMMER (1-1/2")	35.000 EA	1,000.00000		35,000.00	
0232	6071050000-E **" SKIMMER (2")	4.000 EA	1,100.00000		4,400.00	
0233	6071050000-E **" SKIMMER (2-1/2")	2.000 EA	1,300.00000		2,600.00	
0234	6084000000-E SEEDING & MULCHING	55.000 ACR	2,100.00000		115,500.00	
0235	6087000000-E MOWING	27.000 ACR	65.00000		1,755.00	
0236	6090000000-E SEED FOR REPAIR SEEDING	700.000 LB	10.00000		7,000.00	
0237	6093000000-E FERTILIZER FOR REPAIR SEEDING	2.500 TON	1,200.00000		3,000.00	
0238	6096000000-E SEED FOR SUPPLEMENTAL SEEDING	1,425.000 LB	2.60000		3,705.00	
0239	6108000000-E FERTILIZER TOPDRESSING	42.500 TON	710.00000		30,175.00	
0240	6111000000-E IMPERVIOUS DIKE	75.000 LF	70.00000		5,250.00	
0241	6114500000-N SPECIALIZED HAND MOWING	30.000 MHR	60.00000		1,800.00	

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Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0242	6117000000-N RESPONSE FOR EROSION CONTROL	100.000 EA	200.00000		20,000.00	
0243	6120000000-E CULVERT DIVERSION CHANNEL	52.000 CY	60.00000		3,120.00	
0244	6123000000-E REFORESTATION	5.000 ACR	800.00000		4,000.00	
0245	6126000000-E STREAMBANK REFORESTATION	1.850 ACR	3,900.00000		7,215.00	
0246	7048500000-E PEDESTRIAN SIGNAL HEAD (16", 1SECTION W/COUNTDOWN)	40.000 EA	650.00000		26,000.00	
0247	7060000000-E SIGNAL CABLE	24,975.000 LF	2.80000		69,930.00	
0248	7120000000-E VEHICLE SIGNAL HEAD (12", 3 SECTION)	107.000 EA	645.00000		69,015.00	
0249	7132000000-E VEHICLE SIGNAL HEAD (12", 4 SECTION)	11.000 EA	775.00000		8,525.00	
0250	7144000000-E VEHICLE SIGNAL HEAD (12", 5 SECTION)	16.000 EA	975.00000		15,600.00	
0251	7252000000-E MESSENGER CABLE (1/4")	19,300.000 LF	1.45000		27,985.00	
0252	7264000000-E MESSENGER CABLE (3/8")	5,300.000 LF	2.80000		14,840.00	
0253	7279000000-E TRACER WIRE	730.000 LF	1.00000		730.00	

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0254	7300000000-E UNPAVED TRENCHING (**********) (1, 2")	4,890.000 LF	5.25000		25,672.50	
0255	7300000000-E UNPAVED TRENCHING (**********) (2, 2")	500.000 LF	5.00000		2,500.00	
0256	7300100000-E UNPAVED TRENCHING FOR TEMP-ORARY LEAD-IN	4,525.000 LF	3.40000		15,385.00	
0257	7301000000-E DIRECTIONAL DRILL (**********) (2, 2")	430.000 LF	14.25000		6,127.50	
0258	7324000000-N JUNCTION BOX (STANDARD SIZE)	55.000 EA	195.00000		10,725.00	
0259	7348000000-N JUNCTION BOX (OVER-SIZED, HEA-VY DUTY)	12.000 EA	445.00000		5,340.00	
0260	7360000000-N WOOD POLE	14.000 EA	675.00000		9,450.00	
0261	7372000000-N GUY ASSEMBLY	47.000 EA	275.00000		12,925.00	
0262	7408000000-E 1" RISER WITH WEATHERHEAD	4.000 EA	300.00000		1,200.00	
0263	7420000000-E 2" RISER WITH WEATHERHEAD	29.000 EA	320.00000		9,280.00	
0264	7430000000-N HEAT SHRINK TUBING RETROFIT KIT	1.000 EA	395.00000		395.00	
0265	7444000000-E INDUCTIVE LOOP SAWCUT	20,175.000 LF	4.85000		97,848.75	

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0266	7456000000-E LEAD-IN CABLE (**********) (14-2)	42,255.000 LF	1.05000		44,367.75	
0267	7516000000-E COMMUNICATIONS CABLE (**FIBER) (48)	21,550.000 LF	1.38000		29,739.00	
0268	7528000000-E DROP CABLE	1,150.000 LF	1.36000		1,564.00	
0269	7540000000-N SPLICE ENCLOSURE	7.000 EA	1,325.00000		9,275.00	
0270	7552000000-N INTERCONNECT CENTER	7.000 EA	1,150.00000		8,050.00	
0271	7564000000-N FIBER-OPTIC TRANSCEIVER, DROP & REPEAT	7.000 EA	1,800.00000		12,600.00	
0272	7566000000-N DELINEATOR MARKER	10.000 EA	100.00000		1,000.00	
0273	7575160000-E REMOVE EXISTING COMMUNICATIONSCABLE	18,575.000 LF	0.65000		12,073.75	
0274	7575180000-N CABLE TRANSFER	3.000 EA	250.00000		750.00	
0275	7576000000-N METAL STRAIN SIGNAL POLE	28.000 EA	5,125.00000		143,500.00	
0276	7588000000-N METAL POLE WITH SINGLE MAST ARM	2.000 EA	7,180.00000		14,360.00	
0277	7613000000-N SOIL TEST	30.000 EA	720.00000		21,600.00	

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0278	7614100000-E DRILLED PIER FOUNDATION	180.000 CY	710.00000		127,800.00	
0279	7631000000-N MAST ARM WITH METAL POLE DE- SIGN	2.000 EA	150.00000		300.00	
0280	7636000000-N SIGN FOR SIGNALS	18.000 EA	215.00000		3,870.00	
0281	7642100000-N TYPE I POST WITH FOUNDATION	18.000 EA	850.00000		15,300.00	
0282	7642200000-N TYPE II PEDESTAL WITH FOUND- ATION	19.000 EA	1,158.00000		22,002.00	
0283	7684000000-N SIGNAL CABINET FOUNDATION	7.000 EA	700.00000		4,900.00	
0284	7756000000-N CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)	7.000 EA	10,999.00000		76,993.00	
0285	7780000000-N DETECTOR CARD (TYPE 2070L)	42.000 EA	80.00000		3,360.00	
0286	7901000000-N CABINET BASE EXTENDER	7.000 EA	275.00000		1,925.00	
0287	7980000000-N GENERIC SIGNAL ITEM MICROWAVE VEHICLE DETECTION SYSTEM - MULTIPLE ZONE	1.000 EA	9,656.00000		9,656.00	
0288	7980000000-N GENERIC SIGNAL ITEM MICROWAVE VEHICLE DETECTOR- SINGLE ZONE	1.000 EA	9,656.00000		9,656.00	

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0289	7990000000-E GENERIC SIGNAL ITEM BACK PULL FIBER OPTIC CABLE	2,050.000 LF	1.10000		2,255.00	
0330	2619000000-E 4" CONCRETE PAVED DITCH	83.000 SY	64.00000		5,312.00	
	Section 0001 Total				25,605,847.95	

Section 0002 CULVERT ITEMS

Alt Group

0290	8126000000-N CULVERT EXCAVATION, STA ****** (266+36.00 -L-)	LUMP	LUMP		48,000.00	
0291	8133000000-E FOUNDATION CONDITIONING MATER-IAL, BOX CULVERT	105.000 TON	48.00000		5,040.00	
0292	8196000000-E CLASS A CONCRETE (CULVERT)	146.600 CY	840.00000		123,144.00	
0293	8245000000-E REINFORCING STEEL (CULVERT)	20,800.000 LB	1.15000		23,920.00	
	Section 0002 Total				200,104.00	

Section 0003 WALL ITEMS

Alt Group

0294	8801000000-E MSE RETAINING WALL NO **** (1)	1,870.000 SF	56.00000		104,720.00	
0295	8801000000-E MSE RETAINING WALL NO **** (2)	680.000 SF	56.00000		38,080.00	

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0296	8801000000-E MSE RETAINING WALL NO **** (6)	385.000 SF	58.00000		22,330.00	
0297	8802014000-E SOLDIER PILE RETAINING WALLS	830.000 SF	243.75000		202,312.50	
0298	8802030000-E SEGMENTAL GRAVITY RETAINING WALLS	150.000 SF	119.00000		17,850.00	
	Section 0003 Total				385,292.50	

Section 0004 STRUCTURE ITEMS

Alt Group

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0299	8017000000-N CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP ACCESS AT STA ********** (238+33.00 -L-)	LUMP	LUMP		181,200.00	
0300	8035000000-N REMOVAL OF EXISTING STRUCTURE AT STATION ********** (238+33.00 -L-)	LUMP	LUMP		176,500.00	
0301	8096000000-E PILE EXCAVATION IN SOIL	1,466.000 LF	145.50000		213,303.00	
0302	8097000000-E PILE EXCAVATION NOT IN SOIL	179.000 LF	850.00000		152,150.00	
0303	8105540000-E 3'-6" DIA DRILLED PIERS IN SOIL	207.000 LF	860.00000		178,020.00	
0304	8105640000-E 3'-6" DIA DRILLED PIERS NOT IN SOIL	75.000 LF	2,725.00000		204,375.00	

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0305	8111400000-E PERMANENT STEEL CASING FOR 3'-6" DIA DRILLED PIER	209.800 LF	326.75000		68,552.15	
0306	8113000000-N SID INSPECTIONS	2.000 EA	950.00000		1,900.00	
0307	8115000000-N CSL TESTING	2.000 EA	2,450.00000		4,900.00	
0308	8121000000-N UNCLASSIFIED STRUCTURE EXCAVA-TION AT STATION ******** (238+33.00 -L-)	LUMP	LUMP		5,550.00	
0309	8147000000-E REINFORCED CONCRETE DECK SLAB	20,702.000 SF	30.85000		638,656.70	
0310	8156000000-E CONCRETE WEARING SURFACE	8,310.000 SF	16.50000		137,115.00	
0311	8161000000-E GROOVING BRIDGE FLOORS	28,401.000 SF	0.85000		24,140.85	
0312	8175000000-E CLASS AA CONCRETE (BRIDGE)	82.300 CY	391.00000		32,179.30	
0313	8182000000-E CLASS A CONCRETE (BRIDGE)	421.100 CY	710.00000		298,981.00	
0314	8210000000-N BRIDGE APPROACH SLABS, STATION********** (233+87.56 -L- LT LN)	LUMP	LUMP		46,650.00	
0315	8210000000-N BRIDGE APPROACH SLABS, STATION********** (233+87.56 -L- RT LN)	LUMP	LUMP		60,000.00	

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0316	8210000000-N BRIDGE APPROACH SLABS, STATION********** (238+33.00 -L-)	LUMP	LUMP		56,400.00	
0317	8217000000-E REINFORCING STEEL (BRIDGE)	71,811.000 LB	1.00000		71,811.00	
0318	8224000000-E EPOXY COATED REINFORCING STEEL(BRIDGE)	3,359.000 LB	1.10000		3,694.90	
0319	8238000000-E SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	7,857.000 LB	2.12000		16,656.84	
0320	8265000000-E 54" PRESTRESSED CONCRETE GIR-DERS	2,478.000 LF	215.00000		532,770.00	
0321	8364000000-E HP12X53 STEEL PILES	1,850.000 LF	50.00000		92,500.00	
0322	8391000000-N STEEL PILE POINTS	28.000 EA	195.00000		5,460.00	
0323	8482000000-E THREE BAR METAL RAIL	603.460 LF	226.00000		136,381.96	
0324	8503000000-E CONCRETE BARRIER RAIL	219.200 LF	125.00000		27,400.00	
0325	8608000000-E RIP RAP CLASS II (2'-0" THICK)	775.000 TON	12.70000		9,842.50	
0326	8622000000-E GEOTEXTILE FOR DRAINAGE	850.000 SY	2.25000		1,912.50	

Contract ID: C203256 Project(s): STP-1820(5)
Letting Date: 01-20-15 Call Order: 010
Bidder: 4315 - APAC-Atlantic, Inc. Thompson-Arthur Division

Line No.	Item Description	Approx. Quantity and Units	Unit Price Dollars	Unit Price Cts	Bid Amount Dollars	Bid Amount Ct
0327	8657000000-N ELASTOMERIC BEARINGS	LUMP	LUMP		39,000.00	
0328	8748000000-E SELECT MATERIAL, CLASS ** (V)	13.300 TON	100.00000		1,330.00	
0329	8753200000-E 3'-0" X 3'-3" PRESTRESSED CONCBOX BEAMS	3,388.000 LF	380.00000		1,287,440.00	
	Section 0004 Total				4,706,772.70	
	Bid Total				30,898,017.15	

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: C203256
LETTING: L150120 CALL: 010
VENDOR: 4315 APAC-Atlantic, Inc. Thompson-Arthur Division

LINE NO.	ITEM NO.	ITEM DESC.	UNIT TYPE	SUBCONTRACTOR QUANTITY	SUBCONTRACTOR UNIT PRICE	EXTENDED AMOUNT
DBE SUBCONTRACTOR: 11572 CRUZ BROTHERS CONCRETE, INC.						
Will Use Quote: Yes						
0080	2440000000-N	CONC TRANS S	EA	41.000	600.00000	24600.00
0081	2451000000-N	CONC TRANS S	EA	5.000	550.00000	2750.00
0086	2538000000-E	**'-**" CONC	LF	5455.000	13.25000	72278.75
0087	2542000000-E	1'-6" CONC C	LF	16570.000	10.00000	165700.00
0088	2549000000-E	2'-6" CONC C	LF	34775.000	13.00000	452075.00
0089	2570000000-N	MODIFIED CON	EA	5.000	1500.00000	7500.00
0090	2591000000-E	4" CONCRETE	SY	18210.000	26.32000	479287.20
0091	2605000000-N	CONCRETE CUR	EA	75.000	950.00000	71250.00
0092	2612000000-E	6" CONCRETE	SY	1722.000	39.33000	67726.26
0093	2655000000-E	5" MONO CONC	SY	2300.000	43.00000	98900.00
0094	2657000000-E	**" MONO CON	SY	25.000	64.00000	1600.00
0330	2619000000-E	4" CONCRETE	SY	83.000	64.00000	5312.00

	DBE COMMITMENT TOTAL FOR SUBCONTRACTOR:					1,448,979.21 Committed
	DBE COMMITMENT TOTAL FOR VENDOR (SubContractor)					1,448,9
DBE SUBCONTRACTOR: 4877 ABACHI TRANSPORT, INC. DBA S&B TRUCKING CO.						
Will Use Quote: Yes						
0055	1489000000-E	ASP CONC BAS	TON	42100.000	3.50000	147350.00
	Hauling only.					
0056	1498000000-E	ASP CONC INT	TON	31700.000	3.50000	110950.00
	Hauling only.					
0057	1519000000-E	ASP CONC SUR	TON	32200.000	3.50000	112700.00
	Hauling Only.					
0010	0106000000-E	BORROW EXCAV	CY	125000.000	2.70000	337500.00
0050	1099700000-E	CLASS IV SUB	TON	6000.000	3.00000	18000.00
0052	1121000000-E	AGGREGATE BA	TON	5000.000	3.00000	15000.00
0213	6006000000-E	EROS CONTRL	TON	1400.000	3.00000	4200.00
0214	6009000000-E	EROS CONTRL	TON	4000.000	3.00000	12000.00
0005	0022000000-E	UNCLASSIFIED	CY	52900.000	2.00000	105800.00
0013	0156000000-E	REMOVAL OF E	SY	22700.000	0.50000	11350.00
0014	0177000000-E	BREAKING OF	SY	33000.000	0.50000	16500.00

	DBE COMMITMENT TOTAL FOR SUBCONTRACTOR:					891,350.00 Committed
	DBE COMMITMENT TOTAL FOR VENDOR (SubContractor)					891,350
DBE SUBCONTRACTOR: 12418 LEVEL CROSS SURVEYING PLLC						
Will Use Quote: Yes						
0002	0000400000-N	CONSTRUCTION	LS	1.000	140000.00000	140000.00

LINE NO.	ITEM NO.	ITEM DESC.	UNIT TYPE	SUBCONTRACTOR QUANTITY	SUBCONTRACTOR UNIT PRICE	EXTENDED AMOUNT
						140,000.00

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 140,000.00
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 140,000

DBE SUBCONTRACTOR: 12802 NICKELSTON INDUSTRIES, INC.
Will Use Quote: Yes

0098	3000000000-N	IMPACT ATTEN	EA	1.000	13500.00000	13500.00
0100	3045000000-E	SBGR SHOP CU	LF	325.000	14.00000	4550.00
0099	3030000000-E	STL BM GUARD	LF	4675.000	14.00000	65450.00
0101	3150000000-N	ADDIT GUARDR	EA	10.000	1.00000	10.00
0102	3195000000-N	GR ANCHOR TY	EA	3.000	300.00000	900.00
0103	3210000000-N	GR ANCHOR TY	EA	12.000	400.00000	4800.00
0104	3215000000-N	GR ANCHOR TY	EA	8.000	1465.00000	11720.00
0110	3389100000-N	TEMP GDRL AN	EA	1.000	1400.00000	1400.00
0109	3387000000-N	TEMP GDRL AN	EA	1.000	350.00000	350.00
0108	3380000000-E	TEMP STL BM	LF	237.500	5.00000	1187.50
0107	3360000000-E	REMOVE EXIST	LF	2844.000	0.20000	568.80
0106	3317000000-N	GR ANCHOR TY	EA	3.000	1500.00000	4500.00
0105	3270000000-N	GR ANCHOR TY	EA	14.000	1650.00000	23100.00

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 132,036.30
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 132,036

DBE SUBCONTRACTOR: 3346 LINEBERRY, INC.
Will Use Quote: Yes

0216	6015000000-E	TEMPORARY MU	ACR	55.000	450.00000	24750.00
0217	6018000000-E	SEED FOR TEM	LB	3700.000	3.00000	11100.00
0218	6021000000-E	FERT FOR TEM	TON	18.500	1200.00000	22200.00
0222	6036000000-E	MATTING FOR	SY	52000.000	1.20000	62400.00
0223	6037000000-E	COIR FIBER M	SY	2900.000	4.40000	12760.00
0224	6038000000-E	PERM SOIL RE	SY	1685.000	5.40000	9099.00
0234	6084000000-E	SEEDING AND	ACR	55.000	2100.00000	115500.00
0236	6090000000-E	SEED FOR REP	LB	700.000	10.00000	7000.00
0235	6087000000-E	MOWING	ACR	27.000	65.00000	1755.00
0237	6093000000-E	FERT FOR REP	TON	2.500	1200.00000	3000.00
0238	6096000000-E	SEED FOR SUP	LB	1425.000	2.60000	3705.00
0239	6108000000-E	FERTILIZER T	TON	42.500	710.00000	30175.00
0241	6114500000-N	SPECIALIZED	MHR	30.000	60.00000	1800.00
0244	6123000000-E	REFORESTATIO	ACR	5.000	800.00000	4000.00
0245	6126000000-E	STREAMBANK R	ACR	1.850	3900.00000	7215.00

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 316,459.00 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 316,459

DBE SUBCONTRACTOR: 4247 SEAL BROTHERS CONTRACTING LLC
Will Use Quote: Yes

0212	6000000000-E	TEMPORARY SI	LF	31600.000	1.50000	47400.00
0220	6029000000-E	SAFETY FENCE	LF	7100.000	1.15000	8165.00

LINE NO.	ITEM NO.	ITEM DESC.	UNIT TYPE	SUBCONTRACTOR QUANTITY	SUBCONTRACTOR UNIT PRICE	EXTENDED AMOUNT
0230	6071030000-E	COIR FIBER B	LF	6455.000	3.10000	20010.50

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 75,575.50 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 75,575.

DBE SUBCONTRACTOR: 1991 MCCAIN STRIPING SERVICE, INC.
Will Use Quote: No

0150	4650000000-N	TEMP RAISED	EA	1319.000	4.25000	5605.75
0151	4685000000-E	THERMO PVT M	LF	10060.000	0.62000	6237.20
0152	4686000000-E	THERMO PVT M	LF	36545.000	0.68000	24850.60
0153	4695000000-E	THERMO PVT M	LF	3175.000	1.23000	3905.25
0162	4805000000-N	COLD APPL PL	EA	7.000	150.00000	1050.00
0161	4805000000-N	COLD APPL PL	EA	9.000	150.00000	1350.00
0160	4770000000-E	4" COLD APPL	LF	3012.000	1.65000	4969.80
0159	4770000000-E	4" COLD APPL	LF	2439.000	1.65000	4024.35
0158	4725000000-E	THERMO PVT S	EA	259.000	100.00000	25900.00
0157	4721000000-E	THERMO PVT M	EA	48.000	85.00000	4080.00
0156	4710000000-E	24"WIDE THER	LF	1185.000	5.75000	6813.75
0155	4700000000-E	12"WIDE THER	LF	760.000	2.90000	2204.00
0154	4697000000-E	THERMO PVT M	LF	3439.000	1.35000	4642.65
0167	4845000000-N	PAINT PVT MK	EA	233.000	30.00000	6990.00
0166	4840000000-N	PAINT PVT MK	EA	8.000	28.50000	228.00
0165	4835000000-E	PAINT PVT MK	LF	5112.000	0.90000	4600.80
0164	4820000000-E	PAINT PVMT M	LF	38751.000	0.25000	9687.75
0163	4810000000-E	PAINT PVMT M	LF	513936.000	0.12000	61672.32
0173	4905000000-N	SNOWPLB PVMT	EA	1447.000	23.00000	33281.00
0172	4900000000-N	PERM RAISED	EA	33.000	4.25000	140.25
0171	4875000000-N	REMOVAL OF S	EA	25.000	35.00000	875.00
0170	4870000000-E	LINE REMOVAL	LF	500.000	2.00000	1000.00
0169	4860000000-E	LINE REMOVAL	LF	4060.000	1.20000	4872.00
0168	4850000000-E	LINE REMOVAL	LF	50201.000	0.60000	30120.60

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 249,101.07
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 249,101

DBE SUBCONTRACTOR: 4761 TRAFFIC CONTROL SAFETY SERVICES, INC.
Will Use Quote: Yes

0140	4465000000-N	TEMPORARY CR	EA	6.000	4100.00000	24600.00
0143	4485000000-E	PORT CONC BA	LF	2825.000	17.50000	49437.50
0141	4470000000-N	RESET CRASH	EA	7.000	1200.00000	8400.00
0144	4490000000-E	PORT CONC BA	LF	1260.000	34.50000	43470.00
0145	4500000000-E	RESET PORT C	LF	1460.000	4.00000	5840.00
0146	4507000000-E	WATER FILLED	LF	1375.000	47.00000	64625.00
0147	4508000000-E	RESET WATER	LF	1670.000	2.00000	3340.00
0131	4400000000-E	WORK ZONE SI	SF	1368.000	4.10000	5608.80
0132	4405000000-E	WORK ZONE SI	SF	768.000	7.75000	5952.00
0133	4410000000-E	WORK ZONE SI	SF	141.000	5.00000	705.00
0138	4445000000-E	BARRICADES (	LF	1632.000	15.00000	24480.00
0123	4072000000-E	SUPPORT, 3-L	LF	2805.000	3.50000	9817.50

LINE NO.	ITEM NO.	ITEM DESC.	UNIT TYPE	SUBCONTRACTOR QUANTITY	SUBCONTRACTOR UNIT PRICE	EXTENDED AMOUNT
0124	4096000000-N	SIGN ERECTIO	EA	10.000	85.00000	850.00
0125	4102000000-N	SIGN ERECTIO	EA	166.000	50.00000	8300.00
0126	4108000000-N	SIGN ERECTIO	EA	10.000	85.00000	850.00
0127	4116100000-N	SIGN ERECT,	EA	6.000	50.00000	300.00
0129	4192000000-N	DISPOSE SUPP	EA	5.000	1.00000	5.00
0130	4238000000-N	DISPOSE SIGN	EA	5.000	1.00000	5.00

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 256,585.80 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 256,585

DBE SUBCONTRACTOR: 3538 BONN-J CONTRACTING, INC. OF FLORIDA
Will Use Quote: Yes

0294	8801000000-E	MSE RETAIN W	SF	1870.000	35.00000	65450.00
0295	8801000000-E	MSE RETAIN W	SF	680.000	35.00000	23800.00
0296	8801000000-E	MSE RETAIN W	SF	385.000	35.00000	13475.00

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 102,725.00 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 102,725

DBE SUBCONTRACTOR: 4434 LONG BROTHERS OF SUMMERFIELD, INC.
Will Use Quote: Yes

0058	1575000000-E	ASP FOR PLAN	TON	5310.000	10.00000	53100.00

DBE COMMITMENT TOTAL FOR SUBCONTRACTOR: 53,100.00 Committed
DBE COMMITMENT TOTAL FOR VENDOR (SubContractor) 53,100.

TOTAL DBE COMMITMENT FOR VENDOR: Entered: 11.06% or 3416810.81
Required: 11.00% or 3398781.89
<GOAL MET>

THIS PROPOSAL CONTAINS THE FOLLOWING ERRORS/WARNINGS (IF ANY)

This Bid contains 1 amendment files

00001 01-09-15 MODIFY & ADD ITEMS

Electronic Bid Submission

By submitting this bid electronically, I hereby acknowledge that all requirements included in the hard copy proposal, addendum, amendments, plans, standard specifications, supplemental specifications and special provisions are part of the bid and contract. Further, I acknowledge that I have read, understand, accept, acknowledge and agree to comply with all statements in this electronic bid.

I Hereby certify that I have the authority to submit this bid.

Signature	Agency	Date

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
			ROADWAY ITEMS			
0001	0000100000-N	800	MOBILIZATION	Lump Sum LS	1,500,000.00	1,500,000.00
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum LS	300,000.00	300,000.00
0003	0001000000-E	200	CLEARING & GRUBBING .. ACRE(S)	Lump Sum LS	920,000.00	920,000.00
0004	0008000000-E	200	SUPPLEMENTARY CLEARING & GRUB-BING	2 ACR	100.00	200.00
0005	0022000000-E	225	UNCLASSIFIED EXCAVATION	52,900 CY	31.00	1,639,900.00
0006	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ********** (233+87.56 -L- LT)	Lump Sum LS	75,000.00	75,000.00
0007	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ********** (233+87.56 -L- RT)	Lump Sum LS	75,000.00	75,000.00
0008	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ********** (238+33.00 -L-)	Lump Sum LS	94,800.00	94,800.00
0009	0036000000-E	225	UNDERCUT EXCAVATION	2,250 CY	8.50	19,125.00
0010	0106000000-E	230	BORROW EXCAVATION	205,600 CY	5.45	1,120,520.00
0011	0134000000-E	240	DRAINAGE DITCH EXCAVATION	6,630 CY	6.50	43,095.00
0012	0141000000-E	240	BERM DITCH CONSTRUCTION	1,000 LF	4.00	4,000.00
0013	0156000000-E	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	22,700 SY	3.00	68,100.00
0014	0177000000-E	250	BREAKING OF EXISTING ASPHALT PAVEMENT	33,000 SY	3.00	99,000.00
0015	0195000000-E	265	SELECT GRANULAR MATERIAL	2,500 CY	22.00	55,000.00
0016	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZA-TION	14,050 SY	1.70	23,885.00
0017	0199000000-E	SP	TEMPORARY SHORING	6,444 SF	26.00	167,544.00
0018	0220000000-E	SP	ROCK EMBANKMENTS	1,700 TON	38.00	64,600.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0019	0222000000-E	SP	GEOTEXTILE FOR ROCK EMBANK-MENTS	1,130 SY	2.25	2,542.50
0020	0223000000-E	275	ROCK PLATING	880 SY	70.00	61,600.00
0021	0318000000-E	300	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRUCTURES	3,979 TON	27.65	110,019.35
0022	0320000000-E	300	FOUNDATION CONDITIONING GEO-TEXTILE	15,014 SY	1.70	25,523.80
0023	0335100000-E	305	12" DRAINAGE PIPE	76 LF	53.80	4,088.80
0024	0335200000-E	305	15" DRAINAGE PIPE	2,252 LF	34.25	77,131.00
0025	0335300000-E	305	18" DRAINAGE PIPE	440 LF	37.00	16,280.00
0026	0335400000-E	305	24" DRAINAGE PIPE	1,860 LF	43.75	81,375.00
0027	0335500000-E	305	30" DRAINAGE PIPE	756 LF	53.75	40,635.00
0028	0343000000-E	310	15" SIDE DRAIN PIPE	20 LF	30.00	600.00
0029	0366000000-E	310	15" RC PIPE CULVERTS, CLASS III	100 LF	44.60	4,460.00
0030	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	728 LF	48.50	35,308.00
0031	0378000000-E	310	24" RC PIPE CULVERTS, CLASS III	52 LF	73.00	3,796.00
0032	0384000000-E	310	30" RC PIPE CULVERTS, CLASS III	788 LF	61.75	48,659.00
0033	0396000000-E	310	42" RC PIPE CULVERTS, CLASS III	296 LF	107.00	31,672.00
0034	0402000000-E	310	48" RC PIPE CULVERTS, CLASS III	208 LF	107.00	22,256.00
0035	0408000000-E	310	54" RC PIPE CULVERTS, CLASS III	344 LF	128.00	44,032.00
0036	0420000000-E	310	66" RC PIPE CULVERTS, CLASS III	568 LF	250.00	142,000.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0037	0448200000-E	310	15" RC PIPE CULVERTS, CLASS IV	15,432 LF	35.00	540,120.00
0038	0448300000-E	310	18" RC PIPE CULVERTS, CLASS IV	3,332 LF	40.85	136,112.20
0039	0448400000-E	310	24" RC PIPE CULVERTS, CLASS IV	4,140 LF	50.50	209,070.00
0040	0448500000-E	310	30" RC PIPE CULVERTS, CLASS IV	276 LF	73.00	20,148.00
0041	0448700000-E	310	42" RC PIPE CULVERTS, CLASS IV	40 LF	180.00	7,200.00
0042	0576000000-E	310	**" CS PIPE CULVERTS, *****" THICK (72", 0.139")	200 LF	282.00	56,400.00
0043	0582000000-E	310	15" CS PIPE CULVERTS, 0.064" THICK	244 LF	53.50	13,054.00
0044	0594000000-E	310	24" CS PIPE CULVERTS, 0.064" THICK	68 LF	88.00	5,984.00
0045	0992000000-E	SP	GENERIC PIPE ITEM REMOVE & RESET FES	1 EA	800.00	800.00
0046	0995000000-E	340	PIPE REMOVAL	4,585 LF	10.00	45,850.00
0047	1011000000-N	500	FINE GRADING	Lump Sum LS	417,000.00	417,000.00
0048	1077000000-E	SP	#57 STONE	1,690 TON	29.50	49,855.00
0049	1099500000-E	505	SHALLOW UNDERCUT	4,343 CY	8.50	36,915.50
0050	1099700000-E	505	CLASS IV SUBGRADE STABILIZA-TION	9,140 TON	24.85	227,129.00
0051	1110000000-E	510	STABILIZER AGGREGATE	1,000 TON	26.00	26,000.00
0052	1121000000-E	520	AGGREGATE BASE COURSE	8,800 TON	28.35	249,480.00
0053	1220000000-E	545	INCIDENTAL STONE BASE	1,000 TON	24.50	24,500.00
0054	1275000000-E	600	PRIME COAT	4,530 GAL	2.75	12,457.50
0055	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	42,100 TON	40.00	1,684,000.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0056	1498000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	31,700 TON	40.65	1,288,605.00
0057	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	32,200 TON	41.65	1,341,130.00
0058	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	5,310 TON	616.50	3,273,615.00
0059	1693000000-E	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	1,610 TON	120.00	193,200.00
0060	2022000000-E	815	SUBDRAIN EXCAVATION	168 CY	15.00	2,520.00
0061	2033000000-E	815	SUBDRAIN FINE AGGREGATE	84 CY	70.00	5,880.00
0062	2044000000-E	815	6" PERFORATED SUBDRAIN PIPE	500 LF	3.00	1,500.00
0063	2070000000-N	815	SUBDRAIN PIPE OUTLET	1 EA	300.00	300.00
0064	2077000000-E	815	6" OUTLET PIPE	6 LF	50.00	300.00
0065	2209000000-E	838	ENDWALLS	28 CY	900.00	25,200.00
0066	2220000000-E	838	REINFORCED ENDWALLS	77 CY	1,325.00	102,025.00
0067	2253000000-E	840	PIPE COLLARS	15.3 CY	600.00	9,180.00
0068	2264000000-E	840	PIPE PLUGS	1.96 CY	1,500.00	2,940.00
0069	2275000000-E	SP	FLOWABLE FILL	613.1 CY	152.00	93,191.20
0070	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	324 EA	1,325.00	429,300.00
0071	2297000000-E	840	MASONRY DRAINAGE STRUCTURES	15 CY	1,200.00	18,000.00
0072	2308000000-E	840	MASONRY DRAINAGE STRUCTURES	134 LF	285.00	38,190.00
0073	2354200000-N	840	FRAME WITH GRATE, STD 840.24	1 EA	800.00	800.00
0074	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	16 EA	500.00	8,000.00
0075	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	20 EA	800.00	16,000.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0076	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	33 EA	580.00	19,140.00
0077	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	106 EA	610.00	64,660.00
0078	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	113 EA	615.00	69,495.00
0079	2396000000-N	840	FRAME WITH COVER, STD 840.54	25 EA	500.00	12,500.00
0080	2440000000-N	852	CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN	41 EA	600.00	24,600.00
0081	2451000000-N	852	CONCRETE TRANSITIONAL SECTION FOR DROP INLET	5 EA	550.00	2,750.00
0082	2462000000-E	SP	**" SLUICE GATE (15")	3 EA	2,878.00	8,634.00
0083	2462000000-E	SP	**" SLUICE GATE (18")	1 EA	3,300.00	3,300.00
0084	2462000000-E	SP	**" SLUICE GATE (24")	5 EA	3,680.00	18,400.00
0085	2462000000-E	SP	**" SLUICE GATE (30")	2 EA	5,200.00	10,400.00
0086	2538000000-E	846	**'-**" CONCRETE CURB & GUTTER (2'-9")	5,455 LF	13.25	72,278.75
0087	2542000000-E	846	1'-6" CONCRETE CURB & GUTTER	16,570 LF	10.00	165,700.00
0088	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	34,775 LF	13.00	452,075.00
0089	2570000000-N	SP	MODIFIED CONCRETE FLUME	5 EA	1,500.00	7,500.00
0090	2591000000-E	848	4" CONCRETE SIDEWALK	18,210 SY	26.35	479,833.50
0091	2605000000-N	848	CONCRETE CURB RAMP	75 EA	950.00	71,250.00
0092	2612000000-E	848	6" CONCRETE DRIVEWAY	1,722 SY	39.35	67,760.70

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0093	2655000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)	2,300 SY	43.00	98,900.00
0094	2657000000-E	852	**" MONOLITHIC CONCRETE MEDIAN (*****) (7", KEYED IN)	25 SY	64.00	1,600.00
0095	2800000000-N	858	ADJUSTMENT OF CATCH BASINS	1 EA	800.00	800.00
0096	2845000000-N	858	ADJUSTMENT OF METER BOXES OR VALVE BOXES	2 EA	1,200.00	2,400.00
0097	2905000000-N	859	CONVERT EXISTING DROP INLET TO JUNCTION BOX	3 EA	2,000.00	6,000.00
0098	3000000000-N	SP	IMPACT ATTENUATOR UNIT, TYPE 350	1 EA	13,500.00	13,500.00
0099	3030000000-E	862	STEEL BM GUARDRAIL	4,675 LF	14.00	65,450.00
0100	3045000000-E	862	STEEL BM GUARDRAIL, SHOP CURVED	325 LF	14.00	4,550.00
0101	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	10 EA	1.00	10.00
0102	3195000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE AT-1	3 EA	300.00	900.00
0103	3210000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	12 EA	400.00	4,800.00
0104	3215000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE III	8 EA	1,465.00	11,720.00
0105	3270000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350	14 EA	1,650.00	23,100.00
0106	3317000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE B-77	3 EA	1,500.00	4,500.00
0107	3360000000-E	863	REMOVE EXISTING GUARDRAIL	2,844 LF	0.20	568.80
0108	3380000000-E	862	TEMPORARY STEEL BM GUARDRAIL	237.5 LF	5.00	1,187.50
0109	3387000000-N	862	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE ********** (CAT-1)	1 EA	350.00	350.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0110	3389100000-N	SP	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE 350	1 EA	1,400.00	1,400.00
0111	3533000000-E	866	CHAIN LINK FENCE, **" FABRIC (72")	254 LF	15.00	3,810.00
0112	3539000000-E	866	METAL LINE POSTS FOR **" CHAIN LINK FENCE (72")	22 EA	50.00	1,100.00
0113	3545000000-E	866	METAL TERMINAL POSTS FOR **" CHAIN LINK FENCE (72")	10 EA	100.00	1,000.00
0114	3557000000-E	866	ADDITIONAL BARBED WIRE	100 LF	2.00	200.00
0115	3564000000-E	866	SINGLE GATES, **" HIGH, **' WIDE, **' OPENING (72", 4', 4')	2 EA	800.00	1,600.00
0116	3628000000-E	876	RIP RAP, CLASS I	35 TON	80.00	2,800.00
0117	3635000000-E	876	RIP RAP, CLASS II	135 TON	85.00	11,475.00
0118	3642000000-E	876	RIP RAP, CLASS A	415 TON	45.00	18,675.00
0119	3649000000-E	876	RIP RAP, CLASS B	520 TON	47.00	24,440.00
0120	3651000000-E	SP	BOULDERS	260 TON	80.00	20,800.00
0121	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	8,565 SY	2.20	18,843.00
0122	3659000000-N	SP	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	5 EA	2,500.00	12,500.00
0123	4072000000-E	903	SUPPORTS, 3-LB STEEL U-CHANNEL	2,805 LF	3.50	9,817.50
0124	4096000000-N	904	SIGN ERECTION, TYPE D	10 EA	85.00	850.00
0125	4102000000-N	904	SIGN ERECTION, TYPE E	166 EA	50.00	8,300.00
0126	4108000000-N	904	SIGN ERECTION, TYPE F	10 EA	85.00	850.00
0127	4116100000-N	904	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)	6 EA	50.00	300.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0128	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	109 EA	1.00	109.00
0129	4192000000-N	907	DISPOSAL OF SUPPORT, U-CHANNEL	5 EA	1.00	5.00
0130	4238000000-N	907	DISPOSAL OF SIGN, D, E OR F	5 EA	1.00	5.00
0131	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	1,368 SF	4.10	5,608.80
0132	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	768 SF	7.75	5,952.00
0133	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	141 SF	5.00	705.00
0134	4415000000-N	1115	FLASHING ARROW BOARD	3 EA	2,500.00	7,500.00
0135	4420000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN	7 EA	8,500.00	59,500.00
0136	4430000000-N	1130	DRUMS	2,000 EA	46.00	92,000.00
0137	4435000000-N	1135	CONES	20 EA	44.25	885.00
0138	4445000000-E	1145	BARRICADES (TYPE III)	1,632 LF	15.15	24,724.80
0139	4450000000-N	1150	FLAGGER	9,600 HR	19.50	187,200.00
0140	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	6 EA	4,100.00	24,600.00
0141	4470000000-N	1160	RESET TEMPORARY CRASH CUSHION	7 EA	1,200.00	8,400.00
0142	4480000000-N	1165	TMA	4 EA	3,500.00	14,000.00
0143	4485000000-E	1170	PORTABLE CONCRETE BARRIER	2,825 LF	17.50	49,437.50
0144	4490000000-E	1170	PORTABLE CONCRETE BARRIER (ANCHORED)	1,260 LF	34.50	43,470.00
0145	4500000000-E	1170	RESET PORTABLE CONCRETE BARRIER	1,460 LF	4.00	5,840.00
0146	4507000000-E	1170	WATER FILLED BARRIER	1,375 LF	48.50	66,687.50
0147	4508000000-E	1170	RESET WATER FILLED BARRIER	1,670 LF	3.25	5,427.50

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0148	4510000000-N	SP	LAW ENFORCEMENT	1,320 HR	30.00	39,600.00
0149	4516000000-N	1180	SKINNY DRUM	50 EA	55.50	2,775.00
0150	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	1,319 EA	4.00	5,276.00
0151	4685000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	10,060 LF	0.55	5,533.00
0152	4686000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	36,545 LF	0.66	24,119.70
0153	4695000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	3,175 LF	3.00	9,525.00
0154	4697000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)	3,439 LF	3.00	10,317.00
0155	4700000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)	760 LF	6.00	4,560.00
0156	4710000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)	1,185 LF	15.00	17,775.00
0157	4721000000-E	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)	48 EA	125.00	6,000.00
0158	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	259 EA	125.00	32,375.00
0159	4770000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (II)	2,439 LF	1.75	4,268.25
0160	4770000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)	3,012 LF	1.75	5,271.00
0161	4805000000-N	1205	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (II)	9 EA	250.00	2,250.00
0162	4805000000-N	1205	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (IV)	7 EA	250.00	1,750.00
0163	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	513,936 LF	0.10	51,393.60

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0164	4820000000-E	1205	PAINT PAVEMENT MARKING LINES (8")	38,751 LF	0.30	11,625.30
0165	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	5,112 LF	4.00	20,448.00
0166	4840000000-N	1205	PAINT PAVEMENT MARKING CHARAC-TER	8 EA	50.00	400.00
0167	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	233 EA	50.00	11,650.00
0168	4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	50,201 LF	0.35	17,570.35
0169	4860000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (8")	4,060 LF	0.50	2,030.00
0170	4870000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (24")	500 LF	3.00	1,500.00
0171	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	25 EA	25.00	625.00
0172	4900000000-N	1251	PERMANENT RAISED PAVEMENT MARKERS	33 EA	4.00	132.00
0173	4905000000-N	1253	SNOWPLOWABLE PAVEMENT MARKERS	1,447 EA	23.00	33,281.00
0174	5325800000-E	1510	8" WATER LINE	95 LF	54.95	5,220.25
0175	5326200000-E	1510	12" WATER LINE	2,299 LF	94.15	216,450.85
0176	5546000000-E	1515	8" VALVE	1 EA	1,600.00	1,600.00
0177	5558000000-E	1515	12" VALVE	5 EA	2,800.00	14,000.00
0178	5571600000-E	1515	6" TAPPING VALVE	3 EA	3,900.00	11,700.00
0179	5589200000-E	1515	2" AIR RELEASE VALVE	4 EA	6,400.00	25,600.00
0180	5648000000-N	1515	RELOCATE WATER METER	48 EA	1,275.00	61,200.00
0181	5656100000-E	1515	RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (1 1/2")	4 EA	2,000.00	8,000.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0182	5656100000-E	1515	RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (1")	1 EA	1,000.00	1,000.00
0183	5656100000-E	1515	RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (2")	2 EA	2,200.00	4,400.00
0184	5656100000-E	1515	RELOCATE **" RPZ BACKFLOW PRE-VENTION ASSEMBLY (3/4")	1 EA	1,000.00	1,000.00
0185	5666000000-E	1515	FIRE HYDRANT	1 EA	3,970.00	3,970.00
0186	5672000000-N	1515	RELOCATE FIRE HYDRANT	33 EA	2,950.00	97,350.00
0187	5679200000-E	1515	16" LINE STOP	4 EA	17,000.00	68,000.00
0188	5691300000-E	1520	8" SANITARY GRAVITY SEWER	257 LF	78.00	20,046.00
0189	5691400000-E	1520	10" SANITARY GRAVITY SEWER	167 LF	93.20	15,564.40
0190	5691500000-E	1520	12" SANITARY GRAVITY SEWER	946 LF	212.00	200,552.00
0191	5709700000-E	1520	16" FORCE MAIN SEWER	9,247 LF	87.45	808,650.15
0192	5768000000-N	1520	SANITARY SEWER CLEAN-OUT	72 EA	1,800.00	129,600.00
0193	5775000000-E	1525	4' DIA UTILITY MANHOLE	10 EA	2,400.00	24,000.00
0194	5781000000-E	1525	UTILITY MANHOLE WALL, 4' DIA	106 LF	225.00	23,850.00
0195	5801000000-E	1530	ABANDON 8" UTILITY PIPE	614 LF	4.00	2,456.00
0196	5802000000-E	1530	ABANDON 10" UTILITY PIPE	492 LF	6.20	3,050.40
0197	5804000000-E	1530	ABANDON 12" UTILITY PIPE	1,190 LF	8.00	9,520.00
0198	5810000000-E	1530	ABANDON 16" UTILITY PIPE	3,795 LF	13.85	52,560.75
0199	5816000000-N	1530	ABANDON UTILITY MANHOLE	5 EA	800.00	4,000.00
0200	5828000000-N	1530	REMOVE UTILITY MANHOLE	5 EA	1,800.00	9,000.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0201	5836000000-E	1540	24" ENCASEMENT PIPE	416 LF	105.00	43,680.00
0202	5836200000-E	1540	30" ENCASEMENT PIPE	390 LF	145.00	56,550.00
0203	5871700000-E	1550	TRENCHLESS INSTALLATION OF 12" IN SOIL	120 LF	370.00	44,400.00
0204	5871710000-E	1550	TRENCHLESS INSTALLATION OF 12" NOT IN SOIL	120 LF	720.00	86,400.00
0205	5872200000-E	1550	TRENCHLESS INSTALLATION OF 24" IN SOIL	208 LF	519.00	107,952.00
0206	5872210000-E	1550	TRENCHLESS INSTALLATION OF 24" NOT IN SOIL	208 LF	849.00	176,592.00
0207	5872300000-E	1550	TRENCHLESS INSTALLATION OF 30" IN SOIL	195 LF	559.00	109,005.00
0208	5872310000-E	1550	TRENCHLESS INSTALLATION OF 30" NOT IN SOIL	195 LF	899.00	175,305.00
0209	5882000000-N	SP	GENERIC UTILITY ITEM ADJUSTMENT OF WATER METER VAULT TOP	1 EA	1,000.00	1,000.00
0210	5882000000-N	SP	GENERIC UTILITY ITEM RELOCATE FIRE WATER METER IN VAULT	1 EA	12,000.00	12,000.00
0211	5882000000-N	SP	GENERIC UTILITY ITEM SUPPORT EXISTING WATER LINE DURING CULVERT INSTALL	1 EA	10,000.00	10,000.00
0212	6000000000-E	1605	TEMPORARY SILT FENCE	31,600 LF	1.50	47,400.00
0213	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	2,440 TON	43.00	104,920.00
0214	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	7,000 TON	44.00	308,000.00
0215	6012000000-E	1610	SEDIMENT CONTROL STONE	7,000 TON	40.00	280,000.00
0216	6015000000-E	1615	TEMPORARY MULCHING	55 ACR	450.00	24,750.00
0217	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	3,700 LB	3.00	11,100.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0218	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEED-ING	18.5 TON	1,200.00	22,200.00
0219	6024000000-E	1622	TEMPORARY SLOPE DRAINS	6,080 LF	9.50	57,760.00
0220	6029000000-E	SP	SAFETY FENCE	7,100 LF	1.15	8,165.00
0221	6030000000-E	1630	SILT EXCAVATION	24,820 CY	5.45	135,269.00
0222	6036000000-E	1631	MATTING FOR EROSION CONTROL	52,000 SY	1.20	62,400.00
0223	6037000000-E	SP	COIR FIBER MAT	2,900 SY	4.40	12,760.00
0224	6038000000-E	SP	PERMANENT SOIL REINFORCEMENT MAT	1,685 SY	5.40	9,099.00
0225	6042000000-E	1632	1/4" HARDWARE CLOTH	16,660 LF	3.25	54,145.00
0226	6048000000-E	SP	FLOATING TURBIDITY CURTAIN	1,200 SY	25.00	30,000.00
0227	6070000000-N	1639	SPECIAL STILLING BASINS	30 EA	380.00	11,400.00
0228	6071012000-E	SP	COIR FIBER WATTLE	950 LF	7.75	7,362.50
0229	6071020000-E	SP	POLYACRYLAMIDE (PAM)	1,400 LB	7.50	10,500.00
0230	6071030000-E	1640	COIR FIBER BAFFLE	6,455 LF	3.10	20,010.50
0231	6071050000-E	SP	**" SKIMMER (1-1/2")	35 EA	1,000.00	35,000.00
0232	6071050000-E	SP	**" SKIMMER (2")	4 EA	1,100.00	4,400.00
0233	6071050000-E	SP	**" SKIMMER (2-1/2")	2 EA	1,300.00	2,600.00
0234	6084000000-E	1660	SEEDING & MULCHING	55 ACR	2,100.00	115,500.00
0235	6087000000-E	1660	MOWING	27 ACR	65.00	1,755.00
0236	6090000000-E	1661	SEED FOR REPAIR SEEDING	700 LB	10.00	7,000.00
0237	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	2.5 TON	1,200.00	3,000.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0238	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	1,425 LB	2.60	3,705.00
0239	6108000000-E	1665	FERTILIZER TOPDRESSING	42.5 TON	710.00	30,175.00
0240	6111000000-E	SP	IMPERVIOUS DIKE	75 LF	70.00	5,250.00
0241	6114500000-N	1667	SPECIALIZED HAND MOWING	30 MHR	60.00	1,800.00
0242	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	100 EA	200.00	20,000.00
0243	6120000000-E	SP	CULVERT DIVERSION CHANNEL	52 CY	60.00	3,120.00
0244	6123000000-E	1670	REFORESTATION	5 ACR	800.00	4,000.00
0245	6126000000-E	SP	STREAMBANK REFORESTATION	1.85 ACR	3,900.00	7,215.00
0246	7048500000-E	1705	PEDESTRIAN SIGNAL HEAD (16", 1 SECTION W/COUNTDOWN)	40 EA	650.00	26,000.00
0247	7060000000-E	1705	SIGNAL CABLE	24,975 LF	2.80	69,930.00
0248	7120000000-E	1705	VEHICLE SIGNAL HEAD (12", 3 SECTION)	107 EA	645.00	69,015.00
0249	7132000000-E	1705	VEHICLE SIGNAL HEAD (12", 4 SECTION)	11 EA	775.00	8,525.00
0250	7144000000-E	1705	VEHICLE SIGNAL HEAD (12", 5 SECTION)	16 EA	975.00	15,600.00
0251	7252000000-E	1710	MESSENGER CABLE (1/4")	19,300 LF	1.45	27,985.00
0252	7264000000-E	1710	MESSENGER CABLE (3/8")	5,300 LF	2.80	14,840.00
0253	7279000000-E	1715	TRACER WIRE	730 LF	1.00	730.00
0254	7300000000-E	1715	UNPAVED TRENCHING (**********) (1, 2")	4,890 LF	5.25	25,672.50
0255	7300000000-E	1715	UNPAVED TRENCHING (**********) (2, 2")	500 LF	5.00	2,500.00
0256	7300100000-E	1715	UNPAVED TRENCHING FOR TEMP-ORARY LEAD-IN	4,525 LF	3.40	15,385.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0257	7301000000-E	1715	DIRECTIONAL DRILL (**********) (2, 2")	430 LF	14.25	6,127.50
0258	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	55 EA	195.00	10,725.00
0259	7348000000-N	1716	JUNCTION BOX (OVER-SIZED, HEA-VY DUTY)	12 EA	445.00	5,340.00
0260	7360000000-N	1720	WOOD POLE	14 EA	675.00	9,450.00
0261	7372000000-N	1721	GUY ASSEMBLY	47 EA	275.00	12,925.00
0262	7408000000-E	1722	1" RISER WITH WEATHERHEAD	4 EA	300.00	1,200.00
0263	7420000000-E	1722	2" RISER WITH WEATHERHEAD	29 EA	320.00	9,280.00
0264	7430000000-N	1722	HEAT SHRINK TUBING RETROFIT KIT	1 EA	395.00	395.00
0265	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	20,175 LF	4.85	97,848.75
0266	7456000000-E	1726	LEAD-IN CABLE (**********) (14-2)	42,255 LF	1.05	44,367.75
0267	7516000000-E	1730	COMMUNICATIONS CABLE (**FIBER) (48)	21,550 LF	1.38	29,739.00
0268	7528000000-E	1730	DROP CABLE	1,150 LF	1.36	1,564.00
0269	7540000000-N	1731	SPLICE ENCLOSURE	7 EA	1,325.00	9,275.00
0270	7552000000-N	1731	INTERCONNECT CENTER	7 EA	1,150.00	8,050.00
0271	7564000000-N	1732	FIBER-OPTIC TRANSCEIVER, DROP & REPEAT	7 EA	1,800.00	12,600.00
0272	7566000000-N	1733	DELINEATOR MARKER	10 EA	100.00	1,000.00
0273	7575160000-E	1734	REMOVE EXISTING COMMUNICATIONS CABLE	18,575 LF	0.65	12,073.75
0274	7575180000-N	1735	CABLE TRANSFER	3 EA	250.00	750.00
0275	7576000000-N	SP	METAL STRAIN SIGNAL POLE	28 EA	5,125.00	143,500.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0276	7588000000-N	SP	METAL POLE WITH SINGLE MAST ARM	2 EA	7,180.00	14,360.00
0277	7613000000-N	SP	SOIL TEST	30 EA	720.00	21,600.00
0278	7614100000-E	SP	DRILLED PIER FOUNDATION	180 CY	710.00	127,800.00
0279	7631000000-N	SP	MAST ARM WITH METAL POLE DE-SIGN	2 EA	150.00	300.00
0280	7636000000-N	1745	SIGN FOR SIGNALS	18 EA	215.00	3,870.00
0281	7642100000-N	1743	TYPE I POST WITH FOUNDATION	18 EA	850.00	15,300.00
0282	7642200000-N	1743	TYPE II PEDESTAL WITH FOUND-ATION	19 EA	1,158.00	22,002.00
0283	7684000000-N	1750	SIGNAL CABINET FOUNDATION	7 EA	700.00	4,900.00
0284	7756000000-N	1751	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)	7 EA	10,999.00	76,993.00
0285	7780000000-N	1751	DETECTOR CARD (TYPE 2070L)	42 EA	80.00	3,360.00
0286	7901000000-N	1753	CABINET BASE EXTENDER	7 EA	275.00	1,925.00
0287	7980000000-N	SP	GENERIC SIGNAL ITEM MICROWAVE VEHICLE DETECTION SYSTEM - MULTIPLE ZONE	1 EA	9,656.00	9,656.00
0288	7980000000-N	SP	GENERIC SIGNAL ITEM MICROWAVE VEHICLE DETECTOR-SINGLE ZONE	1 EA	9,656.00	9,656.00
0289	7990000000-E	SP	GENERIC SIGNAL ITEM BACK PULL FIBER OPTIC CABLE	2,050 LF	1.10	2,255.00
0330	2619000000-E	850	4" CONCRETE PAVED DITCH	83 SY	64.00	5,312.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0290	8126000000-N	414	CULVERT EXCAVATION, STA ****** (266+36.00 -L-)	Lump Sum LS	48,000.00	48,000.00
0291	8133000000-E	414	FOUNDATION CONDITIONING MATER-IAL, BOX CULVERT	105 TON	48.00	5,040.00
0292	8196000000-E	420	CLASS A CONCRETE (CULVERT)	146.6 CY	840.00	123,144.00
0293	8245000000-E	425	REINFORCING STEEL (CULVERT)	20,800 LB	1.15	23,920.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0294	8801000000-E	SP	MSE RETAINING WALL NO **** (1)	1,870 SF	56.00	104,720.00
0295	8801000000-E	SP	MSE RETAINING WALL NO **** (2)	680 SF	56.00	38,080.00
0296	8801000000-E	SP	MSE RETAINING WALL NO **** (6)	385 SF	58.00	22,330.00
0297	8802014000-E	SP	SOLDIER PILE RETAINING WALLS	830 SF	243.75	202,312.50
0298	8802030000-E	SP	SEGMENTAL GRAVITY RETAINING WALLS	150 SF	119.00	17,850.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0299	8017000000-N	SP	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP ACCESS AT STA ********** (238+33.00 -L-)	Lump Sum LS	181,200.00	181,200.00
0300	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ********** (238+33.00 -L-)	Lump Sum LS	176,500.00	176,500.00
0301	8096000000-E	450	PILE EXCAVATION IN SOIL	1,466 LF	145.50	213,303.00
0302	8097000000-E	450	PILE EXCAVATION NOT IN SOIL	179 LF	850.00	152,150.00
0303	8105540000-E	411	3'-6" DIA DRILLED PIERS IN SOIL	207 LF	860.00	178,020.00
0304	8105640000-E	411	3'-6" DIA DRILLED PIERS NOT IN SOIL	75 LF	2,725.00	204,375.00
0305	8111400000-E	411	PERMANENT STEEL CASING FOR 3'-6" DIA DRILLED PIER	209.8 LF	326.75	68,552.15
0306	8113000000-N	411	SID INSPECTIONS	2 EA	950.00	1,900.00
0307	8115000000-N	411	CSL TESTING	2 EA	2,450.00	4,900.00
0308	8121000000-N	412	UNCLASSIFIED STRUCTURE EXCAVA-TION AT STATION ******** (238+33.00 -L-)	Lump Sum LS	5,550.00	5,550.00
0309	8147000000-E	420	REINFORCED CONCRETE DECK SLAB	20,702 SF	30.85	638,656.70
0310	8156000000-E	SP	CONCRETE WEARING SURFACE	8,310 SF	16.50	137,115.00
0311	8161000000-E	420	GROOVING BRIDGE FLOORS	28,401 SF	0.85	24,140.85
0312	8175000000-E	420	CLASS AA CONCRETE (BRIDGE)	82.3 CY	391.00	32,179.30
0313	8182000000-E	420	CLASS A CONCRETE (BRIDGE)	421.1 CY	710.00	298,981.00
0314	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ********** (233+87.56 -L- LT LN)	Lump Sum LS	46,650.00	46,650.00
0315	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ********** (233+87.56 -L- RT LN)	Lump Sum LS	60,000.00	60,000.00

Contract Item Sheets For C203256

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0316	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ********** (238+33.00 -L-)	Lump Sum LS	56,400.00	56,400.00
0317	8217000000-E	425	REINFORCING STEEL (BRIDGE)	71,811 LB	1.00	71,811.00
0318	8224000000-E	425	EPOXY COATED REINFORCING STEEL (BRIDGE)	3,359 LB	1.10	3,694.90
0319	8238000000-E	425	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	7,857 LB	2.12	16,656.84
0320	8265000000-E	430	54" PRESTRESSED CONCRETE GIR-DERS	2,478 LF	215.00	532,770.00
0321	8364000000-E	450	HP12X53 STEEL PILES	1,850 LF	50.00	92,500.00
0322	8391000000-N	450	STEEL PILE POINTS	28 EA	195.00	5,460.00
0323	8482000000-E	460	THREE BAR METAL RAIL	603.46 LF	226.00	136,381.96
0324	8503000000-E	460	CONCRETE BARRIER RAIL	219.2 LF	125.00	27,400.00
0325	8608000000-E	876	RIP RAP CLASS II (2'-0" THICK)	775 TON	12.70	9,842.50
0326	8622000000-E	876	GEOTEXTILE FOR DRAINAGE	850 SY	2.25	1,912.50
0327	8657000000-N	430	ELASTOMERIC BEARINGS	Lump Sum LS	39,000.00	39,000.00
0328	8748000000-E	SP	SELECT MATERIAL, CLASS ** (V)	13.3 TON	100.00	1,330.00
0329	8753200000-E	430	3'-0" X 3'-3" PRESTRESSED CONC BOX BEAMS	3,388 LF	380.00	1,287,440.00

TOTAL AMOUNT OF BID FOR ENTIRE PROJECT **$30,898,017.15**

Contract No. C203256

County Guilford

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

APAC-Atlantic, Inc. Thompson-Arthur Division

Full name of Corporation

P.O. Box 21088 Greensboro, NC 27420

Address as Prequalified

Attest _____ By _____

~~Secretary~~/Assistant Secretary — President/~~Vice President~~/~~Assistant Vice President~~

Select appropriate title — *Select appropriate title*

Leonard D. Conway — Clarence O. Brickey

Print or type Signer's name — Print or type Signer's name

CORPORATE SEAL

AFFIDAVIT MUST BE NOTARIZED

Subscribed and sworn to before me this the

5th day of February 2015

_____

Signature of Notary Public

of Randolph County

State of North Carolina

My Commission Expires: 4/11/16

NOTARY SEAL

Contract No. C203256
County Guilford

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. C203256

County Guilford

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.

Contract No. **C203256**

County (ies): **Guilford**

ACCEPTED BY THE
DEPARTMENT OF TRANSPORTATION

DocuSigned by:
Randy A Hamm
A7079FC32A09478...

Contract Officer

2/9/2015

Date

Execution of Contract and Bonds
Approved as to Form:

DocuSigned by:
Colin Justice
1889E4C5ADF14AE...

Attorney General

2/6/2015

Date

Signature Sheet (Bid - Acceptance by Department)

Contract No. C203256
County GUILFORD

Rev 5-17-11

CONTRACT PAYMENT BOND

Date of Payment Bond Execution: FEBRUARY 3, 2015

Name of Principal Contractor: APAC - ATLANTIC, INC. THOMPSON-ARTHUR DIVISION

Name of Surety: LIBERTY MUTUAL INSURANCE COMPANY

Name of Contracting Body: **North Carolina Department of Transportation**

Raleigh, North Carolina

Amount of Bond: $30,898,017.15

Contract ID No.: C203256

County Name: GUILFORD

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. C203256
County GUILFORD

Rev 5-17-11

CONTRACT PAYMENT BOND

Affix Seal of Surety Company

LIBERTY MUTUAL INSURANCE COMPANY
Print or type Surety Company Name

By TINA DAVIS
Print, stamp or type name of Attorney-in-Fact

Signature of Attorney-in-Fact

Signature of Witness

LISA HALL
Print or type Signer's name

15 W. SOUTH TEMPLE, STE. 700
SALT LAKE CITY, UT 84101
Address of Attorney-in-Fact

Contract No. C203256
County GUILFORD

Rev 5-17-11

CONTRACT PAYMENT BOND

CORPORATION

SIGNATURE OF CONTRACTOR (Principal)

APAC - ATLANTIC, INC. THOMPSON-ARTHUR DIVISION

Full name of Corporation

P.O. BOX 21088, GREENSBORO, NC 27420

Address as prequalified

By Clarence O. Brickey

Signature of **President**, ~~**Vice President**~~, ~~**Assistant Vice President**~~

Select appropriate title

Clarence O. Brickey

Print or type Signer's name

Affix Corporate Seal

Attest Leonard D. Conway

Signature of ~~**Secretary**~~, **Assistant Secretary**

Select appropriate title

Leonard D. Conway

Print or type Signer's name

SURETY ACKNOWLEDGMENT

STATE OF UTAH }

COUNTY OF SALT LAKE } SS

On this 3RD day of FEBRUARY, 2015, before me personally came TINA DAVIS to me known, who, being by me duly sworn, did depose and say that she is an Attorney-In-Fact of LIBERTY MUTUAL INSURANCE COMPANY the corporation described in and which executed the within instrument; that she knows the corporate seal of said corporation, that the seal affixed to the within instrument is such corporate seal, and that she signed the said instrument and affixed the said seal as Attorney-In-Fact of the Board of Directors of said corporation and by authority of this office under the Standing Resolutions thereof.

Notary Public

LISA HALL
Notary Public, State of Utah
Commission # 605901
My Commission Expires
March 13, 2015

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.
This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 6736714

American Fire and Casualty Company
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That American Fire & Casualty Company and The Ohio Casualty Insurance Company are corporations duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Linda Lee Nipper; Lindsey Plattner; Lisa Hall; Tina Davis

all of the city of Salt Lake City, state of UT each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 9th day of October, 2014.

American Fire and Casualty Company
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 9th day of October, 2014, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American Fire and Casualty Company, Liberty Mutual Insurance Company, The Ohio Casualty Insurance Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Plymouth Twp., Montgomery County
My Commission Expires March 28, 2017
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Gregory W. Davenport, the undersigned, Assistant Secretary, of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 3RD day of FEBRUARY, 20 15.

By: Gregory W. Davenport
Gregory W. Davenport, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

Contract No. C203256
County GUILFORD

Rev 5-17-11

CONTRACT PERFORMANCE BOND

Date of Performance Bond Execution: FEBRUARY 3, 2015

Name of Principal Contractor: APAC - ATLANTIC, INC. THOMPSON-ARTHUR DIVISION

Name of Surety: LIBERTY MUTUAL INSURANCE COMPANY

Name of Contracting Body: **North Carolina Department of Transportation**

Raleigh, North Carolina

Amount of Bond: $30,898,017.15

Contract ID No.: C203256

County Name: GUILFORD

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. C203256
County GUILFORD

Rev 5-17-11

CONTRACT PERFORMANCE BOND

Affix Seal of Surety Company

LIBERTY MUTUAL INSURANCE COMPANY
Print or type Surety Company Name

By TINA DAVS
Print, stamp or type name of Attorney-in-Fact

Signature of Attorney-in-Fact

Signature of Witness

LISA HALL
Print or type Signer's name

15 W. SOUTH TEMPLE, STE. 700
SALT LAKE CITY, UT 84101
Address of Attorney-in-Fact

Contract No. C203256
County GUILFORD

Rev 5-17-11

CONTRACT PERFORMANCE BOND

CORPORATION

SIGNATURE OF CONTRACTOR (Principal)

APAC - ATLANTIC, INC. THOMPSON-ARTHUR DIVISION

Full name of Corporation

P.O. BOX 21088, GREENSBORO, NC 27420

Address as prequalified

By _____

Signature of President, ~~Vice President~~, ~~Assistant Vice President~~.
Select appropriate title

Clarence O. Brickey

Print or type Signer's name

Affix Corporate Seal

Attest _____

Signature of ~~Secretary~~, Assistant Secretary
Select appropriate title

Leonard D. Conway

Print or type Signer's name

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.
This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 6736715

American Fire and Casualty Company
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That American Fire & Casualty Company and The Ohio Casualty Insurance Company are corporations duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Linda Lee Nipper; Lindsey Plattner; Lisa Hall; Tina Davis

all of the city of Salt Lake City, state of UT each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 9th day of October, 2014.

American Fire and Casualty Company
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 9th day of October, 2014, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American Fire and Casualty Company, Liberty Mutual Insurance Company, The Ohio Casualty Insurance Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Plymouth Twp., Montgomery County
My Commission Expires March 28, 2017
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Gregory W. Davenport, the undersigned, Assistant Secretary, of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 3RD day of FEBRUARY, 2015.

By: Gregory W. Davenport
Gregory W. Davenport, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.