



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

February 3, 2011

**Addendum No. 1**

RE: Contract ID C202684

WBS # 35196.3.18, 35196.3.19, 35196.3.20

F. A. # NHF-0100(18), NHF-0100(19), NHF-0100(20)

**Cumberland County (X-0002BC & X-0002CA, X-0002CB) Combined Proposal No. 3**

I-295 (Fayetteville Outer Loop) From NC-87/210 (Murchison Road)  
to West of US-401

**February 15, 2011**

To Whom It May Concern:

Reference is made to the proposal furnished to you on this project.

The following revisions have been made to the Proposal:

On New Page No. 40a the project special provision entitled "Stump and Debris Removal" has been added. Please staple New Page No. 40a after Page No. 40 in your proposal.

On Page Nos. 49 and 50 the project special provision entitled "Geogrid Reinforced Slopes" has been revised. Please void Page Nos. 49 and 50 in your proposal and staple the revised Page Nos. 49 and 50 thereto.

New Page Nos. 124a and 124b have been added to include the project special provisions entitled "Flaggers" and "Automated Machine Guidance". Please staple new Page Nos. 124a and 124b after Page No. 124 in your proposal.

On Page No. 226 the second sentence of the first paragraph of the project special provision entitled "Structural Steel For Bridge At Station 146+39.081 -L- (EB & WB)" was revised. Please void Page No. 226 in your proposal and staple the revised Page No. 226 thereto.

Page Nos. 253 thru 261 are being revised to change the project special provision entitled "Mechanically Stabilized Earth Retaining Walls At 146+39.081-L-". Please void Page Nos. 253 thru 261 in your proposal and staple the revised Page Nos. 253 thru 261A thereto.

New Page Nos. 395 thru 416 have been added to include a 404 and 401 permit modification. Please staple New Page Nos. 395 thru 416 after Page No. 394.

**MAILING ADDRESS:**  
NC DEPARTMENT OF TRANSPORTATION  
CONTRACT STANDARDS AND DEVELOPMENT UNIT  
1591 MAIL SERVICE CENTER  
RALEIGH NC 27699-1591

TELEPHONE: 919-250-4128  
FAX: 919-250-4119  
WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

**LOCATION:**  
CENTURY CENTER COMPLEX  
ENTRANCE B-2  
1020 BIRCH RIDGE DRIVE  
RALEIGH NC 27610

The Table of Contents has been revised to reflect the above noted changes. Please void the Table of Contents in your proposal and staple the revised pages thereto.

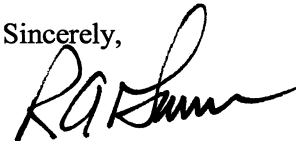
On Page No. 20 of the item sheets the following pay item quantity has been revised.

<u>Item</u>	<u>Description</u>	<u>Old Quantity</u>	<u>New Quantity</u>
324-8893000000-M-SP	Visual Barrier Wall On Structure	281.811 M2	207.225 M2

The Contractor's bid must be based on this revised pay item quantity. The contract will be prepared accordingly.

The Expedite File has been updated to reflect this revision. Please download the Expedite Addendum File and follow the instructions for applying the addendum. Bid Express will not accept your bid unless the addendum has been applied.

Sincerely,



R. A. Garris, PE  
Contract Officer

RAG/jag

**Attachments**

cc: Mr. Jon Nance, PE  
Mr. Ron Hancock, PE  
Mr. G. W. Burns, PE  
Ms. D. M. Barbour, PE  
Mr. Art McMillan, PE  
Mr. J. V. Barbour, PE  
Ms. Lori Strickland  
Mr. John Sullivan (FHWA) Attn: Mr. Jake Riggsbee, PE  
Project File (2)

Mr. R.E. Davenport, PE  
Ms. Natalie Roskam, PE  
Mr. Njoroge Wainaina, PE  
Mr. G. R. Perfetti, PE  
Mr. Larry Strickland  
Mr. Ronnie Higgins

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**PROPOSAL ITEM SHEET AND SIGNATURE SHEET**

Item Sheet (s)

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**STUMP AND DEBRIS REMOVAL:**

The Contractor's attention is directed to the debris and stump pile located left and right of Line -L- on Roadway Plan Sheets 7 and 8 from approximate Station 114+40 to 116+20. The Contractor shall remove and dispose of all stumps and debris within the right of way and temporary drainage easement in accordance with Section 200 of the Specifications.

No direct payment will be made for removal and satisfactory disposal of the stumps and debris, as the cost of this work shall be included in the lump sum price bid for "Clearing and Grubbing".

is required at End Bents 1 and 2 to stabilize the proposed 1.5:1 front slopes. Secondary geogrid reinforcement shall be used between the layers of primary reinforcement to limit surface sloughing. A preconstruction conference shall be scheduled with representatives of the Contractor, Resident Engineer, and Geotechnical Engineering Unit to discuss construction details and quality control measures.

## 2. MATERIALS

### 2.1 Geogrid

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

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

#### Primary Geogrid

Primary geogrid shall provide a minimum long-term design tensile strength ( $T_a$ ) of 45 kN/m.  $T_a$  is computed based on the following formula:

$$T_a = \frac{T_{ULT} \text{ (per ASTM D6637)}}{RF_{CR} \times RF_{ID} \times RF_D}$$

Only geogrids that have a National Transportation Product Evaluation Program (NTPEP) report will be allowed. Use the recommended values for  $RF_{CR}$ ,  $RF_{ID}$ , and  $RF_D$  from the NTPEP reports for default values.

### Secondary Geogrid

Secondary geogrid shall provide a minimum tensile strength of 10 kN/m and a minimum ultimate tensile strength of 19 kN/m determined in accordance with ASTM D 6637. These strength values are in the cross-machine direction (i.e., cross-roll direction).

### 2.2 Borrow Material

Borrow material incorporated into the bridge end slopes reinforced with primary geogrid shall meet the criteria for Coastal Plan Borrow outlined in Section 1018 of the NCDOT Standard Specifications with the additional criteria of a maximum P.I. of 10 and a maximum of 35% passing the No. 200 Sieve.

### 3. CONSTRUCTION

During all periods of shipment and storage, the geogrid shall be protected from temperatures greater than 140° F, direct sunlight, mud, wet cement, epoxy, or other materials which may alter its physical properties. At the time of installation, the geogrid shall be rejected if it has defects, tears, punctures, flaws, deterioration or damage incurred during manufacturing, transportation or storage. Any geogrid damaged during storage or installation shall be replaced by the Contractor at no additional cost to the Department.

**FLAGGERS:**

(2-15-11)

M11 R20

**Revise the 2006 Metric Standard Specifications as follows:****Page 11-10, Article 1150-3 Construction Methods, replace the article with the following:**

Provide the service of properly equipped and qualified flaggers (see *Roadway Standard Drawing* 1150.01) at locations and times for such period as necessary for the control and protection of vehicular and pedestrian traffic. Anyone who controls traffic is required to be qualified. Qualification consists of each flagger receiving proper training in the set-up and techniques of safely and competently performing a flagging operation. Qualification of flaggers is to be done at an NCDOT approved training agency. For a complete listing of these, see the Work Zone Traffic Control's webpage, <http://www.ncdot.gov/doh/preconstruct/wztc/>.

Prior to beginning work on the project, a Qualification Statement that all flaggers used on the project have been properly trained through an NCDOT approved training resource shall be provided to the Engineer.

Flagging operations are not allowed for the convenience of the Contractor's operations. However, if safety issues exist (i.e. sight/stopping site distance), the Engineer may approve the use of flagging operations. Use flagging methods that comply with the guidelines in the MUTCD.

**AUTOMATED MACHINE GUIDANCE**

01-02-11

**GENERAL**

This Special Provision contains requirements to be followed if the Contractor elects to use Global Positioning System (GPS) machine control grading and shall be used in conjunction with Section 801 of the Standard Specifications for Roads and Structures. The use of this technology is referenced as Automated Machine Guidance (AMG)

All equipment using AMG shall be able to generate end results that meet the Standard Specifications. Perform test sections for each type of work to be completed with AMG to demonstrate that the system has the capability to achieve acceptable results. If acceptable results can not be achieved, conform to the requirements for conventional stakeout.

The Contractor shall be responsible for all errors resulting from the use of AMG and shall correct deficiencies to the satisfaction of the Engineer at no cost to the Department.

**SUBMITTALS**

If the Contractor elects to use AMG, a Digital Terrain Model (DTM) of the design surface and all intermediate surfaces shall be developed and submitted to the Engineer for review.

At least 90 days prior to beginning grading operations, the Contractor shall submit to the Engineer an AMG work plan to include, but not limited to, proposed equipment, control



software manufacturer and version, types of work to be completed using AMG, project site calibration report, repetitive calibration methods for construction equipment and rover units to be used for the duration of the project, and local GPS base station to be used for broadcasting differential correction data to rover units (this may include the NC Network RTK). All surveys must be tied to existing project control as established by NCDOT.

## **INSPECTION**

The Engineer will perform quality assurance checks of all work associated with AMG. If it is determined that work is not being performed in a manner that will assure accurate results, the Engineer may require corrective action at no cost to the Department.

The Contractor shall provide the Engineer with one GPS rover unit for use during the duration of the contract. The rover will be loaded with the same model that is used with the AMG and have the same capability as rover units used by the Contractor. The rover will be kept in the possession of the Engineer and will be returned to the Contractor upon completion of the contract. Any maintenance or repairs required for the rover will be the responsibility of the Contractor. Formal training of at least 8 hours shall be provided to the Engineer by the Contractor on the use of the proposed AMG system.

## **SUBGRADE AND BASE CONTROLS**

If the Contractor elects to use AMG for fine grading and placement of base or other roadway materials, the GPS shall be supplemented with a laser or robotic total station. Include details of the proposed system in the AMG work plan. In addition, the following requirements apply for the use of AMG for subgrade and base construction.

1. Provide control points at intervals along the project not to exceed 1000 feet. The horizontal position of these points shall be determined by static GPS sessions or by traverse connection from the original base line control points. The elevation of these control points shall be established using differential leveling from project benchmarks, forming closed loops where practical. A copy of all new control point information shall be provided to the Engineer prior to construction activities.
2. Provide control points and conventional survey grade stakes at 500' intervals and at critical points such as, but not limited to, PCs, PTs, superelevation transition points, and other critical points as requested by the Engineer.
3. Provide hubs at the top of the finished subgrade at all hinge points on the cross section at 500 foot intervals. These hubs shall be established using conventional survey methods for use by the Engineer to check the accuracy of construction.

## **MEASUREMENT AND PAYMENT**

No direct payment will be made for work required to utilize this provision. All work will be considered incidental to various grading operations.

Such substitution is limited to the values shown in the following table.

Material Specified Metric (mm)	Primary Members US Customary (in)	Secondary Members US Customary (in)
8	3/8	*
9	3/8	*
10	7/16	3/8
11	7/16	*
12	1/2	*
14	9/16	*
16	11/16	5/8
18	3/4	11/16
20	13/16	3/4
22	7/8	*
25	1	*
28	1-1/8	*
30	1-3/16	*
32	1-5/16	1-1/4
35	1-7/16	1-3/8
38	1-1/2	*
40	1-5/8	*
45	1-13/16	*
50	2	*
55	2-1/4	*
60	2-3/8	*
70	2-13/16	2-3/4

\* These values are the same as those for Primary members.

There will be no additional payment for any extra weight incurred as a result of any substitution.

**STRUCTURAL STEEL FOR BRIDGE AT**  
**STATION 146+39.081 -L- (EB & WB)**

**(SPECIAL)**

**Structural Steel in flanges designated in the plans shall be AASHTO M270 Grade HPS 485W and shall be in accordance with the plans and this special provision. All other structural steel shall be AASHTO M270 Grade 345W and shall be in accordance with the plans and Standard Specifications.**

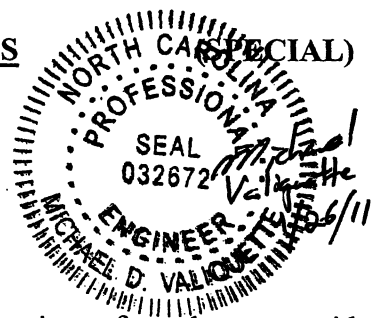
**1.0 GENERAL**

High performance steel shall be produced and fabricated in accordance with ANSI/AASHTO/AWS Bridge Welding Code D1.5-02, applicable portions of the Standard Specifications, and these Special Provisions.

Revised 2-3-11

253

**MECHANICALLY STABILIZED EARTH RETAINING WALLS**  
**AT STA. 142+30 TO 149+20 -L-**



**1.0 GENERAL**

**A. Description**

A mechanically stabilized earth (MSE) retaining wall consists of steel or geogrid reinforcements 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 on the plans or the *NCDOT Policy for Mechanically Stabilized Earth Retaining Walls* prohibits the use of SRW units. Design and construct MSE retaining walls based on actual elevations and dimensions in accordance with the contract and accepted submittals. Use an MSE Wall Installer prequalified by the NCDOT Contractual Services Unit for MSE retaining walls work (work code 3015). For this provision, "MSE wall" refers to a mechanically stabilized earth retaining wall and "MSE Wall Vendor" refers to the vendor supplying the chosen MSE wall system. Also, "blocks" refer to SRW units and "panels" refer to precast concrete panels.

**B. MSE Wall Systems**

Use an MSE wall system approved by the Department in accordance with any NCDOT restrictions for the chosen system, the plans and the NCDOT MSE wall policy. Value engineering proposals for other MSE wall systems will not be considered. Do not use MSE wall systems with SRW units or conditional approval for critical walls or MSE walls connected to critical walls. Critical walls are defined in the NCDOT MSE wall policy. Obtain the list of approved MSE wall systems and NCDOT MSE wall policy from:

[www.ncdot.org/doh/preconstruct/highway/geotech/msewalls](http://www.ncdot.org/doh/preconstruct/highway/geotech/msewalls)

**C. Aggregate**

"Aggregate" refers to fine or coarse aggregate. Coarse aggregate is required in the reinforced zone for critical walls and when noted on the plans. Otherwise, aggregate is required in the reinforced zone for MSE walls.

**2.0 DESIGN SUBMITTAL**

Submit 11 hard copies of working drawings and 3 hard copies of design calculations and an electronic copy (PDF on CD or DVD) of each for the MSE wall design submittal. Provide the submittal at least 30 calendar days before conducting the MSE wall preconstruction meeting. Do not begin MSE wall construction until the design submittal is accepted.

A Design Engineer is required to design MSE walls. Use a Design Engineer approved as a Geotechnical Engineer (key person) for a consultant prequalified by the NCDOT Contractual Services Unit for the MSE retaining wall design discipline.

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 on the plans and other elevations in the vicinity of MSE walls as needed. Based on these elevations, finished grades and actual MSE wall dimensions and details, submit revised wall envelopes for review and acceptance. Use the accepted revised wall envelopes for design.

Design MSE walls in accordance with any NCDOT restrictions for the chosen MSE wall system, the plans and the *AASHTO LRFD Bridge Design Specifications* unless otherwise required. Also, design MSE walls with a uniform reinforcement length throughout the wall height and a minimum reinforcement length of 0.7H or 6' (1.8 m), whichever is greater, unless shown otherwise on the plans with H as defined below. Extend the reinforced zone a minimum of 6" (150 mm) beyond the end of reinforcement as shown on the plans. Use the simplified method for determining maximum reinforcement loads and design factors for reinforcement approved by the Department for the chosen MSE wall system or default values in accordance with the AASHTO LRFD specifications. Design steel components including reinforcement and connection materials for nonaggressive backfill with corrosion losses in accordance with the AASHTO LRFD specifications.

When a note on plans requires a live load (traffic) surcharge, use a surcharge load of 250 psf (12 kPa) in accordance with Figure C11.5.5-3 of the AASHTO LRFD specifications. For steel beam guardrail with 8' (2.4 m) posts above MSE walls, design upper two rows of reinforcement for an additional horizontal load of 300 lbs/linear ft (4.38 kN/linear m) of wall in accordance with the AASHTO LRFD specifications. If existing or future obstructions such as foundations, guardrail, fence or handrail posts, pavements, pipes, inlets or utilities will interfere with reinforcement, maintain a minimum clearance of 3" (75 mm) between the obstruction and reinforcement unless otherwise approved. Place reinforcement within 3" (75 mm) above the corresponding connection elevation.

Use 6 inch (150 mm) thick cast-in-place unreinforced concrete leveling pads beneath panels and blocks that are continuous at steps and extend a minimum of 6" (150 mm) in front of and behind bottom row of panels and blocks. Unless required otherwise on the plans, embed top of leveling pads in accordance with the following.

**EMBEDMENT DEPTH**

Front Slope (H:V)	Minimum Facing Embedment Depth (whichever is greater)	
6:1 or Flatter (except abutment walls)	H/20	1 ft (0.3 m) for H ≤ 10' 2 ft (0.6 m) for H > 10'
6:1 or Flatter (abutment walls)	H/10	2 ft (0.6 m)
Steeper than 6:1 to 3:1	H/10	2 ft (0.6 m)
Steeper than 3:1 to 2:1	H/7	2 ft (0.6 m)
Front slope is as shown on the plans and H is the maximum design height plus embedment per wall as shown on the plans		

When a note on plans requires a drain, extend a continuous drain along the base of the reinforced zone behind the aggregate. Provide drains meeting the requirements of an aggregate shoulder drain in accordance with Roadway Standard Drawing No. 816.02.

For MSE walls with panels, place a minimum of 2 bearing pads in each horizontal panel joint such that the final horizontal joint opening is 3/4 inch (19 mm). Additional bearing pads may be required for panels wider than 5 ft (1.5 m) as determined by the Engineer. Cover joints on the back of panels with filter fabric a minimum of 12" (250 mm) wide.

For MSE walls with SRW units, place coarse aggregate between and behind blocks for a horizontal distance of at least 18" (450 mm) and fill any block core spaces with coarse aggregate.

Separation fabric is required between aggregate and overlying fill or pavement section with the exception of when concrete pavement is placed directly on aggregate. Separation fabric may also be required between coarse aggregate and backfill or natural ground as determined by the Engineer.

Unless shown otherwise on the plans, use reinforced concrete coping at top of walls with dimensions as shown on the plans. Extend coping a minimum of 6" (150 mm) above where finished grade intersects the back of MSE walls unless required otherwise on the plans. Cast-in-place concrete coping is required for MSE walls with SRW units and when noted on the plans. At the Contractor's option, connect cast-in-place concrete coping to panels and blocks with dowels or extend coping down the back of MSE walls. Also, connect cast-in-place leveling concrete for precast concrete coping to panels with dowels. When barriers are required above MSE walls, use concrete barrier rails with moment slabs as shown on the plans.

Submit working drawings and design calculations for review and 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 type and separation fabric locations and details of leveling pads, facing elements, coping, bin walls, slip joints, etc. If necessary, include details on working drawings for concrete barrier rails with moment slabs, geogrid splices, reinforcement connected to end bent caps and obstructions extending through walls or interfering with reinforcement, concrete barrier rails and moment slabs. Submit design calculations for each wall section with different surcharge loads, geometry or material parameters. A minimum of one analysis is required for each wall section with different reinforcement lengths. When designing MSE walls with computer software other than MSEW, verify the design with MSEW version 3.0 or later, manufactured by ADAMA Engineering, Inc. At least one MSEW analysis is required per 100 ft (30 m) of wall length with a minimum of one MSEW analysis for the wall section with the longest reinforcement length. Submit electronic executable MSEW input and output files with the design calculations. Have MSE walls designed, detailed and sealed by the Design Engineer.

### 3.0 MATERIALS

#### A. Certifications, Storage and Handling

Provide certifications in accordance with Article 106-3 of the *Standard Specifications*. Furnish Type 3 Manufacturer's Certifications for MSE wall materials with the exception of precast elements and the following. For reinforcement, provide Type 1 Certified Mill Test Reports for tensile strength. For SRW units, provide Type 1 Certified Mill Test Reports or Type 4 Certified Test Reports for all block properties with the exception of durability. When a note on plans requires freeze-thaw durable blocks, provide Type 2 Typical Certified Mill Test Reports or Type 5 Typical Certified Test Reports for durability.

Store steel materials on blocking a minimum of 12" (300 mm) 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 MSE wall materials such that they are kept clean and free of damage.

Damaged panels or blocks with excessive discoloration, chips or cracks as determined by the Engineer will be rejected. Do not damage reinforcement connection hardware or mechanisms in handling and storing panels or blocks. Mark, store and transport panels in accordance with Section 1077 of the *Standard Specifications*.

Label each pallet of blocks with the information listed in Article 1077-13 of the *Standard Specifications*. Do not transport SRW units away from the casting yard until the concrete strength reaches 4000 psi (27.6 MPa) and a period of at least 5 days elapses after casting unless otherwise approved.

Identify, store and handle geogrids and fabrics in accordance with ASTM D4873. Geogrids and fabrics with defects, flaws, deterioration or damage will be rejected. Do not leave geogrids and fabrics uncovered for more than 7 days.

#### B. Facing Elements

Provide facing elements produced by a manufacturer approved or licensed by the MSE Wall Vendor.

##### 1. Precast Concrete Panels

Provide precast concrete panels meeting the requirements of Sections 1000 and 1077 of the *Standard Specifications* and reinforcing steel meeting the requirements of Section 1070 of the *Standard Specifications*. Accurately locate and secure reinforcement connection hardware and maintain required concrete cover. Produce panels within 1/4 inch (6 mm) of the panel dimensions shown in the accepted submittals.

A minimum compressive strength of 4000 psi (27.6 MPa) at 28 days is required. For testing panels for compressive strength, at least 4 cylinders are required per 2000 ft<sup>2</sup> (186 m<sup>2</sup>) of panel face area or a single day's production, whichever is less.

Unless required otherwise on the plans, provide panels with a smooth flat final finish in accordance with Article 1077-11 of the *Standard Specifications*.

## 2. Segmental Retaining Wall (SRW) Units

Unless required otherwise on the plans, provide SRW units with a vertical straight face and a concrete gray color with no tints, dyes or pigments. Before beginning block production, obtain approval of sample blocks of the type, face and color proposed for the project.

Use blocks meeting the requirements of Section 1040 of the *Standard Specifications* and ASTM C1372 with the exception of absorption, compressive strength and unit height requirements. Test blocks in accordance with ASTM C140 with the exception of the number of units in a lot. For testing blocks, a lot is defined as 5000 units or a single day's production, whichever is less, and at least 6 blocks are required per lot.

Provide blocks with a maximum absorption of 5% and a unit height within 1/16 inch (2 mm) of the dimension shown in the accepted submittals.

A minimum compressive strength of 4000 psi (27.6 MPa) at 28 days is required for blocks with the exception of freeze-thaw durable blocks. When a note on plans requires freeze-thaw durable SRW units, a minimum compressive strength of 5500 psi (37.9 MPa) at 28 days is required.

Test freeze-thaw durable blocks in accordance with ASTM C1262. Test specimens in water. Freeze-thaw durable blocks are acceptable if the weight loss of each of 4 of the 5 specimens after 150 cycles does not exceed 1% of its initial weight.

## C. Reinforcement

Provide reinforcement supplied by the MSE Wall Vendor or a manufacturer approved or licensed by the vendor.

### 1. Steel (Inextensible) Reinforcement

Use welded wire reinforcement grids (mesh, mats and ladders) meeting the requirements of Article 1070-3 of the *Standard Specifications* and metallic strips meeting the requirements of ASTM A572 or A1011 with a grade as specified in the accepted submittals. Galvanize steel reinforcement in accordance with Section 1076 of the *Standard Specifications*.

### 2. Geogrid (Extensible) Reinforcement

Use geogrids that have been approved by the Department for the chosen MSE wall system. Obtain the list of approved geogrids for each MSE wall system from the website shown elsewhere in this provision.

Test geogrids in accordance with ASTM D6637. Machine direction (MD) and cross-machine direction (CD) are as defined by ASTM D4439. Provide minimum average roll values (MARV) as defined by ASTM D4439 for tensile strength of geogrids. For testing geogrids, a lot is defined as a single day's production.

D. Aggregate

Provide aggregate meeting the requirements of Sections 1005 and 1014 of the *Standard Specifications*.

1. Fine Aggregate

Use fine aggregate meeting the requirements of standard size nos. 1S, 2S, 2MS or 4S in accordance with Table 1005-2 of the *Standard Specifications*. When using steel reinforcement with fine aggregate, provide aggregate meeting the electrochemical requirements of Article 7.3.6.3 of the *AASHTO LRFD Bridge Construction Specifications* tested in accordance with the following methods:

Property	AASHTO Test Method
pH	T289
Resistivity	T288
Chlorides	T291
Sulfates	T290

2. Coarse Aggregate

Use coarse aggregate meeting the requirements of standard size nos. 5, 57, 57M, 6M, 67 or 78M in accordance with Table 1005-1 of the *Standard Specifications*.

E. Coping, Leveling Concrete and Pads

Provide concrete coping and leveling pads meeting the requirements of Section 1000 of the *Standard Specifications* and reinforcing steel meeting the requirements of Section 1070 of the *Standard Specifications*. Provide precast coping meeting the requirements of Section 1077 of the *Standard Specifications* and leveling concrete for precast coping meeting the requirements of Section 1000 of the *Standard Specifications*.

Use Class A Concrete for coping, leveling concrete and pads in accordance with Article 1000-4 of the *Standard Specifications* and curing agents for concrete in accordance with Section 1026 of the *Standard Specifications*. For testing precast coping for compressive strength, at least 4 cylinders are required per 40 yd<sup>3</sup> (31 m<sup>3</sup>) of concrete or a single day's production, whichever is less.



#### F. Wall Drainage Systems

Wall drainage systems consist of drains and outlet components. Use drain and outlet materials meeting the requirements of subsurface drainage materials in accordance with Section 1044 of the *Standard Specifications*.

#### G. Bearing Pads

Use bearing pads approved by the Department for the chosen MSE wall system that meet the material requirements in Section 3.6.1.a of the *FHWA Manual "Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume I"* (Publication No. FHWA-NHI-10-024). Obtain the list of approved bearing pads for each MSE wall system from the website shown elsewhere in this provision.

#### H. Geotextile Fabrics

Use filter and separation fabrics meeting the requirements of Type 2 Engineering Fabric in accordance with Section 1056 of the *Standard Specifications*.

#### I. Miscellaneous Components

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

#### J. Joint Sealer

Use joint sealer in accordance with Section 1028 of the *Standard Specifications*.

### 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 NCDOT Materials & 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 PRECONSTRUCTION MEETING

Before starting MSE wall construction, conduct 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.

## 6.0 SITE ASSISTANCE

Provide a representative employed by the MSE Wall Vendor to assist and guide the MSE Wall Installer on-site for at least 8 hours when the first panels or blocks are set and the first reinforcement layer is placed unless otherwise approved. 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 at no additional cost to the Department.

## 7.0 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.

Perform necessary clearing and grubbing in accordance with Section 200 of the *Standard Specifications*. Excavate as necessary for MSE walls in accordance with the accepted submittals. If applicable and at the Contractor's option, "temporary shoring for wall construction" may be used in lieu of temporary slopes to construct MSE walls. Temporary shoring for wall construction is defined as temporary shoring not shown on the plans or required by the Engineer including shoring for OSHA reasons or the Contractor's convenience.

Unless required otherwise on the plans, install foundations located in the reinforced zone before placing aggregate or the first reinforcement layer. Notify the Engineer when foundation excavation is complete. Do not place leveling pad concrete, aggregate or reinforcement until obtaining approval of the excavation depth and foundation material.

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 a minimum of 24 hours before placing panels or blocks.

Erect and support panels or blocks with no negative batter (wall face leaning forward) such that the final position is as shown in the accepted submittals. Stagger vertical joints to create a running bond when possible unless shown otherwise in the accepted submittals. Place blocks with a maximum joint width of 3/8 inch (10 mm).

Set panels with a vertical joint width of 1/2 to 1 inch (13 to 25 mm). Place bearing pads in horizontal panel joints and cover panel joints with filter fabrics as shown in the accepted submittals. Attach filter fabrics to back of panels with adhesives, tapes or other approved methods.

Construct MSE walls with a vertical and horizontal tolerance of 3/4 inch (19 mm) when measured with a 10 ft (3 m) straight edge and a final overall vertical plumbness (batter) of less than 1/2 inch per 10 ft (13 mm per 3 m) of wall height.

Place reinforcement at the locations and elevations shown in the accepted submittals. Do not splice steel reinforcement. Geogrids may be spliced once per reinforcement length in accordance with the accepted submittals. 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 and modify reinforcement as shown in the accepted submittals. Place reinforcement in slight tension free of kinks, folds, wrinkles or creases.

Place aggregate in the reinforced zone in 8 to 10 inch (200 to 250 mm) thick lifts. Compact fine aggregate in accordance with Subarticle 235-4(C) of the *Standard Specifications*. Use only hand operated compaction equipment within 3 ft (1 m) of the wall face. At a distance greater than 3 ft (1 m), compact aggregate with at least 4 passes of an 8 – 10 ton (7.3 - 9.1 metric ton) vibratory roller. 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. Compact aggregate in a direction parallel to the wall face. Do not displace or damage reinforcement when placing and compacting aggregate. End dumping directly on geogrids is not permitted. Do not operate heavy equipment on reinforcement until it is covered with at least 8" (200 mm) of aggregate. Replace any damaged reinforcement to the satisfaction of the Engineer. Backfill for wall construction 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*. Provide drains with positive drainage towards outlets.

Place and construct coping and leveling concrete as shown in the accepted submittals. Construct cast-in-place concrete coping and leveling concrete in accordance with Section 420 of the *Standard Specifications*. When single faced precast concrete barriers are placed in front of MSE walls, stop coping just above barriers such that coping does not interfere with placing barriers up against wall faces. Do not remove forms until concrete achieves a minimum compressive strength of 2400 psi (16.5 MPa). Provide a Class 2 Surface Finish for cast-in-place concrete coping in accordance with Article 420-17 of the *Standard Specifications*.

Construct cast-in-place concrete coping joints at a maximum spacing of 10 ft (3 m) to coincide with vertical joints between panels or blocks. Half-inch (13 mm) thick expansion joints in accordance with Article 420-10 of the *Standard Specifications* are required every third joint. Half-inch (13 mm) deep grooved contraction joints in accordance with Subarticle 825-10(B) of the *Standard Specifications* are required for the remaining joints. Stop coping reinforcement 2" (50 mm) from either side of expansion joints.

When separation fabric is required, overlap fabric a minimum of 18" (450 mm) with seams oriented parallel to the wall face. Seal joints above and behind MSE walls between coping and ditches with joint sealer.

## 8.0 MEASUREMENT AND PAYMENT

*MSE Retaining Walls* will be measured and paid for in square feet (meters). MSE walls will be measured as the exposed face area with the wall height equal to the difference between the top and bottom of wall elevation. The top of wall elevation is defined as the

top of coping or top of panels or blocks for MSE walls without coping. The bottom of wall elevation is as shown on the plans and no payment will be made for portions of MSE walls below bottom of wall elevations.

The contract unit price for *MSE Retaining Walls* will be full compensation for providing design, submittals, labor, tools, equipment and MSE wall materials, excavating, backfilling, hauling and removing excavated materials and providing site assistance, leveling pads, facing elements, reinforcement, aggregate, wall drainage systems, fabrics, bearing pads, coping, miscellaneous components and any incidentals necessary to design and construct MSE walls in accordance with this provision. If necessary, the contract unit price for *MSE Retaining Walls* will also be full compensation for reinforcement connected to and aggregate behind end bent caps in the reinforced zone in accordance with the contract.

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

The contract unit price for *MSE Retaining Walls* does not include the cost for fences, handrails, ditches, guardrail and barriers associated with MSE walls as payment for these items will be made elsewhere in the contract.

Payment will be made under:

**Pay Item**

MSE Retaining Walls at 146+39.081 -L-

**Pay Unit**

Square Foot (Meter)

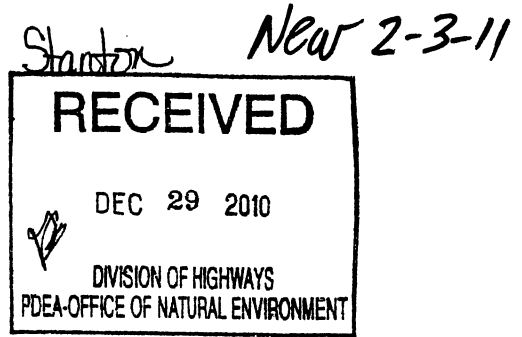


REPLY TO  
ATTENTION OF:

395

DEPARTMENT OF THE ARMY  
WILMINGTON DISTRICT, CORPS OF ENGINEERS  
69 DARLINGTON AVENUE  
WILMINGTON, NORTH CAROLINA 28403-1343

December 21, 2010



Regulatory Division

Subject: Action ID No. 2008-01413, TIP No. U-2519 and X-0002, Fayetteville Outer Loop, Cumberland, Robeson and Hoke Counties, North Carolina.

Dr. Gregory J. Thorpe, Ph.D.  
Environmental Management Director  
Project Development and Environmental Analysis  
1598 Mail Service Center  
Raleigh, North Carolina 27699-1598

Dear Dr. Thorpe:

I am responding to your requests dated June 1, 2010 and October 19, 2010 for modifications to the existing Department of the Army (DA) permit issued for the above referenced project on November 4, 2008.

The referenced Section 404 permit authorizes impacts to 48.43 acres of jurisdictional wetlands, 12,346 linear feet of important stream channel and 3.67 acres of open waters. The permit modification is proposed to include additional impacts that were not authorized by the November 4, 2008 Department of the Army permit. The project impacts proposed in the modification request include an additional 0.43 acres of wetland impacts, 410 linear feet of important stream channel impacts and 2.55 acres of open water pond impacts.

I have determined that the proposed project modifications described above are minor and are not contrary to the public interest and therefore, the DA permit is hereby modified. It is understood that all conditions of the original permit remain applicable and that the expiration date is unchanged

The permit modifications are as follows:

**1. In order to compensate for impacts to 0.43 acres of riparian, non-riverine wetlands and 410 linear feet of warm-water stream, the permittee shall debit the Privateer Farms Stream and Wetland Mitigation Bank in the amount of 1.29 acres of restoration equivalent riparian, non-riverine wetlands and 615 linear feet of warm-water stream.**

**In accordance with the NC DOT Umbrella Mitigation Banking Instrument dated September 4, 2009, the permittee shall, within 30-days of the date of this permit**

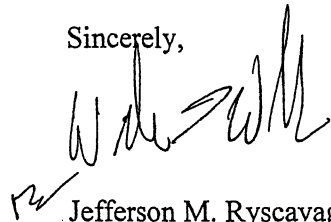
modification, provide two copies of the current debit ledger of the Privateer Farms Stream and Wetland Mitigation Bank to the :

U.S. Army Corps of Engineers  
Wilmington Regulatory Field Office  
69 Darlington Avenue, Wilmington North Carolina 28403

2. All work authorized by this permit modification must be performed in strict compliance with the attached plans, which are part of the permit.

Should you have any questions, please contact Mr. Ronnie Smith, Wilmington Field Office, Regulatory Division, at telephone (910) 251-4829.

Sincerely,



Jefferson M. Ryscavage  
Colonel, U.S. Army  
District Commander

Enclosures

Copies Furnished (with enclosures):

Mr. Greg Burns, PE  
Division Engineer, Division 6  
N.C. Department of Transportation  
Post Office Box 1150  
Fayetteville, North Carolina 28302

Mr. Jim Rerko  
Division Environmental Officer, Division 6  
N.C. Department of Transportation  
Post Office Box 1150  
Fayetteville, North Carolina 28302

Pace Wilber, Ph.D., Chief  
Charleston (F/SER47)  
Southeast Regional Office, NOAA Fisheries  
Post Office Box 12559  
Charleston, South Carolina 29422-2559

U.S. Fish and Wildlife Service  
Fish and Wildlife Enhancement  
Post Office Box 33726  
Raleigh, North Carolina 27636-3726

Mr. Ron Sechler •  
National Marine Fisheries Service  
Pivers Island  
Beaufort, North Carolina 28516

Mr. Doug Huggett  
Division of Coastal Management  
N.C. Department of Environment  
and Natural Resources  
400 Commerce Avenue  
Morehead City, North Carolina 28557

Copies Furnished (without enclosures):

Mr. Travis W. Wilson  
N.C. Wildlife Resource Commission  
1142 I-85 Service Road  
Creedmoor, North Carolina 27522

Mr. Mason Herndon  
N.C. Department of Environment  
and Natural Resources  
Division of Water Quality  
225 Green Street, Suite 214  
Fayetteville, North Carolina 28301-5094

Mr. Gary Jordan  
U.S. Fish and Wildlife Service  
Raleigh Field Office  
Post Office Box 33726  
Raleigh, North Carolina 27636-3726

Mr. Chris Militcher  
U.S. Environmental Protection Agency  
c/o Federal Highway Administration  
310 New Bern Avenue, Room 206  
Raleigh, North Carolina 27601

Ms. Renee Gledhill-Early  
N.C. Department of Cultural Resources  
4617 Mail Service Center  
Raleigh, North Carolina 27699



North Carolina Department of Environment and Natural Resources

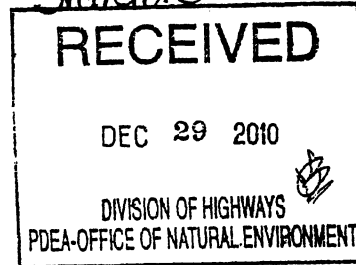
Division of Water Quality  
Coleen H. Sullins  
Director

Beverly Eaves Perdue  
Governor

Dee Freeman  
Secretary

December 16, 2010

Dr. Greg Thorpe, PhD., Manager  
Project Development and Environmental Analysis  
North Carolina Department of Transportation  
1548 Mail Service Center  
Raleigh, North Carolina, 27699-1548



Subject: Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for Proposed improvements to Fayetteville Outer Loop in Cumberland, Hoke and Robeson County, Federal Aid Project No. NHF-DPR-0100(001), State Project No. 8.244130, TIP X-002 B & C and U-2519.  
NCDWQ Project No. 20080737 v. 3

Dear Dr. Thorpe:

Attached hereto is a modification of original Certification No. 3758 issued to The North Carolina Department of Transportation (NCDOT) dated October 6, 2008 and modification dated June 3, 2010.

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

Sincerely,

*for* Coleen H. Sullins  
Director

Attachments

cc: Ronnie Smith, US Army Corps of Engineers, Wilmington Field Office  
Greg Burns, PE, Division 6 Engineer  
Jim Rerko, Division 6 Environmental Officer  
Chris Militscher, Environmental Protection Agency (electronic copy only)  
Travis Wilson, NC Wildlife Resources Commission  
Leilani Paugh, NCDOT, NEU Mitigation  
Sonia Carrillo, NCDWQ Central Office  
File Copy

225 Green St., Suite 714, Fayetteville, NC 28301-5043  
Phone: 910-433-3300 \ FAX: 910-486-0707  
Internet: [www.ncwaterquality.org](http://www.ncwaterquality.org)

One  
North Carolina  
*Naturally*



**Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS**

**THIS CERTIFICATION** is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (NCDWQ) Regulations in 15 NCAC 2H .0500. This certification modification authorizes the NCDOT to impact an additional 0.19 acres of jurisdictional wetlands and 410 linear feet of jurisdictional streams in Cumberland County. The project shall be constructed pursuant to the modification dated received October 14, 2010. The new authorized impacts are as described below:

**Revised X-0002C (Site 8) Stream Impacts in the Cape Fear River Basin**

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)
Original approved impacts at Site 8	509				509	
New additional impacts with this approval at Site 8	410				410	410
<b>Total</b>	<b>919</b>				<b>919</b>	<b>410</b>

**Revised Total Stream Impact for Site 8: 919 linear feet**

**Revised X-0002C (Site 8) Wetland Impacts in the Cape Fear River Basin (non-riverine)**

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Area under Bridge (ac)	Total Wetland Impact (ac)
Original approved impacts at Site 8	0.09			0.04	0.21		0.13
New revised impacts with this approval at Site 8	0.29			0.03	0.00		0.32
<b>Total</b>	<b>0.29</b>			<b>0.03</b>	<b>0.00</b>		<b>0.32</b>

**Revised Total Wetland Impact for Site 8: 0.32 acres.**

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 modified application dated received October 14, 2010. All the authorized activities and conditions of certification associated with the original Water Quality Certification dated October 6, 2008 and modification dated June 3, 2010 still apply except where superseded by this certification. Should your project change, you are required to notify NCDWQ and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

**400**

1. Compensatory mitigation for the additional 0.19 acres of wetland impacts is required at a 2:1 ratio. Compensatory mitigation for the additional 410 feet of stream impacts is required at 1.5:1 ratio. We understand that you have chosen to debit mitigation from Privateer Farm Mitigation Bank. This certification gives you approval to debit 0.38 acres of wetland mitigation and 615 ft of stream mitigation from the Privateer Mitigation Site to satisfy the mitigation requirements of this permit modification.
2. All other conditions written into previous Water Quality Certifications dated October 6, 2008 and June 3, 2010 for this project still apply.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

If you wish to contest any statement in the attached Certification you must file a petition for an administrative hearing. You may obtain the petition form from the office of Administrative hearings. You must file the petition with the office of Administrative Hearings within sixty (60) days of receipt of this notice. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

The petition may be faxed-provided the original and one copy of the document is received by the Office of Administrative Hearings within five (5) business days following the faxed transmission.

The mailing address for the Office of Administrative Hearings is:

Office of Administrative Hearings  
6714 Mail Service Center  
Raleigh, NC 27699-6714  
Telephone: (919)-733-2698, Facsimile: (919)-733-3478

A copy of the petition must also be served on DENR as follows:

Ms. Mary Penny Thompson, General Counsel  
Department of Environment and Natural Resources  
1601 Mail Service Center  
Raleigh, NC 27699-1601

This the 16th day of December 2010

DIVISION OF WATER QUALITY

Coleen H. Sullins  
Director



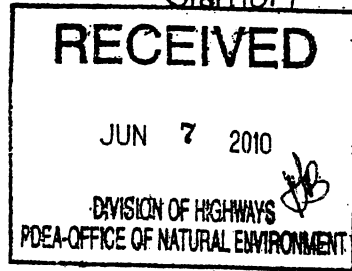
North Carolina Department of Environment and Natural Resources

Division of Water Quality  
Coleen H. Sullins  
Director

Beverly Eaves Perdue  
Governor

Slanton

Dee Freeman  
Secretary



June 3, 2010

Dr. Greg Thorpe, PhD., Manager  
Project Development and Environmental Analysis  
North Carolina Department of Transportation  
1548 Mail Service Center  
Raleigh, North Carolina, 27699-1548

Subject: Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water with ADDITIONAL CONDITIONS for Proposed Fayetteville Outer Loop in Cumberland, Hoke and Robeson Counties, Federal Aid Project No. NHF-DPR-0100(001), State Project No. 8.2441301, TIP Nos. X-002 B&C and U-2519.  
DWQ Project No. 20080737 ver. 2.

Dear Dr. Thorpe:

Attached hereto is a modification of Certification No. 3758 issued to The North Carolina Department of Transportation (NCDOT) originally dated October 6, 2008.

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

Sincerely,

for Coleen H. Sullins  
Director

Attachments

- cc: Tom Walker, US Army Corps of Engineers, Wilmington Field Office
- Jim Rerko, Division 6 Environmental Officer
- LeiLani Paugh, NCDOT NEU
- NCDWQ Fayetteville Regional Office
- File Copy

**Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS**

**THIS CERTIFICATION** is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (NCDWQ) Regulations in 15 NCAC 2H .0500. This certification modification authorizes the NCDOT to impact an additional 0.24 acres of jurisdictional wetlands in Cumberland County. The project shall be constructed pursuant to the modification dated received May 27, 2010. The new authorized impacts are as described below:

**Additional Section X-002 C Wetland Impacts in the Cape Fear River Basin**

Site	Permanent Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Total Wetland Impact (ac)
10	0.19	0.01	0.04	0.24
<b>Total</b>	<b>0.19</b>	<b>0.01</b>	<b>0.04</b>	<b>0.24</b>

**Total Additional Wetland Impact for Section X-002 C: 0.24 acres.**

**Revised Section X-002 C Open Water (Ponds) Impacts in the Cape Fear River Basin**

Site	Permanent Fill in Open Waters (ac)
3	0.73
9	2.53
<b>Total</b>	<b>3.26</b>

**Revised Total Open Water Impact for Section X-002 C: 3.26 acres.**

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 modified application dated received May 27, 2010. All the authorized activities and conditions of certification associated with the original Water Quality Certification dated October 6, 2008 still apply except where superceded by this certification. Should your project change, you are required to notify NCDWQ and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

**Conditions of Certification:**

1. Compensatory mitigation for 0.24 acres of wetlands is required at a 2:1 ratio. We understand that you have chosen to debit mitigation from the Privateer Farm Mitigation Bank. This certification gives approval to the debiting of 0.48 acres of wetland mitigation from the Privateer Farms Mitigation Site in order to satisfy the mitigation requirements of this project modification.
2. All other conditions written into previous Water Quality Certification dated October 6, 2008 for this project still apply.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

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

This the 3rd day of June 2010

DIVISION OF WATER QUALITY



*for* Coleen H. Sullins  
Director

WQC No. 3758

**WETLAND PERMIT IMPACT SUMMARY**

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS							
			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)	Natural Stream Design - (ft)			
1	83+50-85+00-L-	72" RCP	1.11		0.03	0.10				0.04			279	
2	92+90-93+80-L-	42" RCP	0.50		0.02	0.08				0.86			775	
3	105+15-105+70-L-	2 @ 6' x 7' RCBC	0.76			0.05								
4	117+95-118+70-L-	325' Bridge	0.36			0.08		0.55						
5	129+60-130+20-L-	54" RCP	0.69			0.06				0.02			361	
6	135+55-137+00-L-	60" RCP	1.68			0.09				0.04			479	
7	141+30-142+30-L-	36" RCP	1.55			0.05				0.01			213	
8	144+45-144+90-L-	48" RCP	0.29			0.03				0.11			919	
9	14+20-Y-Rev	2 @ 6' x 7' RCBC								2.54			98	
10	13+66-14+06-Y1-	48" RCP	0.19		0.01	0.04				0.01			207	
<b>TOTALS:</b>			<b>7.12</b>		<b>0.06</b>	<b>0.59</b>		<b>0.55</b>		<b>3.63</b>			<b>3332</b>	

SITE 10: LATERAL EFFECT ON WETLAND DUE TO EXCAVATION = 0.01 ac

FILL IN SURFACE WATERS (POND)

SITE 3: 0.73 ac

SITE 9: 2.53 ac

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
CUMBERLAND COUNTY  
WBS - 35196.1.2 (X-0002C)

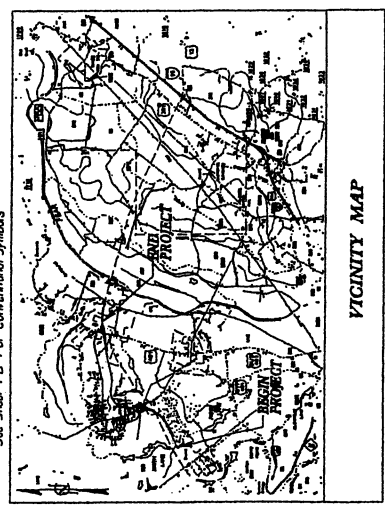
SHEET **REV. 7/28/2010**

Permit Drawing  
Sheet 3 of 64

TIP PROJECT: X-002C

CONTRACT: C201979

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Conventional Symbols



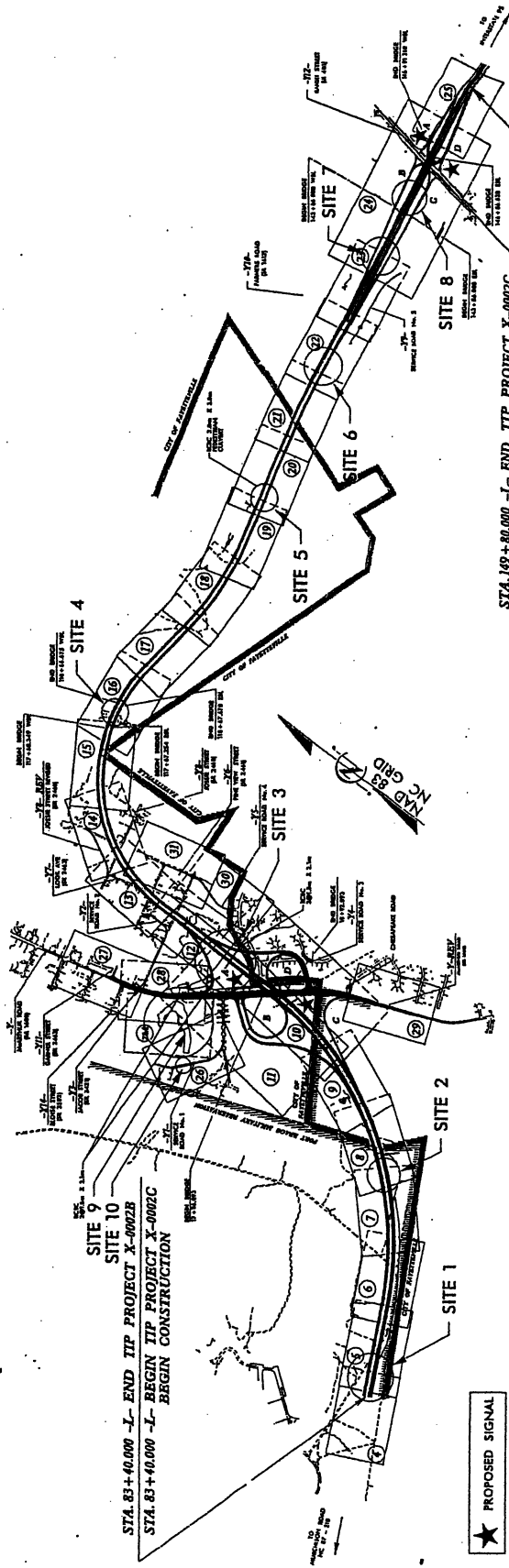
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**CUMBERLAND COUNTY**

LOCATION: NC 24 EXTENSION (FAYETTEVILLE OUTER LOOP)  
FROM 1.3 MILES EAST OF NC87-NC210 TO WEST OF US401  
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES,  
SIGNING AND SIGNALS

STATE	N.C.	PROJECT NUMBER	X-002C
ROUTE	NC 24	CONTRACT	I
DATE	3/16/06	DESIGNER	SDG
SCALE	AS SHOWN	DATE	3/16/06
PROJECT	NC 24 EXTENSION	CONTRACT	I
NO.	35196.1.2	CONTRACT	I
NO.	35196.2.4	CONTRACT	I
NO.	35196.3.16	CONTRACT	I

WETLAND/STREAM  
IMPACTS

Permit Drawing Rev. 4/12/10  
Sheet 6 of 14



GRAPHIC SCALES

PLANS	1" = 100'
PROFILE (HORIZONTAL)	1" = 100'
PROFILE (VERTICAL)	1" = 20'

DESIGN DATA

ADT 2008	= 34,700
ADT 2030	= 59,600
DIV	= 9 %
T	= 10 %
V	= 110 km/h

\* (TST 4 % DUAL 6 %)  
FUNC. CLASS = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT X-002C	= 6.166 km
LENGTH STRUCTURES TIP PROJECT X-002C	= 0.404 km*
TOTAL LENGTH OF TIP PROJECT X-002C	= 6.570 km

\* NOTE: LENGTH BASED ON VBL BRIDGES

RIGHT OF WAY DATE: MAY 31, 2006  
LETTING DATE: NOVEMBER 18, 2008

Prepared in the Office of:  
**MORFITT & MORFITT**  
1100 W. HARRIS STREET, SUITE 100, FAYETTEVILLE, NC 28404  
910.438.2200 FAX 910.438.2201  
WWW.MORFITTANDMORFITT.COM

T.R. REID, P.E.  
PROJECT ENGINEER

J.E. HUFFMAN, P.E.  
PROJECT DESIGN MANAGER

HYDRAULICS ENGINEER  
**SDG**  
Surgate Design Group, P.L.L.C.  
1000 W. HARRIS STREET, SUITE 100, FAYETTEVILLE, NC 28404  
910.438.2200 FAX 910.438.2201  
WWW.SURGATEDESIGN.COM

ROADWAY DESIGN ENGINEER  
**MORFITT & MORFITT**  
1100 W. HARRIS STREET, SUITE 100, FAYETTEVILLE, NC 28404  
910.438.2200 FAX 910.438.2201  
WWW.MORFITTANDMORFITT.COM

PRELIMINARY PLANS  
NOT FOR CONSTRUCTION  
INCOMPLETE PLANS  
DO NOT USE FOR Bidding

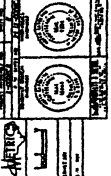
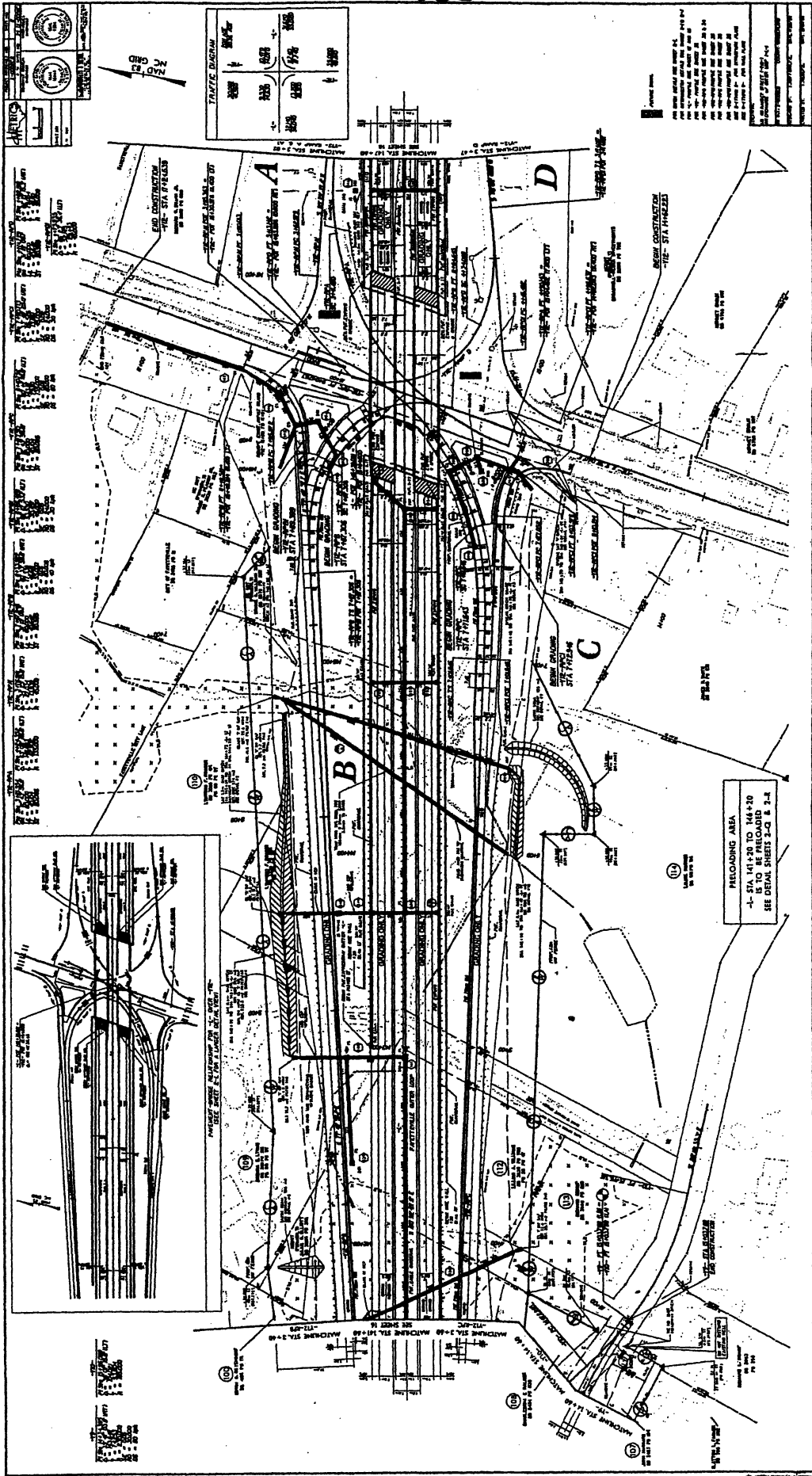
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER





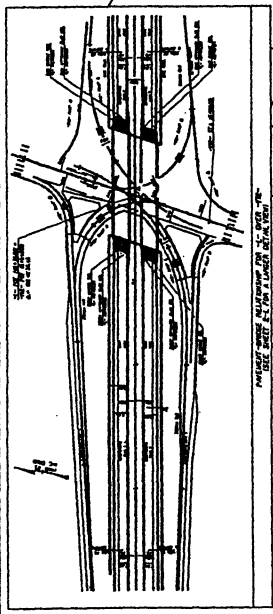




TRAFFIC DIAGRAM

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

NOTES:  
 1. THE TRACKS ARE TO BE CONSTRUCTED AS SHOWN ON THIS PLAN.  
 2. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 3. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 4. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 5. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 6. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 7. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 8. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 9. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 10. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 11. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 12. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 13. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 14. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 15. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.  
 16. THE TRACKS ARE TO BE GRADED TO THE ELEVATIONS SHOWN ON THIS PLAN.



PRELOADING AREA  
 4- STA 141+20 TO 144+20  
 IS TO BE PRELOADED  
 SEE DETAIL SHEETS 3-C & 3-D

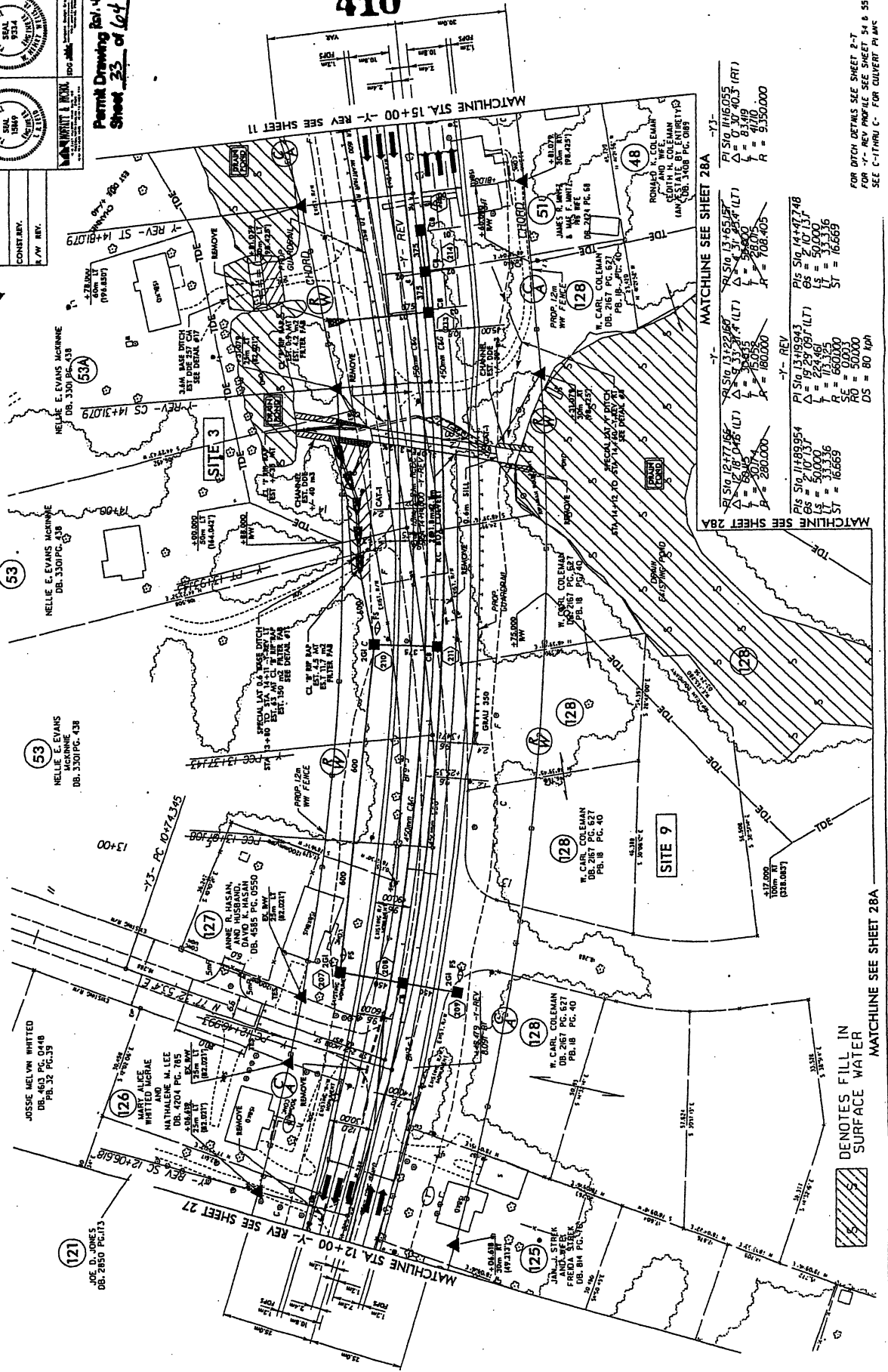


PROJECT REFERENCE NO. 7-0002C  
 SHEET NO. 28  
 E.V.M. SHEET NO. 1000  
 METRIC ENGINEERING  
 1000 AMM  
 METRIC ENGINEERING  
 1000 AMM

Permit Drawing for 410  
 Sheet 23 of 64

410

METRIC  
 COUNTY REV.  
 1/4" = 10'  
 1/8" = 5'



MATCHLINE SEE SHEET 28A  
 -Y-  
 PLS STA 12+77.65  
 Δ = 12.18  
 L = 307.4  
 R = 280.000  
 PLS STA 13+22.65  
 Δ = 31.47  
 L = 150.95  
 R = 180.000  
 PLS STA 13+45.15  
 Δ = 51.27  
 L = 56.00  
 R = 108.000  
 PLS STA 14+03.17  
 Δ = 8.319  
 L = 47.10  
 R = 93.50000

MATCHLINE SEE SHEET 28A  
 -Y- REV  
 PLS STA 14+47.748  
 Δ = 2.10  
 L = 22.461  
 R = 12.075  
 PLS STA 14+99.954  
 Δ = 19.29  
 L = 12.075  
 R = 50.000  
 PLS STA 15+47.748  
 Δ = 2.10  
 L = 33.336  
 R = 16.665  
 PLS STA 15+99.954  
 Δ = 19.29  
 L = 12.075  
 R = 50.000  
 PLS STA 16+47.748  
 Δ = 2.10  
 L = 33.336  
 R = 16.665

FOR DITCH DETAILS SEE SHEET 2-7  
 FOR -Y- REV PROFILE SEE SHEET 54 & 55  
 SEE C-TIRRU C - FOR CULVERT PLANS

MATCHLINE SEE SHEET 28A



PROJECT REFERENCE NO. 1-COOLIDGE  
 SHEET NO. 25  
 DRAWING BY: METRICS  
 CHECKED BY: METRICS  
 DATE: 11/15/14

CONTRACT NO. 15-42446

SCALE: 1" = 40'

DATE: 11/15/14

**DENOTES FILL IN SURFACE WATER**

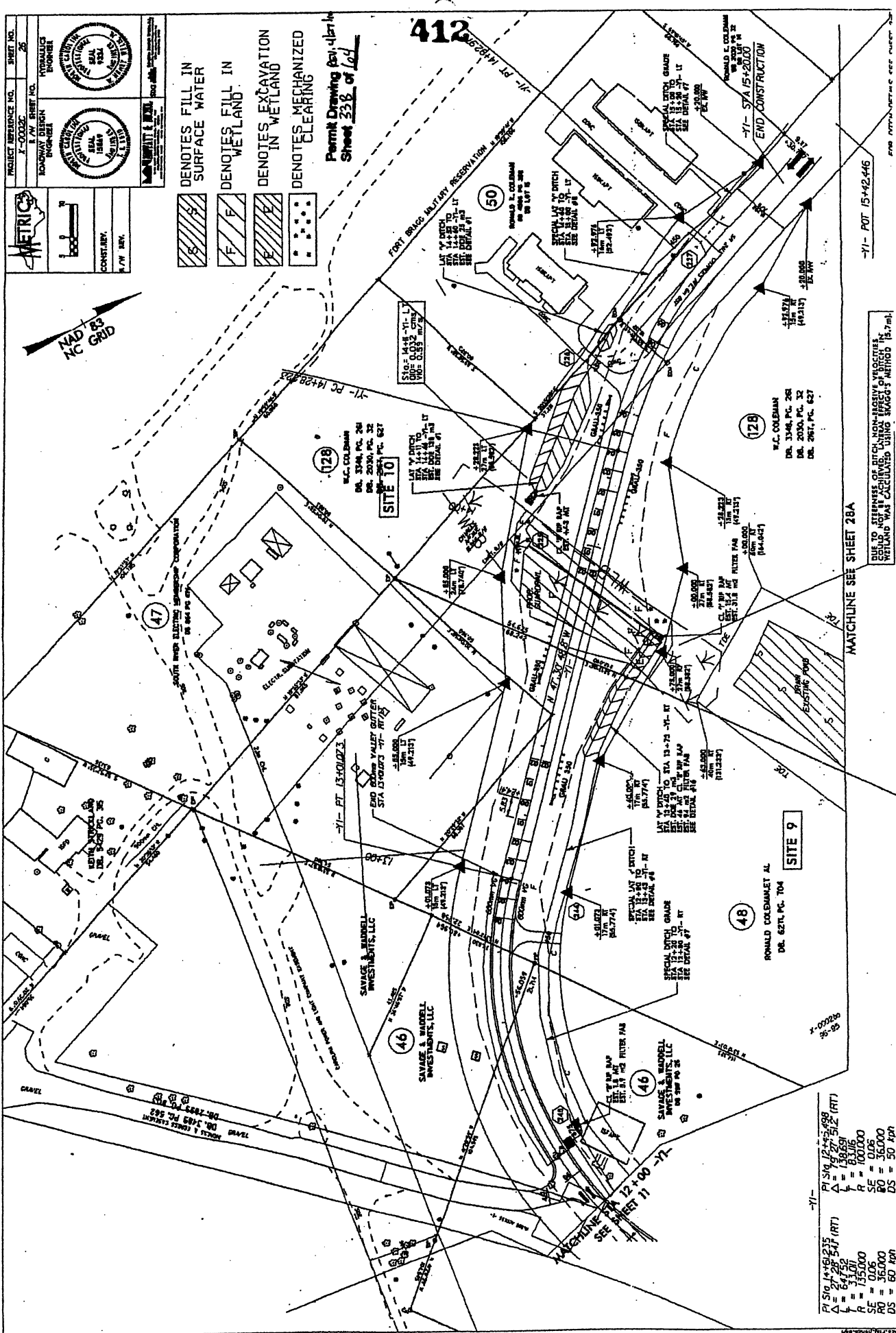
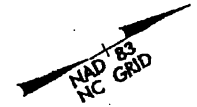
**DENOTES FILL IN WETLAND**

**DENOTES EXCAVATION IN WETLAND**

**DENOTES MECHANIZED CLEARING**

Permit Drawing 891-41st  
 Sheet 23B of 64

412



15-42446  
 END CONSTRUCTION

MATCHLINE SEE SHEET 28A

PI	510.1742-235
Δ	27.29
Δ	130.00
R	64.00
R	100.00
SE	0.06
RO	36.000
DS	60.00

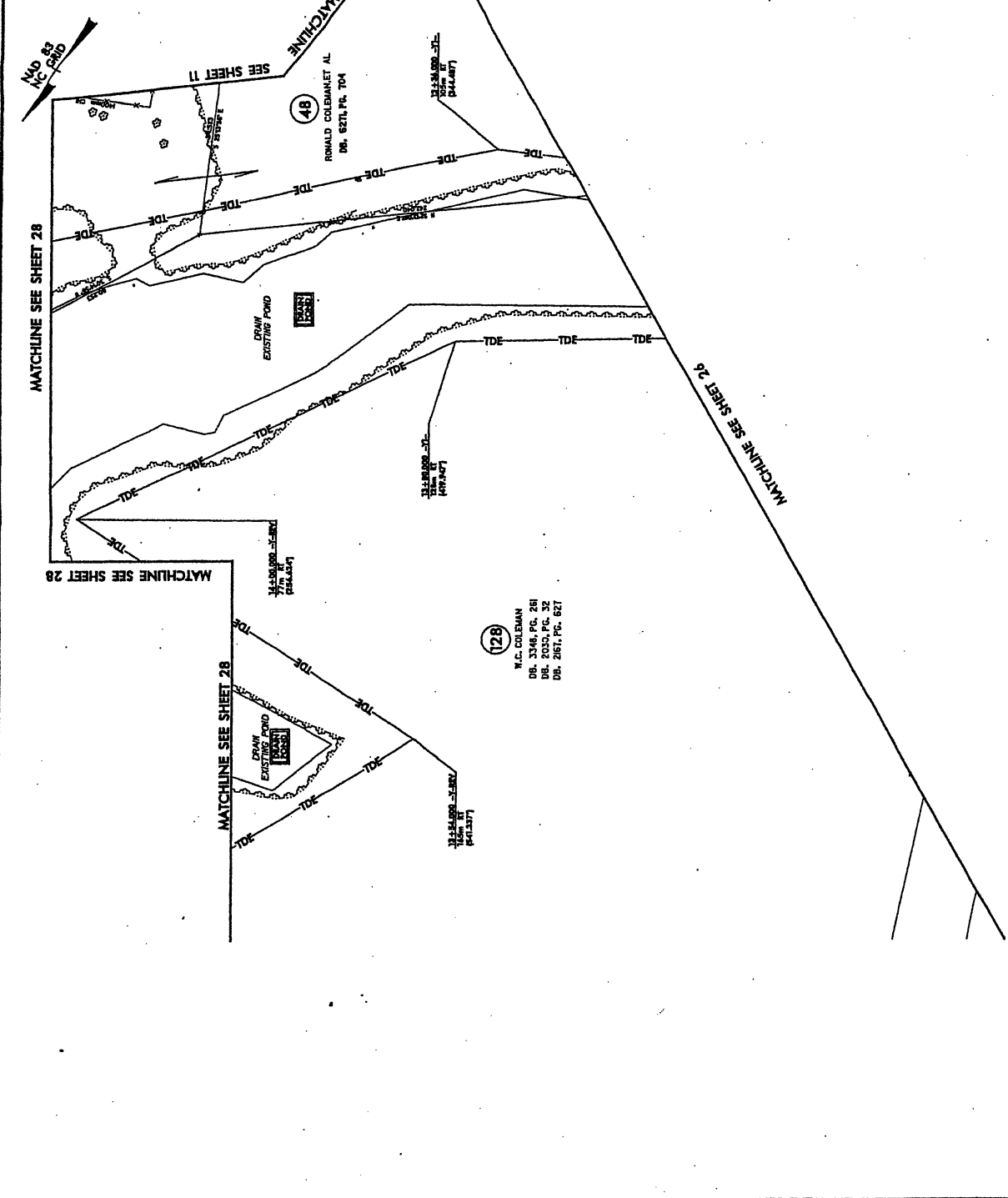
15-42446  
 END CONSTRUCTION

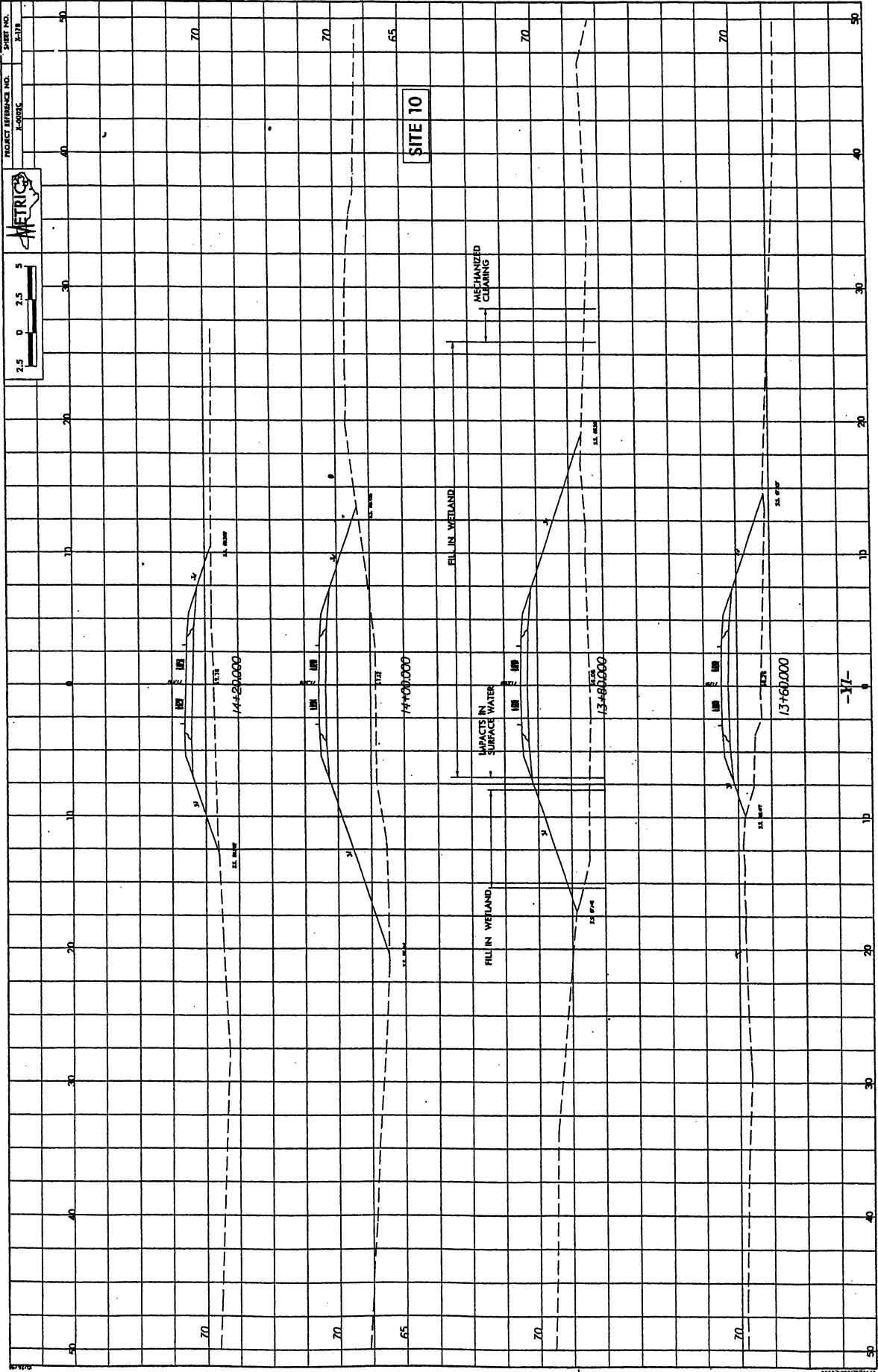






PROJECT REFERENCE NO. 17-00000000	SHEET NO. 415
DATE 1/17/2017	SCALE AS SHOWN
DESIGNED BY M. J. COLEMAN	CHECKED BY M. J. COLEMAN
APPROVED BY M. J. COLEMAN	DATE 1/17/2017





PROJECT REFERENCE NO. 4530C  
SHEET NO. 5  
METRICS  
2.5 0 2.5 5

70  
70  
65  
70  
70

50  
40  
30  
20  
10  
0  
-X/-