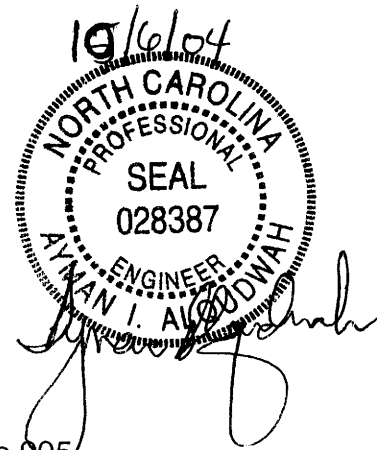


**Luminaire Retrieval System (LRS) Lighting
For
Overhead Sign Assembly**



General:

Performance of this work shall comply with the requirements of sections 905, 1097, and other applicable sections of the North Carolina Department of Transportation's Standard Specifications for Roads and Structures.

Catalog Cut Submittals:

Catalog cut transmittals shall be generated using the NCDOT Signing Section's online qualified products list (QPL). The online QPL is located at:

<http://www.doh.dot.state.nc.us/preconstruct/traffic/congestion/SIGN/qpl/qpl.html>

If a product complies with the requirements of the NCDOT Standard Specifications for Roads and Structures and isn't contained in the online QPL, the submittal process guidelines are online at:

http://www.doh.dot.state.nc.us/preconstruct/traffic/congestion/SIGN/qpl/equipment_submittal.html

Luminaire retrieval system shop drawings shall be submitted directly to the NCDOT signing section for review and approval.

Luminaire Retrieval System:

Overhead sign structure luminaires are to be installed on a luminaire retrieval system with supports and electrical system designed for track mounted luminaires. Design the retrieval and electrical system for the number of luminaires as shown on the plans. The retrieval system must be capable of securely holding all sign luminaires at their designed positions and to allow all luminaires and electrical connections to be maintained from the roadway shoulder without lane closures. Electrical connections for the luminaires are to be arranged to allow each luminaire to be energized while over the shoulder for testing purposes. The system shall be capable of utilizing more than one circuit if required by the plans. A service pole for mounting electric meter, Walkways, handrails and associated equipment will not be required with the luminaire retrieval system.

A possible source of this product is:

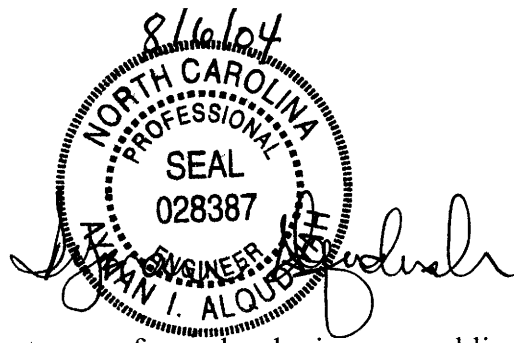
Lumi Trak Inc.
P.O. Box 158
Shrewsbury, PA 17361
(717) 235-2863

Compensation:

Luminaire Retrieval System is part of the Sign Lighting System and shall not be paid for separately. The work performed as described in Section 905, 1097 and in "Luminaire Retrieval System" above shall be paid for at the contract lump sum price.

Payment will be made under:

LRS Lighting for Overhead Sign Assembly _____ Lump Sum



OVERHEAD SIGN ASSEMBLIES

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

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

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

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

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

CONSTRUCTION METHODS

(A) General

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

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

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

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

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

(B) Location and Field Verification

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

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

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

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

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

(C) Shop Drawings

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

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

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

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

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

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

(D) Design and Fabrication

The following criteria governs the design of overhead sign assemblies:

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

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

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

- Overhead cantilever sign structures shall include galloping loads, truck-induced gust loading and natural wind gust loading in the fatigue design, as provided for in Article 11.7.1, 11.7.4 and 11.7.3 respectively.
- The natural wind gust speed in North Carolina shall be assumed to be 5 meters per second or 11.6 mph for inland areas, and 7 meters per second or 15.7 mph for coastal areas. The coastal area shall be defined as any area within 2 miles from the waterfront facing the ocean or sound and all area where the design basic wind speed is above 120 mph, as shown in Figure 3-2.
- The fatigue importance category used in the design, for each type of structure, as provided for in Article 11.6, Fatigue Importance Factors, shall be Category II unless otherwise shown on the contract plans.

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

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

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

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

Case 3 For twin post truss-type upright post with the post connected to two truss chords of a horizontal tri-chord or box truss, the effective column length factor for that column shall be taken as 1.65.

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

- Case 1 Circular or rectangular solid base plate with the upright pole welded to the top surface of base plate with full penetration butt weld, and where no stiffeners are provided. A base plate with a small center hole, which is less than 1/5 of the upright diameter, and located concentrically with the upright pole, may be considered as a solid base plate.

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

where P = anchoring force of each anchor bolt

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

M = bending moment at the critical section of the base plate induced by one anchor bolt

The critical section shall be located at the face of the anchor bolt and perpendicular to the radius of the bolt circle. The overlapped part of two adjacent critical sections shall be considered ineffective.

- Case 2 Circular or rectangular base plate with the upright pole socketed into and attached to the base plate with two lines of fillet weld, and where no stiffeners are provided, or any base plate with a center hole that is larger in diameter than 1/5 of the upright diameter

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

where P = anchoring force of each anchor bolt

D_2 = horizontal distance between the face of the upright and the face of the anchor bolt nut

The critical section shall be located at the face of the anchor bolt top nut and perpendicular to the radius of the bolt circle. The overlapped part of two adjacent critical sections shall be considered ineffective.

The thickness of base plate of Case 2 shall not be less than that calculated based on formula for Case 1.

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

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

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

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

Horizontal components of the supporting structures for overhead signs may be of a truss design or a design using singular horizontal members to support the sign panels. Provide permanent camber in addition to dead load camber in accordance with the "Standard

Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals". Indicate on the shop drawings the amount of camber provided and the method employed in the fabrication of the support to obtain the camber.

Use cantilever sign structures that meet the following design criteria:

1. Do not exceed an $L/150$ vertical dead load deflection at the end of the arm due to distortions in the arm and vertical support, where L is the length of the arm from the center of the vertical support to the outer edge of the sign.
2. Do not exceed an $L/40$ horizontal deflection at the end of the arm due to distortions in the arm and vertical support, as a result of design wind load.

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

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

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

(E) Maintenance Walkways

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

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

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

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

Fabricate folding safety railing in lengths not exceeding 10 feet (3m) and install for the full length of the walkway. Join each folding safety railing post to walkway supports through a hinge support of appropriate design that will rotate freely. Provide a hinge support that has a

locking or latching device and holds the railing in a steady manner, free of movement while in the raised position. Maximum allowable displacement from vertical at the top of the railing will be 1 inch (25mm).

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

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

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

(F) Footings

Anchor Bolts

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

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

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

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

Construct footing excavations for overhead sign assemblies which conform to the applicable provisions of Section 410. Make sure that the sides of the excavation for pole-type footings conform as nearly as practicable to the required dimensions. Place concrete for pole-type footings against undisturbed soil. If, in the judgement of the Engineer, significant discontinuities in the required configuration of the excavation for pole-type footings are created by the removal

of boulders, or as a result of other causes, backfill the excavation and compacted as provided for in Section 410. Re-excavate the footings to the proper dimensions. Obtain approval prior to the use of shoring, if shoring is necessary to stabilize the sides of excavation for pole-type foundations.

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

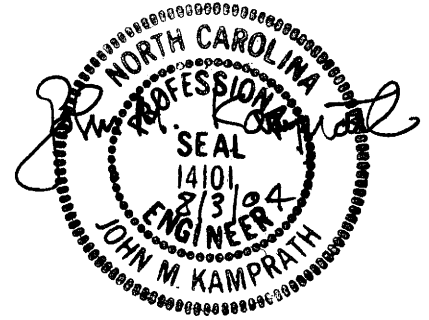
Fill the space between the top of the footing and the bottom of the base plate and neatly finish with a non-shrinking and non-metallic grout approved by the Engineer.

COMPENSATION

The work covered by this section will be paid for at the contract lump sum for the Overhead Sign Assembly “@ Sta 12+80 (-L)”. Such price will be full compensation for all work covered by this specification includes all design, fabrication, construction, transportation, and erection of the complete overhead sign structure, supporting structure, hardware, lighting support brackets, and footings; preparing and furnishing shop drawings; and attaching the signs to the overhead sign structure.

Payment will be made under:
Overhead Sign Assembly @ STA 12+80 (-L).....Lump Sum

PROJECT SPECIAL PROVISIONS
Utility Construction



GENERAL CONSTRUCTION REQUIREMENTS:

Specifications:

The proposed utility construction shall meet the applicable requirements of the NC Department of Transportation's "Standard Specifications for Roads and Structures" dated January 2002 and the details as shown on the plans, as outlined in the following provisions, or as directed by the Engineer.

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

On new water mains and tie in sections of existing water mains, the method of anchoring pipe bends, valves, and related appurtenances will be the responsibility of the Contractor. Tying in to existing water mains may alter such lines to the extent that these pipelines with existing pipe bends, valves and related appurtenances may also require reaction backing; this work shall also be the responsibility of the Contractor.

The Contractor shall submit his proposed method of anchoring to the Engineer for review and approval prior to any applicable water main construction. Such approval will not relieve the Contractor of his responsibility of properly anchoring water mains.

Pipe joint deflections shall not exceed 75% of the manufacturer's recommended maximum deflection.

Owner and Owner's Requirements:

The existing water mains are owned by Robeson County. The Contractor shall provide access for the owner's representatives to all phases of construction. The owner shall be notified two weeks prior to commencement of any work and one week prior to service interruption.

Utility Locations Shown on the Plans:

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

COMPENSATION:

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

1. BEDDING MATERIAL:

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

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

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

2. 20MM PE WATER TUBING, SDR 7, 1.38 MPA WP

All meters installed to serve customers of Robeson County Public Works identified in the construction plans shall be connected to the water mains with standard polyethylene water tubing manufactured from high-density molecular polyethylene resin designated PE 3408. Tubing shall be manufactured according to ASTM D2737 with outside diameter equal to copper tubing (CTS). Tubing shall have a wall thickness as computed by SDR 7. Pressure rating shall be 1.38 MPa minimum. A 14-gauge stranded copper tracer wire with blue insulation shall be taped securely to all polyethylene water service tubing.

The quantity of PE water tubing to be installed as provided above will be paid for at the contract unit price per meter for "20 MM PE Water Tubing, SDR 7, 1.38 MPA WP." Such prices and payments shall be full compensation for all materials, including but not limited to, tubing and copper tracer wire, labor, equipment, compaction and incidentals necessary to complete the work as required.

3. 50MM BLOW OFF ASSEMBLY

Install blow off assemblies in accordance with the applicable utility provisions herein, as shown on the utility plans, and/or as directed by the Engineer.

Blow off assemblies shall include mechanical joint plug with 50mm tap, 50mm gate valve, 50mm piping, valve boxes, concrete blocking, concrete pads for valve boxes, and the necessary pipe fittings and adapters.

Gate valves shall be of all bronze construction with iron pipe thread, screw ends, wedge gates and non-rising stem. Gate valve shall open by turning to the right or clockwise using a tee head operating nut and shall be in accordance with the most recent edition of AWWA C-500 and such ASTM designations as apply with reference to chemical requirements as set forth in Table I of ASTM B-62. The working pressure of all valves shall be 1.38 MPa.

Valve boxes shall be of the screw or slip type, with a base to fit the valve yoke and a removable plug cap with the word "WATER" cast therein. Valve boxes shall be cast iron conforming to ASTM A48, Class 30, unless otherwise shown on the utility plans and/or as directed by the Engineer.

Blow off assemblies installed in accordance with the plans and provisions herein and accepted, will be measured and paid for at the contract unit price per each for "50MM Blow Off Assembly". Such prices and payments shall be full compensation for all materials, including mechanical joint plug with tap, gate valve, piping, valve boxes, concrete blocking, concrete pads for valve boxes, and the necessary pipe fittings and adapters, labor, equipment, excavation, installation, sterilization, pressure testing, valve box installation with the necessary extension pieces, backfilling, and incidentals necessary to complete the work as required.

4. REMOVE EXISTING WATER METER

The existing water meters to be removed at the connection to the existing service piping and stockpiled in an area accessible by truck or as directed by the Engineer.

After the water meters are removed and stockpiled, the Contractor shall contact the owner and arrange for county maintenance forces to receive and remove the water meters from the jobsite.

The quantity of water meters removed, stockpiled, and accepted, will be measured and paid for at the contract unit price per each for "Remove Existing Water Meter". Such price and payment will be full compensation for all labor, excavation, removal, stockpiling, and incidentals necessary to complete the work as required.

5. STEEL ENCASEMENT PIPE

Steel encasement pipe shall be installed in accordance with the applicable utility provisions herein, as shown on the utility plans, and/or as directed by the Engineer. Steel encasement pipe may be of the following types: - spiral welded steel pipe in accordance with ASTM A211; circular black or galvanized steel pipe in accordance with ASTM A53 or A589; high strength smooth wall steel casing in accordance with API-5L, Grade B, or

other grades; or other steel pipe of acceptable quality and meeting the approval of the Engineer.

Steel encasement pipe shall be installed with leak proof joints. The joints shall be butt-welded by a certified welder using approved techniques and materials.

The carrier pipe shall be installed inside the encasement pipe by use of skids or spiders appropriately spaced to support the carrier pipe from deflection. Skids or spiders shall be sized to raise the carrier pipe bells above the encasement pipe and to restrict excessive radial movement. Skids or spiders shall be securely attached to the carrier pipe and shall be approved by the Engineer.

After the carrier pipe is installed and tested, the ends of the encasement pipe shall be plugged or capped with concrete, brick or other approved materials. The plug or cap shall have a one-inch diameter weep hole at the bottom to facilitate drainage of the encasement pipe.

Steel encasement pipe, installed in accordance with the plans and provisions herein and accepted, will be measured along the pipe from end to end and paid for at the contract unit price per meter for "_____mm Steel Encasement Pipe, _____mm Thick, By Boring & Jacking" or "_____mm Steel Encasement Pipe, _____mm Thick, By Open Cut". Such prices and payments will be full compensation for all materials, excavation, equipment, labor, installation, grouting, backfilling, and incidentals necessary to complete the work as required.

6. 250MM HDPE WATER PIPE, DR 9, 1.38MPA WP

250mm High Density Polyethylene (HDPE) Water Pipe shall be installed by directional boring in the location shown on the plans. Install water pipe in accordance with the applicable utility provisions herein, as shown on the utility plans, and/or as directed by the Engineer.

HDPE Water Pipe to be 250mm, DR 9, 1.38 MPa, manufactured in accordance with ANSI/AWWA C906-90. HDPE Pipe materials shall be either PE 2406, PE 3406 or PE 3408 depending upon the required pressure class and dimension ratio (SDR) specified on the plans.

Drilling fluid to be bentonite slurry. Use admixtures suitable to the site conditions.

HDPE water pipe is to be fused and tested prior to placement. Join pipe segments by cutting the ends square, heating and fusing under sufficient pressure to create a single length of pipe sufficient to complete installation in one continuous pulling operation. The pipe manufacturers listing of fusion parameters validated by appropriate testing and the parameters of the contractor's fusion system shall be submitted to the Resident Engineer prior to fusing of segments of HDPE water pipe into the pipe string. Furnish connector assemblies to connect to PVC water pipe and fuse onto each end of the HDPE water pipe.

HDPE water pipe string shall be tested to a hydrostatic pressure of 1.38 MPa in accordance with testing procedure outlined in section 1510 of the standard specifications prior to being placed.

HDPE water pipe is to be installed by boring or drilling a small pilot hole along a parabolic arc beneath the installation location. Enlarge the pilot hole by use of a reamer or reamers to the desired diameter. When the bored hole is of the diameter recommended by the pipe manufacturer for the 250mm HDPE water pipe, the contractor will pull the pipe string through the hole by the drill string. Cap the pipe string during the pulling operation. Pulling operation to incorporate a swivel connection to minimize torsional stress imposed upon the pipe string. Fully support the pipe string before and during pull back so that the pipe string will move freely without damage.

Locator Wire: A 14 gauge stranded copper tracer wire with blue insulation shall be taped securely to the 250mm HDPE water main pipe.

Contractor may elect to conduct reaming and pulling of the pipe string as one operation at the discretion of the engineer.

Drilling fluid to be re-circulated through use of a solids control system to remove spoil from drilling fluid surface returns. After cleaning, return the drilling fluid surface returns to the active system.

HDPE Water Pipe, installed in accordance with the plans and provisions herein and accepted, will be measured along the pipe from end to end, with no deductions for fittings or couplings, and paid for at the contract unit price per meter for "250MM HDPE Water Pipe, DR 9, 1.38MPA WP by Directional Bore". Such prices and payments will be full compensation for furnishing all labor, equipment, material, couplings, mechanical joint adapters and fittings, connector assemblies, reducers, excavation, installation, locator wires, testing, backfilling, and incidentals necessary to complete the work as required.

PROJECT SPECIAL PROVISIONS
UTILITY

UTILITIES BY OTHERS:

GENERAL:

THE FOLLOWING UTILITY COMPANIES HAVE FACILITIES THAT WILL BE IN CONFLICT WITH THE CONSTRUCTION OF THIS PROJECT:

- A. PROGRESS ENERGY (DISTRIBUTION)
- B. PROGRESS ENERGY (TRANSMISSION)
- C. LUMBEE RIVER EMC
- D. BELLSOUTH
- E. MCI WORLDCOM
- F. CAROLINA CABLE PARTNERS

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.

- A. PROGRESS ENERGY (DISTRIBUTION)
 - 1. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.
- B. PROGRESS ENERGY (TRANSMISSION)
 - 1. PROGRESS ENERGY WILL RELOCATE THEIR TRANSMISSION LINE AFTER LUMBEE RIVER EMC RELOCATES THEIR FACILITIES. THEY WILL REQUIRE TWO WEEKS NOTICE AND 4 WEEKS CONSTRUCTION.
 - 2. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.
- C. LUMBEE RIVER EMC
 - 1. LUMBEE RIVER WILL COMPLETE THEIR RELOCATIONS BY FEBRUARY 1, 2005.
 - 2. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.

D. BELLSOUTH

1. BELLSOUTH WILL RELOCATE THEIR BURIED TELEPHONE CABLE AND CONDUIT LEFT OF LINE -Y1- AFTER CLEARING AND GRUBBING. THEY WILL REQUIRE TWO WEEKS NOTICE AND THREE WEEKS TO COMPLETE THEIR RELOCATION.
2. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.

E. MCI WORLDCOM

1. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.

E. CAROLINA CABLE PARTNERS

1. CAROLINA CABLE PARTNERS WILL RELOCATE THEIR FACILITIES ON -Y1- (NC 710) AFTER LUMBEE RIVER EMC HAS RELOCATED THEIR FACILITIES. THEY WILL REQUIRE TWO WEEKS NOTICE AND ONE WEEK TO COMPLETE THEIR RELOCATION
2. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.

PROJECT SPECIAL PROVISIONS
UTILITY

UTILITIES BY OTHERS:

GENERAL:

THE FOLLOWING UTILITY COMPANIES HAVE FACILITIES THAT WILL BE IN CONFLICT WITH THE CONSTRUCTION OF THIS PROJECT:

- A. PROGRESS ENERGY (DISTRIBUTION)
- B. PROGRESS ENERGY (TRANSMISSION)
- C. LUMBEE RIVER EMC
- D. SPRINT
- E. BELLSOUTH
- F. CAROLINA CABLE PARTNERS

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.

- A. PROGRESS ENERGY (DISTRIBUTION)
 - 1. PROGRESS ENERGY WILL COMPLETE THEIR RELOCATIONS PRIOR TO MARCH 1, 2005.
 - 2. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.
- B. PROGRESS ENERGY (TRANSMISSION)
 - 1. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.
- C. LUMBEE RIVER EMC
 - 1. LUMBEE RIVER EMC WILL COMPLETE THEIR RELOCATIONS BY FEBRUARY 1, 2005.
 - 2. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.
- D. SPRINT
 - 1. SPRINT WILL COMPLETE THEIR RELOCATIONS ON -SR1- AFTER CLEARING AND GRUBBING. THEY WILL REQUIRE TWO WEEKS

NOTICE AND THREE WEEKS CONSTRUCTION TO COMPLETE THEIR RELOCATION.

2. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.

E. BELLSOUTH

1. BELLSOUTH WILL RELOCATE THEIR FACILITIES AFTER CLEARING AND GRUBBING. THEY WILL REQUIRE 2 WEEKS NOTICE AND 4 WEEKS TO COMPLETE THEIR CONSTRUCTION.
2. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.

F. CAROLINA CABLE PARTNERS

1. CAROLINA CABLE PARTNERS WILL RELOCATE THEIR FACILITIES TO PROGRESS ENERGY POWER POLES AFTER POLES HAVE BEEN RELOCATED.
2. CAROLINA CABLE PARTNERS WILL ADJUST THEIR CABLE LOCATED AT RIGHT OF -Y2- STATION 17+30 FOR DRAINAGE CONSTRUCTION AND WILL REQUIRE ONE WEEKS NOTICE AND ONE WEEK TO COMPLETE THEIR RELOCATION.
3. CAROLINA CABLE PARTNERS WILL ADJUST THEIR CABLE LOCATED RIGHT OF -Y2- STATION 18+80 AFTER CLEARING AND GRUBBING AND WILL REQUIRE TWO WEEKS NOTICE AND ONE WEEK TO COMPLETE THEIR RELOCATION.
4. SEE UTILITIES BY OTHERS PLANS FOR DETAILS.

R-0513A/BA

**Project Special Provisions
Erosion Control**

Robeson County

Seeding And Mulching:

(4)

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

January 1 - December 31

- 50# (55kg) Tall Fescue
- 5# (6kg) Centipede
- 50# (55kg) Pensacola Bahiagrass
- 500# (560kg) Fertilizer
- 4000# (4500kg) Limestone

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

January 1 - December 31

- 75# (85kg) Tall Fescue
- 50# (55kg) Pensacola Bahiagrass
- 500# (560kg) Fertilizer
- 4000# (4500kg) Limestone

Approved Tall Fescue Cultivars:

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

Add 10# (12kg) Kobe or Korean Lespedeza to the above mixtures May 1 - August 31.

On cut and fill slopes 2:1 or steeper add 30# (35 kg) Sericea Lespedeza

January 1 - December 31.

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

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

Crimping Straw Mulch:

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

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

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

Temporary Seeding:

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

Fertilizer Topdressing:

Fertilizer used for topdressing 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 (560 kg per hectare). Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

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

Supplemental Seeding:

The kinds of seed and proportions shall be the same as specified for "Seeding and Mulching", with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre (28kg to 85kg per hectare). The actual rate per acre (hectare) will be determined by the Engineer prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre (hectare), total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

Mowing:

The minimum mowing height on this project shall be 4 inches (100 mm).

Lawn Type Appearance

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

Specialized Seeding Under Guiderail and Guardrail (Centipede):**General:**

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

Materials:

Only approved centipede grass seed that complies with Section 1060 of the Standard Specifications shall be used.

Soil Preparation:

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

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

Soil amendments shall be as follows:

Limestone: Limestone shall be applied at a rate of 2000 pounds (2250 Kg/Hectare) per acre.

Fertilizer: Fertilizer shall be 10-20-20 analysis and applied at a rate of 300 pounds (330 Kg/Hectare) per acre.

Application of limestone and fertilizer will be considered incidental to the work of "Specialized Seeding Under Guiderail/Guardrail (Centipede)" and no direct payment will be made for such.

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

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

Application:

Centipede seed shall be uniformly distributed at a rate of 20 pounds per acre (28 kilograms per hectare) by mechanical means.

Immediately following the placement of seed, the area shall be cultipacked carefully and firmly by means acceptable to the Engineer to ensure a smooth surface.

Herbicidal Treatment Under Guiderail and Guardrail:

Upon completion of seeding and rolling or tamping operations, a herbicidal treatment shall be made in accordance with these specifications. Herbicide applications will be made by or under the direct supervision of a licensed North Carolina Department of Agriculture and Consumer Services applicator. No direct payment will be made for additional herbicidal work if such work is due to carelessness or neglect on the part of the contractor.

Apply herbicide evenly over the soil surface with the properly calibrated equipment at the specified rate. Sprayers shall be equipped to provide continuous agitation of the spray

mixture during application to ensure application of a uniform spray solution. The herbicide sprayer shall provide a uniform, low volume-low pressure application that does not drift nor produce runoff of product which damages vegetation outside of the 48-inch seeding area. The sprayer shall provide a total volume application rate of 10 to 30 gallons per acre.

The following herbicide shall be used:

<u>Product Name</u>	<u>Application Rate</u>
Drexel Atrazine 4L	1 quart per acre

Due to labeling restrictions, no substitutions shall be allowed for this product. Product label shall be provided to the Engineer for approval prior to beginning work.

Matting:

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

Basis of Payment:

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

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

Specialized Hand Mowing:

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

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

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

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

Payment will be made under:

Specialized Hand Mowing.....HR

High Quality Waters:

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

Seeding and Mulching:

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

Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. No appreciable time shall lapse into the contract time without stabilization of slopes, ditches and other areas within the “High Quality Water Zone(s)” as indicated on the E.C. Plans.

Stage Seeding:

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

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

Environmentally Sensitive Areas:

Clearing and Grubbing:

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

Grading:

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

Temporary Stream Crossings:

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

Minimize Removal Of Vegetation

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

Stockpile Areas

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

Reforestation:

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

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

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

Root dip: The roots of reforestation seedlings shall be coated with a slurry of water, and either a fine clay ("kaolin") or a superabsorbent that is made to be used as a bare root dip. The type, mixture ratio, method of application, and the time of application shall be submitted to the Engineer for approval. With the approval of the Engineer, seedlings may be coated before delivery to the job or at the time of planting, but at no time shall the roots of the seedlings be allowed to dry out. The roots shall be moistened immediately prior to planting.

Waste Areas And Borrow Sources:

Payment for temporary erosion control measures, except those made necessary by the Contractor's own negligence or for his own convenience, will be paid for at the appropriate contract unit price for the devices or measures utilized in borrow sources and waste areas.

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

Temporary Diversion:

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

Safety Fence:

Description:

The work of "Safety Fence" shall consist of furnishing, installing and maintaining polyethylene or polypropylene fence along the outside riparian buffer, wetland, or water boundary located within the construction corridor to mark the areas that have been approved to infringe within the buffer, wetland or water, and as directed by the Engineer in accordance with the special provisions included herein. The fence shall be installed prior to any land disturbing activities.

Materials:

Fence Material:

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

Posts:

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

Clearing and Grading:

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

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

Installation:

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

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

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

Method of Measurement:

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

Basis of Payment:

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

Payment will be made under:

Safety Fence.....LF (M)

Gravel Construction Entrance:

Description:

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

Materials:

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

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

Construction:

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

Method Of Measurement:

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

Basis Of Payment:

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

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

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

Culvert Diversion Channel:**Description:**

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

Material:

Use local material or material specified on plans.

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

Construction requirements:

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

Utilize suitable material and provide disposal area for unsuitable material.

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

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

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

Method of Measurement:

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

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

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

Basis of Payment:

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

Culvert Diversion ChannelCY (M3)

Filter Fabric for Drainage SY (M2)

Impervious Dike:

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

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

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

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

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

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

Temporary Pipe For Culvert Construction:

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

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

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

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

Special Sediment Control Fence:

Description:

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

Materials:

(A) Posts:

Either wood or steel posts may be used. Wood posts shall be a minimum of 6 feet long (1.8 m), at least 3 inches (75 mm) in diameter, and straight enough to provide a fence

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

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

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

C) Sediment Control Stone:

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

Maintenance and Removal:

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

Method of Measurement:

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

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

Basis of Payment:

Payment for special sediment control fence will be as follows:

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

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TIP #: R-0513A
Date: 08/13/04
Revised:

POLICE

DESCRIPTION.

The work covered by this special provision consists of furnishing police officers and marked police vehicles to direct traffic in accordance with the plans.

CONSTRUCTION METHODS.

Police officers shall be outfitted with police uniforms.

Marked police vehicles shall be equipped with police lights mounted on top of the vehicle, and police vehicle emblems.

Police officers and marked police vehicles will be required to be provided simultaneously, or separately to direct or control traffic. The plans or the Engineer will designate the locations where only police officers are required, where only marked police vehicles are required, or where they are both required to be utilized simultaneously.

METHOD OF MEASUREMENT.

The quantity of police officers and police vehicles to be paid for will be the actual number of hours that every police officer is provided to direct traffic during the life of the project as approved by the Engineer.

The Contractor will not be paid for using police officers and marked police vehicles unless prior approval for each use is obtained from the Engineer.

BASIS OF PAYMENT.

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

Such price and payment will be full compensation for all work covered by this provision, including but not limited to furnishing police officers, marked police vehicles, utilizing the police officers and marked police vehicles to direct traffic, and removing them when no longer needed.

Payment will be made under:

Police.....Hour.

107 B

TIP #: R-0513A
Date: 08/13/04
Revised:

TRAFFIC CONTROL DEVICES TO REMAIN ON PROJECT

DESCRIPTION.

The work covered by this special provision consists of furnishing, installing and leaving traffic control devices on the project at its completion in accordance with the plans.

CONSTRUCTION METHODS.

The Contractor shall install and leave on the project the traffic control devices necessary to accommodate the traffic pattern shown on sheet PM-2, PM-3, and PM-4 of the Traffic Control Plan, unless otherwise directed by the Engineer.

The devices remaining on the project shall meet the requirements of their respective specifications in the 2002 Standard Specifications or their respective special provisions contained elsewhere in this Contract.

All devices that are required to remain on the project at its completion shall be in good condition subject to the approval of the Engineer.

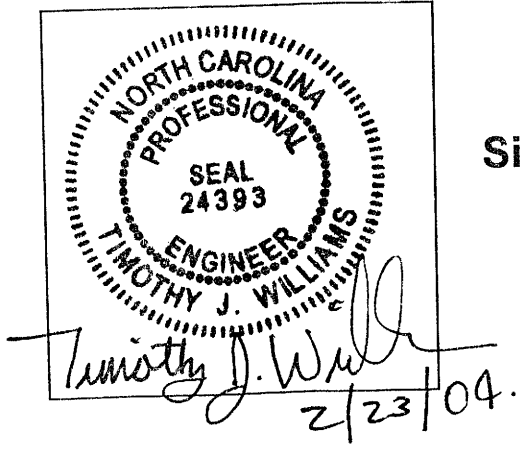
The devices required to remain on the project at its completion will become the property of the Department.

BASIS OF PAYMENT.

No additional payment will be made specifically for leaving devices on the project. These devices will be paid for under their respective pay items in the Contract which will include full compensation for furnishing, installing, maintaining during the life of the project, leaving the devices on the project at its completion, and turning over ownership of the devices to the Department.

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

Prepared By: CJC
23-Feb-04



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

The 2002 Standard Specifications are revised as follows:

1.1. General Requirements (1098-1)

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

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

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

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

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

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

1.2. Signal Heads (1098-2)

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

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

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

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

Replace paragraphs 2 and 3 with the following paragraphs:

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

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

Replace the last paragraph with the following:

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

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

Replace the entire subarticle with the following two subarticles:

(1) Vehicular

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

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

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

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

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

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

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

Design all modules to meet existing NCDOT monitor specifications for each of the following types of signal monitors: NEMA TS-1 conflict monitors (including so-called NEMA plus

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features such as dual indication detection and short yellow time detection); NEMA TS-2 Malfunction Management Units (MMU); and 170 cabinet Type 210ECL and 2010ECL conflict monitors (including red monitoring and so-called plus features such as dual indication detection and short yellow time detection).

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

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

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

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

Notes

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

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

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

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

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

Notes

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

Table 1098-5
Chromaticity Standards (CIE Chart)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(2) Pedestrian

Design the LED pedestrian traffic signal modules for installation into standard pedestrian traffic signal sections that do not contain the incandescent signal section reflector, lens, eggcrate visor, gasket, or socket. Provide a clear 0.25-inch (6.4-mm), non-glare, mat finish lens with a smooth outer surface and UV stabilized to withstand ultraviolet exposure for a minimum period of 60 months without exhibiting evidence of deterioration. Coat the front surface of a

polycarbonate lens to make it more abrasion resistant. Ensure that the lens has light transmission properties equal to or greater than 80%.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Replace the first sentence in the paragraph with the following:

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

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

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

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

1.3. Wood Poles (1098-6)

Page 10-228, Article 1098-6

Replace the entire article with the following:

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

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

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

Page 10-230, Article 1098-9

Replace the entire article with the following:

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

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

1.5. Type 170E Cabinets (1098-19)

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

Add the following paragraph:

If additional surge protected power outlets are needed to accommodate fiber transceivers, modems, etc.; install a UL listed, industrial, heavy-duty type power outlet strip with a maximum rating of 15 A / 125 VAC, 60 Hz. Provide a strip that has a minimum of 3 grounded outlets.

Ensure the power outlet strip plugs into one of the controller unit receptacles located on the rear of the PDA. Ensure power outlet strip is mounted securely; provide strain relief if necessary.

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

Replace Subarticle (D) with the following:

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

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

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

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

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

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displays the proper failure indication (Dual Ind fault). If this condition is detected for less than 250 ms, ensure that the monitor does not trigger.

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

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

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

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

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

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

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

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

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

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

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

1.6. Type 2070L Controllers (1098-20)

Page 10-247, Article 1098-20

Replace the entire article with the following:

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

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

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

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

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

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

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

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

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

The 2002 Standard Specifications are revised as follows:

2.1. General Requirements (1700)

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

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

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

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

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

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

2.2. Underground Conduit (1715)

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

Add the following paragraph:

Install metallic conduit at all locations where conduits traverse railroad tracks or as shown on the plans. For all other locations, install nonmetallic conduit unless otherwise shown on the plans. Backfill with excavated material and compact to 95% of its original density. Remove any rock and debris from backfill material.

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

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Signals & Traffic Management Systems

Delete the first paragraph.

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

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

2.3. Wood Poles (1720)

Page 17-10, Article 1720-3

Replace the fourth paragraph with the following paragraph:

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

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

2.4. Riser Assemblies (1722)

Page 17-12, Article 1722-3

In paragraph 4 add the following after the last sentence:

Install conduit on all risers for lead-in cable.

2.5. Loop Lead-In Cable (1726)

Page 17-14, Article 1726-3

Replace paragraph 1 with the following:

Install lead-in cable.

Delete paragraph 3.

In paragraph 4, delete “type 1.”

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

Page 17-15, Article 1726-4

Delete the last sentence.

2.6. Controllers with Cabinets (1751)

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

In paragraph 3, replace sentence 2 with the following:

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

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

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Add the following paragraph after the first paragraph:

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

Page 17-34, Article 1751-4

Replace paragraph 2 with the following:

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

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

Page 17-35, Article 1751-5

Replace paragraph 2 with the following:

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

In paragraph 3, revise "Detector Channel" to "Detector Card."

3. CABINET BASE ADAPTER

3.1. DESCRIPTION

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

3.2. MATERIALS

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

3.3. CONSTRUCTION METHODS

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

3.4. METHOD OF MEASUREMENT

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

3.5. BASIS OF PAYMENT

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

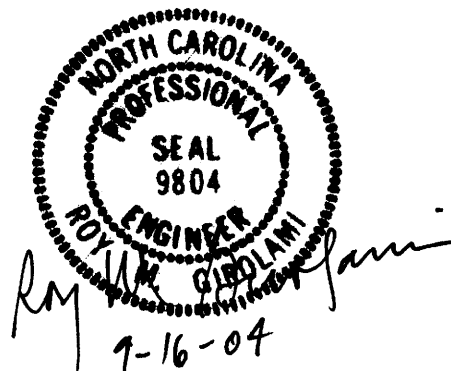
Payment will be made under:

Cabinet Base AdapterEach

**Project Special Provisions
Structures & Culverts**

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PROJECT SPECIAL PROVISIONS
STRUCTURES AND CULVERTS

PROJECT R-513A&BA

ROBESON COUNTY

MAINTENANCE AND PROTECTION OF TRAFFIC
BENEATH PROPOSED STRUCTURE AT STATION
113+73.429 -L- LEFT LN & RIGHT LN

(8-13-04)

Maintain traffic on NC 710 as shown in Traffic Control Plans and as directed by the Engineer.

Provide a minimum temporary vertical clearance of 4.6 m at all times during construction.

Submit plans and calculations for review and approval for protecting traffic and bracing girders, as described herein, at the above station before beginning work at this location. Have the drawings and design calculations prepared, signed, and sealed by a North Carolina Registered Professional Engineer. The approval of the Engineer will not relieve the Contractor of the responsibility for the safety of the method or equipment.

Protect traffic from any operation that affords the opportunity for construction materials, equipment, tools, etc. to be dropped into the path of traffic beneath the structure. Based on Contractor means and methods determine and clearly define all dead and live loads for this system, which, at a minimum, shall be installed between beams or girders over any travelway or shoulder area where traffic is maintained. Install the protective system before beginning any construction operations over traffic. In addition, for these same areas, keep the overhang falsework in place until after the rails have been poured.

Brace girders to resist wind forces, weight of forms and other temporary loads, especially those eccentric to the vertical axis of the member during all stages of erection and construction. Before casting of intermediate diaphragms, decks, or connecting steel diaphragms do not allow the horizontal movement of girders to exceed ½ inch (13mm).

Payment at the contract unit prices for the various pay items will be full compensation for the above work.

FALSEWORK AND FORMS OVER OR ADJACENT TO TRAFFIC

(10-12-01)

This Special Provision applies in addition to Article 420-3 of the Standard Specifications.

This Special Provision covers falsework or forms including metal stay-in-place forms and precast concrete deck panels erected over vehicular, pedestrian or railroad traffic, or vessel traffic on navigable waterways. It also covers falsework and forms for those parts of a substructure unit constructed within 20 ft. (6 m) of the edge of a travelway or railroad track and more than 25 ft. (7.6 m) above the ground line at the time of substructure construction.

1.0 SUBMITTALS

Submit detailed drawings as required by the Standard Specifications or other Special Provisions and one set of design calculations for falsework and forms for review and acceptance before beginning construction of the falsework or forms. Have the drawings and design calculations prepared, signed and sealed by a North Carolina Registered Professional Engineer. These submittal requirements apply to all falsework and form systems covered by this Special Provision.

2.0 DESIGN

Design falsework and forms for the combined effects of dead load and live load and with appropriate safety factors in accordance with these Special Provisions and the respective design codes of the materials used. Include the weight of concrete, reinforcing steel, forms and falsework in the dead load. Live load includes the actual weight of any equipment the falsework supports, applied as concentrated loads at the points of contact, and a uniform load of not less than 20 lbs/ft² (1.0 kPa) applied over the supported area. In addition, apply a line load of 75 lbs/ft (1.1 kN/m) along the outside edge of deck overhangs.

3.0 INSPECTION

Before the form or falsework system is loaded, inspect the erected falsework and forms and submit a written statement certifying that the erected falsework system complies with the accepted detailed drawings prepared by the Registered Professional Engineer. Submit a separate certification for each span, unit, or bridge component. Any condition that does not comply with the accepted drawings, or any other condition deemed unsatisfactory by the Engineer, is cause for rejection until corrections are made.

4.0 BASIS OF PAYMENT

Payment at the contract unit prices for the various pay items will be full compensation for the above work required for falsework or forms.

POT BEARINGS**(8-13-04)****1.0 GENERAL**

This item consists of furnishing, fabrication and installation of pot bearings in accordance with AASHTO Standard Specifications, the Standard Specifications, the recommendations of the manufacturer and the details shown on the plans and as specified herein.

Fixed pot bearings consist of a sole plate, a disc of elastomer in a steel cylinder with a snug fitting steel piston, masonry plate, anchor bolts, nuts and washers. Expansion pot bearings consist of a sole plate, a top steel plate with a polished stainless steel sheet facing bearing on a fixed pot bearing with a layer of virgin polytetrafluoroethylene (PTFE) material on its top, masonry plate, anchor bolt assembly which includes anchor bolts, nuts, washers, pipe

sleeves, a closure plate, grout and various sizes of standard pipe and any other necessary material as detailed on the plans.

2.0 MATERIALS

Use pot bearings produced by the same manufacturer.

Use AASHTO M270 Grade 50W (345W) for all steel in the pot bearings. Clean, coat, and seal the plates in the pot bearing assemblies except for the areas with special facings and the internal surfaces of pot, in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)". Metallization of the internal surfaces of the pot is permitted provided these surfaces are then polished to a surface smoother than 63 micro inches (0.0016 mm) root mean square. Coat surfaces to a thickness of 6 mils (0.150 mm) minimum on all external parts. Repair surfaces that are abraded or damaged after the application of metallizing in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)".

Galvanize all fill plates specified on the plans. Provide anchor bolts and nuts in accordance with the Standard Specifications.

When the maximum plan dimension of the sheet is 12" (300 mm) or less, provide a stainless steel sheet in expansion pot bearings that is at least 16 gage or 1/16" (1.6 mm). When the maximum plan dimension is greater than 12" (300 mm), provide a stainless steel sheet that is at least 11 gage or 1/8" (3 mm). Ensure that all stainless steel sheets are in conformance with ASTM A240/A167 Type 304 and polished to a minimum #8 mirror surface finish.

Blast clean the surface of the plate that will be attached to the stainless sheet to a near white condition in accordance with the Standard Specifications. Position and clamp the back of the stainless sheet that is to be in contact with the steel plate on the steel plate. Apply the stainless steel to the blast cleaned surface of the steel plate as soon as possible after blasting and before any visible oxidation of the blast cleaned surface occurs. Weld the stainless sheet continuously around its perimeter using a tungsten inert gas, wire-fed welder.

For the PTFE sheet, used as a mating surface for the stainless sheet, provide an unfilled virgin PTFE Sheet (Recessed) or a glass-fiber filled PTFE sheet, resulting from skiving billets formed under hydraulic pressure and heat. Provide resin that conforms to the requirements of ASTM D4894 or D4895.

To bond the PTFE and the piston, use heat cured high temperature epoxy capable of withstanding temperature of -320°F to 500°F (-195°C to 260°C).

Provide a neoprene or natural rubber elastomer with a durometer hardness of 50 that allows for a minimum rotation of 0.02 radians. Place a 1/64" (0.4 mm) thick unfilled PTFE disc on either side of the elastomer inside the bearing. Use a brass sealing ring with the neoprene or natural rubber elastomer.

3.0 DESIGN

Have the manufacturer design the pot bearings for the loads and movements shown on the contract plans. However, use the anchor bolt size, length, spacing and masonry plate thickness as shown on the contract plans and provide an overall height of the bearing assembly that is at least the height shown on the contract plans, but no more than 1/2 inch (13 mm) greater than this height. Either combine, cast as a single piece, or weld together the sole plate and top plate/piston and the cylinder with the masonry plate.

When designing the bearings, use the following allowable bearing stresses:

- On confined elastomer: 3500 psi (24.1 MPa)
- On PTFE Sliding Surface, filled or unfilled PTFE (recessed): 3500 psi (24.1 MPa)

Submit eight sets of shop drawings and one set of design calculations for review, comments and acceptance. Have a North Carolina Registered Professional Engineer check and seal the shop drawings and design calculations.

After the Engineer reviews the drawings and, if necessary, corrections are made, submit one 22" x 34" reproducible set of the working drawings.

4.0 SAMPLING AND TESTING

A. Sampling

The manufacturer is responsible for randomly selecting and testing sample bearings from completed lots of bearings. The manufacturer is also responsible for certifying that the completed bearings and their components have been tested and are in compliance with the requirements of this Special Provision. Have the manufacturer furnish the results of the tests to the Materials and Tests Engineer.

B. Testing

1. Proof Load Test

Load a test bearing to 150% of the bearing's rated design capacity and simultaneously subject it to a rotational range of 0.02 radians (1.146°) for a period of 1 hour.

Have the bearing visually examined both during the test and upon disassembly after the test. Any resultant visual defects, such as extruded or deformed elastomer or PTFE, damaged seals or rings, or cracked steel is cause for rejection.

Keep the steel bearing plate and steel piston in continuous and uniform contact for the duration of the test. Any observed lift-off is cause for rejection.

2. Sliding Coefficient of Friction

For all guided and non-guided expansion type bearings, measure the sliding coefficient of friction at the bearing's design capacity in accordance with the test method described below, and on the fifth and fiftieth cycles, at a sliding speed of 1 in/min (25 mm/min).

Calculate the sliding coefficient of friction as the horizontal load required to maintain continuous sliding of one bearing, divided by the bearing's vertical design capacity.

The test results are evaluated as follows:

- A maximum measured sliding coefficients of friction of 3%.
- A visual examination both during and after the test. Any resultant visual defects, such as bond failure, physical destruction, cold flow of PTFE to the point of debonding, or damaged components is cause for rejection of the lot.

Using undamaged test bearings in the work is permitted.

3. Test Method

For the test method and equipment, meet the following requirements:

- a. Arrange the test to determine the coefficient of friction on the first movement of the manufactured bearing.
- b. Clean the bearing surface prior to testing.
- c. Conduct the test at maximum working stress for the PTFE surface with the test load applied continuously for 12 hours prior to measuring friction.
- d. Determine the first movement static and dynamic coefficient of friction of the test bearing at a sliding speed of less than 1 in/min (25 mm/min), not to exceed:

0.04	unfilled PTFE
0.08	filled PTFE
- e. Subject the bearing specimen to 100 movements of at least 1 inch (25 mm) of relative movement and, if the test facility permits, the full design movement at a speed of less than 1 ft/min (300 mm/min). Following this test determine the static and kinetic coefficient of friction again. The specimen is considered a failure if it exceeds the values measured in (d) above or if it shows any signs of bond failure or other defects.

Bearings represented by test specimens passing the above requirements are approved for use in the structure subject to on-site inspection for visible defects.

5.0 INSTALLATION

Prior to shipment, seal the joint between the steel piston and the steel cylinder with a bead of caulk. Store pot bearings delivered to the bridge site under cover on a platform above the ground surface. Protect the bearings from injury at all times and, before placing the bearings, dry and clean all dirt, oil, grease or other foreign substances from the bearing. Do not disassemble the bearings during installation, except at the manufacturer's direction. Place the bearings in accordance with the recommendations of the manufacturer, Contract Drawings, and as directed by the Engineer. If there is any discrepancy between the recommendations of the manufacturer, Special Provisions, and Contract Drawings, the Engineer is the sole judge in reconciling any such discrepancy.

Provide preformed bearing pads under the masonry plates in accordance with Article 1079-1 of the Standard Specifications.

Do not install any bearing before the Engineer approves it.

6.0 BASIS OF PAYMENT

Payment will be at the lump sum contract price bid for "Pot Bearings" which price will be full compensation for furnishing all labor, materials, tools, equipment and incidentals required to complete the work in accordance with the Standard Specifications, this Special Provision, the manufacturer's requirements and as directed by the Engineer.

THERMAL SPRAYED COATINGS (METALLIZATION)**(2-14-04)****1.0 DESCRIPTION**

Apply a thermal sprayed coating (TSC) and sealer to metal surfaces as specified herein when called for on the plans or by other Special Provisions, or when otherwise approved by the Engineer in accordance with the SSPC-CS 23.00/AWS C2.23/NACE No. 12 Specification. Only Arc Sprayed application methods are used to apply TSC coatings, the Engineer must approve other methods of application.

2.0 QUALIFICATIONS

Only use NCDOT approved TSC Contractors meeting the following requirements:

1. Who have the capability of blast cleaning steel surfaces to SSPC SP-5 and SP-10 Finishes.
2. Who employ a Spray Operator(s) qualified in accordance with AWS C.16/C2.16M2002 and a Quality Control Inspector(s) who have documented training in the applicable test procedures of ASTM D-3276 and SSPC-CS 23.00.

A summary of the contractor's related work experience and the documents verifying each Spray Operator's and Quality Control Inspector's qualifications are submitted to the Engineer before any work is performed.

3.0 MATERIALS

Provide wire in accordance with the metallizing equipment manufacturer's recommendations. Use the wire alloy specified on the plans which meets the requirements in Annex C of the SSPC-CS 23.00 Specification. Have the contractor provide a certified analysis (NCDOT Type 2 Certification) for each lot of wire material.

Apply an approved sealer to all metallized surfaces in accordance with Section 9 of SSPC-CS 23. The sealer must either meet SSPC Paint 27 or is an alternate approved by the Engineer.

4.0 SURFACE PREPARATION AND TSC APPLICATION

Grind flame cut edges to remove the carbonized surface prior to blasting. Bevel all flame cut edges in accordance with Article 442-10(D) regardless of included angle. Blast clean surfaces to be metallized with grit or mineral abrasive in accordance with Steel Structures Painting Council SSPC SP-5/10(as specified) to impart an angular surface profile of 2.5 - 4.0 mils (0.063 - 0.100 mm). Surface preparation hold times are in accordance with Section 7.32 of SSPC-CS 23. If flash rusting occurs prior to metallizing, blast clean the metal surface again. Apply the thermal sprayed coating only when the surface temperature of the steel is at least 5°F (3°C) above the dew point.

At the beginning of each work period or shift, conduct bend tests in accordance with Section 6.5 of SSPC-CS 23.00. Any disbonding or delamination of the coating that exposes the substrate requires corrective action, additional testing, and the Engineer's approval before resuming the metallizing process.

Apply TSCs to thickness specified on the plans. All spot results (the average of 3 to 5 readings) must meet the minimum requirement. No additional tolerance (as allowed by SSPC PA-2) is permitted. The specified thickness requirement has been adjusted for surface roughness so that no correction for base metal is needed. (For Steel Beams: For pieces with less than 200 ft² (18.6m²) measure 2 spots/surface per piece and for pieces greater than 200 ft² (18.6m²) add 1 additional spots/surface for each 500 ft² (46.5m²))

When noted on the plans, apply the sealer to all metallized surfaces in accordance with the manufacturer's recommendations. Only apply the seal coat when the air temperature is above 40°F (4°C) and the surface temperature of the steel is at least 5°F (3°C) above the dew point. If the sealer is not applied within eight hours after the final application of TSC, the applicator verifies acceptable TSC surfaces and obtains approval from the Engineer before applying the sealer.

5.0 INSPECTION FREQUENCY

The TSC Contractor must conduct the following tests at the specified frequency and the results documented in a format approved by the Engineer.

TEST/STANDARD	LOCATION	FREQUENCY	SPECIFICATION
Ambient Conditions	Site	Each Process	5°F (3°C) above the dew point
Abrasive Properties	Site	Each Day	Size, angularity, cleanliness
Surface Cleanliness SSPC Vis 1	All Surfaces	Visual All Surfaces	SSPC-SP-10 Atmospheric Service SSPC-SP - 5 Immersion Service
Surface Profile ASTM D-4417 Method C	Random Surfaces	3 per 500 ft ²	2.5 - 4.0 mils
Bend Test SSPC-CS 23.00	Site	5 per shift	Pass Visual
Thickness SSPC PA-2R SSPC-CS 23.00	Each Surface	Use the method in PA-2 Appendix 3 for Girders and Appendix 4 for frames and miscellaneous steel. See Note 1.	Zn - 8.0 mils minimum Al - 12 mils minimum Areas with more than twice the minimum thickness are inspected for compliance to the adhesion and cut testing requirements of this specification.
Adhesion ASTM 4541	Random Surfaces Splice Areas	1 set of 3 per 500 ft ²	ZN > 500 psi Al > 1000 psi
Cut Test - SSPC-CS 23.00	Random Surfaces	3 sets of 3 per 500 ft ²	No peeling or delamination
Job Reference Std. SSPC-CS 23.00	Site	1 per job	Meets all the above requirements

6.0 REPAIRS

All Repairs are to be performed in accordance with the procedures below, depending on whether the repair surface is hidden or exposed. As an exception to the following, field welded splices on joint angles may be repaired in accordance with the procedures for hidden surfaces.

For hidden surfaces (including but not limited to interior girders, interior faces of exterior girders, and below-grade sections of piles):

1. Welding of metallized surfaces may be performed only if specifically permitted by the Engineer. Remove metallizing at the location of field welds by blast cleaning (SSPC SP-6 finish), or hand (SSPC SP-2 finish) or power tool cleaning (SSPC SP-3 finish) just prior to welding. Clean sufficiently to prevent contamination of the weld. All repairs to welded connections are metallized in accordance with SSPC CS 23.00.
2. Minor areas less than or equal to 0.1 ft^2 (9300mm^2) exposing the substrate are metallized in accordance with SSPC CS 23.00 or painted in accordance with ASTM A780, "Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings."
3. Large areas greater than 0.1 ft^2 (9300mm^2) exposing the substrate are metallized in accordance with SSPC CS 23.00.
4. Damaged (burnished) areas not exposing the substrate with less than the specified coating thickness are metallized in accordance with SSPC CS 23.00 or painted in accordance with ASTM A780, "Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings."
5. Damaged (burnished) areas not exposing the substrate with more than the specified coating thickness are not repaired.
6. Defective coating is repaired by either method 2 or 3 depending on the area of the defect.

For Exposed Surfaces (including but not limited to exterior faces of exterior girders and above-grade sections of piles):

1. Welding of metallized surfaces may be performed only if specifically permitted by the Engineer. Remove metallization at the location of field welds by blast cleaning (SSPC SP-6 finish), or hand (SSPC SP-2 finish) or power tool cleaning (SSPC SP-3 finish) just prior to welding. Clean sufficiently to prevent contamination of the weld. All repairs to welded connections are metallized in accordance with SSPC CS 23.00.
2. All areas exposing the substrate are metallized in accordance with SSPC CS 23.00
3. Defective coating is repaired by either method 2 or 3 depending on the area of the defect.

7.0 TWELVE MONTH OBSERVATION PERIOD

The contractor maintains responsibility for the coating system for a twelve (12) month observation period beginning upon the satisfactory completion of all the work required in the plans or as directed by the engineer. The contractor must guarantee the coating system under the payment and performance bond (refer to article 109-10). To successfully complete the observation period, the coating system must meet the following requirements after twelve(12) months service:

- No visible rust, contamination or application defect is observed in any coated area.
- Painted surfaces have a uniform color and gloss.
- Surfaces have an adhesion of no less than 500 psi (3.45 MPa) when tested in accordance with ASTM D-4541.

8.0 BASIS OF PAYMENT

The contract price bid for the bridge component to which the coating is applied will be full compensation for the thermal sprayed coating.

MINIMIZING RAILROAD FLAGGING SERVICE

(10-12-01)

Notify the Engineer whenever construction activity on, or immediately adjacent to, the railroad right-of-way is expected to be delayed for more than 2 weeks due to:

- Construction activity being confined to an area where the activity, including the possible falling or overturning of proposed construction equipment and/or material, is not reasonably expected to interfere with Railroad operations or cause damage to facilities of the Railroad or its tenants, and where Railroad operations would not affect personnel and/or equipment.
- The Contractor removing his work force from the site to pursue his work at other locations.
- Scheduling of needed construction equipment and/or material
- Coordination with other required construction activity
- Seasonal considerations

In the notification, describe the reason for the delay and provide a schedule of when the delay in the area is expected to begin and when work in the area is expected to resume.

Contact the Railroad's authorized representative to determine if the flagman can be released and reassigned to accommodate the proposed work delay schedule. If the Railroad agrees, the Engineer follows the advance notification procedures for releasing and rescheduling a flagman as stated elsewhere in this Special Provision or as provided by the Railroad.

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Prior to the release of the flagman, ensure that drainage facilities and erosion control measures adjacent to the tracks are properly maintained and that the site is left in a condition satisfactory to the Railroad. In addition, remove any material or equipment stored on the Railway right of way that is needed during the absence of the flagman.

If failing to notify the Engineer of a construction activity delay as stated above and a flagman remains assigned to the site for more than 2 weeks after the delay begins, the flagman time exceeding the 2 weeks, until work resumes on a routine schedule, is considered the Contractor's responsibility.

For that portion of the flagman time considered as the Contractor's responsibility, the Department will continue to pay the flagging charges but an amount of \$250 per day will be withheld from partial or final payment due the Contractor.

ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS**(10-12-01)****1.0 DESCRIPTION**

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

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

2.0 MATERIALS

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

Package components of the adhesive so that one whole container of each component mixes to form one batch of adhesive. Use containers designed so that all of the contents may be removed easily and sealed tightly to prevent leakage. Furnish adhesive material requiring hand mixing in two separate containers designated as Component A and Component B.

Provide a self contained cartridge or capsule consisting of two components which are automatically mixed as they are dispensed, as in the case of a cartridge, or drilled into, as in the case of a capsule.

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

3.0 PROCEDURE

A. Drilling of Holes into Concrete

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

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

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

Repair spalled or otherwise damaged concrete using approved methods.

B. Inspection of Holes

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

C. Mixing of Adhesive

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

D. Embedment of Anchor Bolt/Dowel

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

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

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

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

4.0 FIELD TESTING

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

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

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

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

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

5.0 BASIS OF PAYMENT

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

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

EVAZOTE JOINT SEALS

(8-13-04)

1.0 SEALS

Use preformed seals compatible with concrete and resistant to abrasion, oxidation, oils, gasoline, salt and other materials that are spilled on or applied to the surface. Use a low-density closed cell, cross-linked ethylene vinyl acetate polyethylene copolymer nitrogen blown material for the seal.

Use seals manufactured with grooves 1/8" (3 mm) ± wide by 1/8" (3 mm) ± deep and spaced between 1/4 (6 mm) and 1/2 inch (13 mm) apart along the bond surface running the length of the joint. Use seals sized so that the depth of the seal meets the manufacturer's recommendation, but is not less than 70% of the uncompressed width. Provide a seal designed so that, when compressed, the center portion of the top does not extend upward above the original height of the seal by more than 1/4 inch (6 mm). Splice the seal using the heat welding method by placing the joint material ends against a teflon heating iron of 350°F (177°C) for 7 - 10 seconds, then pressing the ends together tightly. Do not test the welding until the material has completely cooled. Use material that resists weathering and ultraviolet rays. Provide a seal that has a working range of 30% tension and 60% compression and is watertight along its entire length including the ends.

Provide seals that meet the requirements given below.

TEST	TEST METHOD	REQUIREMENT
Elongation at break	ASTM D3575	210 ± 15%
Tensile strength, psi (kPa)	ASTM D3575	110 ± 15 (755 ± 100)
Compression Recovery (% of original width)	AASHTO T42 50% compr. for 22 hr. @ 73°F (23°C) 1/2 hr. recovery	87 ± 3
Weather/Deterioration	AASHTO T42 Accelerated Weathering	No deterioration for 10 years min.
Compression/Deflection	@ 50% deflection of original width @ 50% deflection of original width	10 psi (69 kPa) min. 60 psi (414 kPa) max.
Tear Strength, psi (kPa)	ASTM D624	16 ± 3 (110 ± 20)
Density	ASTM D545	2.8 to 3.4
Water Absorption (% vol/vol)	ASTM D3575 Total immersion for 3 months	3

Have the top of the evazote seal clearly shop marked. Inspect the evazote seals upon receipt to ensure that the marks are clearly visible upon installation.

2.0 ADHESIVES

Use a two component, 100% solid, modified epoxy adhesive with the seal that meets the requirements of ASTM C881, Type 1, Grade 3, Class B & C and has the following physical properties:

Tensile strength	3500 psi (24.1 MPa) min.
Compressive strength	7000 psi (48.3 MPa) min.
Shore D Hardness.....	75 psi (0.5 MPa) min.
Water Absorption	0.25% by weight

Use an adhesive that is workable to 40°F (4°C). When installing in temperatures below 40°F (4°C) or for application on moist, difficult to dry concrete surfaces, use an adhesive specified by the manufacturer of the joint material.

3.0 SAWING THE JOINTS

When the plans call for sawing the joints, the joints shall be initially formed to a width as shown on the plans including the blockout for the elastomeric concrete. Complete placement of the elastomeric concrete after the reinforced concrete deck slab has cured for seven full days and reached a minimum strength of 3000 psi (20.7 Mpa).

Cure the elastomeric concrete for a minimum of 2 days prior to sawing the elastomeric concrete to the final width and depth as specified in the plans.

When sawing the joint to receive the evazote seal, always use a rigid guide to control the saw in the desired direction. To control the saw and to produce a straight line as indicated on the plans, anchor and positively connect a template or a track to the bridge deck. Do not saw the joint by visual means such as a chalk line. Fill the holes used for holding the template or track to the deck with an approved, flowable non-shrink, non-metallic grout.

Saw cut to the desired width and depth in one or two passes of the saw by placing and spacing two metal blades on the saw shaft to the desired width for compression seals.

The desired depth is the depth of the seal plus 1/4 inch (6 mm) above the top of the seal plus approximately 1 inch (25 mm) below the bottom of the seal. An irregular bottom of sawed joint is permitted as indicated on the plans. Grind exposed corners on saw cut edges to a 1/4" (6 mm) chamfer.

Remove any staining or deposited material resulting from sawing with a wet blade to the satisfaction of the Engineer.

Use extreme care to saw the joint straight to the desired width and to prevent any chipping or damage to sawed edges of the joint.

4.0 PREPARATIONS FOR SAWED JOINTS

When the plans call for sawing the joint, the Engineer thoroughly inspects the sawed joint opening for spalls, popouts, cracks, etc. Make all necessary repairs prior to blast cleaning and installing the seal.

Immediately before sealing, clean the joints by sandblasting with clean dry sand. Sandblast to provide a firm, clean joint surface free of curing compound, loose material and any foreign matter. Sandblast without causing pitting or uneven surfaces. The aggregate in the elastomeric concrete may be exposed after sandblasting.

After blasting, either brush the surface with clean brushes made of hair, bristle or fiber, blow the surface with compressed air, or vacuum the surface until all traces of blast products and abrasives are removed from the surface, pockets, and corners.

If nozzle blasting, use compressed air that does not contain detrimental amounts of water or oil.

Examine the blast cleaned surface and remove any traces of oil, grease or smudge deposited in the cleaning operations.

Bond the seal to the blast cleaned surface on the same day the surface is blast cleaned.

5.0 PREPARATIONS FOR ARMORED JOINTS

When the plans call for armored joints, form the joint and blockout openings in accordance with the plans. If preferred, wrap the temporary form with polyethylene sheets to allow for easier removal. Do not use form release agents.

A. Submittals

Submitting detailed working drawings is not required; however, submitting catalog cuts of the proposed material is required. In addition, direct the joint supplier to provide an angle segment placing plan.

B. Surface Preparation

Prepare the surface within the 48 hours prior to placing the elastomeric concrete. Do not place the elastomeric concrete until the surface preparation is completed and approved.

1. Angle Assembly

Clean and free metallized steel of all foreign contaminants and blast the non-metallized steel surfaces to SSPC SP-10. Blast-cleaning anchor studs is not required.

2. Concrete

Prior to placing the elastomeric concrete, thoroughly clean and dry all concrete surfaces. Sandblast the concrete surface in the blockout and clear the surface of all loose debris.

C. Elastomeric Concrete Placement

Make sure that a manufacturer's representative is present when placing elastomeric concrete. Do not place elastomeric concrete if the ambient air temperature is below 45°F (7°C).

Prepare and apply a primer, as per manufacturer's recommendations, to all vertical concrete faces, all steel components to be in contact with elastomeric concrete, and to areas specified by the manufacturer. Align the angles with the joint opening.

Prepare, batch, and place the elastomeric concrete in accordance with the manufacturer's instructions. Place the elastomeric concrete in the areas specified on the plans while the primer is still tacky and within 2 hours after applying the primer. Pay careful attention to properly consolidate the concrete around the steel and anchors. Trowel the elastomeric concrete to a smooth finish.

D. Joint Preparation

Prior to installing the seal, the Engineer thoroughly inspects the armored joint opening for proper alignment and full consolidation of elastomeric concrete under the angle assemblies. Make all necessary repairs prior to cleaning the joint opening and installing the seal.

Clean the armored joint opening with a pressure washer rated at 3000 psi (20.7 MPa) minimum at least 24 hours after placing the elastomeric concrete. Dry the cleaned surface prior to installing the seal.

Examine the cleaned surface and remove traces of oil, grease or smudge deposited during the cleaning operations.

Bond the seal to the cleaned surface on the same day the surface is cleaned.

6.0 SEAL INSTALLATION

Install the joint seal according to the manufacturer's procedures and recommendations and as recommended below. Do not install the joint seal if the ambient air temperature is below 45°F (7°C). Have a manufacturer's representative present during the installation of the first seal of the project.

Begin installation at the low end of the joint after applying the mixed epoxy to the sides of both the joint material and both sides of the joint, making certain to completely fill the grooves with epoxy. With gloved hands, compress the material and with the help of a blunt

probe, push it down into the joint until it is recessed approximately 1/4 inch (6 mm) below the surface. Do not push the seal at an angle that would stretch the material. Once work on a joint begins, do not stop until it is completed. Clean the excess epoxy off the surface of the joint material *quickly* and *thoroughly*. Do not use solvents to remove excess epoxy. Remove excess epoxy in accordance with the joint manufacturer's recommendations.

Install the seal so that it is watertight. Testing of the joint seal is not required, but it is observed until final inspection.

7.0 BASIS OF PAYMENT

Payment for all evazote joint seals will be at the lump sum contract price bid for "Evazote Joint Seals" which prices and payment will be full compensation for furnishing all material, including elastomeric concrete when required, labor, tools and equipment necessary for installing these units in place and accepted.

EPOXY PROTECTIVE COATING

(10-12-01)

1.0 DESCRIPTION

This work consists of preparing the concrete surface and furnishing and applying an epoxy protective coating to the surfaces described in this Special Provision. When epoxy protective coating is required, cure the top surfaces of the bent or end bent caps in accordance with the Standard Specifications, but do not use the Membrane Curing Compound method.

2.0 MATERIALS

Use an epoxy coating that meets the most recently published NCDOT Specification on the date of advertisement. Use the epoxy coating that meets NCDOT-Type 4A Flexible, epoxy coating, moisture insensitive.

Provide a certification for the proposed epoxy showing that it meets NCDOT-Type 4A.

The following companies have epoxies that meet Type 4A Specifications:

- E-Bond Epoxy, Inc.
Fort Lauderdale, Florida 33307
- Permagile Industries
Plainview, NY 11803
- Poly-Carb
Cleveland, OH 44139

- Tamms, Inc.
Mentor, OH 44060
- Adhesive Engineering
Cleveland, OH 44122-5554
- Kaufman Products
Baltimore, MD 21226-1131
- Prime Resins
Lithonia, GA 30058
- Sika Corporation
Lyndhurst, N. J. 07071

A copy of the specifications for Epoxy Resin Systems is available from the Materials and Tests Unit.

3.0 SURFACES

With the exception of cored slab bridges, apply the epoxy protective coating to the top surface area, including chamfer area, of bent caps under expansion joints and of end bent caps, excluding areas under elastomeric bearings. For cored slab bridges, do not apply the epoxy protective coating to the bent or end bent caps. Also, apply epoxy protective coating to the ends of prestressed concrete members as noted on the plans.

Use extreme care to keep the area under the elastomeric bearings free of the epoxy protective coating. Do not apply the epoxy protective coating in the notch at the ends of the prestressed concrete girders.

Thoroughly clean all dust, dirt, grease, oil, laitance, and other objectionable material from the concrete surfaces to be coated. Air-blast all surfaces immediately prior to applying the protective coating.

Only use cleaning agents pre-approved by the Engineer.

4.0 APPLICATION

Apply epoxy protective coating only when the air temperature is at least 40°F (4°C) and rising, but less than 95°F (35°C) and the surface temperature of the area to be coated is at least 40°F (4°C). Remove any excess or free standing water from the surfaces before applying the coating. Apply one coat of epoxy protective coating at a rate such that it covers between 100 and 200 ft²/gal (2.5 and 5 m²/liter).

Note: Under certain combinations of circumstances, the cured epoxy protective coating may develop “oily” condition on the surface due to amine blush. This condition is not detrimental to the applied system.

Apply the coating so that the entire designated surface of the concrete is covered and all pores filled. To provide a uniform appearance, use the exact same material on all visible surfaces.

5.0 BASIS OF PAYMENT

No separate measurement or payment will be made for preparing, furnishing and applying the epoxy protective coating to the concrete surfaces.

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

OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT AT STATIONS 14+19.671 -RPB-, 14+40.000 -Y1-, 120+86.500 -L-, 12+42.500 -Y2-

(2-14-04)

1.0 GENERAL

This Special Provision covers precast reinforced concrete box culverts intended for the construction of culverts and for the conveyance of storm water.

If the option is indicated on the plans, the submittal of a design for a precast reinforced box culvert in lieu of a cast-in-place culvert is permitted. Provide the size and number of barrels as indicated on the plans. Precast wing walls will not be allowed. For culverts with less than 2 feet (0.6 m) of cover, design the precast culvert sections in accordance with AASHTO M273. Detail the culvert with cast in place wings. Provide a precast box culvert that meets the requirements of Section 1077 and any other applicable parts of the Standard Specifications.

The design of the precast members is the responsibility of the Contractor and is subject to review, comments and approval. Submit two sets of detailed plans for review. Include all details in the plans, including the size and spacing of the required reinforcement necessary to build the precast box culvert. Include checked design calculations for the precast members complying with the latest AASHTO Standard Specifications and requirements detailed herein. Have a North Carolina Registered Professional Engineer check and seal the plans and design calculations. After the plans are reviewed and, if necessary, the corrections made, submit one set of reproducible tracings on 22" x 34" sheets to become the revised contract plans.

A pre-installation meeting is required prior to installation. Representatives from the Contractor, the precast box manufacturer, and the Department should attend this meeting. The precast box manufacturer representative shall be on site during installation.

2.0 PRECAST REINFORCED CONCRETE BOX SECTIONS

A. Types

Precast reinforced concrete box sections manufactured in accordance with this Special Provision are designated by span, rise, and design earth cover.

B. Design

1. Design – The box section dimensions and reinforcement details are subject to the provisions of Section F.
2. Placement of Reinforcement – Provide a 1 inch (25 mm) concrete cover over the circumferential reinforcement subject to the provisions of Section F. Extend the inside circumferential reinforcement into the male portion of the joint and the outside circumferential reinforcement into the female portion of the joint. Detail the clear distance of the end circumferential wires so it is not less than 1/2 inch (13 mm) nor more than 2 inches (51 mm) from the ends of the box section. Assemble reinforcement per the requirements of AASHTO M259, Section 7.3. The exposure of the ends of the wires used to position the reinforcement is not a cause for rejection.
3. Laps and Spacing – Use lap splices for the circumferential reinforcement. Detail the circumferential wires so that the center to center spacing is not less than 2 inches (50 mm) nor more than 4 inches (100 mm). Do not detail the longitudinal wires with a center to center spacing of more than 8 inches (200 mm).
4. The design earth cover is reported on the plans as the elevation difference between the point of maximum fill and the top of the top slab.

C. Joints

1. Produce the precast reinforced concrete box section with male and female ends. Design and form these ends of the box section so, when the sections are laid together, they make a continuous line of box sections with a smooth interior free of appreciable irregularities in the flowline, all compatible with the permissible variations given in Section F. The internal joint formed at the male and female ends of the precast units shall be sealed with either bitumen/butyl sealant or closed-cell neoprene material. The internal joint material shall be installed in accordance with the manufacturer's recommendations. The material shall be shown on the shop drawings when they are submitted for review.
2. Seal the external joint with an outside sealer wrap that is at least 12 inches (300 mm) wide and covers the joint on both the sides and the top of the box section. Use ConWrap CS-212 from Concrete Sealants, Inc., EZ-Wrap from Press-Seal Gasket Corporation, Seal Wrap from Mar-Mac Manufacturing Co., Inc., Cadilloc External Pipe Joint from Cadilloc, or an approved equal for the outside sealer wrap. If the outside sealer wrap is not applied in a continuous strip along the entire joint, a 12 inch (300 mm) minimum lap of the outside sealer wrap is permitted. Before placing the outside sealer wrap, clean and prime the area receiving the outside sealer wrap in accordance with the sealer wrap manufacturer recommendations. The joint wrap manufacturer installation recommendations shall be included with shop drawings submitted for review. The external joint wrap shall be installed in three pieces, as indicated on Figure 1 below:

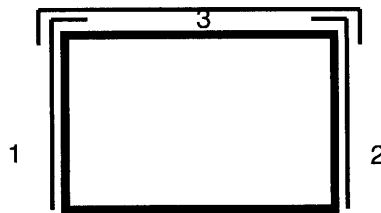


Figure 1

Cover the external joint sealer with a 3 foot (900 mm) strip of filter fabric conforming to Type 4 requirements in Section 1056 of the Standard Specifications.

Place multiple lines of a precast reinforced concrete box culvert such that the longitudinal joint between the sections has a minimum width of 3 inches (75 mm). Fill the joint between multiple lines of precast box sections with Class A concrete. Use Class A concrete that meets the requirements listed in the Standard Specifications except that Field Compressive Strength Specimens are not required.

D. Manufacture

Precast box culverts may be manufactured by either the wet cast method or dry cast method.

1. Mixture – In addition to the requirements of Section 1077 of the Standard Specifications, do not proportion the mix with less than 564 lb/yd³ (335 kg/m³) of portland cement.
2. Strength – Make sure that all concrete develops a minimum 28-day compressive strength of 5000 psi (34.5 MPa). Movement of the precast sections should be minimized during the initial curing period. Any damage caused by moving or handling during the initial curing phase will be grounds for rejection of that precast section.
3. Air Entrainment – Air entrain the concrete in accordance with Section 1077 - 5(A) of the Standard Specifications. For dry cast manufacturing, air entrainment is not required.
4. Testing – Test the concrete in accordance with the requirements of Section 1077 - 5(B).
5. Handling – Handling devices or holes are permitted in each box section for the purpose of handling and laying. Submit details of handling devices or holes for approval and do not cast any concrete until approval is granted. Remove all handling devices flush with concrete surfaces as directed. Fill holes in a neat and workmanlike manner with an approved non-metallic non-shrink grout, concrete, or hole plug.

E. Physical Requirements

Acceptability of precast culvert sections is based on concrete cylinders made and tested in accordance with AASHTO T22 and AASHTO T23.

F. Permissible Variations

1. Flatness – All external surfaces shall be flat, true, and plumb. Irregularities, depressions, or high spots on all external surfaces shall not exceed 1/2 inch (12 mm) in 8 feet (2.5 meters).
2. Internal Dimensions – Produce sections so that the internal and haunch dimensions do not vary by more than 1/4 inch (6 mm) from the plan dimensions.
3. Adjacent Sections - Internal, external, and haunch dimensions for connecting sections shall not vary by more than 1/2 inch (12 mm).
4. Length of Tongue and Groove – The minimum length of the tongue shall be 4 inches (100 mm). The minimum length of the groove shall be 4 inches (100 mm). The dimensions of the tongue and groove shall not vary by more than 1/4 inch (6 mm) from the plan dimensions.
5. Slab and Wall Thickness – Produce sections so that the slab and wall thickness are not less than that shown on the plans by more than 5% or 3/16 inch (5 mm), whichever is greater. A thickness more than that required on the plans is not a cause for rejection.
6. Length of Opposite Surfaces – Produce sections so that variations in laying lengths of two opposite surfaces of the box section meet the requirements of AASHTO M259, Section 11.3.
7. Length of Section – Produce sections so that the underrun in length of a section is not more than 1/2 inch (13 mm) in any box section.
8. Position of Reinforcement – Produce sections so that the maximum variation in the position of the reinforcement is $\pm 3/8$ " (± 10 mm) for slab and wall thicknesses of 5 inches (125 mm) or less and $\pm 1/2$ " (± 13 mm) for slab and wall thicknesses greater than 5 inches (125 mm). Produce sections so that the concrete cover is never less than 5/8 inch (16 mm) as measured to the internal surface or the external surface. The preceding minimum cover limitations do not apply at the mating surfaces of the joint.
9. Area of Reinforcement – Use the design steel shown on the plans for the steel reinforcement. Steel areas greater than those required are not cause for rejection. The permissible variation in diameter of any wire in finished fabric is prescribed for the wire before fabrication by either AASHTO M32 or M225.

G. Marking

1. Each section shall be match-marked in order of intended installation as indicated on the approved shop drawings. Ensure that pieces fit together neatly and in a workmanlike manner. In order to ensure a good, neat field fit, assemble adjacent sections at the producer's facility and match-mark the pieces. This will require that a minimum of three adjacent sections of the culvert be fitted at the production yard at a time and then match-marked. Once three sections have been match-marked, the first section may be removed for shipment and a fourth section set for marking. Continue in a progressive manner until all sections have been properly match-marked.
2. Clearly mark each section of the box culvert in accordance with AASHTO M259, Section 15.

H. Construction

1. Foundation – Foundation for precast box culvert shall meet the requirements of Section 414 of the Standard Specifications. In addition, Type VI foundation material shall be encapsulated in filter fabric conforming to Type 4 requirements in Section 1056 of the Standard Specifications. The filter fabric shall be placed perpendicular to the culvert barrel. Provide sufficient overhang beyond the excavation to allow a minimum lap of 3 feet (900 mm) when the foundation material is placed and fabric wrapped on top. Perpendicular sections of fabric shall be continuous. A minimum lap of 2 feet (600 mm) shall be provided between sections of fabric.
2. Installation – Sections shall be placed at the beginning of the outlet end of the culvert with the groove end being laid up grade. Tongue sections shall be laid into the groove sections. Positive means shall be provided to pull each section firmly into the previously placed section so that the joints are tightly homed. Use a "come-along", box pullers or other approved methods to create a positive means of joining box sections. Construction equipment shall not have direct contact with the box section. The load of the box shall be suspended by lifting device during joining procedure.
3. Backfill – Complete backfill in accordance with Section 414 of the Standard Specifications.

3.0 BASIS OF PAYMENT

Any additional cost of redesigning will be paid for by the Contractor if Precast Reinforced Concrete Culvert is used in lieu of the cast-in-place culvert shown on the plans. Except for Foundation Conditioning Material and Culvert Excavation, payment for the Precast Box Culvert will be a lump sum amount equal to the payment that would be allowed for construction of a Cast-in-Place Box Culvert. Plan quantities and unit bid prices will be used to compute the lump sum amount. Such price and payment will be full compensation for all work covered by this Special Provision, the plans and applicable parts of the Standard Specifications and will include, but not be limited to, furnishing all labor, materials (including all filter fabric), equipment and other incidentals necessary to complete this work. Such price and payment will also be full compensation for concrete, reinforcing steel, labor, equipment and all other related materials necessary for the completion of the barrel section, and the construction of the headwalls, leveling pad, end curtain walls, wings and wing footings.

ELASTOMERIC CONCRETE**(10-12-01)****1.0 DESCRIPTION**

Elastomeric concrete is a mixture of a two-part polymer consisting of polyurethane and/or epoxy, and kiln-dried aggregate. Have the manufacturer supply it as a unit. Use the concrete in the blocked out areas on both sides of the bridge deck joints as indicated on the plans.

2.0 MATERIALS

Provide materials that comply with the following minimum requirements at 14 days.

CONCRETE PROPERTIES	TEST METHOD	MINIMUM REQUIREMENT
Bond Strength to Concrete, psi (MPa)	ASTM D638 (D638M)	450 (3.1)
Brittleness by Impact, ft-lb (kg-m)	Ball Drop	7 (0.97)
Compressive Strength, psi (MPa)	ASTM D695 (D695M)	2800 (19.3)

BINDER PROPERTIES (without aggregate)	TEST METHOD	MINIMUM REQUIREMENT
Tensile Strength, psi (MPa)	ASTM D638 (D638M)	800 (5.5)
Ultimate Elongation	ASTM D638 (D638M)	150%
Tear Resistance, lb/in (kN/m)	ASTM D624	90 (15.7)

In addition to the requirements above, use elastomeric concrete that also resists water, chemical, UV, and ozone exposure and withstands extreme temperature (freeze-thaw) changes.

Furnish a manufacturer's certification verifying that the materials satisfy the above requirements. Provide samples of elastomeric concrete to the Engineer, if requested, to independently verify conformance with the above requirements.

Require a manufacturer's representative to be present on site during the installation of the elastomeric concrete.

3.0 BASIS OF PAYMENT

No separate payment will be made for elastomeric concrete. The lump sum contract price bid for "Evazote Joint Seals" will be full compensation for furnishing and placing the Elastomeric Concrete.

FALSEWORK AND FORMWORK

(10-12-01)

1.0 DESCRIPTION

Use this Special Provision as a guide to develop temporary works submittals required by the Standard Specifications or other provisions; no additional submittals are required herein. Such temporary works include, but are not limited to, falsework and formwork.

Falsework is any temporary construction used to support the permanent structure until it becomes self-supporting. Formwork is the temporary structure or mold used to retain plastic or fluid concrete in its designated shape until it hardens. Access scaffolding is a temporary structure that functions as a work platform that supports construction personnel, materials, and tools, but is not intended to support the structure. Scaffolding systems that are used to temporarily support permanent structures (as opposed to functioning as work platforms) are considered to be falsework under the definitions given. Shoring is a component of falsework such as horizontal, vertical, or inclined support members. Where the term "temporary works" is used, it includes all of the temporary facilities used in bridge construction that do not become part of the permanent structure.

Design and construct safe and adequate temporary works that will support all loads imposed and provide the necessary rigidity to achieve the lines and grades shown on the plans in the final structure.

2.0 MATERIALS

Select materials suitable for temporary works; however, select materials that also ensure the safety and quality required by the design assumptions. The Engineer has authority to reject material on the basis of its condition, inappropriate use, safety, or nonconformance with the plans. Clearly identify allowable loads or stresses for all materials or manufactured devices on the plans. Revise the plan and notify the Engineer if any change to materials or material strengths is required.

3.0 DESIGN REQUIREMENTS

A. Working Drawings

Provide working drawings for items as specified in the contract, or as required by the Engineer, with design calculations and supporting data in sufficient detail to permit a structural and safety review of the proposed design of the temporary work.

When concrete placement is involved, include data such as the drawings of proposed sequence, rate of placement, direction of placement, and location of all construction joints. Submit the number of copies as called for by the contract.

When required, have the drawings and calculations prepared under the guidance of, and sealed by, a North Carolina Registered Professional Engineer who is knowledgeable in temporary works design.

Design falsework and formwork requiring submittals in accordance with the 1995 AASHTO *Guide Design Specifications for Bridge Temporary Works* except as noted herein.

1. Wind Loads

Table 2.2 of Article 2.2.5.1 is modified to include wind velocities up to 110 mph (177 km/hr). In addition, Table 2.2A is included to provide the maximum wind speeds by county in North Carolina.

Table 2.2 - Wind Pressure Values

Height Zone feet (m) above ground	Pressure, lb/ft ² (kPa) for Indicated Wind Velocity, mph (km/hr)				
	70 (112.7)	80 (128.7)	90 (144.8)	100 (160.9)	110 (177.0)
0 to 30 (0 to 9.1)	15 (0.72)	20 (0.96)	25 (1.20)	30 (1.44)	35 (1.68)
30 to 50 (9.1 to 15.2)	20 (0.96)	25 (1.20)	30 (1.44)	35 (1.68)	40 (1.92)
50 to 100 (15.2 to 30.5)	25 (1.20)	30 (1.44)	35 (1.68)	40 (1.92)	45 (2.15)
over 100 (30.5)	30 (1.44)	35 (1.68)	40 (1.92)	45 (2.15)	50 (2.39)

2. Time of Removal

The following requirements replace those of Article 3.4.8.2.

Do not remove forms until the concrete has attained strengths required in Article 420-17 of the Standard Specifications and these Special Provisions.

Do not remove forms until the concrete has sufficient strength to prevent damage to the surface.

Table 2.2A - Steady State Maximum Wind Speeds by Counties in North Carolina

COUNTY	25 YR (mph) (km/hr)	COUNTY	25 YR (mph) (km/hr)	COUNTY	25 YR (mph) (km/hr)
Alamance	70 (112.7)	Franklin	70 (112.7)	Pamlico	100 (160.9)
Alexander	70 (112.7)	Gaston	70 (112.7)	Pasquotank	100 (160.9)
Alleghany	70 (112.7)	Gates	90 (144.8)	Pender	100 (160.9)
Anson	70 (112.7)	Graham	80 (128.7)	Perquimans	100 (160.9)
Ashe	70 (112.7)	Granville	70 (112.7)	Person	70 (112.7)
Avery	70 (112.7)	Greene	80 (128.7)	Pitt	90 (144.8)
Beaufort	100 (160.9)	Guilford	70 (112.7)	Polk	80 (128.7)
Bertie	90 (144.8)	Halifax	80 (128.7)	Randolph	70 (112.7)
Bladen	90 (144.8)	Harnett	70 (112.7)	Richmond	70 (112.7)
Brunswick	100 (160.9)	Haywood	80 (128.7)	Robeson	80 (128.7)
Buncombe	80 (128.7)	Henderson	80 (128.7)	Rockingham	70 (112.7)
Burke	70 (112.7)	Hertford	90 (144.8)	Rowan	70 (112.7)
Cabarrus	70 (112.7)	Hoke	70 (112.7)	Rutherford	70 (112.7)
Caldwell	70 (112.7)	Hyde	110 (177.0)	Sampson	90 (144.8)
Camden	100 (160.9)	Iredell	70 (112.7)	Scotland	70 (112.7)
Carteret	110 (177.0)	Jackson	80 (128.7)	Stanley	70 (112.7)
Caswell	70 (112.7)	Johnston	80 (128.7)	Stokes	70 (112.7)
Catawba	70 (112.7)	Jones	100 (160.9)	Surry	70 (112.7)
Cherokee	80 (128.7)	Lee	70 (112.7)	Swain	80 (128.7)
Chatham	70 (112.7)	Lenoir	90 (144.8)	Transylvania	80 (128.7)
Chowan	90 (144.8)	Lincoln	70 (112.7)	Tyrell	100 (160.9)
Clay	80 (128.7)	Macon	80 (128.7)	Union	70 (112.7)
Cleveland	70 (112.7)	Madison	80 (128.7)	Vance	70 (112.7)
Columbus	90 (144.8)	Martin	90 (144.8)	Wake	70 (112.7)
Craven	100 (160.9)	McDowell	70 (112.7)	Warren	70 (112.7)
Cumberland	80 (128.7)	Mecklenburg	70 (112.7)	Washington	100 (160.9)
Currituck	100 (160.9)	Mitchell	70 (112.7)	Watauga	70 (112.7)
Dare	110 (177.0)	Montgomery	70(112.7)	Wayne	80 (128.7)
Davidson	70 (112.7)	Moore	70 (112.7)	Wilkes	70 (112.7)
Davie	70 (112.7)	Nash	80 (128.7)	Wilson	80 (128.7)
Duplin	90 (144.8)	New Hanover	100 (160.9)	Yadkin	70 (112.7)
Durham	70 (112.7)	Northampton	80 (128.7)	Yancey	70 (112.7)
Edgecombe	80 (128.7)	Onslow	100 (160.9)		
Forsyth	70 (112.7)	Orange	70 (112.7)		

Note on the working drawings any anchorages, connectors, inserts, steel sleeves or other such devices used as part of the falsework or formwork that remains in the permanent structure. If the plan notes indicate that the structure contains the necessary corrosion protection required for a Corrosive Site, epoxy coat, galvanize, metallize or otherwise protect these devices as directed by the Engineer. Any coating required by the Engineer will be considered incidental to the various pay items requiring temporary works.

B. Review and Approval

The Engineer is responsible for the review and approval of temporary works' drawings.

Submit the working drawings sufficiently in advance of proposed use to allow for their review, revision (if needed), and approval without delay to the work.

Do not start construction of any temporary work for which working drawings are required until the drawings have been approved. Such approval does not relieve the Contractor of the responsibility for the accuracy and adequacy of the working drawings.

The time period for review of the working drawings does not begin until complete drawings and design calculations, when required, are received by the Engineer.

On the drawings, show all information necessary to allow the design of any component to be checked independently as determined by the Engineer.

If requested by the Engineer, submit with the working drawings manufacturer's catalog data listing the weight of all construction equipment that will be supported on the temporary work. Show anticipated total settlements and/or deflections of falsework and forms on the working drawings. Include falsework footing settlements, joint take-up, and deflection of beams or girders. Design the falsework and forms supporting deck slabs and overhangs on girder bridges so that there will be no differential settlement between the girders and the deck forms during placement of deck concrete.

4.0 CONSTRUCTION REQUIREMENTS

All requirements of Section 420 of the Standard Specifications apply.

Construct temporary works in conformance with the approved working drawings. Ensure that the quality of materials and workmanship employed is consistent with that assumed in the design of the temporary works. Do not weld falsework members to any portion of the permanent structure unless approved. Show any welding to the permanent structure on the approved construction drawings.

Provide tell-tales attached to the forms and extending to the ground, or other means, for accurate measurement of falsework settlement. Make sure that the anticipated compressive settlement and/or deflection of falsework does not exceed 1 inch (25 mm). For cast-in-place concrete structures, make sure that the calculated deflection of falsework flexural members does not exceed 1/240 of their span regardless of whether or not the deflection is compensated by camber strips.

A. Maintenance and Inspection

Inspect and maintain the temporary work in an acceptable condition throughout the period of its use. Certify that the manufactured devices have been maintained in a condition to allow them to safely carry their rated loads. Clearly mark each piece so that its capacity can be readily determined at the job site.

Perform an in-depth inspection of an applicable portion(s) of the temporary works, in the presence of the Engineer, not more than 24 hours prior to the beginning of each concrete placement. Inspect other temporary works at least once a month to ensure that they are functioning properly. Have a North Carolina Registered Professional Engineer inspect the cofferdams, shoring, sheathing, support of excavation structures, and support systems for load tests prior to loading.

B. Foundations

Determine the safe bearing capacity of the foundation material on which the supports for temporary works rest. If required by the Engineer, conduct load tests to verify proposed bearing capacity values that are marginal or in other high-risk situations.

The use of the foundation support values shown on the contract plans of the permanent structure is permitted if the foundations are on the same level and on the same soil as those of the permanent structure.

Allow for adequate site drainage or soil protection to prevent soil saturation and washout of the soil supporting the temporary works supports.

If piles are used, the estimation of capacities and later confirmation during construction using standard procedures based on the driving characteristics of the pile is permitted. If preferred, use load tests to confirm the estimated capacities; or, if required by the Engineer conduct load tests to verify bearing capacity values that are marginal or in other high risk situations.

The Engineer reviews and approves the proposed pile and soil bearing capacities.

5.0 REMOVAL

Unless otherwise permitted, remove and keep all temporary works upon completion of the work. Do not disturb or otherwise damage the finished work.

Remove temporary works in conformance with the contract documents. Remove them in such a manner as to permit the structure to uniformly and gradually take the stresses due to its own weight.

6.0 METHOD OF MEASUREMENT

Unless otherwise specified, temporary works will not be directly measured.

7.0 BASIS OF PAYMENT

Payment at the contract unit prices for the various pay items requiring temporary works will be full compensation for the above falsework and formwork.

SUBMITTAL OF WORKING DRAWINGS**8-13-04****1.0 GENERAL**

Submit working drawings in accordance with Article 105-2 of the Standard Specifications and the requirements of this Special Provision. The list of submittals contained herein does not represent a list of required submittals for this project. Submittals are only necessary for those items as required by the Standard Specifications, other Special Provisions, or contract plans. Make submittals that are not specifically noted in this Special Provision directly to the Resident Engineer.

If submittals contain variations from plan details or specifications, significantly affect project cost, or significantly affect field construction or operations, discuss them with, and submit them through, the Resident Engineer. State the reason for the proposed variation in the submittals. To minimize overall review time, make sure all working drawing submittals are complete when first submitted. Provide a contact name and phone number with each submittal. Direct any questions regarding working drawing submittal requirements to the Resident Engineer, Structure Design Unit contacts or the Geotechnical Engineering Unit contacts noted below.

2.0 WORKING DRAWINGS SUBMITTAL CONTACTS

All submittals noted herein are reviewed by the Structure Design Unit and/or the Geotechnical Engineering Unit.

For submittals to the Structure Design Unit, use the following addresses:

Via US mail:

Mr. G. R. Perfetti, P. E.
State Bridge Design Engineer
North Carolina Department
of Transportation
Structure Design Unit
1581 Mail Service Center
Raleigh, NC 27699-1581

Attention: Mr. P. D. Lambert, P. E.

Via other delivery service:

Mr. G. R. Perfetti, P. E.
State Bridge Design Engineer
North Carolina Department
of Transportation
Structure Design Unit
1000 Birch Ridge Drive
Raleigh, NC 27610

Attention: Mr. P. D. Lambert, P. E.

For submittals to the Geotechnical Engineering Unit, use the following addresses:

For projects in Divisions 1-7, use the following Eastern Regional Office address:

Via US mail:

Mr. K. J. Kim, Ph. D., P. E.
Eastern Regional Geotechnical
Manager
North Carolina Department
of Transportation
Geotechnical Engineering Unit
Eastern Regional Office
1570 Mail Service Center
Raleigh, NC 27699-1570

Via other delivery service:

Mr. K. J. Kim, Ph. D., P. E.
Eastern Regional Geotechnical
Manager
North Carolina Department
of Transportation
Geotechnical Engineering Unit
Eastern Regional Office
3301 Jones Sausage Road, Suite 100
Garner, NC 27529

For projects in Divisions 8-14, use the following Western Regional Office address:

Via US mail:

Mr. John Pilipchuk, L. G., P. E.
Western Regional Geotechnical
Manager
North Carolina Department
of Transportation
Geotechnical Engineering Unit
Western Regional Office
5253 Z Max Boulevard
Harrisburg, NC 28075

Via other delivery service:

Mr. John Pilipchuk, L. G., P. E.
Western Region Geotechnical
Manager
North Carolina Department
of Transportation
Geotechnical Engineering Unit
Western Regional Office
5253 Z Max Boulevard
Harrisburg, NC 28075

Direct any questions concerning submittal review status, review comments, or drawing markups to the following contacts:

Primary Structures Contact:	Paul Lambert (919) 250 – 4041 (919) 250 – 4082 facsimile plambert@dot.state.nc.us
Secondary Structures Contacts:	James Gaither (919) 250 – 4042 Man-Pan Hui (919) 250 – 4044
Eastern Regional Geotechnical Contact (Divisions 1-7):	K. J. Kim (919) 662 – 4710 (919) 662 – 3095 facsimile kkim@dot.state.nc.us
Western Regional Geotechnical Contact (Divisions 8-14):	John Pilipchuk (704) 455 – 8902 (704) 455 – 8912 facsimile jpilipchuk@dot.state.nc.us

3.0 SUBMITTAL COPIES

The quantities provided in this Special Provision act as a guide in the submittal process.

Unless otherwise required by the contract, submit two sets of supporting calculations to the Structure Design Unit.

Furnish one complete copy of the submittal, including all attachments, to the Resident Engineer. If requested, provide additional copies of any submittal. At the same time, submit the following number of copies directly to the Structure Design Unit and/or the Geotechnical Engineering Unit:

Working Drawing Submittal	Copies Required by Structure Design Unit	Copies Required by Geotechnical Engineering Unit	Contract Reference Requiring Submittal ¹
Arch Culvert Falsework	5	0	Plan Note & SN Sheet
Box Culvert Falsework ²	5	0	Plan Note & SN Sheet
Cofferdams ⁴	6	1	Articles 410-5 and 420-8
Expansion Joint Seals (hold down plate type with base angle)	9	0	“Expansion Joint Seals”
Expansion Joint Seals (modular)	2, then 9	0	“Modular Expansion Joint Seals”
Expansion Joint Seals (strip seals)	9	0	“Strip Seals”
Falsework & Forms (superstructure)	8	0	Article 420-3
Falsework & Forms ² (substructure)	8	0	Article 420-3
Mechanically Stabilized Earth Retaining Walls ⁴	7	1	“MSE Retaining Walls”
Metal Bridge Railing	8	0	Plan Note
Metal Stay-in-Place Forms	8	0	Article 420-3
Metalwork for Elastomeric Bearings ^{5,6}	7	0	Article 1072-10
Miscellaneous Metalwork ^{5,6}	7	0	Article 1072-10
Overhead Sign Assemblies	13	0	Article 903-3(C)
Pile Points	7	1	Article 450-8(D) & “Steel Pile Points”
Placement of Equipment on Structures (cranes, etc.)	7	0	Article 420-20

Precast Concrete Box Culverts	2, then 1 reproducible	0	“(Optional) Precast Reinforced Concrete Box Culvert at Station ____”
Precast Retaining Wall Panels	10	0	Article 1077-2
Pot bearings ⁵	8	0	“Pot Bearings”
Prestressed Concrete Deck Panels	6 and 1 reproducible	0	Article 420-3
Proprietary retaining walls ⁴	9	1	Applicable Project Special Provision
Prestressed Concrete Girder (strand elongation and detensioning sequences)	6	0	Articles 1078-8 and 1078-11
Prestressed Concrete Cored Slab (detensioning sequences) ³	6	0	Article 1078-11
Revised Bridge Deck Plans (adaptation to metal stay-in-place forms)	2, then 1 reproducible	0	Article 420-3
Revised Bridge Deck Plans (adaptation to modular expansion joint seals)	2, then 1 reproducible	0	“Modular Expansion Joint Seals”
Soil Nail Retaining Walls ⁴	4	1	Applicable Project Special Provision
Sound Barrier Wall Steel Fabrication Plans ⁶	7	0	Article 1072-10 & “Sound Barrier Wall”
Sound Barrier Wall Casting Plans	10	0	Article 1077-2 & “Sound Barrier Wall”
Structural Steel ⁵	2, then 7	0	Article 1072-10
TFE Expansion Bearings ⁵	8	0	Article 1072-10
Temporary Detour Structures ⁴	10	1	Article 400-3 & “Construction, Maintenance and Removal of Temporary Structure at Station ____”
Temporary Shoring ⁴	6	1	Article 410-4 & “Temporary Shoring for Maintenance of Traffic”

Temporary Fabric or Wire Walls ⁸	0	2	Applicable Project Special Provision
Permanent Anchored Tieback Retaining Walls ⁴	4	1	Applicable Project Special Provision
Evazote Joint Seals ⁷	9	0	Applicable Project Special Provision
Optional Disc Bearings ⁵	8	0	“Optional Disc Bearings”
Removal of Existing Structure over Railroad	5	0	Railroad Special Provisions
Drilled Pier Construction Sequence Plans ⁸	0	2	“Drilled Piers”
Pile Hammers ⁸	0	2	Article 450-6

FOOTNOTES

- References are provided to help locate the part of the contract where the working drawing submittals are required. References in quotes refer to the Project Special Provision by that name. Articles refer to the Standard Specifications.
- Submittals for these items are necessary only when plan notes require them.
- Submittals for these items may not be required. A list of pre-approved sequences is available from the producer or the Materials and Tests Unit.
- These submittals are reviewed by the Structure Design Unit and the Geotechnical Engineering Unit. If NCDOT Shoring Standards are used, working drawings need not be submitted, but the Shoring Selection Form should be forwarded to the Geotechnical Engineering Unit.
- The fabricator may submit these items directly to the Structure Design Unit.
- The two sets of preliminary submittals required by Article 1072-10 of the Standard Specifications are not required for these items.
- Submittals for Fabrication Drawings are not required. Submission of Catalogue Cuts of Proposed Material is required. See Section 5.A of the Project Special Provision.
- Submittals for these items are reviewed by the Geotechnical Engineering Unit only and correspondence regarding these items should be directed to and will come from the Geotechnical Engineering Unit.

METRIC STRUCTURAL STEEL

(10-12-01)

The structural steel for this project is specified in SI (Metric) units with plate thickness designated in millimeters in accordance with AASHTO M160M.

The substitution of structural steel in US Customary nominal thickness is permitted for primary and secondary members defined as follows:

- Primary members - members such as webs and flanges of plate girders, transverse and bearing stiffeners, girder field splice plates, and connector plates for curved girders.
- Secondary members - members such as connector plates for straight girders, bearing plates and miscellaneous hardware.

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

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

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

OPTIONAL DISC BEARINGS

(10-03-02)

1.0 GENERAL

This item consists of furnishing, fabrication and installation of disc bearings in accordance with AASHTO Standard Specifications, the Standard Specifications, the recommendations of the manufacturer and as specified herein. In addition, all plan notes pertaining to furnishing and installing pot bearing assemblies shall also apply to disc bearing assemblies, except as noted herein.

Disc Bearings consist of a polyether urethane structural element (disc) confined by upper and lower steel bearing plates. Equip disc bearings with a shear restriction mechanism to prevent movement of the disc. Supply disc bearings as fixed bearings and guided expansion bearings as designated by the Contract Documents.

Fixed disc bearings allow rotation but no longitudinal or transverse movement in the bearing plane. Fixed bearings consist of a sole plate, an elastomer disc, upper bearing plate, lower bearing plate, masonry plate, anchor bolts, nuts and washers.

Guided expansion disc bearings allow rotation and only longitudinal movement in the bearing plane. Guided expansion disc bearings consist of a sole plate, a top steel plate with a polished stainless steel sheet facing bearing on a fixed disc bearing with a layer of virgin polytetrafluoroethylene (PTFE) material on its top, masonry plate, anchor bolt assembly which includes anchor bolts, nuts, washers, pipe sleeves, a closure plate, grout and various sizes of standard pipe and any other necessary material as detailed on the plans. To allow longitudinal movement, bond a polytetrafluoroethylene (PTFE) sheet to the upper steel bearing plate. Support a sliding steel top bearing plate with the upper steel bearing plate. Face the mating surface of the sliding steel top bearing plate with polished stainless steel. Use either a guide bar or keyway system to restrict transverse movement. Face the sliding surfaces of the guide bar or keyway systems with either PTFE sheets or stainless steel.

2.0 MATERIALS

Use disc bearings produced by the same manufacturer.

Use AASHTO M270 Grade 50W (345W) for all steel in the disc bearings. Clean, coat, and seal the plates in the disc bearing assemblies except for the areas with special facings and the areas that come in contact with the elastomer disc, in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)". Coat surfaces to a thickness of 6 mils (0.150 mm) minimum on all external parts. Repair surfaces that are abraded or damaged after the application of metallizing in accordance with the Special Provision for "Thermal Sprayed Coatings (Metallization)".

Provide anchor bolts and nuts in accordance with the Standard Specifications.

When the maximum plan dimension of the sheet is 12" (300 mm) or less, provide a stainless steel sheet in expansion disc bearings that is at least 16 gage or 1/16" (1.6 mm).

When the maximum plan dimension is greater than 12" (300 mm), provide a stainless steel sheet that is at least 11 gage or 1/8" (3 mm). Ensure that all stainless steel sheets are in conformance with ASTM A167/A240 Type 304 and polished to a minimum #8 mirror surface finish.

Blast clean the surface of the plate that will be attached to the stainless sheet to a near white condition in accordance with the Standard Specifications. Position and clamp the back of the stainless sheet that is to be in contact with the steel plate on the steel plate. Apply the stainless steel to the blast cleaned surface of the steel plate as soon as possible after blasting and before any visible oxidation of the blast cleaned surface occurs. Weld the stainless sheet continuously around its perimeter using a tungsten inert gas, wire-fed welder.

For the PTFE sheet, used as a mating surface for the stainless sheet, provide an unfilled virgin PTFE Sheet (Recessed) or a glass-fiber filled PTFE sheet, resulting from skiving billets formed under hydraulic pressure and heat. Provide resin that conforms to the requirements of ASTM D4894 or D4895.

To bond the PTFE and the bearing plate, use heat cured high temperature epoxy capable of withstanding temperature of -320°F to 500°F (-195 °C to 260 °C).

Mold the polyether urethane structural element from a polyether urethane compound. Conform the physical properties of the polyether urethane to the following requirements:

Physical Property	ASTM Test Method	Requirements	
		Min.	Max.
Hardness, Type D Durometer	D2240	60	64
Tensile Stress psi (Mpa) At 100% elongation At 200% elongation	D412	2000 (13.8) 3700 (25.5)	-----
Tensile Strength psi (Mpa)	D412	5000 (34.5)	-----
Ultimate Elongation %	D412	220	-----
Compression Set % 22 hrs. at 158°F (70°C)	D395	-----	40

3.0 DESIGN

Design the disc bearings for the loads and movements shown on the contract plans. However, use the anchor bolt size, length, spacing and masonry plate thickness as shown on the contract plans and provide an overall height of the bearing assembly that is at least the height shown on the contract plans, but no more than 1/2 inch (13 mm) greater than this height. Either combine and cast the sole plate and top plate/upper bearing plate and the lower bearing plate and masonry plate as a single unit or weld together prior to the installation of the disc.

When designing the bearings, use the following allowable bearing stresses:

- On polyether urethane structural element: 5000 psi (34.5 MPa)
- On PTFE Sliding Surface, filled or unfilled PTFE (recessed): 3500 psi (24.1 MPa)

Submit eight sets of shop drawings and one set of design calculations for review, comments and acceptance. Have a North Carolina Registered Professional Engineer check and seal the shop drawings and design calculations.

After the Engineer reviews the drawings and, if necessary, corrections are made, submit one 22" x 34" reproducible set of the working drawings.

4.0 SAMPLING AND TESTING

A. Sampling

The manufacturer is responsible for randomly selecting and testing sample bearings from completed lots of bearings. The manufacturer is also responsible for certifying that the completed bearings and their components have been tested and are in compliance with the requirements of this Special Provision. Have the manufacturer furnish the results of the tests to the Materials and Tests Engineer.

B. Testing

1. Proof Load Test

Load a test bearing to 150% of the bearing's rated design capacity and simultaneously subject it to a rotational range of 0.02 radians (1.146°) for a period of 1 hour.

Have the bearing visually examined both during the test and upon disassembly after the test. Any resultant visual defects, such as extruded or deformed elastomer or PTFE, damaged seals or rings, or cracked steel is cause for rejection.

Keep continuous and uniform contact between the polyether urethane element and the bearing plates and between the sliding steel top plate and the upper bearing plate for the duration of the test. Any observed lift-off is cause for rejection.

2. Sliding Coefficient of Friction

For all guided and non-guided expansion type bearings, measure the sliding coefficient of friction at the bearing's design capacity in accordance with the test method described below, and on the fifth and fiftieth cycles, at a sliding speed of 1 in/min (25 mm/min).

Calculate the sliding coefficient of friction as the horizontal load required to maintain continuous sliding of one bearing, divided by the bearing's vertical design capacity.

The test results are evaluated as follows:

- A maximum measured sliding coefficient of friction of 3%.
- A visual examination both during and after the test. Any resultant visual defects, such as bond failure, physical destruction, cold flow of PTFE to the point of debonding, or damaged components is cause for rejection of the lot.

Using undamaged test bearings in the work is permitted.

3. Test Method

The test method and equipment shall meet the following requirements:

- f. Arrange the test to determine the coefficient of friction on the first movement of the manufactured bearing.
- g. Clean the bearing surface prior to testing.
- h. Conduct the test at maximum working stress for the PTFE surface with the test load applied continuously for 12 hours prior to measuring friction.
- i. Determine the first movement static and dynamic coefficient of friction of the test bearing at a sliding speed of less than 1 in/min (25 mm/min), not to exceed:

0.04	unfilled PTFE
0.08	filled PTFE
- j. Subject the bearing specimen to 100 movements of at least 1 inch (25 mm) of relative movement and, if the test facility permits, the full design movement at a speed of less than 1 ft/min (300 mm/min). Following this test determine the static and kinetic coefficient of friction again. The specimen is considered a failure if it exceeds the values measured in (d) above or if it shows any signs of bond failure or other defects.

Bearings represented by test specimens passing the above requirements are approved for use in the structure subject to on-site inspection for visible defects.

5.0 INSTALLATION

Store disc bearings delivered to the bridge site under cover on a platform above the ground surface. Protect the bearings from injury at all times and, before placing the bearings, dry and clean all dirt, oil, grease or other foreign substances from the bearing. Do not disassemble the bearings during installation, except at the manufacturer’s direction. Place the bearings in accordance with the recommendations of the manufacturer, Contract Drawings, and as directed by the Engineer. If there is any discrepancy between the recommendations of the manufacturer, Special Provisions, and Contract Drawings, the Engineer is the sole judge in reconciling any such discrepancy.

Provide preformed bearing pads under the masonry plates in accordance with Article 1079-1 of the Standard Specifications.

Do not install any bearing before the Engineer approves it.

6.0 BASIS OF PAYMENT

Payment for all optional disc bearings will be at the lump sum contract price bid for “Pot Bearings” which includes full compensation for furnishing all disc bearings, labor, materials, tools, equipment, testing and incidentals required to complete the work in accordance with the Standard Specifications, this Special Provision, the manufacturer’s requirements and as directed by the Engineer.

ELASTOMERIC BEARINGS

(10-03-02)

Use elastomeric bearings in accordance with Article 1079-2 of the Standard Specifications except as follows:

**TABLE 1079-2
NATURAL RUBBER ELASTOMER REQUIREMENTS**

Grade (durometer)	50	60
PHYSICAL PROPERTIES		
Hardness ASTM D2240	50 +5 -5	60 +5 -5

CHARPY V-NOTCH TESTS**(SPECIAL)**

All structural steel furnished for main beam and girder members (for girder members see plans) shall meet the longitudinal Charpy V-Notch Tests specified in the supplementary requirements in ASTM A709-03a for zone 1. Unless otherwise noted on the plans, the material shall be marked and tested as non-fracture critical. Sampling and testing procedures shall be in accordance with AASHTO T243M (ASTM A673M). The (P) frequency of heat testing shall be used. For grade or grades of structural steel required, see Structure plans.

Obtain and submit certified mill test reports to the Materials and Tests Unit to show the results of each test required by this specification.

Material failing to meet the qualification requirements outlined above is unacceptable for use on this project.

2080 MM CHAIN LINK FENCE**(SPECIAL)**

The 2080 mm Chain Link Fence will be constructed according to methods described in the Standard Specifications. The materials making up the 2080 mm Chain Link Fence will be as specified in the Standard Specifications.

The quantity of 2080 mm Chain Link Fence will be the actual number of meters of fence, measured in place from end post to end post, which has been completed and accepted. All posts used for the chain link fence are included in the price of the fence and will not be paid for separately. There will be no measurement made for installing adhesive anchors in concrete barrier rail as such work is considered incidental.

The quantity of fence, measured as described above, will be paid for at the contract unit price per meter for "2080 mm Chain Link Fence."

Payment will be made under:

2080 mm Chain Link Fence _____ Meter

HIGH PERFORMANCE STEEL**(SPECIAL)****1.0 GENERAL**

High performance steel shall be produced and fabricated in accordance with ANSI/AASHTO/AWS Bridge Welding Code D1.5-96, applicable portions of the Standard Specifications, and these Special Provisions.

2.0 MATERIAL PROPERTIES

Structural steel designated on the plans as Grade HPS 485W shall conform to the requirements of ASTM A709-03a.

3.0 WELDING**A. General**

All welding procedures for HPS 485W Steel shall be qualified in accordance with AWS D1.5 unless otherwise modified within this Special Provision.

Butt welds of flanges and webs and fillet welds of web to flanges of plate girders shall be made using the Submerged Arc Welding process. Only Submerged Arc Welding (SAW) or Shielded Metal Arc Welding (SMAW) may be used for all other connections involving HPS 485W steel.

The maximum level of diffusible hydrogen in deposited weld metal shall be 4 mL/100g. The level of diffusible hydrogen may be raised to 8mL/100g for SMAW only, provided that the higher preheat temperatures of Table 1 are attained.

B. Filler Metal Requirements

1. Filler metals for use in connecting Grade HPS 485W plates using the SAW process shall be as follows:
 - a. LA85 electrode with Mil800HPNi flux, by Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199; (216) 481-8100
 - b. ENi4 electrode, by ESAB, 801 Wilson Avenue, Hanover, PA 17331-1058; (800) 933-7070, combined with Mil800H flux by Lincoln Electric Company
 - c. In lieu of the above consumable combinations, the contractor may request approval of alternate consumables from the Engineer. Alternate manufacturer specific filler metals, both electrode and flux, shall meet the AWS Electrode/Flux Classification F9A4 EXXX-X, with supplementary moisture resistance designators H4 or H2, as per AWS A5.23, with 1% Nickel minimum in the weld deposit.

When using alternate consumables, the fabricator is required to perform the full range of weld tests as required by AWS D1.5 Section 12.6.

When using alternate consumables, diffusible hydrogen (H_d) tests shall be performed on the weld metal. Minimum preheat and interpass temperatures to be used with alternate consumables shall be in accordance with AWS D1.5, Table 4.4. The deposited weld metal shall have a diffusible hydrogen level equivalent to 4 mL/100g or less. H_d test specimens are to be prepared at the fabrication plant. Specimens are to be tested in accordance with AWS A4.3. Test results in excess of 4 mL/100g are unacceptable, and a retest is required, with or without revised welding procedures. AWS D1.5 Section 5.7.6 is applicable, but WPS or H_d results are not transferable from fabricator to fabricator. Fabricators with multiple plants under a common umbrella of welding equipment, welding training, and supervision are required to perform the H_d testing only once per combination of consumables for each location. Plants audited as a single facility by the American Institute of Steel Construction (AISC) as a part of their Quality Certification Program, or other owner approved equal Quality Assurance Program, are considered one location. Multiple plants not falling under the AISC, or other 'single facility' audit definition, are considered separate facilities and additional WPS and H_d tests are required.

SAW consumables shall meet the hydrogen control level of H4 as per AWS D1.5, Section VIII6.2.2.1(1).

2. Filler metals for all welds connecting a Grade HPS 485W plate to a Grade 345W plate shall conform to the requirements for Grade 345W base metal as listed in AWS D1.5, Table 4.1 (H8 maximum). At the fabricator's option, the consumable combinations of Section 3.0(B)(1)(a) or 3.0(B)(1)(b) may be used provided the hydrogen control level of H4 is met as per AWS D1.5, Section VIII6.2.2.1(1). Electrodes for use in connecting Grade HPS 485W plates to Grade 345W plates using the SMAW process shall have the designator 'R' for moisture resistant coating. The designator 'HZ' shall be either H4 or H8, depending upon the level of preheat used.
3. SAW consumables and SMAW electrodes shall produce weld deposits that meet the requirements of AWS D1.5 Table 4.3.
4. Filler Metal Qualification Test Requirements for welding of HPS 485W plates together are as listed in AWS D1.5, Table 4.1, for Grade 485W base metal. Qualification, Pretest and Verification Test Requirements for welding HPS 485W plates as determined using WPS Test Plates shall provide properties equal to or greater than the base metal requirements as specified in ASTM A709-03a.

C. Preheat and Interpass Temperature

The maximum interpass temperature for welding HPS 485W steel is 232°C.

The minimum preheat and interpass temperatures for welding of HPS 485W steel plates using the electrodes of Section 3.0(B)(1)(a) or 3.0(B)(1)(b) shall be in accordance with Table 1.

Table 1

Minimum Preheat and Interpass Temperature, °C, for HPS 485W

Welding Process	H _d maximum	Thickness, t, (mm) of Thickest Part at Point of Welding			
		t ≤ 19	19 < t ≤ 38	38 < t ≤ 64	t > 64
SAW/SMAW*	4 mL/100g	10	22	22	52
SMAW	8 mL/100g	10	52	80	108

If satisfactory results are not achieved with the above minimum preheat and interpass temperatures during development of the Welding Procedure Specifications (WPS), and an increased preheat temperature is used to provide a satisfactory Procedure Qualification Record (PQR), the higher preheat temperature shall be used during bridge fabrication as the required minimum.

The minimum preheat or interpass temperature required for a joint composed of different base metals and/or thicknesses, shall be based on the highest of the minimum preheat from AWS D1.5, Table 4.4 or the table above.

* Diffusible hydrogen or filler metal tested by manufacturer shall not exceed a H4 classification. Heat input shall be limited as indicated below.

For all other consumable combinations:

The preheat and interpass temperature requirements shall be in accordance with AWS D1.5, Table 4.4. When welding two pieces of Grade HPS 485W steel, the temperature requirements of Table 4.4, Group IV shall be used. When welding Grade HPS 485W steel to Grade 345W steel, the temperature requirements of Table 4.4, Group I/II shall be used.

D. Heat Input

The minimum amount of heat input shall be 1.57 kilojoules per millimeter (kJ/mm) and the maximum shall be 3.54 kJ/mm determined using AWS D1.5, Section 5.12.

E. Backing

Steel backing material for Welding Procedure Specification test plates may be composed of Grade 345W (Sulfur = 0.025 maximum) or HPS 485W material.

4.0 AISC CERTIFICATION

Only fabricators meeting the requirements of the AISC Quality Certification Program for “Major Steel Bridges ” may be used to fabricate HPS 485W steel.

5.0 BASIS OF PAYMENT

Structural steel will be paid for at the contract lump sum price for “Approximately _____ Kilograms Structural Steel”. No separate payment will be made for HPS 485W Steel. The approximate quantity shown in the contract pay item is an estimate based on the computed weight of the structural steel necessary to complete the work. No measurement for payment will be made for this pay item, and no adjustment in the contract lump sum price will be made for any variation from the approximate quantity shown except for revisions in the plans which affect the quantity of structural steel necessary to complete the work.

When revisions in the plans have been made which affect the quantities of structural steel, adjustments in compensation will be made by supplemental agreement.

Payment at the contract lump sum price for “Approximately _____ Kilograms Structural Steel” will be full compensation for shop painting.

The above prices and payments will be full compensation for all work covered by this section including but not limited to furnishing, fabricating, delivering, placing, erecting, cleaning, and shop painting; furnishing, erecting, and removing falsework; setting bearings and anchorages; welding; and assembling all structural joints.

Payment will be made under:

Approximately _____ Kilograms Structural Steel.....Lump Sum

BEARING PILES

A. GENERAL

During pile driving operations, the Contractor shall use an approved system. No variations in the driving system will be permitted without the Engineer's written approval. Any change in the driving system will only be considered after the Contractor has submitted the necessary information for a revised wave equation analysis. The Contractor will be notified of the acceptance or rejection of the driving system changes within five (5) calendar days of the Engineer's receipt of the requested change.

A detailed and accurate record shall be kept by the Engineer during the driving of piles. Pile logs shall be forwarded to the Eastern Regional Design Group, Geotechnical Engineering Unit.

B. PILE DRIVING ANALYZER (PDA)

1.0 General:

This work shall consist of driving steel pipe pile(s) and steel H pile(s) with the Pile Driving Analyzer (PDA) (ASTM D 4945-89) attached. The PDA shall be used on the first production pile installed as directed by the Engineer. This pipe pile or H pile shall be a vertical pile. The Contractor shall be responsible for notifying the Engineer of their pile driving schedule not less than fourteen (14) working days prior to the beginning of pile driving.

The Engineer will take dynamic measurements during pile driving. Measurements taken during driving will include, but not be limited to: hammer performance, skin friction, bearing capacity, and driving stresses.

Pile driving criteria for the production piles will be furnished to the Contractor two (2) weeks after the dynamic testing is completed. Deeper driving or less driving may be required in order to allow for variations in the location and/or strength of the stratum from which the pile obtains its primary capacity.

The acceptability of production piles will be determined by the Engineer if absolute refusal above the specified plan elevation or the order length can not be driven to the plan elevation.

Piles not achieving the specified resistance within these limits shall be driven to penetrations established by the Engineer.

2.0 Equipment:

The Engineer will furnish the dynamic measuring instruments. Transducers will be attached at an approximate distance equal to $1.00 \pm$ m below the head of the pile. The transducers will be attached with bolts placed in holes that the Contractor has pre-drilled as directed by the Engineer. The Engineer will furnish materials and directions for installation of the transducers. The Contractor shall install the transducers as directed by the Engineer.

The Contractor is responsible in terms of both actual expense and time delays for transducers that are either damaged during installation or are installed incorrectly. The Engineer may require the Contractor to readjust the transducers during driving if the dynamic records are inconclusive. The transducers will be attached near the head of the pile after the hammer and leads have been placed on the pile.

It shall be the Contractor's responsibility to supply a suitable enclosure (shelter) to protect the computer and the test equipment operator from conditions of sun, wet, wind, and cold. The shelter shall have a minimum floor size of 2 m x 2 m and minimum roof height of 2.2 m. The inside temperature of the shelter shall be maintained between 10 to 30 degrees C. A heating or cooling system shall be provided, if required, to maintain the above-mentioned temperature. The enclosure shall be sufficiently near the pile location (within 23 m of the pile being tested) to be reached by the PDA cable(s).

Any damage to the Pile Driving Analyzer and supporting equipment due to the fault or negligence of the Contractor shall be replaced by the Contractor at no additional cost to the department.

3.0 Construction

The Contractor shall drill the holes necessary for the attachment of the transducers. The Contractor shall then lift, align and rotate the pile(s) to be tested in the driving leads. The Contractor shall install the instrumentation after the hammer and leads have been placed on the pile as directed by the Engineer. The Engineer will measure the wavespeed of the pile(s) as the Contractor drives the pile for approximately ten (10) blows with the proposed hammer or as directed by the Engineer. It is estimated that it will take approximately one (1) hour per pile to attach the transducers and measure the wavespeed after the hammer has been placed on the pile.

It is the Contractor's responsibility to supply pile(s) with extra length, if needed, or to situate the pile(s) in the leads and template such that the dynamic instruments and their accompanying wires will not be damaged by the template during driving.

The pile(s) shall be driven to the depth at which the Pile Driving Analyzer indicates that the capacity as shown in the plans has been achieved or as directed by the Engineer.

The Engineer may require that the Contractor reduce the energy transmitted to the pile(s) by reducing the energy of the hammer during driving. The pile installation procedure shall be subject to modification if dynamic testing indicates it to be necessary.

When directed by the Engineer, the Contractor shall wait a minimum 24 hours and then redrive the pile. After the Engineer reattaches the instruments, the contractor shall restrike the pile with the approved hammer. The hammer shall obtain the required stroke and then the minimum amount of penetration as directed by the Engineer. The minimum amount of penetration required during restrike will be 15 cm or as directed by the Engineer.

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The Contractor shall notify the Engineer of his re-driving schedule not less than one (1) working day prior to beginning re-drive.

The Engineer shall determine when the dynamic testing has been satisfactorily completed.

C. DYNAMIC TESTING OF PRODUCTION PILES

The work shall consist of driving steel pipe pile(s) and steel H pile(s) with the Pile Driving Analyzer (PDA) (ASTM D 4945-89) attached. The PDA shall be used on the first production pile installed as directed by the Engineer.

The piles shall be tested vertically in accordance with Section B., "Pile Driving Analyzer" of this Special Provision.

Evaluation of the results of the dynamic testing may require that additional dynamic testing be performed at other locations as required by the Engineer.

The Engineer will determine when the dynamic testing has been satisfactorily completed.

Procedures for installing piles shall be subject to modification if subsequent dynamic testing indicates it to be necessary.

The number of production piles to be dynamically tested on this project will be as directed by the Engineer. It is anticipated that the number of monitor piles(s) will be two (2).

D. METHOD OF MEASUREMENT AND BASIS OF PAYMENT

The number of production steel pipe piles and steel H piles to be dynamically tested on this project will be as directed by the Engineer. The number of piles to be tested is anticipated to be two (2). However, evaluation of the PDA results may require that additional dynamic testing be performed on other production piles as required by the Engineer.

All costs involved with dynamic load testing the steel pipe pile(s) and steel H pile(s) using the PDA shall be included in the unit price bid for the "Dynamic Load Test", each per pile. The unit price bids shall be full compensation for all materials, labor, tools, equipment, mobilization, and incidentals necessary to complete the work for each dynamic test, including re-driving but excluding the production pile(s).

CSX TRANSPORTATION, INC. - RAILROAD SPECIAL PROVISIONSNOTICE TO THE RAILROAD COMPANY OF START OF WORK:

The Contractor shall notify CSX Transportation, Inc., herein called the Railroad Company, at least thirty (30) days in advance of the date on which he expects to start work on the railroad right-of-way. A written notice is required. No work shall commence on CSXT right-of-way until the Railroad Company has received and approved the Contractor's insurance policy.

RELOCATION OF WIRE LINES:

Any temporary or permanent changes in wire lines necessitated by the construction of the project will be made by others without cost to the Contractor. However, the Contractor will be required to bear the cost of any changes that are made at his request solely for his convenience in the conduct of his operations.

DELAYS CAUSED BY OPERATIONS OF OTHERS:

The Contractor's attention is called to the fact that neither the North Carolina Department of Transportation, herein called the Department of Transportation, nor the Railroad Company assumes any responsibility for any work performed by others in connection with the construction of the project, and the Contractor shall have no claim whatsoever against the Department of Transportation or the Railroad Company for any inconvenience, delay, or additional cost incurred by him on account of such operations by others.

COOPERATION WITH OTHERS:

The Contractor shall cooperate with others participating in the construction of the project to the end that all work may be carried on to the best advantage.

AUTHORITY OF RAILROAD ENGINEER:

The authorized representative of the Railroad Company hereinafter referred to as Railroad Engineer, shall have the final authority in all matters affecting the safe maintenance of railroad traffic of his company.

CONSTRUCTION CORRESPONDENCE AND SUBMITTALS:

Initially, direct all construction related correspondence to the Philadelphia DMJM+Harris office, CSXT's General Engineering Contractor. The Philadelphia office address is:

Mr. Brian Harrison
DMJM+Harris
260 South Broad Street
Suite 1500
Philadelphia, PA 19102

All required construction submittals shall be forwarded to and approved in writing by the Railroad Company prior to proceeding with construction of each applicable phase. Thirty (30) days will be required to review all construction submittals. An additional thirty (30) day will be required to review any subsequent submissions returned not approved.

EMERGENCY ACTION PLAN:

The Contractor shall develop and submit an emergency action plan indicating the location of the site, contact names and phone numbers, access to the site, instructions for emergency response, and location of the nearest hospitals. The plan shall also cover the Contractor's means of fire suppression that may include the phone number and location of the nearest fire department. The plan shall cover all items required in the event of an emergency at the site.

CONSTRUCTION SCHEDULE:

The Contractor shall prepare and submit a detailed construction schedule for the duration of the project clearly indicating the time periods while working on and around CSXT right-of-way.

INTERFERENCE WITH RAILROAD OPERATIONS:

The Contractor shall so arrange and conduct his work that there will be no interference with railroad operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad Company or to the poles, wire, and other facilities of tenants on the rights-of-way of the Railroad Company. Wherever work is liable to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability.

Should conditions arising from or in connection with the work, require that immediate and unusual provisions be made to protect train operations and property of the Railroad Company, it shall be a part of the required services by the Contractor to make such provisions and if, in the judgement of the Railroad Engineer such provisions is insufficient, the Railroad Engineer or the Highway Engineer, may at the expense of the Contractor, require or provide such provisions as may be deemed necessary.

The Contractor will not be permitted to provide less than the following temporary clearances during construction of the proposed overhead bridge:

15'-0" horizontal clearance measured to track from centerline of track to falsework.

22'-0" vertical clearance from top of rail to falsework.

STRUCTURE EXCAVATION AND SHORING:

The Contractor shall furnish evidence to the Department of Transportation and the Railroad Company that, upon starting construction of the proposed grade separation structure, he shall expedite the excavation and bridge work continuously and diligently to completion.

The Contractor will be required to take special precaution and care in connection with excavating and shoring pits, and in driving piles, for highway bridge footings adjacent to track to provide adequate lateral support for the track and loads which it carries without disturbance of track alignment and service, and to avoid obstructing track clearances with working equipment, tools or other material. The procedure for doing such work, including need of and plans for shoring, shall first be approved by the Railroad, but such approval shall not relieve the contractor from liability.

Shoring or sheeting protection shall be provided when excavating adjacent to an active railroad track, except as noted below.

Shoring will not be required if both the following conditions are satisfied:

1. Excavation does not encroach upon a 1½ horizontal: 1 vertical theoretical slope line starting 1'-6" below top of rail and at 12'-0" minimum from centerline of the track.
2. Track is on level ground or in a cut section and on stable soil.

When track is on embankment, excavating the toe of embankment without shoring may affect the stability of the embankment. Therefore, excavation of embankment toe without shoring will not be permitted.

Preferred protection is the cofferdam type that completely encloses the excavation. Where dictated by conditions, partial cofferdams with open sides away from the track may be used. Cofferdams shall be constructed using steel sheet piling or steel soldier beams with timber lagging. Wales and struts shall be provided as needed. The following shall be considered when designing cofferdams:

- a. Sheeting shall be designed to resist a vertical live load surcharge of 1800 lbs per square foot, in addition to active earth pressure. The surcharge shall be assumed to act on a continuous strip, 8'-6" wide. Lateral pressures due to surcharge shall be computed using the strip load formula shown in A.R.E.M.A. specifications, Chapter 8, Part 20.
- b. Allowable stresses in materials shall be in accordance with A.R.E.M.A. Specifications, Chapter 7, 8, and 15.
- c. A construction procedure for temporary shoring shall be shown on the drawing.

- d. Safety railing shall be installed when temporary shoring is within 12 feet of track.
- e. A minimum distance of 10 feet from centerline of the track to face of sheeting shall be maintained.

The Contractor shall submit the following drawings and calculations for Railroad review and approval.

1. Three (3) sets of detailed drawings of the shoring systems showing sizes of all structural members, details of connections, and distances from centerline of track to face of shoring. Drawing shall show a section showing height of sheeting and track elevation in relation to bottom of excavation.
2. One set of calculations of the cofferdam design prepared in accordance with CSXT's Criteria for Overhead Bridges dated October 1, 1999. The drawings and calculations shall be prepared by a North Carolina Registered Professional Engineer experienced in the design of shoring and cofferdams and shall bear his seal and signature.

The subgrade of an operated track shall be maintained with edge of berm at least 10' from centerline of track and not more than 24" below top of rail. Unless so indicated on the plans the Contractor will not be required to make the existing section meet this specification and if substandard, the existing section will be maintained.

DEMOLITION OF EXISTING STRUCTURE:

Railroad tracks shall be protected from damage during demolition of existing structure or replacement of deck slab. Either of the following methods may be used:

- a. During demolition of the deck, a protection shield shall be erected over the track to catch falling debris. The protection shield shall be supported from girders or beams and shall not be lower than allowed temporary clearance. The deck shall be removed by cutting it in sections and lifting out. All cranes and hardware used in picks is to account for a 150% Factor of Safety. Large pieces of deck shall not be allowed to fall on protection shield.
- b. On light traffic density lines or when overhead protection shield cannot be installed due to limited clearance or type of superstructure, track may be protected by timber mats placed over the track structure, subject to approval by the Railroad Engineer. Timber mats shall be made in sections such that they may be lifted in and out quickly. Mats shall not rest on ties or rails. Geofabric or canvas shall be placed over the track structure to keep the ballast clean. The ballast protection is to extend 25' beyond the existing overhead bridge structure.

Blasting will not be permitted to demolish a structure over or within railroad right-of-way.

The Contractor shall submit detailed plans of the protection shield or the timber mats to the Railroad Engineer for approval prior to the start of demolition. The plans shall also indicate the location and capacity of the proposed cranes and estimated lifting loads. The plans shall be prepared by a North Carolina Registered Professional Engineer and shall bear his seal and signature.

BLASTING:

Explosives shall not be used adjacent to any track or other railroad property without the advance approval of the Highway Engineer and the Railroad Engineer, but such approval will not relieve the Contractor of any liability. If use of explosives is permitted, the blasting shall be done with light charges under the direct experienced supervision of a responsible officer or employee of the Contractor, or of the Department of Transportation. Electric detonating fuses or charges shall not be used on account of possible premature explosions resulting from operation of 2-way train radios. Every precaution shall be taken to avoid damage to property, injury to persons and interruption of railroad operations.

No blasting shall be done without an authorized Railroad representative present, who will determine the approximate location of trains in order that the Contractor can be certain whether or not sufficient time will be available for blasting and subsequent cleanup without delaying trains. The Contractor shall notify the Railroad Engineer at least 10 days in advance of blasting to permit arrangement for the presence of an authorized Railroad representative and such flagging service as may be deemed necessary.

The Contractor shall have adequate equipment, labor, and materials at the job site and provide sufficient time to clean up the debris resulting from the blasting without delay to trains. He will at his expense correct any track misalignment or other damage to railroad property resulting from the blasting as directed by the Railroad Engineer. If his actions result in delays to trains, the Contractor shall bear the entire cost thereof.

Blasting shall be discontinued immediately upon notice by the Railroad Engineer or the Highway Engineer that it is too hazardous.

STORAGE OF MATERIALS:

Materials and equipment shall not be stored where they will interfere with railroad operations, nor on the rights-of-way of the Railroad Company without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad Company will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.

DAMAGES:

The Contractor shall assume all liability for any and all damages to his work, employees, servants, equipment and materials caused by railroad traffic.

MAINTENANCE OF DITCHES ADJACENT TO RAILROAD TRACKS:

The Contractor shall submit plans indicating the proposed methods of erosion control during construction, in particular, excavation for the piers and grading.

The Contractor shall exercise necessary precautions to prevent fouling of track ballast and existing ditches in the excavation of material at the proposed structure site. He shall maintain the existing railroad ditches free from obstruction and silt through the duration of his construction operations and upon completion of the structure shall leave the ditches in conditions satisfactory to the Railroad Engineer.

Should material from excavating at the proposed structure site foul the track ballast, the Contractor will be required to clean or replace the fouled ballast under the direction of and to the satisfaction of the Railroad Engineer.

Any cost incurred by the Railroad Company for repairing damage to its property or to property of its tenants, caused by or resulting from the operations of the Contractor, shall be paid by the Contractor to the Railroad Company.

TEMPORARY RAILROAD GRADE CROSSINGS:

Where the plans show or imply that equipment or materials of any nature must be transported across a Railroad, unless the Department of Transportation has included arrangements for such crossings in its agreement with the Railroad, the Contractor will be required to first obtain authority for its installation, maintenance, and removal from the Railroad Engineer. The Contractor shall execute CSX Railroad's standard private road crossing agreement. Railroad Forces will do all work within two feet of the rail and the Contractor will pay all cost associated with the installation, maintenance and removal of the temporary grade crossing. The Contractor shall arrange for any resulting necessity of watching and flagging and to furnish the Railroad Company with a separate Railroad Protective Liability Policy other than the one required by these special provisions. All the above shall be at no cost to the Department of Transportation.

In the event the Department of Transportation has made arrangements for the Temporary Grade Crossings, the Contractor will need to have a railroad flagman on site during any use of the crossing and the crossings must be physically barricaded during such times that it is not required for use. The Contractor shall construct the road and approaches such that it does not interrupt existing drainage patterns and to the satisfaction of the Railroad. Flagman must be on site for construction and the roadway must be removed upon completion of the project. The Contractor shall restore the property including any drainage ditches. The Contractor's attention is called to the fact that he will not be required to bear the cost of the flagging services required by the Railroad Company or provide any additional railroad insurance except that required by the Insurance Special Provision.

ERECTION PROCEDURE:

The Contractor shall submit a detailed procedure for erecting the spans over railroad tracks. Equipment used for the erection, or removal of structures over railroad facilities, shall have a minimum lifting capacity of one hundred-fifty percent (150%) of the lift weight (operational capacity limited to sixty-six and two-thirds ($66\frac{2}{3}\%$) of the tipping load). The procedure shall indicate the capacity of cranes, location of cranes with respect to the tracks and estimated lifting loads. The erection procedure must follow CSX Construction Guidelines and be prepared by a North Carolina Registered Professional Engineer and shall bear his seal and signature. The procedure must be approved by the Railroad.

FLAGGING PROTECTION OR WATCHMAN SERVICE:

The watchman and flagging service required by the Railroad Company for the safety of railroad operations because of work performed by the Contractor or subcontractors in connection with the construction of the proposed dual overheads structures will be provided by CSX Transportation, Inc. and the Contractor's special attention is called to the fact that he will not be required to bear the cost of any watchman or flagging service required by CSX Transportation, Inc., other than that required at any temporary grade crossing, as the Railroad Company will be reimbursed by the Department of Transportation on bills rendered monthly. All bills to be prepared in accordance with the Federal-Aid Policy Guide 23 CFR 646B.

When the Contractor's men or equipment are working within eighteen (18) feet of the nearest rail, over, under or adjacent to the track over which trains are operated, or when work is being performed adjacent to an operated track which may present a hazard to train operations, or when equipment is being used which does, or may infringe on such limits, and at other times, when in the opinion of the Railroad Engineer such protection is necessary, the services of a man or men will be used for flagman or watchman service.

The Contractor shall give 10 days advance notice to the Railroad Engineer in order that flagging service can be arranged and provided. No work shall be undertaken until the flagman, or flagmen, are at the job site. The estimated number and classification of men are shown in the Force Account Estimate.

The estimated cost of Flagging Protection or Watchman Service is shown in the Force Account Estimates prepared by CSX Transportation, Inc., and made a part of the Plans, Specifications and Estimate.

If the Railroad Company for any reason finds it necessary to furnish a watchman or flagman of a different classification from that shown in the Force Account Estimate, bills will be rendered and shall be paid on the basis of the rate of pay for the men used whether that is above or below the rate given. If the rate of pay of any employee that is to be used for watchman or flagging service is changed before the work is started or during the progress of the work, either by law or agreement between the Railroad Company and its employees, or if the tax rates on labor are changed, bills will be rendered by the Railroad Company and paid by the Department of Transportation on the new rates.

The Contractor's attention is also called to the fact that he will be required to carry on his operations which require flagging protection or watchman service in such a manner and sequence that the cost of such will be as economical as possible.

COMPLETION AND ACCEPTANCE OF WORK:

Upon completion of the work, the Contractor shall remove from within the limits of the railroad right of way all machinery, equipment, surplus materials, rubbish or temporary buildings of the Contractor, and leave said rights-of-way in a neat and orderly condition. After the final inspection has been made and work found to be completed in a satisfactory manner acceptable to the Department of Transportation and the Railroad Company, the Department of Transportation will be notified of the Railroad Company's acceptance in writing by the Railroad Engineer within ten (10) days or as soon thereafter as practicable.

At project completion, a complete set of "As Built" plans for the proposed construction shall be submitted to CSXT Bridge Maintenance and Design Group. CSXT will keep these plans on file in Jacksonville for future reference. Please address these plans to:

Mr. Rick Garro
Senior Engineer of Structures
4901 Belfort Road, Suite 130
Jacksonville, FL 32256

INSURANCE SPECIAL PROVISIONS FOR

CSX TRANSPORTATION, INC.

STRUCTURE

TIP: R-513BA

Robeson County

A. In addition to any other forms of insurance or bonds required elsewhere in the contract documents, the Contractor will be required to provide coverage conforming to the requirements of the Federal-Aid Policy Guide outlined under 23 CFR 646A for all work to be performed on Railroad right(s)-of-way under the terms of the contract by carrying insurance of the following kinds:

1. CONTRACTOR'S COMMERCIAL GENERAL LIABILITY INSURANCE:

a. The Contractor shall furnish an original and one copy of the certificates of insurance and one certified copy of the policy to the Department of Transportation as evidence that, with respect to the operations he performs on railroad right-of-way, he carries Commercial General Liability Insurance including "XCU" coverage providing for limits of liability as follows:

<u>COVERAGE</u>	<u>MINIMUM COMBINED LIMITS OF LIABILITY</u>
Bodily Injury Liability	\$ 2,000,000 Per Occurrence
Property Damage Liability	\$ 2,000,000 Aggregate

b. If any part of the work is sublet, similar insurance and evidence thereof in the same amounts as required of the Prime Contractor, shall be provided by the subcontractor to cover his operations on railroad right-of-way. As an alternative, the Prime Contractor may provide insurance for the subcontractor by means of separate and individual policies.

c. Certificates of Insurance holders are to be sent to the addressees given below. Certificates shall make reference to the project, milepost and county.

Division of Highways
Dept. of Transportation
c/o State Railroad Agent
1546 Mail Service Center
Raleigh, N.C. 27601

CSX Transportation, Inc.
Public Projects Engineer
P. O. Box 45052
Jacksonville, Florida
32232-5052

2. RAILROAD PROTECTIVE LIABILITY INSURANCE:

- a. The Contractor shall furnish to the Department of Transportation an original and one duplicate of the Railroad Protective Liability Insurance Policy with limits of liability as follows:

<u>COVERAGE</u>	<u>MINIMUM COMBINED LIMITS OF LIABILITY</u>
Bodily Injury Liability	\$5,000,000 Per Occurrence
Property Damage Liability	\$10,000,000 Aggregate Per Annual Policy Period
Physical Damage to Property	

- b. The Railroad Protective Liability Policy is to be written on the ISO/RIMA Form No. CG 00 35 10 93 (or updates thereof) including Endorsements CG 28 31 11 85 and IL 00 21 or their equivalents.
- c. The insurer must be financially stable and rated B+ or better in A.M. Best & Company's Insurance Reports.
- d. The name and address of Contractor and Agency must be shown on the Declarations page.
- e. The named insured, description of the work and designation of the job site to be shown on the Policy are as follows:

Named Insured: CSX Transportation, Inc.
 Casualty Insurance Department (J-907)
 500 Water Street
 Jacksonville, Florida 32202

Description and Designation: Construction of a new dual overhead structures on proposed US 74 Bypass over the tracks of CSX Transportation, Inc. in Pembroke, Robeson County, North Carolina near Railroad Milepost A-245.19 identified as State TIP R-513BA.

- B. The Railroad Protective Liability Policy shall contain a clause requiring that sixty (60) days written notice be given the Department of Transportation and the Railroad Company prior to cancellation or change.

All other policies and certificates shall contain a clause requiring that thirty (30) days written notice be given to the Department of Transportation and the Railroad Company prior to cancellation or change. The notices shall make reference to the project, milepost and county.

NOTICE TO:

CSX Transportation, Inc.
 Public Projects Engineer
 P. O. Box 45052
 Jacksonville, Florida
 32232-5052

COPY NOTICE TO:

Division of Highways
 Dept. of Transportation
 c/o State Railroad Agent
 1546 Mail Service Center
 Raleigh, N. C. 27601

- C. All insurance herein before specified shall be carried until the final inspection and acceptance of the project, or that portion of the project within railroad right-of-way, by the Department of Transportation or, in the case of subcontractors, until the Contractor furnishes a letter to the Engineer stating that the subcontractor has completed his subcontracted work within railroad right-of-way to the satisfaction of the Contractor and that the Contractor will accomplish any additional work necessary on railroad right-of-way with his own forces. It is understood that the amounts specified are minimum amounts and that the Contractor may carry insurance in larger amounts if he so desires. As to "aggregate limits", if the insurer establishes loss reserves equal to or in excess of the aggregate limit specified in any of the required insurance policies, Contractor shall immediately notify the Department of Transportation and shall cease all operations until the aggregate limit is reinstated. If the insurer establishes loss reserves equal to or in excess of one/half of the aggregate limit, Contractor shall arrange to restore the aggregate limit to at least the minimum amount stated in these requirements. Any insurance policies and certificates taken out and furnished due to these requirements shall be approved by the Department of Transportation and the Railroad Company as to form and amount prior to beginning work on railroad right-of-way.

No extra allowance will be made for the insurance required hereunder; the entire cost of same is to be included in the unit contract price bids for the several pay items.

- D. Evidence of insurance as required above shall be furnished for review to the Department of Transportation at the address shown below after which it will be forwarded by the Department of Transportation to the Railroad.

Send to Department:

Division of Highways
 Dept. of Transportation
 c/o State Railroad Agent
 1546 Mail Service Center
 Raleigh, NC 27601

R-513BA

Railroad Site Data:

The following information was received from the Railroad on September 13, 2004, and is provided as a convenience to the Contractor in bidding this project. This information is subject to change and the Contractor may, at his discretion, contact the Railroad directly to verify its current accuracy. Since this information is shown as a convenience to the Contractor, but is subject to change, the Contractor shall have no claims whatsoever against either the Railroad or the Department of Transportation for any delays or additional costs incurred based on changes in this information which occur after the above date of receipt.

Type and number of tracks within 50 ft. of project.

2 - Mainline

Number of trains on affected track per day.

17 per day

Type of trains.

Freight & Passenger

Maximum authorized operating speed of trains.

79 mph

Type and number of RR employees assigned to job.

1 Flagman

**PROJECT SPECIAL PROVISION
POLYUREA PAVEMENT MARKING MATERIAL
HIGHLY RETROREFLECTIVE ELEMENTS**

Section 1205-1 DESCRIPTION:

This special provision covers machine applied “Highly Retroreflective” Polyurea pavement marking material with reflective elements. All remaining Articles in Section 1205 shall be as described in the 2002 Standard Specification for Roads and Structures with the exceptions below.

Section 1205-2 Materials

(A) General

Replace Article (A) with the following:

Use Section 1087-Articles 1, 3, 5 & 6 (General, Color, Packaging for Shipment, and Storage Life) as described in the 2002 Standard Specifications for Roads and Structures. The manufacturer may recommend any remaining information necessary for the placement of “Highly Retroreflective” Polyurea pavement markings.

(B) Material Qualification

Replace Article (B) with the following:

Use only “Highly Retroreflective” polyurea pavement markings that have been pre-approved by the Traffic Control Unit prior to application. Use retroreflecting elements according to the manufacturer’s recommendations in order to meet the retroreflectivity requirements as stated in Section 1205-3(G)(8) as measured by a LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer.

Furnish a Type 3 Material Certification and Type 4 Material Certification in accordance with Article 106-3 as described in the 2002 Standard Specifications for Roads and Structures.

For more information, contact the Traffic Control Unit at 919 250-4151.

Section 1205-3 Construction Methods

Section 1205-3(B) (1) General for all Application Equipment: Add the following sentence after the last paragraph:

Do not use handliners or any other non-truck mounted pavement marking machine to install “Highly Retroreflective” polyurea pavement markings on long-line applications.

R-0513A
Updated 12/30/02
Revised:

Add the following Section immediately following Section 1205-3(G)(8)

Section 1205-3 (G) (9) “Highly Retroreflective” Polyurea Application:

Produce “Highly Retroreflective” Polyurea pavement marking lines which have a minimum dry thickness of 20 mils (0.50mm) when placed on concrete and asphalt pavements.

Using the Polyurea application equipment, apply the pavement marking materials simultaneously. Apply the Polyurea resin, mixed at the proper ratio according to the manufacturer recommendations, to the pavement surfaces within the proper application temperatures as determined by the material manufacturer. Inject reflective elements into the molten (liquid) Polyurea pavement markings.

Apply reflective elements according to manufacturer’s recommendation to immediately produce a highly reflective marking.. At the time of installation, provide in-place marking with the minimum reflectance values shown below, as obtained with a LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer. Maintain the retroreflectance values shown below for a minimum of 30 days from the time of placement of marking material.

WHITE: 800 mcd/lux/m²
YELLOW: 500 mcd/lux/m²

Produce marking, which upon cooling, is uniformly reflectorized and has the ability to resist deformation caused by traffic throughout its entire length.

The manufacturer of the Polyurea pavement marking material shall certify the Contractor to place the material. Provide at least one member of each crew that completed this training. Furnish the Engineer written confirmation of this training from the material manufacturer prior to the beginning of work. The manufacturer’s technical representative shall be onsite during the entire installation of product.

Provide a manufacturer’s technical representative that is knowledgeable and familiar with the Contractors application equipment prior to the installation of the Polyurea pavement markings.

Section 1205-3(H)(1) Observation Period for “Highly Retroreflective” Polyurea Pavement Markings:

Replace the first paragraph with the following:

R-0513A
Updated 12/30/02
Revised:

Thermoplastic, epoxy, and polyurea pavement markings are subject to a 180 day observation period.

Add the following just before the last paragraph:

Provide high visibility polyurea pavement marking materials that maintain minimum retroreflectance values throughout the observation period as follows:

WHITE: 700 mcd/lux/m2
YELLOW: 400 mcd/lux/m2

In addition to the 180 day observation period, provide high visibility polyurea pavement marking materials that meet the following minimum retroreflectance values after having been snowplowed:

WHITE: 375 mcd/lux/m2
YELLOW: 250 mcd/lux/m2

These measurements will be taken within 30 days prior to the end of the Observation Period. The reflectance values will be taken using a LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer.

Section 1205-3(I) Removal of Pavement Markings:

Add the following just before the last paragraph:

Do not apply Polyurea pavement marking over existing pavement marking materials having less adherence than the Polyurea. Remove existing lines according to the manufacturer's recommendations.

Measurement and Payment:

Measurement and payment shall be in accordance with Section 1205 of the North Carolina Standard Specifications for Roads and Structures.

R-0513BA
Updated 12/30/02
Revised:

PROJECT SPECIAL PROVISIONS
POLYUREA PAVEMENT MARKING MATERIAL WITH
STANDARD GLASS BEADS

Section 1205-1 DESCRIPTION:

This special provision covers machine applied Polyurea pavement marking material with both incorporated glass beads and drop-on glass beads. All remaining Articles in Section 1205 shall be as described in the 2002 Standard Specification for Roads and Structures with the exceptions below.

Section 1205-2 Materials

(A) General

Replace Article (A) with the following:

Section 1087-Articles 1, 3, 5 & 6 (General, Color, Packaging for Shipment, and Storage Life) shall be as described in the 2002 Standard Specifications for Roads and Structures. The manufacturer may recommend any remaining information necessary for the placement of Polyurea pavement markings.

(B) Material Qualification

Replace Article (B) with the following:

Use only Polyurea pavement markings that have been pre-approved by the Traffic Control Unit prior to application. Use both incorporated glass beads and drop-on glass beads according to the manufacturer's recommendations in order to meet the retroreflectivity requirements as stated in Section 1205-3(G)(8) as measured by a LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer.

Furnish a Type 3 Material Certification and Type 4 Material Certification in accordance with Article 106-3 as described in the 2002 Standard Specifications for Roads and Structures.

For more information, contact the Traffic Control Unit at 919 250-4151.

Section 1205-3 Construction Methods

Section 1205-3(B) (1) General for all Application Equipment: Add the following sentence after the last paragraph:

Do not use handliners or any other non-truck mounted pavement marking machine to install Polyurea pavement markings on long-line applications.

R-0513BA
Updated 12/30/02
Revised:

Add the following Section immediately following Section 1205-3(G)(8)

Section 1205-3 (G) (9) Polyurea Application:

Produce Polyurea pavement marking lines that have a minimum dry thickness of 20 mils (0.50mm) when placed on concrete and asphalt pavements.

Using the Polyurea application equipment, apply the pavement materials simultaneously. Apply the Polyurea resin, mixed at the proper ratio according to the manufacturer's recommendations, to the pavement surfaces within the proper application temperatures as determined by the material manufacturer. Inject reflective glass beads into the molten (liquid) Polyurea pavement markings.

Apply glass beads according to manufacturer's recommendations. At the time of installation, provide in-place marking with the minimum reflectance values shown below, as obtained with a LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer. Maintain the retroreflectance values shown below for a minimum of 30 days from the time of placement of marking material.

WHITE: 375 mcd/lux/m²
YELLOW: 250 mcd/lux/m²

Produce marking, which upon cooling, is uniformly reflectorized and has the ability to resist deformation caused by traffic throughout its entire length.

The manufacturer of the Polyurea pavement marking material shall certify the Contractor to place the material. Provide at least one member of each crew that completed this training. Furnish the Engineer written confirmation of the training from the material manufacturer prior to the beginning of work. The manufacturer's technical representative shall be onsite during the entire installation of product.

Provide a manufacturer's technical representative that is knowledgeable and familiar with the Contractor's application equipment prior to the installation of the Polyurea pavement markings.

Section 1205-3(H)(1) Observation Period for Polyurea Pavement Markings:

Replace the first paragraph with the following:

Thermoplastic, epoxy, and polyurea pavement markings are subject to a 180 day observation period.

Add the following just before the last paragraph:

R-0513BA
Updated 12/30/02
Revised:

Provide polyurea pavement marking materials that maintain minimum retroreflectance values throughout the 180 day observation period as follows:

WHITE: 325 mcd/lux/m²
YELLOW: 200 mcd/lux/m²

These measurements will be taken by the Department within 30 days prior to the end of the Observation Period. The reflectance values shall be taken with an LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer.

Section 1205-3(I) Removal of Pavement Markings:

Add the following just before the last paragraph:

Do not apply Polyurea pavement marking over existing pavement marking materials having less adherence than Polyurea. Remove existing lines according to the manufacturer's recommendations.

Measurement and Payment:

Measurement and payment shall be in accordance with Section 1205 of the North Carolina Standard Specifications for Roads and Structures.

T.I.P. #: R-0513A
Date: 08/16/04
Revised:

WORK ZONE SIGNS – FLUORESCENT ORANGE TYPES VII, VIII OR IX 09-21-04

DESCRIPTION.

Page 11-5, Article 1110-1 DESCRIPTION.

Delete Article 1110-1 and substitute the following:

Furnish, install, maintain, temporarily cover and uncover, relocate and remove work zone signs (stationary, portable, barricade mounted and detour) as shown in the Traffic Control Plans, the contract documents and *2002 Standard Specifications*.

MATERIALS.

Page 11-5, Sub-Article 1110-2 Part (A) General:

Delete Sub-Article 1110-2 Part (A) and substitute the following:

(A) General:

Refer to Division 10:

Work Zone Sign Supports.....	Article 1089-2
Barricades.....	Article 1089-3

Work Zone Signs

Sign retroreflective sheeting requirements for Types I through IX are described in *Section 1093 Retroreflective Sheeting* of the *2002 Standard Specifications*. Cover the entire sign face with reflective sheeting. Apply the reflective sheeting in a workmanlike manner so there are no bubbles or wrinkles in the material.

1. Work Zone Signs (Stationary):

Use Types VII, VIII or IX fluorescent orange retroreflective sheeting. Construct sign backing of a rigid material such as aluminum or approved rigid composite material. Signs and sign supports shall meet NCHRP 350 requirements for Breakaway Devices.

2. Work Zone Signs (Barricade Mounted):

Use Types VII, VIII or IX fluorescent orange retroreflective sheeting. Signs and barricade assembly shall meet the requirements of NCHRP 350 for Work Zone Category II Devices and be on the NCDOT Approved Products list. Black on White Barricade Mounted Signs shall conform to the requirements of *Section 900 General Requirements for Signing* of the *2002 Standard Specifications*.

3. Work Zone Signs (Portable):

Use fluorescent orange retroreflective sheeting without adhesive backing with equal retroreflective properties as Type VII, VIII or IX sheeting for roll-up portable work zone signs. Construct roll-up portable work zone sign backing with 3/16" x 1 1/4" horizontal rib and 3/8" x 1 1/4" vertical rib.

Use Types VII, VIII or IX fluorescent orange retroreflective sheeting for rigid portable work zone signs. Construct rigid portable work zone sign backing with an approved composite material.

Use portable work zone signs only with portable work zone sign stands specifically designed for one another. Signs and sign supports shall meet NCHRP 350 requirements for Work Zone Category II Devices and be on the NCDOT Approved Products list.

4. Work Zone Signs (Detour):

Use Types VII, VIII or IX fluorescent orange sheeting. Signs and supports shall meet the requirements of NCHRP 350 for Work Zone Category II Devices.

(B) Material Qualifications:

Materials shall conform to the requirements of *Article 1093 and Sub-Articles 1089-1 (B), 1089-1 (C) and 1110-2 (B)* of the *2002 Standard Specifications* and the following.

Page 11-6, Sub-Article 1110-2 Part (B):

Change references in sub-article from "Traffic Control Section" to "Traffic Control Unit".

Page 11-6, Sub-Article 1110-2 Part (B):

Append the second paragraph in this sub-article with the following 2 sentences.

A three-year warranty is required for all new roll-up signs for discoloration and retroreflectivity. Signs must maintain eighty percent (80%) of its retroreflectivity for first two (2) years and fifty percent (50%) for third year.

(C) Historical Performance:

Materials shall conform to the requirements of *Sub-Article 1110-2 (C)* of the *2002 Standard Specifications*.

CONSTRUCTION METHODS.

Work zone signs with fluorescent orange Types VII, VIII or IX shall conform to the requirements of *Article 1110-3 Construction Methods* of the *2002 Standard Specifications*.

MAINTENANCE.

Maintain work zone signs with fluorescent orange Types VII, VIII or IX (stationary, portable and barricade mounted) in accordance with the provisions of *Article 1110-04 Maintenance* of the *2002 Standard Specifications*.

MEASUREMENT AND PAYMENT.

Measurement and payment for work zone signs with fluorescent orange Types VII, VIII or IX (stationary, portable, barricade mounted and detour) will be made in accordance with the provisions of *Articles 1110-4 Method of Measurement and 1110-5 Basis of Payment* of the *2002 Standard Specifications* and the following.

Payment will be made under:

PAY ITEM	PAY UNIT
Work Zone Signs – Fluorescent Orange Types VII, VIII or IX (Stationary)	Square Foot (Square Meter)
Work Zone Signs – Fluorescent Orange Types VII, VIII or IX (Portable)	Square Foot (Square Meter)
Work Zone Signs – Fluorescent Orange Types VII, VIII or IX (Barricade Mounted)	Square Foot (Square Meter)

Revised: August 12, 2004

PROJECT SPECIAL PROVISIONS
PERMITS

The Contractor's attention is directed to the following permits, which have been issued to the Department of Transportation by the authority granting the permit.

PERMIT

AUTHORITY GRANTING THE PERMIT

Dredge and Fill and/or
Work in Navigable Waters (404)

U. S. Army Corps of Engineers

Water Quality (401)

Division of Environmental Management, DENR,
State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-14 of the Standard Specifications and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the Engineer to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.



REPLY TO
ATTENTION OF:

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

200

September 2, 2004

Regulatory Division

Action ID Number 200300999, U.S. 74, Transportation Improvements Project R-513

Dr. Gregory J. Thorpe, PhD, Manager
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
Division of Highways
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

In accordance with your written request of May 5, 2004, and the ensuing administrative record, enclosed are two copies of a Department of the Army permit to directly discharge dredged and/or fill material into tributaries to Back Swamp, Double Branch, Jacob Swamp, and Lumber River to facilitate the construction of the U.S. 74, Transportation Improvements Project (TIP) R-513, State Project Number 6.469002T, in Roberson County, North Carolina. The proposed 19.6 mile four-lane, median divided, full control of access highway extends from the existing US 74/74 Business intersection in Maxton (LAT. DD 34.7165; LONG DD 79.3110) and runs on new alignment to just east of the I-95 interchange (LAT. DD 34.5938; LONG DD 79.0842) and continues on the existing US 74 alignment to the intersection with NC 41 (LAT DD 34.5798; LONG DD 79.0483).

You should acknowledge that you accept the terms and conditions of the enclosed permit by signing and dating each copy in the spaces provided ("Permittee" on page 3). Your signature, as permittee, indicates that, as consideration for the issuance of this permit, you voluntarily accept and agree to comply with all of the terms and conditions of this permit. All pages of both copies of the signed permit with drawings should then be returned to this office for final authorization. A self-addressed envelope is enclosed for your convenience.

In addition, I have enclosed a copy of the Notification of Administrative Appeal Process and Options and Request for Appeal. Please carefully read Section "B" of this form for information regarding the appeal process for proffered permits.

After the permit is authorized in this office, the original copy will be returned to you; the duplicate copy will be permanently retained in this office. Should you have questions, contact Mr. Richard K. Spencer of my Wilmington Field Office regulatory staff at telephone (910) 251-4172.

Sincerely,



E. David Franklin.
Chief, NCDOT Team

Enclosures

DEPARTMENT OF THE ARMY PERMIT

RECEIVED

NC Department of Transportation

Permittee _____

200300999

Permit No. _____

USAED, Wilmington

Issuing Office _____

SEP 08 2004

REGULATORY
WILM. FLD. OFC.

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:

Directly discharge dredged and/or fill material into tributaries to Back Swamp, Double Branch, Jacob Swamp, and Lumber River to facilitate the construction of the U.S. 74, Transportation Improvements Project (TIP) R-513, State Project Number 6.469002T. This authorization will also include the temporary construction of diversion structures consisting of impervious dikes and a fabric-lined diversion channel at Site #2, Section BA.

Project Location: In the Lumber River basin, beginning at the existing US 74/74 Business intersection in Maxton (LAT. DD 34.7165; LONG DD 79.3110) and runs on new alignment to just east of the I-95 interchange (LAT. DD 34.5938; LONG DD 79.0842) and continues on the existing US 74 alignment to the intersection with NC 41 (LAT. DD 34.5798; LONG DD 79.0483), Roberson County, North Carolina.

Permit Conditions:**General Conditions:**

1. The time limit for completing the work authorized ends on December 31, 2007. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

See enclosed sheet.

Further Information:

1. **Congressional Authorities:** You have been authorized to undertake the activity described above pursuant to:
 - () Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
 - (x) Section 404 of the Clean Water Act (33 U.S.C. 1344).
 - () Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).
2. **Limits of this authorization.**
 - a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
 - b. This permit does not grant any property rights or exclusive privileges.
 - c. This permit does not authorize any injury to the property or rights of others.
 - d. This permit does not authorize interference with any existing or proposed Federal project.
3. **Limits of Federal Liability.** In issuing this permit, the Federal Government does not assume any liability for the following:
 - a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
 - b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
 - c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
 - d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

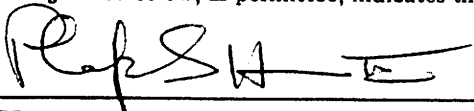
b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.



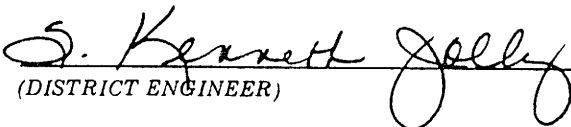
(PERMITTEE)

9/3/04

(DATE)

NC DEPARTMENT OF TRANSPORTATION

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.



(DISTRICT ENGINEER)

9/9/04

(DATE)

CHARLES R. ALEXANDER, JR. COLONEL

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE)

(DATE)

SPECIAL CONDITIONS (Action ID. 2003-0-0999; NCDOT/TIP R-513)

1. All work authorized by this permit must be performed in strict compliance with the attached plans, which are a part of this permit. 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. The permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any deviation in the construction design plans shall be brought to the attention of the Corps of Engineers, Mr. Richard Spencer, Wilmington Regulatory Field Office prior to any active construction in waters or wetlands and any modification to the permit plans must be approved by the Corps of Engineers prior to implementation.
2. The permittee shall schedule a preconstruction meeting between its representatives, the contractor's representatives, and the Corps of Engineers, Mr. Richard Spencer, Wilmington Regulatory Field Office, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all of the terms and conditions contained within this Department of the Army Permit. The permittee shall notify the Corps of Engineers Project Manager a minimum of thirty (30) days in advance of the scheduled meetings in order to provide that individual with ample opportunity to schedule and participate in the required meetings. One copy of the final construction drawings shall be furnished to the Corps of Engineers, Mr. Richard Spencer, Wilmington Regulatory Field Office prior to the pre-construction meeting. Written verification shall be provided to the Corps of Engineers that the final construction drawings comply with the attached permit drawings.
3. 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 and any authorized modifications. Copies of this permit and any modifications authorized by the USACE shall be available for review at the construction site at all times. All violations, including non-compliance of these conditions, of the authorized permit shall be reported to the District Engineer within 24 hours of the violation.
- *4. Compensatory mitigation for the unavoidable impacts to 54.12 acres of wetland and 8,192 linear feet of stream associated with the proposed project shall be provided by the Ecosystem Enhancement Program (EEP), as outlined in the letter dated July 28, 2004 from William D. Gilmore, EEP Transition Manager. The EEP will provide 541.20 acres of preservation of wetlands (55.3 acres of riverine and 485.9 acres of non-riverine wetlands) and 81,920 linear feet of stream preservation in the Southern Inner Coastal Plain Eco-Region at the Great Coharie Site in Sampson County that has been acquired and protected by the EEP. Pursuant to the EEP Memorandum of Agreement (MOA) between the State of North Carolina and the US Army Corps of Engineers signed on July 22, 2003, the EEP will provide a minimum of 48.59 acres of restoration of non-riverine wetlands, 5.53 acres of restoration of riverine wetlands and 8,192 linear feet of restoration of warm water stream channel in the Lumber River basin (Hydrologic Cataloging Unit 03040203 by July 22, 2005 and half of the proposed preservation mitigation would be available at that time for mitigation for other project impacts.

Construction within wetlands on the permitted highway project shall begin only after the EEP has provided written confirmation to the District Engineer that the EEP and not the NCDOT is responsible for providing the required mitigation, pursuant to Paragraph VI.B.7 of the MOA. The NCDOT shall, within 30 days of the issue date of this permit, certify that sufficient funds have been provided to EEP to complete the required mitigation, pursuant to Paragraph V. of the MOA.

5. The permittee and its contractors and/or agents shall not excavate, fill, or perform mechanized landclearing at any time in the construction or maintenance of this project within waters and/or wetlands, or cause the degradation of waters and/or wetlands, except as authorized by this permit, or any modification to this permit. There shall be no excavation from, waste disposal into, or degradation of, jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and fill activities connected with this project.

6. To ensure that all borrow and waste activities occur on high ground and do not result in loss or the degradation of adjacent wetlands and streams, except as authorized by this permit, the permittee shall require its contractors and/or agents to identify all areas to be used to borrow material, or to dispose of dredged, fill, or waste material. The permittee shall ensure that all such areas comply with the preceding condition (#5) of this permit, and shall require and maintain documentation of the location and characteristics of all borrow and disposal sites associated with this project. This information will include data regarding soils, vegetation and hydrology sufficient to clearly demonstrate compliance with the preceding condition (#5). All information will be available to the Corps of Engineers upon request. NCDOT shall require its contractors to complete and execute reclamation plans for each waste and borrow site and provide written documentation that the reclamation plans have been implemented and all work is completed. This documentation will be provided to the Corps of Engineers within 30 days of the completion of the reclamation work.

7. The permittee shall comply with the conditions specified in the water quality certification, No. 3468, issued by the North Carolina Division of Water Quality on August 5, 2004.

8. The permittee shall place the inverts of culverts and other structures greater than 48 inches in diameter in waters, streams, and wetlands one foot below the bed of the stream to allow low flow passage of water and aquatic life, unless providing passage would be impractical and the Corps of Engineers has waived this requirement. For culverts 48 inches in diameter or smaller, culverts must be buried below the bed of the stream to a depth equal to or greater than 20 percent of the diameter of the culvert. 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, upstream or downstream of the structures.

9. The temporary diversion channels at Site #2, Section BA shall be constructed in accordance with Section 5.2.4 of the August 2003, "Best Management Practices for Construction and Maintenance Activities". All temporary diversion channels shall be constructed of non-erodible materials. All channel diversion structures shall be sized to withstand expected high flows.
10. The permittee shall use appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of the "North Carolina Sediment and Erosion Control Planning and Design Manual" to assure compliance with the appropriate turbidity water quality standard.
11. 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.
12. The permittee shall take measures to prevent live or fresh concrete from coming into contact with any surface waters until the concrete has hardened.
13. If the permittee discovers any previously unknown historic or archeological remains while accomplishing the authorized work, he shall immediately stop work and notify the Wilmington District Engineer who will initiate the required State/Federal coordination.
14. No excavated or fill material shall be placed at any time in waters or wetlands outside the authorized permit area, nor will it be placed in any location or in any manner so as to impair surface water flow into or out of any wetland area.
15. The permittee shall maintain the authorized work in good condition and in conformance with the terms and conditions of this permit. The permittee is not relieved of this requirement if he abandons the permitted activity without transferring it to a third party.
16. All fill material shall be clean and free of any pollutants except in trace quantities. Metal products, organic materials, or unsightly debris will not be used.
17. This Department of the Army permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.
18. In issuing this permit, the Federal Government does not assume any liability for:
 - 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 Federal activities initiated on behalf of the general public.
 - c. Damages to other permitted or un-permitted activities or structures caused by the authorized activity.

- d. Design and construction deficiencies associated with the permitted work.
- e. Damage claims associated with any future modification, suspension, or revocation of this permit.

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND
REQUEST FOR APPEAL**

Applicant: NCDOT/TIP R-513 (U.S. 74)	File Number: 2003-0-0999	Date: September 2, 2004
Attached is:		See Section below
<input checked="" type="checkbox"/>	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
<input type="checkbox"/>	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
<input type="checkbox"/>	PERMIT DENIAL	C
<input type="checkbox"/>	APPROVED JURISDICTIONAL DETERMINATION	D
<input type="checkbox"/>	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://www.usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

210
REASONS FOR APPEAL OR OBJECTIONS: (Describe as for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

<p>If you have questions regarding this decision and/or the appeal process you may contact: Mr. Richard K. Spencer, Regulatory Project Manager U.S. Army Corps of Engineers, Wilmington District Wilmington Regulatory Field Office 69 Darlington Avenue Wilmington, North Carolina 228402</p>	<p>If you only have questions regarding the appeal process you may also contact: Mr. Arthur Middleton, Administrative Appeal Review Officer CESAD-ET-CO-R U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 9M15 Atlanta, Georgia 30303-8801</p>
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RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

<p>_____ Signature of appellant or agent.</p>	<p>Date:</p>	<p>Telephone number:</p>
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DIVISION ENGINEER:
 Commander
 U.S. Army Engineer Division, South Atlantic
 60 Forsyth Street, Room 9M15
 Atlanta, Georgia 30303-3490



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

Michael F. Easley, Governor

William G. Ross, Jr., Secretary
Alan W. Klimek, P.E., Director

August 5, 2004

RECEIVED

AUG 10 2004

REGULATORY

Mr. Gregory J. Thorpe, Ph.D., Environmental Director
NCDOT Planning and Environmental Branch
1548 Mail Service Center
Raleigh, NC, 27699-1548

Dear Dr. Thorpe:

Re: Water Quality Certification Pursuant to §401 of the Federal Clean Water Act,
Maxton Bypass, from existing US 74 Business Bypass in Maxton to just east of the I-95 Interchange
to the intersection with NC 41, Robeson County.
WBS Element 34336.1.5; State Project No. 6.469002T
TIP No. R-513
DWQ Project No. 040734

Attached hereto is a copy of Certification No. 3468 issued to The North Carolina Department of
Transportation dated August 5, 2004.

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

Sincerely,

Alan W. Klimek, P.E.

Attachments

cc: Wilmington District Corps of Engineers
Richard Spencer, USACE Wilmington Field Office
Ken Averitte, NCDWQ Fayetteville Regional Office
Christopher Militscher, US Environmental Protection Agency – Region IV
William D. Gilmore, P.E., Transition Manager, NC DENR Division of Ecosystem Enhancement
T. R. Gibson, PE, Division Engineer, NCDOT Division 6
Central Files
File Copy

NORTH CAROLINA 401 WATER QUALITY CERTIFICATION

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (DWQ) Regulations in 15 NCAC 2H .0500. This Certification authorizes the NCDOT to incur the following permanent impacts:

- 54.12 acres of jurisdictional wetlands;
- 3.48 ac of fill in surface waters; and
- 8,192 linear feet of jurisdictional stream loss;

in Robeson County.

Site R-513A	Station Number	Wetlands Impacts (ac)	Drainage Impacts (ac)
1	13+00-16+60	0.37	0.87
3	33+38-33+75	1.07	0
4	12 + 78 Rp 'B'	0.03	0
6	82+00-85+50	8.54	
Site R-513BA			
1	85+80-87+14.77	2.19	0
1A	14+19.67-RPB-144+ 40 -Y1 -	0.04	0
2	12+86-SR1 -	0.004	0
7	140+30-140+60	0.12	0
8	145+58-148+15	2.58	0
Site R-513BB			
1	160+92-161+44	0.334	0
2	18+99-19+52	0.252	0
3	170+05-172+16	3.697	0
4	188+99-191+93	3.018	0
5	194+51-195+93	1.551	0
7	214+49-215+89	1.843	0
8	217+06-223+00	8.531	0
Site R-513C			
	Station Number	Wetland Impacts (ac)	Drainage Impacts (ac)
1	250+34-253+07	8.47	0
2	282+14-282+72 12+23-14+03-Y8-	3.62	0
2A	6+50-RP"D"-	0.13	0
3	285+59-287+09 15+85-18+27-Y8-	4.25	0
4	32+42-33+42-Y3-	1.17	0
5	51+63-53+56-Y8-	1.42	0
7	272+90 LT&RT	0.01	0
TOTAL		54.12 acres	

NCDOT TIP No. R-513

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Site R-513A	Station Number	Stream Name	Impact (feet)
1	13+00-16+60	UT to Lumber River	1715
5	12+42-Y2	Double Branch Canal	164
Site R-513BA	Station Number	Stream Name	Impact (feet)
1A	14+19-RPB-14+40-Y1-	Double Branch Canal	640
2	12+86-SR1-	Double Branch Canal	135
4	120+86	Back Swamp Canal	1132
5	128+01	UT to Back Swamp Canal	341
6	134+00-136+00	UT to Back Swamp Canal	338
Site R-513BB	Station Number	Stream Name	Impact (feet)
6	200+21	UT to Little Back Swamp	246
9	229+60	UT to Back Swamp	207
Site R-513C	Station Number	Stream Name	Impact (feet)
1A	252+00-257+00	UT to Back Swamp	2217
3	285+59-287+09	Jacob Swamp	827
7	272+90 LT&RT	UT to Back Swamp	1056
8	290+85	UT to Jacob Swamp	413
9	308+00	UT to Little Jacob Swamp	230
TOTAL			8,192 feet

The US 74 relocation from Maxton bypass in Maxton to NC 41 in Lumberton, Robeson County, shall be constructed pursuant to the Application dated May 5, 2004 (complete application received July 28, 2004).

The Application provides adequate assurance that the discharge of fill material into the waters of the state with the proposed development will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your Application. All work authorized by this Certification must be done in strict compliance with the plans attached to the Application. If this project changes, incurring additional impacts to streams or wetlands, you are required to notify the DWQ *in writing*, and you may be required to submit a new application. Additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion Control, Non-discharge and Water Supply watershed regulations. This Certification shall expire three (3) years from the date of the cover letter from DWQ or on the same day as the expiration date of the corresponding US Army Corps of Engineers Permit, whichever is later.

Condition(s) of Certification:

1. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards:
 - a. Page The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
 - b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
 - c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
 - d. Any reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.
2. No waste, spoil, solids, or fill of any kind shall occur in wetlands, waters, or riparian areas beyond the footprint of the impacts depicted in the Application. All construction activities shall be performed so that no violations of state water quality standards, statutes, or rules occur.
3. Sediment and erosion control measures shall not be placed in wetlands or waters to the maximum extent practicable. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, they shall be removed and the natural grade restored within 30 days after the project has been released.
4. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by orange fabric fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification.
5. NCDOT and its contractors and/or agents shall not excavate, fill, or perform mechanized land clearing at any time in the construction or maintenance of this project within waters and/or wetlands, except as authorized by this Certification, or any modification to this Certification. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this Certification without appropriate modification. If this occurs, compensatory mitigation will be required since it is a direct impact from road construction activities.
6. Excavation of stream crossings should be conducted in the dry unless demonstrated by the applicant or its authorized agent to be unfeasible and approved by the DWQ. Sandbags, cofferdams, flexible pipe, or other diversion structures should be used to minimize excavation in flowing water.

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7. Placement of culverts and other structures in waters, streams, and wetlands shall be placed below the elevation of the streambed to allow low flow passage of water and aquatic life unless it is otherwise approved by the DWQ that providing passage would be impractical. 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 shall be maintained if requested in writing by DWQ.
8. The natural dimension, pattern and profile of the streams above and below the approved crossings shall not be modified by widening the stream channel or changing the depth of the stream, except as approved by this certification.
9. The removal of vegetation in riparian areas should be minimized. NCDOT is encouraged to use existing on-site vegetation and materials for stream bank stabilization and to minimize the use of rip rap. Riprap shall not be placed in the stream bottom.
10. Using native trees and shrubs, riparian vegetation must be re-established within the construction limits of the project by the end of the growing season following completion of construction.
11. Heavy equipment should be operated from the stream bank rather than in the stream channel unless demonstrated by the applicant or its authorized agent to be unfeasible and approved by the DWQ. All mechanized equipment operated near surface waters should be inspected and maintained regularly to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids or other toxic substances.
12. Live or fresh concrete shall not come into contact with waters of the state until the concrete has hardened. Water that inadvertently contacts uncured concrete should not be discharged to surface waters.
13. Discharging hydroseeding mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is strictly prohibited.
14. NCDOT shall require its contractors (and/or agents) to comply with all of the terms of this Certification, and shall provide each of its contractors (and/or agents) a copy of this Certification.

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✧ 15. *Mitigation:*

Wetland Mitigation

Compensatory mitigation for 54.12 acres of wetland impacts shall be provided through the following schemes:

- The NCDENR Ecosystem Enhancement Program (EEP) has agreed to provide compensatory mitigation for 54.12 acres of wetland impacts incurred for construction of R-513. DWQ acknowledges that the EEP has agreed to provide compensation for the subject project (reference EEP letter May 20, 2004, received by DWQ July 28, 2004).

Stream Mitigation

Compensatory mitigation for 8,192 feet of stream impacts shall be provided through the following schemes:

- The NCDENR Ecosystem Enhancement Program has agreed to provide compensatory mitigation for 8,192 feet of stream impacts incurred for construction of R-513 (reference EEP letter May 20, 2004). EEP shall provide the compensatory mitigation in accordance with the Tri-Party MOA signed on June 12, 2002 and the Dual-Party MOA signed on July 22, 2003.

- ✧ 16. Upon completion of the project, the NCDOT shall complete and return the enclosed "Certification of Completion Form" to notify DWQ when all work included in the 401 Certification has been completed. The responsible party shall complete the attached form and return it to the Transportation Permitting Unit of the Division of Water Quality upon completion of the project.

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

If DWQ determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use), or that State or federal law is being violated, or that further conditions are necessary to assure compliance, DWQ may reevaluate and modify this certification to include conditions appropriate to assure compliance with such standards and requirements in accordance with 15A NCAC 2H .0507(d). Any new or revised conditions shall be provided to NCDOT in writing, shall be provided to the United States Army Corps of Engineers for reference in any permit issued pursuant to Section 404 of the Clean Water Act, and shall also become conditions of the 404 Permit for the project.

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

NCDOT TIP No. R-513

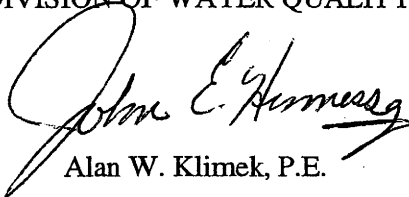
Page 6

August 5, 2004

If you do not accept any of the conditions of this certification, you may ask for an adjudicatory hearing. You must act within 60 days of the date that you receive this letter. To ask for a hearing, send a written petition that conforms to Chapter 150B of the North Carolina General Statutes to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. This Certification and its conditions are final and binding unless you ask for a hearing.

This the 5th day of August 2004

DIVISION OF WATER QUALITY

A handwritten signature in black ink, appearing to read "Alan W. Klimek", written over a horizontal line.

Alan W. Klimek, P.E.

WQC No. 3468

DWQ Project No.: 040734

County: Robeson

Applicant: NCDOT

Project Name: R-513 Maxton Bypass

Date of Issuance of 401 Water Quality Certification: August 5, 2004

Certificate of Completion

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

Applicant's Certification

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

Signature: _____ Date: _____

Agent's Certification

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

Signature: _____ Date: _____

Engineer's Certification

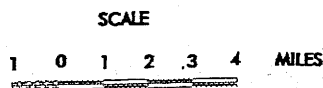
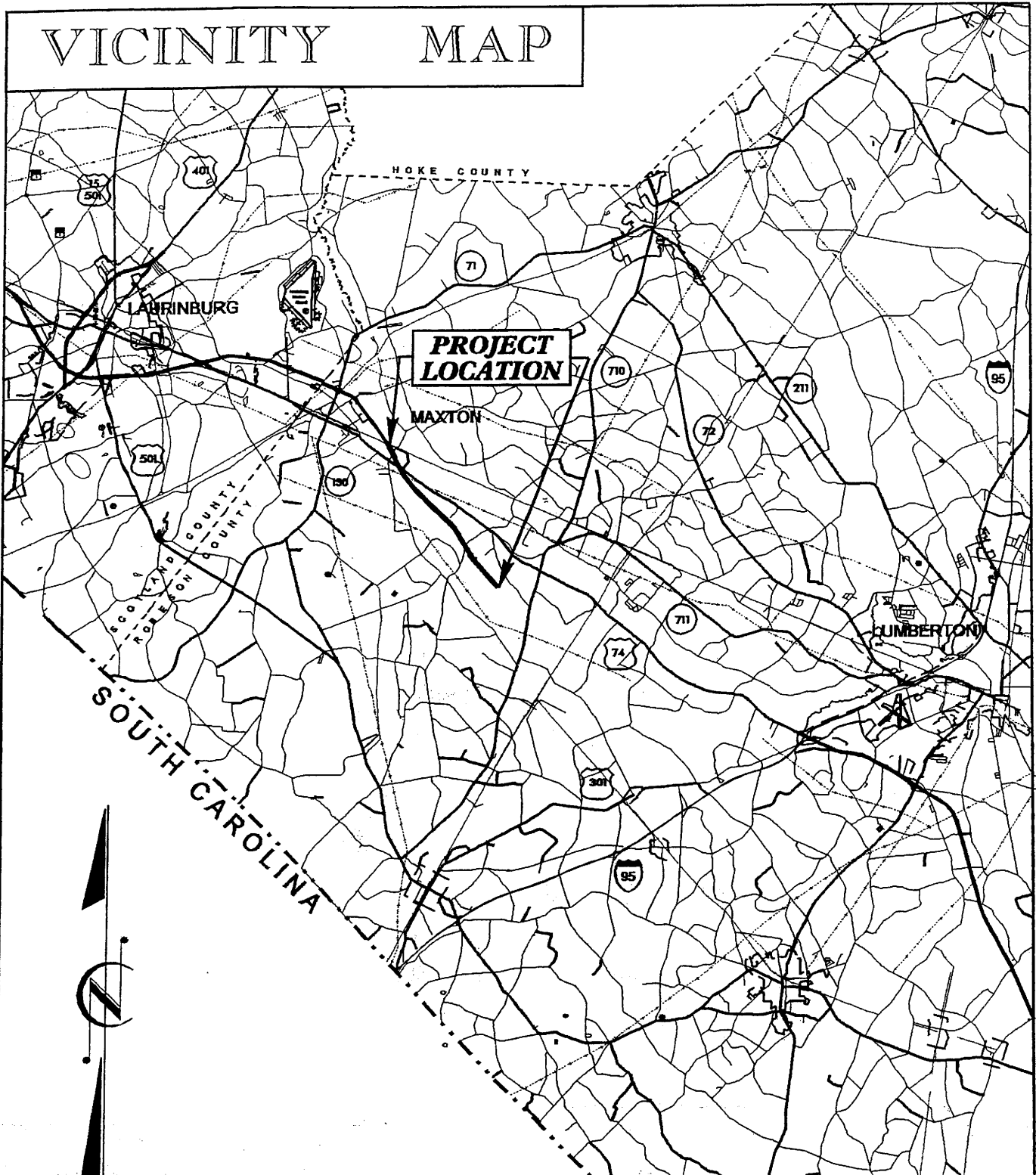
_____ Partial _____ Final

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

Signature _____ Registration No. _____

Date _____

VICINITY MAP



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROBESON COUNTY

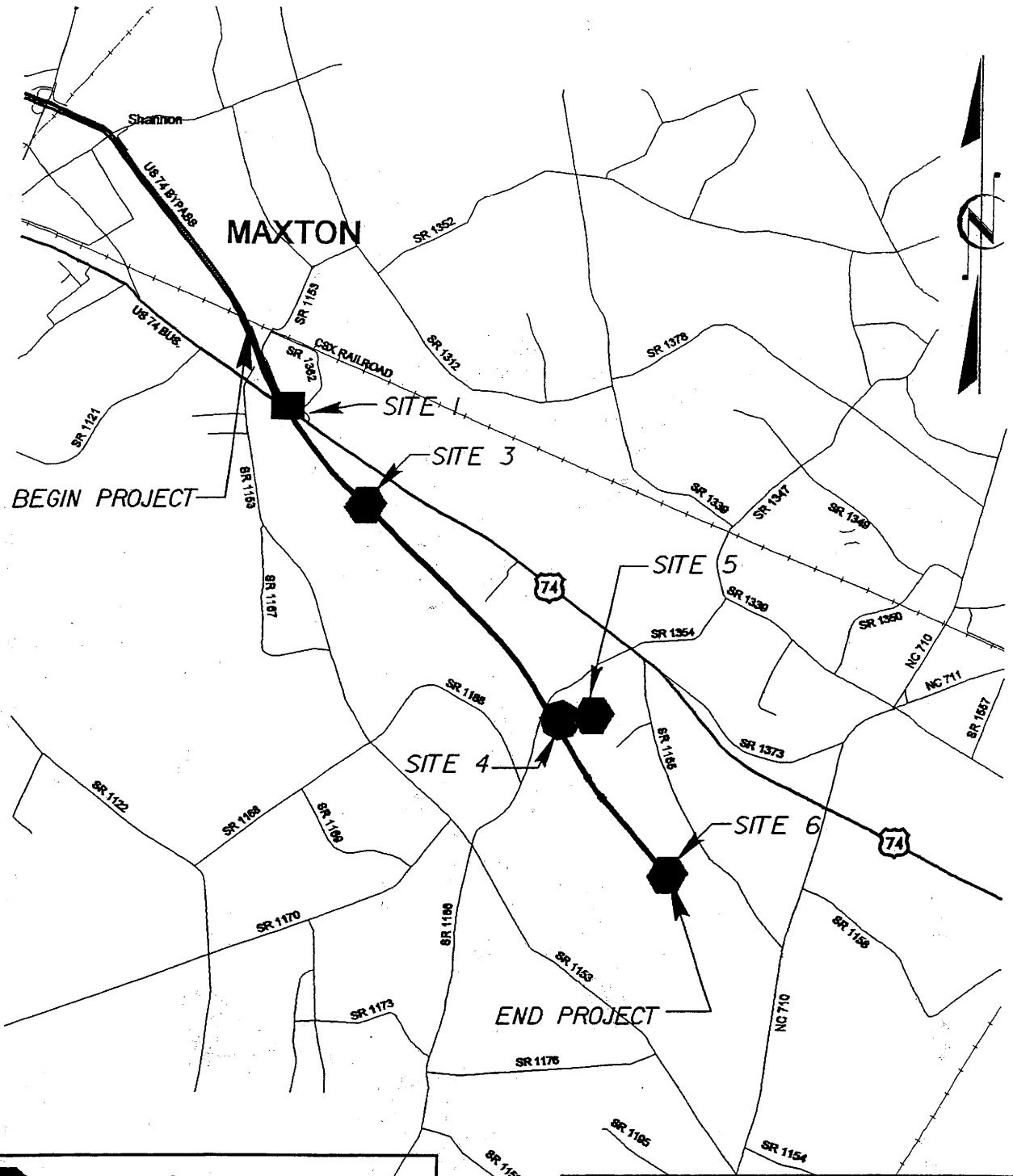
PROJECT 6.469002T R-513A




RELOCATION OF US 74
FROM MAXTON BY-PASS
TO EAST OF S.R.1166

Rev. 2/13/04

SHEET 1 OF 15

APRIL, 2002



 FILL IN WETLANDS
 FILL IN SURFACE WATERS
 COMBINATION FILL IN WETLANDS AND SURFACE WATERS

SCALE

1 .5 0 1 km



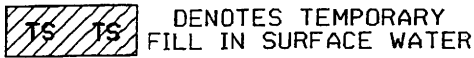
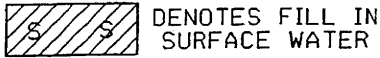
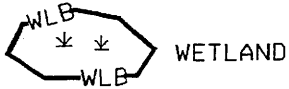
1 1/2 0 1 mile



LOCATION MAP
 SHOWING SITES FOR PERMIT APPLICATION ALONG PROPOSED US 74
 N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT: 6.469002T - R-513A
 US 74 FROM MAXTON BY-PASS TO EAST OF S.R. 1166
 Rev. 2/13/04

LEGEND

—WLB— WETLAND BOUNDARY



← ← FLOW DIRECTION

—TB— TOP OF BANK

---WE--- EDGE OF WATER

---C--- PROP. LIMIT OF CUT

---F--- PROP. LIMIT OF FILL

———— PROP. RIGHT OF WAY

---NG--- NATURAL GROUND

---PL--- PROPERTY LINE

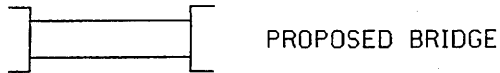
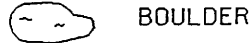
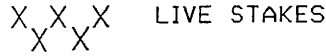
---TDE--- TEMP. DRAINAGE EASEMENT

---PDE--- PERMANENT DRAINAGE EASEMENT

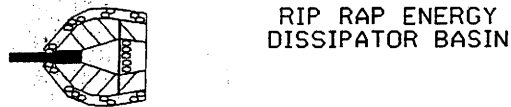
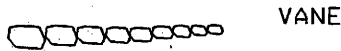
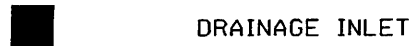
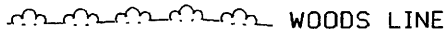
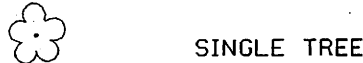
---EAB--- EXIST. ENDANGERED ANIMAL BOUNDARY

---EPB--- EXIST. ENDANGERED PLANT BOUNDARY

---▽--- WATER SURFACE



(DASHED LINES DENOTE EXISTING STRUCTURES)



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

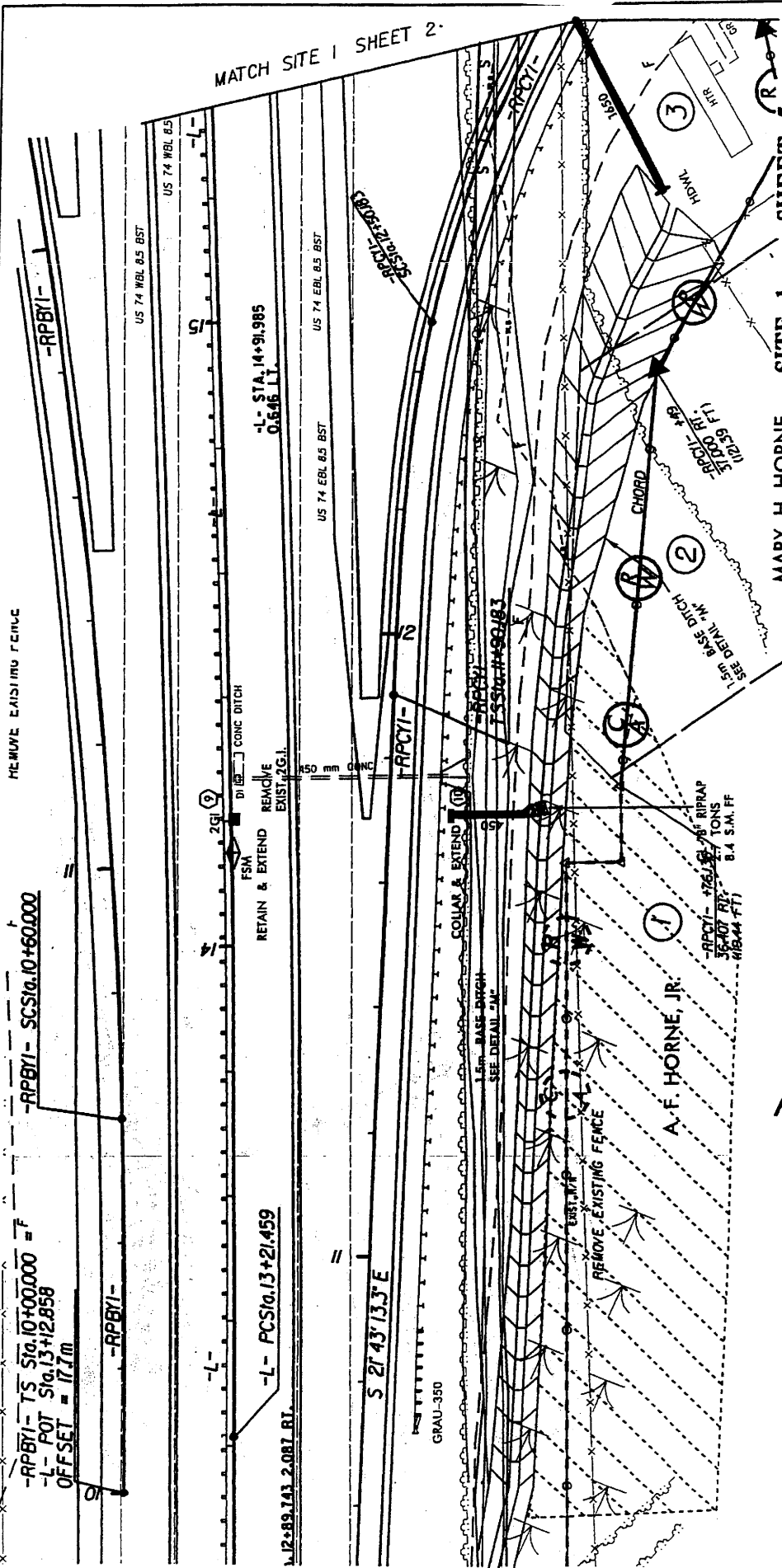
ROBESON COUNTY

PROJECT: 6.469002T - R-513 A

US 74 FROM MAXTON BY-PASS
TO EAST OF SR 1166

SHEET 3 OF 15 *Rev. 2/13/04*
APRIL, 2002

MATCH SITE 1 SHEET 2-



NCDOT

DIVISION OF HIGHWAYS
ROBESON COUNTY

PROJECT: 6.469002T (R-513A)

US 74 OM MAXTON BY-PASS
TO EAST OF SR 1166

REV 3/2004
09/19/03

SHEET 6 OF 15

MARY H. HORNE SITE 1 SHEET 3

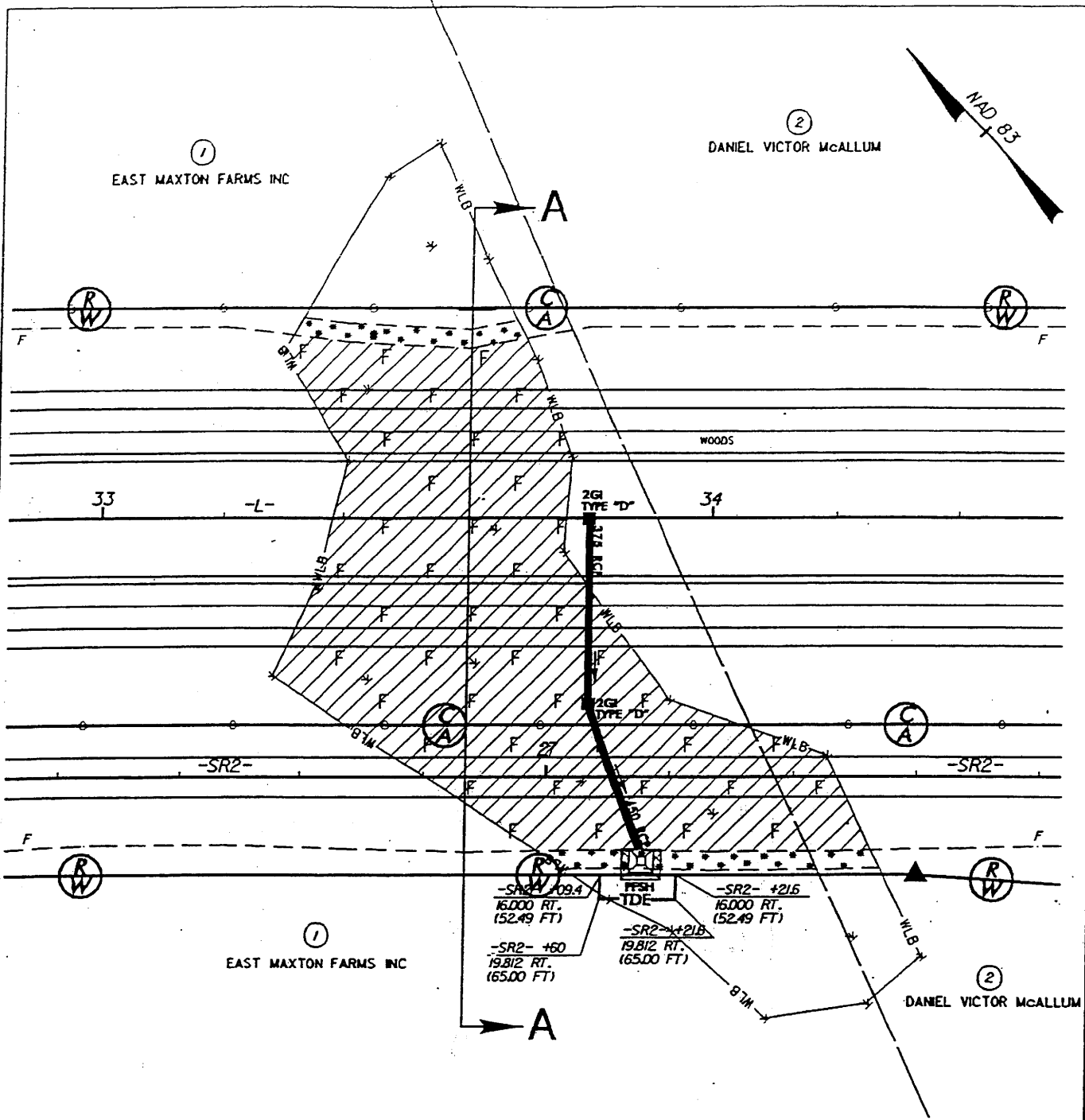
BOUSSINESQ EQUATION
DITCH IMPACTS

PLAN VIEW

10 0 20



SCALE (METERS)

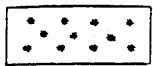


SITE 5 SHEET 1

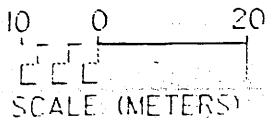
PROPOSED FILL IN WETLAND



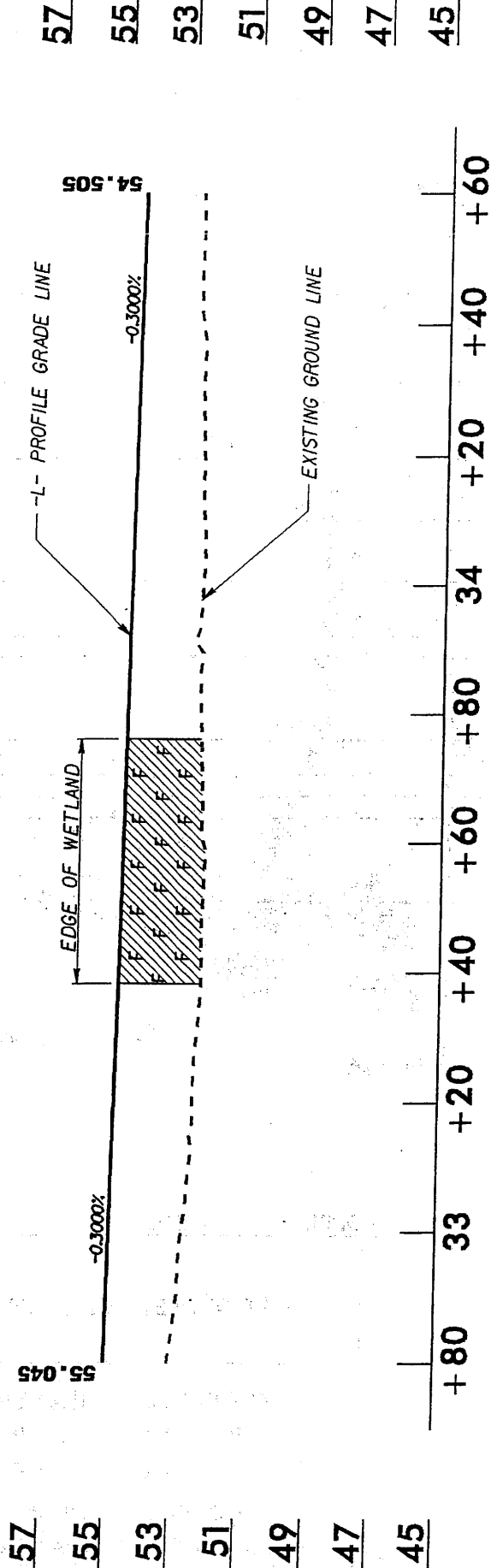
DENOTES FILL IN WETLAND



DENOTES MECHANIZED CLEARING

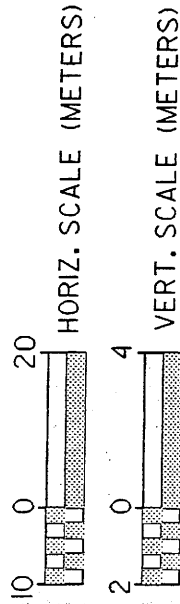


N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT 6.469002T - R-515 A
 US 74 FROM MAXTON BY-PASS
 TO EAST OF SR 1166



SITE 3 SHEET 2

PROFILE VIEW
SITE 3

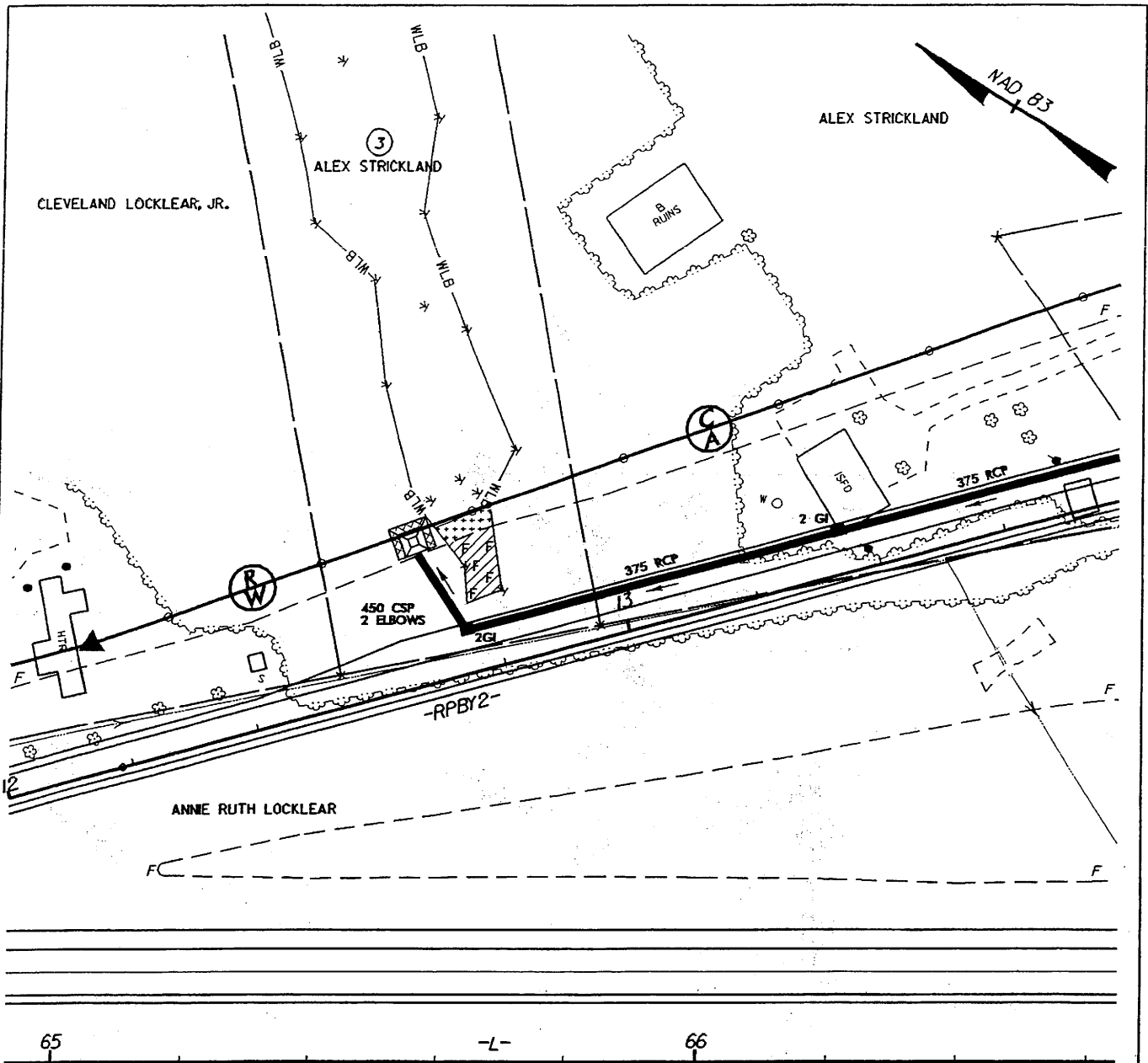



 DENOTES FILL IN WETLAND

N.C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT 6.469002T - R-513 A
 US 74 FROM MAXTON BY-PASS
 TO EAST OF SR 1166



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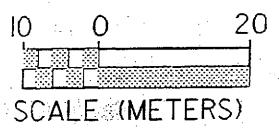
SHEET 8 OF 15



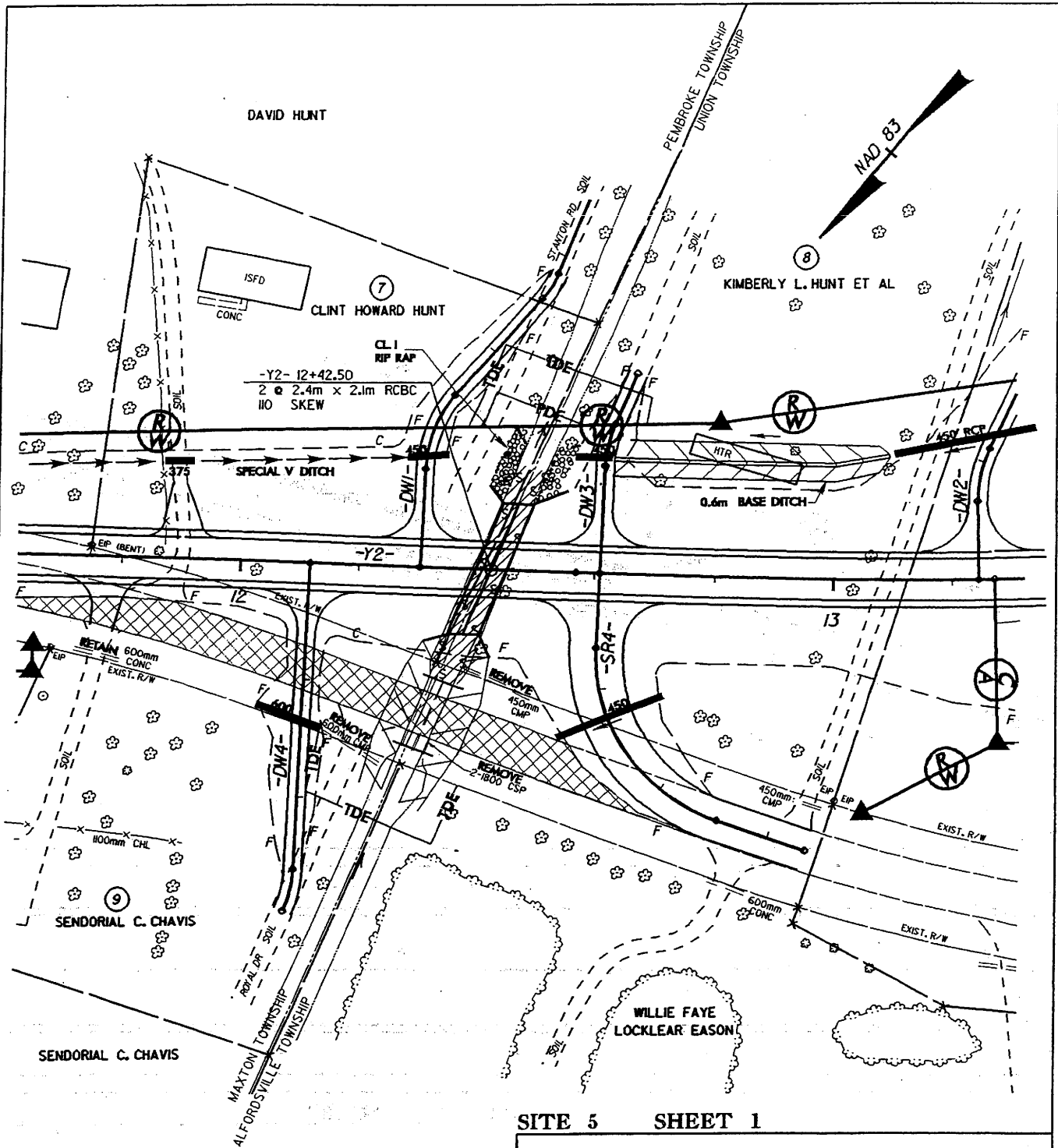
SITE 4 SHEET 1

PROPOSED FILL IN WETLAND

-  DENOTES FILL IN WETLAND
-  DENOTES MECHANIZED CLEARING



N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT 6.469002T - R-513 A
 US 74 FROM MAXTON BY-PASS
 TO EAST OF SR 1166



SITE 5 SHEET 1

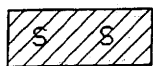
PROPOSED FILL IN WETLAND

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ROBESON COUNTY

PROJECT 6.469002T - R-513 A
US 74 FROM MAXTON BY-PASS
TO EAST OF SR 1166

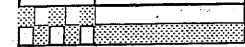
SHEET 10 OF 15

REV. 2/13/04
APRIL, 2002



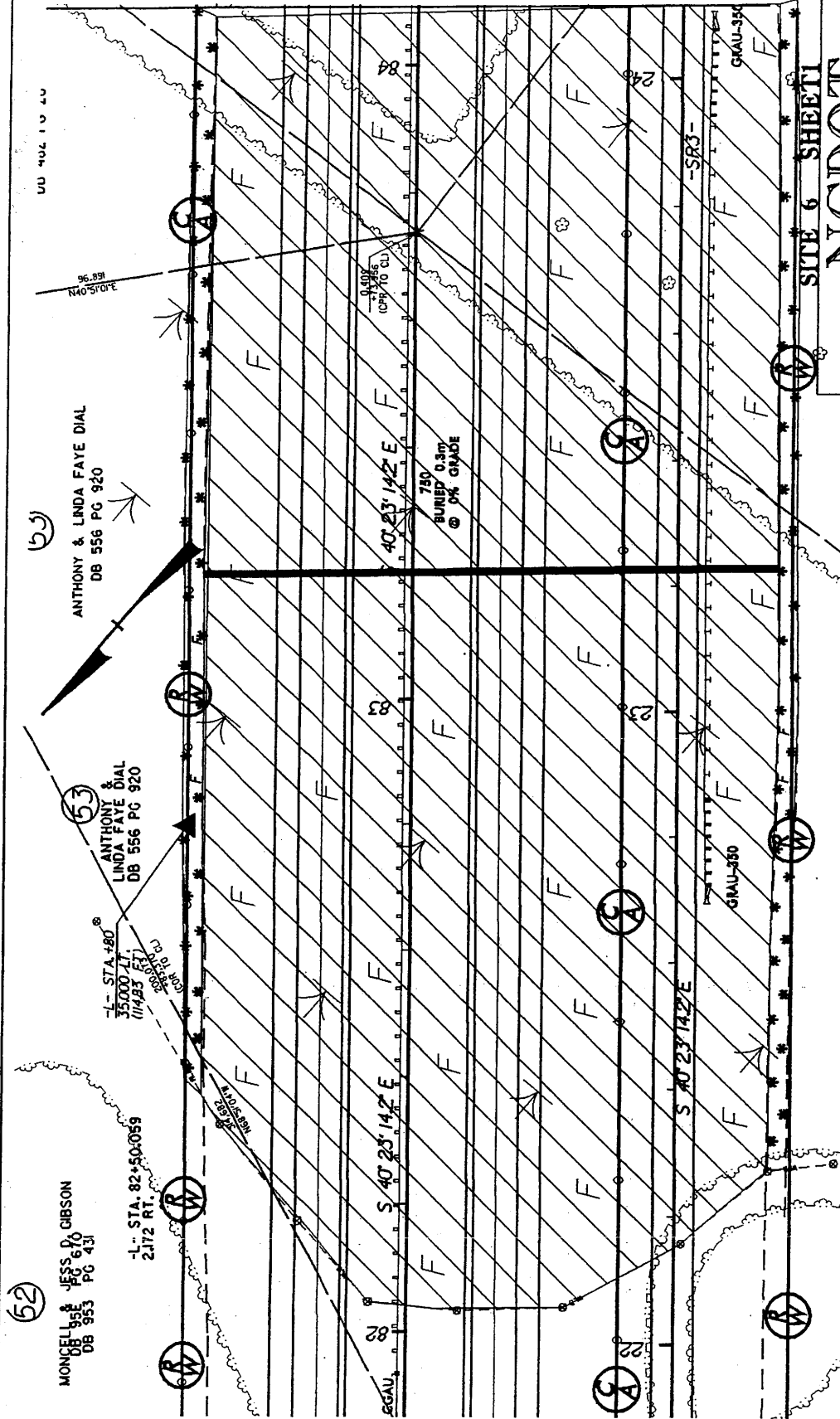
DENOTES FILL IN SURFACE WATER.

10 0 20



SCALE (METERS)

MATCH SITE 6 SHEET 2



(52) MONCELL & JESS D. GIBSON
DB 953 PG 431

L- STA. 82+50.059
2,172 FT.

L- STA. 80+35000 FT.
(114.83 FT.)

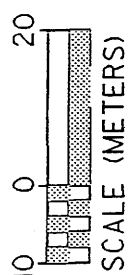
(53) ANTHONY & LINDA FAYE DIAL
DB 556 PG 920

(53) ANTHONY & LINDA FAYE DIAL
DB 556 PG 920

750' BUNDED 0.3m @ 0% GRADE

F DENOTES FILL IN WETLAND

***** DENOTES MECHANIZED CLEARING



PLAN VIEW
SITE 6

SITE 6 SHEET 1

NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 6.469002T (R-513A)

US 74 FROM MAXTON BY-PASS

TO EAST OF SR 1166

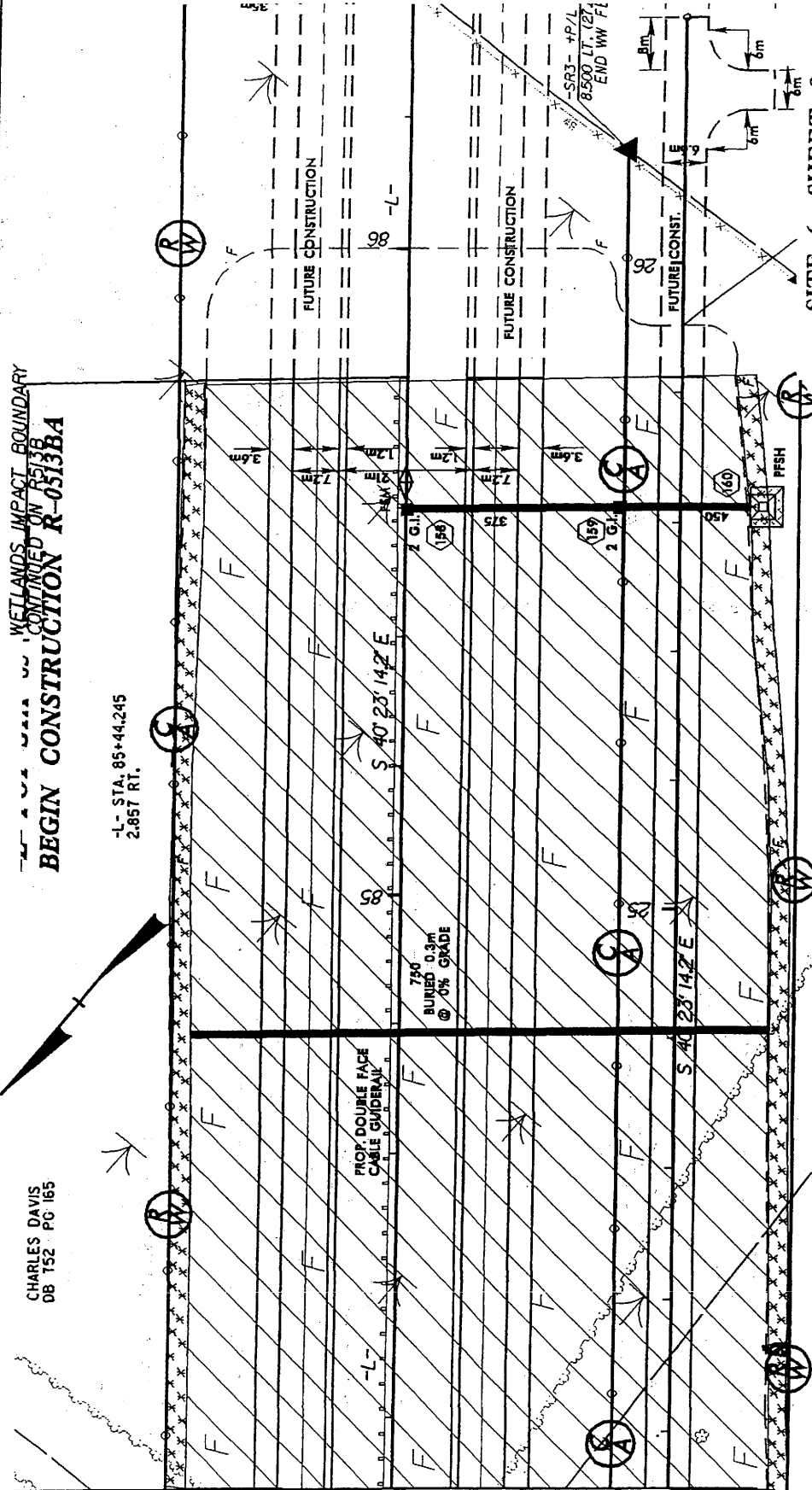
Rev. 2/12/04

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CHARLES DAVIS
DB 152 PG 165

WETLANDS IMPACT BOUNDARY
CONTINUED ON R-513B
BEGIN CONSTRUCTION R-0513BA

-L- STA. 85+44.245
2.857 RT.



MATCH SITE 6 SHEET 1

SITE 6 SHEET 2

NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 6.469002T1 (R-513A)

US 74 FROM MAXTON BY-PASS



TO EAST OF SR 1166

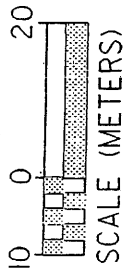
Rev. 2/13/04

SHEET 12 OF 15

09/19/03

PLAN VIEW
SITE 6

-  DENOTES FILL WETLAND
-  DENOTES MECHANIZED CLEARING



IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size	WETLAND IMPACTS				SURFACE WATER IMPACTS				DITCH IMPACTS			
			Fill In Wetlands (ac)	Temp. Fill In Wetland (ac)	Excavation In Wetlands (ac)	Mech Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Relocated Channel (ft)	Enclosed Channel (ft)	Boussinesq Equation (ac)	
1	13+00 TO 16+60 -L-	1650mm	0.14		0.23		0.39					1715	230	0.87
2	13+60 TO 14+20 RPB1	900mm							NON-JURISDICTIONAL STREAM					
3	28+10 -L-								0.06					
4	33+38 to 33+75		1.01						0.01					
5	12+78 Rp 'B'		0.02									164	79	
6	12+42 -Y2-	2 - 2.4m x 2.1m					0.07							
	82+00 TO 85+50		8.01						0.53					
	-L-													
PEE DEE RIVER BASIN (LUMBER RIVER) NO BUFFER REGULATIONS														
TOTALS			9.18	0	0.23	0.60	0.46	0	0	0	1879	0	308	0.87

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

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Rev 3/2004

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PROPERTY OWNER

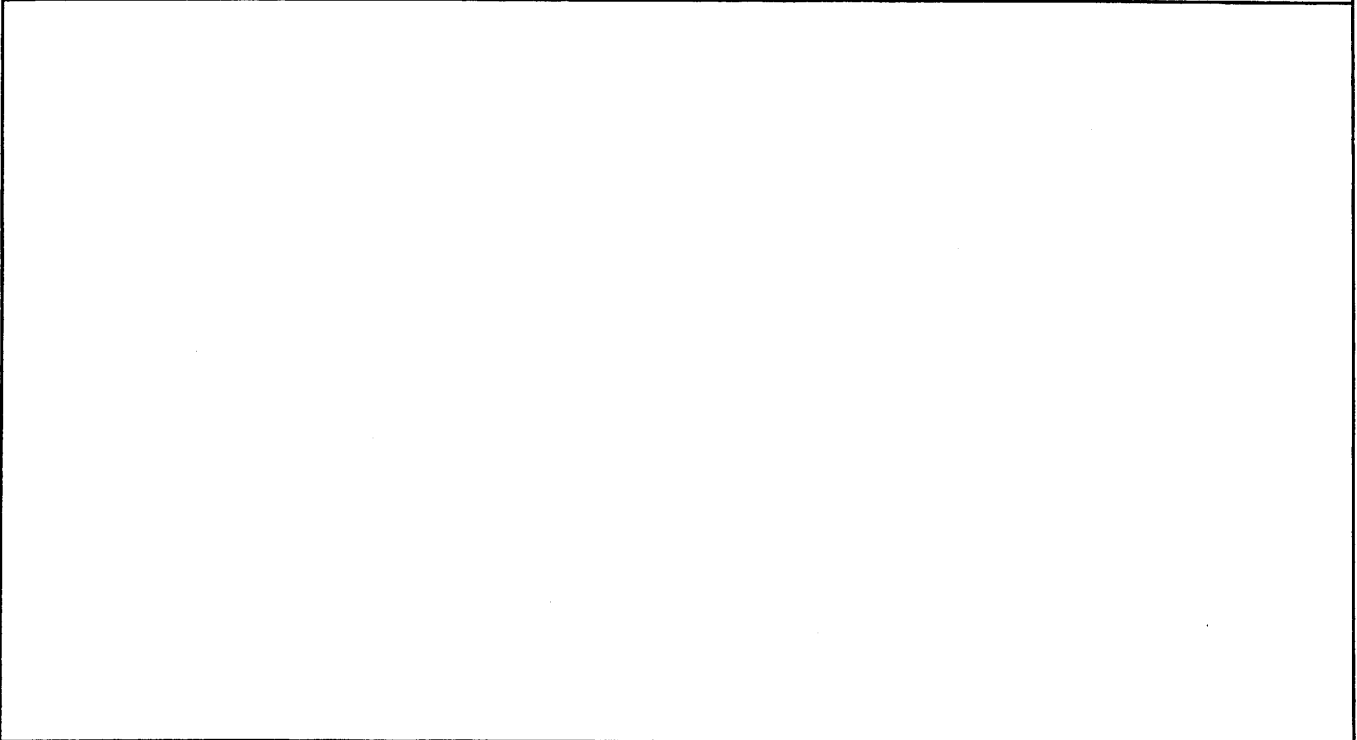
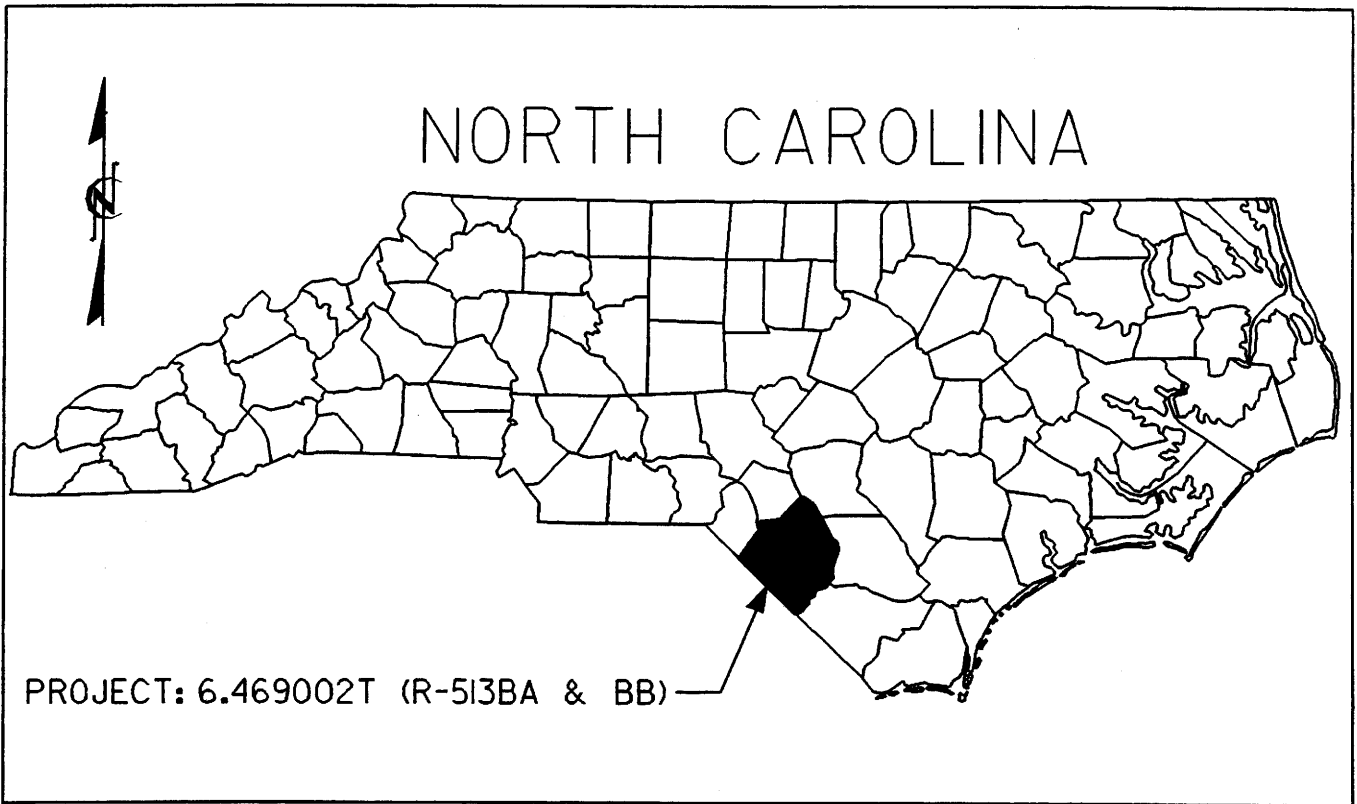
SITE	PARCEL	OWNER'S NAME	ADDRESS
1	1	A. F. HORNE, Jr	202 US 74 Bus. W Maxton, NC 28364
	2, 4	MARY H. HORNE	Rt. 4 Box 10 Maxton, NC 28364
	3	COY C. HORNE	Rt. 4 Box 10 Maxton, NC 28364
3	1	EAST MAXTON FARMS INC	P.O. Box 310308 Columbia, SC 29221
	2	DANIEL VICTOR McALLUM	P.O. Box 205 Rockwell, NC 28138
4	3	ALEX STRICKLAND	754 Cabinet Shop Rd Maxton, NC 28364
5	7	CLINT HOWARD HUNT	Rt 4 Box 47 Maxton, NC 28364
	8	KIMBERLY L. HUNT	Rt 4 Box 47 Maxton, NC 28364
	9	SENDORIAL C. CHAVIS	Rt 2 Box 80A Pembroke, NC 28372
6	53	ANTHONY & LINDA FAYE DIAL CHARLES DAVIS	1766 Gaddys Mill Rd. Rowland, NC 283834 Rt 34 Box 80 149 Neelson Rd. Maxton, NC 28364

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 6.469002 - R-513 A

US 74 FROM MAXTON BY-PASS
TO EAST OF SR 1166



VICINITY
MAP

NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 6.469002T (R-513BA
MAXTON-LUMBERTON
US 74 FROM EAST OF SR 1166
TO WEST OF SR 1164
SHEET 1 OF 23 **9/18/03**

NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

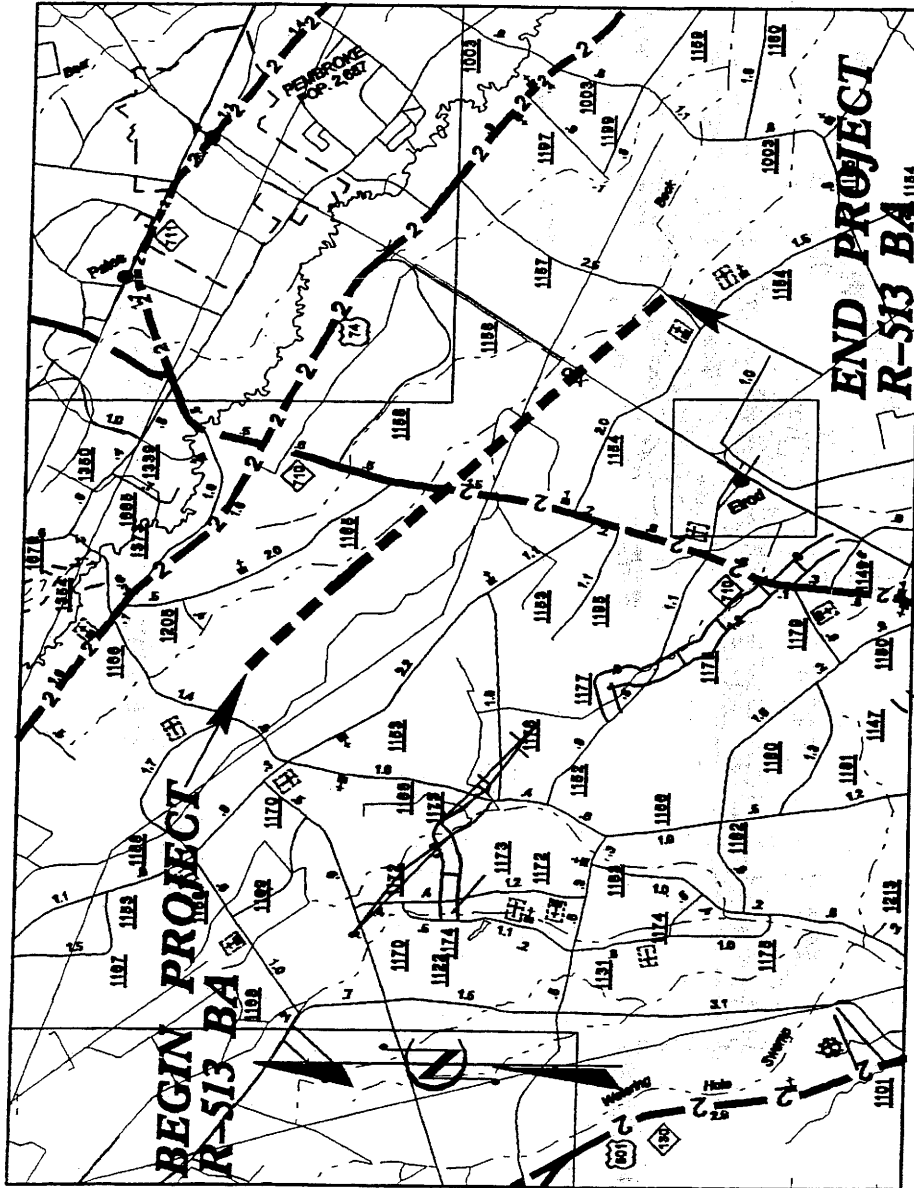
PROJECT: 6.469002T (R-513BA)

MAXTON-LUMBERTON

US 74 FROM EAST OF SR 1166


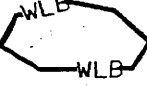
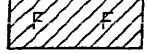


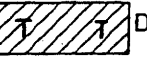
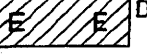



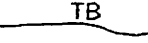
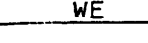
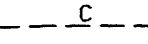
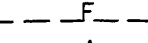

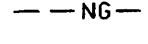
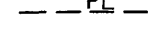

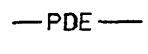


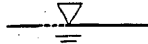
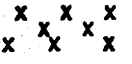


TO WEST OF SR 1157

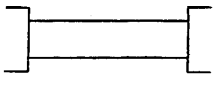
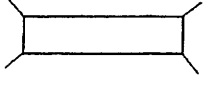

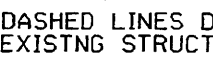
SHEET 2 OF 23 9/18/03


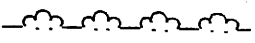
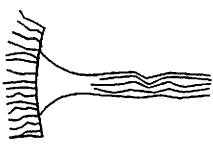
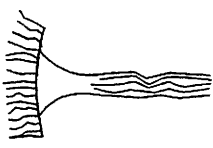





VICINITY MAP

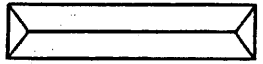
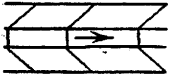
WETLAND LEGEND

-  WETLAND BOUNDARY
-  WETLAND
-  DENOTES FILL IN WETLAND
-  DENOTES FILL IN SURFACE WATER
-  DENOTES FILL IN SURFACE WATER (POND)
-  DENOTES TEMPORARY FILL IN WETLAND
-  DENOTES EXCAVATION IN WETLAND
-  DENOTES TEMPORARY FILL IN SURFACE WATER
-  DENOTES MECHANIZED CLEARING
-  FLOW DIRECTION
-  TOP OF BANK
-  EDGE OF WATER
-  PROP. LIMIT OF CUT
-  PROP. LIMIT OF FILL
-  PROP. RIGHT OF WAY
-  NATURAL GROUND
-  PROPERTY LINE
-  TEMP. DRAINAGE EASEMENT
-  PERMANENT DRAINAGE EASEMENT
-  EXIST. ENDANGERED ANIMAL BOUNDARY
-  EXIST. ENDANGERED PLANT BOUNDARY
-  WATER SURFACE
-  LIVE STAKES
-  BOULDER
-  CORE FIBER ROLLS

-  PROPOSED BRIDGE
-  PROPOSED BOX CULVERT
-  PROPOSED PIPE CULVERT
12"-48" PIPES
54" PIPES & ABOVE
-  (DASHED LINES DENOTE EXISTING STRUCTURES)

-  SINGLE TREE
-  WOODS LINE
-  DRAINAGE INLET
-  ROOTWAD

-  RIP RAP
-  ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE
-  PREFORMED SCOUR HOLE

-  LEVEL SPREADER (LS)
-  DITCH / GRASS SWALE

NCDOT
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT: 6.469002T (R-513BA)
 MAXTON-LUMBERTON
 US 74 FROM EAST OF SR 1166
 TO WEST OF SR 1157

NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 6.469002T (R-513BA)

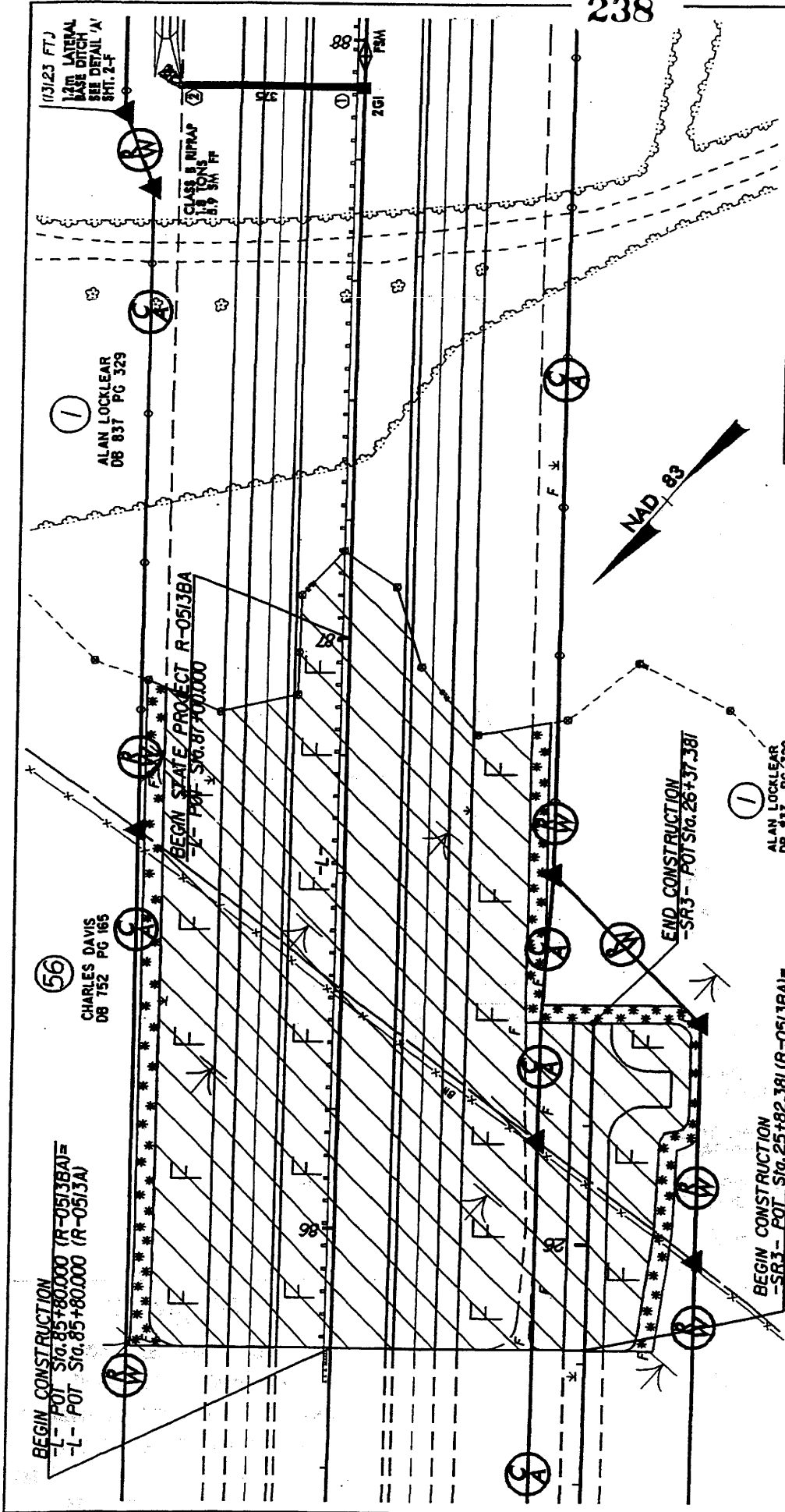
MAXTON-LUMBERTON

US 74 FROM EAST OF SR 1166

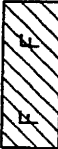

TO WEST OF SR 1157

SHEET OF 23

9/18/03

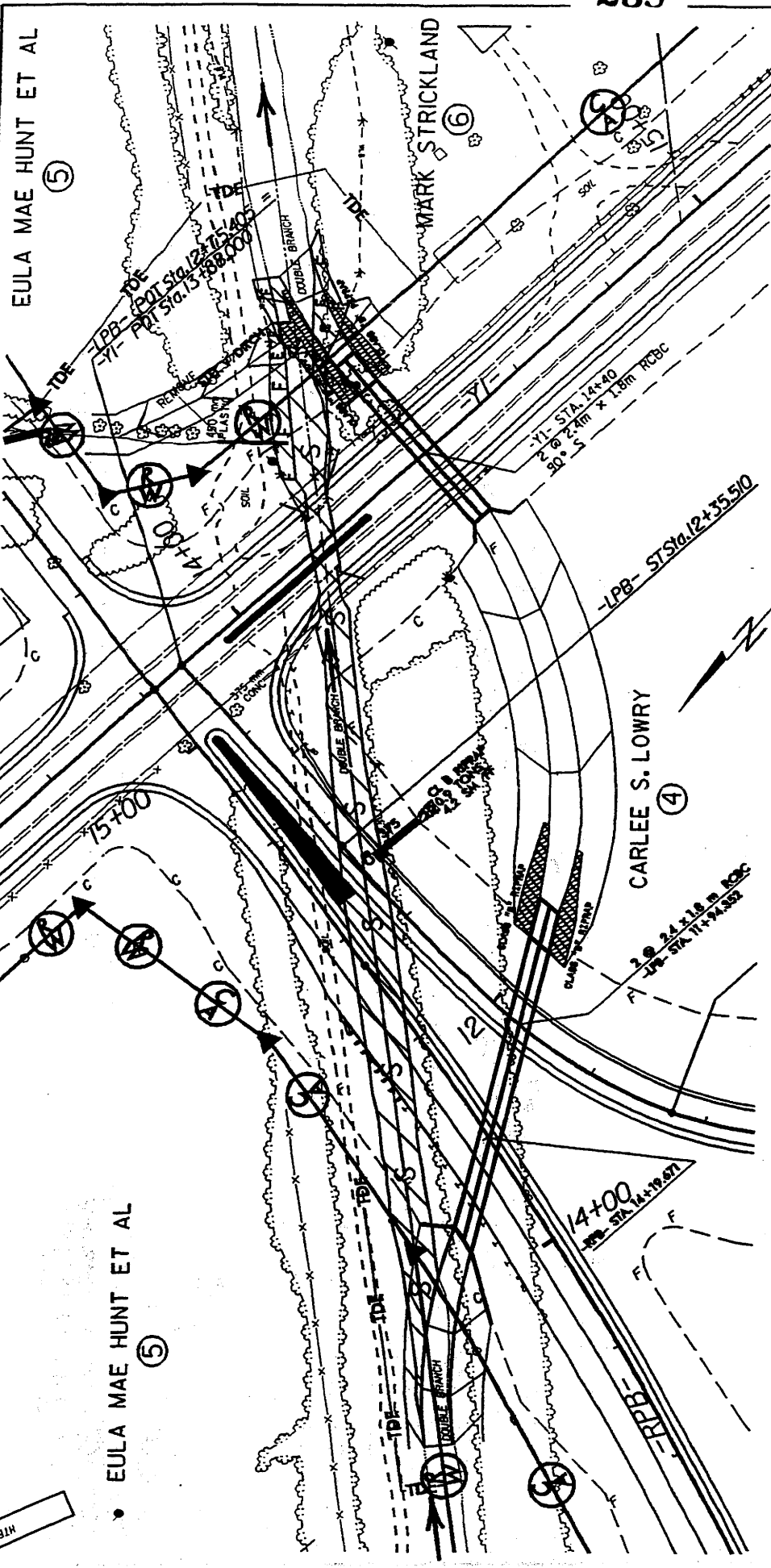


PLAN VIEW
SITE # 1

-  DENOTES FILL IN WETLAND
-  DENOTES MECHANIZED CLEARING



EULA MAE HUNT ET AL



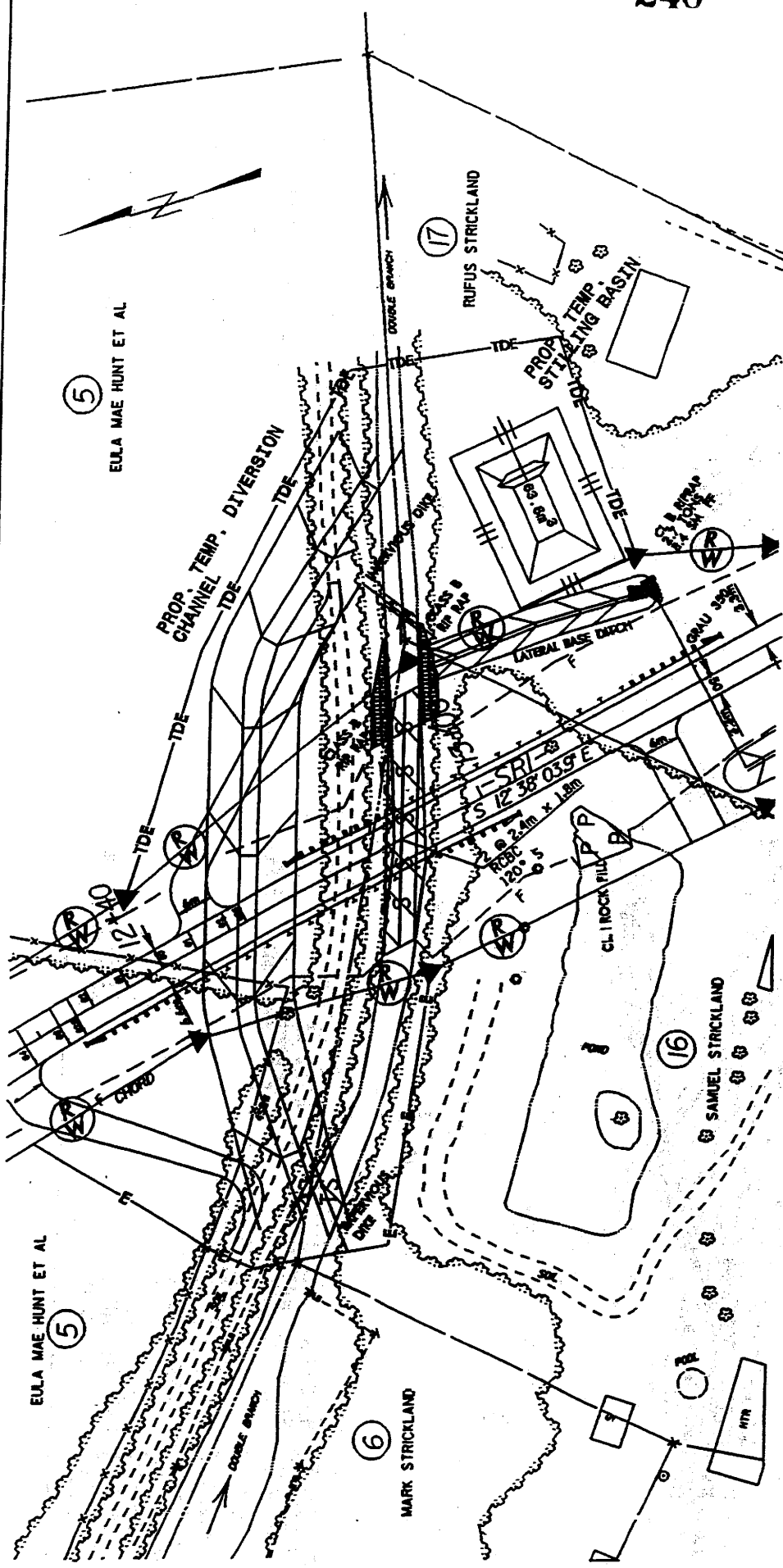
NCDOT
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT: 6.469002T (R-513BA)
 MAXTON-LUMBERTON
 US 74 FROM EAST OF SR 1166
 TO WEST OF SR 1157
 SHEET 6 OF 23 9/18/03

PLAN VIEW
SITE # 1A

- DENOTES FILL IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING








HORIZONTAL SCALE



NCDOT
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT: 6.469002T (R-513BA)
 MAXTON-LUMBERTON
 US 74 FROM EAST OF SR 1166
 TO WEST OF SR 1157
 SHEET 7 OF 23 9/18/03

**PLAN VIEW
 SITE # 2**



-  DENOTES FILL IN SURFACE WATER (POND)
-  DENOTES FILL IN SURFACE WATER
-  DENOTES TEMPORARY FILL IN SURFACE WATER
-  DENOTES EXCAVATION IN WETLAND
-  DENOTES TEMPORARY FILL IN WETLAND

STA. 12 + 86.5 -SR1- CULVERT CONSTRUCTION SEQUENCE



CONST.REV.

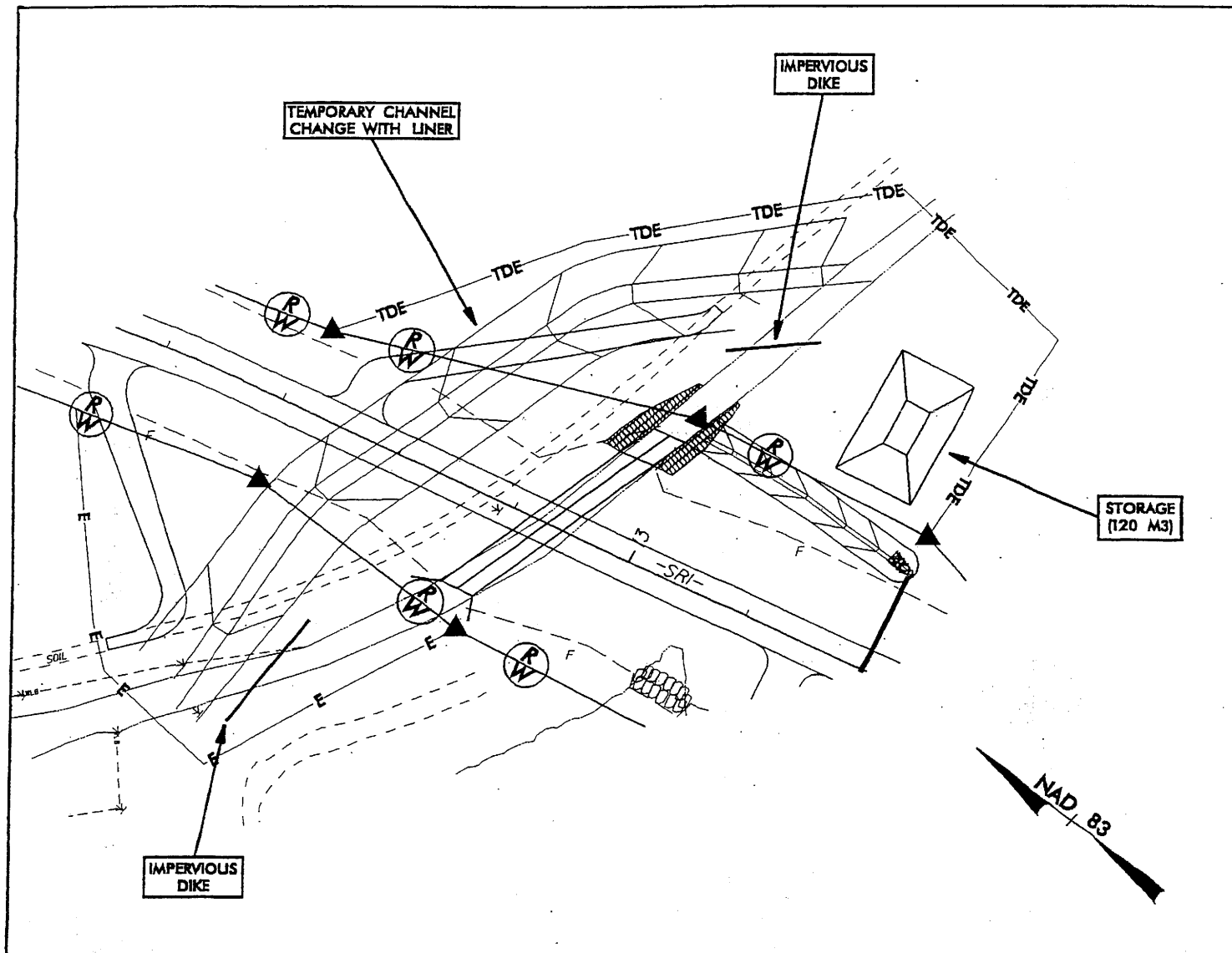
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PROJECT REFERENCE NO.

SHEET NO.

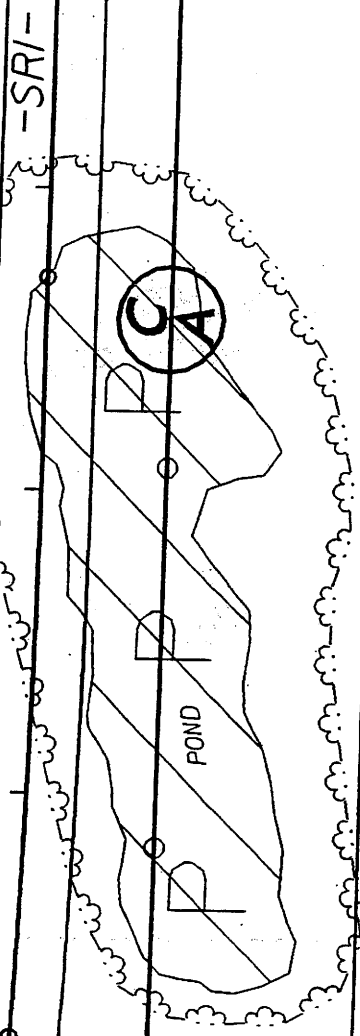
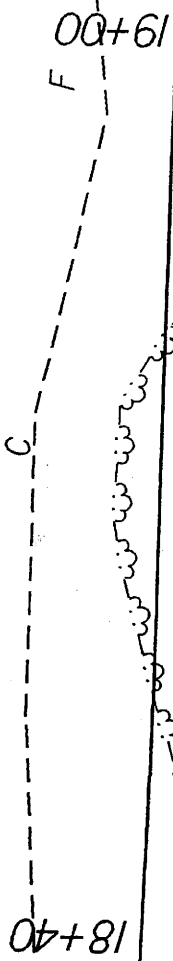
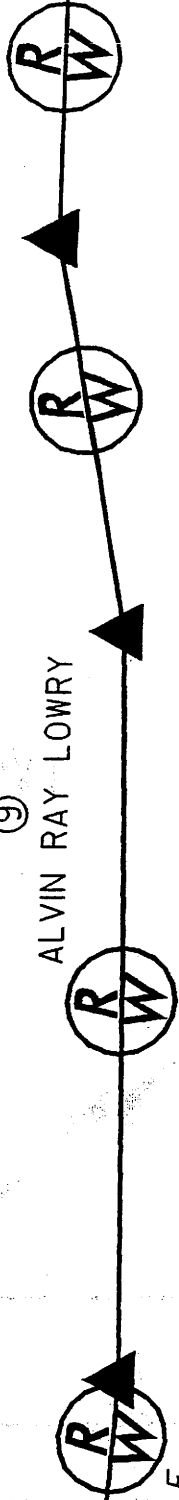
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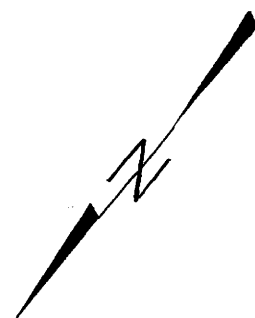
ROADWAY DESIGN
ENGINEERHYDRAULICS
ENGINEER

1. CONSTRUCT STILLING BASIN (120 M3).
2. CONSTRUCT TEMPORARY CHANNEL CHANGE WITH LINER (3:1 SIDE SLOPES, 2M BASE, 1.5M DEEP).
3. CONSTRUCT IMPERVIOUS DIKES, DIVERTING FLOW THROUGH TEMPORARY CHANNEL CHANGE.
4. CONSTRUCT CULVERT.
5. CONSTRUCT ANY NECESSARY CHANNEL IMPROVEMENTS AND DIVERT FLOW THROUGH CULVERT.
6. COMPLETE ROADWAY.

⑨
ALVIN RAY LOWRY



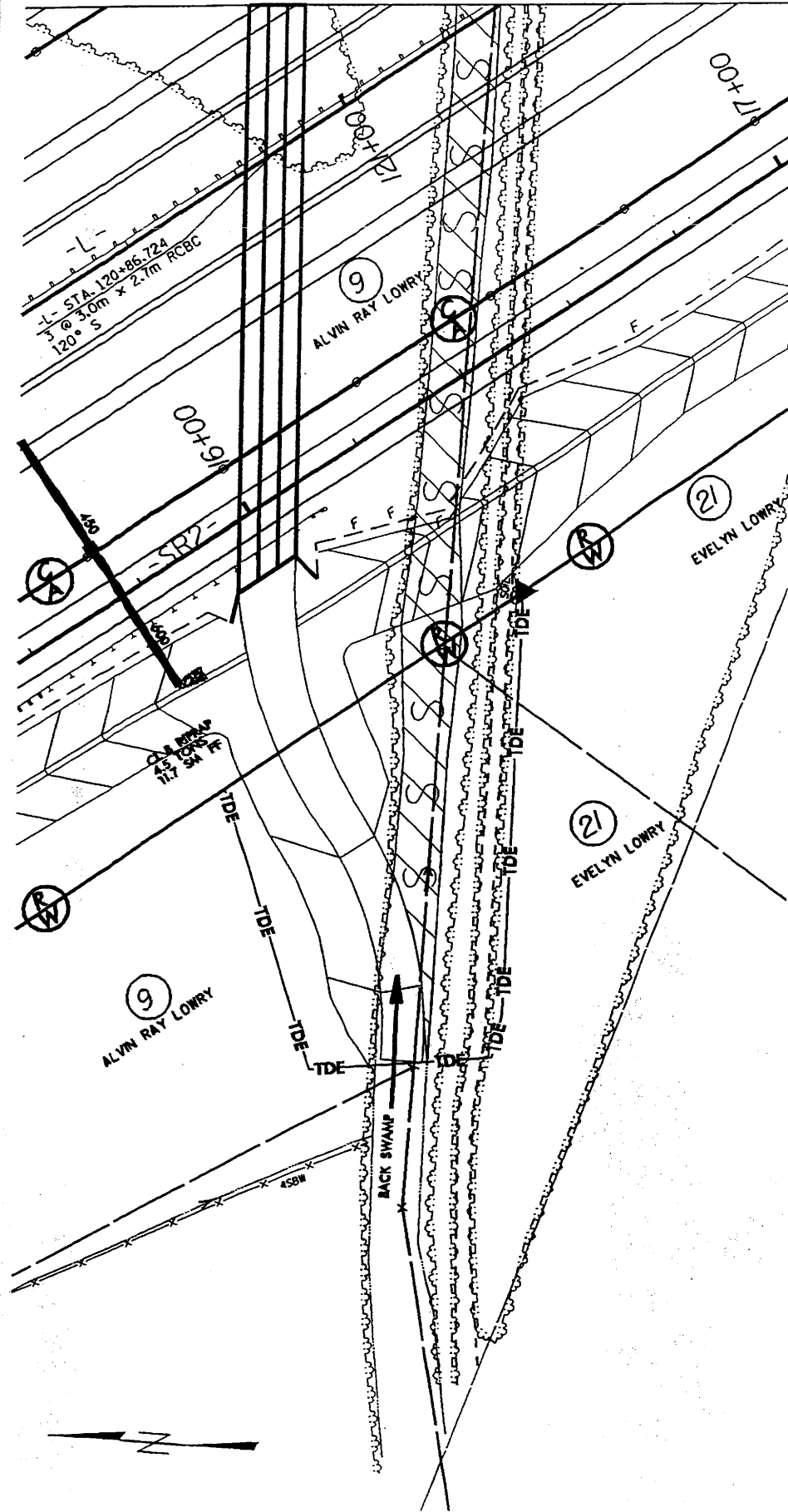
PLAN VIEW
SITE # 3



 DENOTES FILL IN
 SURFACE WATER
 (POND)

HORIZONTAL SCALE

NCDOT
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT: 6.469002T (R-513BA)
 MAXTON-LUMBERTON
 US 74 FROM EAST OF SR 1166
 TO WEST OF SR 1157
 SHEET ? OF 23 9/18/03



NCDOT
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT: 6.469002T (R-513BA)
 MAXTON-LUMBERTON
 US 74 FROM EAST OF SR 1166
 TO WEST OF SR 1157
 SHEET 10 OF 23 9/18/03

**PLAN VIEW
 SITE # 4**

DENOTES FILL IN
 SURFACE WATER



HORIZONTAL SCALE

NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 6.469002T (R-513BA)

MAXTON-LUMBERTON

US 74 FROM EAST OF SR 1166

TO WEST OF SR 1157

SHEET 11 OF 23 9/18/03

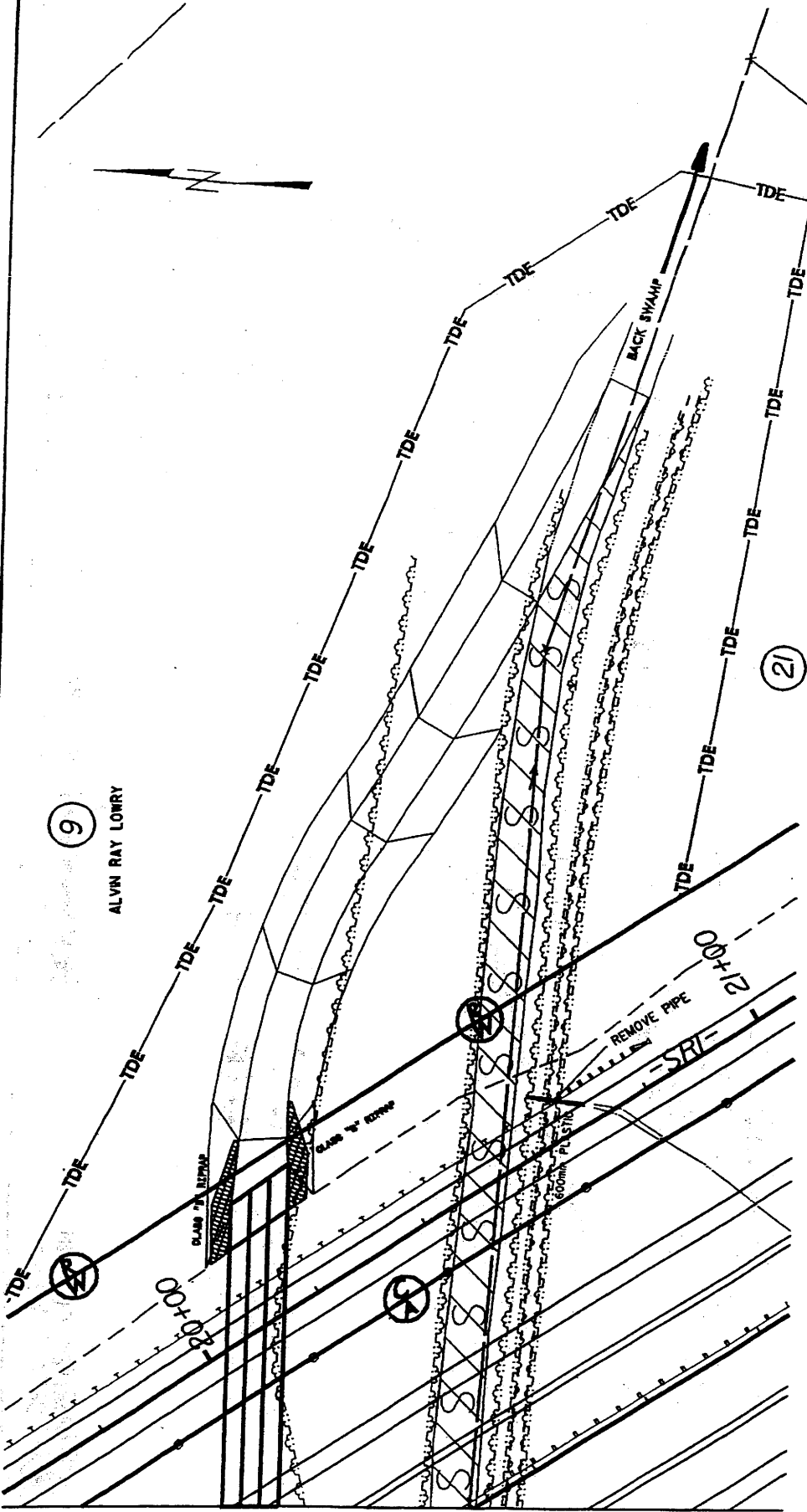
PLAN VIEW
SITE # 4

□ DENOTES FILL IN
□ SURFACE WATER



HORIZONTAL SCALE

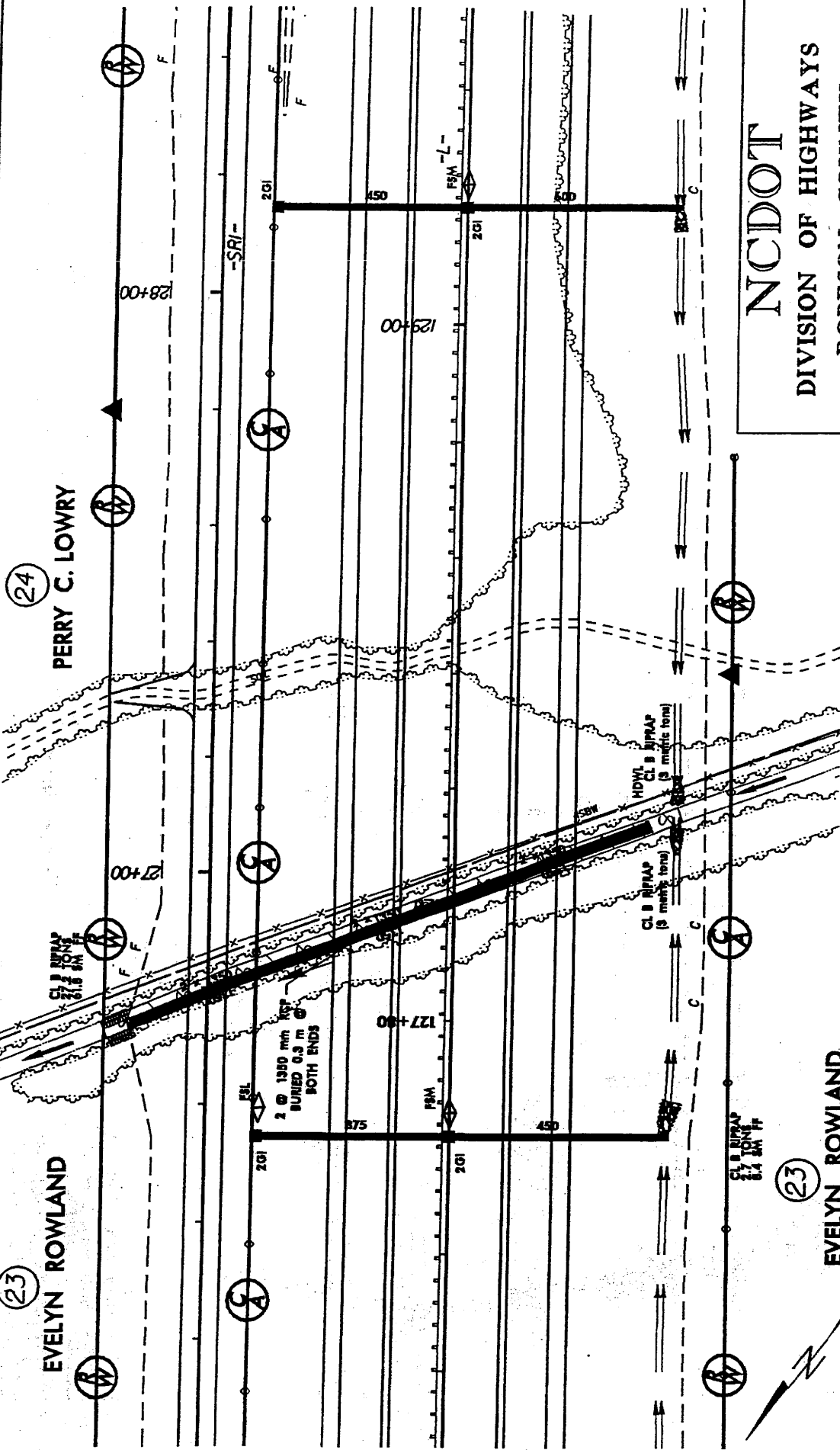
EVELYN LOWRY



MATCH LINE A - A

9

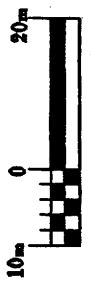
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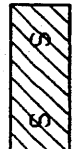
NCDOT
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT: 6-469002T (R-513BA)
 MAXTON-LUMBERTON
 US 74 FROM EAST OF SR 1166
 TO WEST OF SR 1157
 SHEET / 2 OF 23 9 / 18 / 03

PLAN VIEW
SITE # 5
 PERRY C. LOWRY

HORIZONTAL SCALE



DENOTES FILL IN
 SURFACE WATER



NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

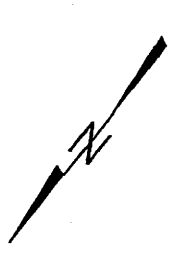
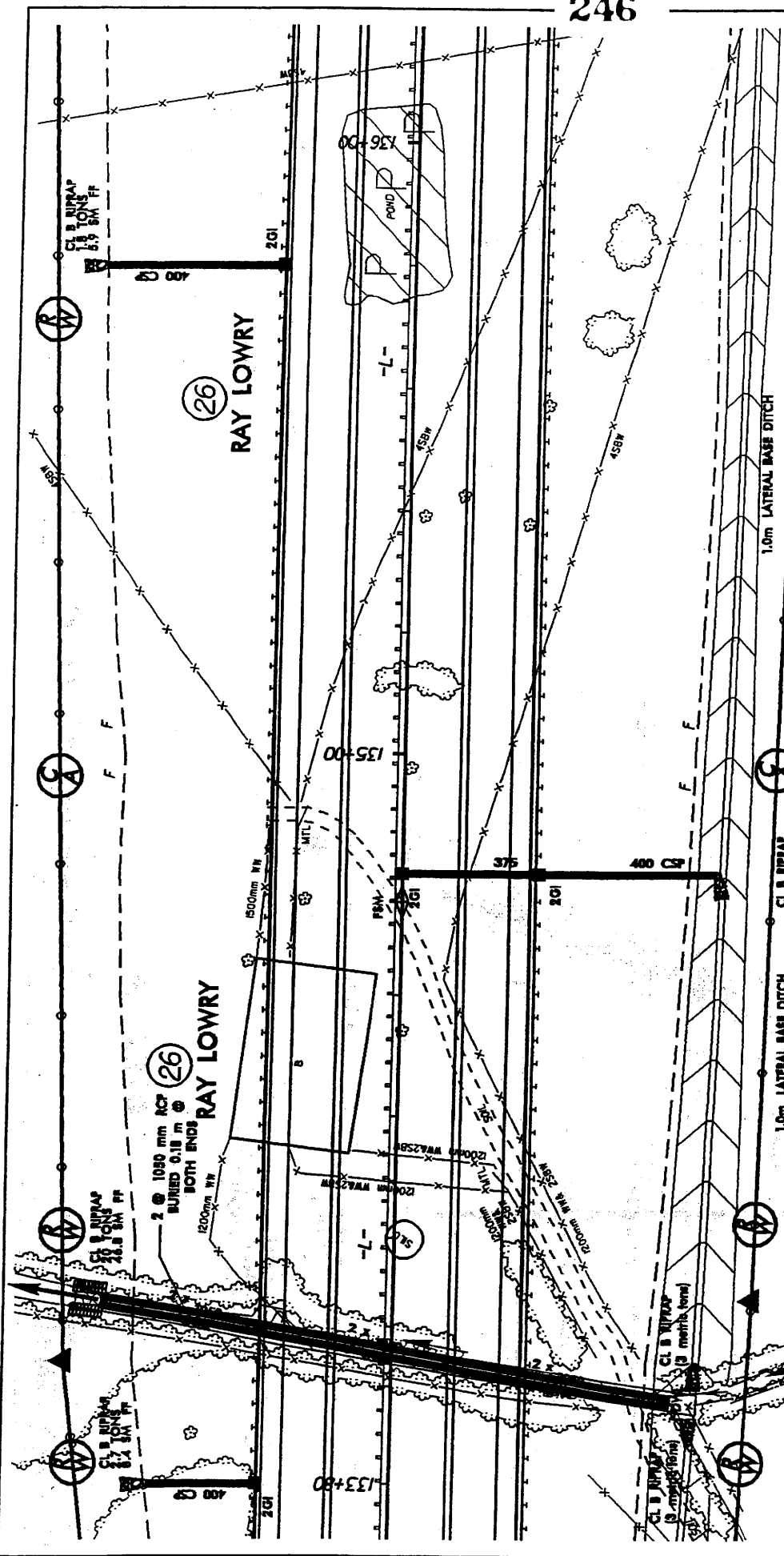
PROJECT: 6.469002T (R-513BA)

MAXTON-LUMBERTON

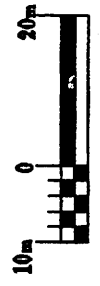
US 74 FROM EAST OF SR 1166

TO WEST OF SR 1157

SHEET 1/3 OF 23 9/18/03




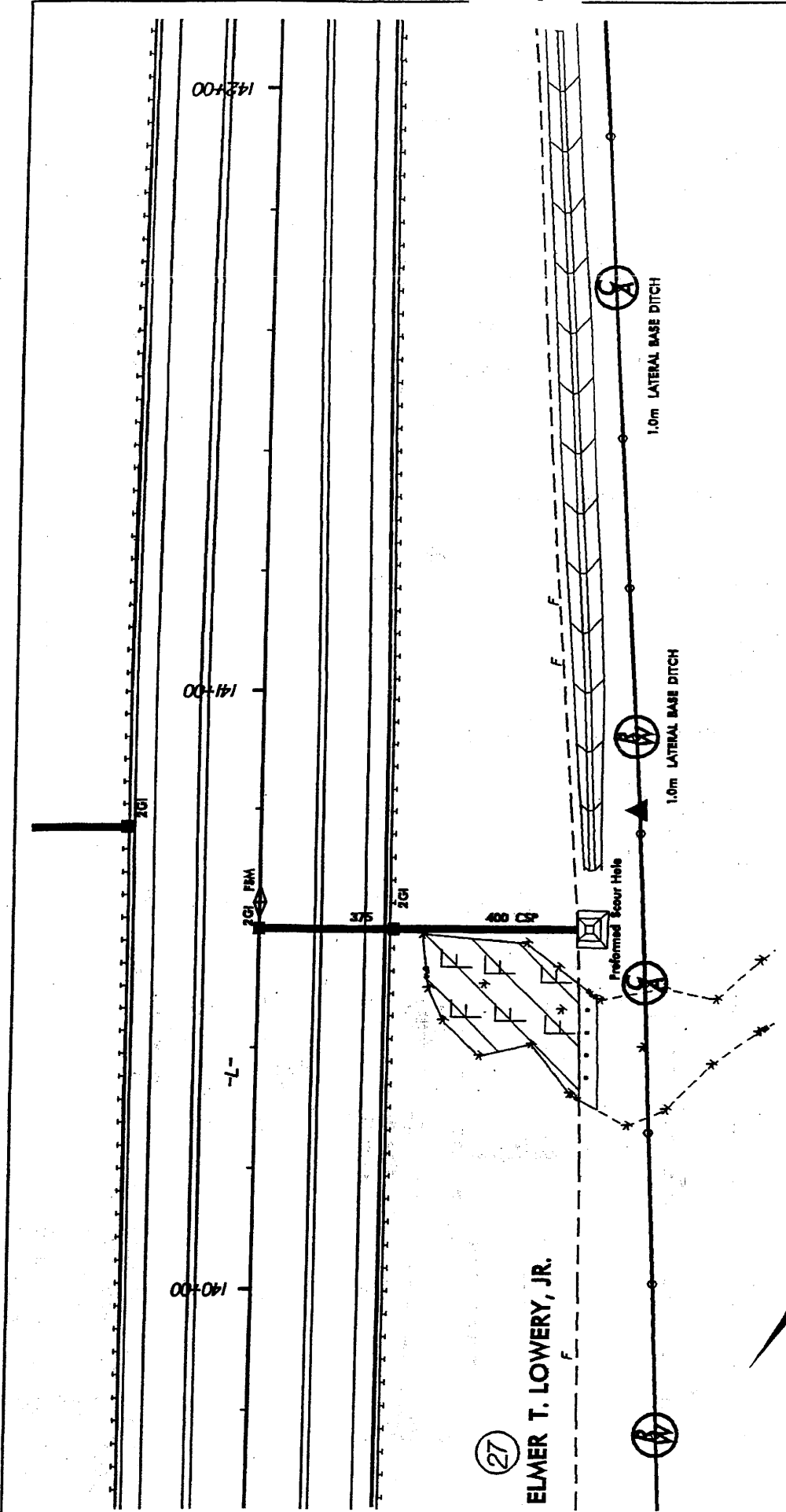
RAY LOWRY
 PLAN VIEW
 SITE # 6



HORIZONTAL SCALE

 DENOTES FILL IN SURFACE WATER (POND)

 DENOTES FILL IN SURFACE WATER



(27)

ELMER T. LOWERY, JR.

PLAN VIEW SITE # 7

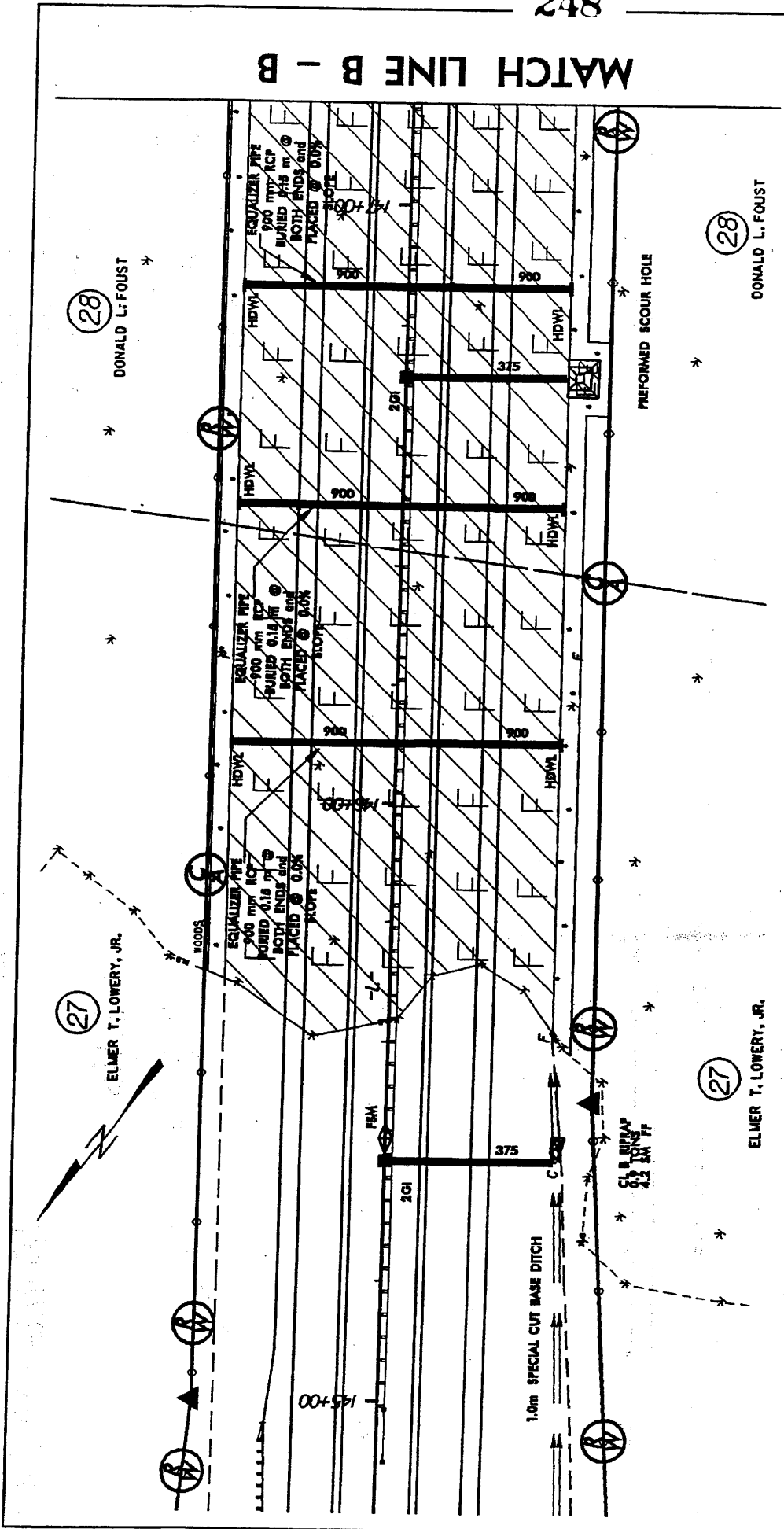
-  DENOTES FILL IN WETLAND
-  DENOTES MECHANIZED CLEARING





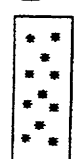
HORIZONTAL SCALE

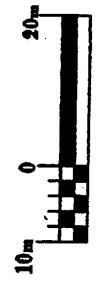
NCDOT
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT: 6.469002T (R-513BA)
 MAXTON-LUMBERTON
 US 74 FROM EAST OF SR 1166
 TO WEST OF SR 1157
 SHEET 14 OF 23 9/18/03

MATCH LINE B - B



PLAN VIEW
SITE # 8

-  DENOTES FILL IN WETLAND
-  DENOTES EXCAVATION IN WETLAND
-  DENOTES MECHANIZED CLEARING



HORIZONTAL SCALE

NCDOT
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT: 6.469002T (R-513BA)
 MAXTON-LUMBERTON
 US 74 FRPM EAST OF SR 1166
 TO WEST OF SR 1157

SHEET 15 OF 23 9/18/03

NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 6.469002T (R-513BA)

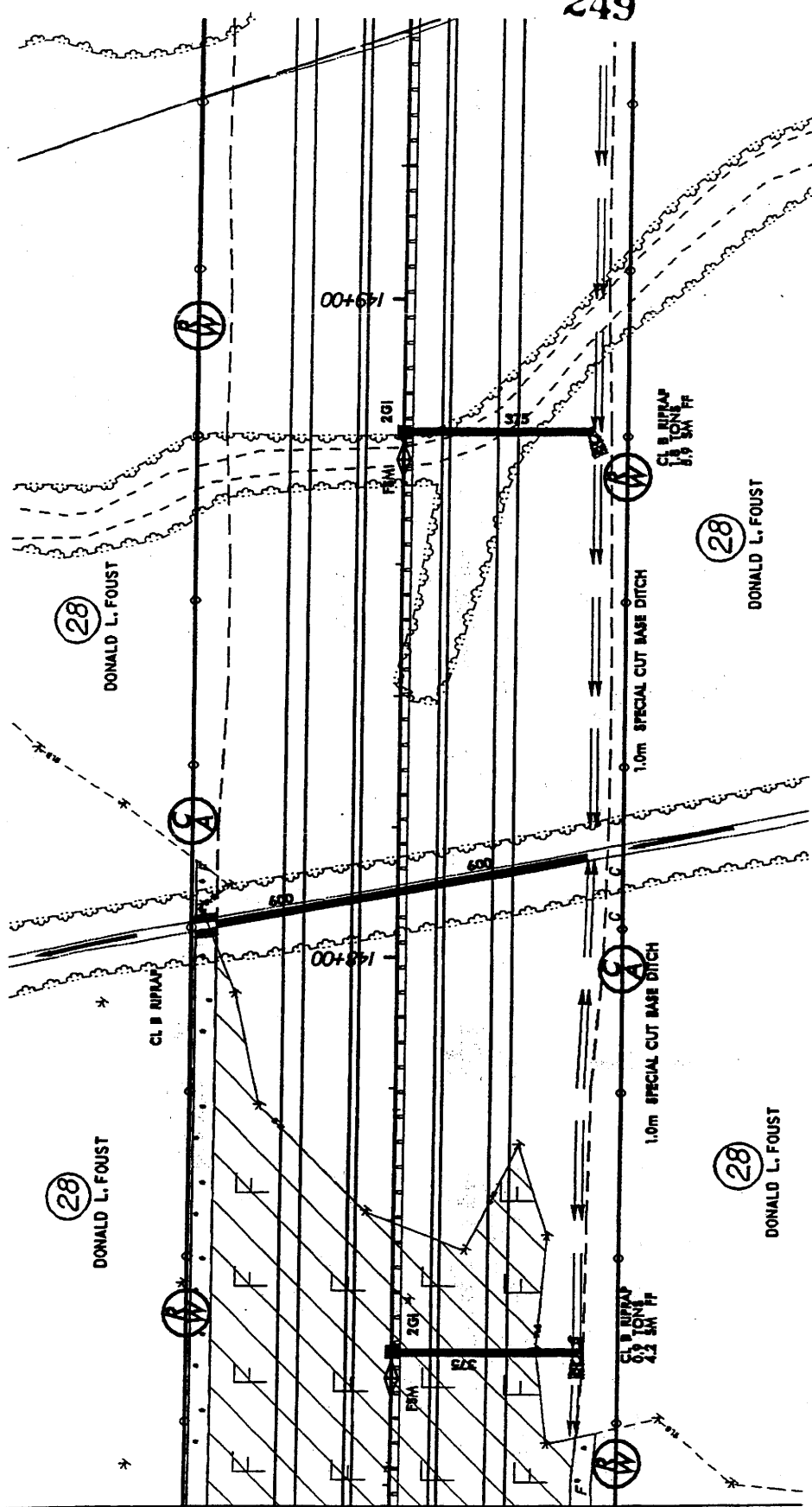
MAXTON-LUMBERTON

US 74 FROM EAST OF SR 1166



TO WEST OF SR 1157

SHEET 16 OF 23

9/18/03



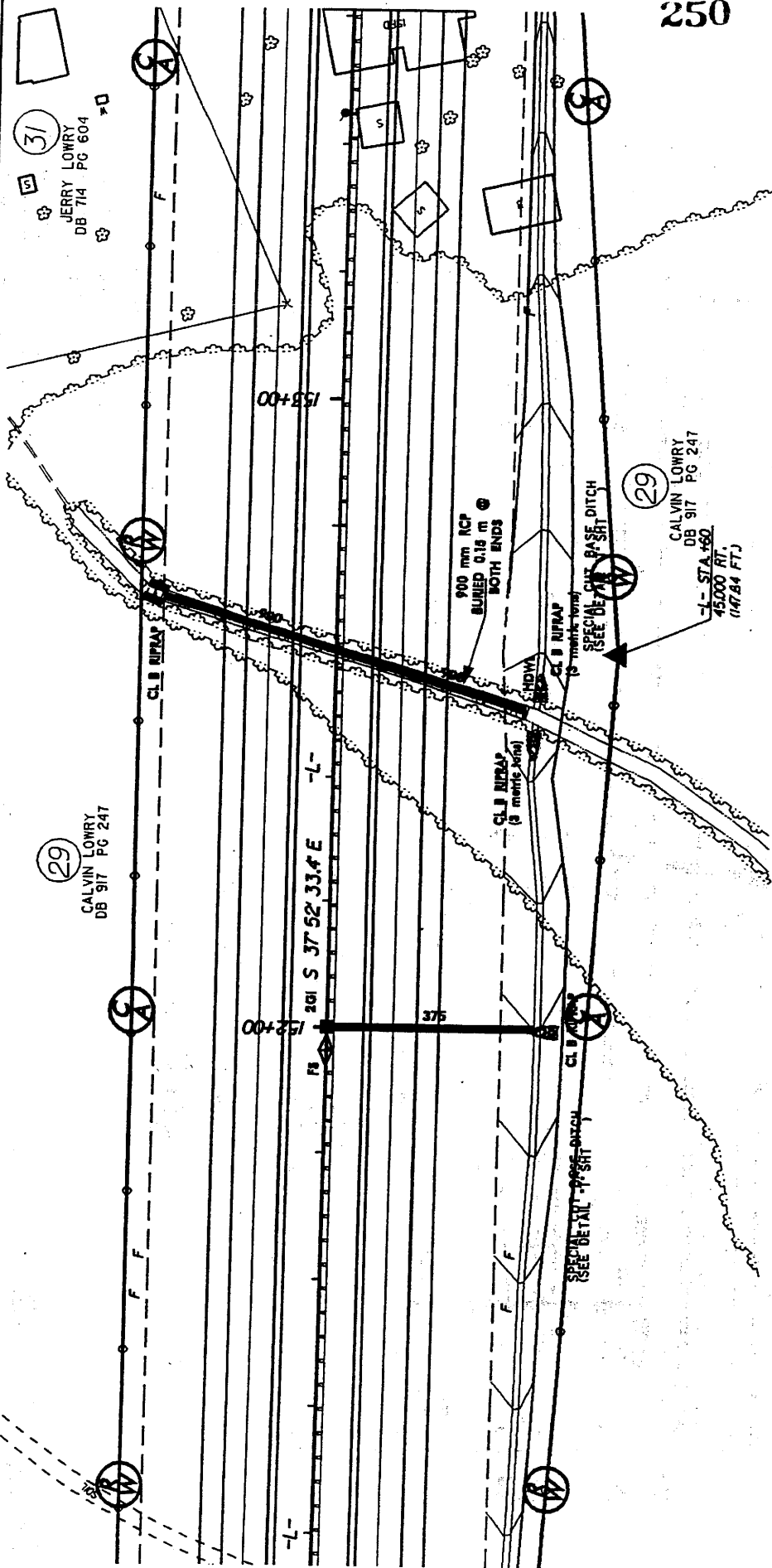
PLAN VIEW
SITE # 8

-  DENOTES FILL IN WETLAND
-  DENOTES MECHANIZED CLEARING



HORIZONTAL SCALE

NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 6.469002T (R-513BA)
MAXTON-LUMBERTON
US 74 FROM EAST OF SR 1166
TO WEST OF SR 1157



31
 JERRY LOWRY
 DB 714 PG 604

29
 CALVIN LOWRY
 DB 917 PG 247

29
 CALVIN LOWRY
 DB 917 PG 247
 -L- STA +60
 45,000 FT.
 (13,714 FT.)

PLAN VIEW
SITE # 9



 DENOTES FILL IN
 SURFACE WATER

HORIZONTAL SCALE

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				Natural Stream Design (ft)		
			Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)			
1	85+80 to 87+14.77 -L-	NONE	2.009			0.18							
1A	14+19.67 -RPB- 14+40 -Y1-	2 @ 2.4 m. x 1.8 m. RCBC 2 @ 2.4 m. x 1.8 m. RCBC	0.03		0.012				0.24			640	
2	12+86 -SR1-	2 @ 2.4 m. x 1.8 m. RCBC		0.002	0.002				0.049	0.015	0.017	135	
3	18+28 to 18+78 -SR1-	POND								0.133			
4	120+86 -L-	3 @ 3.0 m. x 2.7 m. RCBC							0.524			1132	
5	128+01 -L-	2 @ 1050 mm RCP							0.082			341	
6	134+00 to 136+00 -L-	2 @ 900 mm RCP and POND							0.079	0.126		338	
7	140+30 to 140+60 -L-	NONE	0.109			0.015							
8	145+58 to 148+15 -L-	3 @ 750 mm and 600 mm	2.265		0.007	0.304							
TOTALS:			4.413	0.002	0.021	0.499	0.974	0.274	0.017	2586	0		

NCDOT

DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT 6.469002T (R-513BA)
 MAXTON-LUMBERTON
 US 74 FROM EAST OF SR 1166
 TO WEST OF SR 1157

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				Natural Stream Design (m)		
			Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation In Wetlands (ha)	Mechanized Clearing (Method III) (ha)	Fill In SW (Natural) (ha)	Fill In SW (Pond) (ha)	Temp. Fill In SW (ha)	Existing Channel Impacted (m)			
1	85+80 to 87+14.77 -L-	NONE	0.813			0.073							
1A	14+19.67 -RPB- 14+40 -Y1-	2 @ 2.4 m. x 1.8 m. RCBC 2 @ 2.4 m. x 1.8 m. RCBC	0.012		0.005			0.097			195		
2	12+86 -SR1-	2 @ 2.4 m. x 1.8 m. RCBC		0.001	0.001			0.02	0.006	0.007	41		
3	18+28 to 18+78 -SR1-	POND							0.054				
4	120+86 -L-	3 @ 3.0 m. x 2.7 m. RCBC						0.212			345		
5	128+01 -L-	2 @ 1050 mm RCP						0.033			104		
6	134+00 to 136+00 -L-	2 @ 900 mm RCP and POND						0.032	0.051		103		
7	140+30 to 140+60 -L-	NONE	0.044			0.006							
8	145+58 to 148+15 -L-	3 @ 750 mm and 600 mm	0.917		0.003	0.123							
TOTALS:			1.786	0.001	0.009	0.202	0.394	0.111	0.007	788	0		

NCDOT

DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT 6.469002T (R-513BA)
 MAXTON-LUMBERTON
 US 74 FROM EAST OF SR 1166
 TO WEST OF SR 1157

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
56	CHARLEA DAVIS	149 NELSON DR. MAXTON, NC 28364
1	ALAN LOCKLEAR	1306 OLD BAKER RD. MAXTON, NC 28364
4	CARLEE S. LOWRY	2252 HENRY BERRY RD. ROWLAND, NC 28383
5	EULA MAE HUNT, ET AL	1217 NC HWY 710 S. ROWLAND, NC 28383
6	MARK STRICKLAND	1457 NC HWY 710 S. ROWLAND, NC 28383
16	SAMUEL STRICKLAND	77 RUBY ROAD ROWLAND, NC 28383
17	RUFUS STRICKLAND	RT. 3 BOX 251 A1 ROWLAND, NC 28383
9	ALVIN RAY LOWRY	1565 NC HWY 710 S. ROWLAND, NC 28383
21	EVELYN LOWRY	2129 NC HWY 710 S. ROWLAND, NC 28383
23	EVELYN ROWLAND	7811 DOGWOOD TRAIL HAUGHTON, LA 71037
24	PERRY C. LOWRY	16620 MUSIC GROVE CT. ROCKVILLE, MD 20853
26	RAY LOWRY	1565 NC HWY 710 S. ROWLAND, NC 28383
27	ELMER T. LOWERY, JR.	RT. 3 BOX 137 ROWLAND, NC 28383
28	DONALD L. FOUST	3676 UNION SCHOOL ROAD ROWLAND, NC 28383

NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 6.469002T (R-513BA)

MAXTON-LUMBERTON

US 74 FROM EAST OF SR 1166

TO WEST OF SR 1157

SHEET 22 OF 23

9/18/03

STANDARD SPECIAL PROVISION

AVAILABILITY OF FUNDS - TERMINATION OF CONTRACTS

In accordance with G.S. 143.18.1 (6), Subsection (5) of G.S. 143-28.1 is hereby incorporated verbatim in this contract. G.S. 143-28.1(5) is as follows:

“(5). Amounts Obligated - Payments subject to the Availability of Funds - Termination of Contracts. Highway maintenance and construction appropriations may be obligated in the amount of allotments made to the Department of Transportation by the Office of State Budget and Management for the estimated payments for maintenance and construction contract work to be performed in the appropriation fiscal year. The allotments shall be multi-year allotments and shall be based on estimated revenues and shall be subject to the maximum contract authority contained in subdivision (2) above. Payment for highway maintenance and construction work performed pursuant to contract in any fiscal year other than the current fiscal year will be subject to appropriations by the General Assembly. Highway maintenance and construction contracts shall contain a schedule of estimated completion progress and any acceleration of this progress shall be subject to the approval of the Department of Transportation provided funds are available. The State reserves the right to terminate or suspend any highway maintenance or construction contract and any highway maintenance or construction contract shall be so terminated or suspended if funds will not be available for payment of the work to be performed during that fiscal year pursuant to the contract. In the event of termination of any contract, the contractor shall be given a written notice of termination at least 60 days before completion of schedule work for which funds are available. In the event of termination, the contractor shall be paid for the work already performed in accordance with the contract specifications”.

Payment will be made on any contract terminated pursuant to the special provision in accordance with Article 108-13, Item 5, of the North Carolina Department of Transportation Standard Specifications for Roads and Structures, dated January 1, 2002.

STANDARD SPECIAL PROVISIONS
(ENGLISH AND METRIC)
NCDOT GENERAL SEED SPECIFICATION FOR SEED QUALITY

Seed shall be sampled and tested by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory. When said samples are collected, the vendor shall supply an independent laboratory report for each lot to be tested. Results from seed so sampled shall be final. Seed not meeting the specifications shall be rejected by the Department of Transportation and shall not be delivered to North Carolina Department of Transportation warehouses. If seed has been delivered it shall be available for pickup and replacement at the supplier's expense.

Any relabeling required by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory, that would cause the label to reflect as otherwise specified herein shall be rejected by the North Carolina Department of Transportation.

Seed shall be free from seeds of the noxious weeds Johnsongrass, Balloonvine, Jimsonweed, Witchweed, Itchgrass, Serrated Tussock, Showy Crotalaria, Smooth Crotalaria, Sicklepod, Sandbur, Wild Onion, and Wild Garlic. Seed shall not be labeled with the above weed species on the seed analysis label. Tolerances as applied by the Association of Official Seed Analysts will NOT be allowed for the above noxious weeds except for Wild Onion and Wild Garlic.

Tolerances established by the Association of Official Seed Analysts will generally be recognized. However, for the purpose of figuring pure live seed, the found pure seed and found germination percentages as reported by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory will be used. Allowances, as established by the NCDOT, will be recognized for minimum pure live seed as listed on the following pages.

The specifications for restricted noxious weed seed refers to the number per pound as follows:

<u>Restricted Noxious Weed</u>	<u>Limitations per Lb. Of Seed</u>	<u>Restricted Noxious Weed</u>	<u>Limitations per Lb. of Seed</u>
Blessed Thistle	4 seeds	Bermudagrass	27 seeds
Cocklebur	4 seeds	Cornflower (Ragged Robin)	27 seeds
Spurred Anoda	4 seeds	Texas Panicum	27 seeds
Velvetleaf	4 seeds	Bracted Plantain	54 seeds
Morning-glory	8 seeds	Buckhorn Plantain	54 seeds
Corn Cockle	10 seeds	Broadleaf Dock	54 seeds
Wild Radish	12 seeds	Curly Dock	54 seeds
Purple Nutsedge	27 seeds	Dodder	54 seeds
Yellow Nutsedge	27 seeds	Giant Foxtail	54 seeds
Canada Thistle	27 seeds	Horsenettle	54 seeds
Field Bindweed	27 seeds	Quackgrass	54 seeds
Hedge Bindweed	27 seeds	Wild Mustard	54 seeds

Seed of Pensacola Bahiagrass shall not contain more than 7% inert matter, Kentucky Bluegrass and Fine or Hard Fescue shall not contain more than 5% inert matter whereas a maximum of 2% inert matter will be allowed on all other kinds of seed. In addition, all seed shall not contain more than 2% other crop seed nor more than 1% total weed seed. The germination rate as tested by the North Carolina Department of Agriculture shall not fall below 70%, which includes both dormant and hard seed. Seed shall be labeled with not more than 7%, 5% or 2% inert matter (according to above specifications), 2% other crop seed and 1% total weed seed.

Exceptions may be made for minimum pure live seed allowances when cases of seed variety shortages are verified. Pure live seed percentages will be applied in a verified shortage situation. Those purchase orders of deficient seed lots will be credited with the percentage that the seed is deficient.

Further specifications for each seed group are give below:

Minimum 85% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 83% pure live seed will not be approved.

Sericea Lespedeza
Oats (seeds)

Minimum 80% pure live seed; maximum 1% total weed seed; maximum 2% total other crop; maximum 144 restricted noxious weed seed per pound. Seed less than 78% pure live seed will not be approved.

Tall Fescue (all approved varieties)	Bermudagrass
Kobe Lespedeza	Browntop Millet
Korean Lespedeza	German Millet - Strain R
Weeping Lovegrass	Centipedegrass
Carpetgrass	Clover - Red/White/Crimson

Minimum 78% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 76% pure live seed will not be approved.

Common or Sweet Sundangrass

Minimum 76% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 74% pure live seed will not be approved.

Rye (grain; all varieties)
Kentucky Bluegrass (all approved varieties)
Hard Fescue (all approved varieties)
Shrub (bicolor) Lespedeza

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 70% pure live seed will not be approved.

Crownvetch
Pensacola Bahiagrass
Japanese Millet
Switchgrass
Reed Canary Grass

STANDARD SPECIAL PROVISIONS
ERRATA

Correct the *2002 Standard Specifications* as follows:

Page 1-61, Subarticle 108-10(A)

In the first sentence, change the Article reference from 101-24 to 101-25.

Page 2-21, Subarticle 235-4(B)

In the third sub-bullet under the eighth bullet in this subarticle, delete the word "subgrade" and insert the words "finished grade".

Page 3-4, Article 300-10

Change all references to 300-8 to 300-9.

Page 5-9, Subarticle 520-3(A)

Delete the words "at your option".

Page 5-10, Subarticle 520-6(A)

In the first sentence, add a period after "(B)" and delete the words "and (C)."

Delete the last sentence of the subarticle.

Page 8-47, Subarticle 862-6

Change the subarticle number from 862-6 to **862-7**.

Page 8-49, Subarticle 864-4

In the first paragraph, change the Article reference from 862-3 to **864-3**.

Page 8-55, Subarticle 866-5(G)

In the third pay item, insert the words "with Posts" after the word "Fence".

Page 10-1, Subarticle 1000-3(A)

In the second paragraph, change 550 psi to 600 psi (4.1 MPa).

Page 10-2, Subarticle 1000-3(A)

In the last sentence of the second paragraph on this page, change 550 psi to 600 psi (4.1 MPa).

Page 10-5, Table 1000-1

Under the column "Consistency Max. Slump" change the sub-heading 'Non-Vibrated' to 'Vibrated' and change the sub-heading 'Vibrated' to 'Non-Vibrated'. Under the column "Min. Cement Content" change the sub-heading 'Non-Vibrated' to 'Vibrated' and change the sub-heading 'Vibrated' to 'Non-Vibrated'.

Page 10-7, Table 1005-2

For Std. Size # 2S make the following changes:

- #50 (0.300) Sieve change the limits from 8 - 30 to **5 - 30**.
- #100 (0.150) Sieve change the limits from 0.5 - 10 to **0 - 10**.

For Std. Size # 2MS make the following changes:

- #50 (0.300) Sieve change the limits from 8 - 35 to **5 - 35**.
- #100 (0.150) Sieve change the limits from 0.5 - 20 to **0 - 20**.

Page 15-3, Article 1505-3

In the last paragraph of this article, change Article 300-6 to Article 300-7.

Page 15-10, Article 1510-5

In the fourth paragraph, insert a comma after the word "water".

Page 15-18, Article 1530-2

In the third paragraph on the page, change "Section 812" to "Section 340".

Page 16-15, Article 1635-3(A)

Substitute the second paragraph with the following:

Construct the rock pipe inlet sediment trap type-A with a minimum height of 18 inches (457.2 mm) and a minimum of 12 inches (304.8 mm) below the roadway shoulder or diversion point.

MINIMUM WAGES

Federal: The Fair Labor Standards Act provides that with certain exceptions every employer must pay wages at the rate of not less than FIVE DOLLARS AND FIFTEEN CENTS (\$5.15) per hour.

State: The North Carolina Minimum Wage Act provides that every employer shall pay to each of his employees wages at a rate of not less than FIVE DOLLARS AND FIFTEEN CENTS (\$5.15) per hour.

The minimum wage paid to all skilled labor employed on this contract shall be FIVE DOLLARS AND FIFTEEN CENTS (\$5.15) per hour.

The minimum wage paid to all intermediate labor employed on this contract shall be FIVE DOLLARS AND FIFTEEN CENTS (\$5.15) per hour.

The minimum wage paid to all unskilled labor on this contract shall be FIVE DOLLARS AND FIFTEEN CENTS (\$5.15) per hour.

This determination of the intent of the application of this act to the contract on this project is the responsibility of the Contractor.

The Contractor shall have no claim against the Department of Transportation for any changes in the minimum wage laws, State or Federal. It is the responsibility of the Contractor to keep himself fully informed of all Federal and State Laws affecting his contract.

County: Robeson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
ROADWAY ITEMS						
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum	L.S.	
0003	0000900000-N	SP	GENERIC MISCELLANEOUS ITEM CRITICAL PATH METHOD SCHEDULE	Lump Sum	L.S.	
0004	0001000000-M	200	CLEARING & GRUBBING ... HEC- TARE(S)	Lump Sum	L.S.	
0005	0008000000-M	200	SUPPLEMENTARY CLEARING & GRUB- BING	3.2 HA		
0006	0015000000-N	205	SEALING ABANDONED WELLS	1 EA		
0007	0022000000-M	225	UNCLASSIFIED EXCAVATION	39,200 M3		
0008	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ***** (113+73.429-L- EBD)	Lump Sum	L.S.	
0009	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ***** (113+73.429-L- WBD)	Lump Sum	L.S.	
0010	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ***** (138+30.429-L- EBD)	Lump Sum	L.S.	
0011	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ***** (138+30.429-L- WBD)	Lump Sum	L.S.	
0012	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ***** (16+90.210-Y2-)	Lump Sum	L.S.	
0013	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ***** (17+01.790-Y1-)	Lump Sum	L.S.	
0014	0036000000-M	225	UNDERCUT EXCAVATION	13,520 M3		
0015	0080000000-M	SP	CLASS IV SUBGRADE STABILIZA- TION	2,000 MTN		
0016	0084000000-M	SP	WICK DRAINS	44,000 M		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0017	0106000000-M	230	BORROW EXCAVATION	4,995,000 M3		
0018	0127000000-N	SP	EMBANKMENT SETTLEMENT GAUGES	13 EA		
0019	0134000000-M	240	DRAINAGE DITCH EXCAVATION	40,515 M3		
0020	0156000000-M	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	15,300 M2		
0021	0177000000-M	250	BREAKING OF EXISTING ASPHALT PAVEMENT	33,000 M2		
0022	0192000000-N	260	PROOF ROLLING	145 HR		
0023	0195000000-M	265	SELECT GRANULAR MATERIAL	79,000 M3		
0024	0196000000-M	270	FABRIC FOR SOIL STABILIZATION	117,320 M2		
0025	0234000000-M	SP	GENERIC GRADING ITEM SELECT MATERIAL, CLASS III	11,000 M3		
0026	0318000000-M	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	2,650 MTN		
0027	0366000000-M	310	375MM RC PIPE CULVERTS, CLASS III	2,145.2 M		
0028	0372000000-M	310	450MM RC PIPE CULVERTS, CLASS III	1,724.6 M		
0029	0378000000-M	310	600MM RC PIPE CULVERTS, CLASS III	1,081.7 M		
0030	0384000000-M	310	750MM RC PIPE CULVERTS, CLASS III	536.2 M		
0031	0390000000-M	310	900MM RC PIPE CULVERTS, CLASS III	917.7 M		
0032	0396000000-M	310	1050MM RC PIPE CULVERTS, CLASS III	189.6 M		
0033	0408000000-M	310	1350MM RC PIPE CULVERTS, CLASS III	373.2 M		
0034	0420000000-M	310	1650MM RC PIPE CULVERTS, CLASS III	92.4 M		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0035	0448000000-M	310	****MM RC PIPE CULVERTS, CLASS IV (1350MM)	69.6 M		
0036	0448000000-M	310	****MM RC PIPE CULVERTS, CLASS IV (1650MM)	64.8 M		
0037	0448000000-M	310	****MM RC PIPE CULVERTS, CLASS IV (450MM)	62.4 M		
0038	0448000000-M	310	****MM RC PIPE CULVERTS, CLASS IV (750MM)	87.6 M		
0039	0453000000-M	310	***MM PIPE END SECTION (375MM)	6 EA		
0040	0453000000-M	310	***MM PIPE END SECTION (450MM)	4 EA		
0041	0708000000-M	310	400MM BIT COAT CS PIPE CULVERTS, TYPE B 1.63MM THICK	942 M		
0042	0714000000-M	310	450MM BIT COAT CS PIPE CULVERTS, TYPE B 1.63MM THICK	60 M		
0043	0750000000-M	310	1400MM BIT COAT CS PIPE CULVERTS, TYPE B 2.77MM THICK	28.8 M		
0044	0806000000-M	310	400MM BIT COAT CS PIPE ELBOWS, TYPE B 1.63MM THICK	68 EA		
0045	0807000000-M	310	450MM BIT COAT CS PIPE ELBOWS, TYPE B 1.63MM THICK	6 EA		
0046	0995000000-M	340	PIPE REMOVAL	263.4 M		
0047	1000000000-M	462	150MM SLOPE PROTECTION	950 M2		
0048	1011000000-N	500	FINE GRADING	Lump Sum	L.S.	
0049	1110000000-M	510	STABILIZER AGGREGATE	3,000 MTN		
0050	1121000000-M	520	AGGREGATE BASE COURSE	312,200 MTN		
0051	1220000000-M	545	INCIDENTAL STONE BASE	2,000 MTN		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0052	1275000000-M	600	PRIME COAT	172,600 L		
0053	1330000000-M	607	INCIDENTAL MILLING	2,100 M2		
0054	1491000000-M	610	ASPHALT CONC BASE COURSE, TYPE B25.0C	69,640 MTN		
0055	1498000000-M	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	4,650 MTN		
0056	1503000000-M	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	64,200 MTN		
0057	1519000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	24,400 MTN		
0058	1523000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	9,100 MTN		
0059	1539000000-M	610	ASPHALT CONC SURFACE COURSE, TYPE S12.5C	85,200 MTN		
0060	1560000000-M	620	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22	7,785 MTN		
0061	1565000000-M	620	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22	5,265 MTN		
0062	1693000000-M	654	ASPHALT PLANT MIX PAVEMENT REPAIR	500 MTN		
0063	1840000000-M	665	MILLED RUMBLE STRIPS	57,200 M		
0064	2022000000-M	815	SUBDRAIN EXCAVATION	331.2 M3		
0065	2033000000-M	815	SUBDRAIN FINE AGGREGATE	165.6 M3		
0066	2044000000-M	815	150MM PERFORATED SUBDRAIN PIPE	400 M		
0067	2055000000-M	815	150MM SUBDRAIN PIPE WYES, TEES, & ELBOWS	40 EA		
0068	2066000000-N	815	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET	4 EA		
0069	2077000000-M	815	150MM OUTLET PIPE (SUBDRAINS)	8 M		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0070	2099000000-M	816	SHOULDER DRAIN	7,000 M		
0071	2110000000-M	816	100MM SHOULDER DRAIN PIPE	7,000 M		
0072	2121000000-M	816	100MM OUTLET PIPE (SHOULDER DRAINS)	150 M		
0073	2132000000-N	816	CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET	84 EA		
0074	2209000000-M	838	ENDWALLS	50.3 M3		
0075	2220000000-M	838	REINFORCED ENDWALLS	25.3 M3		
0076	2253000000-M	840	PIPE COLLARS	7.15 M3		
0077	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	165 EA		
0078	2308000000-M	840	MASONRY DRAINAGE STRUCTURES	20.55 M		
0079	2354000000-N	840	FRAME WITH GRATE, STD 840.22	1 EA		
0080	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	3 EA		
0081	2364200000-N	840	FRAME WITH TWO GRATES, STD 840.20	37 EA		
0082	2365000000-N	840	FRAME WITH TWO GRATES, STD 840.22	102 EA		
0083	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	1 EA		
0084	2367000000-N	840	FRAME WITH TWO GRATES, STD 840.29	11 EA		
0085	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	1 EA		
0086	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	2 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0087	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	7 EA		
0088	2549000000-M	846	750MM CONCRETE CURB & GUTTER	1,550 M		
0089	2556000000-M	846	SHOULDER BERM GUTTER	3,376 M		
0090	2577000000-M	846	CONCRETE EXPRESSWAY GUTTER	360 M		
0091	2655000000-M	852	125MM MONOLITHIC CONCRETE IS- LANDS (KEYED IN)	1,190 M2		
0092	3030000000-M	862	STEEL BM GUARDRAIL	7,357.11 M		
0093	3045000000-M	862	STEEL BM GUARDRAIL, SHOP CURVED	327.66 M		
0094	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	20 EA		
0095	3195000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE AT-1	5 EA		
0096	3210000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	12 EA		
0097	3215000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE III	20 EA		
0098	3270000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350	35 EA		
0099	3285000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE M-350	4 EA		
0100	3389400000-M	865	DOUBLE FACED CABLE GUIDERAIL	13,800 M		
0101	3389600000-N	865	CABLE GUIDERAIL ANCHOR UNITS	40 EA		
0102	3503000000-M	866	WOVEN WIRE FENCE, 1200MM FAB- RIC	29,830 M		
0103	3509000000-M	866	100MM TIMBER FENCE POSTS, 2.30M LONG	6,475 EA		
0104	3515000000-M	866	125MM TIMBER FENCE POSTS, 2.50M LONG	900 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0105	3557000000-M	866	ADDITIONAL BARBED WIRE	500 M		
0106	3628000000-M	876	PLAIN RIP RAP, CLASS I	307 MTN		
0107	3649000000-M	876	PLAIN RIP RAP, CLASS B	690 MTN		
0108	3656000000-M	876	FILTER FABRIC FOR DRAINAGE	7,110 M2		
0109	3659000000-N	SP	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	5 EA		
0110	4048000000-M	902	REINFORCED CONCRETE SIGN FOOT- INGS	27 M3		
0111	4054000000-M	902	PLAIN CONCRETE SIGN FOOTINGS	5 M3		
0112	4060000000-M	903	SUPPORTS, BREAKAWAY STEEL BEAM	13,846 KG		
0113	4066000000-M	903	SUPPORTS, SIMPLE STEEL BEAM	1,293 KG		
0114	4072000000-M	903	SUPPORTS, 4.5KG STEEL U-CHANNEL	2,151 M		
0115	4078000000-M	903	SUPPORTS, 3KG STEEL U-CHANNEL	44 EA		
0116	4082200000-N	SP	OVERHEAD SIGN ASSEMBLY AT STA ***** (12+80.00-L-)	Lump Sum	L.S.	
0117	4096000000-N	904	SIGN ERECTION, TYPE D	30 EA		
0118	4102000000-N	904	SIGN ERECTION, TYPE E	157 EA		
0119	4108000000-N	904	SIGN ERECTION, TYPE F	125 EA		
0120	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)	20 EA		
0121	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)	61 EA		
0122	4114000000-N	904	SIGN ERECTION, MILEMARKERS	44 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0123	4115000000-N	904	SIGN ERECTION, OVERLAY (OVER-HEAD)	1 EA		
0124	4127500000-N	SP	LRS LIGHTING SYSTEM FOR OVER-HEAD SIGN ASSEMBLY AT STA ***** (12+80.00-L-)	Lump Sum	L.S.	
0125	4129000000-N	906	RELOCATE SIGN, TYPE ***** (D)	1 EA		
0126	4152000000-N	907	DISPOSAL OF SIGN SYSTEM, STEEL BEAM	7 EA		
0127	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	139 EA		
0128	4158000000-N	907	DISPOSAL OF SIGN SYSTEM, WOOD	6 EA		
0129	4192000000-N	907	DISPOSAL OF SUPPORT, U-CHANNEL	5 EA		
0130	4415000000-N	1115	FLASHING ARROW PANELS, TYPE C	2 EA		
0131	4420000000-N	1120	CHANGEABLE MESSAGE SIGNS	4 EA		
0132	4425000000-N	1125	WARNING FLAG SETS	8 EA		
0133	4430000000-N	1130	DRUMS	600 EA		
0134	4445000000-M	1145	BARRICADES (TYPE III)	198 M		
0135	4450000000-N	1150	FLAGGER	400 HR		
0136	4510000000-N	SP	POLICE	10 HR		
0137	4520000000-N	1266	TUBULAR MARKERS (FIXED)	20 EA		
0138	4595000000-M	SP	GENERIC TRAFFIC CONTROL ITEM WORK ZONE SIGNS - FLUORESCENT ORANGE TYPE VII (BARRICADE MOUNTED)	88 M2		
0139	4595000000-M	SP	GENERIC TRAFFIC CONTROL ITEM WORK ZONE SIGNS - FLUORESCENT ORANGE TYPE VII (PORTABLE)	58 M2		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0140	4595000000-M	SP	GENERIC TRAFFIC CONTROL ITEM WORK ZONE SIGNS - FLUORESCENT ORANGE TYPE VII (STATIONARY)	138 M2		
0141	4615000000-M	1205	REMOVABLE TAPE PAVEMENT MARK- ING LINES (100MM)	400 M		
0142	4645000000-N	1205	REMOVABLE TAPE PAVEMENT MARK- ING SYMBOL	5 EA		
0143	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	1,440 EA		
0144	4685000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 2.3MM)	25,970 M		
0145	4686000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 3.1MM)	26,790 M		
0146	4695000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM)	990 M		
0147	4710000000-M	1205	THERMOPLASTIC PAVEMENT MARKING LINES (600MM, 3.1MM)	180 M		
0148	4721000000-M	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (3.1MM)	8 EA		
0149	4725000000-M	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM)	59 EA		
0150	4810000000-M	1205	PAINT PAVEMENT MARKING LINES (100MM)	114,500 M		
0151	4820000000-M	1205	PAINT PAVEMENT MARKING LINES (200MM)	2,500 M		
0152	4835000000-M	1205	PAINT PAVEMENT MARKING LINES (600MM)	150 M		
0153	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	24 EA		
0154	4847220000-N	SP	POLYUREA PAVEMENT MARKING SYMBOL	28 EA		
0155	4850000000-M	1205	REMOVAL OF PAVEMENT MARKING LINES (100MM)	1,000 M		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0156	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	7 EA		
0157	4890000000-M	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES (150MM, HIGHLY REFLECTIVE ELEMENTS)	44,160 M		
0158	4890000000-M	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES (150MM, STANDARD BEADS)	34,060 M		
0159	4890000000-M	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES (300MM, HIGHLY REFLECTIVE ELEMENTS)	2,250 M		
0160	4890000000-M	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES (300MM, STANDARD BEADS)	650 M		
0161	4900000000-N	1252	PERMANENT RAISED PAVEMENT MARKERS	950 EA		
0162	4905000000-N	1253	SNOWPLOWABLE RAISED PAVEMENT MARKERS	1,250 EA		
0163	5300000000-M	1505	FOUNDATION CONDITIONING MATERIAL, UTILITIES CLASS ***** (VI)	187 MTN		
0164	5306000000-M	SP	BEDDING MATERIAL, UTILITIES CLASS ***** (IV)	187 MTN		
0165	5318000000-M	1505	PAVEMENT REPAIR FOR UTILITY WORK	27.7 MTN		
0166	5360000000-M	1510	150MM DI WATER PIPE, PC 2.41MPA	21 M		
0167	5366000000-M	1510	200MM DI WATER PIPE, PC 2.41MPA	21 M		
0168	5444000000-M	1510	150MM PVC WATER PIPE, SDR 21, 1.38MPA WP	165 M		
0169	5450000000-M	1510	200MM PVC WATER PIPE, SDR 21, 1.38MPA WP	2,191 M		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0170	5462000000-M	1510	300MM PVC WATER PIPE, SDR 21, 1.38MPA WP	1,064 M		
0171	5480000000-M	1510	DUCTILE IRON WATER PIPE FIT- TINGS, 1.72MPA MIN WP	7,789 KG		
0172	5510000000-M	1510	20MM CORPORATION STOP	18 EA		
0173	5540000000-M	1510	150MM GATE VALVE & VALVE BOX, 1.38MPA WP	5 EA		
0174	5546000000-M	1510	200MM GATE VALVE & VALVE BOX, ****MPA WP (1.38MPA WP)	4 EA		
0175	5582000000-M	1510	*** X ***MM TAPPING SADDLE (150MM X 20MM)	2 EA		
0176	5582000000-M	1510	*** X ***MM TAPPING SADDLE (200MM X 20MM)	16 EA		
0177	5606000000-M	SP	50MM BLOW OFF ASSEMBLY	1 EA		
0178	5648000000-N	1510	RELOCATE EXISTING WATER METER	15 EA		
0179	5660000000-N	SP	REMOVE EXISTING WATER METER	12 EA		
0180	5666000000-M	1510	FIRE HYDRANT, ****MPA WP (1.38MPA WP)	1 EA		
0181	5672000000-N	1510	RELOCATE EXISTING FIRE HYDRANT	3 EA		
0182	5798000000-M	1530	FILL OR REMOVE ABANDONED ***MM PIPE, ***** (150MM, PVC WATER)	110 M		
0183	5798000000-M	1530	FILL OR REMOVE ABANDONED ***MM PIPE, ***** (200MM, PVC WATER)	2,279 M		
0184	5804000000-M	1530	FILL OR REMOVE ABANDONED 300MM PIPE, ***** (PVC WATER)	1,080 M		
0185	5852000000-M	SP	***MM STEEL ENCASEMENT PIPE, ****MM THICK, BY BORING & JACKING (400MM, 6.35MM)	15 M		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0186	5888000000-M	SP	GENERIC UTILITY ITEM 20MM PE WATER TUBING, SDR 7, 1.38MPA WP	463.5 M		
0187	5888000000-M	SP	GENERIC UTILITY ITEM 250MM HDPE WATER PIPE, SDR 9, 1.38MPA BY DIRECTIONAL BORE	80 M		
0188	6000000000-M	1605	TEMPORARY SILT FENCE	19,000 M		
0189	6006000000-M	1610	STONE FOR EROSION CONTROL, CLASS A	1,510 MTN		
0190	6009000000-M	1610	STONE FOR EROSION CONTROL, CLASS B	20,000 MTN		
0191	6012000000-M	1610	SEDIMENT CONTROL STONE	7,275 MTN		
0192	6015000000-M	1615	TEMPORARY MULCHING	175 HA		
0193	6018000000-M	1620	SEED FOR TEMPORARY SEEDING	13,100 KG		
0194	6021000000-M	1620	FERTILIZER FOR TEMPORARY SEED- ING	110 MTN		
0195	6024000000-M	1622	TEMPORARY SLOPE DRAINS	3,725 M		
0196	6027000000-N	1622	INLET PROTECTION AT TEMPORARY SLOPE DRAINS	233 EA		
0197	6029000000-M	SP	SAFETY FENCE	5,250 M		
0198	6030000000-M	1630	SILT EXCAVATION	46,125 M3		
0199	6036000000-M	1631	MATTING FOR EROSION CONTROL	53,600 M2		
0200	6042000000-M	1632	6.4MM HARDWARE CLOTH	1,050 M		
0201	6045000000-M	SP	***MM TEMPORARY PIPE (300MM)	5 M		
0202	6045000000-M	SP	***MM TEMPORARY PIPE (600MM)	10 M		
0203	6045000000-M	SP	***MM TEMPORARY PIPE (750MM)	15 M		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0204	6069000000-M	1638	STILLING BASINS	700 M3		
0205	6084000000-M	1660	SEEDING & MULCHING	315 HA		
0206	6087000000-M	1660	MOWING	90 HA		
0207	6090000000-M	1661	SEED FOR REPAIR SEEDING	2,000 KG		
0208	6093000000-M	1661	FERTILIZER FOR REPAIR SEEDING	7 MTN		
0209	6096000000-M	1662	SEED FOR SUPPLEMENTAL SEEDING	9,000 KG		
0210	6108000000-M	1665	FERTILIZER TOPDRESSING	550 MTN		
0211	6109200000-M	SP	SPECIALIZED SEEDING UNDER GUIDERAIL & GUARDRAIL (CENTI-PEDE)	2.55 HA		
0212	6111000000-M	SP	IMPERVIOUS DIKE	250 M		
0213	6114000000-N	SP	SPECIALIZED HAND MOWING	137 HR		
0214	6117000000-N	1675	RESPONSE FOR EROSION CONTROL	24 EA		
0215	6120000000-M	SP	CULVERT DIVERSION CHANNEL	625 M3		
0216	6123000000-M	1670	REFORESTATION	14.27 HA		
0217	7060000000-M	1705	SIGNAL CABLE	165 M		
0218	7120000000-M	1705	VEHICLE SIGNAL HEAD (300MM, 3 SECTION)	6 EA		
0219	7264000000-M	1710	MESSENGER CABLE (9.52MM)	135 M		
0220	7300000000-M	1715	TRENCHING (UNPAVED)	174 M		
0221	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	6 EA		
0222	7360000000-N	1720	WOOD POLE	4 EA		
0223	7372000000-N	1721	GUY ASSEMBLY	8 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0224	7408000000-M	1722	25MM RISER WITH WEATHERHEAD	1 EA		
0225	7420000000-M	1722	50MM RISER WITH WEATHERHEAD	4 EA		
0226	7444000000-M	1725	INDUCTIVE LOOP SAWCUT	59 M		
0227	7456000000-M	1726	LEAD-IN CABLE	455 M		
0228	7636000000-N	1745	SIGN FOR SIGNALS	1 EA		
0229	7684000000-N	1750	SIGNAL CABINET FOUNDATION	1 EA		
0230	7688000000-N	SP	CABINET BASE ADAPTER	1 EA		
0231	7756000000-N	1751	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)	1 EA		
0232	7780000000-N	SP	DETECTOR CARD (TYPE 2070L)	3 EA		
CULVERT ITEMS						
0233	8056000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ***** (14+40.000 -Y1-)	Lump Sum	L.S.	
0234	8126000000-N	414	CULVERT EXCAVATION, STA ***** (12+42.500 -Y2-)	Lump Sum	L.S.	
0235	8126000000-N	414	CULVERT EXCAVATION, STA ***** (12+86.500 -SR1-)	Lump Sum	L.S.	
0236	8126000000-N	414	CULVERT EXCAVATION, STA ***** (120+86.500 -L-)	Lump Sum	L.S.	
0237	8126000000-N	414	CULVERT EXCAVATION, STA ***** (14+19.671 -RPB)	Lump Sum	L.S.	
0238	8126000000-N	414	CULVERT EXCAVATION, STA ***** (14+40.000 -Y1-)	Lump Sum	L.S.	
0239	8133000000-M	414	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	1,543 MTN		
0240	8196000000-M	420	CLASS A CONCRETE (CULVERT)	1,677.2 M3		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0241	824500000-M	425	REINFORCING STEEL (CULVERT)	186,605 KG		

STRUCTURE ITEMS						

0242	809100000-N	410	FOUNDATION EXCAVATION FOR BENT ** AT STATION ***** (1, 18+64.065 -L-)	Lump Sum	L.S.	

0243	809100000-N	410	FOUNDATION EXCAVATION FOR BENT ** AT STATION ***** (1, 68+75.743 -L-)	Lump Sum	L.S.	

0244	811270000-N	SP	DYNAMIC LOAD TEST	4 EA		

0245	814700000-M	420	REINFORCED CONCRETE DECK SLAB	6,749.4 M2		

0246	816100000-M	420	GROOVING BRIDGE FLOORS	7,369.8 M2		

0247	818200000-M	420	CLASS A CONCRETE (BRIDGE)	897.4 M3		

0248	821000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (113+73.429 -L- LT)	Lump Sum	L.S.	

0249	821000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (113+73.429 -L- RT)	Lump Sum	L.S.	

0250	821000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (138+30.800 -L- LT)	Lump Sum	L.S.	

0251	821000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (138+30.800 -L- RT)	Lump Sum	L.S.	

0252	821000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (18+64.065 -L-)	Lump Sum	L.S.	

0253	821000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (68+75.743 -L-)	Lump Sum	L.S.	

0254	821700000-M	425	REINFORCING STEEL (BRIDGE)	77,600 KG		

County : Robeson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0255	8238000000-M	425	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	2,379	KG	
0256	8280000000-M	440	APPROX KG STRUCTURAL STEEL	1,461,582	LS	
0257	8364000000-M	450	HP310X79 STEEL PILES	1,500	M	
0258	8385000000-M	450	PP *** X ***** STEEL PILES (305 X 9.5)	6,296	M	
0259	8503000000-M	460	CONCRETE BARRIER RAIL	878.406	M	
0260	8524000000-M	SP	****MM CHAIN LINK FENCE (2080MM)	146.526	M	
0261	8531000000-M	462	100MM SLOPE PROTECTION	4,725	M2	
0262	8650000000-N	SP	POT BEARINGS	Lump Sum	L.S.	
0263	8657000000-N	430	ELASTOMERIC BEARINGS	Lump Sum	L.S.	
0264	8692000000-N	SP	EVAZOTE JOINT SEALS	Lump Sum	L.S.	

1557/Oct11/Q8550278.022/D1096773420000/E264

Total Amount Of Bid For Entire Project :

C200970
ROBESON COUNTY

2/16/99

Contract No: C200970

County: Robeson

ACCEPTED BY THE
DEPARTMENT OF TRANSPORTATION

Contract Officer

Date

Execution of Contract and Bonds
Approved as to Form:

Attorney General

