



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

July 5, 2007

**Addendum No. 2**

RE: Contract ID: C201797

WBS# 1SP.10481.3, 39393, 41479, 41481,  
41484.3.1, 41485.3.1, 41486.3.1

**Hyde County (B-5015, B-5016, B-5017)**

Bridges No. 10, 24, 31, 39, 42, 46 and 49 on NC-12

**July 17, 2007 Letting**

To Whom It May Concern:

The below listed information is being provided to the Contractor for consideration in placing their bid.

- Memo listing "Vehicle Load Limits for Ferries"
- Memo concerning planned Ferry Schedule during construction period
- Excerpt from GS 143-215.22H concerning withdrawal of water from the surface or groundwaters of the State

Reference is made to the Plans and Proposal Form recently furnished to you on this project.

The following revisions has been made to the Structure Subsurface Investigation:

The Contractor is hereby notified that additional subsurface information is available in the form of a report based on the results of Dynamic Pile Testing and Analyses performed on four concrete test piles. This report titled "Summary Report for Dynamic Pile Testing and Analyses" is being provided along with this addendum to those Contractors that previously requested subsurface information from the Department.

The following is a list of Plan Sheets that have been revised:

3, 4, 10, 11, 13, 25-28, 35-37, 42-45, 47, 53-55, 67-70, 73, 74, 77-81, 88-90, 102-107, 110, 111, 114-118, 125-127, 139-142, 145, 146, 149-153, 161-163, 175-178, 181, 182, 185-189, 196-198, 210-213, 216, 217 and 220-223.

**MAILING ADDRESS:**  
NC DEPARTMENT OF TRANSPORTATION  
DESIGN SERVICES UNIT  
1591 MAIL SERVICE CENTER  
RALEIGH NC 27699-1591

TELEPHONE: 919-250-4128  
FAX: 919-250-4119

WEBSITE: [WWW.DOH.DOT.STATE.NC.US](http://WWW.DOH.DOT.STATE.NC.US)

**LOCATION:**  
CENTURY CENTER COMPLEX  
ENTRANCE B2  
1020 BIRCH RIDGE DRIVE  
RALEIGH NC

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The following is a general list outlining the changes that were made:

- Guardrail Anchor Units added; Guardrail Lengths adjusted
- Sediment Control Fence changed to Temporary Silt Fence
- Gravel Construction Entrances removed
- Changed 16" Prestressed Concrete Piles to 16" Composite Prestressed Concrete Piles
- Added notes concerning requirement for Calcium Nitrite Corrosion Inhibitor in Prestressed Members
- Amended the "Working Drawing" note
- Added note concerning Grout of Dowel Holes
- Amended Grout Note to Clarify Compressive Strength requirement
- Changed requirement for Pile Concrete Strength from 5,000 psi to 6,000 psi
- Changed "Swedge Bolts" to "Threaded Bars" in the Steel Pile Connection detail
- Galvanizing Steel Pile note added

In view of the large number of revised sheets, we are furnishing you with a completely revised set. Please destroy the set previously furnished.

The following revisions have been made to the proposal form:

On Page No. 4 a revision was made to the first paragraph of the Project Special Provision entitled "Staging Areas" to correct the plan sheet reference number. On Page No. 5 a paragraph was added to the same Project Special Provision. Please void Page Nos. 4 & 5 in your proposal and staple the revised Page Nos. 4 & 5 thereto.

On Page No. 24 a revision was made to the second paragraph of the Project Special Provision entitled "Traffic Control" to correct the plan sheet reference number. Please void Page No. 24 in your proposal and staple the revised page No. 24 thereto.

On Page No. 29, the "Structure-Table of Contents" has been revised. On Page No. 37 the Project Special Provision entitled "Submittal of Working Drawings" was revised to remove the date at the top of the page and replace with the word "Special". On Page No. 40 of the same Project Special Provision, "Precast Pieces" was added to the list of required "Structure Submittals". Please void Page Nos. 29, 37 and 40 in your proposal and staple the revised Page Nos. 29,37 and 40 thereto.

New Page Nos. 51-A thru 51-E have been added to include the Project Special Provision entitled "Pile Driving Analyzer". Please staple new Page Nos. 51-A thru 51-E after Page No. 51 in your proposal.

New Page Nos. 159 thru 166 have been added to include the "Wetland Buffer Drawings". Please staple new Page Nos. 159 thru 166 after Page No. 158 in your proposal form.

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**Addendum No. 2**

RE: Contract ID: C201797

WBS# 1SP.10481.3, 39393, 41479, 41481,  
41484.3.1, 41485.3.1, 41486.3.1

**Hyde County (B-5015, B-5016, B-5017)**

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

On Page No. 2 of the Item Sheets, by copy of this addendum, the quantity for Line Item "19-3030000000-E-862 Steel Beam Guardrail" is hereby reduced from 5,025 LF to 3,562.5 LF.

On Page No. 3 of the Item Sheets, by copy of this addendum, the quantity for Line Item "33-8329000000-E-450 12" Prestressed Concrete Piles" is hereby reduced from 3,451 LF to 3,111 LF. Also, on Page No. 3 of the Item Sheets, by copy of this addendum, Line Item "34-8333000000-E-450 16" Prestressed Concrete Piles" is hereby deleted.

On Page No. 4 of the Item Sheets, by copy of this addendum the quantity for Line Item "48-8867000000-E-SP 16" Composite Prestressed Concrete Piles" is hereby increased from 1,197 LF to 5,952 LF. Also, on Page No. 4 of the Item Sheets, by copy of this addendum the following three (3) new Pay Items are hereby added:

"49-3215000000-N-862 Guardrail Anchor Units, Type III (Quantity = 24 EA)"

"50-81127300000-N-SP PDA Testing (Quantity = 3 EA)"

"51-81127400000-N-SP PDA Assistance (Quantity = 3 EA)"

The contract will be prepared accordingly.

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

Sincerely,



R. A. Garris, PE  
Contract Officer

RAG/jag/blr  
Attachment

cc: Mr. W. S. Varnedoe, PE  
Mr. E. C. Powell, PE  
Mr. A. W. Roper, PE (Attn: S. D. Baker, PE)  
Ms. D. M. Barbour, PE  
Mr. Art McMillan, PE  
Mr. Victor Barbour, PE  
Mr. Ron Hancock, PE  
Mr. Dan Holderman, PE

Mr. Mark Staley (2)  
Mr. R. E. Davenport, Jr., PE  
Mr. Paul Garrett, PE  
Ms. Norma Smith  
Ms. Marsha Byrd  
Mr. Ronnie Higgins  
Ms. Taylor Mishoe  
Project File (2)



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
Governor

P.O. BOX 25201, RALEIGH, N.C. 27611-3201

LYNDO TIPPETT  
SECRETARY

May 23, 2007

MEMORANDUM

TO: All Operation Managers  
District Superintendents

FROM: Joe D. Waldrep  
Marine Design Engineer II

SUBJECT: Vehicle Load Limits for Ferries

The following replaces all previous loading conditions:

Description	2 Axles	3 Axles	4 Axles	5 Axles	12,000 Pounds Per Axle Up To 120,000 Pounds
Hatteras Class & M/V Hunt	-	-	80,000	80,000	-
Sound Class	40,000	60,000	80,000	92,000	120,000
Double Ender	40,000	60,000	80,000	92,000	120,000

Note: Anything above 120,000 pounds may be separated and walked on.  
However, if equipment is walked on it will need timber to support the weight.

JDW/kgs

**APPROVED**  
N. C. DEPARTMENT OF TRANSPORTATION  
  
MARKIS HODGE  
FERRY DIVISION



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

PO BOX 25201, RALEIGH, NC 27611-5201

LYNDO TIPPETT  
SECRETARY

June 25, 2007

Memorandum to: To Whom It May Concern

From: C. S. Fearing, Superintendent  
District I, Ferry Division

Subject: Bridge Replacement – Ocracoke (Hyde County)

In regard to the Ferry Divisions plans during the bridge replacement on Hwy 12 in Ocracoke this winter, the Hatteras runs will be as follows with the current plans:

A vessel will leave each side at 5:00 am, run every other hour from each side until 9:00 pm. The last vessel will leave Hatteras and tie up at Ocracoke and be in place for an emergency over night.

Example:

Leave Ocracoke	Leave Hatteras
5:00 am	5:00 am
6:00 am	7:00 am
8:00 am (etc...)	9:00 am (etc...)
8:00 pm – last run	9:00 pm - last run

The Ocracoke / Swan Quarter run will be the same as the summer schedule:

6:30 am, 10:00 am, 12:30 pm and 4:00 pm from Ocracoke  
7:00 am, 9:30 am, 1:00 pm and 4:00 pm form Swan Quarter

We plan to have the larger vessels on these runs and to have a vessel on standby in case of breakdowns. Cedar Island departures will be the normal winter runs as in the ferry schedule.

Mr. Jack Cahoon, Director of the Ferry Division, said the DOT contractors could use the area that the Dredge ties up at South Dock, but he will need assurance that any damage would be repaired and restore the area.

Also, we will have to have scheduled days for fuel deliveries because of limited passengers on vessels with fuel trucks as per USCG.

**§ 143-215.22H. Registration of water withdrawals and transfers required.**

(a) Any person who withdraws 100,000 gallons per day or more of water from the surface or groundwaters of the State or who transfers 100,000 gallons per day or more of water from one river basin to another shall register the withdrawal or transfer with the Commission. A person registering a water withdrawal or transfer shall provide the Commission with the following information:

- (1) The maximum daily amount of the water withdrawal or transfer expressed in thousands of gallons per day.
- (1a) The monthly average withdrawal or transfer expressed in thousands of gallons per day.
- (2) The location of the points of withdrawal and discharge and the capacity of each facility used to make the withdrawal or transfer.
- (3) The monthly average discharge expressed in thousands of gallons per day.

(b) Any person initiating a new water withdrawal or transfer of 100,000 gallons per day or more shall register the withdrawal or transfer with the Commission not later than six months after the initiation of the withdrawal or transfer. The information required under subsection (a) of this section shall be submitted with respect to the new withdrawal or transfer.

(b1) Subsections (a) and (b) of this section shall not apply to a person who withdraws or transfers less than 1,000,000 gallons per day of water for activities directly related or incidental to the production of crops, fruits, vegetables, ornamental and flowering plants, dairy products, livestock, poultry, and other agricultural products.

(c) A unit of local government that has completed a local water supply plan that meets the requirements of G.S. 143-355(l) and that has periodically revised and updated its plan as required by the Department has satisfied the requirements of this section and is not required to separately register a water withdrawal or transfer or to update a registration under this section.

(d) Any person who is required to register a water withdrawal or transfer under this section shall update the registration by providing the Commission with a current version of the information required by subsection (a) of this section at five-year intervals following the initial registration. A person who submits information to update a registration of a water withdrawal or transfer is not required to pay an additional registration fee under G.S. 143-215.3(a)(1a) and G.S. 143-215.3(a)(1b), but is subject to the late registration fee established under this section in the event that updated information is not submitted as required by this subsection.

(e) Any person who is required to register a water transfer or withdrawal under this section and fails to do so shall pay, in addition to the registration fee required under G.S. 143-215.3(a)(1a) and G.S. 143-215.3(a)(1b), a late registration fee of five dollars (\$5.00) per day for each day the registration is late up to a maximum of five hundred dollars (\$500.00). A person who is required to update a registration under this section and fails to do so shall pay a fee of five dollars (\$5.00) per day for each day the updated information is late up to a maximum of five hundred dollars (\$500.00). A late registration fee shall not be charged to a farmer who submits a registration that pertains to farming operations. (1991, c. 712, s. 1; 1993, c. 344, s. 1; c. 553, s. 81; 1998-168, s. 3.)

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*This document (also available in PDF and RTE formats) is not an official document.  
Please read the caveats on the main NC Statutes page for more information.*

**§ 143-215.22A. Water withdrawal policy; remedies.**

(a) It is against the public policy of North Carolina to withdraw water from any major river or reservoir if both of the following factors are present: (i) the withdrawal will cause the natural flow of water in the river or a portion of the reservoir to be reversed; and (ii) substantial portions of the water are not returned to the river system after use. For purposes of this section, a withdrawal will cause natural flow to be reversed if as a result of the withdrawal, the rate of flow in the river or discrete portion of the reservoir is 15 cubic feet per second or more, moving in a generally opposite direction than prior to the withdrawal, over a distance of more than one mile. To correct for periodic effects, including tidal influences and reservoir fluctuations, flow speed and direction shall be calculated by using annual average flow data to determine pre-withdrawal flows, and projected annual average flow assuming the maximum practical rate of withdrawal, to determine post-withdrawal flows.

(b) This section shall not be construed to create an independent cause of action by the State or by any person. This section shall not apply to any project or facility for which a withdrawal of water began prior to the date this section is effective. (1991, c. 567, c. 712, ss. 5, 6.)

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Signature Sheet (Bid Acceptance by Department)



The pre-bid conference will include a thorough discussion of the plans, contract pay items, special provisions, etc.

Only bidders who have attended and properly registered at the above scheduled pre-bid conference will be considered prequalified to bid on this project. A bid received from a bidder who has not attended and properly registered at the above scheduled pre-bid conference will not be considered for award.

Attendance at the pre-bid conference will not meet the requirements of proper registration unless the individual attending has registered at the pre-bid conference in accordance with the following:

- (A) The individual has signed his name on the official roster no later than thirty (30) minutes after the beginning of the conference.
- (B) The individual has written in the name and address of the company he or she represents.
- (C) Only one company has been shown as being represented by the individual attending.
- (D) The individual attending is an officer or permanent employee of the company they are representing.

Attendance at any prior pre-bid conference will not meet the requirement of this provision.

### **STAGING AREAS**

(4-14-07)

The Department of Transportation has coordinated with the National Park Service in order to designate three (3) predetermined sites that may be used by the Contractor as staging areas. The three staging areas have been designated as staging areas "A", "B", and "C". The three sites are shown on Plan Sheet No. 2A. This plan sheet shows the location of each site and gives the approximate acreage available at each site.

Staging Area "A" is located at the National Park Service's campground. This staging area is directly adjacent to the National Park Service's existing beach access. The Contractor will not be allowed to block this access as it will be the southern access to the detour along the beach.

Staging Area "B" is located at the National Park Service's pony pens. This site is also directly adjacent to the new, temporary beach access that will be utilized for this project, therefore the Contractor will not be allowed to block this access point.

Staging Area "C" is located at the ferry dredge site. This location is directly adjacent to the ferry dock. This site is accessible by barge. The Contractor may barge in materials to this site if so desired.

These predetermined staging areas are available to the Contractor free of charge. The Contractor is required to return these sites to their original condition upon completion of this

project. Any work performed by the Contractor to return these sites to their original condition shall be done so at no expense to the Department or the National Park Service. Staging Areas "A" and "B" contain paved parking lots. Any damage to these paved parking lots shall be repaired by the Contractor at no expense to the Department or the National Park Service.

**Staging Areas "A", "B", and "C" will be available for the Contractor to use after November 1, 2007.** After this date the Contractor can begin operations in these areas. The staging areas will be available for use by the Contractor during the entire duration of this contract.

Once the road closure is underway the Contractor may use the roadway surface and shoulders to stage and stockpile material as needed. The Contractor will not be allowed to pre-stage material along the roadway prior to the road closure without written consent of the Engineer.

The Contractor shall be responsible for ensuring that the requirements of Item #30 in the National Park Service's Special Use Permit concerning safety fences and signs are adhered to. The Contractor shall install all safety fences and required signs as needed to properly designate the staging areas. The materials and work associated with meeting this permit condition shall be incidental to the total cost of the project.

**BARGE ACCESS:**  
(4-14-07)

The Contractor will be allowed to utilize the barge docking area located at the island's northern ferry dock facility. This site has been used during past ferry rehabilitation projects to deliver materials to the island. This docking facility is directly adjacent to staging area "C" and the northern ferry ramps. If the Contractor uses this barge access the Contractor shall be responsible for removing the existing chain link fence, storing the fence during the project duration, and for re-installing the fence once the project is complete. The Contractor shall be responsible for restoring this site to original condition at no expense to the Department.

This docking facility belongs to the North Carolina Department of Transportation's Ferry Division. The Contractor shall notify the Engineer in writing two weeks in advance of utilizing this site so that the Engineer can coordinate with the Ferry Division. Any barge traffic must be coordinated with the Ferry Division so there is no conflict with ferry traffic.

**MOBILIZATION:**  
6-19-07

SPI

Revise the *2006 Standard Specifications* as follows:

Page 8-1, Section 800, delete Mobilization and replace with the following:

**800-1 Description**

This work consists of preparatory work and operations to mobilize personnel, materials and equipment to the project site.

**800-2 Measurement and Payment**

*Mobilization* will be paid for as contract lump sum price.

Partial payments for mobilization will be made at the rate of 50% of the lump sum price on each of two partial pay estimates, provided the amount bid for mobilization does not exceed

### TRAFFIC CONTROL

The Contractor will be required to give the Engineer a minimum of two (2) weeks written notice before starting work which will require traffic to be placed on the off-site detour. The Department will be responsible for erection and maintenance of all traffic control devices except for the traffic barricades at the immediate site which shall be erected by the Department and maintained by the Contractor.

#### **Detour Route**

During the road closure vehicular traffic will be detoured onto the beach. The detour route is shown on Plan Sheet No. 2A. This detour route will only be accessible for four-wheel drive vehicles. The Contractor will be allowed to transport personnel only along the beach detour route. No machinery will be allowed along the beach detour. The Contractor will be allowed to use the other beach access point(s) located along the projects to deliver personnel to the sites in the middle of the road closure. These accesses will be closed to any other public traffic.

The Department will be responsible for preparing the temporary northern beach access for detour traffic. The National Park Service will install carsonite markers along the beachfront to designate the route.

The Department will be responsible for maintaining the detour route including access points.

#### **Work Zone Signing**

The Department of Transportation shall install signing in accordance with Sections 1100 & 1200 of the North Carolina Department of Transportation (NCDOT) *2006 Standard Specifications for Roads and Structures*, and the following provisions:

All barricades and detour signing shall be installed by the Department of Transportation. The Department will maintain all signs related to the detour and road closure. The maintenance of the road closure barricades (Type III) shall be the responsibility of the Contractor during the road closure.

When paving operations begin the Contractor shall furnish and install temporary signs prior to beginning of work and shall be removed by the Contractor upon final completion of the project. Any required lane closure signing (see NCDOT *Roadway Standard Drawing* Nos. 1101.01, 1101.11, 1102.02, and 1110.02) needed during the life of the project shall be furnished and installed by the Contractor and shall be removed at the end of the work period.

No direct payment will be made for maintaining the road closure signs as such work will be considered incidental to the various other bid items in the Contract.

#### **Pavement Markings**

Pavement markings will be installed by North Carolina Department of Transportation Forces.

**Project Special Provisions  
Structure**

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**SUBMITTAL OF WORKING DRAWINGS**

(SPECIAL)

**1.0 General**

Submit working drawings in accordance with Article 105-2 of the Standard Specifications and the requirements of this special provision. For the purposes of this provision, "submittals" refers to only those listed in this provision. The list of submittals contained herein does not represent a list of required submittals for 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. Either the Structure Design Unit or the Geotechnical Engineering Unit or both units will jointly review submittals.

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

In order to facilitate in-plant inspection by NCDOT and approval of working drawings, provide the name, address and telephone number of the facility where fabrication will actually be done if different than shown on the title block of the submitted working drawings. This includes, but is not limited to, precast concrete items, prestressed concrete items and fabricated steel or aluminum items.

**2.0 Addresses and Contacts**

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

Via US mail:

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

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

Via other delivery service:

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

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

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

Via other delivery service:

Mr. K. J. Kim, Ph. D., P. E.  
Eastern Regional Geotechnical  
Manager  
North Carolina Department

C201797

40

Optional Disc Bearings <sup>4</sup>	8	0	“Optional Disc Bearings”
Overhead Signs	13	0	Article 903-3(C) & Applicable Project Special Provisions
Pile Splicer	7	2	Subarticle 450-7(C)
Placement of Equipment on Structures (cranes, etc.)	7	0	Article 420-20
Pot Bearings <sup>4</sup>	8	0	“Pot Bearings”
Precast Concrete Box Culverts	2, then 1 reproducible	0	“Optional Precast Reinforced Concrete Box Culvert at Station _____”
Precast Pieces	7	0	Plan Note
Precast Retaining Wall Panels	10	1	Article 1077-2
Prestressed Concrete Cored Slab (detensioning sequences) <sup>3</sup>	6	0	Article 1078-11
Prestressed Concrete Deck Panels	6 and 1 reproducible	0	Article 420-3
Prestressed Concrete Girder (strand elongation and detensioning sequences)	6	0	Articles 1078-8 and 1078-11
Removal of Existing Structure over Railroad	5	0	Railroad Special Provisions
Revised Bridge Deck Plans (adaptation to prestressed deck panels)	2, then 1 reproducible	0	Article 420-3
Revised Bridge Deck Plans (adaptation to modular expansion joint seals)	2, then 1 reproducible	0	“Modular Expansion Joint Seals”
Sound Barrier Wall Casting Plans	10	0	Article 1077-2 & “Sound Barrier Wall”
Sound Barrier Wall Steel Fabrication Plans <sup>5</sup>	7	0	Article 1072-10 & “Sound Barrier Wall”
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**FOOTNOTES**

1. References are provided to help locate the part of the contract where the submittals are required. References in quotes refer to the Project Special Provision by that name. Articles or subarticles refer to the Standard Specifications.
2. Submittals for these items are necessary only when required by a note on plans.

## 51-A

**PILE DRIVING ANALYZER**

(SPECIAL)

**1. General**

PDA testing has been included in this project as a contingency item to diagnose pile driving problems if they arise. PDA testing will not be performed unless a problem installing piles occurs.

This special provision governs driving piles with a pile driving analyzer (PDA) in accordance with the plans and as directed by the Engineer. The PDA test method is described in ASTM D4945, "Standard Test Method for High-Strain Dynamic Testing of Piles". Install piles in accordance with Section 450 of the Standard Specifications and this provision.

Submit the proposed pile driving methods and equipment (Pile Driving Equipment Data Form) in accordance with the Submittal of Working Drawings Special Provision and the Standard Specifications. The Engineer will respond with preliminary approval or rejection of the proposed pile driving methods and equipment within 5 calendar days. Preliminary approval is required before driving piles with a PDA. Notify the Engineer of the pile driving schedule a minimum of 14 calendar days in advance.

Either a PDA Consultant or the NCDOT Geotechnical Engineering Unit, as directed by the Engineer, shall perform PDA testing and analysis. If required, retain a PDA Consultant and submit experience documentation with the proposed pile driving methods and equipment.

The Engineer will determine the number of piles and which piles to be tested with the PDA based upon the subsurface conditions and the pile installation sequence and progress.

The Engineer will complete the review of the proposed pile driving methods and equipment and provide the required driving resistance within 10 calendar days after the Engineer receives the PDA report or the Geotechnical Engineering Unit completes the PDA testing. A PDA report for PDA testing on multiple piles may be required as directed by the Engineer before the 10 day time period begins.

**2. Prequalification and Experience Requirements**

Use a PDA Consultant prequalified by the Contractual Services Unit of the Department for Pile Driving Analyzer work (work code 3060).

Submit documentation that the PDA Consultant has successfully completed at least 5 PDA testing projects within the last 3 years of a scope and complexity similar to that anticipated for this project. Documentation should include the General Contractor and Owner's name and current contact information with descriptions of each past project. Also, submit documentation of experience with PDA manufactured by Pile Dynamics, Inc and the CAsE Pile Wave Analysis Program (CAPWAP).

Provide a list of PDA Operators and the Project Engineer that will be assigned to this project. Submit documentation for each PDA Operator verifying employment with the PDA Consultant

and a minimum of 1 year experience in collecting PDA data with past projects of scope and complexity similar to that anticipated for this project. Submit documentation for the Project Engineer verifying employment with the PDA Consultant, registration as professional engineer in North Carolina and a minimum of 5 years experience in PDA testing and analysis with past projects of scope and complexity similar to that anticipated for this project. Documentation should include resumes, references, certifications, project lists, experience descriptions and details, etc.

### **3. Preparation for PDA Testing**

Supply 110 V, 60 Hz, 30 Amp of AC electrical power to operate the PDA equipment. Direct current welders or non-constant power sources are unacceptable.

Provide a suitable shelter to protect the PDA equipment and operator from conditions of sun, water, wind and temperature. The shelter should have a minimum floor size of 6 ft x 6 ft (2 m x 2 m) and a minimum roof height of 8 ft (2.5 m). If necessary, heat or cool the shelter to maintain a temperature between 50 and 85 degrees F (10 and 30 degrees C). Place the shelter within 75 ft (23 m) of the pile such that the PDA cables reach the computer and the operator can clearly observe the pile. The Engineer may waive the shelter requirement if weather conditions allow.

Drill up to a total of 16 bolt holes in either 2 or 4 sides of the pile, as directed by the PDA Consultant or the Engineer, at an approximate distance equal to 3 times the pile diameter below the head of the pile. If the PDA Consultant or the Engineer choose to drill the bolt holes, provide the necessary equipment, tools and assistance to do so. A hammer drill is required for concrete piles and up to 2 hours may be required to drill the holes.

Lift, align and rotate the pile to be tested with the PDA as directed by the PDA Consultant or the Engineer. Place the pile in the leads and template so that the PDA instruments and their accompanying wires will not be damaged.

The PDA Consultant or the Engineer will furnish the PDA measuring instruments and materials for installing the instruments. Attach the PDA instruments as directed by the PDA Consultant or the Engineer after the pile is placed in the leads and the template.

### **4. PDA Testing**

Use only the preliminarily approved pile driving methods and equipment to drive piles with the PDA instruments attached. Drive the pile as directed by the PDA Operator or the Engineer in order to measure the wavespeed of the pile.

Drive the pile to the required bearing capacity and specified tip elevation, if applicable, as shown on the plans or as directed by the PDA Consultant or the Engineer. During pile driving, the PDA will be used to evaluate, including but not limited to, the following: hammer performance, bearing capacity, distribution of soil resistance, pile driving stresses, energy transfer, pile integrity and various soil parameters such as quake and damping.

The PDA Operator or the Engineer may require the Contractor to modify the pile installation procedure during driving as follows:



- Reduce the hammer energy
- Drive deeper or shallower because of variations in the subsurface conditions
- Readjust the transducers
- Realign the pile

The Contractor is responsible in terms of both actual expense and time delays for any damage to the PDA instruments and supporting equipment due to the Contractor's fault or negligence. Replace any damaged equipment at no additional cost to the Department.

### **5. CAPWAP Analysis and PDA Report**

The PDA Consultant shall perform analysis of the PDA raw data with the CAPWAP (version 2006 or later). At a minimum, analysis is required for a hammer blow near the end of initial drive. Additional CAPWAP analysis may be required as determined by the PDA Consultant or the Engineer.

Submit three hard copies and an electronic copy (pdf or jpeg format on CD or DVD) of a PDA report sealed by the Project Engineer within 7 calendar days after field testing is complete. The PDA report shall include but not be limited to the following:

#### A. Title Sheet

- NCDOT TIP number and WBS element number
- Project description
- County
- Bridge station number
- Pile location
- Personnel
- Report date

#### B. Introduction

#### C. Site and Subsurface Conditions (including water table elevation)

#### D. Pile Details

- Pile type and length
- Required bearing capacity and factor of safety
- Concrete compressive strength and/or steel pile yield strength
- Pile splice type and locations
- Pile batter
- Installation methods including use of jetting, preaugering, spudding, vibratory hammer, template, barge, etc.

#### E. Driving Details

- Hammer make, model and type
- Hammer and pile cushion type and thickness
- Pile helmet weight
- Hammer efficiency and operation data including fuel settings, bounce chamber pressure, blows per minute, equipment volume and pressure
- Ground or mud line elevation and template reference elevation at the time of driving
- Final pile tip elevation
- Driving resistance (ram stroke, blows per foot (0.3 meter) and set for last 10 hammer blows)

#### F. PDA field work details

#### G. CAPWAP analysis results

- Table showing percent skin and tip, skin and toe damping, skin and toe quake and match quality

#### H. Summary/Conclusions

#### I. Attachments

- Boring log(s)
- Pile Driving Equipment Data Form (from Contractor)
- Field pile driving inspection data (from Engineer)
- Accelerometer and strain gauge locations
- Accelerometer and strain gauge serial numbers and calibration information
- PDA hardware model and CAPWAP software version information
- Electronic copy of all PDA raw data and executable CAPWAP input and output files (version 2006 format)

### 6. Measurement And Payment

The complete and accepted PDA testing will be paid for at the unit bid price for "PDA Testing" per each. Include in the unit bid price for "PDA Testing" all costs for providing the PDA, PDA instruments and materials for installing the instruments and recording the dynamic measurements the first time the pile is tested with the PDA. Also include in the unit bid price for "PDA Testing" all costs for performing the CAPWAP analysis on data collected during initial drive and preparing and submitting the PDA report. No payment for "PDA Testing" will be made if the PDA report submitted is incomplete as described in Section 5.0. No payment for "PDA Testing" will be made if the Department performs PDA testing. If the Department does not perform PDA testing, the number of "PDA Testing" per pile will be equal to one.

The complete and accepted PDA assistance will be paid for at the unit bid price for "PDA Assistance" per each. Include in the unit bid price for "PDA Assistance" all costs for PDA preparation and support including all materials, labor, tools, equipment, mobilization and incidentals necessary to complete the work described in this provision excluding the costs for the PDA testing described above. Costs for PDA preparation will not be paid for separately. The number of "PDA Assistance" per pile will be equal to one for each pile tested with the PDA.

The cost of the pile will be paid for separately in accordance with the Standard Specifications and will not be part of these PDA pay items.

# PLAN VIEW DETAILED DRAWING

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### SYMBOLS

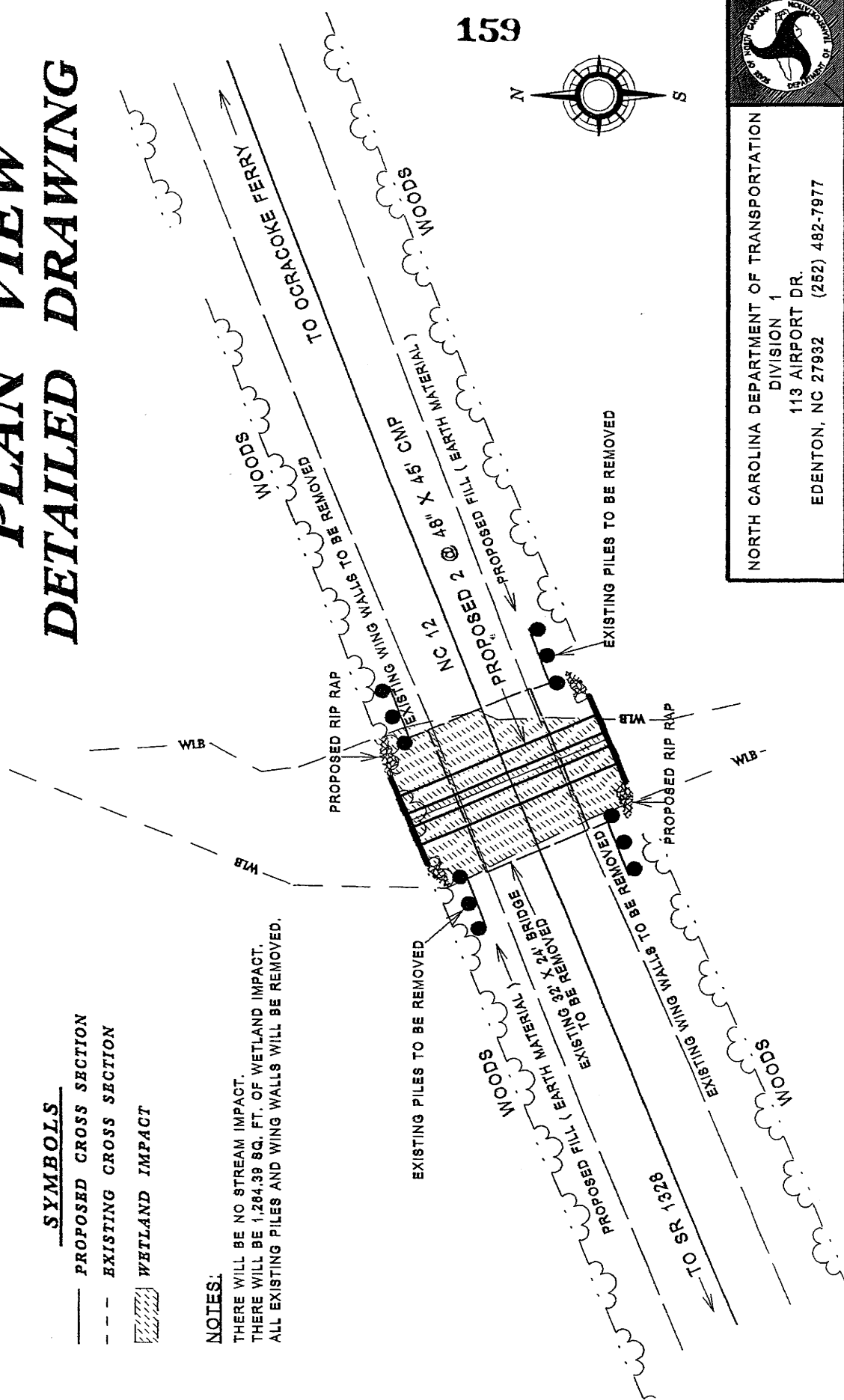
— PROPOSED CROSS SECTION

- - - EXISTING CROSS SECTION

WETLAND IMPACT

### NOTES:

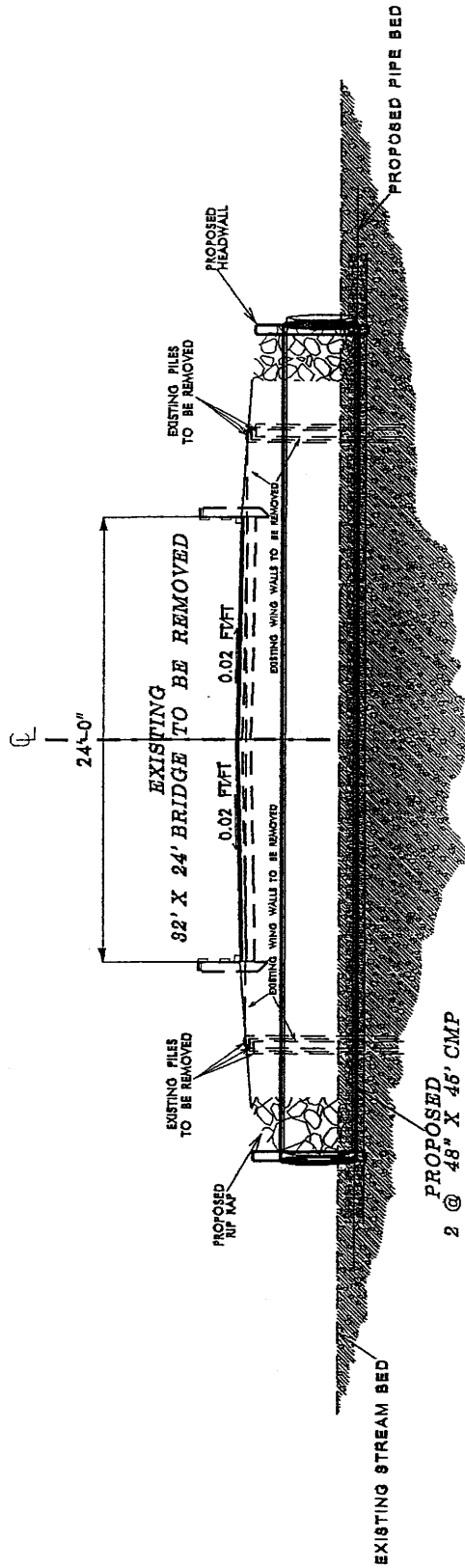
THERE WILL BE NO STREAM IMPACT.  
THERE WILL BE 1,284.39 SQ. FT. OF WETLAND IMPACT.  
ALL EXISTING PILES AND WING WALLS WILL BE REMOVED.



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION 1 113 AIRPORT DR. EDENTON, NC 27932 (252) 482-7977	
COUNTY: HYDE QUAD: HOWARD REEF BASIN: TAR-PAMLICO	WBS#: N/A DATE: MARCH 16, 2007 SHEET#: 1 OF 2
SUBJECT: BRIDGE REPLACEMENT ON NC 12 (OCRACOKE)	
LAT. = 36.1279164 N	LONG. = 75.9212250 W
DRAWN BY: A.L. MULDER	
SCALE: 1" = 30'	

Revised 7-5-07

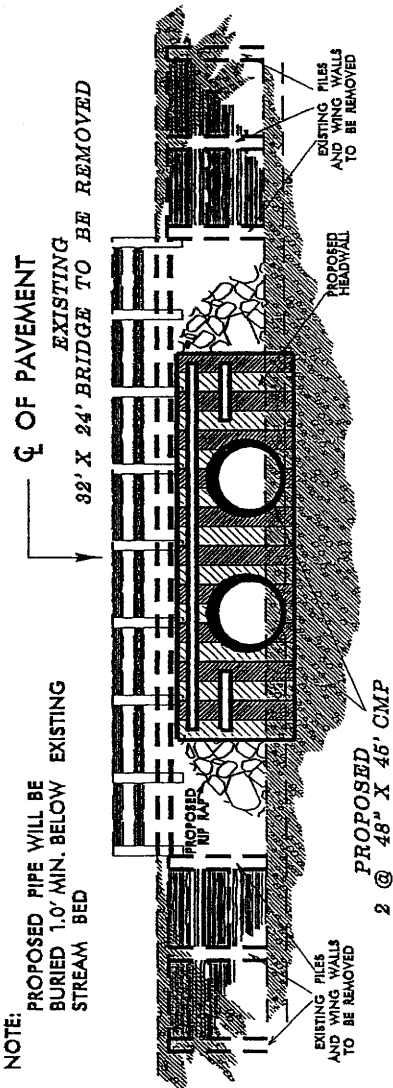
# DETAIL SECTION - CROSS SECTION



160

NOTE: PROPOSED 2 @ 48" X 45' CMP TO BE BURIED 1.0' MIN., BELOW EXISTING STREAM BED

NOTE: PROPOSED PIPE WILL BE BURIED 1.0' MIN. BELOW EXISTING STREAM BED



# DETAIL SECTION - END VIEW

## SYMBOLS

- PROPOSED CROSS SECTION
- - - EXISTING CROSS SECTION

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 DIVISION 1  
 113 AIRPORT DR.  
 EDENTON, NC 27832 (252) 482-7977

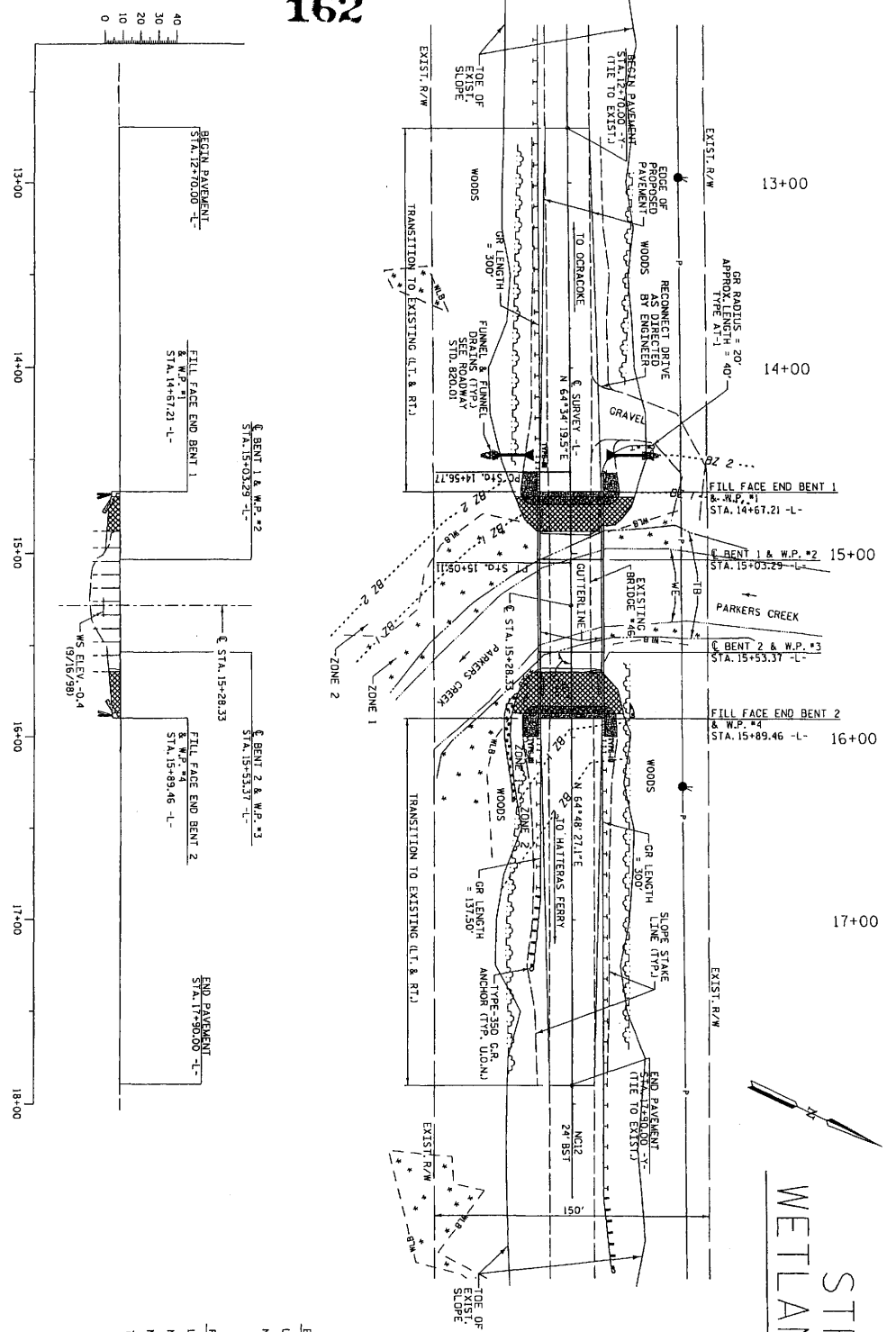


COUNTY: HYDE	WBS#: N/A
QUAD: HOWARD REEF	DATE: MARCH 16, 2007
BASIN: TAR-PAMLICO	SHEET#: 2 OF 2
SUBJECT: BRIDGE #24 TO BE REPLACED WITH PIPE	
LAT. = 35.1279184 N	LONG. = 75.8212250 W
DRAWN BY: A.L. MULDER	
SCALE: 1" = 10'	



Added 7-5-07

162



STREAM &  
WETLAND IMPACTS

USE METHOD 3  
FOR CLEARING

DEMOTES MECHANIZED  
CLEARING DOES NOT  
INCLUDE PROBING

ZONE 1 BUFFER  
FILL REMOVAL

EXISTING BRIDGE INFORMATION  
LENGTH = 78'  
NO. OF BENTS = 9

PROPOSED BRIDGE INFORMATION  
LENGTH = 128'  
NO. OF BENTS = 2  
NO. OF PILES AT EACH BENT = 8  
TOTAL SQ. FT. OF PILES AT EACH BENT = 14

PLAN & PROFILE VIEW

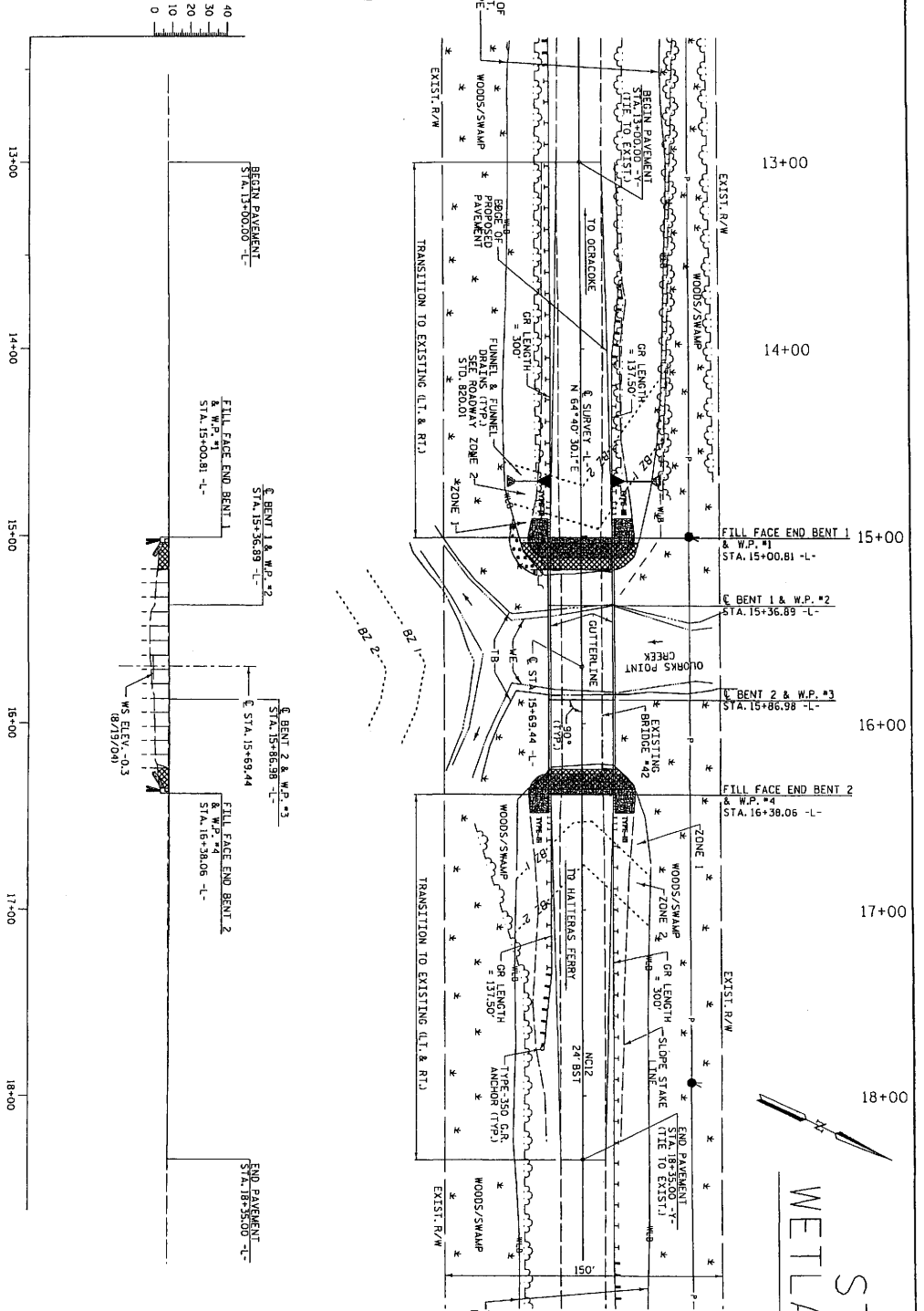
SCALE: 1" = 60' (HORIZONTAL)  
1" = 60' (VERTICAL)

SHEET OF 3/13/07

NC DOT  
DIVISION OF HIGHWAYS  
HYDE COUNTY  
PROJECT: MA-1009B  
REPLACE BRIDGE #46  
ON NC 12 OVER  
PARKERS CREEK

Added 7-5-07

163



PLAN & PROFILE VIEW

SCALE: 1" = 60' (HORIZONTAL)  
1" = 60' (VERTICAL)

STREAM &  
WETLAND IMPACTS

USE METHOD 3  
FOR CLEARING

DEPOTES MECHANIZED  
DOES NOT INCLUDE  
GROBBING

ZONE 1 BUFFER  
REMOVAL

EXISTING BRIDGE INFORMATION

LENGTH = 107'  
NO. OF BENTS = 13

PROPOSED BRIDGE INFORMATION

LENGTH = 120'  
NO. OF BENTS = 2  
NO. OF PILES AT EACH BENT = 8  
TOTAL SQ. FT. OF PILES AT EACH BENT = 14

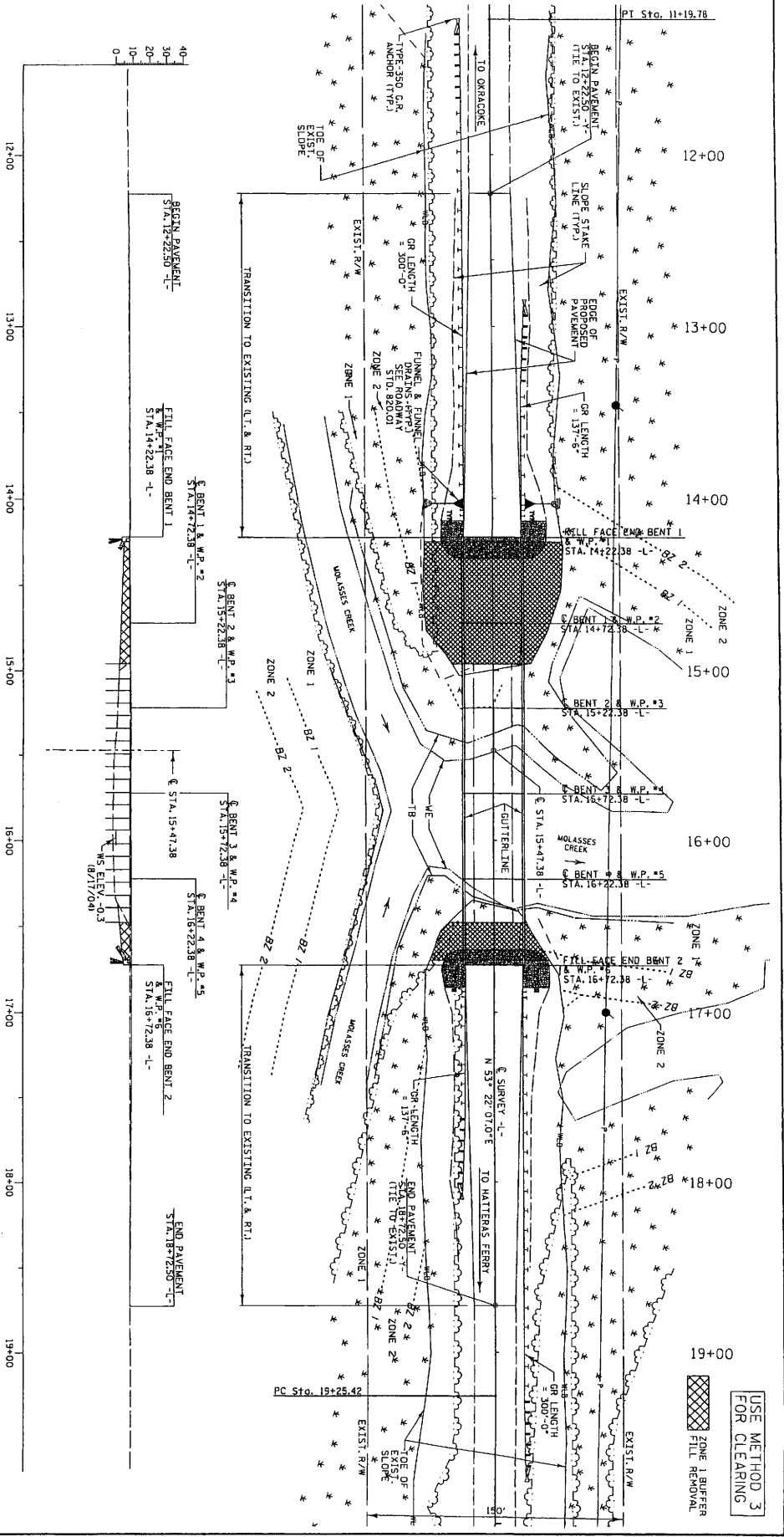
SHEET OF 3/15/07

NCDDOT  
DIVISION OF HIGHWAYS  
HYDE COUNTY  
PROJECT: B-5017  
REPLACE BRIDGE #42  
ON NC 12 OVER  
QUORKS POINT CREEK



Added 7-5-07

STREAM, WETLAND & BUFFER IMPACTS



PLAN & PROFILE VIEW

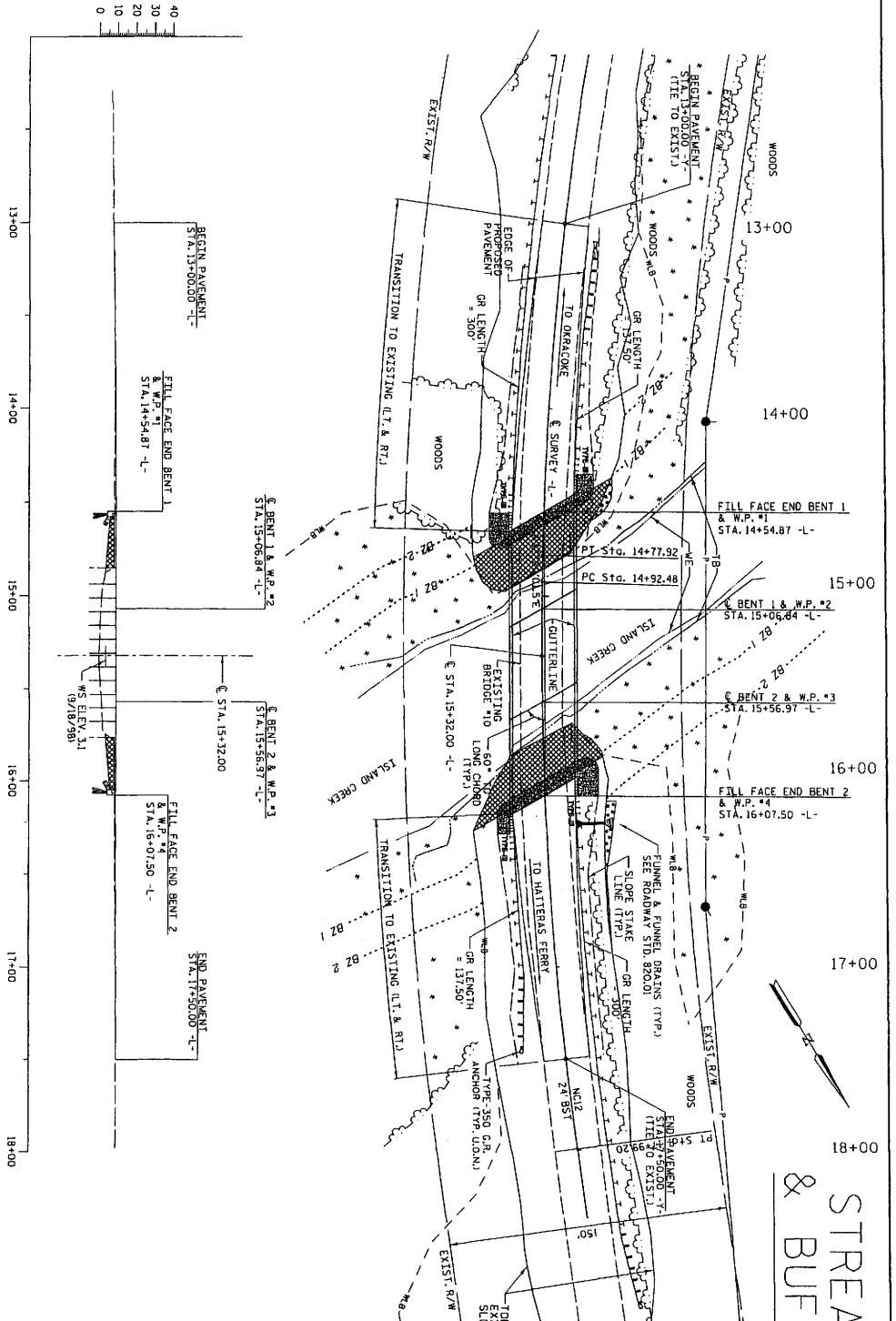
SCALE: 1" = 60' (HORIZONTAL)  
1" = 60' (VERTICAL)

<p><b>EXISTING BRIDGE INFORMATION</b></p> <p>LENGTH = 152'</p> <p>NO. OF BENTS = 19</p>		<p><b>NC DOT</b></p> <p>DIVISION OF HIGHWAYS</p> <p>HYDE COUNTY</p> <p>PROJECT: B-5016</p>
<p><b>PROPOSED BRIDGE INFORMATION</b></p> <p>LENGTH = 256'</p> <p>NO. OF BENTS = 4</p> <p>NO. OF PILES AT EACH BENT = 8</p> <p>TOTAL SQ. FT. OF PILES AT EACH BENT = 14</p>		
<p><b>REPLACE BRIDGE #39</b></p> <p><b>ON NC 19 OVER</b></p> <p><b>MOLASSES CREEK</b></p>		<p>SHEET <b>OF</b></p> <p>3 / 16 / 07</p>

USE METHOD 3 FOR CLEARING

ZONE 1 BUFFER FILL REMOVAL





PLAN & PROFILE VIEW

SCALE: 1" = 60' (HORIZONTAL)  
1" = 60' (VERTICAL)

STREAM, WETLAND & BUFFER IMPACTS

USE METHOD 3 FOR CLEARING

- DENOTES MECHANIZED (DOES NOT INCLUDE GRABBING)
- ▨ ZONE 1 BUFFER FILL REMOVAL

EXISTING BRIDGE INFORMATION  
LENGTH = 92'-8"  
NO. OF BENTS = 11

PROPOSED BRIDGE INFORMATION  
LENGTH = 156'  
NO. OF BENTS = 2  
NO. OF PILES AT EACH BENT = 8  
TOTAL SQ. FT. OF PILES AT EACH BENT = 14

NCDDOT  
DIVISION OF HIGHWAYS  
HYDE COUNTY  
PROJECT: MA-1011B  
REPLACE BRIDGE #10  
ON NC 12 OVER  
ISLAND CREEK

SHEET OF 37/13/07