

**Project Special Provisions  
Structure**

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A circular professional seal for a North Carolina Professional Engineer. The seal contains the text "NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20211" and the name "THOMAS PAYNE". A handwritten signature is written over the seal, and the date "12/4/09" is written below it.

**PROJECT SPECIAL PROVISIONS**  
**STRUCTURE**

WBS 41732.2

BRUNSWICK COUNTY

**SECURING OF VESSELS**

(10-12-01)

Secure vessels in accordance with Section 107 of the Standard Specifications and the following provision.

When utilizing barges, tugboats or other vessels, take all necessary precautions to ensure that such vessels are securely anchored or moored when not in active operation. Take all necessary measures to ensure that the vessels are operated in a manner that avoids damage to or unnecessary contact with bridges and other highway structures and attachments. If severe weather conditions are anticipated, or should be anticipated through reasonable monitoring of weather forecasts, take additional measures to protect bridges and other highway structures and attachments from extreme conditions. The Contractor is strictly liable for damages to any bridge or other highway structure or attachment caused by a vessel owned or controlled by the Contractor. The Contractor is also liable to third parties for property damages and loss of revenue caused by vessels under the Contractor's control.

**SUBMITTAL OF WORKING DRAWINGS**

(9-16-08)

**1.0 GENERAL**

Submit working drawings in accordance with Article 105-2 of the *Standard Specifications* and this provision. For this provision, "submittals" refers to only those listed in this provision. The list of submittals contained herein does not represent a list of required submittals for the project. Submittals are only necessary for those items as required by the contract. Make submittals that are not specifically noted in this provision directly to the Resident Engineer. Either the Structure Design Unit or the Geotechnical Engineering Unit or both units will jointly review submittals.

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

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

## 2.0 ADDRESSES AND CONTACTS

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

Via US mail:

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

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

Via other delivery service:

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

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

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 <a href="mailto:plambert@ncdot.gov">plambert@ncdot.gov</a>
Secondary Structures Contacts:	James Gaither (919) 250 – 4042 David Stark (919) 250 – 4044
Eastern Regional Geotechnical Contact (Divisions 1-7):	K. J. Kim (919) 662 – 4710 (919) 662 – 3095 facsimile <a href="mailto:kkim@ncdot.gov">kkim@ncdot.gov</a>
Western Regional Geotechnical Contact (Divisions 8-14):	John Pilipchuk (704) 455 – 8902 (704) 455 – 8912 facsimile <a href="mailto:jpilipchuk@ncdot.gov">jpilipchuk@ncdot.gov</a>

### 3.0 SUBMITTAL COPIES

Furnish one complete copy of each submittal, including all attachments, to the Resident Engineer. At the same time, submit the number of hard copies shown below of the same complete submittal directly to the Structure Design Unit and/or the Geotechnical Engineering Unit.

The first table below covers “Structure Submittals”. The Resident Engineer will receive review comments and drawing markups for these submittals from the Structure Design Unit. The second table in this section covers “Geotechnical Submittals”. The Resident Engineer will receive review comments and drawing markups for these submittals from the Geotechnical Engineering Unit.

Unless otherwise required, submit one set of supporting calculations to either the Structure Design Unit or the Geotechnical Engineering Unit unless both units require submittal copies in which case submit a set of supporting calculations to each unit. Provide additional copies of any submittal as directed by the Engineer.

**STRUCTURE SUBMITTALS**

<b>Submittal</b>	<b>Copies Required by Structure Design Unit</b>	<b>Copies Required by Geotechnical Engineering Unit</b>	<b>Contract Reference Requiring Submittal <sup>1</sup></b>
Arch Culvert Falsework	5	0	Plan Note, SN Sheet & "Falsework and Formwork"
Box Culvert Falsework <sup>7</sup>	5	0	Plan Note, SN Sheet & "Falsework and Formwork"
Cofferdams	6	2	Article 410-4
Evazote Joint Seals <sup>6</sup>	9	0	"Evazote Joint Seals"
Expansion Joint Seals (hold down plate type with base angle)	9	0	"Expansion Joint Seals"
Expansion Joint Seals (modular)	2, then 9	0	"Modular Expansion Joint Seals"
Expansion Joint Seals (strip seals)	9	0	"Strip Seals"
Falsework & Forms <sup>2</sup> (substructure)	8	0	Article 420-3 & "Falsework and Formwork"
Falsework & Forms (superstructure)	8	0	Article 420-3 & "Falsework and Formwork"
Girder Erection over Railroad	5	0	Railroad Provisions
Maintenance and Protection of Traffic Beneath Proposed Structure	8	0	"Maintenance and Protection of Traffic Beneath Proposed Structure at Station ____"
Metal Bridge Railing	8	0	Plan Note
Metal Stay-in-Place Forms	8	0	Article 420-3
Metalwork for Elastomeric Bearings <sup>4,5</sup>	7	0	Article 1072-10
Miscellaneous Metalwork <sup>4,5</sup>	7	0	Article 1072-10
Optional Disc Bearings <sup>4</sup>	8	0	"Optional Disc Bearings"
Overhead Signs	13	0	Article 903-3(C) &

			Applicable Provisions
Pile Splicers	7	2	Subarticle 450-7(C) & "Piles"
Pile Points	7	2	Subarticle 450-7(D) & "Piles"
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 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 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"
Structural Steel <sup>4</sup>	2, then 7	0	Article 1072-10
Temporary Detour Structures	10	2	Article 400-3 & "Construction, Maintenance and Removal of Temporary Structure at Station ____"
TFE Expansion Bearings <sup>4</sup>	8	0	Article 1072-10

**FOOTNOTES**

1. References are provided to help locate the part of the contract where the submittals are required. References in quotes refer to the provision by that name. Articles and subarticles refer to the *Standard Specifications*.
2. Submittals for these items are necessary only when required by a note on plans.
3. Submittals for these items may not be required. A list of pre-approved sequences is available from the producer or the Materials & Tests Unit.
4. The fabricator may submit these items directly to the Structure Design Unit.
5. The two sets of preliminary submittals required by Article 1072-10 of the *Standard Specifications* are not required for these items.
6. Submittals for Fabrication Drawings are not required. Submittals for Catalogue Cuts of Proposed Material are required. See Section 5.A of the referenced provision.
7. Submittals are necessary only when the top slab thickness is 18" or greater.

**GEOTECHNICAL SUBMITTALS**

<b>Submittal<sup>1</sup></b>	<b>Copies Required by Geotechnical Engineering Unit</b>	<b>Copies Required by Structure Design Unit</b>	<b>Contract Reference Requiring Submittal<sup>2</sup></b>
Crosshole Sonic Logging (CSL) Reports	1	0	“Crosshole Sonic Logging”
Drilled Pier Construction Sequence Plans	1	0	“Drilled Piers”
Pile Driving Analyzer (PDA) Reports	2	0	“Pile Driving Analyzer”
Pile Driving Equipment Data <sup>3</sup>	1	0	Article 450-5 & “Piles”
Retaining Walls	8	2	Applicable Provisions
Contractor Designed Shoring	7	2	“Temporary Shoring”, “Anchored Temporary Shoring” & “Temporary Soil Nail Walls”

**FOOTNOTES**

1. With the exception of “Pile Driving Equipment Data”, electronic copies of geotechnical submittals are required. See referenced provision.
2. References are provided to help locate the part of the contract where the submittals are required. References in quotes refer to the provision by that name. Articles refer to the *Standard Specifications*.
3. Download Pile Driving Equipment Data Form from following link:  
<http://www.ncdot.org/doh/preconstruct/highway/geotech/formdet/>  
Submit one hard copy of the completed form to the Resident Engineer. Submit a second copy of the completed form electronically, by facsimile or via US Mail or other delivery service to the Geotechnical Engineering Unit. Electronic submission is preferred. See second page of form for submittal instructions.



**CRANE SAFETY****(8-15-05)**

Comply with the manufacturer specifications and limitations applicable to the operation of any and all cranes and derricks. Prime contractors, sub-contractors, and fully operated rental companies shall comply with the current Occupational Safety and Health Administration regulations (OSHA).

Submit all items listed below to the Engineer prior to beginning crane operations involving critical lifts. A critical lift is defined as any lift that exceeds 75 percent of the manufacturer's crane chart capacity for the radius at which the load will be lifted or requires the use of more than one crane. Changes in personnel or equipment must be reported to the Engineer and all applicable items listed below must be updated and submitted prior to continuing with crane operations.

**CRANE SAFETY SUBMITTAL LIST**

- A. **Competent Person:** Provide the name and qualifications of the "Competent Person" responsible for crane safety and lifting operations. The named competent person will have the responsibility and authority to stop any work activity due to safety concerns.
- B. **Riggers:** Provide the qualifications and experience of the persons responsible for rigging operations. Qualifications and experience should include, but not be limited to, weight calculations, center of gravity determinations, selection and inspection of sling and rigging equipment, and safe rigging practices.
- C. **Crane Inspections:** Inspection records for all cranes shall be current and readily accessible for review upon request.
- D. **Certifications:** By July 1, 2006, crane operators performing critical lifts shall be certified by NC CCO (National Commission for the Certification of Crane Operators), or satisfactorily complete the Carolinas AGC's Professional Crane Operator's Proficiency Program. Other approved nationally accredited programs will be considered upon request. All crane operators shall also have a current CDL medical card. Submit a list of anticipated critical lifts and corresponding crane operator(s). Include current certification for the type of crane operated (small hydraulic, large hydraulic, small lattice, large lattice) and medical evaluations for each operator.

**COORDINATION WITH THE U. S. COAST GUARD****(SPECIAL)**

At no time during work will the waterway be closed to navigation without prior approval from the Coast Guard. The contractor is required to maintain close and regular contact with Coast Guard Sector North Carolina to keep them informed to activities in the waterway at (252)-247-4570.

All waterway closures shall be requested in writing and shall be received by the District Commander of the Coast Guard at least 30 days in advance of the closure so that the appropriate

marine notifications can be made. The Contractor shall send a copy of each request to Stephen Lane, Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557.

All work shall be conducted so that free navigation of the waterway is not unreasonably interfered with and the present navigable depths are not impaired. Timely notice of any and all events that affect navigation shall be given to the District Commander during the removal of the existing fender and the installation of the proposed fender system. The channel at the fender site shall be promptly cleared of all obstructions placed therein or caused by the contractor.

Prior to any work commencing in the waterway, temporary navigational lighting will be required by the Coast Guard. Additional lighting or obstruction lighting may also be required. All temporary navigational lighting shall be coordinated with the District Commander and shall be provided and installed by the Contractor.

After installation of the temporary navigation lighting and prior to the removal of the existing structure, the Contractor shall notify the Engineer so NCDOT Bridge Management can remove the existing fender system navigation lighting system. When the fender system is complete and prior to removal of the temporary navigation lighting, the Contractor shall notify the Engineer so NCDOT Bridge Management can install the navigation lighting system on the fender system.

The Contractor shall give the Engineer a minimum of 5 days notice so NCDOT Bridge Management may schedule the removal or installation of the navigation lighting system and clearance gauge.

#### **REMOVAL OF EXISTING FENDER SYSTEM**

**(SPECIAL)**

The existing fender system shall be removed in accordance with Section 402 of the Standard Specifications and this special provision.

In order to protect the bridge at all times, the replacement of the fender system, both removal and construction, shall be limited to replacing three new panels of fender system at any one time. Therefore, removal of the existing fender system shall be done in stages consisting of removing the existing length necessary to build three new panels of fender system and then building the three new panels prior to starting the next stage.

Piles from the existing fender system and any remnant piles from previous fender systems shall be removed in their entirety. In the event that a pile breaks during removal and cannot be removed in its entirety, the pile may be cut off flush with the bed of the water body, and the NCDCM shall be notified of each occurrence within one working day.

The lump sum price bid for "Removal of Existing Fender System" will be full compensation for the above work covered by Section 402 of the Standard Specifications, the applicable permits, and this Special Provision including all materials, equipment, tools, labor, disposal, and incidentals necessary to complete this work.

**PLASTIC FENDER SYSTEM****(SPECIAL)****1.0 Description**

The work for providing the plastic fender system including the pile clusters consists of furnishing and installing structural plastic (SP) components including fiberglass reinforced plastic lumber (FRPL) and fiberglass reinforced plastic piles (FRPP) and all miscellaneous hardware to complete the work in accordance with the plans and this special provision. The work also includes providing, installing, and later removing temporary navigational lights as mentioned in the "Coordination with the US Coast Guard" special provision.

**2.0 Materials**

Use plastic consisting of a mixture of one or more of the following recycled post consumer or post industrial thermoplastics: high-density polyethylene, medium-density polyethylene, low-density polyethylene. Mix the plastic with appropriate colorants, UV inhibitors, hindered amine light stabilizers and antioxidants so that the resulting product meets the material property requirements specified in Table 1. SP products must not absorb moisture, corrode, rot, warp, splinter or crack. The outer skin of both the FRPL and FRPP shall be black in color unless otherwise specified in the Contract Documents. The outer surface of both the FRPL and the FRPP shall be generally smooth, uniform and consolidated but may contain occasional small blisters or pockmarks.

Manufacture FRPL and FRPP as one continuous piece with no joints or splices to the dimensions and tolerances in accordance with Table 2 and consisting of a dense outer skin surrounding a less dense core. Interior voids shall not exceed 1.0 inch in diameter. The total area of voids shall be less than 5% of the total cross sectional area of the member. FRPL and FRPP shall be free of twist and curvature. Reinforce 10"x10" FRPL with a minimum of four 1-1/2 inch reinforcing rods placed in the corners of the section. Reinforce 13" OD FRPP with a minimum of eight 1-3/8 inch fiberglass reinforcing rods. Reinforce 16" OD FRPP with a minimum of sixteen 1-1/4 inch fiberglass reinforcing rods. Space the fiberglass reinforcing rods evenly around the inside perimeter of the pile. Reinforcing rods must be continuous and offer a minimum flexural strength of 70 ksi when tested in accordance with ASTM D 4476 and a minimum compressive strength of 40 ksi when tested in accordance with ASTM D 695. Steel reinforcement of either FRPL or FRPP is not permitted.

Add a minimum of 15% (by weight) glass filament to the polyethylene used for FRPL and a minimum of 5% (by weight) glass filament to the polyethylene used for FRPP.

10"x10" FRPL must meet the minimum structural properties listed in Table 3. The FRPL reinforced with glass filament shall meet the minimum properties listed in Table 4. 13" O.D. and 16" OD FRPP must meet the minimum structural properties listed in Table 5.

Density ASTM D 792-00	Skin	55-65 pcf
Density ASTM D792-00	Core	35-55 pcf
Water Absorption ASTM D 570-98	Skin	2 hrs: 0.01% weight. increase 24 hrs: 0.03% weight. increase
Brittleness ASTM D 746-07	Skin	No break at < -40°F
Impact Resistance ASTM D256-06 Method A	Skin	Greater than 0.62 ft-lbs/in
Hardness ASTM D 2240-05	Skin/Core	55-70 (Shore D)
Abrasion ASTM D 4060-07	Skin	Weight Loss: < 0.3g Wear Index: 25-30 Cycles = 10,000 Wheel = CS17 Load: 1kg
Chemical Resistance ASTM D756-03	Skin/Core Sea Water Gasoline No. 2 Diesel	< 1.0% weight increase < 9.0% weight increase < 5.0% weight increase
Tensile Properties ASTM D 638-03	Skin/Core	Minimum 1500 psi at break
Compressive Modulus ASTM D 695-02	Skin/Core	Minimum 40 ksi
Static Coefficient of Friction ASTM D1894-06	Skin Sea Water Dry	0.2 max. 0.25 max.
Nail Pull-Out ASTM D6117	Skin/Core	Minimum 97 lbs

Table 2 Dimensions and Tolerances		
FRPL	Dimension	Tolerance
Length	Per order (80 ft maximum)	+6 -0 in
Width	See Contract Plans	± ¼ in
Height	See Contract Plans	± ¼ in
Corner Radius – FRPL (w/ rebar)	1 3/4 in	± ¼ in
- FRPL (w/o rebar)	¼ in	± 1/16 in
Outer Skin Thickness –	3/16 in	± 1/8 in
Distance from outer surface to rebar elements (FRPL)	1 1/2 in	± 5/8 in
Straightness (gap, bend or inside while lying on a flat surface)		<1 ½ in per 10 feet

Table 3 Structural Properties for 10"x10" FRPL reinforced w/ (4) - 1.50" rebar	
Member Size	10 in x 10 in
Modulus of Elasticity as derived below	521 ksi
Stiffness, E.I.	4.05E+08 lb-in <sup>2</sup>
Yield Stress in Bending	5.8 ksi
Weight	30-37 lb/ft

Determine the modulus of elasticity for FRPL by conducting a three point or four point bend test as per ASTM D790 or D6109. The modulus for FRPL with rebar is to be taken at a strain of 0.01 inches per inch. The modulus for FRPL reinforced with glass filament may be taken by one of the methods suggested in ASTM D6109.

Table 4 Structural Properties for FRPL reinforced w/ glass filament	
Modulus of Elasticity (ASTM D6109)	300,000 psi
Flexural Strength (ASTM D6109)	No fracture at 3000 psi
Compressive Strength (ASTM D6108)	2900 psi parallel to grain 2400 psi perpendicular to grain
Screw / Nail Withdrawal (ASTM D6117)	370 lbs screw 97 lbs nail

Table 5 Structural Properties for 13" OD FRPP reinforced w/ (8) – 1.375" rebar Structural Properties for 16" OD FRPP reinforced w/ (16) – 1.25" rebar		
Member Size	13" O.D.	16" O.D.
Modulus of Elasticity as derived below	735 ksi	856 ksi
Stiffness, E.I.	1.03E+09 lb-in <sup>2</sup>	2.76E+09 lb-in <sup>2</sup>
Yield Stress in Bending	6,028 psi	6,785 ksi
Weight	42-51 lbs/ft	64-78 lb/ft

Determine the modulus of elasticity for FRPP by one of two methods: Method one consists of a three point or four point bend test per ASTM D790 or D6109. The modulus for FRPP is to be taken at a strain 0.01 inches per inch.

Method two consists of a 54 foot long specimen horizontally clamped with six foot of piling firmly fixed and the other end simply supported. Gradually apply a vertical load at a point 12 feet from the simply supported end, with deflection measured at three equidistant locations. The modulus for FRPP is to be taken at a strain 0.01 inches per inch.

Calculate properties for Tables 3 and 5 utilizing standard elastic beam flexure formulas. Conduct each test on a full size product specimen of the cross section dimensions indicated. Results of the test may be extended to a product of similar or smaller cross section. The specified minimum yield stress in bending shall be reached before failure of the test specimen.

FRPP shall exhibit recoverable deflection with not more than a 5% reduction in bending stiffness (EI) when cyclically tested. Cyclic load testing shall be for a minimum of 200 load cycles. The applied load shall produce a minimum of 40% of the pile's bending moment at yield.

### 3.0 Acceptance

The Contractor shall submit the following information to the Resident Engineer and Steve Walton of Materials & Tests (336-993-2300) at least 20 days prior to installing any SP products:

- Copies of the SP manufacturer's standards and most recent brochure for the FRPP & FRPL products covered by these Specifications.
- Independent test lab report confirming the SP products meet the Plastic Material properties found in Table 1.
- Independent test lab report confirming the submitted FRPP & FRPL products meet the minimum structural property requirements found in Table 3 (FRPL), Table 4 (FRPL reinforced with glass filament) and Table 5 (FRPP).
- Independent test lab report (cyclical load test) confirming FRPP meets the recoverable deflection requirements found in this specification.
- Written certification from the SP manufacturer that the submitted FRPL and FRPP products satisfy the requirements of this specification and have been in service for a minimum of five (5) years on at least three (3) other bridge pier protection applications in the U.S. This written certification shall include project owner information, project names, locations, contacts and phone numbers.

The Department reserves the right to place a duly authorized inspector in the plant prior to shipment of any SP product for the purpose of determining preapproval. Notify the Engineer at least 7 days in advance of any shipment. Preapproval of SP products shall be on the basis of tests of materials, inspection of SP products, conformance with specified dimensions, appearance, and freedom from defect. Each individual SP piece shall be available for inspection by the inspector. The inspector shall have the authority to reject any or all SP products not manufactured in accordance with these specifications. Any SP products found to be defective in any manner at any time shall be rejected and replaced by an acceptable SP product or repaired in a manner approved by the engineer. All SP products preapproved by the inspector shall be stamped as approved. Preapproval does not guarantee final acceptance.

Final acceptance of all SP products shall be determined by the Engineer prior to installation.

#### 4.0 Construction Details

Protect materials at all times against exposure to extreme heat or impact. Transport SP in a manner that will minimize scratching or damage to the outer surfaces, stack on dunnage above ground so that it may be easily inspected and store in a manner that will avoid damage. Handle and lift SP with nylon slings. Do not use sharp instruments in handling the product. SP damaged in shipping or handling will be rejected.

Cut, bevel, drill, countersink, and otherwise fabricate SP in accordance with the manufacturer's recommendations Set all material accurately to required levels and lines, with members plumb and true and accurately cut and fitted. Securely attach all composite lumber to substrate by anchoring and fastening as shown on plans. Perform all cutting and drilling in a manner that allows for the collection of all debris and dispose of properly.

After driving, cut off piles at the elevation shown on the plans using sawing or other means as approved by the Engineer to provide a smooth level cut.

#### 5.0 Basis of Payment

The lump sum price bid for "Plastic Fender System" will be full compensation for the above work including material, equipment, tools, disposal, fasteners, coordinating with the Coast Guard, and other necessary items required for completing the work. No separate payment will be made for plates, bolts, screws, or other hardware necessary to complete the work.

#### **WIRE ROPE FOR FENDER PILE CLUSTER**

**(SPECIAL)**

Unless otherwise shown on the plans, galvanized aircraft quality wire rope with ultraviolet ray resistant polypropylene impregnation shall be used. The polypropylene plastic shall form a wall of protection by using spacer wires in the outer gallery of each strand and shall be effectively bonded to the outer plastic jacket. The rope diameter shall be 1/2 inch and the outside diameter of the covering shall be 5/8 inch. The rope construction shall be 6 by 19 independent wire rope core with nominal strength of 22,800 pounds. All ends shall be protected with heat shrinkable end caps, compatible with the rope's polypropylene. The caps shall provide an effective water-

tight seal and shall be installed in accordance with the manufacturer’s instructions. The rope shall conform to Federal Specifications W83420 for aircraft quality and the protective coating shall conform to ASTM A 475 (Type 1 coating).

**AS-BUILT PLANS**

**(SPECIAL)**

The Contractor shall provide As-Built plans to both the Resident Engineer and the Navigational Branch of the U.S. Army Corps of Engineers showing the location of the new fender system. A survey must be performed and referenced to the North Carolina State Plain Coordinate System NAD 1983 US survey feet horizontal datum and NGVD 1929 US survey feet vertical datum. The As-built plans shall be submitted within thirty (30) days of completion of construction activities to the Resident Engineer and to the US Army Corps of Engineers, Wilmington District, 69 Darlington Ave., Wilmington, North Carolina 28403.

No separate payment will be made for the above work. All costs associated with providing the As-Built plans shall be considered incidental to the lump sum cost of the Plastic Fender System.

**SPARE PARTS PACKAGE**

**(SPECIAL)**

In addition to the Bill of Materials list shown on the plans for materials required to build the plastic fender system, the Contractor shall also provide the Department with the following materials for future repair purposes.

Structural Composite Lumber		
Mark	Size	Quantity
A1	10" X 10" X 32'	8

Plastic Lumber		
Mark	Size	Quantity
B	8" X 8" X 8"	21
C	2" X 6" X 16'	10
D	4" X 6" X 4'-4"	6
E	2" X 12" X 2'-6"	20
F2	6" X 10" X 16'	8

The Contractor shall contact Mr. Chuck Francka at phone number 910-371-6580 at least 24 hours prior to delivery and shall deliver the materials to the bridge maintenance yard at 25 Old River Road, Leland, NC 28451. NCDOT forces will unload the materials.

No separate payment will be made for the above work. All costs associated with providing the Spare Parts Package shall be considered incidental to the lump sum cost of the Plastic Fender System.



**LOCATION OF NEW FENDER SYSTEM****(SPECIAL)**

The new fender system is shown at the same location of the existing fender system and shall not encroach into the existing 90' navigational channel. The Contractor may request building both sides of the fender system up to two foot up or down stream from the existing location. The Contractor may also request building one side or both sides of the fender system up to two feet away from/outside of the existing 90' navigational channel; thereby, increasing the navigational channel width.

Any requests to slightly move the location of the new fender system is subject to the Engineer's approval.