



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

November 5, 2010

**Addendum No. 1**

RE: Contract ID C202606

WBS # 47065.3.1

F. A. # BRSTP-0133(9)

**Brunswick County (BK-5129)**

Replace Fender System Bridge #14 on NC-133 Over Atlantic Intracoastal Waterway  
Between Southport and Oak Island

**November 16, 2010 Letting**

To Whom It May Concern:

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

The following revision has been made to the plans:

On Sheet S-1 the note concerning the "Stainless Steel Bolts" has been revised. Please void Sheet No. S-1 in your plans and staple the revised Sheet No. S-1 thereto.

The following revisions have been made to the Proposal:

On Page Nos. 17 and 18 the project special provision entitled "Outsourcing Outside the USA" has been removed. Please void Page Nos. 17 and 18 in your proposal and staple the revised Page Nos. 17 and 18 thereto.

The Table of Contents has been revised to reflect the above noted change. Please void the Table of Contents and staple the revised page thereto

On Page Nos. 30 thru 34 the project special provision entitled "Plastic Fender System" has been revised. Please void Page Nos. 30 thru 34 in your proposal and staple the revised Page Nos. 30 thru 34 thereto.

Sincerely,

R. A. Garris, PE  
Contract Officer

RAG/jag

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

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

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

Attachments

cc: Mr. Jon Nance, PE  
Mr. Ron Hancock, PE  
Mr. H. A. Pope, PE  
Ms. D. M. Barbour, PE  
Mr. Art McMillan, PE  
Mr. J. V. Barbour, PE  
Ms. Lori Strickland  
Mr. John Sullivan (FHWA) Attn: Mr. Brad Hibbs, PE  
Project File (2)

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

**CONTRACTOR CLAIM SUBMITTAL FORM:**

(9-16-08)

SP1 G140

If the Contractor elects to file a written claim or requests an extension of contract time, it shall be submitted on the *Contractor Claim Submittal Form (CCSF)* available through the Construction Unit or [http://ncdot.org/doh/operations/dp\\_chief\\_eng/constructionunit/formsmanuals/](http://ncdot.org/doh/operations/dp_chief_eng/constructionunit/formsmanuals/).

**TWELVE MONTH GUARANTEE:**

(7-15-03)

SP1 G145

- (A) The Contractor shall guarantee materials and workmanship against latent and patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve months following the date of final acceptance of the work for maintenance and shall replace such defective materials and workmanship without cost to the Department. The Contractor will not be responsible for damage due to faulty design, normal wear and tear, for negligence on the part of the Department, and/or for use in excess of the design.
- (B) Where items of equipment or material carry a manufacturer's guarantee for any period in excess of twelve months, then the manufacturer's guarantee shall apply for that particular piece of equipment or material. The Department's first remedy shall be through the manufacturer although the Contractor is responsible for invoking the warranted repair work with the manufacturer. The Contractor's responsibility shall be limited to the term of the manufacturer's guarantee. NCDOT would be afforded the same warranty as provided by the Manufacturer.

This guarantee provision shall be invoked only for major components of work in which the Contractor would be wholly responsible for under the terms of the contract. Examples would include pavement structures, bridge components, and sign structures. This provision will not be used as a mechanism to force the Contractor to return to the project to make repairs or perform additional work that the Department would normally compensate the Contractor for. In addition, routine maintenance activities (i.e. mowing grass, debris removal, ruts in earth shoulders,) are not parts of this guarantee.

Appropriate provisions of the payment and/or performance bonds shall cover this guarantee for the project.

To ensure uniform application statewide the Division Engineer will forward details regarding the circumstances surrounding any proposed guarantee repairs to the Chief Engineer for review and approval prior to the work being performed.

**LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC:**

(12-19-06)(Rev 3-16-10)

SP1 G151

Revise the *2006 Standard Specifications* as follows:

**Page 1-60, 107-2 Assignment of Claims Void**, replace the reference from *G.S. 143-3.3* to *G.S. 143B-426.40A*.

**Page 1-69, 107-18 Contractor’s Responsibility for Work**, in the first paragraph, last sentence, replace the word *legally* with the word *contractually*.

**GIFTS FROM VENDORS AND CONTRACTORS:**

(12-15-09)

SP1 G152

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

- (1) have a contract with a governmental agency; or
- (2) have performed under such a contract within the past year; or
- (3) anticipate bidding on such a contract in the future.

For additional information regarding the specific requirements and exemptions, vendors and contractors are encouraged to review Executive Order 24 and *G.S. § 133-32*.

Executive Order 24 also encouraged and invited other State Agencies to implement the requirements and prohibitions of the Executive Order to their agencies. Vendors and contractors should contact other State Agencies to determine if those agencies have adopted Executive Order 24.

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**PROPOSAL ITEM SHEET AND SIGNATURE SHEET**

- Item Sheet (s)
- Signature Sheet (Bid Acceptance by Department)

**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. The Department does not require the contractor to purchase the various components of the plastic fender system from the same manufacturer.

**2.0 Materials**

FRPP may either be solid thermoplastic piles with fiberglass reinforcing rods or thermoset pipe piles with high-density polyethylene outer protective sleeves. Pipe piles shall have a minimum wall thickness of one half ( $\frac{1}{2}$ ) inch. The HDPE sleeves shall have a minimum thickness of six tenths (0.6) inch and extend from the top of the piles downward a minimum of twenty (20) feet. Pipe piles shall be filled with clean sand after the wales and other attachments are installed. Pipe piles shall then be topped with caps recommended by the pile manufacturer and approved by the Engineer. Resin in thermoset pipe piles shall be two component polyurethane, vinyl ester, or modified vinyl ester. Resin shall be appropriate for marine use and have low water absorption. For solid thermoplastic piles, use plastic consisting of a mixture of one or more of the following recycled or virgin thermoplastics: high-density polyethylene, medium-density polyethylene, low-density polyethylene. SP shall contain appropriate colorants and UV inhibitors and shall meet the material property requirements specified in Table 1. SP products shall contain glass filament. SP products must not corrode, rot, warp, splinter or crack. The outer surface 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. For solid thermoplastic piles, interior voids shall not exceed one (1) inch in diameter. The total area of voids shall be less than five (5) percent of the total cross sectional area of the member. Voids less than one (1) inch in diameter shall be repaired in accordance with a repair procedure approved by the Engineer. FRPL and FRPP shall be free of twist and curvature. Steel reinforcement of either FRPL or FRPP is not permitted. FRPP shall not contain portland cement materials.

FRPL blocking, decking, posts, rails and stringers must meet the minimum structural properties listed in Table 4 and the dimensions and tolerances of Table 2. In addition, 10"x10" FRPL wales must meet the minimum structural properties listed in Table 3. 13" O.D. and 16" O.D. FRPP must meet the minimum structural properties listed in Table 5. Variation of up to one (1) inch of the pile diameter is acceptable but the minimum structural properties listed in Table 5 must still be met and this variation must not cause encroachment on the ninety (90) foot navigational channel.

Use one of the following products for FRPP:

SeaPile (Virginia Harbour Services, (540) 667-5191, [www.trelleborg.com/en/Trelleborg-Marine-Systems/Products/Engineered-Plastics/SeaPile-SeaTimber/](http://www.trelleborg.com/en/Trelleborg-Marine-Systems/Products/Engineered-Plastics/SeaPile-SeaTimber/) )

HarborPile (Harbor Technologies, LLC, (207) 725-4878, [www.harbortech.us/index.html](http://www.harbortech.us/index.html) )

Or approved equal

Table 1 SP Material Properties		
Applicable ASTM Code	Applies to	Requirement
Density ASTM D792-00	Skin of Thermoplastic piles and lumber Thermoset piles	55 pcf min. 100 pcf min.
Density ASTM D792-00	Core of Thermoplastic piles and lumber	48 pcf min.
Water Absorption ASTM D570-98	Skin of Thermoplastic piles and lumber Thermoset piles	24 hrs: <3.0% 24 hrs: <0.6%
Impact Resistance ASTM D256-06 Method A or ASTM D256-06 Method D	Skin of Thermoplastic piles and lumber and HDPE outer sleeves	Greater than 0.55 ft-lbs/in Greater than 2.77 ft-lbs/in
Hardness ASTM D2240-05	Skin of Thermoplastic piles and lumber and HDPE outer sleeves	44-75 (Shore D)
Abrasion ASTM D4060-07	Skin of Thermoplastic piles and lumber and HDPE outer sleeves	Weight Loss: < 0.02 oz Cycles = 10,000 Wheel = CS17 Load: 2.2 lbs
Chemical Resistance ASTM D756-03 or ASTM D543 Sea Water Gasoline No. 2 Diesel	All Materials	< 1.5% weight increase < 9.5% weight increase < 6.0% weight increase
Tensile Properties ASTM D638-03	Core of Thermoplastic piles and lumber	Minimum 2200 psi at break
Compressive Modulus ASTM D695-02	Core of Thermoplastic piles and lumber	Minimum 40 ksi
Static Coefficient of Friction ASTM D1894-06	Skin of Thermoplastic piles and lumber and HDPE outer sleeves	Maximum 0.25, wet
Nail Pull-Out ASTM D6117	All Materials	Minimum 60 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/ rods)	1 ¼ in	± ½ in
- FRPL (w/o rods)	¼ in	± 1/16 in
Outer Skin Thickness – (if reinforced with rods)	3/16 in	± 1/8 in
Distance from outer surface to rod elements (if reinforced with rods)	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	
Member Size	10 in x 10 in
Modulus of Elasticity as derived below	424 ksi min.
Stiffness, E.I.	3.28E+08 lb-in <sup>2</sup> min.
Flexural Strength or Flexural Yield Strength*	5.8 ksi min.
Weight	30-37 lb/ft

\*As defined in ASTM D6109.

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 reinforcing rods is to be taken at a strain of 0.01 inches per inch. The modulus for FRPL reinforced without reinforcing rods may be taken by one of the methods suggested in ASTM D6109.

Table 4 Structural Properties for FRPL	
Modulus of Elasticity (ASTM D6109)	300 ksi min.
Flexural Strength (ASTM D6109)	No fracture at 2500 psi
Compressive Strength (ASTM D6108)	2200 psi parallel to grain 700 psi perpendicular to grain
Screw / Nail Withdrawal (ASTM D6117)	400 lbs screw 250 lbs nail

Table 5 Structural Properties for 13" O.D. FRPP Structural Properties for 16" O.D. FRPP		
Member Size	13" O.D. FRPP	16" O.D. FRPP
Modulus of Elasticity as derived below	526 ksi min.	561 ksi min.
Stiffness, E.I. (for pipe piles, this is the pile itself without sand fill)	7.38E+08 lb-in <sup>2</sup> min. 1.60E+09 lb-in <sup>2</sup> max.	1.81E+09 lb-in <sup>2</sup> min. 4.00E+09 lb-in <sup>2</sup> max.
Flexural Strength or Flexural Yield Strength*	6.8 ksi min.	6.8 ksi min.

\*As defined in ASTM D6109.

Determine the modulus of elasticity for FRPP by conducting 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.

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 shipping any SP products:

- Copies of the SP manufacturer's standards and most recent brochure for the FRPP and FRPL products covered by these Specifications.
- Independent test lab report confirming the SP products meet the Plastic Material properties found in Table 1.
- For thermoset pipe piles, provide the manufacturer's data sheet on the specific resin used in the piles.
- Independent test lab report confirming the submitted FRPP and FRPL products meet the minimum structural property requirements found in Table 3, Table 4 and Table 5.
- 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.

The independent test lab reports must be no older than five (5) years.

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.

#### 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, portions of piles above the elevation shown on the plans shall be cut off using sawing or other means as approved by the Engineer. The cut shall be smooth and level to the satisfaction of the Engineer.

#### 5.0 Basis of Payment

The lump sum price bid for "Plastic Piles" will be the full compensation for all plastic piles and all equipment, tools, and work necessary for their installation. The lump sum price bid for "Plastic Lumber" will be full compensation for all other work including but not limited to material, equipment, tools, disposal, fasteners, plates, wire rope, sand and pile caps if pipe piles are used, coordinating with the Coast Guard, as-built plans, spare parts package, and other necessary items or effort required for completing 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