NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

RAIL DIVISION

CUMBERLAND COUNTY, NORTH CAROLINA

PROJECT SPECIAL PROVISIONS

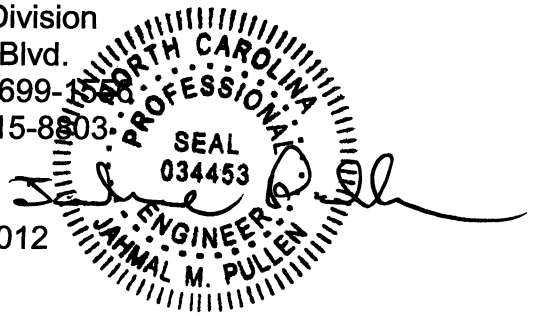
FOR

NC DOT PROJECT U-4444AB
CAPE FEAR RAILROAD
AT GRADE CROSSING SURFACE INSTALLATIONS

At Grade Surface Installation at:
Bragg Blvd (862 601N)
Randolph Street (930 759N)

Submitted by
NCDOT Rail Division
862 Capital Blvd.
Raleigh N. C. 27699-1556
Phone (919) 715-8803

June 20, 2012



I. General Special Provisions

The NCDOT Rail Division in conjunction with NCDOT Project U-4444AB desires to improve and widen the grade crossings along Cape Fear Railroad in Cumberland County for the following locations:

Bragg Blvd. (862 601N),

Randolph Street (930 759N)

This track is currently in service and all work will be in coordination with Cape Fear Railroad.

Bragg Blvd is an existing crossing which will be replaced with a concrete "tub" crossing as described on subsequent pages.

Randolph Street will be a new crossing surface, consisting of the same aforementioned concrete "tub" crossing.

The anticipated crossing surface work is to be completed as noted on the following pages.

The CONTRACTOR performing this work shall be able to comply with the laws and regulations of the North Carolina General Contractor's licensing Board. CONTRACTOR is to be prequalified to perform the work presented herein.

The proposed work shall be constructed in accordance with the enclosed plans, specifications, project special provisions, the Unified Facilities Criteria (UFC_4_860_03), the American Railway Engineering and Maintenance of Way Association (AREMA) Manual for railroad engineering, and the North Carolina Department of Transportation's "Standard Specifications for Roads and Structures", latest editions, all hereafter known as the "Standard Specifications".

All materials and workmanship to be furnished by the CONTRACTOR shall be in accordance with the guidelines, special provisions, and/or the Standard Specifications.

The CONTRACTOR performing this work shall have prior experience installing highway-railway "tub" style at-grade crossings in North Carolina or otherwise be able to comply with the laws and regulations of the North Carolina General Contractor's Licensing Board.

The CONTRACTOR's lump sum bid shall include costs associated with furnishing and installation of all materials for each crossing and provide all labor and equipment required to construct as defined on the plans and in these special provisions. Payment for furnishing of materials and labor to complete the work will only be made for the pay items shown. Costs of all other items not listed, and required to complete the project, shall be included in the costs of the various pay items shown. Cost to remove the existing Bragg Blvd crossing surface shall be included in the cost of the installation.

Quantities shown, except for lump sum pay items, are estimates and for bidding purposes only. Final payment for the work will be based on the lump sum unit costs bid.

All materials provided to the project site not meeting the specifications will be rejected and replaced by the CONTRACTOR at the CONTRACTOR's expense. The CONTRACTOR shall guarantee materials and workmanship against latent and patent defects arising from faulty materials, faulty workmanship or

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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 or Cape Fear Railroad.

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, in which case, the CONTRACTOR's responsibility shall be limited to the term of the manufacturer's guarantee. NCDOT would be afforded the same warranty period as provided by the Manufacturer.

II. Submittals

A. Submit the following to the Engineer for approval.
   1. Detailed description of construction procedures for the specific type of grade crossing to be installed.
   2. Manufacturer's brochures and other detailed descriptions of crossing materials to be furnished.
   3. Detailed shop drawings and a detailed description of the installation procedure.
   4. Detailed information of changes to the typical ballasted track construction details and/or construction methods to accommodate the crossing surfaces. Modifications may include, but are not limited to, tie spacing, tie size and length, and ballast section.
   5. Submittals should be sent to (for approval by Railroad authority):

      Michael Crawford
      Engineer Research and Development Center
      (601) 634-3857
      Mike.crawford@erdc.dren.mil

III. Products

A. Concrete "Tub" Crossing
   1. Furnish crossing surfaces of a modular full depth concrete "tub" design. Crossings shall be as manufactured by Omni Products, Inc. (TraCast), Hanson Pipe and Precast (Premier Modular Crossing), or equal as approved by the Engineer.
   2. Furnish new material (except as noted below), without modifications to the manufacturer's standard design except as approved by the Engineer.
   3. Existing rail is 115 lb/ft and may be reused at the crossing. Rail shall be welded. Use flowable fill and no new ties will be required.

IV. General Description Proposed Crossing Surface Work

The new Bragg Blvd at-grade crossing surface will consist of one (1) one hundred two and one half foot area to accommodate the travel lanes and shoulder area as shown on plans.

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The CONTRACTOR will need to provide temporary asphalt during phase one to accommodate the lane widening on Bragg Blvd. The asphalt will allow for motor vehicle traffic to maintain flow over the crossing until the "tub" crossing can be installed during the fourth phase of the project. Coordination shall be made with Cape Fear Railways before this asphalt work is done.

The new Randolph Street at-grade crossing surface will consist of one (1) one hundred ninety-four foot area to accommodate the travel lanes and shoulder area as shown on plans.

Coordination will need to be made between the Contractor and NCDOT to determine the exact elevation of the crossing surface in regards to the roadway upon final layering of asphalt.

The CONTRACTOR will need to work out a schedule with Cape Fear Railroad through their track supervisor as to the availability to accommodate train traffic during the track work.

Railroad Contact: Nick Darnell
Superintendent
Cape Fear Railways
W: (910)396-7683
C: (910)409-6629
Charles.n.darnell.ctr@mail.mil

V. Safety Requirements

This work is to be conducted on or in close proximity to operating railroad tracks. The Contractor shall comply with the following Special Provisions when working on Cape Fear Railroad Property.

The Contractor shall ensure that his entire work force, including employees, agents and subcontractors comply fully with all applicable FRA RAILROAD WORKPLACE SAFETY Rules, 49 C.R.F. Part 214.

Particular attention is directed to the requirements for fall protection, protective footwear, protective head gear (hard hats) and eye and face protection equipment (safety goggles or safety eyeglasses).

VI. Interference with Railroad Traffic

General traffic patterns, including anticipated daily work windows, will be discussed at the pre-construction site meeting. The Contractor should ask any necessary questions prior to bid and then at the preconstruction meeting other details can be obtained from the railroad representative such as train data details.
No claim by the Contractor against NCDOT or Cape Fear Railroad will be allowed for hindrance or delay caused by Railway traffic; any work done by Cape Fear Railroad or other delay incident to or necessary for safe maintenance of railway traffic or for any delays due to compliance with these special provisions. Any cost incurred by the Cape Fear Railroad for repairing damaged roads, tracks or other facilities resulting from the operations of the Contractor shall be paid by the Contractor to the Railroad.

The Contractor shall assume all responsibility for any and all damages to his work, men, and equipment caused by the operations of Cape Fear Railroad.

VII. Obstructing Tracks

The track must remain in service for regular rail traffic at all times except as described during the preconstruction site meeting.

VIII. Storage of Materials and Equipment

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

All grading or construction machinery that is left parked near the track unattended by a watchman shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save Cape Fear Railroad and any associated, controlled or affiliated corporation, harmless from and against all losses, costs, expenses, claim or liability for loss or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.

IX. Haul Across Railroad

If deemed necessary, the contractor shall be responsible for a temporary crossing regarding means of transporting materials across the railroad. The Contractor shall coordinate this temporary crossing with the Railroad, including but not limited to protection of train traffic and contractor safety. The contractor shall use materials to construct temporary crossing as instructed by the Railroad.

X. Inspection

Upon completion of the crossing the CONTRACTOR will be required, with representatives from the NCDOT's Resident Engineer's Office, Cape Fear Railroad and the Rail Division to have a final inspection. The CONTRACTOR shall give at least seven days' notice as to the date of final crossing surface inspection.

XI. Related Work

Any work not specifically mentioned in the specification, but which is necessary, both directly or indirectly, for the proper carrying out of the intent thereof, shall be required and applied by the CONTRACTOR and they shall perform all such work just as if it were particularly delineated or described.

XII. Cleanup

The CONTRACTOR shall remove from Cape Fear Railroad and NCDOT right of way all rubbish and waste resulting from construction operations. The CONTRACTOR from the meeting with Cape Fear Railroad will determine if Railroad would like to retain any existing railroad materials in the crossing construction area.

XIII. Detailed Bill of Material

Prior to furnishing and installing any equipment and materials, the CONTRACTOR must submit a detailed bill of material and cost breakdown. This shall include all required spare parts and the part number of all material proposed for use of this project.

XIV. Insurance

A. In regards to the above project the prime contractor is required to carry:

1. **CONTRACTOR'S COMMERCIAL GENERAL LIABILITY INSURANCE:**

The Contractor shall procure and maintain, at its expense, an original and one certified copy of the policy **to the Department** as evidence of:

a. Statutory Worker's Compensation and Employers Liability Insurance with available limits of not less than $1,000,000, which insurance must contain a waiver of subrogation against Fort Bragg Railroad and its Affiliates
b. Commercial General Liability coverage (inclusive of contractual liability) with available limits of not less than $5,000,000 in combined single limits for bodily injury and property damage and covering the contractual liabilities assumed under this Agreement
c. Business automobile liability insurance with available limits of not less than $1,000,000 combined single limit for bodily injury and/or property damage per occurrence

Upon request, Contractor shall provide Fort Bragg Railroad with a copy of Contractor's applicable insurance policies. A policy endorsement naming Fort Bragg Railroad and Cape Fear Railroad as additional insured's and specifying such coverage shall be furnished to Railroad, and the required coverage will be kept in force until all of the Contractor's obligations under this Agreement have been fully discharged and fulfilled, or until Contractor shall have been specifically released by a written instrument signed by an authorized officer of Fort Bragg Railroad

2. **RAILROAD PROTECTIVE LIABILITY INSURANCE:**

The Contractor shall furnish **to the Department** an original and one duplicate of the Railroad Protective Liability Insurance Policy to protect Fort Bragg Railroad in connection with

operations to be performed on or adjacent to Fort Bragg right of way. The specifications for proper evidence of insurance are as follows:

a) The Insurer must be financially stable and rated A- or better in A. M. Best Insurance Reports.
b) The policy must be written using the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.
c) Named Insured and Address:

U.S. Army
Directorate of Public Works
Real Property Accountable Officer
2175 Reilly Road, Stop A
Fort Bragg, NC 28310-5000

d) **Limits of Liability: $5,000,000 per occurrence, $10,000,000 annual aggregate required.**
e) Name and Address of Contractor must be shown on the Declarations page.
f) Name and Address of the Project Sponsor must be shown on the Declarations page.

Description of operations must appear on the Declarations page and must match the project description, including project or contract identification numbers.

The Description and Designation shall read: All work performed on Railroad Right of way for NCDOT project U-4444AB, on Bragg Blvd and Randolph Street in Cumberland County, NC.

Authorized endorsements:

A. **Must**

1) **Pollution Exclusion Amendment - CG 28 31**
(Not required with CG 00 35 01 96 and newer versions)
2) **Delete Common Policy Conditions** – Section E. Premiums

B. **Acceptable**

1) Broad Form Nuclear Exclusion - IL 00 21
2) 30-day Advance Notice of Non-renewal
3) Required State Cancellation Endorsement
4) Quick Reference or Index - CL/IL 240

C. **Unacceptable**

1) Any Pollution Exclusion Endorsement except CG 28 31
2) Any Punitive or Exemplary Damages Exclusion
3) Any endorsement not named in A or B
4) Any type of deductible policy

You must submit the original policy, via the Department of Transportation, for our approval and filing

prior to the commencement of construction or demolition operations.

B. Prior to entry on Fort Bragg right-of-way, the original Railroad Protective Liability Insurance Policy shall be submitted by the Prime Contractor to the Department at the address below for its review and transmittal to Fort Bragg Railroad. In addition, certificates of insurance evidencing the Prime Contractor's Commercial General Liability Insurance shall be "issued" to Fort Bragg Railroad **and** the Department at the addresses below, and **forwarded to the Department** for its review and transmittal to Fort Bragg Railroad. No work will be permitted on Railroad's right-of-way until it has reviewed and approved the evidence of insurance required herein.

DEPARTMENT:	RAILROAD:
Department of Transportation	Fort Bragg Railroad
Rail Division	U.S. Army-Directorate of Public Works
C/O David Hinnant, State Railroad Agent	Real Property Accountable Officer
1556 Mail Service Center	2175 Reilly Road, Stop A
Raleigh NC 27699-1556	Fort Bragg, NC 28310-5000

C. The insurance required herein shall in no way serve to limit the liability of Department or its Contractors under the terms of this agreement.

RAILROAD SITE DATA:

The following information is provided as a convenience to the Contractor. This information is subject to change and the Contractor should contact the Railroad to verify the 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.

Number of tracks	-	1
Number of trains per day	-	1-2 per week (freight only)
Maximum speed of trains	-	10 mph

XV. Compensation

Payment at the contract lump sum price for: "Bragg Blvd Crossing Surface Installation."

Payment at the contract lump sum price for "Randolph Street Crossing Surface Installation."

Payment at the above contract lump sum prices will be full compensation for all work associated with furnishing and installing complete and fully operational highway-railroad at-grade crossings.

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

RAIL DIVISION

CUMBERLAND COUNTY, NORTH CAROLINA

RAIL DIVISION
NC Department of Transportation

PROJECT SPECIAL PROVISIONS

FOR

CAPE FEAR RAILROAD COMPANY
CROSSING SIGNAL INSTALLATIONS

Cumberland County near Fort Bragg, NC

Signal Installations at:

Bragg Blvd	(862 601N)
Randolph Street	(930 759N)

NORTH CAROLINA PROFESSIONAL SEAL 029418 ENGINEER LEEVON McKINNEY JR.
6/5/12

Submitted By

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

June 5, 2012

I. GENERAL SPECIAL PROVISIONS:

The NCDOT RAIL DIVISION desires to upgrade and / or install highway-railroad grade crossing warning devices along the Cape Fear Railroad in Cumberland County for the following locations.

- Bragg Blvd. (862 601N),
- Randolph Street (930 759N),

This track is currently in service.

Bragg Blvd is an existing protected grade crossing which will be widened and reconfigured.

Randolph Street is an existing unprotected grade crossing which will be relocated.

The anticipated work to complete the installation of the two crossing signal systems is as noted in the following pages.

The CONTRACTOR performing this work shall be able to comply with the laws and regulations of the North Carolina General Contractor's Licensing Board. CONTRACTOR is to be prequalified to perform the work presented herein.

The proposed work shall be constructed in accordance with the enclosed plans, project special provisions, the American Railway Engineering and Maintenance of Way Association (AREMA) Signal Manual, Cape Fear Railroad Specifications, the American Railway Engineering and Maintenance-of-Way Association (AREMA) manual for railroad engineering, and the North Carolina Department of Transportation's "Standard Specifications for Roads and Structures", latest editions, all hereinafter known as the "Standard Specifications".

All materials and workmanship to be furnished by the CONTRACTOR shall be in accordance with the guidelines, special provisions, and/or the Standard Specifications.

The CONTRACTOR performing this work shall have prior experience installing highway-railway at-grade crossing signal systems in North Carolina or otherwise be able to comply with the laws and regulations of the North Carolina General Contractor's Licensing Board.

The CONTRACTOR's lump sum bid shall include costs associated with furnishing and installation of all materials for each crossing and provide all labor and equipment required to construct and activate the crossing signals for the project as defined on the plans and in these special provisions. Payment for furnishing of materials and labor to complete the work will only be made for the pay items shown. Costs of all other items not listed, and required to complete the project, shall be included in the costs of the various pay items shown. Cost to remove any existing signals, foundations, crossbucks and posts shall be included in the cost of the installation.

Quantities shown, except for lump sum pay items, are estimates and for bidding purposes only. Final payment for the work will be based on the lump sum unit costs bid.

The CONTRACTOR shall procure and install all insulated joints as shown on these Contract Drawings. The insulated joints shall meet or exceed the standards for and provide track capable of FRA Class 1 operations when completed. Insulated circuits shall be located as indicated on the plans or at the next available joint away from the crossing where the size of rail is the same on either side of the joint.

Salvage value of any items removed from the Cape Fear Railroad corridor shall be reflected in the CONTRACTOR's bid.

CONTRACTOR shall salvage existing Bragg Blvd crossing house and warning devices. CONTRACTOR shall secure and deliver this existing equipment to Cape Fear Railroad at a specified location.

All materials provided to the project site not meeting the specifications will be rejected and replaced by the CONTRACTOR at the CONTRACTOR's expense.

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 or Cape Fear Railroad.

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, in which case, the CONTRACTOR's responsibility shall be limited to the term of the manufacturer's guarantee. NCDOT would be afforded the same warranty period as provided by the Manufacturer.

II. SIGNAL SPECIFICATIONS:

These specifications represent the minimum acceptable standards for the material and installation of highway crossing warning devices for the Cape Fear Railroad by CONTRACTOR. No deviation from these specifications will be permitted without notification of the intended deviation in writing to NCDOT RAIL DIVISION prior to the bid date and approval given in writing from the NCDOT RAIL DIVISION Project Manager.

References are made herein to the following specifications and drawings:

- Specification of the American Railway Engineering & Maintenance-of-Way Association, hereinafter referred to as the AREMA Signal Manual.

- Highway-Railroad Grade Crossing Rules & Regulations Governing Testing, Maintenance and Inspection (49 CFR Part 234), hereinafter referred to as the FRA Handbook.

- Manual for Uniform Traffic Control Devices, U.S. Department of Transportation, Federal Highway Administration, hereinafter referred to as the MUTCD.
- Circuit plans, hereinafter referred to as the Plans.
- Cape Fear Railroad, hereinafter referred to as Cape Fear Railroad.
- North Carolina Department of Transportation RAIL DIVISION, hereinafter referred to as RAIL DIVISION.
- The National Electric Code, National Fire Protection Association.
- American Association of State Highway and Transportation Officials Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals.

In case of discrepancies between these technical specifications and any amendments or addenda thereto, the technical specification shall take precedence and shall apply.

A. General

1. It shall be the CONTRACTOR's responsibility for a complete turnkey system including final inspection and placement of the system in operational service. The CONTRACTOR performing this work shall have prior experience installing highway-railway at-grade crossing signal systems for a class one or short line railroad. The CONTRACTOR shall provide all labor, supervision, material, tools, equipment, transportation, storage, and handling of material necessary for completion of the contract in accordance with these specifications. All material shall comply with AREMA Specifications. Approved equals may be furnished for catalog items.
2. All material shall be new and shall be guaranteed against defects in material and workmanship, damage caused by normal wear and tear excluded, for a period of one year from date of final acceptance. In the event of a manufacturer's warranty that extends beyond 1 year, such additional coverage shall be provided to NCDOT.
3. The CONTRACTOR shall be responsible for correcting any defects or malfunctions in the highway crossing protection installation resulting from poor or faulty installation, workmanship, or deviation from specified standards for a period of 180 days from the date of final acceptance.
4. The CONTRACTOR shall make such tests as may be necessary to demonstrate to the satisfaction of RAIL DIVISION and Cape Fear Railroad that the apparatus, as installed, is in accordance with the requirements of the specifications and contract. All tests shall satisfy the requirements outlined in the FRA handbook and the AREMA Signal Manual where applicable, unless otherwise directed by RAIL DIVISION and Cape Fear Railroad. The CONTRACTOR shall provide such instruments and apparatus as may be necessary for making tests. Instruments and apparatus will remain the property of the CONTRACTOR.

5. The CONTRACTOR shall be responsible for any loss or damage to equipment or material prior to date of acceptance.

6. The contract shall not be considered complete until the installation has been approved and accepted in writing by the authorized representative of RAIL DIVISION and Cape Fear Railroad. However, such acceptance does not relieve the CONTRACTOR of responsibility for guaranteeing their work and materials as detailed in paragraphs A.2 and A.3.

7. The CONTRACTOR is responsible for location and avoidance of all underground utilities.

8. The CONTRACTOR shall give the RAIL DIVISION and Cape Fear Railroad a minimum of ten working days notice prior to the date work is to begin. The CONTRACTOR shall, in the interim before work is begun, meet at the site with RAIL DIVISION and Cape Fear Railroad personnel.

9. The CONTRACTOR shall, where necessary install new insulated rail joints according to Contract Drawings.

10. The CONTRACTOR at Bragg Blvd., shall remove four sets of existing insulated rail joints.

11. The CONTRACTOR shall also replace any uninsulated rail joints, uninsulated switch rods, uninsulated gauge rods within the track circuit necessary to obtain satisfactory operation and to match existing rail with insulated joints.

12. The CONTRACTOR shall be responsible for obtaining a resistance between grounding rods and the instrument case of no greater than 10 ohms.

13. The CONTRACTOR shall obtain and pay for all licenses and/or permits that may be necessary. They shall arrange for all local inspections that may be necessary and pay all fees in connection with such inspections.

14. The CONTRACTOR shall furnish a new 240 volt, 100 amp power service, complete with pole, meter base, and all necessary attachments for each grade crossing. The Breaker Box shall be an exterior Square "D" box or approved equal with the ability to be locked with a RAIL DIVISION and Cape Fear Railroad approved lock. The service shall conform to the standards of the National Electric Code and any state and/or local codes that may apply. It shall also be the responsibility of the CONTRACTOR to provide and connect the power service to the instrument house. Responsibility for applying for service from the power company and for paying any service charges and/or deposits will be by others. The CONTRACTOR shall inform RAIL DIVISION and Cape Fear Railroad upon installation and approval of electrical services by the approving authority.

15. The CONTRACTOR shall not disturb the ballast line while working in the area. If ballast line is disturbed, the CONTRACTOR shall be responsible for returning the ballast line back to its original state.

16. The CONTRACTOR will furnish two sets of marked plans reflecting the exact location of all underground cable, track wire, conduit and any changes in the location of wayside equipment. One set to remain at the project crossing instrument shelter and one set to be located at the RAIL DIVISION office.

17. "AS IN SERVICE" plans shall be provided to the RAIL DIVISION and Cape Fear Railroad within 30 days of completion of project. Two sets of hard copies and one electronic data copy. All circuit plans shall be designed and printed on 11" x 17" paper.

18. The CONTRACTOR shall be responsible for repair of all damages caused by their work including but not limited to track damage, tie damage, roadway and crossing surface damage, damage to drainage, damage to utilities, and damage to landscape.

19. All roadway traffic control signing will be by others except CONTRACTOR is responsible for necessary crossbucks.

20. The CONTRACTOR shall adhere to requirements of the traffic safety plan for grade crossing outages.

21. The CONTRACTOR shall not interfere with the existing grade crossing warning system without prior written approval of the RAIL DIVISION and Cape Fear Railroad.

B. Instrument House Material

1. The instrument houses are as follows:

   a. The Bragg Blvd instrument house shall be a minimum of 6' wide x 8' long with a door in the front for entry and a door for access to underground cable and rear of terminal boards. It shall be constructed of 0.100 aluminum and have adjustable foundations.

      Instrument house shall be manufactured by PTMW or equivalent supplier.

   b. The Randolph instrument house shall be a minimum of 6' wide x 8' long with a door in the front for entry and a door for access to underground cable and rear of terminal boards. It shall be constructed of 0.100 aluminum and have adjustable foundations.

      Instrument house shall be manufactured by PTMW or equivalent supplier.

   c. The instrument houses shall have sufficient structural strength without additional bracing to permit lifting by overhead crane for loading, unloading, and placement on foundation piers or pad with all equipment except fragile apparatus installed and wired. Lifting lugs or engineering approved equal shall be included to permit lifting by overhead crane.

   d. The doors shall be hinged and have gaskets so that they will provide a dustproof and weatherproof seal. Doors shall be provided with handles, hasps, and a three-point locking device securing the doors at the top, bottom, and center. Doors shall be provided with a two-position retaining device to hold doors at 90 degrees and 180 degrees when door is open. Doors shall be equipped with louvers for ventilation. Louvers shall be equipped with a sponge type or pleated paper air filter and a means for closing off the louver. A provision shall be made on each handle for attaching a railroad signal lock.

e. The hinges shall be equipped with a bronze or stainless steel hinge pin and pressure lubricating fittings and shall be lubricated by the manufacturer before the house is shipped.

f. Each instrument house shall have two aerial cable entrance knockouts in each corner and floor knockouts for underground cable. Underground cable knockouts are to be located behind the terminal board.

g. The terminal board shall consist of 3/4" exterior grade plywood. Plastic wire race is to be provided on the back of the terminal board for running internal wiring.

h. The entire floor shall be covered with rubber matting.

i. A light switch with 110V (15A) duplex outlet shall be mounted by the main access door. One fluorescent lighting fixture with safety cover shall be mounted in the ceiling.

2. Battery chargers shall be the self-regulating constant voltage type with temperature compensation. They shall meet the requirements of the AREMA Signal Manual.

   Battery chargers shall be manufactured by National Railway Supply, Inc., (Models NRS-12/20, and NRS-12/40) or approved supplier.

3. Train detection shall be provided with a Safetran Systems Type "C" track circuit model CXP-3 AC Generator or approved equal.

   Solid State Crossing Controller shall be provided using the Safetran Systems model SSCCIII PLUS. This system shall contain electronic stick type logic, stuck stick prevention, loss of shunt timers, delayed approach starts for each track circuit and two track directional stick extended delay MCF application. Safetran Systems model SSCCIII PLUS, Solid State Crossing Controller or approved equal.

   Event Recording shall be provided using the Safetran Systems SEAR II Event Recorder, or approved equal.

   Surge and lightning protector for the Type "C" system shall be a Safetran Protection Network Model SP-19-2A between each track lead and ground, and a Safetran Heavy Duty Equalizer Model 700-1 between each pair of track leads or approved equal.

4. All relays shall be vital, direct current, plug-in type. All relays shall meet the requirements of the AREMA Signal Manual.

   All relays shall be manufactured by Alstom or approved supplier.

5. Lighting resistors shall be installed on each light circuit.

   Resistors shall be the adjustable type, 15 watts, manufactured by Safetran, WCH or approved supplier.

6. A hermetically sealed, pre-ionized spark gap lightning arrester shall be installed across the input AC power. This arrester shall be a Model SDSA-1175 as manufactured by Square "D" or approved equal.

7. Three banks of batteries shall be provided at Randolph Street. One bank will provide power for the crossing control and indication circuit. The other two banks will be used for signal lighting and crossing gate power.

   All banks shall be low maintenance GNB 475AH model 50A19, manufactured by GNB Industrial Power or approved equal.

8. Three banks of batteries shall be provided at Bragg Blvd. One bank will provide power for the crossing control and indication circuit. The other two banks will be used for signal lighting and crossing gate power.

   All banks shall be low maintenance GNB 475AH model 50A19, manufactured by GNB Industrial Power or approved equal.

9. Instrument house wires shall be No. 6 AWG 19 Strand, No. 10 AWG 19 Strand, No. 14 AWG 19 Strand, and No. 16 AWG 19 Strand.

   Instrument house wires shall be manufactured by The Okonite Company or approved supplier.

10. All wires and cable shall be terminated using molded two-post and multiple unit terminal blocks per AREMA Signal Manual.

11. All stranded wire shall be fitted with an approved type of terminal at all points where the wires are to be terminated on terminal posts.

    The terminations shall be an insulated solderless type of terminal as manufactured by AMP Special Industries or approved supplier.

    The terminal shall be attached to the wire with a tool made by the same manufacturer of the terminal and recommended by them for the terminal being used. The tool shall be equipped with a ratchet device to ensure proper crimping of the terminal.

12. Each wire termination shall be tagged with a white tube type wire marker. Each wire shall be imprinted with the circuit start point, circuit name, and end point.

13. All wires not inside plastic wirerace shall be neatly laced using plastic wire ties.

14. A test link consisting of a 2-3/8" insulated test link and terminal block shall be provided for testing the signal system. The test link shall be labeled "MAINTAINERS TEST" located inside a NEMA 4x box with key locks, mounted on the outside the instrument house facing roadside. This locked box shall also include "OUT OF SERVICE or KEYOUT" latching switch that allows the crossing to be taken out of service when necessary.

15. The instrument house shall be equipped with a thermostatically controlled fan (minimum capacity of 150 CFM) for venting.

16. One internal power off light shall be installed in each end of the instrument house such that the lights can be viewed from either approach direction to the crossing.

17. A Circuit Breaker Box shall be provided for the AC Power to be disconnected with the devices in the Instrument House.

Breaker Box shall be Square "D" or approved supplier.

18. Two additional spare Safetran Model SSCCIII Plus, Solid State Crossing Controllers or approved equal shall be provided. One installed in each crossing house.

C. Foundations

1. Flasher Foundations

Flasher foundations shall be made of precast concrete and shall have a bolt spacing of 9 – 1/2 inches by 9 – 1/2 inches, for attaching signal mast, and be 4 feet - 6 inches in height. The signal foundation is to extend from material of sufficient bearing capacity to not more than three inches above the ground except for those foundations placed in or adjacent to sidewalks which shall be flush with the sidewalk.

2. Gate Foundations

Gate foundations shall be made of precast concrete and shall have a bolt spacing of 11 – 11/16 and 11- 11/16 inches, for attaching signal mast, and be 4 feet - 6 inches in height. The gate foundation is to extend from material of sufficient bearing capacity to not more than three inches above the ground except for those foundations placed in or adjacent to sidewalks which shall be flush with the sidewalk.

3. Cantilever Foundations

Cantilever foundations shall be made of precast concrete or poured in place concrete with steel rebar and galvanized hook bolts meeting the requirements of the cantilever manufacturer for the size cantilever required for the project per the engineering plans. The cantilever foundation is to extend from material of sufficient bearing capacity to not more than three inches above the ground except for those foundations placed in or adjacent to sidewalks which will be flush with the sidewalk.

4. House Foundations

Steel foundations shall be constructed of steel angle and plate welded together. Foundations shall be constructed of 2-1/2 inch by 2-1/2 inch by 1/4-inch steel angle and 1/4-inch steel plate. All foundations to be furnished and installed shall be complete with galvanized bolts, washers, nuts, and associated hardware. Galvanizing shall conform to Specifications Section 13579 and AREMA C&S Manual, Part 15.3.1. Bolt spacing shall be to manufacturer's standards for the equipment to be supported by the foundation. House foundations shall be mounted at a minimum of 12" above grade or even with top of rail. Ballast shall be deposited and tapered extending 4' beyond house area.

5. Excavations

All holes excavated for foundations shall be backfilled in layers of soil approximately six inches in depth and each layer tamped before the next layer is placed. Any disturbed curb or sidewalk must be recast and any grassed areas disturbed must be reseeded.

D. Signals

1. Flasher Assembly Masts and Bases

   Mast for flashing light signals shall be four inch inside diameter aluminum. Where only one lamp unit assembly is required, the mast shall be 13'6" in length. Where two or more lamp unit assemblies are required, the mast shall be 15'10" in length. Bases for flashing light signals shall be of the junction box type and of cast aluminum construction with bolt spacing of 9-1/2" x 9-1/2".

   The bases shall be Progress Rail part number 9420000100 or approved equal.

2. Gate Assembly Masts and Bases

   Mast for flashing light signals shall be five inch inside diameter aluminum. Where only one lamp unit assembly is required, the mast shall be 13 feet – 6 inches in length. Where two or more lamp unit assemblies are required to be stacked on top of each other, the mast shall be 15 feet – 10 inches in length. Bases for flashing light gate signals shall be of the junction box type and of cast aluminum construction with bolt spacing of 11-11/16 inches x 11-11/16 inches.

   The gate mechanism shall be Safetran Model S60 or approved equal.

3. Cantilever Assembly Masts and Bases

   Cantilevers shall be all aluminum structures with an arm length as shown on the plans. The walkway and handrail shall be full length along the back side of the arm. A ladder is to be provided which includes a guard to discourage unauthorized access with fall arrest protection conforming to all applicable AREMA and AASH specifications for a railroad highway grade crossing flashing light cantilever structure with walkway. The mast is to be sufficient to support the length of arm required using a double mast when necessary to meet AREMA specifications. An external junction box is to be provided containing a sufficient number of AREMA type terminals for both signal and underground wiring. The roadway clearance must meet the requirements of the AREMA Signal Manual, RAIL DIVISION and Cape Fear Railroad.

4. Bells

   The bell shall be mounted on top of the gate mast and be parallel to the highway. The bell shall be rated for approximately 8-16 VDC and be 12" diameter or electronic equivalent. The bell shall meet the specification of the AREMA Signal Manual.

5. Signal Lamp Units

   Flashing lights shall be LED type. Hoods and backgrounds shall be aluminum. Back-ground shall be 24". Array assembly shall be 12" diameter. Seven pairs of spare LED light assemblies shall be provided. Design and fabrication shall conform to the specifications of the AREMA Signal Manual.

6. Railroad Crossing Sign

   Shall meet the specification of the AREMA Signal Manual.

7. Gate Arm

   The gate arm shall be manufactured by NEG or approved equal.

   The gate shall be striped on both sides with 16 inch alternate diagonal reflectorized stripes of red and white in accordance with the M.U.T.C.D.

   Each gate shall be equipped with three LED gate light units per the specification of the AREMA Signal Manual.

   Gate Keepers shall be installed on each gate and shall meet FRA standards for gate length.

E. Underground Cable

1. Gate lighting and control cable shall consist of one - 7 conductor No. 6 AWG armored underground cable and one - 12 conductor No. 14 AWG armored underground cable conforming to the specification of the AREMA Signal Manual.

2. Cantilever lighting cable shall consist of one - 7 conductor No. 6 AWG armored underground cable conforming to the specification of the AREMA Signal Manual.

3. AC power cable shall be 3 conductor No. 2 AWG(with No. 6 AWG ground) armored underground cable conforming to the specification of the AREMA Signal Manual.

4. Track cable shall be 2 conductor No. 6 AWG twisted pair neoprene sheathed underground cable conforming to the specification of the AREMA Signal Manual.

5. All cable shall be free of splices and installed a minimum of 36 inches below grade. Where cable crosses under the track or highway, it shall be carried in 4 inch rigid galvanized conduit, or 4 inch PVC Schedule 80, cut in and laid, bored or pushed under roadway, and installed a minimum of 48 inches below the bottom of the ties. All cables shall enter the relay house through 4 inch schedule 80 PVC conduit or 4 inch rigid galvanized or aluminum conduit.

6. After installation and before final hook-up, each conductor in each cable shall be tested with a megger and shall read infinity resistance between other conductors in the cable and between each conductor and earth ground. A record of the resistance test on the cables (2 copies) shall be turned over to the RAIL DIVISION and Cape Fear Railroad for their use.

7. Trenches shall be backfilled with 6" of fine soil from which all rock over 1-1/2" in diameter has been removed before any soil is replaced in the trench. Soil shall be backfilled in all trenches in layers of approximately 6" and each layer tamped before the next layer is placed.

F. Track Materials

1. All non-insulated joints shall be double bonded with one exothermically welded signal bond and one single conductor, stranded, plug type rail web bond. Bonds shall conform to the AREMA Signal Manual.

   a. Bonds of the welded type shall be applied in accordance with the manufacturer's instructions. The rail must be cleaned for the full area of the weld. Welded bonds must not be applied during rain, snow, or on a wet rail. Welded bonds shall be applied to the rail on the same day the weld area is cleaned. Welded type bonds must have a brush coat of No-ox-id applied after application to the rail. The No-ox-id may be applied immediately, but in no case may it be applied later than two days after installation of the bond.

      Weld type bonds shall be the Cadweld tab style minimum 6.5"x 3/16" manufactured by Erico, Model SB-SB20112 or approved equal.

   b. Plug type bonds shall be Dwight and Wilson Company Models S-5T or approved equal.

   c. Track circuit connectors shall be Dwight and Wilson Company Model S-8PT or approved equal. The track end of the track circuit connector shall be installed as specified herein, at a maximum distance of 3 inches from the end of the insulated joint.

   d. Ring-10 diodes shall be installed below the ballast line between the rails in locations shown on the Contract Drawings.

G. Locks

Locks shall be supplied for all instrument housings, junction boxes, gate mechanisms and other items which require locking for security. The locks shall be the RAIL DIVISION and Cap Fear Railroad standard make so existing keys will operate them.

Locks shall be Safetran Model 030399-13X, or approved equal.

H. Sealants

Sealants must be waterproof, remain pliable and must not shrink, crack or dry out.

I. Completion

The CONTRACTOR may work in any order they wish, but any location on which work is started and left incomplete or with the lights inoperative shall be left in a neat and safe condition. Inoperative lights shall be covered with black plastic over covered with burlap bags for protection or other suitable covering and not left in excess of seven days.

J. Inspection

Upon completion of the project, an inspection will be required with representatives from the RAIL DIVISION, NCDOT Division of Highways, the CONTRACTOR and a representative of the railroad. The CONTRACTOR shall give at least seven days notice to the RAIL DIVISION and Cape Fear Railroad as to the date the installation will be ready for inspection. Meter readings will be required to

indicate that the voltage is within tolerance throughout the circuits. All possible train movements will be simulated by the use of shunts on the track and the CONTRACTOR shall have available at least three effective shunts (0.06 ohm) for this purpose. The CONTRACTOR shall focus the lights as shown on the plans or as directed by RAIL DIVISION. Signal testing shall be recorded in accordance with FRA regulations and furnished 2 copies to RAIL DIVISION and Cape Fear Railroad for their records.

K. Related Work

Any work not specifically mentioned in the specification, but which is necessary, either directly or indirectly, for the proper carrying out of the intent thereof, shall be required and applied by the CONTRACTOR and they shall perform all such work just as if it were particularly delineated or described.

L. Cleanup, Seeding and Painting

The CONTRACTOR shall remove from Cape Fear property, and NCDOT right-of-way all rubbish and waste resulting from construction operations. RAIL DIVISION may require existing materials to be loaded on NCDOT trucks for relocation.

Any metal part of the installation which is not aluminum shall be painted with one primer coat and at least two coats of aluminum paint or be galvanized coated metal.

M. Circuit Drawing Changes

If the CONTRACTOR changes the circuit drawings furnished in this package in any way, he is responsible to design and furnish new wiring diagrams and circuit drawings for the equipment being furnished by him. The CONTRACTOR shall be solely responsible for the correctness of the wiring diagrams and circuit drawings he designs.

If changes have been made, typical circuit drawings with his quotation must be submitted in order to be considered. He must be prepared to submit his final drawings within 30 days after receipt of the order, for RAIL DIVISION and Cape Fear Railroad approval.

N. Detailed Bill of Material

Prior to furnishing and installing any equipment and materials, the CONTRACTOR must submit a detailed bill of material and cost breakdown. This shall include all required spare parts and the part number of all material proposed for use of this project.

O. Tests

1. The CONTRACTOR shall make necessary tests to demonstrate that all material and equipment has been installed in accordance with the requirements of the specifications and contract. These tests shall be as listed in the AREMA Signal Manual. Two copies of recorded tests will be provided to RAIL DIVISION and Cape Fear Railroad upon completion of installation and testing.

2. Upon completion of all tests specified herein, Contractor shall submit a certified letter signed by an authorized representative, attesting that all tests have been performed and completed successfully.

3. Test reports shall document the calibration date of each instrument used during the test. Calibration of each instrument shall be certified by a recognized testing facility. Re-certification shall be conducted every 90 days or less. Out-of-date instruments will be considered non-certified. Tests conducted with non-certified instruments will be rejected.

4. All in-service field tests shall be conducted with RAIL DIVISION and Cape Fear Railroad as witness, and shall be subject to their acceptance.

III. MEASUREMENT AND PAYMENT

Payment at the contract lump sum price for "Bragg Blvd Crossing Signal Installation."

Payment at the contract lump sum price for "Randolph Street Crossing Signal Installation."

Payment at the above contract lump sum prices will be full compensation for all work associated with furnishing and installing complete and fully operational highway-railroad at-grade crossing warning devices including, but not limited to, mobilization/demobilization, preparatory work and operations, movement of personnel, furnishing and installing equipment, supplies, and incidentals to the project site.

Revised 10-5-12

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