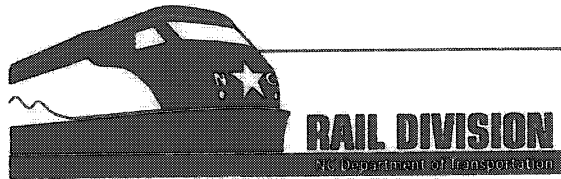
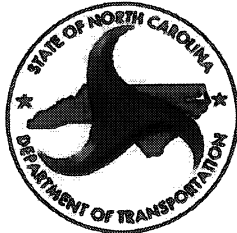


**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**

**RAIL DIVISION**

**ONslow COUNTY, NORTH CAROLINA**



**PROJECT SPECIAL PROVISIONS**

FOR

**CAMP LEJEUNE RAILROAD COMPANY  
CROSSING SIGNAL INSTALLATIONS**

Onslow County in Jacksonville, NC

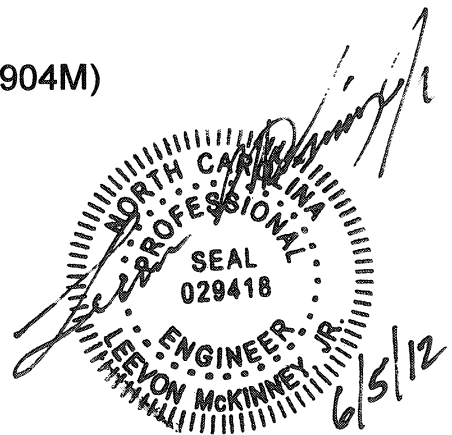
Signal Installations at:

SR 1413 (Piney Green RD.) (722 904M)

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 Camp Lejeune Railroad in Onslow County for the following locations.

- SR 1413 (Piney Green RD.) (722 904M),

This track is currently in service.

Piney Green Road is an existing protected grade crossing which will be widened and reconfigured.

The anticipated work to complete the installation of the 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, Camp Lejeune 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 Camp Lejeune Railroad corridor shall be reflected in the CONTRACTOR's bid.

CONTRACTOR shall salvage existing Piney Green Road crossing house and warning devices. CONTRACTOR shall secure and deliver this existing equipment to Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune 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.

- Camp Lejeune Railroad, hereinafter referred to as Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune

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 Camp Lejeune 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 Camp Lejeune Railroad personnel.
9. The CONTRACTOR shall, where necessary install new insulated rail joints according to Contract Drawings.
10. The CONTRACTOR at Piney Green Road shall remove two sets of existing island circuit insulated rail joints.
11. The CONTRACTOR shall also replace any uninsulated rail joints, 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 Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune Railroad.

**B. Instrument House Material**

1. The instrument houses are as follows:

- a. The Piney Green Road instrument house shall be a minimum of 6' wide x 6' 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 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.
- c. 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.
- d. 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.
- e. 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.
- f. 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.

- g. The entire floor shall be covered with rubber matting.
- h. 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. Two banks of batteries shall be provided at Piney Green Road. One bank will provide power for the crossing control and indication circuit. The other bank 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. 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.

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

11. 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.
12. All wires not inside plastic wirerace shall be neatly laced using plastic wire ties.
13. 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.
14. The instrument house shall be equipped with a thermostatically controlled fan (minimum capacity of 150 CFM) for venting.
15. 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.
16. 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.

17. One additional spare Safetran Model SSCIII 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 Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune 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 Camp Lejeune Railroad as witness, and shall be subject to their acceptance.

### **III. INSURANCE:**

The CONTRACTOR shall not commence work until he has obtained all insurance required and such insurance has been approved by the Department. Nor, shall the CONTRACTOR allow any SUBCONTRACTOR to commence work on their subcontract until all similar insurance required of the SUBCONTRACTOR has been obtained.

Insurance companies used shall be admitted carriers authorized to transact business in the State of North Carolina and shall be rated A10 or better by Best's Rating Service unless the Department is notified and waives this requirement.

The CONTRACTOR shall provide and maintain during the life of this contract, Worker's Compensation meeting the statutory requirements of the State of North Carolina and Employer's Liability of \$500,000 per Accident Limit, \$500,000 Disease per Policy Limit and \$500,000 Disease Each Employee Limit providing coverage for employees.

The CONTRACTOR shall provide and maintain during the life of this contract Automobile Liability Insurance providing Bodily Injury and Property Damage Liability covering all owned, non-owned and hired automobiles for limits of net loss than \$1,000,000 bodily injury each person, each accident, \$2,000,000 Aggregate Accident and \$1,000,000 Property Damage or \$3,000,000 Combined Single Limit Bodily Injury and Property Damage.

The CONTRACTOR shall provide and maintain during the life of this contract Commercial General Liability Insurance for Bodily Injury and Property Damage Liability to protect the CONTRACTOR and any SUBCONTRACTOR performing work under this contract from claims of Bodily Injury or Property Damage which arise from operations of this contract whether such operations are performed by the CONTRACTOR, any SUBCONTRACTOR, or anyone directly or indirectly employed by either the amounts of such insurance shall not be less than \$2,000,000 Bodily Injury Each Occurrence/Aggregate and \$2,000,000 Property Damage Each Occurrence/Aggregate or \$2,000,000 Bodily Injury and Property Damage combined single limits Each Occurrence/Aggregate. This insurance shall include coverage for Products/Completed Operations, Personal Injury, Liability and Contractual Liability assumed under the Indemnity Provision of this contract.

Should the CONTRACTOR be working on the project upon reactivation of rail service on the line, the CONTRACTOR shall provide and maintain during the remaining life of this contract Railroad Protective Liability Insurance in an amount of \$5,000,000 that will satisfy the requirements of the NCDOT and the operating railroad. The CONTRACTOR shall also provide any and all other forms of insurance to the limits required by the NCDOT and operating railroad.

The insurance shall be written for not less than the limits specified or as required by law, whichever coverage is greater. Coverage's shall be maintained without interruption from date of commencement of the work until date of final payment and termination of any coverage required to be maintained after final payment.

Certificates of insurance acceptable to the Department shall be filed with the Department prior to the commencement of work. These certificates and the required insurance policies shall contain a

provision that the policy cannot be cancelled, reduced in amount of coverage or allowed to expire until at least 30 days prior written notice has been delivered to the Department by registered mail.

#### **IV. MEASUREMENT AND PAYMENT**

Payment at the contract lump sum price for "Piney Green Road 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.

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**

**RAIL DIVISION**

**ONSLOW COUNTY, NORTH CAROLINA**



**PROJECT SPECIAL PROVISIONS**

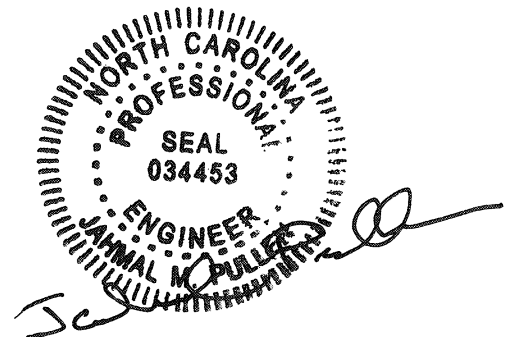
FOR

**NC DOT PROJECT U-3810  
CAMP LEJEUNE RAILROAD  
AT GRADE CROSSING SURFACE  
INSTALLATION**

At Grade Surface Installation at:  
SR 1406 Piney Green Road  
Crossing Number 631 229Y

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

June 4, 2012





**I. General Special Provisions**

The NCDOT Rail Division in conjunction with NCDOT Project U-3810 desires to upgrade and widen the grade crossing along Camp Lejeune Railroad in Onslow County for the following location:

SR1406 Piney Green Road

Crossing Number 722 904M

Mile Post CL3.7

This track is currently in service and all work will be in coordination with Camp Lejeune Railroad.

The existing crossing surface with rubber panels will be replaced with concrete panels (field and gage).

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 Norfolk Southern Corporation's "Specifications for Concrete Road Crossing Panels", 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".

The CONTRACTOR in accordance with the agreement with Camp Lejeune Railroad and Norfolk Southern Corporation will perform all track work in compliance to Norfolk Southern Corporation's standards and 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 concrete panel at-grade crossing 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 the 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 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 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 Camp Lejeune 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. General Description Proposed Crossing Surface Work**

The new at grade crossing surface will consist of two forty foot areas to accommodate four travel lanes and shoulder area as shown on attached sheet RR-1.

The forty foot areas will be made up of five 4x8 foot gage concrete panels and ten 2x8 foot field concrete panels as shown on attached "Plan 7-6".

The panels shall adhere to the attached Norfolk Southern Corporation Specifications for Concrete Road Crossing Panels.

There will be an open median between the two described panel areas and during construction on the crossing surface, the CONTRACTOR will maintain two way vehicular movements.

The CONTRACTOR will need to work out a schedule with Camp Lejeune Railroad as to the availability to suspend train traffic during the track work. Camp Lejeune has indicated that Train traffic could be suspended for a minimum of one work week.

Camp Lejeune Contact: Tim McCurry  
Marine Corps Liaison  
Government & External Relations  
MCB Camp Lejeune/MCAS New River  
W: (910)451-6945  
C: (910)554-8101  
[Timothy.mccurry@usmc.mil](mailto:Timothy.mccurry@usmc.mil)

### **III. Inspection**

Upon completion of the crossing the CONTRACTOR will be required, with representatives from the NCDOT's Resident Engineer's Office, Camp Lejeune 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.

### **IV. 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.

### **V. Cleanup**

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

### **VI. 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.

### **VII. Insurance**

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

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

The Contractor shall furnish an original and one copy of the certificate of insurance and one certified copy of the policy to the Department as evidence that, with respect to the operations he performs on railroad right of way, he carries regular Commercial General Liability Insurance having a combined single limit of not less than \$2,000,000 per occurrence for all loss, damage, cost and expense, including attorneys' fees, arising out of bodily injury liability and property damage liability during the policy period. Said policy shall include explosion, collapse, and underground hazard (XCU) coverage, **shall be endorsed to name Railroad specified in item A.2.c. below as an additional insured, and shall include a severability of interests provision.**

2. **RAILROAD PROTECTIVE LIABILITY INSURANCE:**

The Contractor shall furnish to the Department an original and one duplicate of the Railroad Protective Liability Insurance having a combined single limit of not less than \$2,000,000 each occurrence and \$6,000,000 in the aggregate applying separately to each annual period. If the project involves track over which passenger trains operate, the insurance limits required are not less than a combined single limit of \$5,000,000 each occurrence and \$10,000,000 in the aggregate applying separately to each annual period. Said policy shall provide coverage for all loss, damage or expense arising from bodily injury and property damage liability, and physical damage to property attributed to acts or omissions at the job site.

The standards for the Railroad Protective Liability Insurance are as follows:

- a. The insurer must be rated A- or better by A.M. Best Company, Inc.
- b. The policy must be written using one of the following combinations of Insurance Services Office ("ISO") Railroad Protective Liability Insurance Form Numbers:
  - (1) CG 00 35 01 96 and CG 28 31 10 93; or
  - (2) CG 00 35 07 98 and CG 28 31 07 98; or
  - (3) CG 00 35 10 01; or
  - (4) CG 00 35 12 04.

- c. The named insured shall read:

Camp Lejeune Railroad

- d. The description of operations must appear on the Declarations, must match the project description in this agreement, and must include the appropriate Department project and contract identification numbers.

The Description and Designation shall read:

NCDOT Project U-3810, the SR 1406 (Piney Green Road) widening and improvement project in Jacksonville N. C.

- e. The job location must appear on the Declarations and must include the city, state, and appropriate highway name/number.
- f. The name and address of the prime contractor must appear on the Declarations.
- g. The name and address of the Department must be identified on the Declarations as the “Involved Governmental Authority or Other Contracting Party.”
- h. Other endorsements/forms that will be accepted are:
- (1) Broad Form Nuclear Exclusion – Form IL 00 21
  - (2) 30-day Advance Notice of Non-renewal or cancellation
  - (3) 60- day written notice be given the Department prior to cancellation or change
  - (4) Quick Reference or Index Form CL/IL 240
- i. Endorsements/forms that are **NOT** acceptable are:
- (1) Any Pollution Exclusion Endorsement except CG 28 31
  - (2) Any Punitive or Exemplary Damages Exclusion
  - (3) Known injury or Damage Exclusion form CG 00 59
  - (4) Any Common Policy Conditions form
  - (5) Any other endorsement/form not specifically authorized in item no. 2.h above.
- B. If any part of the work is sublet, similar insurance, and evidence thereof as specified in A.1 above, shall be provided by or on behalf of the subcontractor to cover its operations on Railroad’s right of way. As an alternative, the Prime Contractor may provide insurance for the subcontractor by means of separate and individual policies.
- C. Prior to entry on Railroad right-of-way, the original and one duplicate copy of the 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 the Railroad. In addition, certificates of insurance evidencing the Prime Contractor’s Commercial General Liability Insurance shall be issued to the Railroad and the Department at the addresses below, and one certified copy of the Prime Contractor’s policy is to be forwarded to the Department for its review and transmittal to the Railroad. All policies and certificates of insurance shall state

that the insurance coverage will not be suspended, voided, canceled, or reduced in coverage or limits without (30) days advance written notice to Railroad and the Department. No work will be permitted by Railroad on its right-of-way until it has reviewed and approved the evidence of insurance required herein.

DEPARTMENT:

Department of Transportation  
 Rail Division  
 C/O Mr. David Hinnant, State Railroad Agent  
 1556 Mail Service Center  
 Raleigh, NC 27699-1556

RAILROAD:

Camp Lejeune Railroad

- D. The insurance required herein shall not limit the obligations of Department or its Contractors under the terms of this agreement.
- E. All insurance herein before specified shall be carried until the final inspection and acceptance of the project, or that portion of the project within railroad right of way, by the Department or, in the case of subcontractors, until the Contractor furnishes a letter to the Engineer stating that the subcontractor has completed his subcontracted work within railroad right of way to the satisfaction of the Contractor and that the Contractor will accomplish any additional work necessary on railroad right of way with his own forces. It is understood that the amounts specified are minimum amounts and that the Contractor may carry insurance in larger amounts if he so desires. As to "aggregate limits", if the insurer establishes loss reserves equal to or in excess of the aggregate limit specified in any of the required insurance policies, Contractor shall immediately notify the Department of Transportation and shall cease all operations until the aggregate limit is reinstated. If the insurer establishes loss reserves equal to or in excess of one/half of the aggregate limit, Contractor shall arrange to restore the aggregate limit to at least the minimum amount stated in these requirements. Any insurance policies and certificates taken out and furnished due to these requirements shall be approved by the Department and the Railroad Company as to form and amount prior to beginning work on railroad right of way.

FAILURE TO COMPLY:

- A. In the event the Contractor violates or fails to comply with any of the requirements of these Special Provisions:
- (1) The Railroad Engineer may require that the Contractor vacate Railroad property.
  - (2) The Engineer may withhold all monies due the Contractor on monthly statements.

Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Engineer.

PAYMENT FOR COST OF COMPLIANCE:

- A. No separate payment will be made for any extra cost incurred on account of compliance with these special provisions. All such cost shall be included in prices bid for other items of the work as specified in the payment items.

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	<u>one</u>
Number of trains per day	<u>two</u>
Maximum speed of trains	<u>twenty -five mph</u>

**VIII. Compensation**

Payment at the contract lump sum price for: "Piney Green Road 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 crossing.

**Attachments**



Norfolk Southern Corporation  
 1200 Peachtree Street, N.E.  
 Atlanta, Georgia 30309-3579  
 404/529-1408  
 Fax: 404/527-2589

J. N. Carter, Jr.  
 Chief Engineer  
 Bridges and Structures

S. A. Overbey, P.E.  
 Engineer  
 Public Improvements  
 Phone: 404/582-5588  
 Fax: 404/527-2769

**Subject:** Jacksonville, NC: Proposed Replacement and Improvement of the At-grade Crossing Surface for Piney Green Road/SR 1406 at MP CL-3.63 (DOT No. 722 904M). Onslow County. NCDOT Proj. # U-3810.

October 27, 2011  
 File: CX0031172 SAO

Mr. W. Kirby Warrick  
 Railroad Agent  
 North Carolina Department of Transportation  
 Utilities Coordination Unit  
 1556 Mail Service Center  
 Raleigh, NC 27699-1556

Dear Mr. Warrick:

Reference is made to your letter of January 5, 2011, and later e-mails concerning the above captioned project.

The plans and correspondence provided were reviewed by Engineering as well as shared with our Track Supervisor for that territory. No exceptions were noted and we concur with the minimum horizontal clearance distances shown on the plans.

I am attaching a standard drawing and specifications for Norfolk Southern's approved precast concrete crossing panel design that is available through several vendors including Century Precast. There is no obligation for use of this product off of our right of way, but we would have confidence in its utilization.

If you have any questions or wish to discuss this project, please contact me at (404) 582-5588.

Sincerely,

  
 S. A. Overbey

Copy (by e-mail):

Harold Napier, Realty Specialist, USMC – Camp Lejeune, NC



# Norfolk Southern Corporation Specifications for Concrete Road Crossing Panels

Revised November 27, 2001

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1. **Scope:**

These requirements cover the manufacture of concrete road crossing surface panels as shown on NS Standard Plan 7-6. The gage panel is to be "shunt free" and must pass the attached DC electrical tests.

2. **Material Specifications:**

Reinforcing steel is to be current ASTM A-615 Specification and meet Grade 60 requirements using #5 rebar.

Reinforcing steel is to conform to ASTM A-36 Specifications.

Welding is to be ARC process per current AWS Code. If any welding of the reinforcement is required, reinforcing steel shall conform to current ASTM A-706 Specifications, Grade 60.

Design is to meet AASHTO SH20-44 Loading Specification.

Exposed steel is to receive one coat of primer.

Specified deformed bar anchors are to be epoxy coated so as to prevent an unintended electrical current from passing through the rebar network from one rail to the other within the concrete gage panel.

Concrete material mixing, placing and curing is to be current AREMA Specification for Concrete and Reinforced Concrete Railroad Bridges and Other Structures.

Compressive Strength – 6,000 psi minimum @ 28 days

Compressive Strength – 4,000 psi minimum prior to shipment

Compressive Strength – 2,500 psi minimum before the removal from forms @ 7 days

There is to be a 1-½ inch minimum concrete cover above and below all reinforcing/structural steel.

The maximum water/cement ratio is to be 0.44 (by weight).

The slump is not to exceed 3 inches prior to additives.

The air entrainment percent is to be 5% +/- 1.0% in a plastic container state or as necessary to achieve 3.5% in hardened concrete.

Either one of the following or a combination thereof may be used for curing. Membrane curing shall be used following the recommendations and procedures of AREMA Specifications Chapter 8, Part 1, Section 1.17.4 and/or steam curing may be used following the recommendations and procedures of AREMA Specification Chapter 8, Part 1, Section 1.17.5.

The cement is to be Type – IP (water permeable) or Type – III-A (early strength) conforming to ASTM C-150. It shall not exceed 0.60% alkali equivalent from chemical analysis using ASTM C-114.

3. **Fabrication:**

Production procedures for the manufacture of pre-cast panels shall be in accordance with the Prestressed Concrete Institute's Manual for Quality Control: Pre-cast and Pre-stressed Concrete MNL 116 Edition 4 for quality control and in accordance with AREMA Specification Chapter 8.

4. **Tolerances:**

- A. Warp – The bottom surface to be in contact with railroad ties shall not undulate in any direction more than 3/32 inch. The warp if one corner is out of plane from the other three shall not exceed 1/8 inch. Bottom flatness of panels shall be checked using a straight edge calibrated to within +/- 1/32 inch and a taper gage as follows:  
8 Positions of flat bar (-----). Check Flatness at each position using a taper gage.



- B. Thickness – The total thickness shall be within 1/8 inch of the requirement.  
C. Deviation from Square – The difference in length between the two diagonal measurements shall not exceed 3/16 inch.  
D. Length – The total length shall be within 1/8 inch of the requirement.  
E. Width – The total width shall be within 1/8 inch of the requirement.  
F. General – Unless specifically noted the tolerances on all other dimensions shall be 1/8 inch.

5. **Finish:**

- A. All recesses and minor concrete chipping or voids are to be filled and finished to the planned panel dimensions using the proper bonding agent and repair material. The surface of the repaired area is to match the color and texture of the surrounding areas.  
B. The driving surface is to have a light broom finish and shall be in the same direction as the long axis. The addition of water to the surface during finishing is not permitted.  
C. The top surface shall be non-crack design and shall be sealed to prevent ion migration due to salting.  
D. The manufacturer shall be responsible for loading and properly securing all pre-cast concrete members for shipment.

**6. Identification:**

The manufacturer is to mark each panel (concrete imprint or stamped plating) displaying the following information:

- A. Manufacturer's name
- B. Month and Year of Casting
- C. Rail Size
- D. Weight of Panel

**7. Warranty:**

All material in the concrete road crossing panels is to be warranted for ten (10) years.

**8. Certifications:**

The manufacturer must have in place a working quality assurance program modeled after AAR M-1003 or ISO 9000. The manufacturer shall be PCI certified and have at least one individual certified to PCI level II technician/inspector. All test personnel shall be minimum ACI level I certified.

**9. Qualification:**

Prior to the building of the road crossing material the manufacturer must contact the Norfolk Southern Senior Quality Engineer, Research and Test Department, to acquire approved vendor status. Copies of the concrete design mix shall be submitted to the Senior Quality Engineer at 110 Franklin Road S.E., Box 77, Roanoke, Virginia 24042-0077.

**10. Test Reporting:**

All test results required in these specifications shall be recorded and saved for a minimum of seven years. After the vendor is qualified all ASTM and other test results must be sent to the Senior Quality Engineer at six month intervals.

**11. Inspection:**

Norfolk Southern personnel may inspect concrete road crossing panels ordered under these specifications at unannounced visits to the manufacturer's plant during regular working hours along any part of the process.

**12. Quality Assurance:**

It is the manufacturer's responsibility to satisfy the Norfolk Southern inspector that the commodity conforms to these specifications. This can be handled by performing the tests prescribed and demonstrating that the manufacturing processes are controlled to assure conformity. Quality assurance audits to verify compliance to these requirements will be conducted periodically by Norfolk Southern representatives. Norfolk Southern reserves the right to perform any test set forth in these specifications where it is believed necessary to assure the commodity conforms to the requirements.

**13. Return of Shipment:**

Road crossing material that does not comply with these specifications, or materials, not withstanding tests, inspections, or acceptance, are found to contain deficiencies, will be rejected and returned to the manufacturer. The manufacturer shall be entitled to a joint inspection of the defective material on the Norfolk Southern property. The manufacturer shall be responsible for the expenses associated with the handling and transportation of defective material.

**14. Jurisdiction:**

The decision of Norfolk Southern shall be final with regard to all matters pertaining to the inspection of concrete road crossing material covered by these specifications.

**Norfolk Southern Corporation**  
**DC Conductivity Test for Concrete Crossing Panels**

October 7, 1999

I. Conductivity of a concrete crossing panel must be measured three or more days after its initial pouring.

II. The following equipment will be required to perform the conductivity test:

- A. Battery capable of producing a minimum of five amps at zero resistance, for example - a six volt lantern battery
- B. Multimeter capable of reading volts and amperes, for example – a TS 111 meter.
- C. Jumpers

III. Procedures

A. Battery Test

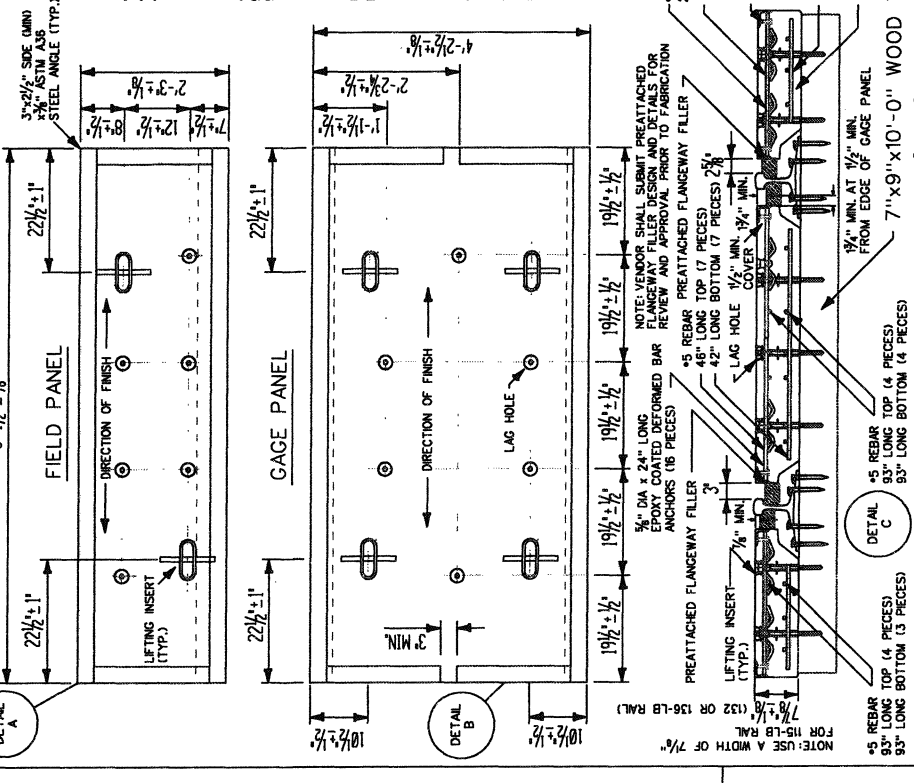
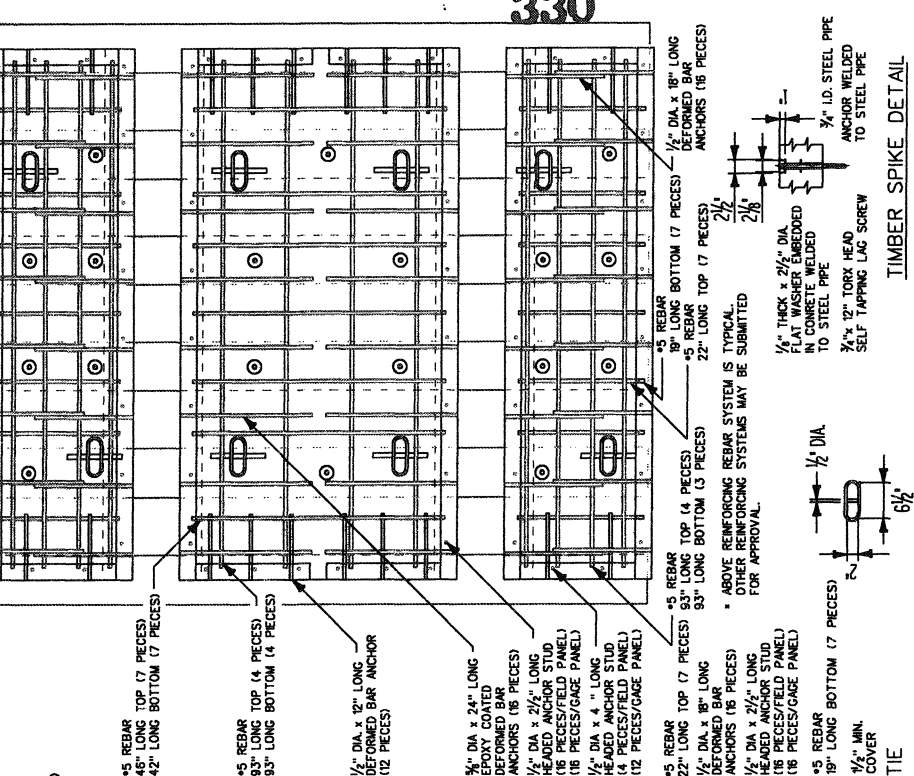
- 1. Test battery by setting the multimeter to the 10 A scale.
- 2. Touch the meter leads to the battery terminals. Red lead on positive battery and black lead on negative battery.
- 3. Measured current must be a minimum of 5 amps.

B. Gauge Panel Test

- 1. A clean conductive surface must be provided on the metal band of the center panel. Scrape off paint or rust from the test points.
- 2. Securely attach the negative battery lead to one side of the break in the metal band on one end of the center panel.
- 3. Securely attach the positive battery lead to the negative ammeter lead.
- 4. Securely attach the positive ammeter lead to the other side of the break in the metal band on the same end of the center panel in step (2) above. The ammeter is now connected in series to read current.
- 5. Maintain above connections for one minute. Allow meter to stabilize.
- 6. Measured current must be 600ma or less.
- 7. Test results must be marked, in milli-amps, on the side of the center panel with a permanent marker.

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THE MANUFACTURE OF CONCRETE ROAD CROSSING SURFACE PANELS ARE TO BE IN ACCORDANCE WITH THE NORFOLK SOUTHERN SPECIFICATIONS FOR CONCRETE ROAD CROSSING PANELS.



- NOTE: USE A WIDTH OF 7/8" FOR 15-LB. RAIL (132 OR 156-LB. RAIL)
- NOTE: VENDOR SHALL SUBMIT PREATTACHED FLANGEWAY FILLER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION
- NOTE: REINFORCING REBAR SYSTEM IS TYPICAL. OTHER REINFORCING SYSTEMS MAY BE SUBMITTED FOR APPROVAL.
- MINIMUM OPENING SHALL BE SHOWN ABOVE DEPTH + 3" LIFTING INSERTS SHALL BE MECHANICALLY GALVANIZED OR SIMILARLY PROTECTED AGAINST CORROSION. LIFTING DEVICES SHALL BE USEABLE WITH BURKE OR DAYTON 5-TON CLUTCH SYSTEMS. LIFTING DEVICE SHALL BE DESIGNED WITH A MINIMUM SAFETY FACTOR OF FOUR AND BE OSHA CERTIFIED.
- REVISION
- | DATE    | REVISION                     |
|---------|------------------------------|
| 8-23-04 | PREATTACHED FLANGEWAY FILLER |
| 9-10-07 | LAG SCREW DIAMETER           |
- DATE