

WORK REQUEST 6449864
REPAIR SIGNAL DETECTOR LOOPS AT
ROOSEVELT & SLOCUM AND 4TH & E ST
MARINE CORP AIR STATION
CHERRY POINT, NORTH CAROLINA 28533-0006

STATEMENT OF WORK:

GENERAL REQUIREMENTS: The objective of this project is to repair two (2) traffic signal systems at the intersection of Slocum Rd, Roosevelt Blvd and 6th Ave **AND** 4th Ave and E St. Repairs to the traffic signal systems shall allow for the signal system program to respond to current vehicular and pedestrian traffic. Additional work shall include, but not limited to, the replacement of all detector loops and lead-in cables, and other incidental work at Slocum Rd, Roosevelt Blvd and 6th Ave. And the replacement of two (2) detector loops, associated lead-in cables, and other incidental work as identified on the reference drawings at 4th Ave and E St.

1. **WORK INCLUDES:** Providing all labor, supervision, tools, equipment, materials, and the transportation needed for the completion of the scope of work.
2. **LOCATION:** All work will be performed at the intersections of Slocum Rd, Roosevelt Blvd and 6th Ave **AND** 4th Ave and E St on MCAS Cherry Point, NC.
3. **SCOPE OF WORK:**
 - i. **Pre-Construction Requirements**
 - a. Verify all that existing signal equipment **NOT** being replaced is in functioning condition. Report all defective signal equipment to the Contracting Officer.
 - b. Locate existing conduit, cable runs, inductive detection loops, lead-in cable, junction boxes and detection equipment before installing or using equipment that can damage or interfere with such facilities. The locations of existing inductive detection loops shown are approximate.
 - c. Locate all underground utilities before beginning drilling, digging or trenching operations.
 - d. Submit material specifications for detector loops, lead-in cables and detectors for approval prior to construction.
 - e. Provide a **Traffic Control Plan** for approval prior to starting construction.
 - f. The Provost Marshal's Office (PMO) and Cherry Point Fire & Emergency Services (CPF&ES) shall be notified prior to starting construction.
 - ii. **Northbound on Roosevelt Boulevard**
 - a. Remove existing inductive detector loops and loop lead-in cables.
 - b. Install new inductive detector loops and loop lead-in cables. Must meet specifications listed within this Statement of Work.
 - c. Seal all inductive detector loops before opening the lane(s) to vehicular traffic.
 - d. All inductive detector loops and loop lead-in cables shall be compatible with the existing Traffic Controller Cabinet, i.e., Traffic Signal Controller Unit(s), Conflict Monitor(s),

- Detector(s), etc.
- e. Provide a **Traffic Control Plan** for approval.
- f. All work must be completed during off-peak vehicular traffic hours.
- g. All emergency vehicles will be given priority during temporary traffic control procedures. And the contractor shall notify the Contracting Officer 14 days in advance of implementing the approved traffic control plan.

iii. Southbound on Roosevelt Boulevard

- a. Remove existing inductive detector loops and loop lead-in cables.
- b. Install new inductive detector loops and loop lead-in cables. Must meet specifications listed within this Statement of Work.
- c. Seal all inductive detector loops before opening the lane(s) to vehicular traffic.
- d. All inductive detector loops and loop lead-in cables shall be compatible with the existing Traffic Controller Cabinet, i.e., Traffic Signal Controller Unit(s), Conflict Monitor(s), Detector(s), etc.
- e. Provide a **Traffic Control Plan** for approval.
- f. All work must be completed during off-peak vehicular traffic hours.
- g. All emergency vehicles will be given priority during temporary traffic control procedures. And the contractor shall notify the Contracting Officer 14 days in advance of implementing the approved traffic control plan.

iv. Eastbound on Slocum Road

- a. Remove existing inductive detector loops and loop lead-in cables.
- b. Install new inductive detector loops and loop lead-in cables. Must meet specifications listed within this Statement of Work.
- c. Seal all inductive detector loops before opening the lane(s) to vehicular traffic.
- d. All inductive detector loops and loop lead-in cables shall be compatible with the existing Traffic Controller Cabinet, i.e., Traffic Signal Controller Unit(s), Conflict Monitor(s), Detector(s), etc.
- e. Provide a **Traffic Control Plan** for approval.
- f. All work must be completed during off-peak vehicular traffic hours.
- g. All emergency vehicles will be given priority during temporary traffic control procedures. And the contractor shall notify the Contracting Officer 14 days in advance of implementing the approved traffic control plan.

v. Westbound on 6th Avenue

- a. Remove existing inductive detector loops and loop lead-in cables.
- b. Install new inductive detector loops and loop lead-in cables. Must meet specifications listed within this Statement of Work.
- c. Seal all inductive detector loops before opening the lane(s) to vehicular traffic.
- d. All inductive detector loops and loop lead-in cables shall be compatible with the existing Traffic Controller Cabinet, i.e., Traffic Signal Controller Unit(s), Conflict Monitor(s), Detector(s), etc.
- e. Provide a **Traffic Control Plan** for approval.
- f. All work must be completed during off-peak vehicular traffic hours.
- g. All emergency vehicles will be given priority during temporary traffic control procedures. And the contractor shall notify the Contracting Officer 14 days in

advance of implementing the approved traffic control plan.

vi. Southbound and Northbound on 4th Avenue

- a. Remove existing inductive detector loop 5 and 8, and their corresponding lead-in cables.
- b. Install new inductive detector loops, loop lead-in cables and loop detectors for loop 5 and 8. Must meet specifications listed within this Statement of Work.
- c. Seal all inductive detector loops before opening the lane(s) to vehicular traffic.
- d. All inductive detector loops, loop lead-in cables and loop detectors shall be compatible with the existing Traffic Controller Cabinet, i.e., Traffic Signal Controller Unit(s), Conflict Monitor(s), Detector(s), etc.
- e. Provide a **Traffic Control Plan** for approval.
- f. All work must be completed during off-peak vehicular traffic hours.
- g. All emergency vehicles will be given priority during temporary traffic control procedures. And the contractor shall notify the Contracting Officer 14 days in advance of implementing the approved traffic control plan.

vii. Peak Vehicular Traffic Hours Shall be the Following:

- a. Monday – Friday, 0700 to 0900
- b. Monday – Friday, 1500 to 1730
- c. Special Events, TBD
- d. Weekend and Night Construction Operations must be approved by the Contracting Officer.

viii. Traffic Signal Activation

- a. All existing traffic signal phases shall remain and tested before initiating steady stop-and-go operation. Contact Contracting Officer if defective signal equipment is detected.
- b. Initiating steady stop-and-go operation of the traffic signal shall be done during off-peak vehicular traffic hours.

1. REFERENCES:

- NAVFAC Drawing 4367392 (Reference Only)
- NAVFAC Drawing 4343330A (Reference Only)
- Typical Existing Pavement and Loop Condition Photos

2. SPECIFICATIONS:

- i. **NCDOT Standard Specifications for Roads and Structures, 2012 or later.**

ii. Wire and Cable

- a. For installation in a conduit system, lubricate cable and wires before installing in conduit. Use lubricant that will not physically or chemically harm cable jacket, wire insulation or conduit.
- b. Terminate all electrical wire and cable at recessed-screw or barrier type terminal blocks. Unless specifically allowed, connect no more than 2 conductors to the same terminal screw.
- c. Splice electrical wire and cable in junction boxes or condulets. Maintain color coding of wires throughout each splice.

- d. Protect ends of wire and cable from water and moisture.

iii. Grounding

- a. In addition to NEC requirements, test grounding electrode resistance for a maximum of 20 ohms. Furnish and install additional ground rods to grounding electrode system as necessary to meet test requirements.

iv. Construction

a. Inductive Detector Loops (Loop Conductors)

- Notify the Contracting Officer's Representative one week before installing inductive detection loops.
- Coordinate saw cutting and loop placement with pavement markings.
- Before saw cutting, pre-mark inductive detection loop locations and receive approval. Saw cut pavement at approved pre-marked locations. Do not allow vehicles to travel over unsealed loop slots.
- Do not saw cut through curb.
- Remove all loose material and wash saw slots with a high-pressure method using an air and water mixture. Dry saw slots with compressed air. Clear saw slots of jagged edges and protrusions. Seat loop conductor at bottom of saw slot without damaging loop wire.
- Before sealing loop conductors, test that impedance from the loop wire to ground is at least 100 megohms. For each location with inductive loops, submit a completed Inductive Detection Loop & Grounding Test Results form and place copy in controller cabinet. Ensure all loops are included on form. The form is located on the NCDOT Department's website.
- Embed loop conductors in saw slot with loop sealant. Seal saw slot and dispose of excess sealant in an environmentally safe manner.
- Between where loop conductors pairs leave saw cut in pavement and junction boxes, twist loop conductors pairs a minimum of 5 turns per foot. Permanently label each twisted pair in the junction box with nylon cable tie using indelible ink. Indicate loop number and loop polarity on the tie.

b. Lead-in Cables

- For underground runs, install lead-in cable in existing conduit. For aerial installation, wrap lead-in cable to messenger cable with at least 4 turns of wrapping tape spaced at intervals less than 15" or lash lead-in cable to messenger cable with one 360° spiral of lashing wire per 12".
- Splicing of lead-in cable will be allowed only for runs in excess of 750 ft. Splice lead-in cable in junction boxes or condulets on poles.
- Test each complete loop system from the controller cabinet by using a megger to verify that impedance from the loop system to the ground is at least 50 megaohms. After successful completion of megger test, test loop system resistance using an electronic ohmmeter to verify loop system resistance is less than 0.00885 ohms per foot.

v. Materials

a. Lead-In Cable

- Furnish lead-in cable with 2 conductors of number 14 AWG fabricated from stranded tinned copper that complies with IMSA Specification 50-2 except as follows:
 - Ensure conductor is twisted with a maximum lay of 2.0" resulting in at least 6 turns per foot.
 - Provide a ripcord to allow cable jacket to be opened without using a cutter.
 - Provide length markings in a contrasting color showing sequential feet and within 1% of actual cable length. Ensure character height of the markings is approximately 0.10".

b. Loop Sealant

- Submit product data for approval.
- Provide loop slot sealant that completely encapsulates loop wire when installed according to manufacturer's instructions. Provide loop sealant that does not generate temperatures greater than 220°F. Ensure sealant bonds with asphalt and concrete pavement saw slots so sealant and encapsulated loop wire do not come out of slot. Ensure sealant is self-leveling, but with sufficient viscosity to prevent exit from saw slot when installed along a 10% grade.
- Provide sealant that protects loop wire by preventing the entrance of dirt, water, rocks, sticks, and other debris into saw slot, and is resistant to traffic, water, gasoline, chemical and chemical fumes, mild alkalis, oils and mild acids. Ensure sealant will not be affected by water and sealant does not chemically interact with pavement and loop wire insulation.
- Ensure loop sealant has sufficient flexibility to permit expected pavement expansion and contraction due to weather and to permit pavement movement due to traffic without cracking for a temperature range of -40 to 160°F.
- Provide sealant with a usable life of at least ten minutes once mixed, when the ambient temperature is 75°F. Ensure sealant dries to tack free state in less than 2 hours, and does not flow within or out of saw slot after exposed surface has become tack free. Tack free time will be determined by testing with a cotton ball until no sealant adheres to cotton ball and no cotton adheres to sealant.
- Ensure 2 part sealant cures within 48 hours to attain 95% of published properties for the cured material.
- Ensure one part sealant cures within 30 days to attain 95% of published properties for the cured material.

c. Loop Wire

- Provide loop wire composed of 19-strand conductor insulated by a cross-linked polyethylene compound. Ensure insulated conductors are completely encased in tubes of low density polyethylene compound. Print manufacturer's name, manufacture year and any applicable part number on encasing tube at intervals of 2 ft or less.
- Provide number 14 AWG copper conductors fabricated from 19 strands that comply with ASTM B3 before insulating. Ensure stranded conductors use either concentric or

bunch stranding and comply with circular mil area and physical requirements of ASTM B8 or ASTM B174 for bunch stranding.

- Provide insulating compound that is cross-linked thermosetting black polyethylene in accordance with ASTM D2655. Ensure insulation is applied concentrically about conductor. Provide insulation thickness not less than 0.026" at any point and minimum average thickness of 0.030" as measured by UL Standard 62.
- Ensure insulation of finished conductor will withstand application of a 60 Hertz or 3,000 Hertz, 7,500 volt (RMS) essentially sinusoidal spark test potential as specified in UL Standard 83.
- Provide insulated conductors that are factory-installed in a protective encasing tube that complies with the following:
 - Encasing tube fabricated of polyethylene compound conforming to ASTM D1248 for Type I, Class C, Grade E5. Provide a minimum inside diameter of 0.150". Provide a wall thickness of 0.040" ± 0.010". Provide an outside diameter of 0.240" ± 0.010".

d. Conduits

- All underground conduits are exiting unless otherwise noted.

1. SPECIFIC REQUIREMENTS:

- i. Coordinate through the Contracting Officer's Designated Representative to schedule work. The contractor is ultimately responsible for the health and safety of their employees. They shall also recognize the other inherent hazards and provide their employees with the appropriate safety equipment for the job. Ensure that permit required procedures and safety requirements are followed prior to entering the work area in accordance with the Station Safety Officer and Air Station Order 5100.8c and NAVMC5100.1. All North Carolina Building Codes, Fire Codes, Statutes, NEC, OSHA Safety Codes and the U.S. Army Corps of Engineer's Safety and Health Requirements Manual, EM 385-1-1 shall be strictly enforced. An accident prevention plan in accordance with the EM 385-1-1 is required.
- ii. Provide and erect all required safety barriers and traffic control devices needed to keep unauthorized personnel out of the work area, and maintaining vehicle and pedestrian traffic flow.
- iii. Prior to work, all necessary permits, safety and traffic control plans must be submitted for approval.

2. PLAN AND SCHEDULE: Lack of knowledge of existing conditions will not be considered a basis for contractor change orders. Verify all dimensions and utilities listed under this contract to ensure constructability. Contractor shall be responsible for obtaining hot work permit when required by the Government. Contractor shall provide trained personnel, equipment and materials required to perform the service outlined above. Contractor shall coordinate with government personnel to insure successful contract completion.

3. TERMS OF THE CONTRACT: The contractor is responsible for an on-site visit to inspect the work area and fully understand the scope of work. All work shall be performed during the hours of 0730-1600, Monday through Friday. Any work performed outside of these periods must be pre-

approved by the Contracting Officer. Project shall be completed within 90 days following contract award.

- 4. JOB EXECUTION:** The contractor shall perform all work and incorporate the intent of this project as outlined in this scope of work. The work practice and installation shall conform to all industry standards and applications, i.e. North Carolina Building Codes and Statutes, National Design Specification for Wood Construction, American Institute for Steel Construction, National Electric Code, EM 385-1-1 Safety and Health Requirements Manual, NESC and other OSHA Safety Standards as they apply to this project. All equipment and debris generated from this project becomes the property of the contractor and it must be removed from the jobsite and MCAS Cherry Point.