

ROAD COMMISSION FOR OAKLAND COUNTY

SPECIAL PROVISIONS
FOR
OPTICAL PRIORITY CONTROL SYSTEM - INFRARED

RCOC/TOC/OHM:AS

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RCOC20SP820BB

ORG: 3-10-22

REV: 12-01-25

a. Description

The priority control system will employ data-encoded optical communications to identify the presence of designated priority vehicles. A record of system users by vehicle identification number, vehicle classification and channel called will be created. In priority vehicle mode, the data-encoded communication will request the traffic signal controller to advance to and/or hold a desired traffic signal display selected from phases normally available. The equipment must be fully compatible with the agency's existing infrastructure and emitters.

This work consists of installing, installing as salvaged, or removing the Optical Priority Control System according to the plans and sections 204, 818, 820, 918, and 921 of the Standard Specifications for Construction, except as herein provided.

b. Materials.

All materials must meet the requirements of this specification or engineer approved equal.

General

- A. Furnish new materials.
- B. All materials shall be compatible with existing RCOC materials.
- C. Compatible with TS1 and TS2 traffic signal cabinet.
- D. Provide proposed material properties to match the existing material properties in place at other intersections within Oakland County, and in accordance with the requirements of this special provision.

If the materials selected by the contractor do not match all the existing material properties in place, alternate models shall require extensive testing by RCOC (RCOC Traffic Operations Center, RCOC Maintenance Department, and RCOC Traffic Safety Director), the supplier, and the contractor at the RCOC TOC building in Pontiac. The materials will require field testing. RCOC may consider information from the MDOT New Traffic Signal Device Product Review Guidelines. The testing should be expected to take several months. This testing will not be paid extra and any requests to use an alternate material/model will not be justification for an extension of time, delay to the project, and/or additional cost to the project. The RCOC Engineer will provide the final determination, and the outcome cannot be appealed.

The system consists of the following matched components:

1. Detector. Provide a minimum of one optical detector per intersection approach, as shown on the plans.

The detectors transform the optical energy detected from an approaching, vehicle-mounted Emitter device to an electrical signal. The electrical signal must be transmitted along a cable to the Phase Selector for processing.

The detector must be single channel with dual detection.

The detector features must include:

- A. Advanced electrical transient immunity
- B. Modular design
- C. Adjustable turret configuration; accommodates skewed approaches
- D. Lightweight, durable, high-impact polycarbonate enclosure
- E. Simplified installation: span wire or mast arm

Operating parameters:

- A. Reception Range: 200 ft. (60 m) adjustable up to 2,500 ft. (760 m)
- B. Electrical: 24 to 28 VDC, 50 MA minimum
- C. Temperature Range: -30° F (-34° C) to 165° F (74° C)
- D. Humidity: 5% to 95% relative

2. Phase Selector. Provide a NEMA TS2 and FCC compliant, plug in, four channel, dual priority, multimode unit capable of operating in infrared only applications, GPS only applications, or simultaneous infrared / GPS applications.

The phase selector must discriminate between three distinct emitter frequency rates and classify approaching vehicle as high priority, low priority, or probe priority. Within each of these levels, it must further discriminate among 254 agency IDs, 15 classes of vehicle identification codes, with 10,000 individual vehicle codes per class.

The unit must internally record the 10,000 most recent system activations. Each record must include intersection name, date and time of activation, activating vehicle class and ID number, channel called, relative and conditional priority level, final green signal indications, time spent in final green indications, and duration of the activation. In GPS Mode, it must also record agency ID, turn signal status, and the entry/exit/average speed of vehicle.

The phase selector will be a plug-in, four channel, multiple-priority device intended to be installed directly into a card rack located within the controller cabinet.

The Opticom 764 Phase Selector (or latest model/version as approved by Engineer) should be used.

3. Auxiliary Interface Panel (AIP). Provide an auxiliary interface panel specifically designed for use with the provided phase selector(s) and intersection control cabinet equipment. The panel must include 2 DB-9 RS-232 communication ports, a 44-pin connector for use with legacy panels, and a 12-foot-long cable to connect to the Phase Selector.

The panel must be able to employ auxiliary infrared detector inputs, green light sensing, and verification, turn signal dependent operation, and confirmation light outputs.

The Opticom 768 Auxiliary Interface Panel (or latest model/version as approved by Engineer) should be used.

4. Card Rack. Provide a stand-alone card rack for the priority control equipment as required for compatibility with the intersection control cabinet equipment.

The Opticom 760 card rack (or latest model/version as approved by Engineer) should be used.

5. Cables. Provide all cables, wires, connectors, and grounding/bonding necessary to provide a fully functional system. Materials must meet or exceed the manufacturer's requirements, be approved by the engineer, and be rated for their intended use.
6. Span Wire or Mast Arm Clamp. Provide all connectors.
7. Warranty and Guarantee

Provide materials with a manufacturer's warranty/guarantee, transferable to the Road Commission for Oakland County, that the supplied materials will be free from all defects in materials and workmanship for five (5) years from the date of final project acceptance. If requested by the Engineer, supply manufacturer's warranty and guarantee documents from the manufacturer and a copy of the invoice showing date of shipment.

8. Acceptance
 - A. Provide General Certification per the MDOT's *Materials Quality Assurance Procedures Manual* to the Engineer that the materials meet the requirements specified herein.
 - B. TOC Operations Engineer can view the preemption events from the TOC Office.

- C. Field Verification –
Engineer, contractor, and supplier representative shall field test the Optical Priority Control System.

The supplier representative shall supply the equipment to perform the test and verify the pay items are functioning in the controller. This includes a vehicle driving the intersection to verify the equipment is functioning.

The contractor may be required to have the fire department and police department present at the field verification.

The supplier representative shall provide written certification that the field test and verification that the pay items were functional in the controller.

c. Construction.

Complete this work in accordance with sections 818 and 820 of the Standard Specifications for Construction and as directed by the engineer. Install the priority detection system per the manufacturer's recommendations.

Remove, store, and dispose of material in accordance with section 204 of the Standard Specifications for Construction.

1. Submittals / Working Drawings
Submit a detailed dimensional drawing of all equipment, material specification list which shows the materials to be used, equipment to be furnished, and assembly/installation method.
2. Delivery
 - A. Deliver the equipment to the RCOC Signal shop for setup and installation in the controller cabinet (if a proposed cabinet is required).
3. Qualifications
Upon request of the Road Commission for Oakland County, the manufacturer of the Traffic Signal Preemption Control System will provide a proven, safe, and successful operation of the proposed solution through current examples of 15 installed Infrared Based Traffic Signal Preemption Control Systems using the same products that consist of a minimum of 10 intersections and 10 emergency vehicles each having been in operation a minimum of 1 year. The examples must be from Oakland County, Michigan.
4. Installation
Ensure that a supplier representative or other certified manufacturer's representative is in attendance during the installation.

d. Measurement and Payment.

The completed work as described will be measured and paid for at the contract unit price for the following pay items:

Pay Item	Pay Unit
Optical Priority Control System, Infrared, RCOC.....	Each
Optical Priority Control System, Infrared, Rem, RCOC	Each
Optical Priority Control System, Infrared, Salv, RCOC	Each

Optical Priority Control System, Infrared, RCOC (Ea) includes furnishing and installing a complete and operational optical priority detection system including delivery, optical detectors, phase selector, auxiliary interface panel, mounting clamps and brackets, card rack (if required) and all associated hardware, conduit risers, cable, wiring, and grounding and such other material as may be required to provide a complete and operating job as specified herein and as shown on the plans.

Optical Priority Control System, Infrared, Rem, RCOC (Ea) includes removing a complete and operational optical priority detection system including optical detectors, phase selector, auxiliary interface panel, and related equipment, hardware, conduit risers, cable, wiring, and grounding all as specified herein and as shown on the plans.

Optical Priority Control System, Infrared, Salv, RCOC (Ea) includes installing a complete salvaged optical priority detection system including delivery, optical detectors, phase selector, auxiliary interface panel, card rack (if required) and all associated hardware, conduit risers, cable, wiring, and grounding as specified herein and as shown on the plans. Provide new mounting hardware and cable between each component. Provide all such other material as may be required to provide a complete and operating job as specified herein and as shown on the plans. If material is not present in existing cabinet, the material shall be provided in proposed cabinet for a complete and operating job.