

THE SHOP DRAWINGS SHALL HAVE AN OHIO PE STAMP AND BE PROVIDED TO THE ENGINEER PRIOR TO ORDERING. NO SIGNAL SUPPORTS SHALL BE ORDERED PRIOR TO SUBMITTING THE SHOP DRAWING INFORMATION. THE SUPPORT SHALL BE A ROUND TAPERED SIGNAL SUPPORT CONSISTENT WITH THE ODOT STANDARD CONSTRUCTION DRAWING AND ITEM 733.11 OF THE ODOT CMS. THE HORIZONTAL MAST ARM SHALL BE CURVED EXTENDING 10 FEET FROM THE VERTICAL SIGNAL SUPPORT AS SHOWN IN THE SIGNAL SUPPORT DETAIL UNLESS OTHERWISE NOTED. SHORTER ARM LENGTHS MAY REQUIRE THE LENGTH OF CURVATURE TO BE LESS THAN 10 FEET TO AVOID THE ARM FROM BEING LOCATED BEHIND THE GREEN INDICATION OF THE SIGNAL HEAD CLOSEST TO THE VERTICAL SUPPORT. THE CURVE OF THE MAST ARM SHALL HAVE A 3-6' RISE ABOVE THE POINT OF ATTACHMENT TO THE SIGNAL SUPPORT. THE POLE HEIGHT SHALL BE NOTED IN THE SIGNAL ATTACHMENT CHART.

SIGNAL SUPPORTS SHALL BE GALVANIZED PER 711.02. PAINTING OF THE SUPPORTS SHALL MEET ODOT SUPPLEMENTAL SPECIFICATION 916 FOR POWDER COATINGS. THE COLOR SHALL BE FEDERAL COLOR: AMS-STD-595-17038 (GLOSS BLACK).

A MINIMUM OF ONE, 3" CONDUIT ELL SHALL BE FURNISHED IN THE FOUNDATION OR BE IN ACCORDANCE WITH THE TRAFFIC SIGNAL PLAN.

DUE TO THE POSSIBILITY OF CONFLICT WITH EXISTING OR PROPOSED UNDERGROUND OBSTRUCTIONS (INCLUDING THE POSSIBILITY OF UNRECORDED OBSTRUCTIONS) WHICH COULD AFFECT THE LOCATION OF THE FOUNDATION FOR THESE ITEMS, AND CONSEQUENTLY, THE DESIGN OF THE VARIOUS SUPPORTS, AND/OR ARMS, THE CONTRACTOR SHALL NOT PLACE FINAL ORDERS FOR THESE ITEMS UNTIL THE FOUNDATION HAVE BEEN INSTALLED, AND HE HAS RECEIVED FROM THE ENGINEER WRITTEN NOTICE TO PROCEED WITH THE ORDERS FOR THESE ITEMS.

IF ANY FOUNDATION LOCATION MUST BE ADJUSTED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER, WHO WILL DETERMINE THE REVISED LOCATIONS AND IF ANY SUPPORT DESIGN CHANGES ARE NECESSARY, IN CONSULTATION WITH THE MAINTAINING AGENCY. THE CONTRACTOR WILL NOT BE RESPONSIBLE FOR DETERMINING THE REVISED DESIGN. THE ENGINEER WILL SUBSEQUENTLY INFORM THE CONTRACTOR OF ANY CHANGES NECESSARY AND AUTHORIZE HIM TO ORDER THE SUPPORTS.

THE CONTRACTOR SHALL, WHEN DEVELOPING HIS PROGRESS SCHEDULE, AND THOSE OF HIS SUBCONTRACTOR, ENSURE THAT THE FOUNDATIONS ARE INSTALLED AT THE EARLIEST TIME AS IS FEASIBLE AND PRACTICAL, AND SHALL INCLUDE SUFFICIENT TIME IN THE PROGRESS SCHEDULE FOR THE ORDERING, MANUFACTURE, DELIVERY, AND INSTALLATION OF THESE ITEMS AFTER THE FOUNDATIONS ARE IN PLACE.

NO PAYMENTS FOR DELIVERED MATERIALS FOR THESE ITEMS WILL BE MADE UNTIL THE FOUNDATIONS ARE IN PLACE, AND IF CHANGES IN THE DESIGN OF THESE ITEMS ARE REQUIRED, NO PAYMENTS WILL BE MADE FOR ITEMS MANUFACTURED TO THE ORIGINAL DESIGNS.

THE CONTRACTOR SHALL PROTECT PEDESTRIANS AND VEHICLES FROM THE EXPOSED ANCHOR BOLTS UNTIL THE ASSOCIATED SIGNAL SUPPORT IS ERECTED. THE METHOD OF COVERING THE ANCHOR BOLTS SHALL BE APPROVED BY THE ENGINEER.

PAYMENT FOR ITEM 632 SIGNAL SUPPORT, TYPE TC-81.22, (BY DESIGN), AS PER PLAN SHALL BE MADE AT THE CONTRACT UNIT PRICE PER EACH COMPLETE AND IN PLACE, AND SHALL INCLUDE ALL DOCUMENTATION, LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO COMPLETE THE WORK.

ITEM 632 COMBINATION SIGNAL SUPPORT, TYPE TC-81.22, (BY DESIGN), AS PER PLAN

IN ADDITION TO PROVISIONS OF THE ODOT C&MS, FURNISH AND INSTALL SIGNAL POLES AS SPECIFIED IN ITEM 632 SIGNAL SUPPORT, TYPE TC-81.22, (BY DESIGN), AS PER PLAN.

POLE PLATES SHALL BE FABRICATED ONLY WHERE BRACKET ARMS AND LUMINAIRES ARE SPECIFIED. OTHERWISE, POLE PLATES SHALL BE OMITTED FROM A COMBINATION POLE.

PAYMENT FOR ITEM 632 COMBINATION SIGNAL SUPPORT, TYPE TC-81.22, (BY DESIGN), AS PER PLAN SHALL BE MADE AT THE CONTRACT UNIT PRICE PER EACH COMPLETE AND IN PLACE, AND SHALL INCLUDE ALL DOCUMENTATION, LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO COMPLETE THE WORK.

ITEM 632 PEDESTAL, 8', TRANSFORMER BASE, AS PER PLAN

PEDESTALS SHALL BE GALVANIZED PER 711.02 AND POWDER COATED FEDERAL BLACK AND SHALL MEET ODOT SUPPLEMENTAL SPECIFICATION 916. THEY SHALL BE IDENTICAL IN COLOR AND PAINT SPECIFICATIONS TO THE SIGNAL SUPPORTS ON THIS PROJECT.

PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID PER EACH OF ITEM 632 PEDESTAL, 8', TRANSFORMER BASE, AS PER PLAN.

SIGNAL SUPPORT AND PEDESTAL FOUNDATION ELEVATIONS

ELEVATIONS SHOWN IN THE PLANS FOR SIGNAL SUPPORT AND PEDESTAL FOUNDATIONS ARE FOR COMPUTATIONAL PURPOSES ONLY. THE ACTUAL ELEVATION OF THE FOUNDATION SHALL BE IN ACCORDANCE WITH TRAFFIC SCD TC-21.21 PROVIDED THE EXISTINGS SLOPE IS LESS THAN 6:1. NOTE THAT THE ELEVATION OF THE TOP OF FOUNDATION SHALL MATCH THE GRADING PLAN INCLUDING SLOPES ADJACENT TO CURB RAMPS.

WHERE CURB IS PRESENT AT BACK OF SIDEWALK, THE ELEVATION OF THE TOP OF FOUNDATION SHALL MATCH THE GRADING PLAN WHICH SHOULD BE EQUAL TO THE TOP OF CURB ELEVATION. THE ADDITIONAL DEPTH OF FOUNDATION NECESSARY TO MEET THESE REQUIREMENTS SHALL BE ADDED TO THE FORMED TOP THAT IS FLUSH WITH THE FACE OF CURB.

AT LOCATIONS WHERE THE EXISTING SLOPE IS 6:1 OR GREATER, THE BURIED DEPTH OF FOUNDATION, AS SHOWN IN SCD TC-21.21 SHALL APPLY TO THE LOW SIDE OF THE SLOPE. THE TOP OF THE FOUNDATION SHALL BE SET 2 INCHES ABOVE THE EXISTING SURFACE ON THE HIGH SIDE OF THE SLOPE. THE ADDITIONAL DEPTH OF FOUNDATION NECESSARY TO MEET THESE REQUIREMENTS SHALL BE ADDED TO THE FORMED TOP.

SIGNAL SUPPORT AND PEDESTAL FOUNDATIONS

PRIOR TO ORDERING THE SIGNAL AND PEDESTAL SUPPORTS, THE CONTRACTOR SHALL CONTACT OUPS TO HAVE ALL THE UTILITIES LOCATED IN THE FIELD THEN MEET WITH THE PROJECT ENGINEER TO LOCATE THE PROPOSED SUPPORT LOCATIONS TO INSURE THERE ARE NO CONFLICTS WITH UTILITIES. IF THERE ARE ISSUES, THE PROJECT ENGINEER SHALL PROVIDE GUIDANCE AS TO THE RELOCATION OF THE SUPPORT POLES.

PAYMENT WILL BE AT THE CONTRACT UNIT PRICE AND WILL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND OTHER INCIDENTALS NECESSARY FOR EACH SUPPORT FURNISHED, IN PLACE, COMPLETE AND ACCEPTED.

ITEM 633 CABINET, TYPE TS-2, AS PER PLAN

THE NEMA TS2 TYPE II CABINET SHALL BE FURNISHED AND INSTALLED ACCORDING TO CMS 633 AND 733, BE LISTED ON THE TRAFFIC AUTHORIZED PRODUCTS LIST (TAP) AND MEET THE FOLLOWING REQUIREMENTS.

1. A MOBOTREX BASE-MOUNTED CABINET WITH A 12-POSITION BACKPANEL SHALL BE USED UNLESS OTHERWISE SPECIFIED. EACH CONTROLLER CABINET SHALL BE EQUIPPED WITH TWO (2) EXHAUST FANS, A GFI CONVENIENCE OUTLET, LED INTERIOR CABINET LIGHTING AND A FLEXIBLE GOOSENECK LIGHT WITH LED LAMP.

2. RACK-MOUNTED DETECTORS. THE CONTRACTOR SHALL NOT REASSIGN THE CABINET DETECTOR INPUTS IN ORDER TO REDUCE THE NUMBER OF 2-CHANNEL DETECTOR UNITS SUPPLIED.

3. TWO (2) SERVICE/OPERATION MANUALS FOR EACH DIFFERENT PIECE OF EQUIPMENT SHALL BE PROVIDED IN EACH CABINET. A HEAVY CLEAR PLASTIC ENVELOPE CONTAINING A COPY OF THE SIGNAL PLAN AND DETAIL SHEETS SHALL BE ATTACHED TO THE INSIDE OF THE CABINET.

4. A POLICE PANEL DOOR SHALL BE PROVIDED ON THE EXTERIOR OF THE CABINET. THE FOLLOWING SWITCHES SHALL BE ACCESSIBLE VIA THE POLICE PANEL DOOR: FLASH CONTROL AND MANUAL SWITCH WITH REMOTE SIGNAL PHASING CONTROL. THE LOCK ACCESSING THE POLICE PANEL DOOR SHALL BE COVERED.

5. THE CABINET SHALL INCLUDE A DEDICATED SINGLE POLE, 20 AMP CIRCUIT BREAKER TO SUPPLY 120VAC TO THE LUMINAIRES.

PAYMENT FOR ITEM 633 CABINET, TYPE TS-2, AS PER PLAN WILL BE AT THE CONTRACT BID PRICE PER EACH COMPLETE AND IN PLACE INCLUDING ALL CONNECTIONS TESTED AND ACCEPTED.

ITEM 633 CABINET FOUNDATION, AS PER PLAN

THIS ITEM SHALL ADHERE TO ALL REQUIREMENTS OF ITEM 633 CABINET FOUNDATION WITH THE FOLLOWING EXCEPTIONS: CABINET FOUNDATION SHALL BE EXTENDED TO SUPPORT A PROPOSED UNINTERRUPTIBLE POWER SUPPLY (UPS). THE TOP OF FOUNDATION FOR THE CABINET FOUNDATION SHALL EXTEND 8 INCHES ABOVE THE EXISTING SURFACE ON THE HIGH SIDE OF THE SLOPE. SEE ODOT PLAN INSERT SHEET 208320 FOR ADDITIONAL INFORMATION.

PAYMENT FOR SHALL BE MADE AT THE CONTRACT UNIT PRICE BID PER EACH OF ITEM 633 CABINET FOUNDATION, AS PER PLAN, COMPLETE.

ITEM 633 UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF C&MS 633 AND 733, POLE ATTACHMENT HARDWARE WILL BE INCLUDED FOR POLE-MOUNTED CABINETS, AND A CABINET RISER (8-INCH MINIMUM) AND ANCHOR BOLTS WILL BE PROVIDED FOR BASE-MOUNTED CABINETS. BEFORE PERFORMING THE WORK, THE CONTRACTOR, THE DISTRICT TRAFFIC ENGINEER AND THE PROJECT ENGINEER WILL PERFORM A SITE INSPECTION TO ESTABLISH THE LOCATION OF THE UPS CABINET AND FOUNDATION.

THE UPS CABINET SHALL INCLUDE A GENERATOR POWER PANEL WITH A HEAVY-DUTY POWER RELAY VERSUS THE LINE VOLTAGE GENERATOR SWITCH. THE GENERATOR INLET SHALL BE A RECESSED PANEL WITH A DOOR THAT IS FLUSH WITH THE EXTERNAL SIDE OF THE UPS CABINET. IT SHALL INCLUDE A RECESSED PLUG, AUTOMATIC TRANSFER SWITCH AND A DOOR THAT SECURELY CLOSES OVER THE POWER CORD.

THE CABINET SHALL HAVE A DOOR STOP MECHANISM AND THERMOSTATICALLY CONTROLLED FAN.

THE CABINET SHALL INCLUDE A BATTERY BALANCING DEVICE THAT REGULATES THE BATTERIES AND OPTIMIZES PERFORMANCE.

AFTER FOUR (4) HOURS OF BATTERY RUNTIME, THE SYSTEM SHALL BE PROGRAMMED TO SWITCH THE INTERSECTION FROM FULL OPERATION TO CONTROLLER AUTOMATIC FLASH OPERATION THROUGH THE MONITOR. THE CONTROLLER SHALL BE PROGRAMMED SO THAT FLASH OPERATION SHALL BEGIN ONCE THE INTERSECTION RUNS MINOR STREET GREEN (TYP. PH. 4 &8), ALL-RED CLEARANCE, AND THEN FLASH OPERATION.

THE UPS OUTPUT NOTIFICATIONS FOR ON BATTERY, BATTERY 2-HOUR TIMER, AND LOW BATTERY SHALL BE WIRED INTO THE TRAFFIC SIGNAL CABINET BACK PANEL OR THROUGH THE CONTROLLER WITH A C11 TO PROVIDE SPECIAL STATUS ALARMS FOR EACH OUTPUT INTO THE SIGNAL CONTROLLER.

THIS ITEM SHALL INCLUDE A RED LED STATUS INDICATOR LAMP TO ALLOW MAINTENANCE PERSONNEL AND LAW ENFORCEMENT TO QUICKLY ASSESS WHETHER A TRAFFIC SIGNAL CABINET IS BEING POWERED BY A UPS. THE LED HOUSING SHALL BE NEMA 4X, IP65 OR IP66, RATED FOR OUTDOOR USE AND BE TAMPER/ SHATTER RESISTANT. IT SHALL BE A DOMED ENCLOSURE CONTAINING A RED LENS WITH LED THAT IS VISIBLE FROM 100 FOOT MINIMUM. THE ENCLOSURE AND LED MODULE SHOULD BE PLACED ON THE SIDE OF THE UPS CABINET FACING TOWARDS THE MAINLINE ROADWAY AND SEALED FROM WATER INTRUSION. IT SHOULD BE WIRED USING MINIMUM 20GA STRANDED, INSULATED HOOKUP WIRE TO THE STATUS RELAY OUTPUTS OF THE UPS. THE WIRES SHALL BE TERMINATED BY LUGS AT THE DISPLAY END AND PERMANENTLY LABELED "BACKUP POWER STATUS DISPLAY," WITH WIRE POLARITY INDICATED. THE RED LED SHALL ONLY ILLUMINATE TO INDICATE THE CABINET IS OPERATING UNDER UPS BACKUP POWER (THE "BACKUP" OPERATING CONDITION).

THIS ITEM INCLUDES PROGRAMMING THE UPS STATUS RELAY OUTPUTS TO PRODUCE THE LAMP STATUS DISPLAYS. THESE STATUS DISPLAYS WILL BE SOLID 100% DUTY CYCLE (NOT FLASHING) DISPLAYS. THE OPERATING VOLTAGE OF THE LED LAMP SHALL BE 120V AC UNLESS OTHERWISE INDICATED.

ITEM 809 STOP LINE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR MATRIX DETECTION UNIT. THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING:

- 1. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
- 2. ALL REQUIRED INPUTS CARDS SHALL BE INCLUDED IN THE TRAFFIC CABINET AND SHALL BE COMPATIBLE WITH CALTRANS, NEMA TS1 AND NEMA TS2 DETECTOR RACKS. THE CARDS SHALL PROVIDE TRUE PRESENCE DETECTOR CALLS OR CONTACT CLOSURE TO THE TRAFFIC CONTROLLER.

3. THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MAST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.

4. SURGE PROTECTION DEVICES, AS RECOMMENDED BY THE MANUFACTURER SHALL BE INCLUDED BOTH AT THE POLE WHERE THE UNIT IS LOCATED TO PROTECT THE UNIT AND IN THE TRAFFIC CABINET TO PROTECT THE CABINET ELECTRONICS.

5. THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ONSITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.

6. A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MINIMUM 7 FEET).

7. THE POWER SUPPLY AND COMMUNICATION MODULES SHALL BE SECURED TO A SINGLE PANEL THAT CAN BE MOUNTED INTERIOR TO THE TRAFFIC CABINET. THE PANEL SHALL INCLUDE MODULAR-PLUG STYLE CONNECTIONS FOR UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD-WIRED TO THE COMMUNICATION MODULES, AS NECESSARY.

8. THE CONTRACTOR SHALL INSTALL THE RADAR DETECTION PRIOR TO MILLING/DISABLING EXISTING LOOPS.

9. THE INSTALLATION SHALL INCLUDE ALL CONTROLLER PROGRAMMING FOR COMPLETE INSTALLATION, WHICH INCLUDES MODIFICATIONS FOR REMOVAL OF EXISTING DETECTION.

PAYMENT FOR ITEM 809 STOP-LINE RADAR DETECTION, AS PER PLAN SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH UNIT. COMPLETE AND IN PLACE INCLUDING ALL REQUIRED CABINET HARDWARE, MOUNTING BRACKETS, CABLES, CONDUIT AND CONNECTIONS TESTED AND ACCEPTED.

ITEM 809 EMERGENCY VEHICLE PREEMPTION

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING PREEMPTION EQUIPMENT IN THE LOCATIONS AND LOCAL CONTROLLERS AS SHOWN IN THE PLANS. THE PREEMPTION SHALL CONFORM TO ODOT SPECIFICATION 809 AND ASSOCIATED SUPPLEMENTAL SPECIFICATIONS AND SHALL UTILIZE COMMUNICATIONS TO IDENTIFY THE PRESENCE OF AN EMERGENCY PRIORITY VEHICLE. IT SHALL CAUSE THE TRAFFIC SIGNAL CONTROLLER TO SELECT A PRE-PROGRAMMED PREEMPTION PLAN THAT WILL DISPLAY AND HOLD THE DESIRED SIGNAL PHASE FOR THE DIRECTION OF THE EMERGENCY VEHICLE.

THE COMMUNICATIONS MEDIUM SHALL EMPLOY SOUND DETECTION TECHNIQUES TO DETERMINE AND LOG THE PRESENCE OF THE EMERGENCY VEHICLE. THE SYSTEM SHALL DETECT THE PRESENCE OF THE VEHICLE THROUGH AN EMITTING DEVICE LOCATED ON THE EMERGENCY VEHICLE. THE SYSTEM SHALL ACTIVATE THE PREEMPTION SEQUENCE BY APPLYING A SIGNAL TO ONE OF THE CONTROLLER'S PREEMPT DISCRETE INPUTS. THE SYSTEM SHALL BE COMPLETELY COMPATIBLE WITH THE CONTROLLER. ALL EQUIPMENT SHALL BE GTT OPTICOM LATEST EDITION.

THE GTT OPTICOM MODEL 700 SERIES EQUIPMENT SHALL BE SHELF OR RACK MOUNTED AND EASILY REMOVABLE AND REPLACEABLE WITHIN THE CABINET. THE EQUIPMENT SHALL BE SUPPLIED COMPLETELY WIRED IN THE CONTROLLER CABINET AND TESTED. THE SYSTEM SHALL BE CAPABLE OF PREEMPTING AND RECEIVING PRIORITY FOR EACH APPROACH TO THE INTERSECTION. IT SHALL BE POSSIBLE TO DETECT THE EMERGENCY VEHICLE AT LEAST 2000 FEET FROM THE INTERSECTION IN AN 80DB-A NOISE ENVIRONMENT.

ALL PREEMPTION PLANS SHOULD BE PROGRAMMED TO PREVENT THE YELLOW TRAP, UNLESS AS DIRECTED BY THE DISTRICT TRAFFIC ENGINEER. YELLOW TRAP PREVENT WILL FORCE THE TRANSITION THROUGH YELLOW CHANGE AND RED CLEARANCE FOR RESOLUTION OF YELLOW TRAP IF ANY PHASE OPPOSING THE PREEMPTION CLEARANCE PHASE(S) IS ACTIVE AND DISPLAYING A GREEN OR FLASHING YELLOW ARROW INDICATION WHEN THE PREEMPTION PLAN IS ACTIVATED AND THE PREEMPTION CLEARANCE PHASE(S) ARE GREEN.

SUPPLY EACH INTERSECTION SHOWN IN THE PLANS WITH THE FOLLOWING COMPONENTS, EACH BID SEPARATELY:

- 1. ITEM 809 PREEMPTION RECEIVING UNIT
- 2. ITEM 809 PREEMPTION DETECTOR CABLE
- 3. ITEM 809 PREEMPTION PHASE SELECTOR
- 4. ITEM 809 PREEMPTION CONFIRMATION LIGHT, LED

THE CONTRACTOR SHALL INVENTORY THE CITY'S EXISTING EMITTERS TO DETERMINE COMPATIBILITY WITH THE PROPOSED SYSTEM. IF EXISTING EMITTERS ARE FOUND TO BE NOT COMPATIBLE, THEN THE CITY SHALL BE SUPPLIED (AT COSTS INCIDENTAL TO THE SYSTEM) WITH THE EMITTERS, TRANSMITTERS, SWITCHES, WIRING, AND ALL REQUIRED VEHICLE EQUIPMENT FOR THE FOLLOWING EMERGENCY VEHICLES. THE CITY SHALL BE RESPONSIBLE FOR INSTALLING VEHICLE EQUIPMENT.

