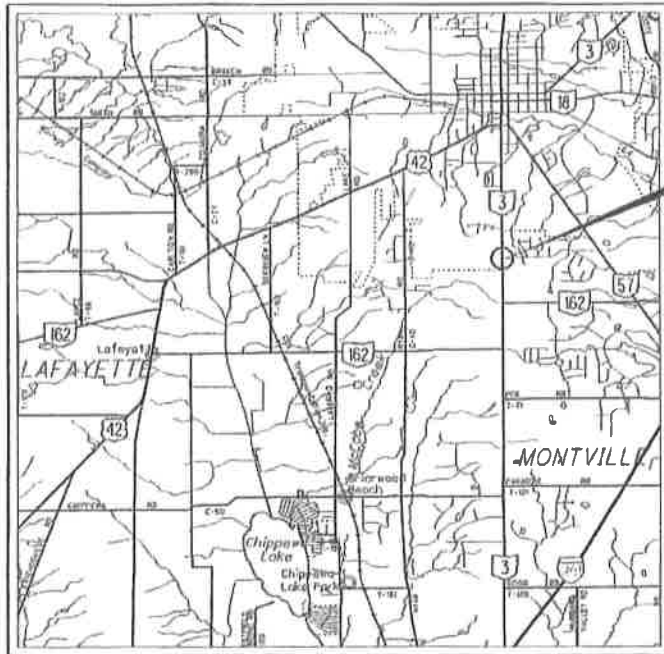




LOCATION MAP

LATITUDE: 41° 06' 50" N LONGITUDE: 81° 51' 50" W

SCALE IN MILES



PORTION TO BE IMPROVED
INTERSTATE & DIVIDED HIGHWAY
UNDIVIDED STATE & FEDERAL ROUTES
OTHER ROADS

DESIGN DESIGNATION

CURRENT ADT (2015) 15,000
DESIGN YEAR ADT (2035) 19,000
DESIGN HOURLY VOLUME (2035) 2,300
DIRECTIONAL DISTRIBUTION 0.53
TRUCKS (24 HOUR B&C) 0.04
DESIGN SPEED 45 MPH
LEGAL SPEED 45 MPH
DESIGN FUNCTIONAL CLASSIFICATION:
URBAN MINOR ARTERIAL
NHS PROJECT NO

DESIGN EXCEPTIONS
NONE

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PLAN PREPARED BY:

RICHLAND ENGINEERING LIMITED

29 NORTH PARK STREET
MANSFIELD OHIO 44902
PHONE: (419) 524-0074 FAX: (419) 524-1812

ENGINEERS SEAL:



SIGNED: *Peter H. Shuman*
DATE: 11-25-14

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

MED-3-9.53

**CITY OF MEDINA
MONTVILLE TOWNSHIP
MEDINA COUNTY**

INDEX OF SHEETS:

TITLE SHEET	1
GENERAL NOTES	2-3
MAINTENANCE OF TRAFFIC	4-5
TRAFFIC SIGNAL NOTES	6-8
GENERAL SUMMARY	9-10
SUBSUMMARIES	11
INTERSECTION DETAILS	12-15
TRAFFIC CONTROL PLAN	16-17
SIGNAL PLAN	18-21
TEMPORARY SIGNAL PLAN	22-23
MISCELLANEOUS SIGNAL DETAILS	24-25
RIGHT OF WAY PLAN	26-30

STANDARD CONSTRUCTION DRAWINGS						SUPPLEMENTAL SPECIFICATIONS	
BP-5.1	7-19-13					800	1-16-15
BP-7.1	7-18-14					809	7-18-14
		TC-12.30	10-18-13			832	1-17-14
		TC-21.20	10-18-13		MT-95.31		
		TC-22.20	1-17-14		MT-95.32		
		TC-41.20	10-18-13		MT-97.10		
		TC-42.20	10-18-13		MT-110.10		
		TC-52.10	10-18-13		MT-120.00		
		TC-52.20	7-18-14				
		TC-65.10	1-17-14				
HL-30.11	1-17-14	TC-65.11	7-18-14				
HL-30.21	1-17-14	TC-71.10	1-17-14				
HL-30.22	1-17-14	TC-81.21	1-17-14				
		TC-83.10	1-17-14				
		TC-83.20	10-18-13				
		TC-85.10	10-18-13				
		TC-85.20	10-18-13				

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO INSTALL A TRAFFIC SIGNAL, CURB RAMPS AND SIDEWALK AT THE INTERSECTION OF STATE ROUTE 3 (WOOSTER PIKE) AND LEXINGTON RIDGE/HIGH POINT.

PROJECT EARTH DISTURBED AREA: N/A - (MAINTENANCE PROJECT)
ESTIMATED CONTRACTOR EARTH DISTURBED AREA: N/A - (MAINTENANCE PROJECT)
NOTICE OF INTENT EARTH DISTURBED AREA: N/A - (MAINTENANCE PROJECT)

2013 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE SET FORTH ON THE PLANS AND ESTIMATES.

APPROVED *Al C. B...*
DATE 1-8-15 DISTRICT DEPUTY DIRECTOR

APPROVED _____
DATE _____ DIRECTOR, DEPARTMENT OF TRANSPORTATION

\\rel6\Current\2013\113029 District Three CFS 2\113029-8\86756\roadway\sheet\86756\GN001.dgn 11/14/2014 8:14:18 AM C:\ugBanghar

POWER SUPPLY FOR TRAFFIC SIGNALS

ELECTRIC POWER SHALL BE OBTAINED FROM THE OHIO EDISON COMPANY AT THE LOCATION INDICATED ON THE PLANS. POWER SUPPLIED SHALL BE 120/240 VOLTS 1Ø.

ITEM 632 – VEHICULAR SIGNAL HEAD. (LED) BLACK. BY TYPE. POLYCARBONATE. WITH BACKPLATE. AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF CMS 632 AND 732, THE FOLLOWING REQUIREMENTS SHALL APPLY:

- 1. ALL UPPER SIGNAL SUPPORT HARDWARE AND PIPING UP TO AND INCLUDING THE WIRE INLET FITTING SHALL BE FERROUS METAL FOR SIGNAL DISPLAYS OF TWO OR MORE SECTIONS.
- 2. THE ENTRANCE FITTING SHALL BE OF THE TRI-STUD DESIGN WITH SERRATED RINGS IN ORDER TO ACHIEVE POSITIVE LOCKING.
- 3. THE SIGNAL HOUSING MATERIAL SHALL BE POLYCARBONATE.
- 4. RIGIDLY ATTACHED TO MAST ARM WITH YELLOW LENS CENTERED ON ARM.

ITEM 632 – POWER SERVICE. AS PER PLAN

POWER SERVICE SHALL BE AS PER CMS ITEM 632 AND SCD TC-83.10 WITH THE FOLLOWING EXCEPTIONS:

- 1. THE METER BASE MOUNTING HEIGHT SHALL BE NO MORE THAN 5 FEET HIGH TO THE CENTER OF THE METER BASE FROM THE GROUND.
- 2. THE CONTRACTOR SHALL SUPPLY THE NECESSARY METER BASES.
- 3. ALL POWER SERVICES SHALL BE METERED. THE METER SHALL HAVE A LEVER OPERATED BYPASS.

DISCONNECT SWITCH ENCLOSURES FURNISHED IN ACCORDANCE WITH CMS ITEM 632, POWER SERVICE, AS PER PLAN, SHALL INCLUDE A PADLOCK EQUAL TO MASTER NO. 4BKA OR WILSON BOHANNON 660, WITH LOCK BODY AND SHACKLE OF BRONZE OR BRASS AND KEYING SHALL BE TO THE STATE MASTER.

THE CONTRACTOR SHALL CONTACT JOE BOYLE, (440) 326-3204, AT THE METER SECTION OF THE POWER COMPANY FOR INFORMATION REGARDING THE METER BASE INSTALLATION PRIOR TO ORDERING POLES. THE CONTRACTOR WILL BE RESPONSIBLE FOR REQUESTING AND SCHEDULING ANY INSPECTIONS THE POWER COMPANY MAY REQUIRE FOR THE POWER SERVICE HOOK UP. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT THE POWER COMPANY FOR THE ELECTRICAL SERVICE CONNECTION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR SPLICE POWER CABLE INTO THE POWER COMPANY'S CIRCUITS. THE VOLTAGE SUPPLIED SHALL BE NOMINALLY 120 VOLTS. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS AND THE PAYING OF ALL FEES. THE CONTRACTOR SHALL PAY ALL POWER CHARGES UNTIL THE SIGNAL IS ACCEPTED BY THE MAINTAINING AGENCY.

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 90 DAYS FOLLOWING COMPLETION OF THE 10-DAY PERFORMANCE TEST. IN THE EVENT OF UNSATISFACTORY OPERATION THE CONTRACTOR SHALL CORRECT FAULTY INSTALLATIONS, MAKE REPAIRS AND REPLACE DEFECTIVE PARTS WITH NEW PARTS OF EQUAL OR BETTER QUALITY. EQUIPMENT, MATERIAL AND LABOR COSTS INCURRED IN CORRECTING AN UNSATISFACTORY OPERATION SHALL BE BORNE BY THE CONTRACTOR.

THE GUARANTEE SHALL COVER THE FOLLOWING ITEMS OF THE TRAFFIC CONTROL SYSTEM: CONTROLLERS AND ASSOCIATED EQUIPMENT, DETECTOR UNITS, INTERCONNECTION ITEMS AND MASTER CONTROL EQUIPMENT.

CUSTOMARY MANUFACTURER'S GUARANTEES FOR THE FOREGOING ITEMS SHALL BE TURNED OVER TO THE STATE OR THE MAINTAINING AGENCY FOLLOWING ACCEPTANCE OF THE EQUIPMENT.

THE COST OF GUARANTEEING THE TRAFFIC CONTROL SYSTEM WILL BE INCIDENTAL TO AND INCLUDED IN THE CONTRACT UNIT PRICE OF THE VARIOUS ITEMS MAKING UP THE SYSTEM.

ITEM 633 – UNINTERRUPTIBLE POWER SUPPLY. AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF CMS 633 AND 733, THE CONTRACTOR SHALL FURNISH, INSTALL AND TEST UNINTERRUPTIBLE POWER SUPPLY (UPS) STATUS INDICATOR LAMPS THAT ALLOW MAINTENANCE PERSONNEL AND LAW ENFORCEMENT TO QUICKLY ASSESS WHETHER A TRAFFIC SIGNAL CABINET IS BEING POWERED BY A UPS. A 1-INCH WATERPROOF NEMA 4X OR IP66 LAMP WITH A DOMED RED LENS SHALL BE USED TO INDICATE THE CABINET IS OPERATING UNDER UPS BACKUP POWER (THE "BACKUP" OPERATING CONDITION). THIS LAMP SHALL 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 "BACK-UP POWER STATUS DISPLAY", WITH WIRE POLARITY INDICATED. THIS ITEM INCLUDES PROGRAMMING THE UPS STATUS RELAY OUTPUTS TO PRODUCE THE LAMP STATUS DISPLAYS. THE STATUS DISPLAY SHALL BE SOLID 100% DUTY CYCLE (NOT FLASHING). THE LAMP SHALL BE PLACED IN THE UPS CABINET WALL (NOT THE ROOF) IN SUCH A MANNER AS TO BE SEALED FROM WATER INTRUSION AND VISIBLE FROM A VEHICLE AT THE STOP LINE IN THE CLOSEST LANE OF AT LEAST ONE APPROACH TO THE SIGNALIZED INTERSECTION. THE OPERATING VOLTAGE OF THE LED LAMP SHALL BE 120V AC.

IN ADDITION, THIS ITEM SHALL ALSO INCLUDE THE COST TO FURNISH AND INSTALL A GENERATOR HOOK UP AS SHOWN ON SHEET 24.

THIS ITEM SHALL INCLUDE ALL COSTS TO CONSTRUCT THIS ITEM AS DESCRIBED ABOVE INCLUDING ALL LABOR, EQUIPMENT, MATERIAL AND INCIDENTALS NECESSARY IN THE CONTRACT ITEM BID FOR ITEM 633 UNINTERRUPTIBLE POWER SUPPLY, AS PER PLAN.

ITEM 633 – CABINET FOUNDATION. AS PER PLAN
ITEM 633 – CABINET RISER. AS PER PLAN
ITEM 633 – CONTROLLER WORK PAD. AS PER PLAN

THESE ITEMS SHALL CONFORM WITH CMS 633 AND 733 WITH THE EXCEPTION THAT THEY SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS NECESSARY TO INCORPORATE AN ADJACENT UPS CABINET AS PER ODOT'S PLAN INSERT SHEET 208320 INCLUDED ON SHEET 25 OF THESE PLANS.

GROUNDING AND BONDING

THE REQUIREMENTS OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS (CMS) AND THE TC SERIES OF STANDARD CONSTRUCTION DRAWINGS ARE MODIFIED AS FOLLOWS:

- 1. ALL METALLIC PARTS CONTAINING ELECTRICAL CONDUCTORS SHALL BE PERMANENTLY JOINED TO FORM AN EFFECTIVE GROUND FAULT CURRENT PATH BACK TO THE GROUNDED CONDUCTOR IN THE POWER SERVICE DISCONNECT SWITCH.
 - A. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR IN METALLIC CONDUITS (725.04) IN ADDITION TO THE CONDUCTORS SPECIFIED AND BOND THE CONDUIT TO THIS GROUNDING CONDUCTOR.
 - B. WHEN AN EQUIPMENT GROUNDING CONDUCTOR IS REQUIRED IN PLASTIC CONDUIT (725.05), THE INSTALLATION SHALL INCLUDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN ADDITION TO THE CONDUCTORS SPECIFIED.
 - C. METALLIC CONDUIT CARRYING THE LOOP WIRES FROM IN THE PAVEMENT TO THE PULL BOX SPLICE LOCATION WILL ONLY BE BONDED AT THE PULL BOX END, AND WILL NOT CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR.
 - D. IF MULTIPLE CONDUIT RUNS BEGIN AND END AT THE SAME POINTS, ONLY ONE EQUIPMENT GROUNDING CONDUCTOR IS REQUIRED.
 - E. IF AN EQUIPMENT GROUNDING CONDUCTOR IS NEEDED IN CONDUIT BETWEEN SIGNALIZED INTERSECTIONS FOR UNDERGROUND INTERCONNECT CABLE, THE GROUNDING SYSTEM FOR EACH SIGNALIZED INTERSECTION WILL BE SEPARATED ABOUT MIDWAY BETWEEN THE INTERSECTIONS.
 - F. THE MESSENGER WIRE AT SIGNALIZED INTERSECTIONS WILL BE USED AS THE CONDUCTIVE PATH FROM CORNER TO CORNER IF CONDUIT IS NOT PROVIDED UNDER THE ROADWAY. WHEN CONDUIT CONNECTS THE CORNERS OF AN INTERSECTION, AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE USED IN THE CONDUIT.
- 2. CONDUITS.
 - A. THE 725.04 CONDUIT SHALL HAVE GROUNDING BUSHINGS INSTALLED AT ALL TERMINATION POINTS. THE BUSHING MATERIAL SHALL BE COMPATIBLE WITH GALVANIZED STEEL CONDUIT AND THE GROUNDING LUG MATERIAL SHALL BE COMPATIBLE FOR USE WITH COPPER WIRE. THREADED OR COMPRESSION TYPE BUSHINGS MAY BE USED.
 - B. THE 725.05 CONDUIT SHALL HAVE THE INSIDE AND OUTSIDE DIAMETERS OF THE CONDUIT DEBURRED AT ALL TERMINATION POINTS.
 - C. BOTH ENDS OF METALLIC CONDUIT SHALL BE BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.
 - D. METALLIC CONDUIT MAY BE BONDED TO METALLIC BOXES THROUGH THE USE OF CONDUIT FITTINGS UL APPROVED FOR THIS TYPE OF CONNECTION, WITH THE BOX BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.
- 3. WIRE FOR GROUNDING AND BONDING.
 - A. USE INSULATED, COPPER WIRE FOR THE EQUIPMENT GROUNDING CONDUCTOR. BONDING JUMPERS IN BOXES AND ENCLOSURES MAY BE BARE OR INSULATED COPPER WIRE. WIRE SIZE SHALL BE AS FOLLOWS:
 - I. USE 4 AWG BETWEEN THE POWER SERVICE AND SUPPORTS, POLES, PEDESTALS, CONTROLLER OR FLASHER CABINETS.
 - II. USE A MINIMUM 8 AWG BETWEEN LOOP DETECTOR PULL BOXES AND THE FIRST CONDUIT THAT REQUIRES A LARGER SIZE AS SPECIFIED IN 3.A.I ABOVE.
 - III. USE A MINIMUM 8 AWG BETWEEN THE "PREPARE TO STOP WHEN FLASHING" INSTALLATION (INCLUDING SUPPORT) AND THE FIRST CONDUIT THAT REQUIRES A LARGER SIZE AS SPECIFIED IN 3.A.I ABOVE.
 - IV. THE INSULATION SHALL BE GREEN OR GREEN WITH YELLOW STRIPE(S). FOR 4 AWG OR LARGER, INSULATION MAY ALSO BE BLACK WITH GREEN TAPE/LABELS INSTALLED AT ALL ACCESS POINTS.
 - B. IN A HIGHWAY LIGHTING SYSTEM, THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE THE SAME WIRE SIZE AS THE DUCT CABLE OR DISTRIBUTION CABLE CIRCUIT CONDUCTORS, WITH THE MINIMUM CONDUCTOR SIZE OF 4 AWG. BONDING JUMPERS WILL BE MINIMUM SIZE 4 AWG.
- 4. GROUND ROD.
 - A. A 3/4 INCH SCHEDULE 40 PVC CONDUIT WILL BE USED IN FOUNDATIONS AND CONCRETE WALLS FOR THE GROUNDING CONDUCTOR (GROUND WIRE) RACEWAY TO THE GROUND ROD. SHOULD METALLIC CONDUIT BE USED, BOTH ENDS OF THE CONDUIT SHALL BE BONDED TO THE GROUNDING CONDUCTOR.
 - B. THE TYPICAL GROUNDING CONDUCTOR (GROUND WIRE) SHALL BE 4 AWG INSULATED, COPPER.
- 5. THE GREEN CONDUCTOR IN SIGNAL CABLES (CONDUCTOR #4) SHALL NOT BE USED TO SUPPLY POWER TO A SIGNAL INDICATION. IT WILL BE CONNECTED TO THE SIGNAL BODY AS AN EQUIPMENT GROUND IN ALUMINUM HEADS AND IT WILL BE UNUSED IN PLASTIC HEADS. UNUSED CONDUCTORS SHALL BE GROUNDED IN THE CABINET. TYPICAL USE OF CONDUCTORS IS AS FOLLOWS:

COND. NO.	COLOR	VEHICLE SIGNAL	PEDESTRIAN SIGNAL
1	BLACK	GREEN BALL	#1 WALK
2	WHITE	AC NEUTRAL	AC NEUTRAL
3	RED	RED BALL	#1 DW/FDW
4	GREEN	EQUIPMENT GROUND	EQUIPMENT GROUND
5	ORANGE	YELLOW BALL	#2 DW/FDW
6	BLUE	GREEN ARROW	#2 WALK
7	WHITE/BLACK STRIPE	YELLOW ARROW	NOT USED

- 6. POWER SERVICE AND DISCONNECT SWITCH.
 - A. AT THE POWER SERVICE LOCATION, THE GROUNDING CONDUCTOR (GROUND WIRE) FROM THE DISCONNECT SWITCH NEUTRAL (AC-) BAR TO THE GROUND ROD SHALL BE A CONTINUOUS, UNSPLICED CONDUCTOR. IF SPLICED, IT SHALL BE AN EXOTHERMIC WELD BUTT SPLICE.
 - B. THE SERVICE NEUTRAL (AC-) SHALL ONLY BE CONNECTED TO GROUND AT THE PRIMARY POWER SERVICE DISCONNECT SWITCH.
 - I. NEMA CONTROLLER CABINETS: IF A POWER SERVICE DISCONNECT SWITCH IS LOCATED BEFORE THE CONTROLLER CABINET, THE NEUTRAL (AC-) AND THE GROUNDING BARS IN THE CONTROLLER CABINET SHALL NOT BE CONNECTED TOGETHER AS SHOWN IN NEMA TS-2, FIGURE 5-4.
 - II. IF SECONDARY DISCONNECT SWITCHES ARE CONNECTED AFTER THE PRIMARY DISCONNECT SWITCH, THE NEUTRAL (AC-) SHALL ONLY BE GROUNDED AT THE PRIMARY SWITCH. EQUIPMENT GROUNDING CONDUCTORS SHALL BE BROUGHT TO THE PRIMARY SWITCH, BUT SHALL BE GROUNDED AT BOTH SECONDARY AND PRIMARY SWITCHES.
- 7. PAYMENT – ALL MATERIALS AND WORK REQUIRED TO COMPLETE THE EFFECTIVE GROUND FAULT CURRENT PATH SYSTEM ARE INCIDENTAL TO THE CONDUCTORS INSTALLED BY CONTRACT.

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ITEM 809 – ADVANCE DETECTION (WAVETRONIX), AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING EQUIPMENT SALVAGED FROM THE TEMPORARY SIGNAL TO BE REMOVED WITH THIS PROJECT. THE CONTRACTOR SHALL CONFIRM THAT THE EXISTING EQUIPMENT IS AN ADVANCE/ DILEMMA ZONE DETECTION MANUFACTURED BY WAVETRONIX UNIT CAPABLE OF INTERSECTION ADVANCE DETECTION CONTROL UTILIZING ABOVE GROUND DIGITAL WAVE RADAR TECHNIQUES. THE UNIT SHALL BE NON-INTRUSIVE AND SHALL DETECT VEHICLES FROM 50 FEET UP TO 600 FEET FROM THE UNIT. THE UNIT SHALL PROVIDE UP TO 8 DETECTION ZONES SIMULTANEOUSLY FOR INTERSECTION CONTROL. ONE UNIT SHALL BE PROVIDED PER APPROACH, WHERE SPECIFIED IN THE PLANS, COVERING MULTIPLE LANES WHERE ADVANCE DETECTION IS REQUIRED. THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING LIST OF FEATURES AND CAPABILITIES:

1. THE UNIT SHALL PROVIDE ACCURATE PRESENCE-DETECTION OF BOTH STOPPED AND MOVING VEHICLES. THE UNIT SHALL BE MOUNTED IN A FORWARD-FIRE, LOOKING AT EITHER APPROACHING OR DEPARTING TRAFFIC AND SHALL ONLY DETECT VEHICLES IN ONE DIRECTION OF TRAVEL.
2. THE UNIT SHALL BE TESTED TO MEET NEMA TS2 ENVIRONMENTAL STANDARDS AND MAINTAIN ACCURATE PERFORMANCE IN THE FOLLOWING OPERATING CONDITIONS:
 - A. RAIN UP TO 4 INCHES PER HOUR
 - B. FREEZING RAIN
 - C. SNOW
 - D. WIND
 - E. DUST
 - F. FOG
 - G. CHANGING TEMPERATURE
 - H. CHANGING LIGHTING
3. THE RADAR DESIGN FOR EACH UNIT SHALL CONFORM TO THE FOLLOWING:
 - A. OPERATING FREQUENCY: 10.5-10.55 GHZ (X-BAND)
 - B. MATRIX OF A MINIMUM OF 16 RADARS
 - C. NO MANUAL TUNING TO CIRCUITRY
 - D. TRANSMITS MODULATED SIGNALS GENERATED DIGITALLY
 - E. NO TEMPERATURE-BASED COMPENSATION NECESSARY
 - F. BANDWIDTH STABLE WITHIN 1%
 - G. PRINTED CIRCUIT BOARD ANTENNAS
 - H. ANTENNA VERTICAL 6 DB BEAM WIDTH (TWO-WAY PATTERN): 80 DEGREES
 - I. ANTENNA HORIZONTAL 6 DB BEAM WIDTH (TWO-WAY PATTERN): 10.5 DEGREES
 - J. ANTENNA TWO-WAY SIDELOBES: -40 DB
 - K. TRANSMIT BANDWIDTH: 45 MHZ
 - L. UN-WINDOWED RESOLUTION: 11 FEET
 - M. RF CHANNELS: 4
4. THE UNIT SHALL INCLUDE A SIMPLE SETUP ROUTINE THAT SHALL AUTOMATICALLY CONFIGURE AND CALIBRATE THE UNIT FOR PROPER OPERATION DURING INSTALLATION. THE UNIT SHALL ALSO BE CAPABLE OF BEING PROGRAMMED AND UPDATED FROM A LAPTOP COMPUTER OR OTHER PORTABLE PROGRAMMING DEVICE, SUCH AS A POCKET PC, VIA A LOCAL OR REMOTE ETHERNET CONNECTION USING VENDOR SUPPLIED SOFTWARE. THE SOFTWARE SHALL SUPPORT TCP/IP CONNECTIVITY, UNIT CONFIGURATION BACK-UP AND RESTORE, AND VIRTUAL SENSOR CONNECTIONS. THE GRAPHICAL USER INTERFACE SHALL OPERATE ON A WINDOWS PLATFORM.
5. THE UNIT SHALL HAVE ONE FULL-DUPLEX RS2-232 AND ONE HALF-DUPLEX RS-485 COMMUNICATION PORTS AND SHALL HAVE THE ABILITY TO UPGRADE FIRMWARE OVER ANY COMMUNICATION PORT.
6. THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MOST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.
7. 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.
8. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET. THE UNIT SHALL CONSUME LESS THAN 10 WATTS AND OPERATE FROM A DC INPUT BETWEEN 9 VDC AND 28 VDC. COMPLETE AND AUTOMATIC RECOVERY FROM A POWER FAILURE SHALL BE WITHIN 15 SECONDS AFTER RESUMPTION OF NORMAL POWER.
9. 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.
10. THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ON SITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.
11. THE UNIT SHALL COME WITH A 2-YEAR MANUFACTURER SUPPLIED WARRANTY.

PAYMENT FOR ITEM 809 – ADVANCE DETECTION (WAVETRONIX), 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, CONNECTIONS TESTED AND ACCEPTED, AND ANY OTHER NECESSARY HARDWARE TO ESTABLISH A FULLY FUNCTIONAL DETECTION SYSTEM UTILIZING THE EQUIPMENT SALVAGED FROM THE TEMPORARY SIGNAL.

ITEM 809 – STOP BAR DETECTION (WAVETRONIX)

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A STOP BAR DETECTION MANUFACTURED BY WAVETRONIX UNIT CAPABLE OF INTER-SECTION DETECTION CONTROL UTILIZING ABOVE GROUND DIGITAL WAVE RADAR TECHNIQUES. THE UNIT SHALL BE NON-INTRUSIVE AND SHALL DETECT VEHICLES FROM 6 FEET UP TO 140 FEET FOR A 90 DEGREE FIELD OF VIEW FROM THE UNIT. THE UNIT SHALL PROVIDE REAL-TIME PRESENCE DATA FOR AT LEAST 10 LANES. THE UNIT SHALL PROVIDE AT LEAST 16 DETECTION ZONES SIMULTANEOUSLY FOR INTER-SECTION CONTROL. ONE UNIT SHALL BE PROVIDED PER APPROACH, WHERE SPECIFIED IN THE PLANS, COVERING MULTIPLE LANES WHERE STOP BAR DETECTION IS REQUIRED. THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING LIST OF FEATURES AND CAPABILITIES:

1. THE UNIT SHALL PROVIDE ACCURATE PRESENCE-DETECTION OF MOVING VEHICLES. THE UNIT SHALL BE MOUNTED IN A FORWARD-FIRE OR SIDE-FIRE POSITION, LOOKING AT EITHER APPROACHING OR DEPARTING TRAFFIC AND SHALL ONLY DETECT VEHICLES IN ONE DIRECTION OF TRAVEL.
2. THE UNIT SHALL BE TESTED TO MEET NEMA TS2 ENVIRONMENTAL STANDARDS AND MAINTAIN ACCURATE PERFORMANCE IN THE FOLLOWING OPERATING CONDITIONS:
 - A. RAIN UP TO 1 INCHES PER HOUR
 - B. FREEZING RAIN
 - C. SNOW
 - D. WIND
 - E. DUST
 - F. FOG
 - G. CHANGING TEMPERATURE
 - H. CHANGING LIGHTING
3. THE RADAR DESIGN FOR EACH UNIT SHALL CONFORM TO THE FOLLOWING:
 - A. OPERATING FREQUENCY: 24.0-24.25 GHZ (K-BAND)
 - B. MATRIX OF 16 RADARS
 - C. NO MANUAL TUNING TO CIRCUITRY
 - D. TRANSMITS MODULATED SIGNALS GENERATED DIGITALLY
 - E. NO TEMPERATURE-BASED COMPENSATION NECESSARY
 - F. BANDWIDTH STABLE WITHIN 1%
 - G. PRINTED CIRCUIT BOARD ANTENNAS
 - H. ANTENNA VERTICAL 6 DB BEAM WIDTH (TWO-WAY PATTERN): 65 DEGREES
 - I. HORIZONTAL FIELD OF VIEW: 90 DEGREES
 - J. ANTENNA TWO-WAY SIDELOBES: -40 DB
 - K. TRANSMIT BANDWIDTH: 245 MHZ
 - L. UN-WINDOWED RESOLUTION: 2 FEET
 - M. RF CHANNELS: 8
 - N. SELF-TEST FOR VERIFYING HARDWARE FUNCTIONALITY
 - O. DIAGNOSTICS MODE FOR VERIFYING SYSTEM FUNCTIONALITY
4. THE UNIT SHALL INCLUDE A SIMPLE SETUP ROUTINE THAT SHALL AUTOMATICALLY CONFIGURE AND CALIBRATE THE UNIT FOR PROPER OPERATION DURING INSTALLATION. THE UNIT SHALL ALSO BE CAPABLE OF BEING PROGRAMMED AND UPDATED FROM A LAPTOP COMPUTER OR OTHER PORTABLE PROGRAMMING DEVICE, SUCH AS A POCKET PC, VIA A LOCAL OR REMOTE ETHERNET CONNECTION USING VENDOR SUPPLIED SOFTWARE. THE SOFTWARE SHALL SUPPORT TCP/IP CONNECTIVITY, UNIT CONFIGURATION BACK-UP AND RESTORE, AND REAL-TIME TRAFFIC VISUALIZATION FOR PERFORMANCE VERIFICATION AND TRAFFIC DISPLAY. THE GRAPHICAL USER INTERFACE SHALL OPERATE ON A WINDOWS PLATFORM.
5. THE UNIT SHALL HAVE TWO HALF-DUPLEX RS-485 COMMUNICATION PORTS AND SHALL HAVE THE ABILITY TO UPGRADE FIRMWARE OVER ANY COMMUNICATION PORT.
6. 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.
7. 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.
8. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET. THE UNIT SHALL CONSUME LESS THAN 10 WATTS AND OPERATE FROM A DC INPUT BETWEEN 9 VDC AND 28 VDC. COMPLETE AND AUTOMATIC RECOVERY FROM A POWER FAILURE SHALL BE WITHIN 15 SECONDS AFTER RESUMPTION OF NORMAL POWER.
9. 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.
10. THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ON SITE TRAINING ON THE SETUP, OPERATION, AND MAINTENANCE OF THE UNIT.
11. THE UNIT SHALL COME WITH A 2-YEAR MANUFACTURER SUPPLIED WARRANTY.

PAYMENT FOR ITEM 809 – STOP BAR DETECTION (WAVETRONIX) 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 – STOP BAR DETECTION (WAVETRONIX), AS PER PLAN

THIS ITEM SHALL CONFORM TO SUPPLEMENTAL SPECIFICATION 809 AND THE NOTES IN THIS PLAN SET WITH THE EXCEPTION THAT THE EQUIPMENT SHALL BE SALVAGED FROM THE TEMPORARY SIGNAL TO BE REMOVED WITH THIS PROJECT. THE CONTRACTOR SHALL CONFIRM THAT THE SALVAGED EQUIPMENT CONFORMS TO THE REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 809 AND THE NOTES IN THIS PLAN SET.

PAYMENT FOR ITEM 809 – STOP BAR DETECTION (WAVETRONIX), 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, CONNECTIONS TESTED AND ACCEPTED, AND ANY OTHER NECESSARY HARDWARE TO ESTABLISH A FULLY FUNCTIONAL DETECTION SYSTEM UTILIZING THE EQUIPMENT SALVAGED FROM THE TEMPORARY SIGNAL.

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ITEM 632 - SIGNAL SUPPORT FOUNDATION, AS PER PLAN

THIS PROJECT REQUIRES CONSTRUCTION OF MAST ARM SIGNAL SUPPORTS AND MAST ARM FOUNDATIONS IN LOCATIONS WHICH CONTAIN EXISTING UNDERGROUND AND OVERHEAD UTILITIES. ORDERS FOR SIGNAL SUPPORTS SHALL BE PLACED SYSTEMATICALLY AFTER THEIR RESPECTIVE FOUNDATIONS HAVE BEEN CONSTRUCTED UNLESS WRITTEN PERMISSION HAS BEEN GIVEN BY THE ENGINEER TO ORDER SUPPORTS AT AN EARLIER DATE. FOUNDATIONS THAT HAVE BEEN CONSTRUCTED SHALL BE PROTECTED AS PER SECTION 107.07 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS.

WITHIN TWO (2) WEEKS OF RECEIVING A SIGNED CONTRACT, THE CONTRACTOR SHALL LAYOUT THE PERIMETER OF EACH FOUNDATION THEN CONTACT OUPS (1-800-362-2764), OGPUPS (1-800-925-0988). A MEETING BETWEEN THE CONTRACTOR, ENGINEER AND A REPRESENTATIVE FROM THE MAINTAINING AGENCY WILL BE HELD ON SITE NO LATER THAN TWO (2) WEEKS AFTER THE OUPS NOTIFICATION. BASED UPON THE PRIORITIES DETERMINED AT THIS MEETING, THE CONTRACTOR WILL CONSTRUCT FOUNDATIONS BEGINNING WITH THE HIGHEST PRIORITY FIRST.

IF A UTILITY OR OTHER CONFLICT EXISTS (UNDERGROUND OR OVERHEAD) WHICH REQUIRES THAT A MAST ARM SUPPORT BE CONSTRUCTED AT A LOCATION OTHER THAN WHAT IS INDICATED IN THE PLAN, THE MAINTAINING AGENCY AND THE ENGINEER SHALL DETERMINE WHETHER THE SPECIFIED MAST ARM SUPPORT SIZE IS APPROPRIATE. IF A LARGER MAST ARM SUPPORT IS REQUIRED, WITHIN TEN (10) WORKING DAYS, THE MAINTAINING AGENCY WILL PROVIDE THE CONTRACTOR WITH REVISED SUPPORT DATA. THE CONTRACTOR SHALL NOT ORDER THE SUPPORTS PRIOR TO RECEIVING THIS DATA. SUPPORT FOUNDATION LOCATIONS SHALL BE ADJUSTED ONLY WHEN APPROVED BY THE ENGINEER. IF THE MAST ARM SUPPORT DESIGN IS MODIFIED DUE TO REVISED FOUNDATION LOCATION THE REVISED MAST ARM DESIGN WILL BE PAID FOR IN THE FINAL CHANGE ORDER TO THE PROJECT.

THE CONTRACTOR IS ADVISED TO LOCATE AND CONSTRUCT THE MAST ARM FOUNDATIONS AS SOON AS POSSIBLE IN ORDER TO PROVIDE AMPLE LEAD TIME TO ORDER THE MAST ARMS. ALL FOUNDATIONS SHALL BE EXCAVATED WITH EXTREME CAUTION AS APPROVED BY THE ENGINEER. NO TIME EXTENSIONS SHALL BE GRANTED FOR DELAYS WHICH ARE CAUSED BY THE CONTRACTOR'S FAILURE TO PLAN FOUNDATION WORK AS SOON AS POSSIBLE IN THE CONTRACTOR'S PROGRESS SCHEDULE.

THIS ITEM SHALL INCLUDE FURNISHING AND INSTALLING AN ADDITIONAL 3" CONDUIT ELL IN THE FOUNDATION AND CAPPING IT FOR FUTURE USE. LOCATIONS AND ORIENTATIONS OF ADDITIONAL CONDUITS WILL BE AS SPECIFIED IN THE PLANS.

PAYMENT FOR ITEM 632 - SIGNAL SUPPORT FOUNDATION, AS PER PLAN SHALL BE MADE AT THE UNIT CONTRACT PRICE BID PER EACH. PAYMENT SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIAL, TOOLS, EQUIPMENT, AND OTHER INCIDENTALS NECESSARY TO EXCAVATE AND BUILD THE FOUNDATION SYSTEM, COMPLETE IN PLACE AND ACCEPTED.

ITEM 632 - SIGNAL SUPPORT, MECHANICAL DAMPER FOR TC-81.21 MAST ARM (GREATER THAN 59' IN LENGTH), AS PER PLAN

THIS ITEM SHALL CONSIST OF THE CONTRACTOR INSTALLING A TUNED MECHANICAL STOCKBRIDGE OR MASS-SPRING TYPE DAMPER ON A TC-81.21 MAST ARM SIGNAL SUPPORT TO REDUCE THE POSSIBILITY OF HARMONIC VIBRATIONS CAUSED BY WIND LOADS. A MECHANICAL DAMPER SHALL BE APPLIED TO ALL MAST ARMS OVER 59 FEET IN LENGTH. THE INSTALLED DAMPER SHALL BE CAPABLE OF REDUCING THE LOADED MAXIMUM VERTICAL MOVEMENT AT THE TIP OF THE ARM TO 8 INCHES MEASURED FROM THE HIGHEST TO THE LOWEST POINT OF DEFLECTION AT WIND SPEEDS OF 5-20 MPH.

ALL ATTACHMENT HARDWARE CONNECTIONS SHALL BE STAINLESS STEEL. STOCKBRIDGE-TYPE DAMPERS SHALL HAVE A STAINLESS STEEL SAFETY CHAIN ANCHORED TO THE MAST ARM TO PREVENT WEIGHTS FROM FALLING SHOULD THEY BECOME SEPARATED FROM THE REST OF THE ASSEMBLY. THE DAMPER SHALL BE ATTACHED TO THE ARM WITHIN 8 FEET OF MAST ARM TIP. INSTALLATION SHALL BE PER THE MANUFACTURER'S GUIDELINES. STATIC DAMPERS SUCH AS HORIZONTAL FLAT SIGN MOUNTINGS SHALL NOT BE USED. ACCEPTABLE DEVICES INCLUDE THE FOLLOWING OR APPROVED EQUAL:

1. UNION METAL ALCOA DAMPER DEVICE - DWG. NO. 2G-1817-C1
2. VALMONT STRUCTURES ALCOA DEVICE - DWG. NO. OH104242P1
3. FLORIDA DOT SPRING-MASS DAMPER - DRAWING INDEX NO. 17749

PAYMENT FOR ITEM 632 - SIGNAL SUPPORT, MECHANICAL DAMPER FOR TC-81.21 MAST ARM (GREATER THAN 59' IN LENGTH), AS PER PLAN SHALL BE MADE AT THE CONTRACT UNIT PRICE PER EACH COMPLETE AND IN PLACE, AND SHALL INCLUDE ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO COMPLETE THE WORK.

ITEM 633 - CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TSI, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF CMS 633 AND 733, THE CONTRACTOR SHALL FURNISH AN ASC/3 TS2 CONTROLLER AS MANUFACTURED BY ECONOLITE ITS AND SHALL INCORPORATE OR BE FURNISHED WITH ALL THE DESIGN FEATURES, AUXILIARY EQUIPMENT, ACCESSORIES, AND PREWIRED CABINET FEATURES AS REQUIRED IN THE STANDARD BID ITEM.

AN ASC/3 TS2 CONTROLLER AS MANUFACTURED BY ECONOLITE ITS AND SHALL INCORPORATE OR BE FURNISHED WITH ALL THE DESIGN FEATURES, AUXILIARY EQUIPMENT, ACCESSORIES, AND PREWIRED CABINET FEATURES AS REQUIRED IN THE STANDARD BID ITEM.

THE CONTROLLER CABINET SHALL BE LARGE ENOUGH AND THE CONTROLLER AND CONFLICT MONITOR SHALL BE CAPABLE OF ACCOMMODATING THE INSTALLATION OF THE FOLLOWING FUTURE EQUIPMENT UPGRADES.

1. PREEMPTION
2. INTERCONNECT EQUIPMENT

PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TSI, AS PER PLAN, IN PLACE, ALL CONNECTIONS MADE AND WIRING COMPLETED, TESTED AND ACCEPTED.

ITEM 625 CONDUIT, JACKED OR DRILLED, 725.04, 2", AS PER PLAN

THIS ITEM SHALL CONFORM TO CMS 625.14 WITH THE EXCEPTION THAT THE CONTRACTOR MAY CHOOSE TO INSTALL THIS CONDUIT UTILIZING AN OPEN TRENCH AND TRENCH IN PAVED AREA AS PER CMS 625.13 AND 625.22 AS APPROVED BY THE ENGINEER AT NO ADDITIONAL COST TO THE PROJECT. IF THE CONTRACTOR CHOOSES TO OPEN CUT THE COST FOR THIS ITEM SHALL INCLUDE THE COST OF THE 2" CONDUIT, 75.04; TRENCH; CURB RAMP REMOVAL; CURB RAMP REPLACEMENT; AND PLASTIC CAUTION TAPE. THE CURB RAMP SHALL BE REMOVED AND REPLACED TO AN EXISTING JOINT LINE AND RECONSTRUCTED AS PER BP-7.1.

ITEM 632 - REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN

TRAFFIC SIGNAL INSTALLATIONS, INCLUDING SIGNAL HEADS, CABLE, MESSENGER WIRE, WOOD POLES, CABINET, CONTROLLER, ETC., SHALL BE REMOVED IN ACCORDANCE WITH CMS 632.26 AND AS INDICATED ON THE PLANS. REMOVED ITEMS SHALL BE REUSED AS PART OF A NEW INSTALLATION ON THE PROJECT OR STORED ON THE PROJECT FOR SALVAGE BY ODOT DISTRICT 3 IN ACCORDANCE WITH THE LISTING GIVEN HEREIN.

- ITEMS TO BE STORED:
1. SPAN WIRE
 2. SIGNAL HEADS
 3. CONTROLLER
 4. SIGNAL CABLE
 5. GUY WIRES
 6. CONDUIT RISERS

- ITEMS TO BE REUSED:
1. RADAR DETECTION UNITS

- ITEMS TO BE DISPOSED OF:
1. WOOD POLES

IN THE EVENT THE ITEMS STORED ON THE PROJECT FOR SALVAGE BY THE LOCAL AGENCY ARE NOT REMOVED, THE CONTRACTOR SHALL, WHEN DIRECTED BY THE ENGINEER IN WRITING, REMOVE AND DISPOSE OF THE ITEMS AT NO ADDITIONAL COST TO THE PROJECT.

ITEM 625 - PULL BOX, 725.08, (BY SIZE), AS PER PLAN

THIS ITEM SHALL BE PER CMS 625.11 & 725.08 AND SCD HL-30.11 WITH THE FOLLOWING EXCEPTIONS: COVER SCREWS SHALL BE 1/4" STAINLESS STEEL MACHINE SCREWS WITH COUNTERSUNK SLOTTED HEADS. EACH SCREW SHALL FASTEN TO THE PULLBOX BY USE OF A THREADED METAL CLIP (U-NUT CAGE STYLE). MULTI-THREAD CLIPS WITH INTEGRAL NUT SHALL NOT BE USED. THE METAL CLIP SHALL BE CORROSION RESISTANT AND BE LUBRICATED PRIOR TO FASTENING. THREADED INSERTS EMBEDDED IN CONCRETE SHALL NOT BE PERMITTED.

PAYMENT WILL BE MADE AT CONTRACT UNIT PRICE PER EACH.

ITEM 633 - PREEMPTION CONFIRMATION LIGHT, AS PER PLAN

FURNISH AND INSTALL A PREEMPTION CONFIRMATION LIGHT CONSISTING OF A VAPOR TIGHT ALUMINUM LIGHTING FIXTURE WITH A BLUE COLORED GLOBE, LED LAMP, AND MOUNTING HARDWARE TO ATTACH TO THE TRAFFIC SIGNAL MAST ARM, AND ALL OTHER ACCESSORIES THAT ARE NECESSARY TO MAKE THE PREEMPT CONFIRMATION LIGHT THROUGH A LOAD SWITCH IN THE TRAFFIC SIGNAL CONTROLLER CABINET.

SUPPLY A CONFIRMATION LIGHT FOR EACH DIRECTION TO INDICATE THAT THE EMERGENCY VEHICLE HAS ACHIEVED CONTROL OF THE TRAFFIC SIGNAL. ENSURE THAT ALL CONFIRMATION LIGHTS AT AN INTERSECTION ARE ILLUMINATED WITH A STEADY INDICATION WHEN PREEMPTION IS DETECTED ON ANY APPROACH TO THE INTERSECTION, AND THAT THEY REMAIN ILLUMINATED UNTIL THE CONTROLLER RESUMES NORMAL OPERATION.

THE DEPARTMENT WILL PAY FOR ITEM 633 - PREEMPTION CONFIRMATION LIGHT, AS PER PLAN AT THE CONTRACT UNIT PRICE FOR EACH CONFIRMATION LIGHT IN PLACE, COMPLETELY INSTALLED AT THE LOCATION SHOWN IN THE PLANS, WIRED, TESTED AND ACCEPTED.

ITEM 633 - PREEMPTION RECEIVING UNIT, AS PER PLAN

FURNISH AND INSTALL PREEMPTION RECEIVING UNITS WHICH CONSIST OF LIGHT WEIGHT, WEATHERPROOF AND DIRECTIONAL ASSEMBLIES, WHICH ARE 360 DEGREE ADJUSTABLE, AND CAPABLE OF SENDING THE PROPER ELECTRICAL SIGNAL TO THE TRAFFIC SIGNAL CONTROLLER VIA THE PREEMPTION DETECTOR CABLE. THE RECEIVING UNITS SHALL BE EVP BRAND AS MANUFACTURED BY WAPITI MICRO SYSTEMS.

SUPPLY THE DETECTORS WITH SPAN WIRE MOUNTING HARDWARE. INSTALL THE DETECTORS AT THE LOCATIONS RECOMMENDED BY THE PREEMPT DETECTOR SUPPLIER.

THE DEPARTMENT WILL PAY FOR ITEM 633 - PREEMPTION RECEIVING UNIT, AS PER PLAN AT THE CONTRACT UNIT PRICE FOR EACH UNIT IN PLACE, COMPLETELY INSTALLED AT THE LOCATION SHOWN IN THE PLANS, WIRED, TESTED, AND ACCEPTED.

ITEM 633 - PREEMPTION PHASE SELECTOR, AS PER PLAN

FURNISH AND INSTALL PREEMPT PHASE SELECTORS, INCLUDING WIRING INTERFACE PANELS IN THE LOCAL CONTROLLER CABINET, AND ALL OTHER ACCESSORIES THAT ARE NECESSARY TO MAKE THE PREEMPT PHASE SELECTORS COMPLETELY FUNCTIONAL AND OPERATIONAL AS SHOWN IN THE PLANS. THE PHASE SELECTOR SHALL BE EVP BRAND AS MANUFACTURED BY WAPITI MICRO SYSTEMS.

FURNISH THE PHASE SELECTORS WHICH CONSIST OF A MODULE OR MODULES THAT WILL PROVIDE THE NECESSARY INPUTS TO THE CONTROLLER, AND HAVE SUFFICIENT QUANTITIES OF CHANNELS TO PROVIDE PREEMPTION FOR ALL APPROACHES TO THE INTERSECTION SEPARATELY, AND WHICH ARE COMPATIBLE WITH THE EXISTING PREEMPTION SYSTEM IN THE CITY OF MEDINA SYSTEM. OBTAIN POWER TO OPERATE THE PHASE SELECTOR FROM A SEPARATE POWER SUPPLY, NOT FROM THE LOCAL CONTROLLER TIMER.

FURNISH PHASE SELECTORS WITH FRONT PANEL INDICATORS FOR ACTIVE PREEMPT CHANNEL STATUS, AND WITH TEST SWITCHES TO ACTIVATE ALL PREEMPT CHANNELS.

THE DEPARTMENT WILL PAY FOR ITEM 633 - PREEMPTION PHASE SELECTOR, AS PER PLAN AT THE CONTRACT UNIT PRICE FOR EACH FOR ALL PHASE SELECTORS AT EACH INTERSECTION IN PLACE, COMPLETELY INSTALLED IN THE LOCAL CONTROLLER SHOWN IN THE PLANS, WIRED, TESTED, AND ACCEPTED.

ITEM 633 - PREEMPTION DETECTOR CABLE, AS PER PLAN

FURNISH AND INSTALL PREEMPTION DETECTOR CABLE, TO CONNECT THE PREEMPT DETECTORS TO THE PHASE SELECTORS IN THE LOCAL CONTROLLER CABINET IN THE LOCATIONS SHOWN IN THE PLANS. THE DETECTOR CABLE SHALL BE EVP BRAND AS MANUFACTURED BY WAPITI MICRO SYSTEMS.

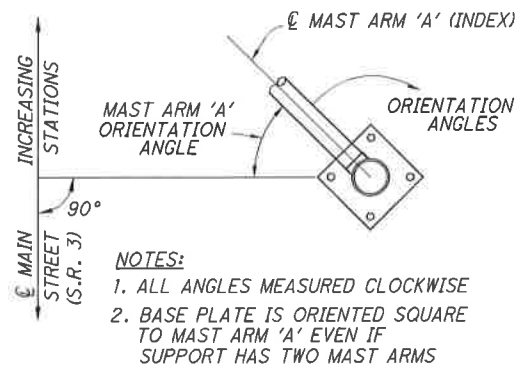
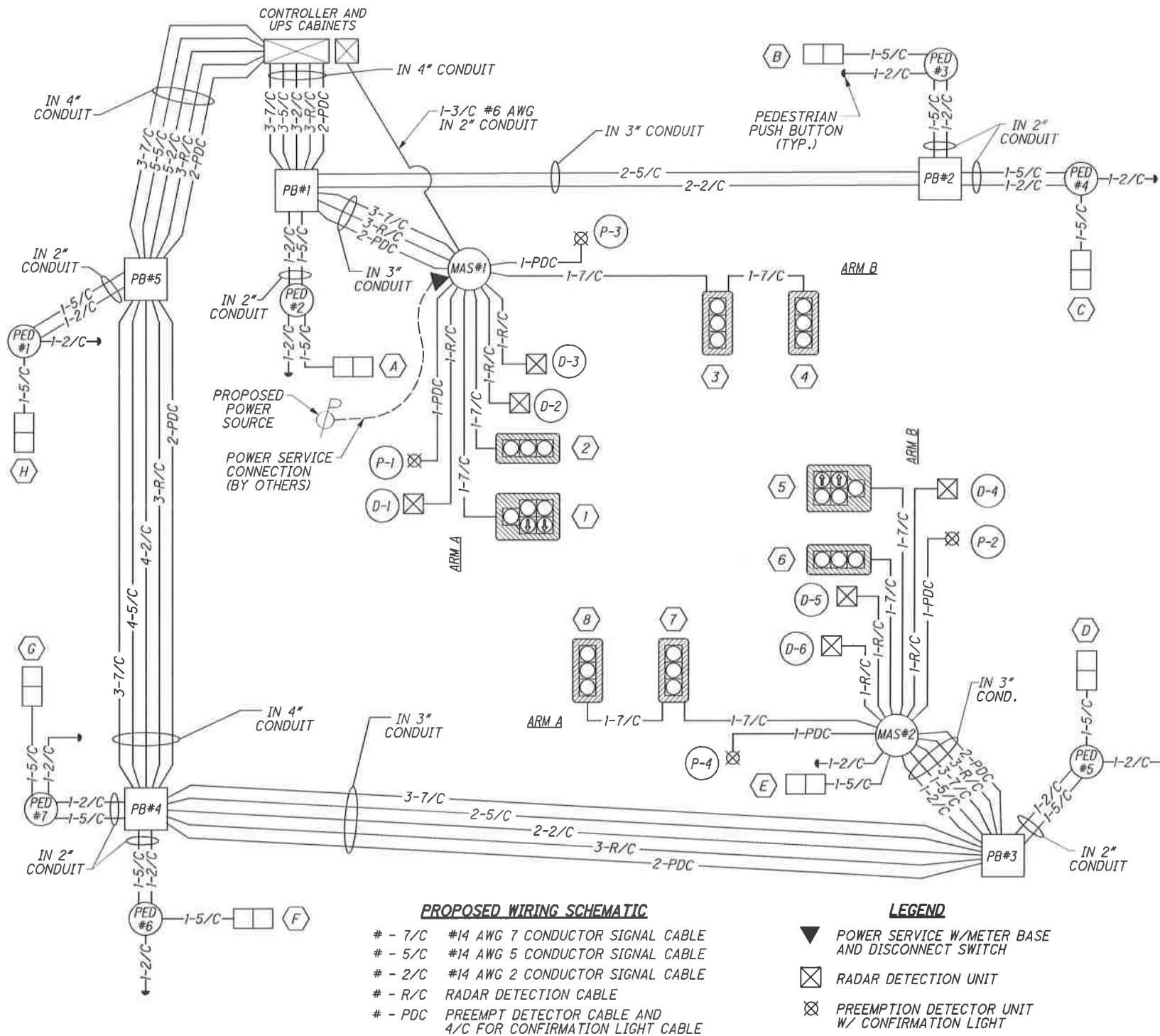
FURNISH PREEMPTION DETECTOR CABLE WHICH CONFORMS TO ITEMS 632 AND 732, AND WHICH IS APPROVED FOR BOTH OVERHEAD AND UNDERGROUND USE. ENSURE THE JACKET CAN WITHSTAND EXPOSURE TO SUNLIGHT, ATMOSPHERIC TEMPERATURES, AND STRESSES REASONABLE EXPECTED IN NORMAL INSTALLATIONS.

THE DEPARTMENT WILL PAY FOR ITEM 633 - PREEMPTION DETECTOR CABLE, AS PER PLAN AT THE CONTRACT UNIT PRICE PER FOOT FOR THE CABLE FURNISHED, IN PLACE, ALL CONNECTIONS MADE, WIRING COMPLETED, TESTED, AND ACCEPTED.

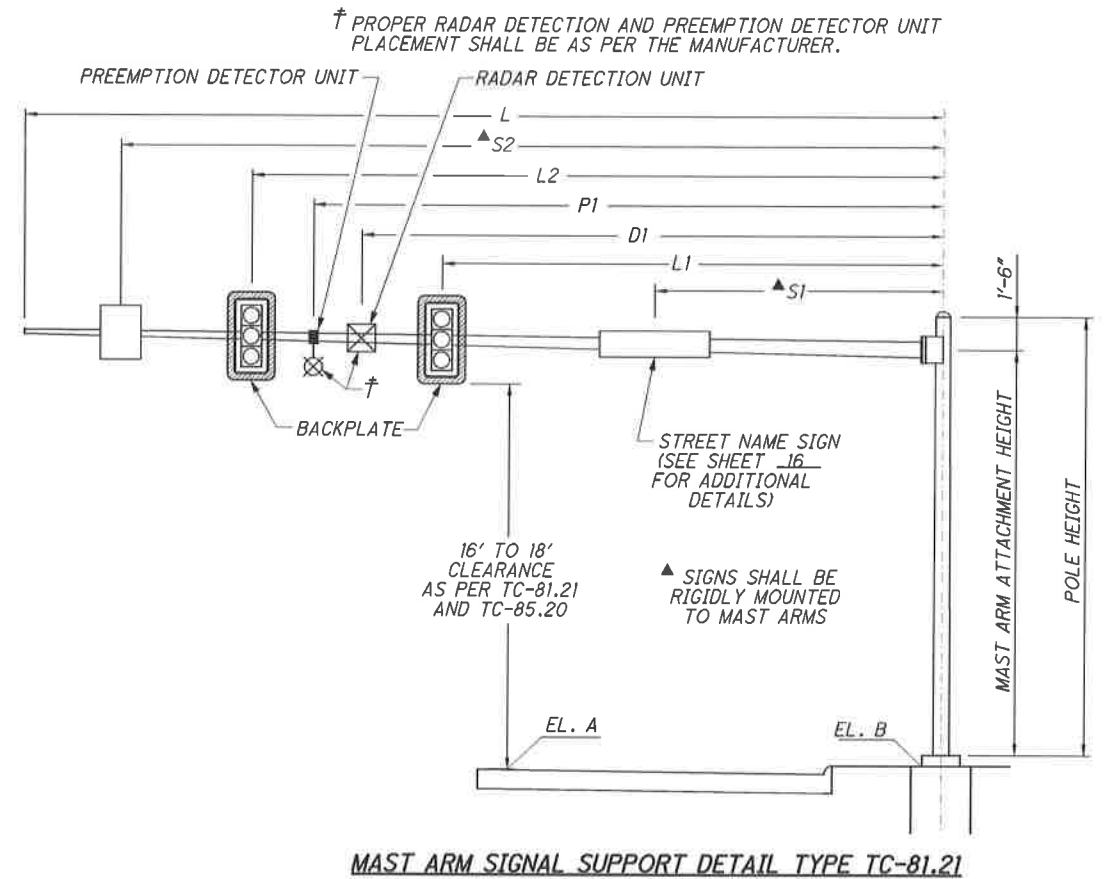
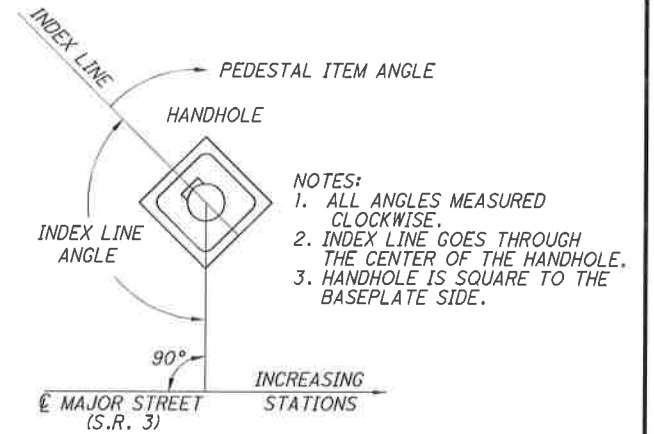
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PEDESTAL NUMBER	HANDHOLE (INDEX LINE)	ORIENTATION ANGLES (DEG.) FROM HANDHOLE	
		PUSHBUTTON	PEDESTRIAN SIGNAL
PED #1	151°	299°	299°
PED #2	90°	270°	270°
PED #3	225°	90°	135°
PED #4	200°	70°	70°
PED #5	180°	90°	90°
PED #6	224°	90°	136°
PED #7	180°	270°	270°



SR 3 AT LEXINGTON RIDGE & HIGH POINT DR.																											
POLE NO.	STATION	OFFSET (FT.)	SIDE	C.L. REF.	POLE DESIGN NO. TC-12.30	POLE HEIGHT (FT.)	ARM	ARM ATTACHMENT HEIGHT *	MAST ARM DESIGN NO. TC-81.21	L (FT.)	S1 (FT.)	S2 (FT.)	L1 (FT.)	L2 (FT.)	D1 (FT.)	D2 (FT.)	D3 (FT.)	P1 (FT.)	*ELEVATION 'A'	*ELEVATION 'B'	MAST ARM A ANGLE (DEG.)	ORIENTATION ANGLES (DEG.) FROM MAST ARM A					
																						MAST ARM B ANGLE (DEG.)	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	3" CONDUIT CAPPED FOR FUTURE USE
MAS #1	502+90.00	49.5	LT.	S.R. 3	10	20.5	A	19.0	14	57	23	54	38	50	31	33	52	46	1185.80±	1185.60	0°				180°	90°	90°
							B	19.0	11	45	7		34	42				20	1185.20±	1185.60		270°					
MAS #2	503+57.50	49.8	RT.	S.R. 3	8	20.5	A	19.0	13	58	12		45	55				35	1185.30±	1185.60	270°		270°	270°		180°	90°
							B	19.0	11	45	15	42	26	38	7	23	40.5	34	1186.00±	1185.60		90°					

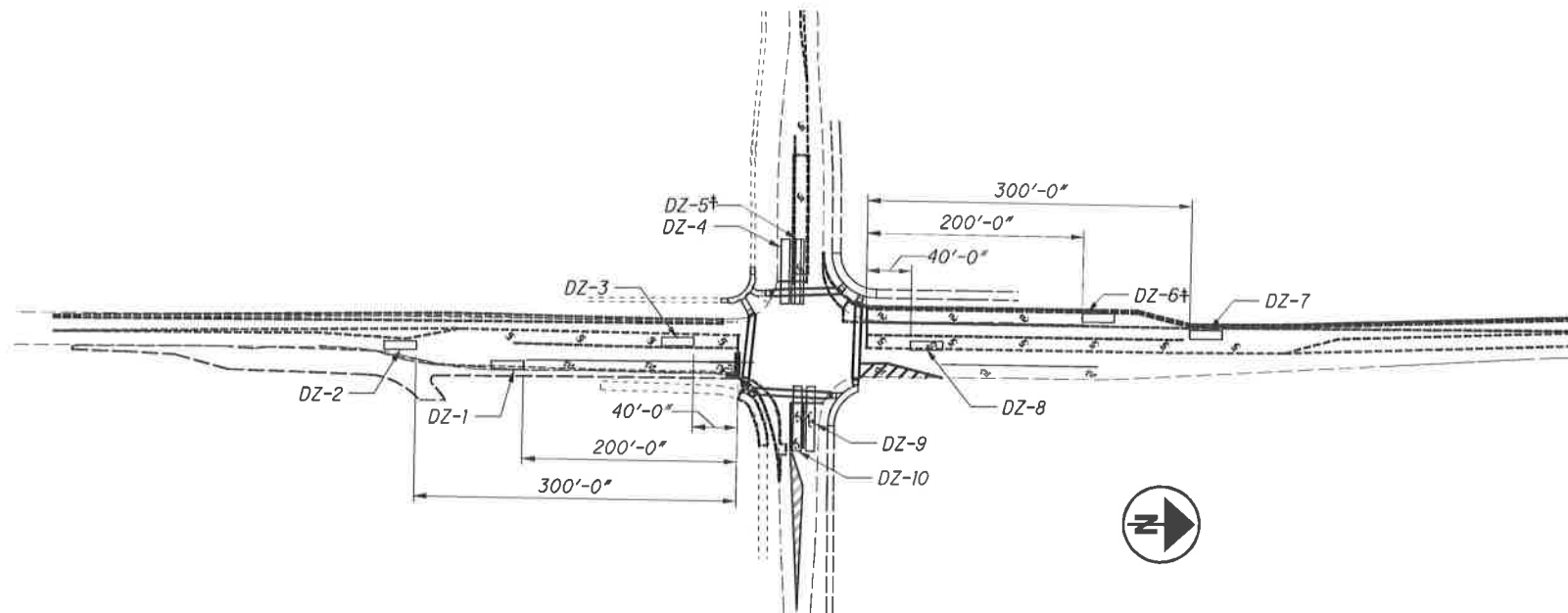
* ELEVATIONS TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ORDERING OF POLES. MAST ARM ATTACHMENT HEIGHT AND POLE HEIGHT MAY NEED TO BE ADJUSTED AS NECESSARY AS APPROVED BY THE ENGINEER FOR CLEARANCE OVER PAVEMENT AND CLEARANCE FROM EXISTING OVERHEAD UTILITIES.

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SIGNAL TIMING											
START - UP				DUAL ENTRY ●							
START IN: Y/R FLASH ● ; ALL RED ○				REST IN RED: RING 1 ○ ; RING 2 ○							
TIME FOR FLASH OR ALL RED 10				OVERLAP:		A	B	C	D		
FIRST PHASE (S) 2 & 6				PHASES							
COLOR DISPLAYED: GREEN ● ; YELLOW ○											
INTERVAL OR FEATURE				PHASE NO.							
				1	2	3	4	5	6	7	8
INTERSECTION MOVEMENT				SB LT	NB	NA	EB	NB LT	SB	NA	WB
MIN. INITIAL GREEN (SEC.)				6	20		10	6	20		10
PASSAGE TIME (SEC.)				3.0	2.0		2.0	3.0	2.0		2.0
MAX GREEN (SEC.)				15	50		30	15	50		30
YELLOW CHANGE (SEC.)				3.0	4.3		3.0	3.0	4.3		3.0
ALL RED CLEARANCE (SEC.)				3.1	1.7		2.7	3.1	1.7		2.7
WALK (SEC.)				0	5		5	0	5		5
PEDESTRIAN CLEARANCE (SEC.)				0	18		19	0	18		19
RECALL PHASE	MAXIMUM (ON/OFF)			OFF	OFF		OFF	OFF	OFF		OFF
	MINIMUM (ON/OFF)			OFF	ON		OFF	OFF	ON		OFF
	PEDESTRIAN (ON/OFF)			OFF	OFF		OFF	OFF	OFF		OFF
	MEMORY (ON/OFF)			OFF	ON		OFF	OFF	ON		OFF
CALL TO NON-ACTUATED	NO. 1										
	NO. 2										

FIELD WIRING HOOK-UP CHART			
SIGNAL HEAD #	INDICATION	FIELD TERMINAL	FLASH
1 (S.B. S.R. 3)	R	φ6 R	Y
	Y	φ6 Y	
	G	φ6 G	
	←Y	φ1 Y	
2 (S.B. S.R. 3)	←G	φ1 G	Y
	R	φ6 R	
	Y	φ6 Y	
	G	φ6 G	
3 (W.B. LEXINGTON RIDGE DR.)	R	φ8 R	R
	Y	φ8 Y	
	G	φ8 G	
	←G	φ8 G	
4 (W.B. LEXINGTON RIDGE DR.)	R	φ8 R	R
	Y	φ8 Y	
	G	φ8 G	
	←G	φ8 G	
5 (N.B. S.R. 3)	R	φ2 R	Y
	Y	φ2 Y	
	G	φ2 G	
	←Y	φ5 Y	
6 (N.B. S.R. 3)	←G	φ5 G	Y
	R	φ2 R	
	Y	φ2 Y	
	G	φ2 G	
7 (E.B. HIGH POINT DR.)	R	φ4 R	R
	Y	φ4 Y	
	G	φ4 G	
	←G	φ4 G	
8 (E.B. HIGH POINT DR.)	R	φ4 R	R
	Y	φ4 Y	
	G	φ4 G	
	←G	φ4 G	
A - B (WEST)	W	OLA G (φ6)	OUT
	DW	OLA R (φ6)	
C - D (NORTH)	W	OLB G (φ8)	OUT
	DW	OLB R (φ8)	
E - F (EAST)	W	OIC G (φ2)	OUT
	DW	OIC R (φ2)	
G - H (SOUTH)	W	OLD G (φ4)	OUT
	DW	OLD R (φ4)	
OLA = LS 9		OLC = LS 11	
OLB = LS 10		OLD = LS 12	

PREEMPTION PHASING			
CHANNEL	EMERGENCY VEHICLE APPROACHING FROM:	ASSOCIATED PHASE	ASSOCIATED SIGNAL HEADS
1	NORTHBOUND SR 3	φ2	⑤ & ⑥
2	SOUTHBOUND SR 3	φ6	① & ②
3	EASTBOUND HIGH POINT	φ4 ↓	⑦ & ⑧
4	WESTBOUND LEXINGTON RIDGE	φ8 ↑	③ & ④



DETECTION ZONE SCHEMATIC PLAN

DETECTION ZONE CHART					
RADAR UNIT	DETECTION ZONE	LANE	LOCATION/ MODE	CONTROLLER PHASE	DELAY (SEC.)
D1	1	NB RT	200' IN ADVANCE OF STOP BAR/EXTENSION	φ2	
	2	NB TH	300' IN ADVANCE OF STOP BAR/EXTENSION	φ2	
D2	3	NB LT	40' IN ADVANCE OF STOP BAR/ PRESENCE AND EXTENSION	φ5	3*
	4	EB TH/RT	STOP BAR/PRESENCE AND EXTENSION	φ4	8*
D3	5 ‡	EB LT	STOP BAR/PRESENCE AND EXTENSION	φ4	3*
	6 ‡	SB RT	200' IN ADVANCE OF STOP BAR/EXTENSION	φ6	
D4	7	SB TH	300' IN ADVANCE OF STOP BAR/EXTENSION	φ6	
	8	SB LT	40' IN ADVANCE OF STOP BAR/ PRESENCE AND EXTENSION	φ1	3*
D5	9	WB TH/RT	STOP BAR/PRESENCE AND EXTENSION	φ8	8*
	10	WB LT	STOP BAR/PRESENCE AND EXTENSION	φ8	3*

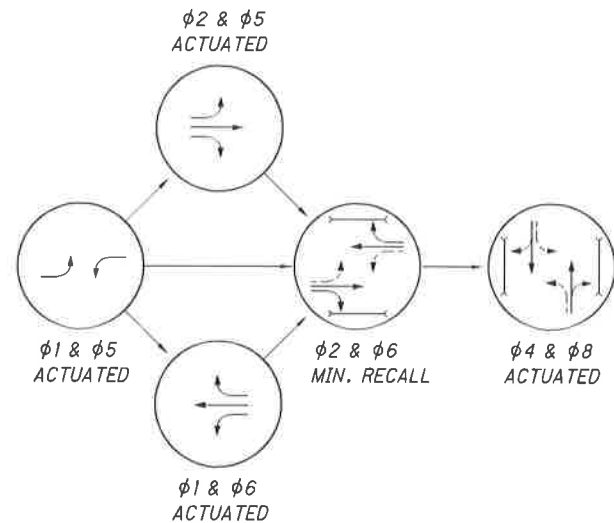
* INHIBIT DELAY DURING ASSOCIATED CONTROLLER PHASE

‡ DETECTION ZONES 5 AND 6 SHALL BE ADDED IN THE FUTURE AFTER THE INSTALLATION OF THE SOUTHBOUND RIGHT AND EASTBOUND LEFT TURN PAVEMENT.

PREEMPTION NOTES:

1. ACTIVE WALK INDICATIONS SHALL IMMEDIATELY GO TO "DON'T WALK" UPON RECEIVING PREEMPTION CALL.
2. IF PHASE ACTIVE CONFLICTS WITH PREEMPT PHASE CALLED, IT SHALL IMMEDIATELY TIME ITS YELLOW AND ALL RED CLEARANCES UPON RECEIVING PREEMPTION CALL.
3. IF ACTIVE PHASE = THE PREEMPT PHASE (φ2 OR φ6), THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL. THE OPPOSING DIRECTION OF THE PREEMPT CALL (φ2 OR φ6), SHALL IMMEDIATELY TIME ITS YELLOW AND ALL RED CLEARANCES UPON RECEIVING PREEMPTION CALL.
4. AFTER RELEASE FROM PREEMPT, YELLOW AND ALL RED CLEARANCE SHALL BE DISPLAYED AND RETURN PHASE SHALL BE φ2 & φ6.
5. IF PREEMPT PHASE = RETURN PHASE (φ2 OR φ6), THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED BEFORE RETURNING TO φ2 & φ6.

PHASING IDENTIFICATION			
1 SB LT S.R. 3	2 NB S.R. 3	3 NOT USED	4 EB HIGH POINT
5 NB LT S.R. 3	6 SB S.R. 3	7 NOT USED	8 WB LEXINGTON RIDGE



SIGNAL PHASING

NOTE: 1) OMIT φ5 WHEN φ6 IS ON
2) OMIT φ1 WHEN φ2 IS ON

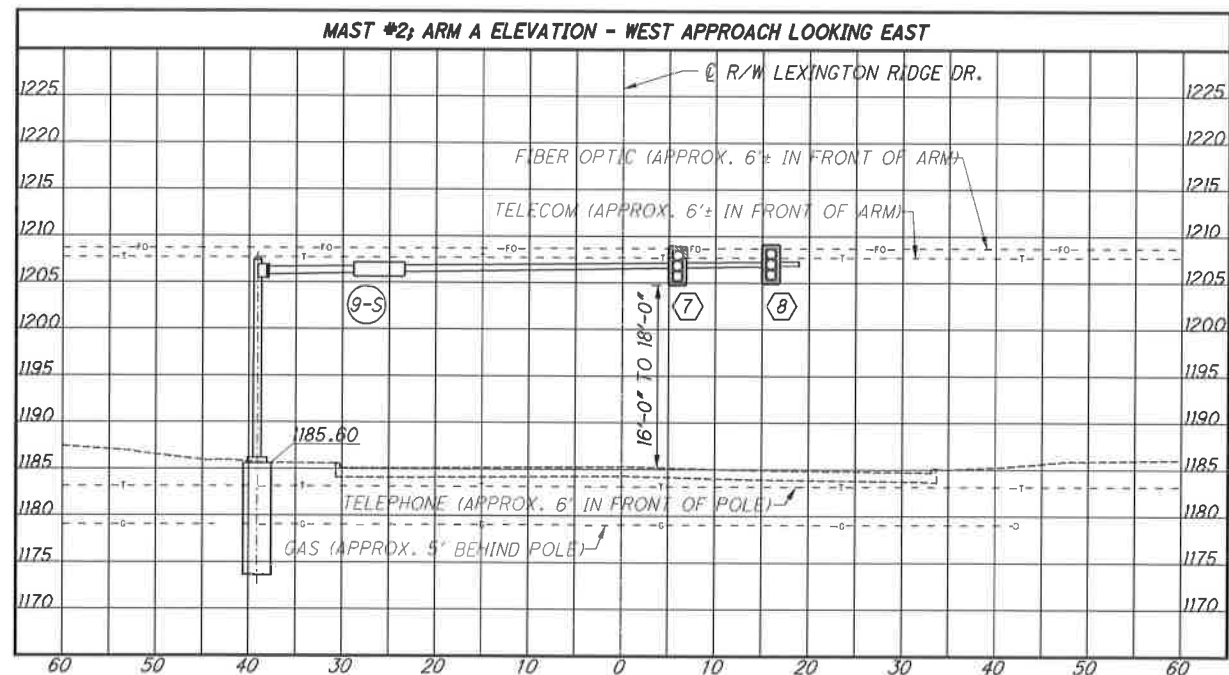
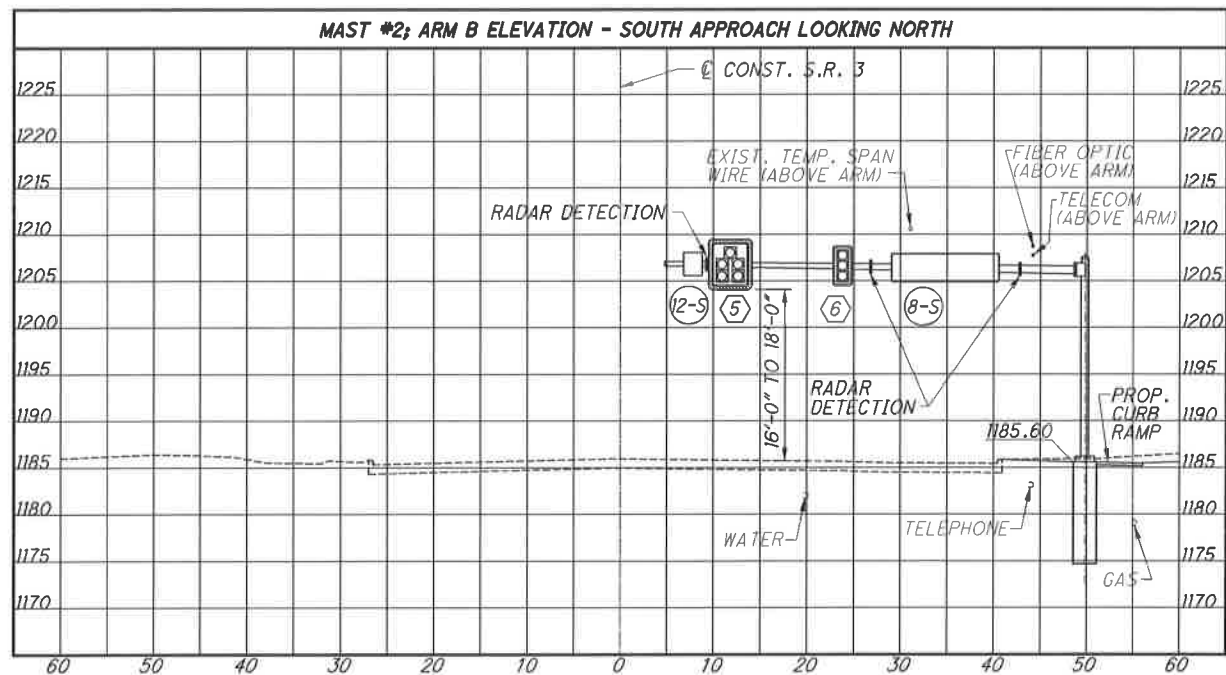
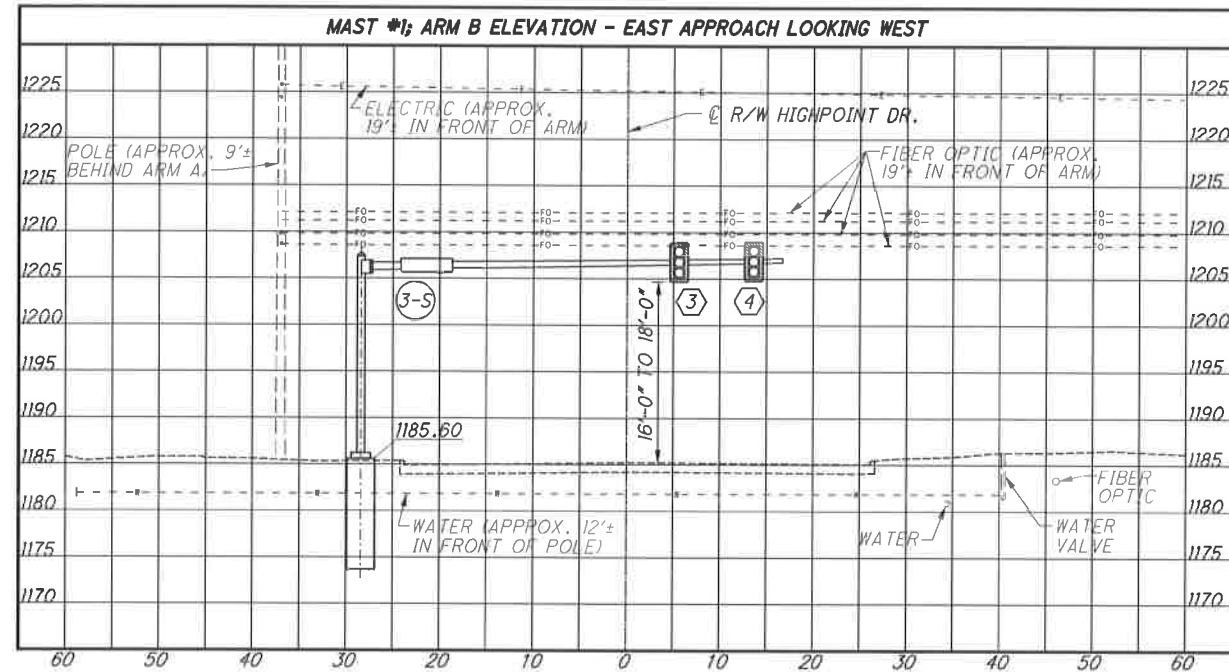
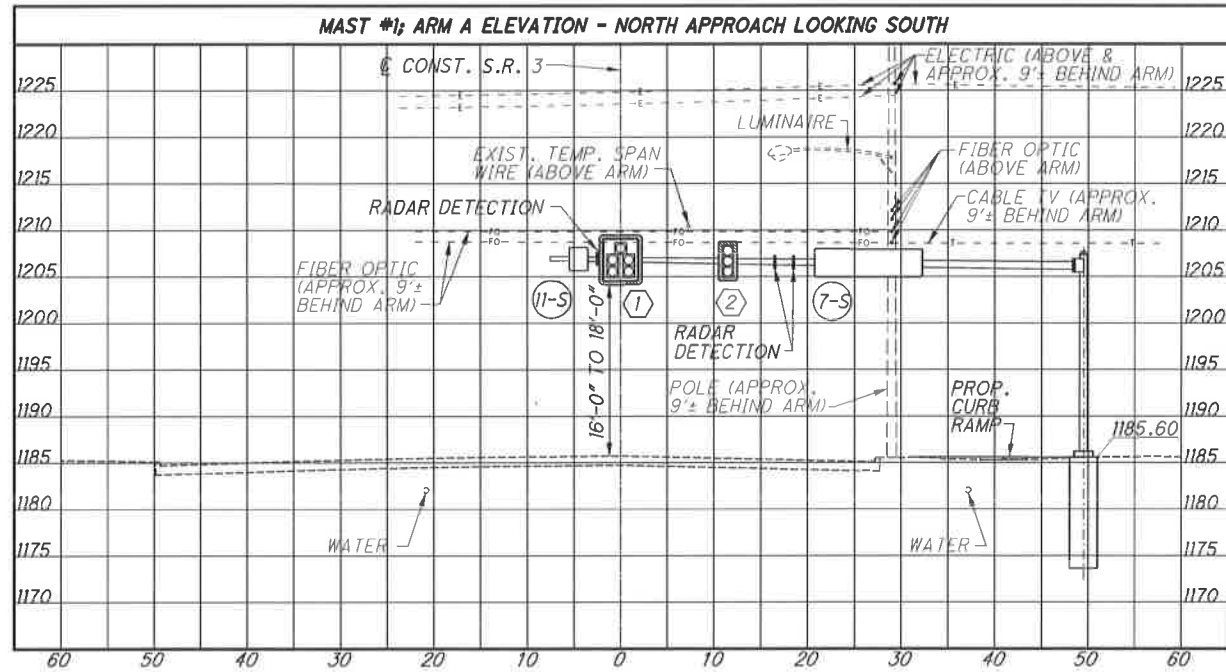
CALCULATED
JDJ
CHECKED
PRS

SIGNAL DETAILS
S.R. 3 AT LEXINGTON RIDGE DR. & HIGH POINT DR.

MED-3-9.53

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*NOTE: UTILITY LOCATIONS AND ELEVATIONS SHOWN ARE APPROXIMATE.

CALCULATED
JDL
CHECKED
PRS

SIGNAL DETAILS
S.R. 3 (WOOSTER PIKE) AT HIGH POINT DR./LEXINGTON RIDGE DR.

MED-3-9.53

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