

DISTRICT 3

LOCATION MAP

DESIGN DESIGNATION

NONE

DESIGN EXCEPTIONS

NONE REQUIRED

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

D03-TSG-FY2020

DISTRICT 3

**ASHLAND, CRAWFORD, HURON, LORAIN,
MEDINA, RICHLAND & WAYNE COUNTY**

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PROJECT DESCRIPTION

THIS PROJECT WILL INSTALL OVERHEAD SIGNS ALONG SR 18, REPLACE UPS BATTERY BACKUPS AND RELAMP VARIOUS SIGNALS THROUGHOUT DISTRICT 3.

EARTH DISTURBED AREAS

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

2019 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PLANS AND CHANGES 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 AS SET FORTH ON THE PLANS AND ESTIMATES.


APPROVED 
DATE 08/12/19 DISTRICT DEPUTY DIRECTOR


APPROVED _____
DATE _____ DIRECTOR, DEPARTMENT OF TRANSPORTATION

UNDERGROUND UTILITIES
Contact Two Working Days
Before You Dig



OHIO811, 8-1-1, or 1-800-362-2764
(Non-members must be called directly)

ENGINEERS SEAL	STANDARD CONSTRUCTION DRAWINGS						SUPPLEMENTAL SPECIFICATIONS	
 SIGNED:  DATE: <u>8/12/19</u>	HL-10.13	7/20/18	TC-21.10	7/21/17	TC-85.21	1/20/17	800	7/19/19
	HL-20.11	4/21/17	TC-21.20	7/20/18	TC-85.22	1/19/18	809	1/18/19
	HL-30.11	1/18/19	TC-22.10	10/18/13			832	10/19/18
	HL-30.21	1/17/14	TC-22.20	1/17/14				
	HL-30.22	1/17/14	TC-41.10	7/19/13				
	HL-40.10	1/20/17	TC-41.30	10/18/13				
	HL-40.20	7/20/18	TC-41.40	10/18/13				
	HL-50.11	1/16/15	TC-42.20	10/18/13				
	HL-60.11	7/21/17	TC-51.11	1/15/16				
	HL-60.12	7/15/16	TC-51.12	1/15/16				
	HL-60.31	1/18/19	TC-52.10	10/18/13				
	MT-95.30	4/19/19	TC-52.20	7/20/18				
	MT-97.10	4/19/19	TC-82.10	1/18/19				
	MT-105.10	7/19/13	TC-84.20	10/18/13				
			TC-84.21	10/18/13				
		TC-16.21	7/20/18	TC-85.20	7/20/18			

PLANS PREPARED BY:
 OHIO DEPARTMENT OF
TRANSPORTATION
DISTRICT THREE
PLANNING AND ENGINEERING

FEDERAL PROJECT NO.
NON-FEDERAL

FID NO.
105359

CONSTRUCTION PROJECT NO.

D03-TSG-FY2020

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UTILITIES

LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS.

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

CRA 602

CABLE
CHARTER COMMUNICATIONS
5520 WHIPPLE AVENUE NW
NORTH CANTON, OH 44720
330.494.9200

CITY
CITY OF GALION
301 HARDING WAY EAST
GALION, OH 44833
419.468.2818

COMMUNICATION
CENTURYLINK

175 ASHLAND ROAD, P.O. BOX 3555
MANSFIELD, OH 44907
419.755.7956

ELECTRIC
AEP OHIO
2552 QUAKER ROAD
BUCYRUS, OH 44820
419.563.1509

GAS

COLUMBIA GAS OF OHIO
1021 NORTH MAIN STREET
MANSFIELD, OH 44903
419.528.1137

SEWER
CRAWFORD COUNTY ENGINEER
815 WHETSTONE STREET
BUCYRUS, OH 44820
419.562.7731

MED 18

CABLE
ARMSTRONG UTILITIES
1141 LAFAYETTE ROAD
MEDINA, OHIO 44256
330.722.3141

CABLE
CHARTER COMMUNICATIONS
5520 WHIPPLE AVENUE NW
NORTH CANTON, OH 44720
330.494.9200

CITY

CITY OF MEDINA
132 NORTH ELMWOOD STREET
MEDINA, OH 44256
330.722.9020

COMMUNICATION

FRONTIER COM
83 TOWNSEND AVENUE
NORWALK, OH 44857
419.744.3613

ELECTRIC

OHIO EDISON
1717 ASHLAND ROAD
MANSFIELD, OH 44905
419.521.6213

GAS

COLUMBIA GAS OF OHIO
780 FRY ROAD
MIDDLEBURG HEIGHTS, OH 44130
440.891.2428

TRAFFIC

ODOT DISTRICT THREE
906 CLARK AVENUE
ASHLAND, OH 44805
419.207.7045

MED 224

CABLE
CHARTER COMMUNICATIONS
5520 WHIPPLE AVENUE NW
NORTH CANTON, OH 44720
330.494.9200

COMMUNICATION
FRONTIER COM
83 TOWNSEND AVENUE
NORWALK, OH 44857
419.744.3613

ELECTRIC

OHIO EDISON
1717 ASHLAND ROAD
MANSFIELD, OH 44905
419.521.6213

GAS

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440.891.2428

TRAFFIC

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906 CLARK AVENUE
ASHLAND, OH 44805
419.207.7045

UTILITIES (CONTINUED)

THE AFOREMENTIONED UTILITY COMPANIES AND AGENCIES HAVE VARIOUS FACILITIES IN THE AREA THAT WILL REMAIN IN PLACE DURING CONSTRUCTION.

EXTREME CAUTION SHOULD BE EXERCISED IN AREAS WITH UTILITIES. SECTIONS 105.07 AND 107.16 OF THE DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIALS SPECIFICATIONS REQUIRE, AMONG OTHER THINGS, THAT THE CONTRACTOR COOPERATE WITH ALL UTILITIES LOCATED WITHIN THE LIMITS OF THIS CONSTRUCTION PROJECT AND TAKE RESPONSIBILITY FOR THE PROTECTION OF THE UTILITY PROPERTY AND SERVICES.

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 180 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.

AIRWAY/HIGHWAY CLEARANCE FOR AIRPORTS AND HELIPORTS

THIS PROJECT HAS BEEN IDENTIFIED AS BEING WITHIN THE INFLUENCE AREA OF A PUBLIC USE AIRPORT OR HELIPORT. THE CONTRACTOR IS ADVISED THAT NO TEMPORARY STRUCTURES OR CONSTRUCTION EQUIPMENT AT MAXIMUM OPERATING HEIGHT SHALL EXCEED A HEIGHT OF 100 FEET WITHIN THE LIMITS OF MED-18-15.14 TO MED-18-15.22. IF ANY TEMPORARY STRUCTURES OR CONSTRUCTION EQUIPMENT WILL EXCEED THIS HEIGHT, THE CONTRACTOR IS ADVISED THAT FURTHER COORDINATION WITH THE FEDERAL AVIATION ADMINISTRATION (FAA) WILL BE NECESSARY PRIOR TO ERECTING SUCH TEMPORARY STRUCTURES OR OPERATING SUCH EQUIPMENT ON THE PROJECT. THE CONTRACTOR WILL BE REQUIRED TO FILE A NEW FAA FORM 7460-1, ADVISING THE FAA THAT AERONAUTICAL STUDY NO. (SEE BELOW LIST) IS BEING RESUBMITTED AND THAT AN ALTERATION TO THE ORIGINAL SUBMISSION IS REQUESTED. COPIES OF THE ALTERATION AND FORM 7460-1 SHALL BE FORWARDED TO THE ODOT OFFICE OF AVIATION. THE CONTRACTOR IS ADVISED THAT NO TEMPORARY STRUCTURES OR CONSTRUCTION EQUIPMENT SHALL EXCEED THE PERMISSIBLE HEIGHT UNTIL A COPY OF THE FAA APPROVAL AND ODOT OFFICE OF AVIATION PERMIT HAS BEEN FURNISHED TO THE PROJECT ENGINEER.

THE CONTRACTOR IS FURTHER ADVISED THAT THE FAA APPROVAL WILL TAKE A MINIMUM OF 45 DAYS. ALL SUBMISSIONS SHALL BE DIRECTED TO THESE OFFICES:

EXPRESS PROCESSING CENTER
THE FEDERAL AVIATION ADMINISTRATION
SOUTHWEST REGIONAL OFFICE
OBSTRUCTION EVALUATION SERVICE, AJR-32
2601 MEACHAN BLVD.
FORT WORTH, TX 76137-0520

ODOT
OFFICE OF AVIATION
2829 W DUBLIN-GRANVILLE RD.
COLUMBUS, OH 43235
614.793.5046

AERONAUTICAL STUDY NUMBER	COUNTY	ROUTE	STRAIGHT LINE MILE	LAT-LONG	
				LATITUDE	LONGITUDE
2019-AGL-9824-OE	MED	18	15.14	41.1361710	-81.8013020
2019-AGL-9825-OE	MED	18	15.22	41.1361660	-81.7996770

GROUNDING AND BONDING

THE REQUIREMENTS OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS (C&MS) 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.

GROUNDING AND BONDING (CONTINUED)

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.

GENERAL ELECTRICAL REQUIREMENTS FOR SOLAR-POWERED DEVICES

UTILIZE ENVIRONMENTALLY-SEALED, HIGH-EFFICIENCY LED LIGHT SOURCES FOR THIS SOLAR-POWERED APPLICATION.

HOUSE THE SOLAR POWER SUPPLY CONTROLLER AND BATTERY IN ONE OR TWO STAINLESS STEEL OR ALUMINUM ENCLOSURES WITH A MINIMUM NEMA 3 OR 3X RATING. IF THE EXTERIOR SIZE OF THE ENCLOSURE NECESSARY TO MEET THE REQUIREMENTS BELOW IS LESS THAN 1000 CUBIC INCHES, A SINGLE POLYMER ENCLOSURE RATED NEMA 4 AND LISTED AS SUNLIGHT-RESISTANT MAY BE INSTALLED, WITH APPROVAL OF THE ENGINEER.

SEAL ENCLOSURE CONDUIT ENTRIES TO PREVENT INSECT AND/OR RODENT ENTRY. PROVIDE METAL ENCLOSURES WITH AN EXTERIOR OF BARE OR POWDER-COATED ALUMINUM, OR STAINLESS STEEL. PROVIDE A LOCKING ENCLOSURE USING EITHER AN INTEGRATED LOCKING MECHANISM OR A PADLOCK PER C&MS 631.06.

SMALL ENCLOSURES OF 300 CUBIC INCHES OR LESS (EXTERIOR) MAY BE PROVIDED WITH SECURITY FASTENERS IN LIEU OF A LOCKING MECHANISM OR PADLOCK. SEPARATE THE CONTROL ELECTRONICS AND BATTERY, IF CONTAINED WITHIN A SINGLE ENCLOSURE, TO PREVENT DAMAGE TO THE CONTROL ELECTRONICS IF THE BATTERY ENVELOPE IS COMPROMISED. PROVIDE SEALED GEL-CELL OR AGM (ABSORBED GLASS MAT) LEAD-ACID BATTERIES FOR ALL INSTALLATIONS WITH INSTANTANEOUS LOAD REQUIREMENTS OF 4 WATTS OR ABOVE, REGARDLESS OF DUTY CYCLE.

FOR INSTALLATIONS WITH INSTANTANEOUS LOAD REQUIREMENTS OF LESS THAN 4 WATTS, RECHARGEABLE NICD, LI-ION, OR NIMH BATTERIES MAY BE USED INSTEAD OF AGM OR GEL-CELL, IF APPROVED BY THE ENGINEER.

PROVIDE SIGNED COPIES FROM THE SOLAR PANEL AND/OR CONTROLLER MANUFACTURER OF ALL CALCULATIONS USED TO SIZE THE SOLAR PANEL AND BATTERIES. INCLUDE IN THESE CALCULATIONS THE INSULATION VALUE USED AND ITS REFERENCE SOURCE, THE SOLAR PANEL EFFICIENCY, CHARGER/CONTROLLER EFFICIENCY, INVERTER EFFICIENCY, PROPOSED LED LAMP AND/OR EQUIPMENT LOAD, AND A FIGURE REPRESENTING ANTICIPATED MISCELLANEOUS LOSSES.

SHOW CALCULATIONS DOCUMENTING A RESERVE CAPACITY OF TWO WEEKS OPERATION UNDER CONTINUOUS WORST-CASE (MINIMUM) INSULATION FIGURES (USUALLY DECEMBER) FOR THE PROPOSED GEOGRAPHIC LOCATION, USING A PANEL ELEVATION ANGLE APPROPRIATE TO THE SITE, AT A SUSTAINED TEMPERATURE OF 25 DEGREES FAHRENHEIT (-4 DEGREES CELSIUS).

DELIVER A COPY OF THE CALCULATIONS TO THE ENGINEER AND ANOTHER COPY TO THE OFFICE OF ROADWAY ENGINEERING FOR APPROVAL. PROVIDE DOCUMENTATION SHOWING THAT THE SOLAR PANEL MANUFACTURER TESTED THE PANEL ACCORDING TO IEC61215 OR EQUIVALENT APPROVED STANDARD. PROVIDE DOCUMENTATION SHOWING THAT SOLAR PANEL MOUNTING IS RATED FOR 90 MPH DESIGN WIND AND DESIGNED TO RESIST VANDALISM.

ENSURE NEC GROUNDING AND BONDING REQUIREMENTS ARE MET IF VOLTAGES OVER 50V AC OR DC ARE PRESENT. PROVIDE A TIMER (IF REQUIRED) THAT SATISFIES THE REQUIREMENTS OF C&MS 731.10 AND IS LISTED ON THE ODOT QUALIFIED PRODUCTS LIST. PROVIDE COMPLETE PHOTO-CONTROLLER SPECIFICATIONS, INCLUDING ON/OFF PHOTOMETRIC SWITCH POINTS (TYPICALLY GIVEN IN FOOT-CANDLES), IF A PHOTO-CONTROLLER IS UTILIZED.

ITEM 630 - SIGNING, MISC.: SOLAR POWERED LED ENHANCED (R1-1, 36x36)

THIS SPECIFICATION DESCRIBES THE MINIMUM ACCEPTABLE DESIGN AND PERFORMANCE REQUIREMENTS FOR LED ENHANCED STOP SIGN (R1-1). THE SIGN SHALL BE SELF-POWERED BY SOLAR PANELS AND BATTERIES WITH NO EXTERNAL ELECTRICAL POWER INSTALLATION. THE LED ENHANCED SIGN SHALL BE MUTCD COMPLIANT.

THE FOLLOWING CRITERIA SHALL BE MET:

1. THE NEW UNIT SHALL ATTACH SECURELY TO THE PROPOSED DUAL POSTED SIGN SUPPORT USING A TAMPER RESISTANT FASTENING SYSTEM. SPECIAL TOOLS NEEDED FOR THE TAMPER RESISTANT FASTENING SYSTEM SHALL BE SUPPLIED WITH EACH SIGN.

2. EACH SIGN UNIT SHALL BE IDENTIFIED WITH THE MANUFACTURER'S NAME, DATE OF MANUFACTURE, AND SERIAL NUMBER ON THE BACK SIDE.

3. THE SIGN UNIT SHALL BE VISIBLE AT A MINIMUM OF 1/4 MI. DURING ALL CONDITIONS.

4. THE SIGN UNIT SHALL INCORPORATE CIRCUITRY AND A PHOTOCCELL TO ENSURE THAT IS HAS BRIGHTNESS ADJUSTMENT DURING DAY, DUSK, AND AT NIGHT.

5. THE LENS OF THE LED UNIT SHALL BE CAPABLE OF WITHSTANDING ULTRAVIOLET LIGHT (DIRECT SUNLIGHT) EXPOSURE FOR A MINIMUM TIME PERIOD OF FIVE YEARS WITHOUT EXHIBITING EVIDENCE OF DETERIORATION.

6. THE LENSES SHALL WITHSTAND A 3 FOOT DROP TEST ONTO A HARD SURFACE AND SHALL BE A MINIMUM OF 1/4 INCH THICK AND FREE OF BUBBLES AND IMPERFECTIONS. THE LENSES SHALL BE SMOOTH ON THE OUTSIDE, WITH NO EXTERNAL FACETS TO PREVENT DIRT AND DEBRIS BUILD-UP.

7. IF LENSES ARE TINTED, THEY SHALL MATCH THE WAVELENGTH (CHROMATICITY) OF THE LED.

8. THE INDIVIDUAL LED LIGHT SOURCES SHALL BE WIRED SO THAT A CATASTROPHIC FAILURE OF ONE LED LIGHT SOURCE WILL NOT RESULT IN THE LOSS OF MORE THAN ONE LED LIGHT SOURCE IN THE SIGN UNIT.

9. LED UNITS AND ASSOCIATED ON-BOARD CIRCUITRY SHALL CONFORM TO THE REQUIREMENTS IN FEDERAL COMMUNICATIONS COMMISSION (FCC) TITLE 47, SUB PART B, SECTION 15 REGULATIONS CONCERNING THE EMISSION OF ELECTRONIC NOISE.

10. LED'S SHALL BE RATED FOR USE IN THE AMBIENT OPERATING TEMPERATURE RANGE OF -40 DEGREES F TO +166 DEGREES F. (-40 DEGREES C TO +74 DEGREES C)

11. THE LED'S WIRING SHALL BE SEALED WATERTIGHT TO ELIMINATE DIRT CONTAMINATION AND ALLOW FOR SAFE HANDLING IN ALL WEATHER CONDITIONS. THE LED'S SHALL BE SEALED AGAINST DUST AND MOISTURE INTRUSION AS PER THE REQUIREMENTS OF NEMA STANDARD 250-1991 FOR TYPE 4 ENCLOSURES AND TO PROTECT ALL INTERNAL LED AND ELECTRICAL COMPONENTS.

12. THE SIGN LED'S SHALL DISPLAY A MINIMUM OF 500,000 MCD FOR DAYTIME VISIBILITY.

SOLAR REQUIREMENTS -

SEE "GENERAL ELECTRICAL REQUIREMENTS FOR SOLAR-POWERED DEVICES".

REQUIRED DOCUMENTATION -

EACH SIGN UNIT SHALL BE PROVIDED WITH THE FOLLOWING DOCUMENTATION EITHER IN HARD COPY OR AS A PDF.

1. ONE SCHEMATIC DIAGRAM SHALL BE PROVIDED FOR THE SIGN UNIT ALONG WITH ANY NECESSARY INSTALLATION INSTRUCTIONS.

2. THE LED MANUFACTURERS NAME, BRAND, AND MODEL NUMBER.

WARRANTY -

1. THE LED ENHANCED SIGNAL AHEAD SIGN UNIT SHALL BE REPAIRED OR REPLACED BY THE MANUFACTURER IF IT EXHIBITS A FAILURE DUE TO WORKMANSHIP OR MATERIAL DEFECTS WITHIN 2 YEARS OF FIELD OPERATION.

2. THE MANUFACTURER SHALL PROVIDE A WRITTEN WARRANTY AGAINST DEFECTS IN MATERIALS, WORKMANSHIP, AND LUMINOUS INTENSITY FOR THE LED ENHANCED SIGN UNIT FOR A PERIOD OF 2 YEARS AFTER INSTALLATION. A REPLACEMENT LED ENHANCED SIGN UNIT SHALL BE PROVIDED WITHIN 10 DAYS AFTER RECEIPT OF FAILED UNIT AT NO COST, EXCEPT THE COST OF SHIPPING THE FAILED UNIT.

PAYMENT -

PAYMENT FOR ITEM 630, SIGNING MISC., SOLAR POWERED LED ENHANCED (STOP (R1-1)) SIGN SHALL BE MADE AT THE CONTRACT BID PRICE, EACH, COMPLETELY INSTALLED IN PLACE AND FULLY FUNCTIONAL INCLUDING ALL MATERIAL, LABOR, AND EQUIPMENT REQUIRED TO FURNISH THE SIGN WITH SOLAR POWERED LED'S AND MOUNT THE SOLAR UNIT TO THE SIGN SUPPORT.

ITEM 630 - OVERHEAD SIGN SUPPORT, MISC.: MECHANICAL DAMPER

THIS ITEM SHALL CONSIST OF THE CONTRACTOR INSTALLING A TUNED MECHANICAL STOCKBRIDGE OR MASS-SPRING TYPE DAMPER ON A MAST ARM SUPPORT TO REDUCE THE POSSIBILITY OF HARMONIC VIBRATIONS CAUSED BY WIND LOADS. A MECHANICAL DAMPER SHALL BE APPLIED AS SHOWN IN THE PLANS. 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. VALMONT STRUCTURES MITIGATOR - MODEL TRI
4. FLORIDA DOT SPRING-MASS DAMPER - DRAWING INDEX NO. 17749
5. PATHMASTER DAMPER ASSEMBLY - DWG. U2G-1817-C

PAYMENT FOR ITEM 630 - OVERHEAD SIGN SUPPORT, MISC.: MECHANICAL DAMPER 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.

WORK INSPECTION

THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER AND THE DISTRICT TRAFFIC ENGINEER WITH 72 HOUR NOTICE OF ANY SIGNAL WORK TO BE PERFORMED AT THE INTERSECTION SITE(S) SO THAT INSPECTION SERVICES CAN BE SUPPLIED.

ITEM 632 - SIGNALIZATION, MISC.: UNLASH AND RELASH MESSENGER WIRE

THE CONTRACTOR SHALL REMOVE EXISTING MESSENGER WIRE LASHING RODS AND REINSTALL THEM AS NECESSARY FOR THE INSTALLATION OF ANY NEW CABLES ON THE EXISTING INTERSECTION SIGNAL SPANS. THE CABLES SHALL ENTER THE EXISTING STRAIN POLE THROUGH THE POLE CABLE ENTRANCE FITTING AND USE THE EXISTING CONDUIT SYSTEM TO GET TO THE CONTROLLER CABINET. THE NEW CABLES SHALL BE SUPPORTED BY A NEW CABLE SUPPORT ASSEMBLY AT THE TOP OF THE STRAIN POLE.

THE NEW SIGNAL CABLES SHALL BE BID BY SEPARATE BID ITEMS. PAYMENT FOR ITEM 632 "SIGNALIZATION MISC.: UNLASH AND RELASH MESSENGER WIRE" SHALL BE MADE AT THE CONTRACT UNIT PRICE PER FOOT AND SHALL INCLUDE ALL LABOR, MATERIALS, CABLE SUPPORT ASSEMBLIES AND EQUIPMENT TO INSTALL NEW CABLES ON EXISTING SIGNAL SPAN WIRE INSTALLATIONS.

ITEM 632 - RELAMP EXISTING SIGNAL SECTION WITH LED LAMP UNIT, AS PER PLAN

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

APPLY A BEAD OF ROOM-TEMPERATURE VULCANIZING (RTV) SILICONE TO THE SIGNAL HEAD, WASHER, AND ENTRANCE ADAPTER SERRATIONS TO PREVENT WATER INTRUSION. ALSO, FILL THE SPACE BETWEEN CONCENTRIC SERRATION RINGS ON THE TOP OF THE SIGNAL HEAD TO COMPLETELY EXCLUDE WATER FROM THE SPACE BETWEEN THE CONCENTRIC RINGS. BEFORE CLOSING SERRATIONS, APPLY A BEAD OF RTV TO ALL SERRATED SURFACES THEN TIGHTEN. RTV SILICONE SHALL BE WHITE TO FACILITATE VISUAL INSPECTION. ON HEADS WITH DUAL CONCENTRIC SERRATED RINGS, COMPLETELY FILL THE SPACE BETWEEN THE RINGS WITH RTV SILICONE.

PAYMENT FOR THIS ITEM WILL BE MADE AT THE CONTRACT UNIT PRICE PER EACH LAMP AND SHALL INCLUDE ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED TO PERFORM THIS ITEM OF WORK AS DESCRIBED ABOVE.

630 - SUPPORT FOUNDATION

PRIOR TO ORDERING THE 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.

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633 - UNINTERRUPTIBLE POWER SUPPLY (UPS), BATTERY REPLACEMENT

IN ADDITION TO THE REQUIREMENTS OF 733.09, PROVIDE FOUR (4) BATTERIES FOR EACH EXISTING UNINTERRUPTIBLE POWER SUPPLY (UPS) CABINET LOCATION SELECTED.

BATTERIES SHALL BE PROVIDED FROM THE DEPARTMENT'S QUALIFIED PRODUCT LIST.

FURNISH BATTERIES CERTIFIED BY THE MANUFACTURER TO OPERATE OVER A TEMPERATURE RANGE OF -13 DEGREES F TO +165 DEGREES F.

PLACE ALL BATTERIES ON BATTERY HEATER MATS IN THE ENCLOSURE.

BATTERIES SHALL BE WARRANTED FOR FULL REPLACEMENT FOR TWO (2) YEARS FROM DATE OF PURCHASE.

THE DEPARTMENT WILL PAY FOR ITEM 633 UNINTERRUPTIBLE POWER SUPPLY (UPS), BATTERY REPLACEMENT AT THE CONTRACT PRICE BID FOR EACH UPS LOCATION WHERE THE FOUR (4) EXISTING BATTERIES ARE REPLACED. PAYMENT SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, DISPOSAL AND OTHER INCIDENTALS NECESSARY TO REPLACE THE UPS BATTERIES COMPLETE, IN PLACE, AND ACCEPTED.

SURVEYING PARAMETERS

PROJECT CONTROL MONUMENTS GOVERN ALL POSITIONING ON ODOT PROJECTS. SEE BELOW FOR A TABLE CONTAINING PROJECT CONTROL INFORMATION.

USE THE FOLLOWING PROJECT CONTROL, VERTICAL POSITIONING AND HORIZONTAL POSITIONING PARAMETERS FOR ALL SURVEYING:

PROJECT CONTROL
POSITIONING METHOD: ODOT VRS GNSS
MONUMENT TYPE: TYPE B

VERTICAL POSITIONING
ORTHOMETRIC HEIGHT DATUM: NAVD88
GEOID: GEOID12B

HORIZONTAL POSITIONING
REFERENCE FRAME: NAD83(2011)
ELLIPSOID: GRS80
MAP PROJECTION: LAMBERT CONFORMAL CONIC
COORDINATE SYSTEM: OHIO STATE PLANE - NORTH ZONE (3401)
COMBINED SCALE FACTOR: 0.999894253
UNITLESS GRID TO GROUND MULTIPLIER: 1.000105758

USE THE POSITIONING METHODS AND MONUMENT TYPE USED IN THE ORIGINAL SURVEY TO RESTORE ALL MONUMENTS RELATED TO PROJECT CONTROL THAT ARE DAMAGED OR DESTROYED BY CONSTRUCTION ACTIVITIES. RESTORE THE DAMAGED OR DESTROYED MONUMENTS IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION 823, THE DEPARTMENT'S MAPPING AND SURVEY SPECIFICATION, AND STANDARD CONSTRUCTION DRAWING RM-1.1. PROVIDE DELIVERABLES ACCORDING TO THE DEPARTMENT'S MAPPING AND SURVEY SPECIFICATION TO THE PROJECT ENGINEER.

UNITS ARE IN U.S. SURVEY FEET. USE THE FOLLOWING CONVERSION FACTOR:
1 METER = 3.280833333 U.S. SURVEY FEET.

ITEM 809 - STOP BAR DETECTION (WAVETRONIX)

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

- POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
- 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.
- 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.
- 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.
- 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.
- A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MINIMUM 7 FEET).
- 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.

PAYMENT FOR ITEM 809 STOP-BAR RADAR DETECTION 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.

SURVEY PROJECT CONTROL TABLE

OHIO STATE PLANE - NORTH ZONE										
POINT #	PROJECT COORDINATES - U.S. SURVEY FEET			GRID-METERS			STATION	OFFSET	FEATURE	DESCRIPTION
	NORTHING	EASTING	ELEVATION	NORTHING	EASTING	ELEVATION				
GP1	536176.828	2161650.858	1069.52	163409.742	658802.825	325.990	804+78.39	41.77	IPINS	5/8_FOK
GP2	536164.910	2161257.981	1068.29	163406.110	658683.089	325.615	800+85.47	52.05	IPINS	5/8_FOK
MN10	536138.835	2161707.624	-	163398.163	658820.126	-	805+35.00	80.00	IPID	5/8_GARRETT 3974 & 5714
MN11	536317.311	2161848.974	-	163452.557	658863.205	-	806+77.09	-97.88	CMON	DISC-AZIMUTH-MARK-102A
MN12	535672.973	2160854.813	-	163256.183	658560.216	-	-	-	IPIN	1_IN_MONBOX
MN13	535793.583	2160906.524	-	163292.941	658575.976	-	-	-	MONBOX	CNO
MN14	535897.068	2161005.022	-	163324.480	658605.995	-	-	-	MONBOX	CNO
MN15	536035.940	2161060.155	-	163366.804	658622.798	-	798+87.10	180.19	MONBOX	CNO
MN16	536152.576	2161477.845	-	163402.351	658750.097	-	803+05.28	65.30	IPIN	5/8
MN17	536123.414	2161632.671	-	163393.463	658797.283	-	804+59.98	95.11	IPID	5/8_WELLER
MN18	536123.684	2161662.700	-	163393.545	658806.435	-	804+90.01	94.97	IPID	5/8_WELLER
MN19	536128.836	2161677.893	-	163395.116	658811.065	-	805+05.23	89.88	IPID	5/8_WELLER
MN20	536139.075	2161772.587	-	163398.236	658839.925	-	805+99.96	80.04	IPID	5/8_WELLER
MN21	536164.530	2161872.551	-	163405.994	658870.390	-	807+00.03	55.00	IPID	5/8_WELLER
SVC155	536172.192	2161366.508	1068.60	163408.329	658716.165	325.710	801+94.02	45.22	BM	X_CUT_TOP_W-BOLT_CONC_BASE_SGPOLE
SVT1016	536143.906	2161707.537	1063.82	163399.709	658820.099	324.253	805+34.93	74.93	BM	MAG_N/S_TPP-OE#216146-D53609

COMBINED SCALE FACTOR = 0.999894253

NOTE: BOLD ELEVATION VALUES DERIVED FROM DIFFERENTIAL LEVELING.

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GENERAL NOTES

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ITEM 614 - MAINTAINING TRAFFIC LANE CLOSURE/REDUCTION REQUIRED

LENGTH AND DURATION OF LANE CLOSURES AND RESTRICTIONS SHALL BE AT THE APPROVAL OF THE ENGINEER. IT IS THE INTENT TO MINIMIZE THE IMPACT TO THE TRAVELING PUBLIC. LANE CLOSURES OR RESTRICTIONS OVER SEGMENTS OF THE PROJECT IN WHICH NO WORK IS ANTICIPATED WITHIN A REASONABLE TIME FRAME, AS DETERMINED BY THE ENGINEER, SHALL NOT BE PERMITTED. THE LEVEL OF UTILIZATION OF MAINTENANCE OF TRAFFIC DEVICES SHALL BE COMMENSURATE WITH THE WORK IN PROGRESS.

ITEM 614 - MAINTAINING TRAFFIC (LANES OPEN DURING HOLIDAYS OR SPECIAL EVENTS)

NO WORK SHALL BE PERFORMED AND ALL EXISTING LANES SHALL BE OPEN TO TRAFFIC DURING THE FOLLOWING DESIGNATED HOLIDAYS OR EVENTS:

CHRISTMAS FOURTH OF JULY
NEW YEARS LABOR DAY
MEMORIAL DAY THANKSGIVING

THE PERIOD OF TIME THAT THE LANES ARE TO BE OPEN DEPENDS ON THE DAY OF THE WEEK ON WHICH THE HOLIDAY OR EVENT FALLS. THE FOLLOWING SCHEDULE SHALL BE USED TO DETERMINE THIS PERIOD:

DAY OF THE WEEK TIME ALL LANES MUST BE OPEN TO TRAFFIC

SUNDAY 12:00N FRIDAY THROUGH 6:00 AM MONDAY
MONDAY 12:00N FRIDAY THROUGH 6:00 AM TUESDAY
TUESDAY 12:00N MONDAY THROUGH 6:00 AM WEDNESDAY
WEDNESDAY 12:00N TUESDAY THROUGH 6:00 AM THURSDAY
THURSDAY 12:00N WEDNESDAY THROUGH 6:00 AM MONDAY
FRIDAY 12:00N THURSDAY THROUGH 6:00 AM MONDAY
SATURDAY 12:00N FRIDAY THROUGH 6:00 AM MONDAY

SHOULD THE CONTRACTOR FAIL TO MEET ANY OF THESE REQUIREMENTS, THE CONTRACTOR SHALL BE ASSESSED A DISINCENTIVE IN THE AMOUNT OF \$75 FOR EACH MINUTE THE ABOVE DESCRIBED LANE CLOSURE RESTRICTIONS ARE VIOLATED.

ITEM 614 - MAINTENANCE OF TRAFFIC SIGNAL/FLASHER INSTALLATION

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC SIGNAL/FLASHER INSTALLATIONS WITHIN THE PROJECT UNDER THE FOLLOWING CONDITIONS:

1. EXISTING SIGNAL/FLASHER INSTALLATIONS WHICH THE PLANS REQUIRE THE CONTRACTOR TO ADJUST, MODIFY, ADD ONTO OR REMOVE, OR WHICH THE CONTRACTOR ACTUALLY ADJUSTS, MODIFIES OR OTHERWISE DISTURBS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ENTIRE INSTALLATION (AT AN INTERSECTION) FROM THE TIME HIS OPERATIONS FIRST DISTURB THE INSTALLATION UNTIL THE INSTALLATION HAS BEEN SUBSEQUENTLY REMOVED OR MODIFIED AND THE WORK ACCEPTED.

2. NEW OR REUSED SIGNAL/FLASHER INSTALLATIONS OR DEVICES, INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THESE FROM THE TIME OF INSTALLATION UNTIL THE WORK IS ACCEPTED. THE EXISTING SIGNAL INSTALLATION SHALL REMAIN IN OPERATION UNTIL THE NEW/PROPOSED SIGNAL INSTALLATION IS IN PLACE AND OPERATIONAL AS APPROVED BY THE ENGINEER.

THE CONTRACTOR SHALL CORRECT AS QUICKLY AS POSSIBLE ALL OUTAGES OR MALFUNCTIONS. HE SHALL PROVIDE THE MAINTAINING AGENCY AND THE ENGINEER SUCH ADDRESSES AND PHONE NUMBERS WHERE HIS MAINTENANCE FORCES CAN BE CONTACTED. THE CONTRACTOR SHALL PROVIDE ONE OR MORE PERSONS TO RECEIVE ALL CALLS AND DISPATCH THE NECESSARY MAINTENANCE FORCES TO CORRECT OUTAGES. SUCH A PERSON OR PERSONS MAY BE USED TO PERFORM OTHER DUTIES AS LONG AS PROMPT ATTENTION IS GIVEN TO THESE CALLS AND A PERSON IS READILY AVAILABLE CONTINUOUSLY 24 HOURS A DAY, 7 DAYS A WEEK. ALL LAMP OUTAGES, CABLE OUTAGES, ELECTRICAL FAILURES, EQUIPMENT MALFUNCTIONS AND MISALIGNED SIGNAL HEADS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER WITH THE SIGNAL BACK TO SERVICE WITHIN FOUR HOURS AFTER THE CONTRACTOR HAS BEEN NOTIFIED OF THE OUTAGE.

IN THE EVENT NEW SIGNALS ARE DAMAGED PRIOR TO ACCEPTANCE, ALL DAMAGED EQUIPMENT EXCEPT POLES AND CONTROL EQUIPMENT SHALL BE REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN 8 HOURS AFTER THE CONTRACTOR'S NOTIFICATION OF THE OUTAGE. THE CONTRACTOR SHALL ARRANGE FOR FULL TRAFFIC CONTROL UNTIL THE SIGNAL IS BACK IN OPERATION.

IF POLES AND/OR CONTROL EQUIPMENT ARE DAMAGED AND MUST BE REPLACED, THE CONTRACTOR SHALL MAKE TEMPORARY REPAIRS AS NECESSARY TO BRING THE SIGNAL BACK INTO FULL OPERATION WITHIN THE ALLOWED 8-HOUR PERIOD, AND SHALL MAKE PERMANENT REPAIRS OR REPLACEMENT AS SOON THERE AFTER AS POSSIBLE.

NONE OF THE ABOVE SHALL BE CONSTRUED AS COLLECTIVE OR CONSECUTIVE OUTAGE TIME PERIODS AT ANY ONE LOCATION. THAT IS WHERE MORE THAN ONE OUTAGE OCCURS AT ANY ONE LOCATION, THEN THE ALLOTTED TIME LIMIT SHALL BE FOR THE WORST SINGLE OUTAGE.

ITEM 614 - MAINTENANCE OF TRAFFIC SIGNAL INSTALLATION (CONT.)

WHERE OUTAGES ARE THE DIRECT RESULT OF A VEHICLE ACCIDENT, THE RESPONSE OF THE CONTRACTOR SHALL BE AS OUTLINED ABOVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COLLECTION OF ANY COMPENSATION FOR THIS WORK FROM THOSE PARTIES RESPONSIBLE FOR THE DAMAGE.

WHERE THE CONTRACTOR HAS FAILED TO, OR CANNOT RESPOND TO, AN OUTAGE OR SIGNAL EQUIPMENT MALFUNCTION AT THESE LOCATIONS WITHIN HIS RESPONSIBILITY, WITHIN PERIODS AS SPECIFIED ABOVE, THE ENGINEER MAY INVOKE THE PROVISIONS OF SECTION 105.15 AND ANY SUBSEQUENT BILLINGS TO STATE OR THE CITY OF ASHLAND FOR POLICE SERVICES AND MAINTENANCE SERVICES BY CITY FORCES SHALL BE DEDUCTED FROM MONIES DUE OR TO BECOME DUE THE CONTRACTOR IN ACCORDANCE WITH PROVISIONS OF SECTION 105.15.

THE CONTRACTOR SHALL PROVIDE THE MAINTENANCE SERVICE ENTIRELY WITH HIS FORCES OR HE MAY CHOOSE TO ENTER INTO A COOPERATIVE UNDERSTANDING WITH THE LOCAL MAINTAINING AGENCY TO PROVIDE THE MAINTENANCE. THE CONTRACTOR SHALL INFORM THE ENGINEER, IN WRITING, OF THE MAINTENANCE METHOD SELECTED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO ANY TRAFFIC SIGNAL COMPONENTS REQUIRED TO BE HANDLED DURING THE RELOCATION OF POLES AND REVISIONS TO THE SIGNAL SYSTEM.

WHEN A TRAFFIC SIGNAL MUST BE TAKEN OUT OF SERVICE BY THE CONTRACTOR, DUE TO CONSTRUCTION PROCEDURES THIS OUTAGE SHALL NOT EXCEED 12 HOURS AND SHALL NOT INCLUDE THE HOURS OF 6:00 AM TO 6:00 PM. ANY SIGNALIZED INTERSECTION, WHERE THE SIGNAL IS OUT OF SERVICE DUE TO CONSTRUCTION PROCEDURES, OR DUE TO AN OUTAGE OR MALFUNCTION OF EQUIPMENT AS DESCRIBED ABOVE, SHALL BE PROTECTED, BY THE CONTRACTOR, BY THE INSTALLATION OF TEMPORARY "STOP" SIGNS. ANY VEHICULAR TRAFFIC SIGNAL HEAD, EITHER NEW OR EXISTING WHICH WILL BE OUT OF OPERATION SHALL BE COVERED IN THE MANNER DESCRIBED IN 632.25.

THE CONTRACTOR SHALL MAINTAIN COMPLETE RECORDS OF MALFUNCTIONS INCLUDING:

- 1. TIME OF NOTIFICATION OF MALFUNCTION;
- 2. TIME OF WORK CREWS ARRIVAL TO CORRECT THE MALFUNCTION;
- 3. ACTIONS TAKEN TO CORRECT THE MALFUNCTION, INCLUDING A LIST OF PARTS REPAIRED OR REPLACED;
- 4. A DIAGNOSIS OF REASON FOR THE MALFUNCTION AND PROBABILITY OF REOCCURRENCE;
- 5. TIME OF COMPLETION OF THE REPAIR AND SYSTEM RESTORED TO FULL SERVICE.

A COPY OF THESE RECORDS SHALL BE PROVIDED TO THE ENGINEER WITHIN THREE (3) WORKING DAYS FOLLOWING COMPLETION OF EACH REPAIR. ALL COSTS RESULTING FROM THE ABOVE REQUIREMENTS SHALL BE CONSIDERED TO BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614, MAINTAINING TRAFFIC.

ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE DURING CONSTRUCTION OPERATIONS

IN ADDITION TO THE REQUIREMENTS OF CMS 614 AND THE LATEST EDITION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD), A UNIFORMED LAW ENFORCEMENT OFFICER (AND OFFICIAL PATROL CAR WITH MOUNTED EMERGENCY FLASHING LIGHTS) SHALL BE PROVIDED FOR CONTROLLING TRAFFIC FOR THE FOLLOWING TASKS AS DIRECTED BY THE ENGINEER:

FOR LANE CLOSURES: DURING INITIAL SET-UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED.

DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED.

DURING A TRAFFIC SIGNAL INSTALLATION.

LAW ENFORCEMENT OFFICERS (LEO'S) SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED. THE LEO'S ARE CONSIDERED TO BE EMPLOYED BY THE CONTRACTOR AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR ACTIONS. ALTHOUGH THEY ARE EMPLOYED BY THE CONTRACTOR, THE PROJECT ENGINEER SHALL HAVE CONTROL OVER THEIR PLACEMENT. THE OFFICIAL PATROL CAR SHALL BE A PUBLIC SAFETY VEHICLE AS REQUIRED BY THE OHIO REVISED CODE. THE CONTRACTOR SHALL PROVIDE THE LEO WITH A TWO WAY COMMUNICATION DEVICE WHICH SHALL BE RETURNED TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT.

LEO'S SHOULD NOT FORGO THEIR TRAFFIC CONTROL RESPONSIBILITIES TO APPREHEND MOTORISTS FOR ROUTINE TRAFFIC VIOLATIONS. HOWEVER, IF A MOTORIST'S ACTIONS ARE CONSIDERED TO BE RECKLESS, THEN PURSUIT OF THE MOTORIST IS APPROPRIATE.

THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THESE SERVICES AND PROVIDE 72 HOURS ADVANCE NOTICE AS REQUIRED BY THE HIGHWAY PATROL LISTED BELOW:

STATE HIGHWAY PATROL
LORAIN COUNTY
38000 CLETUS DRIVE
ELYRIA, OHIO 44035
440-365-5045 *4020

MEDINA COUNTY
3149 FRANTZ ROAD
MEDINA, OHIO 44256
330-725-4921 *4021

LAW ENFORCEMENT OFFICERS WITH PATROL CAR REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE. THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE 70 HOURS

THE HOURS PAID SHALL INCLUDE MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED.

IF THE CONTRACTOR WISHES TO UTILIZE LEO'S FOR FLAGGING AND TRAFFIC CONTROL OTHER THAN FOR THAT REQUIRED IN THESE PLANS, THEY MAY DO SO AT THEIR OWN EXPENSE.

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MAINTENANCE OF TRAFFIC

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NOTES:

- REPLACE 1 STOP SIGN ON ALL 4 CORNERS (RIGHT SIDE), 1 LED ENHANCED SHEET PER APPROACH. ALL SIGNS SHALL BE MOUNTED ON DUAL NO. 3 POSTS.
- REMOVE EXISTING OVERHEAD FLASHERS.
- CONTRACTOR SHALL COORDINATE WITH AMERICAN ELECTRIC POWER TO DISCONNECT/REMOVE SERVICE DROP. THIS WORK IS INCIDENTAL TO REMOVAL OF TRAFFIC SIGNAL INSTALLATION.

ITEM	QUANTITY	UNIT	DESCRIPTION
625	2	EACH	PULL BOX REMOVED
630	4	EACH	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL
630	8	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL
630	4	EACH	SIGNING, MISC.: SOLAR POWERED LED ENHANCED (R1-1-36, 36x36)
630	128	FT	GROUND MOUNTED SUPPORT, NO. 3 POST
632	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION

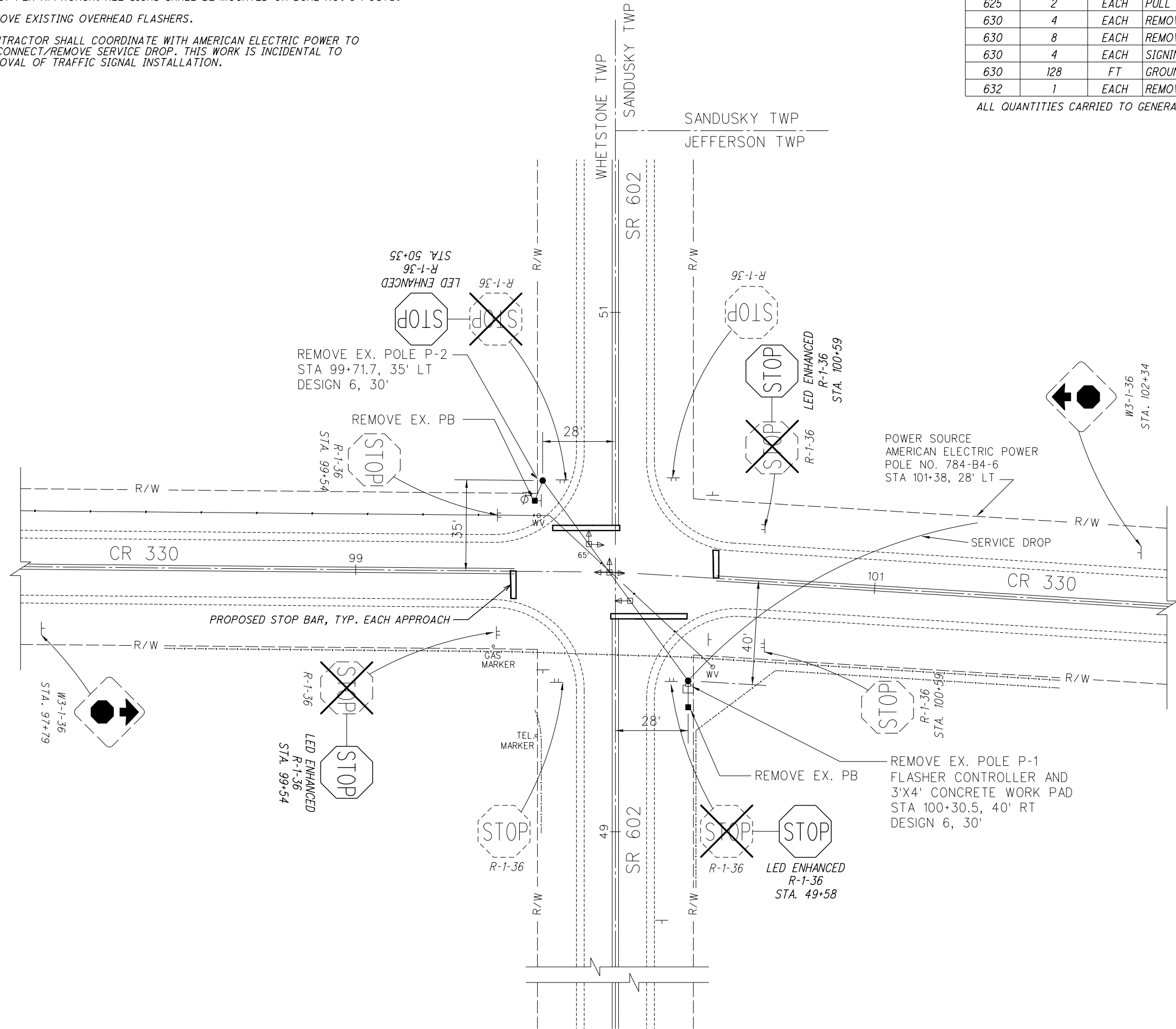
ALL QUANTITIES CARRIED TO GENERAL SUMMARY.

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HORIZONTAL SCALE IN FEET

**TRAFFIC SIGNAL PLAN
CRA SR 602 & LINCOLN HWY**

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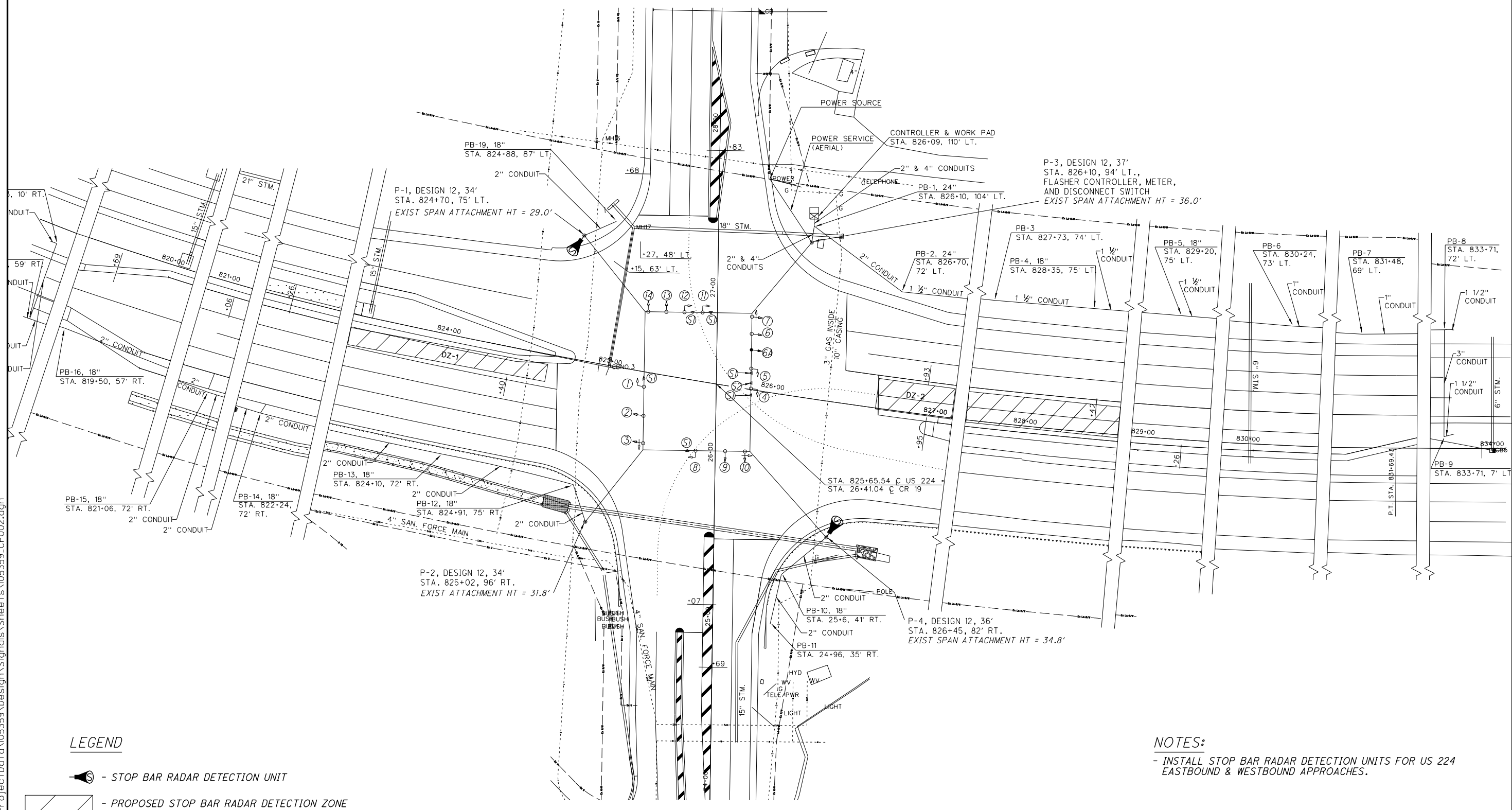
**TRAFFIC SIGNAL PLAN
MED US 224 & LAKE RD**

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ITEM	QUANTITY	UNIT	DESCRIPTION
632	340	FT	SIGNALIZATION, MISC.: UNLASH AND RELASH MESSENGER
809	2	EACH	STOP BAR RADAR DETECTION (WAVETRONIX)

ALL QUANTITIES CARRIED TO THE GENERAL SUMMARY.



LEGEND

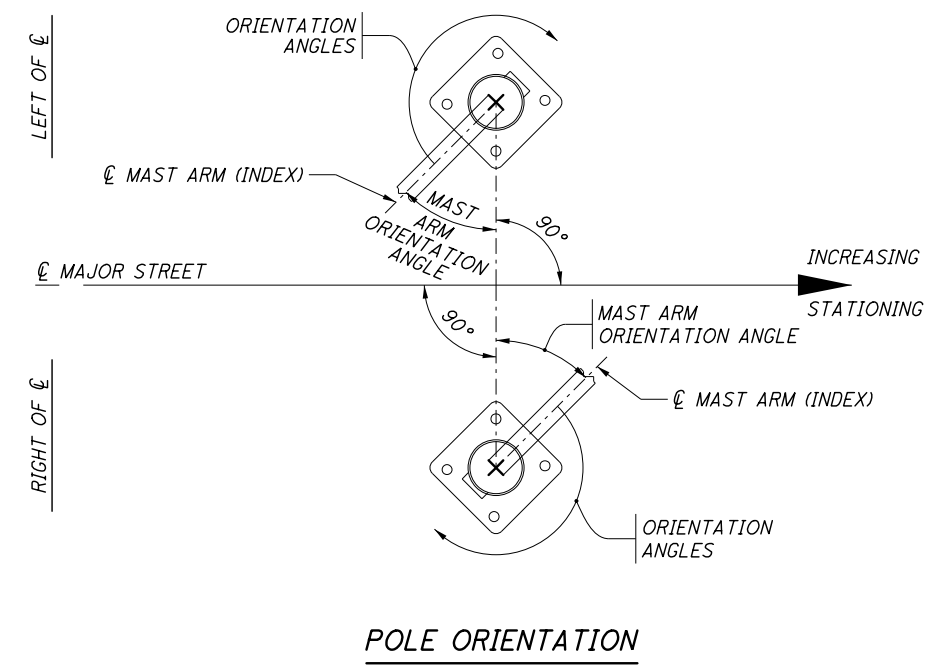
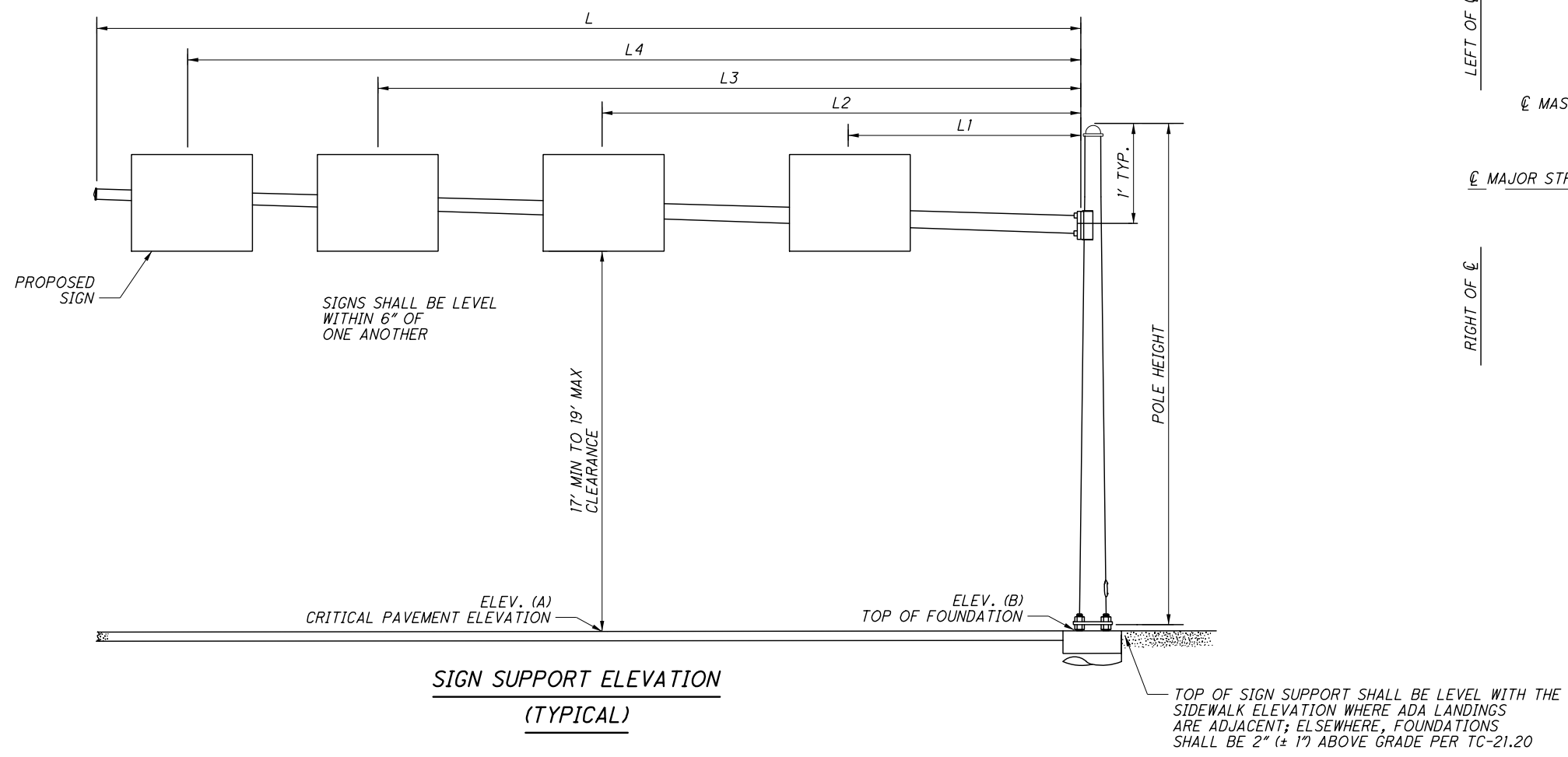
- STOP BAR RADAR DETECTION UNIT

- PROPOSED STOP BAR RADAR DETECTION ZONE

NOTES:

- INSTALL STOP BAR RADAR DETECTION UNITS FOR US 224 EASTBOUND & WESTBOUND APPROACHES.

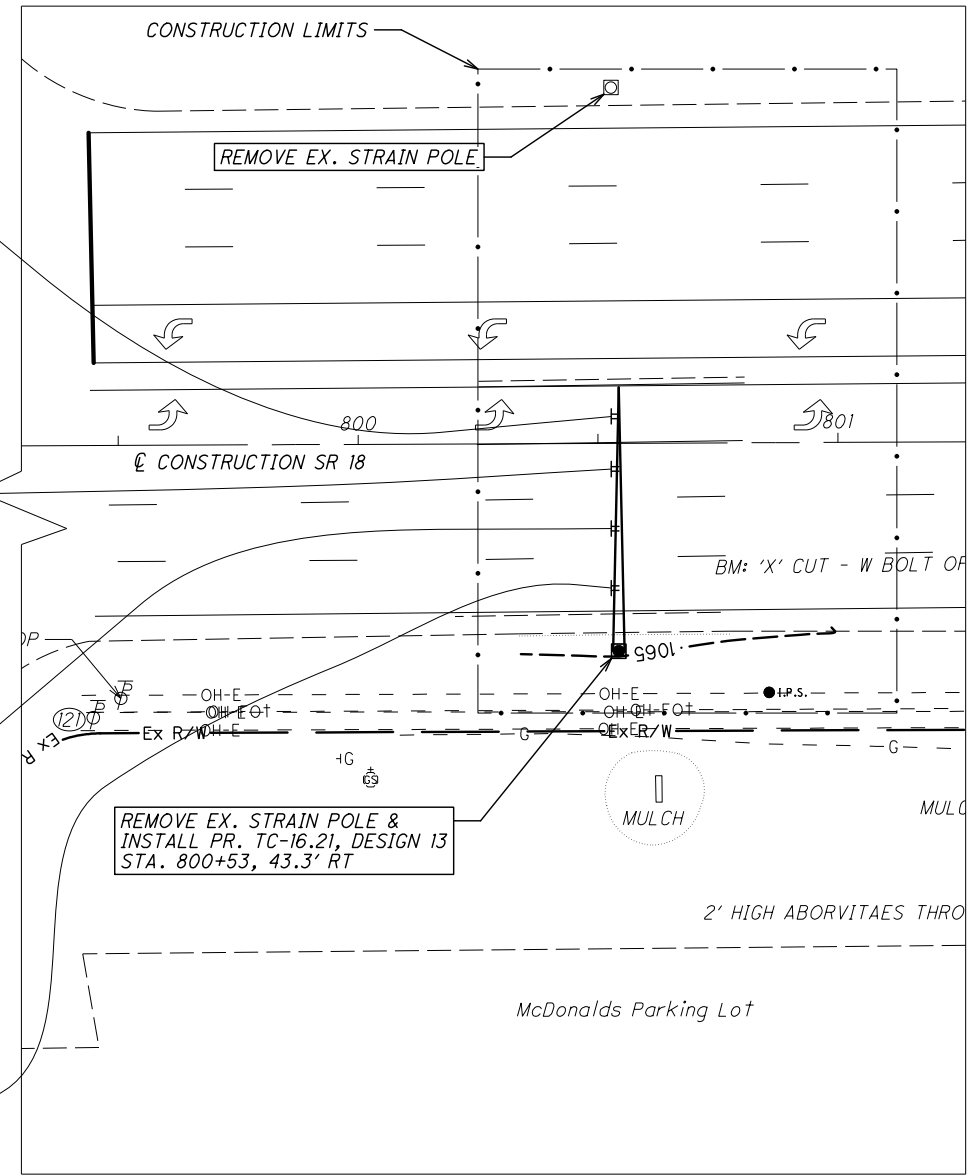
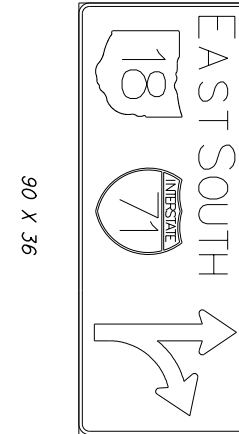
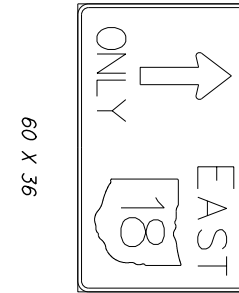
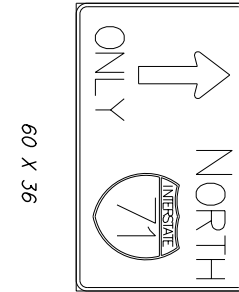
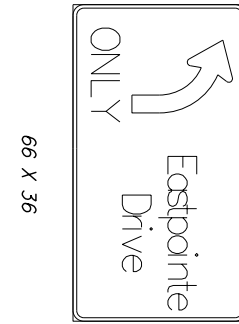
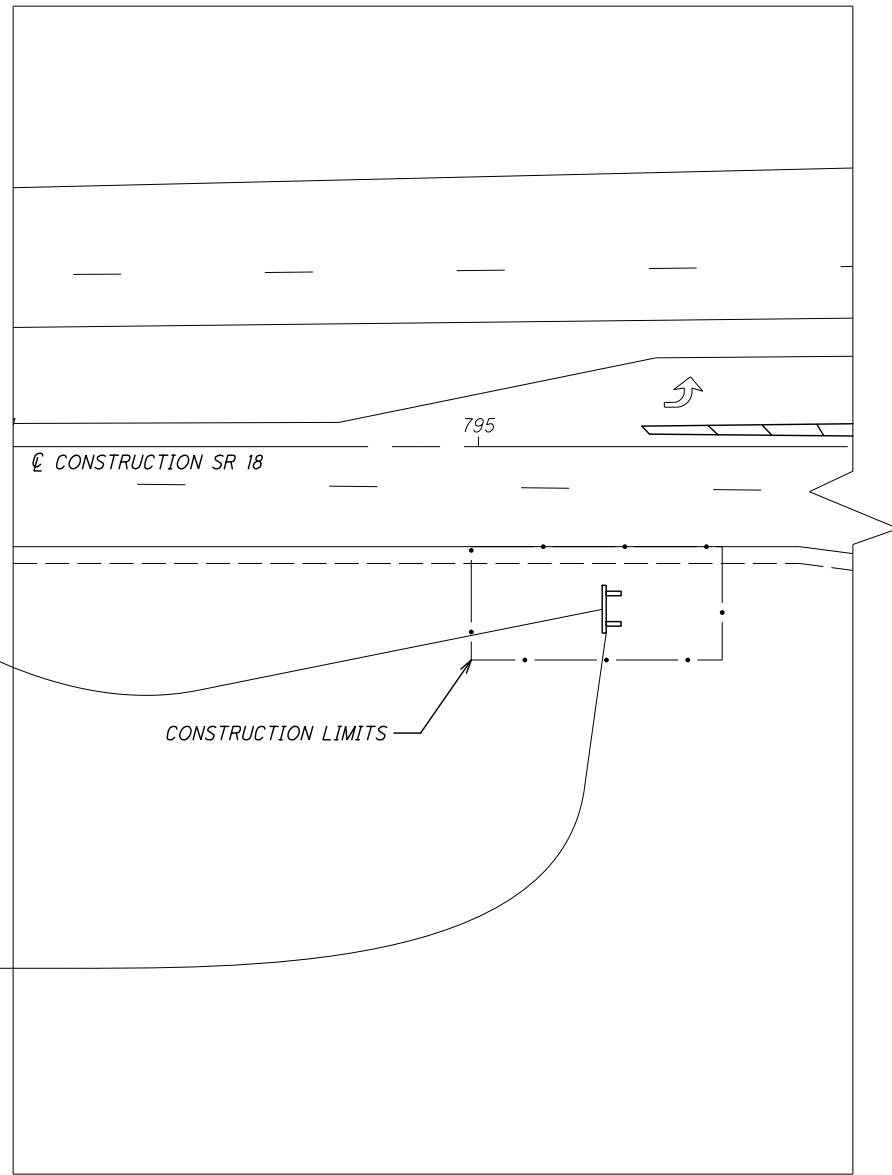
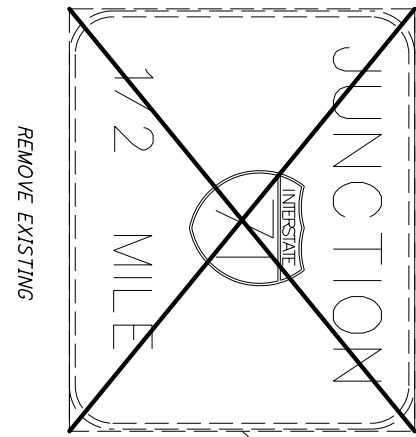
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OVERHEAD SIGN SUPPORT

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGN SUPPORT DETAILS										ORIENTATION ANGLES FROM MAST ARM									
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	L	L1	L2	L3	L4	D1	D2	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	CONTROLLER	BRACKET ARM	HANDHOLE	CABLE ENTRANCE 12" FROM TOP	
			FT	FT																				FT
1	800+53	43.3'	1064.21	1064.77	TC-16.21	13	20	55	14	26	38	50	-	-	0°	-	-	-	-	-	-	-	180°	-
2	805+04	45.3'	1070.19	1070.10	TC-16.21	12	21	45	16	28	40	-	-	0°	-	-	-	-	-	-	-	180°	-	

I:\ProjectData\05359\Design\Traffic\Sheets\05359_IP001.dgn



ITEM	QUANTITY	UNIT	DESCRIPTION
625	1	EACH	GROUND ROD
630	1	EACH	REMOVAL OF GROUND MOUNTED MAJOR SIGN AND DISPOSAL
630	2	EACH	REMOVAL OF GROUND MOUNTED STRUCTURAL BEAM SUPPORT AND DISPOSAL
630	2	EACH	REMOVAL OF OVERHEAD SIGN SUPPORT AND DISPOSAL
630	38	FT	GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W10x12
630	2	EACH	BREAKAWAY STRUCTURAL BEAM CONNECTION
630	60	SF	SIGN, GROUND MOUNTED EXTRUSHEET
630	69	SF	SIGN, OVERHEAD EXTRUSHEET
630	4	EACH	SIGN ATTACHMENT ASSEMBLY, MAST ARM
630	2	EACH	GROUND MOUNTED STRUCTURAL BEAM SUPPORT FOUNDATION
630	1	EACH	OVERHEAD SIGN SUPPORT, TYPE TC-16.21, DESIGN 13
630	1	EACH	RIGID OVERHEAD SIGN SUPPORT FOUNDATION
630	1	EACH	OVERHEAD SIGN SUPPORT, MISC.: MECHANICAL DAMPER

ALL QUANTITIES CARRIED TO GENERAL SUMMARY.

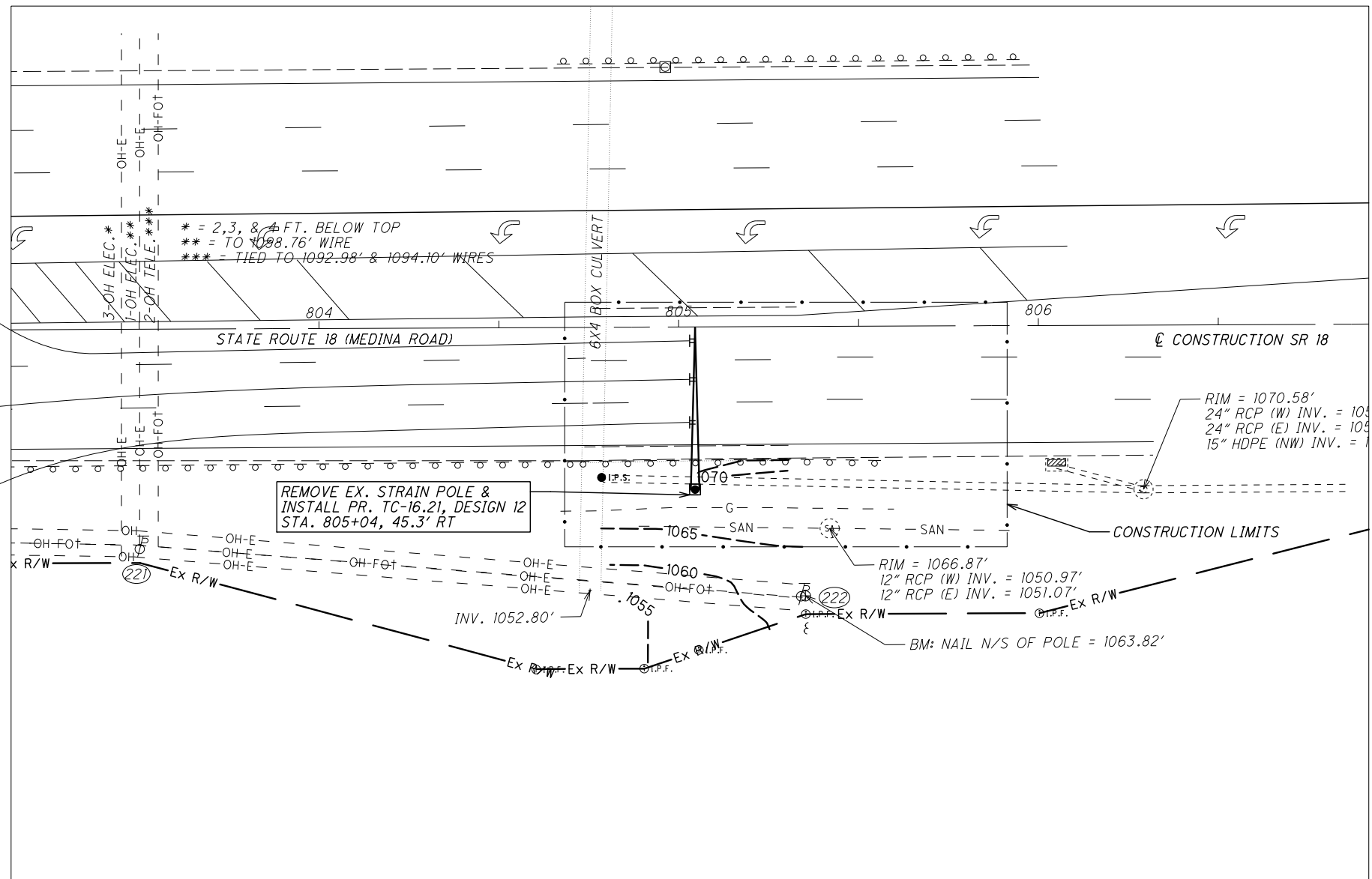
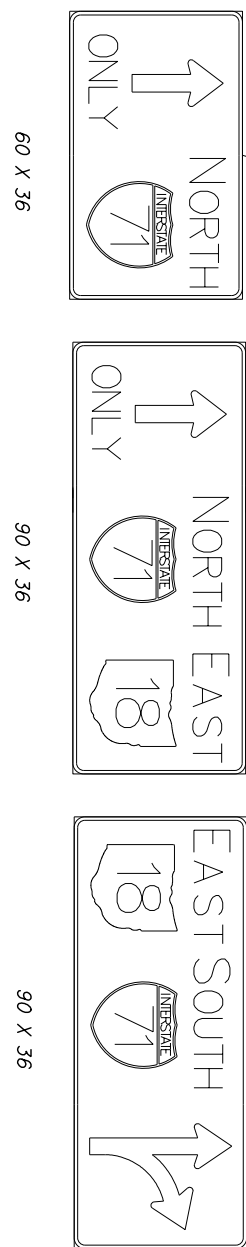
NOTES:

SIGN DESIGN FILES ARE AVAILABLE UPON REQUEST FROM THE DISTRICT 3 PLANNING DEPARTMENT.



SIGNING PLAN
MED SR 18, STA. 795+00 TO STA. 800+53

D03-TSG-FY2020



NOTES:

SIGN DESIGN FILES ARE AVAILABLE UPON REQUEST FROM THE DISTRICT 3 PLANNING DEPARTMENT.

ITEM	QUANTITY	UNIT	DESCRIPTION
625	1	EACH	GROUND ROD
630	1	EACH	REMOVAL OF OVERHEAD SIGN SUPPORT AND DISPOSAL
630	60	SF	SIGN, OVERHEAD EXTRUSHEET
630	3	EACH	SIGN ATTACHMENT ASSEMBLY, MAST ARM
630	1	EACH	OVERHEAD SIGN SUPPORT, TYPE TC-16.21, DESIGN 12
630	1	EACH	RIGID OVERHEAD SIGN SUPPORT FOUNDATION

ALL QUANTITIES CARRIED TO GENERAL SUMMARY.

CALCULATED
MAE
CHECKED
CAD

0 20 40
HORIZONTAL
SCALE IN FEET

SIGNING PLAN
MED SR 18, STA. 805+04

D03-TSG-FY2020