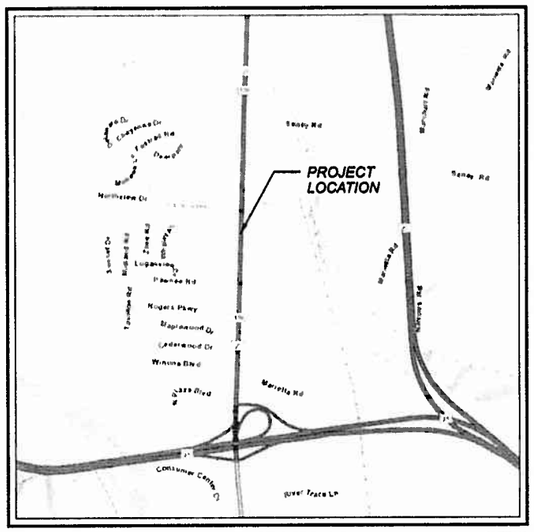
ROS - SR 159-0.79 Signal Project
218008 PID - 114216
Dist 9 5/13/2021

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

ROS-159 SIGNAL UPGRADES 2020

CITY OF CHILLICOTHE

ROSS COUNTY



LOCATION MAP

LATITUDE: 39°55'64" LONGITUDE: 84°23'32"

PORTION TO BE IMPROVED
INTERSTATE HIGHWAY
FEDERAL ROUTES
STATE ROUTES
COUNTY & TOWNSHIP ROADS
OTHER ROADS

DESIGN DESIGNATION

CURRENT ADT (2020)	40,600
DESIGN YEAR ADT (2020)	40,600
DESIGN HOURLY VOLUME (2020)	3,711
DIRECTIONAL DISTRIBUTION	54%
TRUCKS (24 HOUR B&C)	2,700
DESIGN SPEED	VARIES
LEGAL SPEED	VARIES

DESIGN FUNCTIONAL CLASSIFICATION:
URBAN ARTERIAL
NHS PROJECT

DESIGN EXCEPTIONS

NONE

UNDERGROUND UTILITIES
OHIO811.org Before You Dig

PLAN PREPARED BY:
CMT
CRAWFORD, MURPHY & TILLY, INC.

INDEX OF SHEETS:

ENGINEER'S SEAL:

STATE OF OHIO Kevin R. Miller E-67093 REGISTERED PROFESSIONAL ENGINEER

SIGNED: K-M
DATE: 12/11/2020

ENGINEER'S SEAL:

SIGNED:
DATE:

STANDARD CONSTRUCTION DRAWINGS		SUPPLEMENTAL SPECIFICATIONS		SPECIAL PROVISIONS
MT-95.30	7/19/19	800-2020	1/15/21	
MT-95.31	7/19/19	809	7/17/20	
MT-95.32	4/19/19			
MT-97.10	4/19/19			
TC-9.31	4/17/20			
TC-21.11	4/17/20			
TC-22.20	1/17/14			
TC-71.10	1/19/18			
TC-83.10	1/17/20			
TC-85.20	7/20/18			
ITS-60.10	7/17/20			

FEDERAL PROJECT NUMBER

E210059

RAILROAD INVOLVEMENT

NONE

PROJECT DESCRIPTION

MINOR EQUIPMENT UPGRADES TO EIGHT TRAFFIC SIGNALS ON BRIDGE STREET CORRIDOR. ALSO IMPLEMENTATION OF A QUEUE DETECTION SYSTEM FOR EB US ROUTE 35.

EARTH DISTURBED AREAS

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

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.

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.

APPROVED Michael J. Ambrosius
DATE 04-07-2021 DISTRICT DEPUTY DIRECTOR

APPROVED Jack Marchbanks / DES
DATE 4/9/21 DIRECTOR, DEPARTMENT OF TRANSPORTATION

TITLE SHEET

DESIGN AGENCY
CMT
CRAWFORD, MURPHY & TILLY, INC.
84 RESEARCH BOULEVARD
DAYTON, OHIO 45430
PH (937)781-2163
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DESIGNER LDW
REVIEWER KRM 03/23/21
PROJECT ID 114216
SHEET 1 TOTAL 13

ROS-159 SIGNAL UPGRADES 2020
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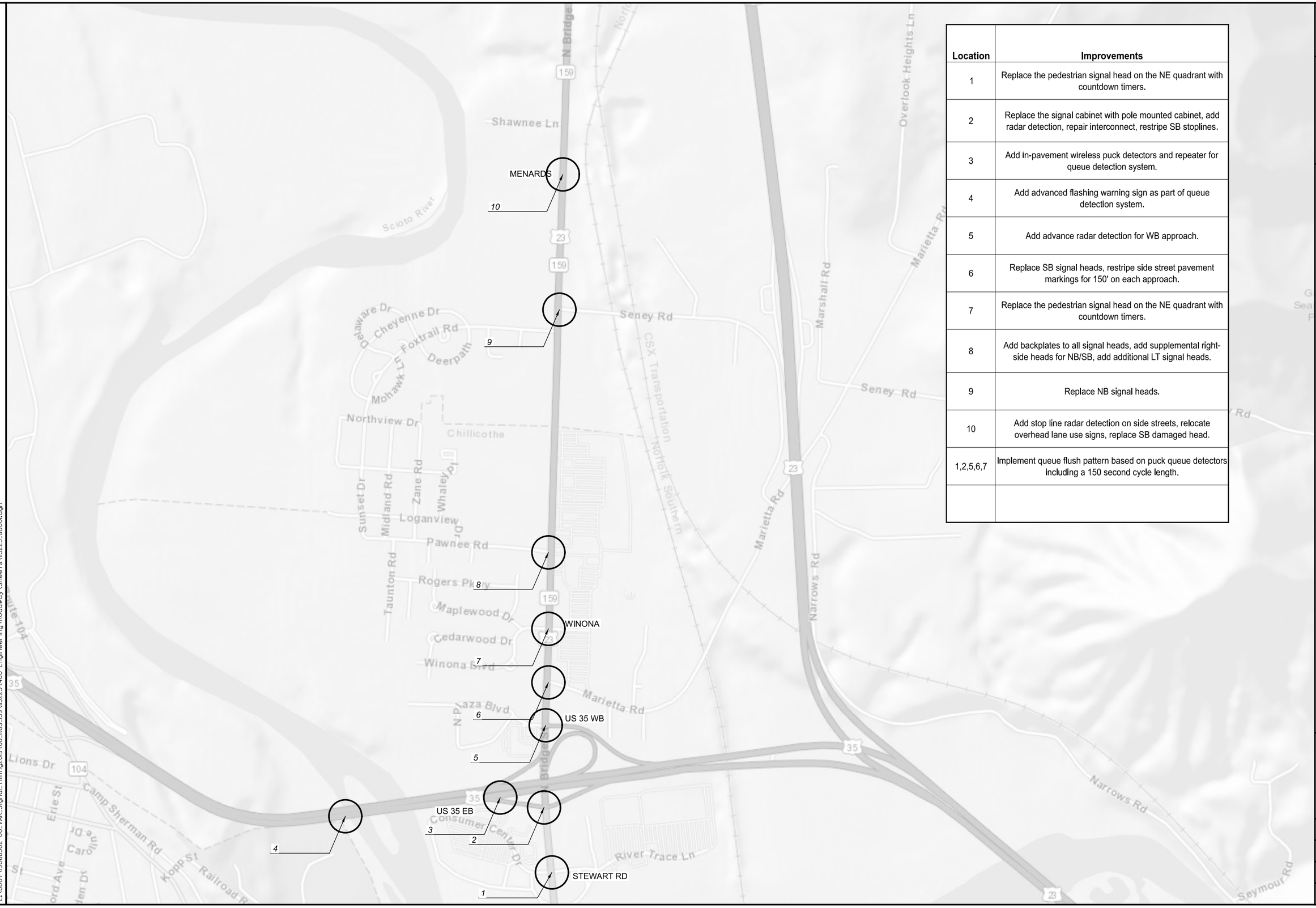

Location	Improvements
1	Replace the pedestrian signal head on the NE quadrant with countdown timers.
2	Replace the signal cabinet with pole mounted cabinet, add radar detection, repair interconnect, restripe SB stoplines.
3	Add in-pavement wireless puck detectors and repeater for queue detection system.
4	Add advanced flashing warning sign as part of queue detection system.
5	Add advance radar detection for WB approach.
6	Replace SB signal heads, restripe side street pavement markings for 150' on each approach.
7	Replace the pedestrian signal head on the NE quadrant with countdown timers.
8	Add backplates to all signal heads, add supplemental right-side heads for NB/SB, add additional LT signal heads.
9	Replace NB signal heads.
10	Add stop line radar detection on side streets, relocate overhead lane use signs, replace SB damaged head.
1,2,5,6,7	Implement queue flush pattern based on puck queue detectors including a 150 second cycle length.

HORIZONTAL SCALE IN FEET
0 1500 3000 6000

SCHEMATIC PLAN

ROS-159 SIGNAL UPGRADES 2020

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DESIGN AGENCY
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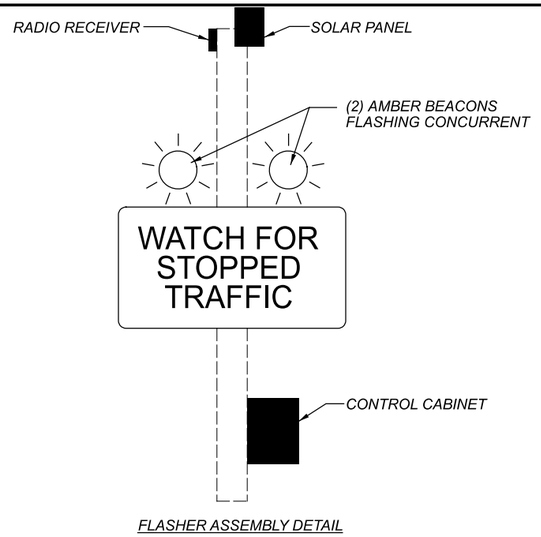
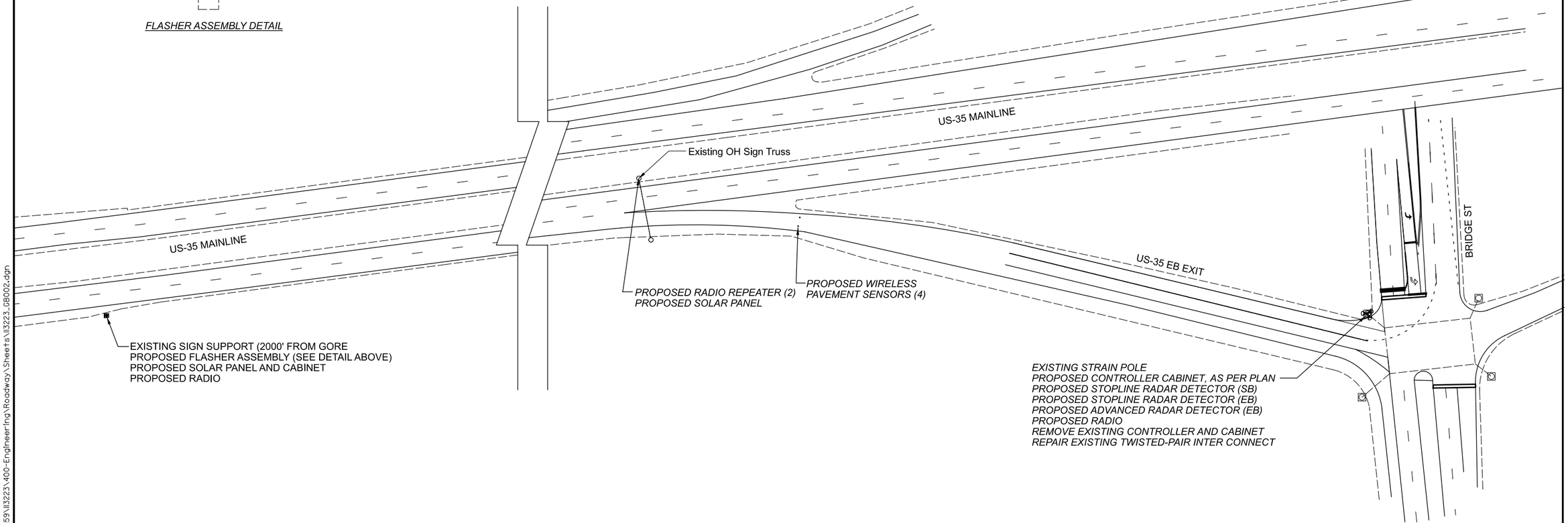
DESIGNER LDW
REVIEWER KRM 03/23/21
PROJECT ID 114216
SHEET 2 TOTAL 13



FLASHER ASSEMBLY DETAIL



HORIZONTAL SCALE IN FEET
0 50 100 200

SCHEMATIC PLAN

ROS-159 SIGNAL UPGRADES 2020

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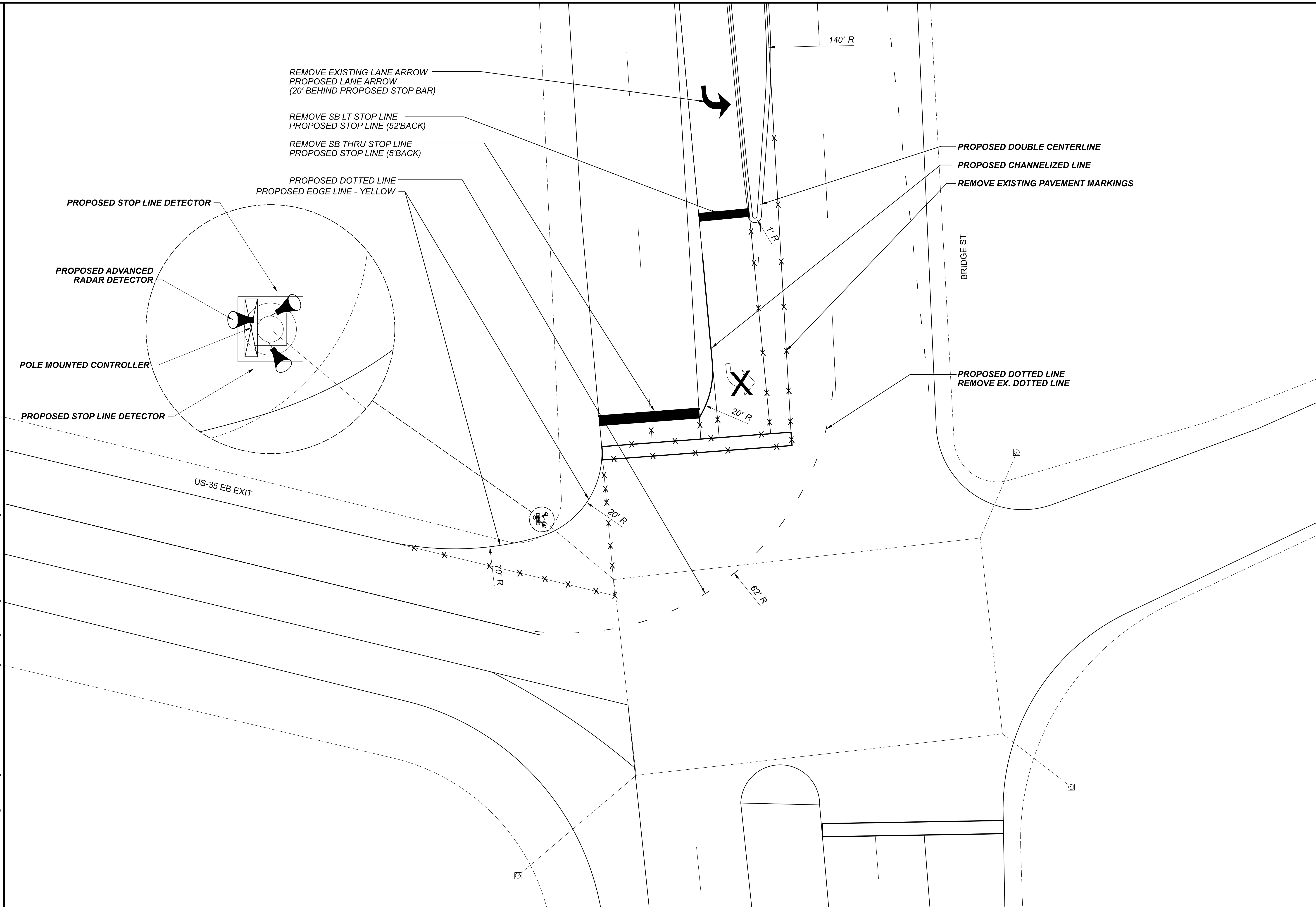
DESIGNER: LDW
REVIEWER: KRM 11/13/20
PROJECT ID: 114216
SHEET: 3 TOTAL: 12



HORIZONTAL SCALE IN FEET

0 5 10 20

INTERSECTION DETAIL
SR 35 RAMPS/BRIDGE ST

DESIGN AGENCY

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DESIGNER	LDW
REVIEWER	KRM 03/23/21
PROJECT ID	114216
SHEET 4	TOTAL 13

ROS-159 SIGNAL UPGRADES 2020

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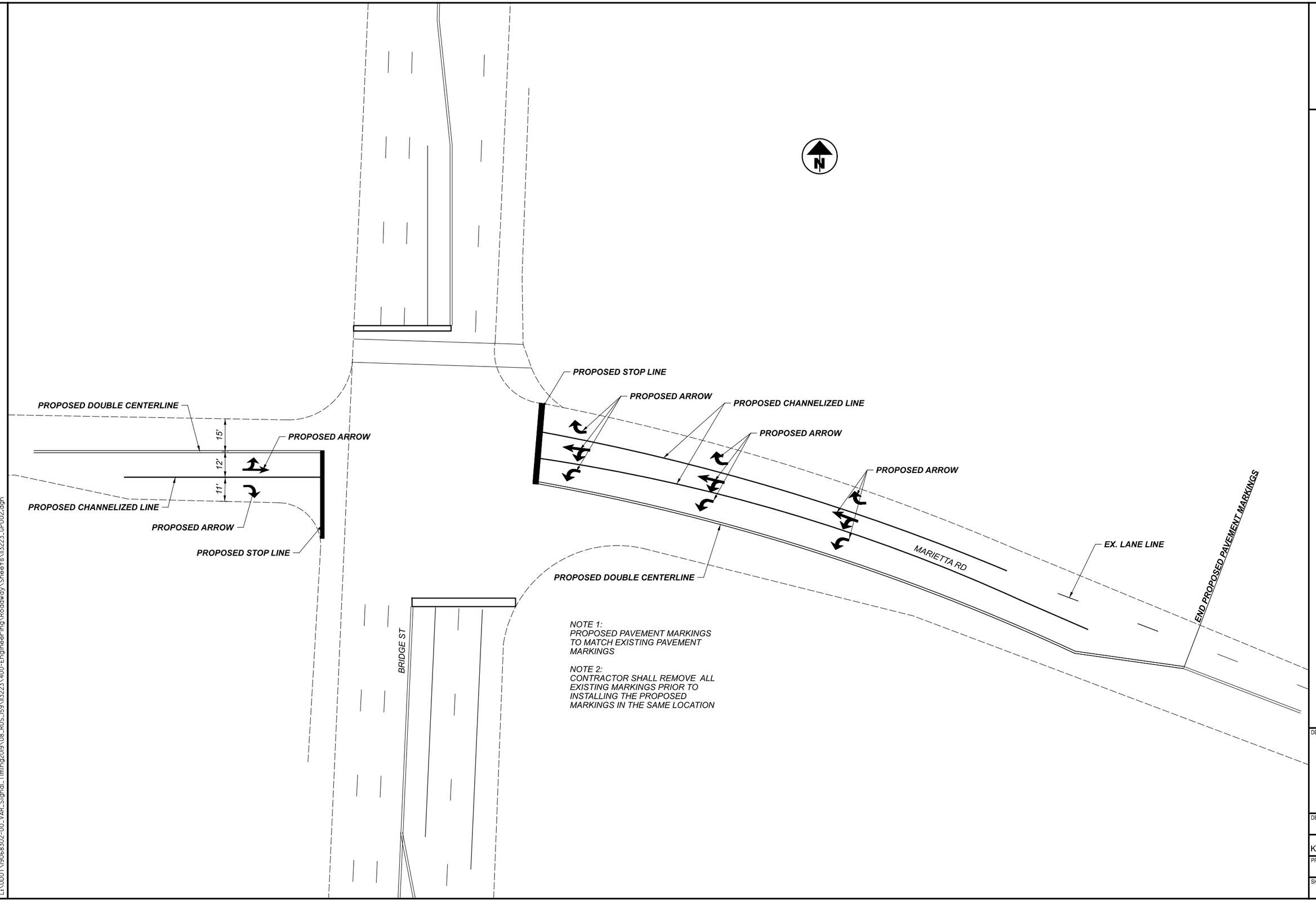

NOTE 1:
PROPOSED PAVEMENT MARKINGS TO MATCH EXISTING PAVEMENT MARKINGS

NOTE 2:
CONTRACTOR SHALL REMOVE ALL EXISTING MARKINGS PRIOR TO INSTALLING THE PROPOSED MARKINGS IN THE SAME LOCATION

HORIZONTAL SCALE IN FEET
0 10 20 40

INTERSECTION DETAIL
MARIETTA RD/BRIDGE ST

ROS-159 SIGNAL UPGRADES 2020

MODEL: Sheet PAPERSIZE: 34x22 (in) DATE: 4/6/2021 TIME: 6:24:47 AM USER: lwilson
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DESIGN AGENCY
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(937) 972-7500

DESIGNER: LDW
REVIEWER: KRM 03/23/21
PROJECT ID: 114216
SHEET 5 TOTAL 13

GENERAL REQUIREMENTS

THE PURPOSE OF THIS SPECIFICATION AND THE ASSOCIATED PLANS IS TO COMPLETE MINOR UPGRADES AT 9 EXISTING SIGNALIZED INTERSECTIONS IN THE CITY OF CHILLICOTHE, OHIO. THESE PLANS AND SPECIFICATIONS ARE TO RESULT IN THE COMPLETE UPGRADE OF FULLY FUNCTIONAL TRAFFIC SIGNALS AND SHALL OPERATE ACCORDING TO THE REQUIREMENTS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD).

BIDDERS SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE OHIO REVISED CODE AND ADMINISTRATIVE CODE.

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:

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 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 THEREAFTER 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.

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 THE STATE OR THE CITY FOR POLICE SERVICES AND MAINTENANCE SERVICES BY STATE/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 4 HOURS AND SHALL NOT INCLUDE THE HOURS OF 7 AM TO 9 AM OR 4 PM to 6 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 RE-OCCURRENCE
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

USE OF LAW ENFORCEMENT OFFICERS (LEOS) BY CONTRACTORS OTHER THAN THE USES SPECIFIED BELOW WILL NOT BE PERMITTED AT PROJECT COST. LEOS SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED. IN ADDITION TO THE REQUIREMENTS OF CMS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHALL BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

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

2. DURING A TRAFFIC SIGNAL INSTALLATION WHEN IMPACTING THE NORMAL FUNCTION OF THE SIGNAL OR THE FLOW OF TRAFFIC OR WHEN TRAFFIC NEEDS TO BE DIRECTED THROUGH AN ENERGIZED TRAFFIC SIGNAL CONTRARY TO THE SIGNAL DISPLAY (E.G., DIRECTING MOTORISTS THROUGH A RED LIGHT). IN ADDITION TO THE REQUIREMENT OF CMS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHOULD BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

A. 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 FOR LONG-TERM LANE CLOSURES/SHIFTS (FOR THE FIRST AND LAST DAY OF MAJOR CHANGES IN TRAFFIC CONTROL SETUP). IN GENERAL, LEOS SHOULD BE POSITIONED AT THE POINT OF LANE RESTRICTION OR ROAD CLOSURE AND TO MANUALLY CONTROL TRAFFIC MOVEMENTS THROUGH INTERSECTIONS IN WORK ZONES.

B. WHEN CONSTRUCTION VEHICLES ARE ENTERING/EXITING THE ZONE DIRECTLY FROM/INTO AN OPEN LANE OF TRAFFIC. IF A LANE HAS BEEN CLOSED TO PROVIDE AN ACCELERATION/DECELERATION LANE FOR THE VEHICLE, THE LEO WILL NOT BE REQUIRED.

LEOS 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 LEOS WORK AT THE DIRECTION OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SERVICES OF THE LEOS WITH THE APPROPRIATE AGENCIES AND COMMUNICATING THE INTENTIONS OF THE PLANS WITH RESPECT TO DUTIES OF THE LEOS. THE ENGINEER SHALL HAVE FINAL CONTROL OVER THE LEOS' DUTIES AND PLACEMENT, AND WILL RESOLVE ANY ISSUES THAT MAY ARISE BETWEEN THE TWO PARTIES. THE LEO SHALL REPORT IN TO THE CONTRACTOR PRIOR TO THE START OF THE SHIFT, IN ORDER TO RECEIVE INSTRUCTIONS REGARDING SPECIFIC WORK ASSIGNMENTS DURING HIS/HER SHIFT. THE LEO IS EXPECTED TO STAY AT THE PROJECT SITE FOR THE ENTIRE DURATION OF HIS/HER SHIFT. THE LEO SHALL REPORT TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. ONCE THE LEO HAS COMPLETED THE DUTIES DESCRIBED ABOVE AND STILL HAS TIME REMAINING ON HIS/HER SHIFT, THE LEO MAY BE ASKED TO PATROL THROUGH THE WORK ZONE (WITH FLASHING LIGHTS OFF) OR BE PLACED AT A LOCATION TO DETER MOTORISTS FROM SPEEDING. SHOULD IT BE NECESSARY TO LEAVE THE PROJECT SITE, THE LEO SHALL NOTIFY THE ENGINEER.
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. LEOS (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 QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY. ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE 50 HOURS.

THE HOURS PAID SHALL INCLUDE ANY MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED. ANY ADDITIONAL COSTS (ADMINISTRATIVE OR OTHERWISE) INCURRED BY THE CONTRACTOR TO OBTAIN THE SERVICES OF AN LEO ARE INCLUDED WITH THE BID UNIT PRICE FOR ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE.

DETECTION MAINTENANCE

IF VEHICLE DETECTION BECOMES UNEXPECTEDLY DISABLED, REQUIRES MODIFICATION, OR IS SCHEDULED TO BE TEMPORARILY REMOVED DURING THE CONSTRUCTION PROJECT, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT ENGINEER AND DISTRICT TRAFFIC ENGINEER.

IF THE LOSS OF VEHICLE DETECTION IS KNOWN PRIOR TO THE START OF CONSTRUCTION, IT SHALL BE DISCUSSED AT THE PRECONSTRUCTION MEETING. AT SUCH TIME, THE DISTRICT TRAFFIC ENGINEER SHALL ADVISE THE PROJECT ENGINEER AND CONTRACTOR ON THE APPROPRIATE ACTION TO RECTIFY ANY LOSS OF VEHICLE DETECTION. THIS MAY INCLUDE PLACING THE TRAFFIC SIGNAL ON MINIMUM OR MAXIMUM RECALL, MODIFYING THE MINIMUM GREEN TIMES, AND REMOVING THE MALFUNCTIONING DETECTION FROM SERVICE. WHERE NONINTRUSIVE DETECTION (I.E. VIDEO, RADAR) ALREADY EXISTS, THE CONTRACTOR SHALL INSURE THAT DETECTION IS OPERATING AND MAINTAINED BY RECONFIGURING THE DETECTION UNITS ACCORDINGLY DURING ALL CONSTRUCTION PHASES. THIS IS TO AVOID THE SIGNAL FROM MAXING OUT THE EFFECTED SIGNAL PHASE AND CREATING UNNECESSARY DELAYS.

LOCATIONS WHERE NON-INTRUSIVE DETECTION IS PROPOSED AND THE EXISTING VEHICLE DETECTION IS TO BE ABANDONED, THE NON-INTRUSIVE VEHICLE DETECTION SHALL BE INSTALLED, CONFIGURED AND MADE FULLY FUNCTIONAL PRIOR TO THE EXISTING DETECTION BEING DISABLED. THE CONTRACTOR SHALL CONTINUE TO MAINTAIN AND MODIFY THE DETECTION UNTIL FINAL ACCEPTANCE OF THE TRAFFIC SIGNAL. THIS IS TO ENSURE VEHICLE DETECTION REMAINS FULLY FUNCTIONAL THROUGHOUT CONSTRUCTION.

NOTIFICATION OF TRAFFIC RESTRICTION

THROUGHOUT THE DURATION OF THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IN WRITING OF ALL TRAFFIC RESTRICTIONS AND UPCOMING MAINTENANCE OF TRAFFIC CHANGES. THE CONTRACTOR SHALL ENSURE THE WRITTEN NOTIFICATION IS SUBMITTED IN A TIMELY MANNER TO ALLOW THE PROJECT ENGINEER TO MEET THE REQUIRED TIME FRAMES SET FORTH IN THE TABLE BELOW. THIS NOTIFICATION SHALL BE RECEIVED BY THE PROJECT ENGINEER PRIOR TO THE PHYSICAL SETUP OF ANY APPLICABLE SIGNS OR MESSAGE BOARDS.

INFORMATION SHOULD INCLUDE BUT IS NOT LIMITED TO ALL CONSTRUCTION ACTIVITIES THAT IMPACT OR INTERFERE WITH TRAFFIC AND SHOULD LIST THE SPECIFIC LOCATION, TYPE OF WORK, ROAD STATUS, DATE AND TIME OF RESTRICTION, DURATION OF RESTRICTION, NUMBER OF LANES MAINTAINED, DETOUR ROUTES IF APPLICABLE, AND ANY OTHER INFORMATION REQUESTED BY THE PROJECT ENGINEER.

ANY UNFORESEEN CONDITIONS NOT SPECIFIED IN THE PLANS REQUIRING TRAFFIC RESTRICTIONS SHALL ALSO BE REPORTED TO THE PROJECT ENGINEER USING THE NOTIFICATION TIME FRAME TABLE.

WORK INSPECTION

THE CONTRACTOR SHALL PROVIDE THE PROJECT 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 REMOVAL OF MISC. TRAFFIC CONTROL ITEM: (BY TYPE)

IN ADDITION TO FOLLOWING CMS 632, THE REMOVED EQUIPMENT SHALL BE STORED AND DELIVERED TO THE CITY OF CHILLICOTHE SERVICE DEPARTMENT UNLESS THE CITY INSTRUCTS IN WRITING THE CONTRACTOR TO DISPOSE OF IT.

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

THE CABINET SHALL BE FURNISHED AND INSTALLED ACCORDING TO CMS 633 AND 733 AND BE LISTED ON THE TRAFFIC AUTHORIZED PRODUCTS LIST (TAP). THE CABINET SHALL BE A POLE MOUNTED CABINET AND SHALL BE INSTALLED ON THE SIGNAL POLE ON THE NW CORNER OF THE INTERSECTION. THIS ITEM SHALL INCLUDE THE REROUTING OF ALL EXISTING CABLES FROM THE INTERIOR OF THE SIGNAL POLE INTO THE NEW CABINET AND RECONNECTING THE CABLES. THE SIGNAL CABLES ARE CURRENTLY CONNECTED TO THE EXISTING TRAFFIC SIGNAL CABINET AND THESE SHALL NOT BE DISCONNECTED UNTIL THE PROPOSED CABINET AND CONTROLLER ARE FULLY INSTALLED AND PREPARED FOR OPERATION. THIS SHALL ALSO INCLUDE RECONNECTING THE EXISTING TWISTED-PAIR COPPER INTERCONNECT CABLE TO THE NEW CABINET LOCATION, AND VERIFYING THE OPERATION AND COMMUNICATION OF THE CONTROLLER WITHIN THE CLOSED-LOOP SYSTEM.

THIS ITEM SHALL BE COMPATIBLE WITH THE QUEUE DETECTION SYSTEM, RADIOS, AND CONTROLLER CARDS SPECIFIED THEREIN.

THE EXISTING SIGNAL INCLUDES EMERGENCY VEHICLE PREEMPTION. THIS ITEM SHALL INCLUDE TRANSFERRING THE EXISTING EQUIPMENT TO THE NEW CABINET, RECONNECTING THE EXISTING CABLING, AND TESTING THE EQUIPMENT FUNCTION FOR APPROVAL BY THE PROJECT ENGINEER.

PAYMENT FOR ITEM 633 CABINET, TYPE 332L, AS PER PLAN WILL BE AT THE CONTRACT BID PRICE PER EACH COMPLETE AND IN PLACE INCLUDING ALL MOUNTING HARDWARE AND CONNECTIONS TESTED AND ACCEPTED.

DESIGN AGENCY
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DESIGNER	LDW
REVIEWER	KRM 03/23/21
PROJECT ID	114216
SHEET	6
TOTAL	13

ITEM 809 ATC V6.24 CONTROLLER, AS PER PLAN

THE CONTROLLER UNIT SHALL BE FURNISHED AND INSTALLED PER SS 809 AND BE LISTED ON THE TRAFFIC AUTHORIZED PRODUCTS (TAP) LIST.

THE CONTROLLER SHALL BE AN ECONOLITE COBALT AND COMPATIBLE WITH THE CABINET TYPE BEING INSTALLED.

ITEM 632 INTERCONNECT, MISC.: TWISTED PAIR INTERCONNECT CABLE

THIS ITEM SHALL INCLUDE PROVIDING AND INSTALLING UP TO 1500 FEET OF TWISTED PAIR COPPER INTERCONNECT CABLE. THE TRAFFIC SIGNAL AT THE INTERSECTION OF BRIDGE STREET AND US ROUTE 35 EB RAMPS CURRENTLY HAS INTERMITTENT COMMUNICATION WITH THE MASTER. THIS ITEM INCLUDES THE TESTING OF THE EXISTING CONNECTION AND THE REPAIR/REPLACEMENT OF THE EXISTING TWISTED PAIR COPPER INTERCONNECT CABLE AS NECESSARY TO BRING THE INTERSECTION INTO FULL COMMUNICATION WITH THE MASTER CONTROLLER. THIS ITEM WILL INCLUDE UP TO 1500 FEET OF CABLE AND WILL INCLUDE ALL ASSOCIATED HARDWARE AND LABOR NECESSARY TO CORRECT THE COMMUNICATIONS FAILURE AT THE NEW TRAFFIC SIGNAL CABINET/CONTROLLER.

ITEM 632 REMOVAL OF MISC. TRAFFIC CONTROL ITEM: LOOP LEAD-IN CABLE

THE REMOVAL OF LOOP LEAD-IN CABLE INCLUDES ANY CABLE RUN, WHICH INCLUDES IN THE SUPPORT POLES, CONDUITS, AND CABINETS. THE REMOVAL OF LOOP LEAD IN SHALL BE DONE WHERE NEW DETECTION IS TO BE INSTALLED. LOOP LEAD IN SHALL BE REMOVED COMPLETELY FROM THE CABINET TO THE NEAREST PULL BOX WHEN THE LOOPS ARE ON THE CABINET CORNER, OR FROM THE CABINET TO ACROSS THE SPAN AND TO THE NEXT PULL BOX WHEN THE CABLES ARE OVERHEAD, OR FROM THE CABINET TO THE PULL BOX ADJACENT TO THE LOOPS FOR MAST ARM INSTALLATIONS. UNLASH/RELASHING OF MESSENGER WIRE TO REMOVE THE CABLE IS ACCOUNTED FOR IN AN ADDITIONAL ITEM.

PAYMENT FOR ITEM 632 REMOVAL OF MISC. TRAFFIC CONTROL ITEM: LOOP LEAD-IN CABLE SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH INTERSECTION, WHICH MAY INCLUDE ONE OR MORE CABLES.

ITEM 632 SIGNALIZATION, MISC.: UNLASH & 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 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 SIGNALIZATION, MISC.: PROGRAM QUEUE FLUSH PLAN

THE CONTRACTOR SHALL INSTALL COORDINATION TIMING IN THE TRAFFIC SIGNAL CONTROLLERS AT SIX INTERSECTIONS AS SHOWN ON THE PLAN SHEETS. THIS SPECIAL COORDINATION PLAN SHALL BE CALLED IN THE MASTER CONTROLLER BY AN INPUT FROM THE US-35 EB RAMPS INTERSECTION CABINET. THE INPUT SHALL BE TRIGGERED BY THE QUEUE DETECTORS AT THE TOP OF THE RAMP AND THE INPUT SHALL CAUSE THE MASTER CONTROLLER TO TRIGGER THE SPECIAL PLAN. THE PLAN SHALL STAY IN EFFECT AS LONG AS THE QUEUE DETECTORS PLACE A CALL TO THE CONTROLLER. THE REMAINING INTERSECTIONS ON THE SYSTEM SHALL RUN A FREE PLAN DURING THIS TIME PERIOD. ONCE THE QUEUE DETECTORS FALL BELOW THE MINIMUM OCCUPANCY THRESHHOLD, THE INTERSECTIONS SHALL RETURN TO NORMAL OPERATIONS.

THIS ITEM SHALL INCLUDE ALL PROGRAMMING IN THE CONTROLLERS AND MASTER CONTROLLER TO CALL FOR AND ACCOMMODATE THE USE OF THIS SPECIAL TIMING PLAN. PAYMENT FOR ITEM 632 SIGNALIZATION MISC.: PROGRAM QUEUE FLUSH PLAN SHALL BE MADE AT THE CONTRACT UNIT PRICE PER EACH AND SHALL INCLUDE ALL LABOR, MATERIALS, TESTING SOFTWARE AND HARDWARE NECESSARY TO COMPLETE THIS ITEM.

ITEM 632 SIGNALIZATION, MISC.: QUEUE WARNING DETECTION SYSTEM

THE CONTRACTOR SHALL INSTALL A QUEUE WARNING DETECTION SYSTEM THAT DETECTS QUEUES AT THE GORE OF THE US ROUTE 35 EB RAMP TO BRIDGE STREET AND PROVIDES ADVANCE WARNING TO TRAFFIC ON US ROUTE 35 IN ADVANCE OF THE BRIDGE TO THE WEST, WHILE ALSO CALLING A PROGRAMMED SPECIAL PLAN IN THE TRAFFIC SIGNAL SYSTEM CONTROLLERS ON BRIDGE STREET. THE DETECTION ELEMENTS SHALL BE PROVIDED BY SENSYS, TRAFFICWARE, OR APPROVED EQUAL. THIS ITEM SHALL PROVIDE THE FULLY FUNCTIONAL SYSTEM THAT INCLUDES, DETECTION, CONTROLS, RADIO COMMUNICATION, AND THE ADVANCED FLASHER ON US ROUTE 35. THIS SHALL INCLUDE THE FOLLOWING COMPONENTS:

1. FOUR WIRELESS VEHICLE DETECTION PAVEMENT SENSORS SHALL BE PROVIDED ON THE RAMP PAVEMENT 25' TO THE EAST OF THE RAMP GORE. THESE WIRELESS SENSORS SHALL UTILIZE 3-AXIS MAGNETIC FIELD SENSING AND BE CAPABLE OF BEING INSTALLED IN A 4" DIAMETER HOLE WITH A FREQUENCY BAND RANGING FROM 2405 TO 2480 MHZ. THE DETECTORS SHALL HAVE A MINIMUM OF 16 FREQUENCY CHANNELS AND AN EXPECTED BATTERY LIFE OF 10 YEARS OR GREATER. ANY SPECIAL TOOLS AND MATERIALS NEEDED FOR INSTALLATION SHALL BE PROVIDED.

2. TWO LONG RANGE REPEATERS AND ANTENNA SHALL BE PROVIDED AT THE RAMP GORE LOCATION AND MOUNTED TO THE EXISTING SIGN STRUCTURE. THEY SHALL MAINTAIN A FREQUENCY COMPATIBLE WITH THE PAVEMENT SENSORS AND SHALL INCLUDE A SELF CONTAINED INTERNAL BATTERY WITH SOLAR PANELS FOR RECHARGING. THEY SHALL HAVE A MINIMUM COMMUNICATION RANGE TO THE PAVEMENT SENSORS OF 150 FEET AND A MINIMUM COMMUNICATION RANGE TO THE ASSOCIATED ACCESS POINT OF 2000 FEET. ANY REQUIRED CONNECTING CABLES AS WELL AS ANY CUSTOM MOUNTING BRACKETS REQUIRED TO MOUNT THE REPEATERS TO 4 ¾" DIAMETER HORIZONTAL CHORD MEMBER OF AN OVERHEAD SIGN SUPPORT TRUSS SHALL BE INCLUDED.

3. TWO TWO-WAY RADIOS SHALL BE PROVIDED, ONE AT THE BRIDGE STREET TRAFFIC SIGNAL CONTROLLER POLE, AND ONE AT THE ADVANCED WARNING SIGN LOCATION ON US ROUTE 35. THE RADIOS SHALL BE COMPATIBLE WITH THE PAVEMENT SENSORS, REPEATERS, AND CONTROLLER CARD, AND SHALL INCLUDE ANY REQUIRED CABLES OR ADDITIONAL COMPONENTS NEEDED TO CONNECT TO A CONTROLLER CARD HOUSED 50 FEET AWAY. ANY CUSTOM MOUNTING BRACKETS THAT MAY BE NEEDED FOR MOUNTING TO THE SIDE OF THE VERTICAL ALUMINUM POLES SHALL ALSO BE INCLUDED.

4. TWO CONTROLLER CARDS SHALL BE PROVIDED AT EACH OF THE RADIO LOCATIONS THAT ARE COMPATIBLE WITH THE RADIO AND PAVEMENT SENSORS. THE CARDS SHALL HAVE AT LEAST 16 FREQUENCY CHANNELS, INTERFACE PORTS WITH CONNECTIONS TO 2 RADIOS, 2 USB 2.0 OR GREATER CONNECTIONS, AND A 10/100 BASE T ETHERNET PORT. THE CARD AT THE BRIDGE STREET INTERSECTION SHALL BE COMPATIBLE WITH A NEMA TS2 SIGNAL CONTROLLER, WHILE THE CARD AT THE ADVANCED FLASHER SHALL BE COMPATIBLE WITH THE FLASHER CONTROLLER.

5. TWO 12 VOLT, 100-105 AMP HOUR, FLOAT CHARGE VOLT 13.5 TO 13.8 VDC, NON SPILLABLE BATTERIES SHALL BE PROVIDED AT THE ADVANCED FLASHER LOCATION.

6. ONE POLE MOUNTED FLASHER ENCLOSURE CABINET SHALL BE PROVIDED AT THE ADVANCED FLASHER LOCATION. THE CABINET SHALL INCLUDE ADDITIONAL ROOM FOR THE SOLAR CHARGING EQUIPMENT, CONTROLLER, AND TWO BATTERIES. THE HOUSING SHALL BE STEEL OR ALUMINUM WITH A MINIMUM NEMA 3 OR 3X RATING AND HAVE AN INTEGRATED LOCKING MECHANISM. THE CABINET SHALL INCLUDE ALL NECESSARY MOUNTING BRACKETS AND HARDWARE.

7. ONE SOLAR PANEL AND BATTERY CHARGING CONTROLLER SHALL BE PROVIDED AT THE ADVANCE FLASHER LOCATION. THE PANEL SHALL RECHARGE THE 12 VOLT BATTERIES FOR OPERATION OF TWO 12" LED FLASHING BEACONS THAT WILL RUN FOR APPROXIMATELY 4 HOURS PER DAY, 7 DAYS PER WEEK. THIS SHALL INCLUDE BRACKETS FOR MOUNTING THE SOLAR PANEL TO THE SIDE OF THE SUPPORT POLE.

8. ONE SIGN FLASHER ASSEMBLY MEETING THE REQUIREMENTS OF ODOT ITEM 731.06 SHALL BE PROVIDED AT THE ADVANCED FLASHER LOCATION, EXCLUDING THE CABINET, WHICH HAS ALREADY BEEN SPECIFIED HEREIN. THIS SHALL INCLUDE TWO 12" LED BEACONS, FLASHER CONTROL UNIT, AND ASSOCIATED CABINET HARDWARE. ODOT DISTRICT 9 SHALL PROVIDE THE RECTANGULAR BLACK ON YELLOW "WATCH FOR STOPPED TRAFFIC" SIGN (60" BY 48") FOR INSTALLATION BY THE CONTRACTOR.

9. THE SYSTEM SHALL BE PROGRAMMED TO OUTPUT A CALL FROM THE CONTROLLER CARDS TO THE FLASHER CONTROLLER AND SIGNAL CONTROLLER WHEN THE PAVEMENT SENSORS HAVE DETECTED QUEUED TRAFFIC. THE DETECTOR FUNCTIONS SHALL INCLUDE A 60 SECOND DELAY ON THE CALL TO ACTUATE THE SPECIAL PLAN AND ALSO SHALL INCLUDE A REST FUNCTION THAT DELAYS THE "OFF" NOTIFICATION FOR 300 SECONDS TO AVOID RAPID ON/OFF CALLS TO THE WARNING SIGN AND THE SIGNAL CONTROLLER FOR PLAN CHANGES. THE SYSTEM SHALL BE CAPABLE OF RETURNING THE TRAFFIC SIGNAL SYSTEM TO NORMAL OPERATION ONCE THE QUEUE DETECTION SYSTEM IS IN OFF MODE.

10. SUPPORT AND TECHNICAL ASSISTANCE SHALL BE PROVIDED, INCLUDING TRAINING ON ANY SOFTWARE AND HARDWARE USAGE. ALL SOFTWARE TO OPERATE THE SYSTEM AND INSTALLATION GUIDES/MANUALS NEEDED TO INSTALL OPERATE AND MAINTAIN THE EQUIPMENT SHALL BE PROVIDED, INCLUDING A TECHNICIAN AVAILABLE FOR ON-SITE TRAINING OF BOTH ODOT DISTRICT 9 AND CITY OF CHILLICOTHE SIGNAL ELECTRICIANS.

THESE ITEMS, IN COMBINATION WITH THE PROPOSED TRAFFIC SIGNAL CONTROLLER AND SIGN FLASHER ASSEMBLY SHALL RESULT IN THE INSTALLATION OF A FULLY FUNCTIONING QUEUE DETECTION AND WARNING SYSTEM. ALL WORK NECESSARY TO INTEGRATE THIS ITEM WITH THE PROPOSED SIGNAL CONTROLLER, THE EXISTING MASTER CONTROLLER, AND THE PROPOSED SIGN FLASHER ASSEMBLY SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

ITEM 809 ADVANCE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING AN ODOT APPROVED ADVANCE RADAR 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 ON-SITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.

6. 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.

7. IF THE INTERSECTIONS DO NOT HAVE SUFFICIENT SPACE IN THE CABINET FOR DIN RAIL MOUNTING OF THE EQUIPMENT, SHELF OR RACK MOUNTED POWER, CONTROL, AND COMMUNICATION UNITS SHALL BE PROVIDED.

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

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

PAYMENT FOR ITEM 809 ADVANCE 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, CONNECTIONS TESTED AND ACCEPTED, AND ANY OTHER NECESSARY HARDWARE TO ESTABLISH A FULLY FUNCTIONAL DETECTION SYSTEM.

ITEM 809 STOP LINE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A STOP-LINE RADAR 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. 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.

7. IF THE INTERSECTIONS DO NOT HAVE SUFFICIENT SPACE IN THE CABINET FOR DIN RAIL MOUNTING OF THE EQUIPMENT, SHELF OR RACK MOUNTED POWER, CONTROL, AND COMMUNICATION UNITS SHALL BE PROVIDED.

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

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 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.

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 120 DAYS FOLLOWING COMPLETION OF THE 10-DA Y 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 DUE TO POOR WORKMANSHIP OR DEFECTIVE EQUIPMENT SHALL BE BORNE BY THE CONTRACTOR. CUSTOMARY MANUFACTURER'S GUARANTEES FOR ALL ITEMS SHALL BE TURNED OVER TO THE ENGINEER FOLLOWING ACCEPTANCE OF THE EQUIPMENT.

THE COST OF GUARANTEEING SATISFACTORY OPERATION OF THE TRAFFIC CONTROL SYSTEM WILL BE INCIDENTAL TO THE PROJECT AND INCLUDED IN THE UNIT COST OF EACH ITEM.

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

ROS-159 SIGNAL UPGRADES 2020

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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 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/
2/WHITE/AC NEUTRAL/AC NEUTRAL
3/RED/RED BALL/
4/GREEN/EQUIPMENT GROUND/EQUIPMENT GROUND
5/ORANGE/YELLOW BALL/
6/BLUE/GREEN ARROW/
7/WHITE WITH 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.

NOTIFICATION TIME FRAME TABLE		
ITEM	DURATION OF CLOSURE	NOTIFIFICATION DUE TO DISTRICT COMMUNICATIONS OFFICE
RAMP AND ROAD CLOSURES	>=2 WEEKS	14 BUSINESS DAYS PRIOR TO CLOSURE
	> 12 HOURS AND < 2 WEEKS	7 BUSINESS DAYS PRIOR TO CLOSURE
	< 12 HOURS	2 BUSINESS DAYS PRIOR TO CLOSURE
LANE CLOSURES/ RESTRICTIONS	>= 2 WEEKS	7 BUSINESS DAYS PRIOR TO CLOSURE
	< 2 WEEKS	2 BUSINESS DAYS PRIOR TO CLOSURE

Window Contract Table				
Description of Critical Work	**Calendar Days to Complete**	**Disincentive $ per Day**	**Work Window**	
			Start	**End**
All Work on Project	75	Per C&MS 108.07	Contract Execution Date	10/29/2021

LANE RESTRICTIONS

THE CONTRACTOR SHALL MAKE EVERY EFFORT TO PERFORM WORK IN SUCH A WAY THAT LANE CLOSURES ARE NOT NECESSARY. TEMPORARY LANE CLOSURES ARE ACCEPTABLE, HOWEVER NO MORE THAN ONE LANE OF TRAFFIC SHALL BE CLOSED IN ANY GIVEN DIRECTION ON BRIDGE STREET OR US ROUTE 35 AT ANY TIME. TEMPORARY LANE CLOSURES SHALL NOT BE IN PLACE DURING THE HOURS OF 7:00 TO 9:00 AM AND 3:00 TO 7:00 PM.

HIGH VOLTAGE TESTING

THE HIGH VOLTAGE TESTING REQUIRED FOR TRAFFIC SIGNAL ITEMS UNDER CMS 632 IS WAIVED ON THIS PROJECT IN CASES WHERE EXISTING WIRING IS USED IN CONJUCTION WITH PROPOSED WIRING.

GENERAL NOTES

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ROS-159 SIGNAL UPGRADES 2020

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SHEET NUM.									PART.		ITEM	ITEM EXT	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
					10	11				01/ODOT						
															TRAFFIC CONTROL	
					2					2	630	87100	2	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION	
					1,300					1,300	644	30000	1,300	FT	REMOVAL OF PAVEMENT MARKING	
					12					12	644	30020	12	EACH	REMOVAL OF PAVEMENT MARKING	
					200					200	644	01510	200	FT	DOTTED LINE, 6"	
					0.01					0.01	644	00104	0.01	MILE	EDGE LINE, 6"	
					0.09					0.09	644	00300	0.09	MILE	CENTER LINE	
					440					440	644	00400	440	FT	CHANNELIZING LINE, 8"	
					120					120	644	00500	120	FT	STOP LINE	
					12					12	644	01300	12	EACH	LANE ARROW	
															TRAFFIC SIGNALS	
						2				2	625	32000	2	EACH	GROUND ROD	
						5				5	632	05006	5	EACH	VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE (YELLOW)	
						2				2	632	05086	2	EACH	VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE (YELLOW)	
					7					7	632	05006	7	EACH	VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE (YELLOW WITH BACKPLATES)	
					2					2	632	05086	2	EACH	VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE (YELLOW WITH BACKPLATES)	
					2					2	632	20730	2	EACH	PEDESTRIAN SIGNAL HEAD (LED), TYPE D2, COUNTDOWN	
					400					400	632	30600	400	FT	TETHER WIRE, WITH ACCESSORIES	
					1,300					1,300	632	40700	1,300	FT	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	
					1					1	632	62820	1	EACH	INTERCONNECT, MISC.:TWISTED PAIR INTERCONNECT CABLE	7
						1				1	632	90020	1	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM, CABINET AND CONTROLLER	7
						2				2	632	90020	2	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM: LOOP LEAD-IN CABLE	7
					1					1	632	90400	1	EACH	SIGNALIZATION, MISC.:PROGRAM QUEUE FLUSH PLAN	7
					1					1	632	90400	1	EACH	SIGNALIZATION, MISC.:QUEUE WARNING DETECTION SYSTEM	7
					650					650	632	90500	650	FT	SIGNALIZATION, MISC.: UNLASH & RELASH MESSENGER WIRE	7
						1				1	633	65511	1	EACH	CABINET, TYPE TS-2, AS PER PLAN	6
					2					2	809	69001	2	EACH	ADVANCE RADAR DETECTION, AS PER PLAN	7
					4					4	809	69101	4	EACH	STOP LINE RADAR DETECTION, AS PER PLAN	7
						1				1	809	69123	1	EACH	ATC V6.24 CONTROLLER, AS PER PLAN	7
															MAINTENANCE OF TRAFFIC	
										50	614	11110	50	HOUR	LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE	
										1	614	18600	1	SNMT	PORTABLE CHANGEABLE MESSAGE SIGN	
															INCIDENTALS	
										LS	614	11000	LS		MAINTAINING TRAFFIC	
										LS	624	10000	LS		MOBILIZATION	
										5	619	16000	5	MNTH	FIELD OFFICE, TYPE A	

GENERAL SUMMARY

ROS-159 SIGNAL UPGRADES 2020

MODEL: Sheet PAPERSIZE: 34x22 (In.) DATE: 4/6/2021 TIME: 6:25:02 AM USER: lwilson
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DESIGN AGENCY
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DESIGNER
LDW

REVIEWER
KRM 03/23/21

PROJECT ID
114216

SHEET 9 TOTAL 13

ESTIMATED QUANTITIES

REF NO.	SHEET NO.	STATION TO STATION			644 REMOVAL OF PAVEMENT MARKING (FT)	644 REMOVAL OF PAVEMENT MARKING (EACH)	644 DOTTED LINE, 6" (FT)	644 CENTER LINE (MILE)	644 CHANNELIZING LINE, 8" (FT)	644 EDGE LINE, 6" (MILE)	644 STOP LINE (FT)	644 LANE ARROW (EACH)	632 TETHER WIRE, WITH ACCESSORIES (FT)	632 SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG (FT)	632 VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE (YELLOW WITH BACKPLATES) (EACH)	632 VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE (YELLOW WITH BACKPLATES) (EACH)	632 PEDESTRIAN SIGNAL HEAD (LED), TYPE D2, COUNTDOWN (EACH)	630 REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION (EACH)	632 SIGNALIZATION, MISC.: UNLASH & RELASH MESSENGER WIRE (FT)	632 SIGNALIZATION, MISC.:PROGRAM QUEUE FLUSH PLAN (EACH)	632 SIGNALIZATION, MISC.:QUEUE WARNING DETECTION SYSTEM (EACH)	632 INTERCONNECT, MISC.:TWISTED PAIR INTERCONNECT CABLE (EACH)	809 ADVANCE RADAR DETECTION, AS PER PLAN (EACH)	809 STOP LINE RADAR DETECTION, AS PER PLAN (EACH)
	9	SR-159	AT	STEWART										300			1							
	3/4	SR-159	AT	US35 EB RAMP	460	1	200	0.019	20	0.006	50	1								1		1	1	2
	3	US35 EB RAMP	AT	GORE																	1			
	3	US35 EB	AT	ADVANCED																				
	12	SR-159	AT	US35 WB RAMP																			1	
	5/12	SR-159	AT	MARRIETTA	840	11		0.066	420		70	11												
	12	SR-159	AT	WINONA										300			1							
	12	SR-159	AT	PAWNEE									400	700	7	2			350					
	12	SR-159	AT	SENEY															180					
	12	SR-159	AT	MENARDS														2	120					2
TOTALS CARRIED TO GENERAL SUMMARY					1300	12	200	0.085	440	0.006	120	12	400	1300	7	2	2	2	650	1	1	1	2	4

ROS-159 SIGNAL UPGRADES 2020

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 4/6/2021 TIME: 6:25:05 AM USER: lwilson
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DESIGN AGENCY
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DESIGNER: LDW
REVIEWER: KRM 03/23/21
PROJECT ID: 114216
SHEET 10 TOTAL 13

ESTIMATED QUANTITIES

REF NO.	SHEET NO.	STATION TO STATION			809 ATC V6.24 CONTROLLER, AS PER PLAN	633 CABINET, TYPE TS-2, AS PER PLAN	632 REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM, CABINET AND CONTROLLER	625 GROUND ROD	632 VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE (YELLOW)	632 VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE (YELLOW)	632 REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM: LOOP LEAD-IN CABLE
					EACH	EACH	EACH	EACH	EACH	EACH	EACH
			TO								
	3/4	SR-159	AT	US35 EB RAMP	1	1	1	1			1
	3	US35 EB	AT	ADVANCED				1			
	5	SR-159	AT	MARRIETTA					2	1	
	12	SR-159	AT	SENEY					2	1	
	12	SR-159	AT	MENARDS					1		1
TOTALS CARRIED TO GENERAL SUMMARY					1	1	1	2	5	2	2

ROS-159 SIGNAL UPGRADES 2020

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 4/6/2021 TIME: 6:25:08 AM USER: lwilson
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DESIGN AGENCY
CMT CRAWFORD, MURPHY & TILLY, INC.

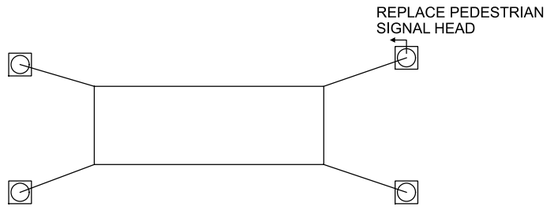
DESIGNER
LDW

REVIEWER
KRM 03/23/21

PROJECT ID
114216

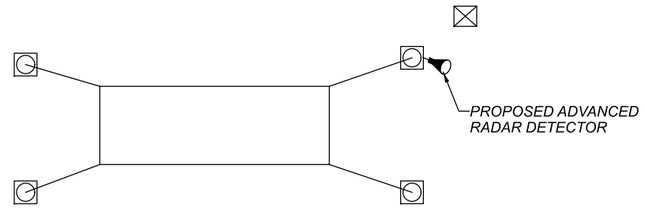
SHEET 11 TOTAL 13

1



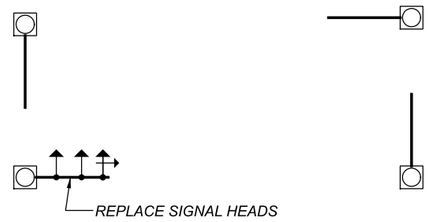
BRIDGE ST @ STEWART RD

5



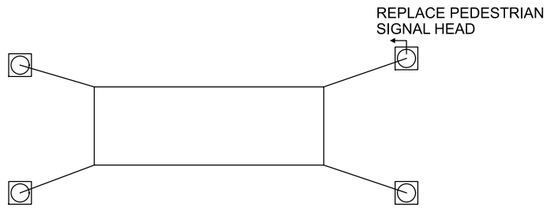
BRIDGE ST @ US 35 WB

6



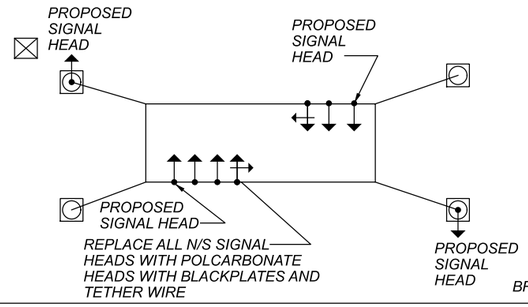
BRIDGE ST @ MARIETTA

7



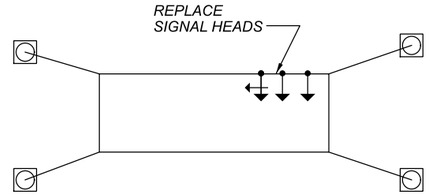
BRIDGE ST @ WINONA

8



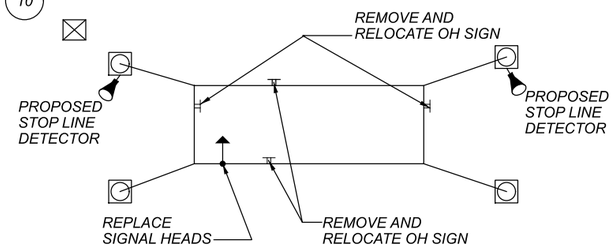
BRIDGE ST @ PAWNEE

9



BRIDGE ST @ SENEY

10



BRIDGE ST @ MENARDS

NOTE 1: THE CONTRACTOR SHALL INSTALL ONE ADDITIONAL SIGNAL HEAD FOR THE NB AND SB DIRECTIONS AT THE PAWNEE INTERSECTION. ON INSTALLATION, THE CONTRACTOR SHALL ADJUST THE SAG/TENSION OF THE SPAN WIRE TO BE AS CLOSE TO MAXIMUM SAG AS POSSIBLE WHILE MAINTAINING VERTICAL CLEARANCE REQUIREMENTS FROM THE ROADWAY. THE CONTRACTOR SHALL NOT OVERSTRESS THE EXISTING STRAIN POLES BY EXCEEDING 4% SAG UNDER ANY CIRCUMSTANCES. AFTER INSTALLATION, THE CONTRACTOR SHALL MONITOR THE STRAIN POLES FOR THE DURATION OF THE CONTRACT AND ALERT THE PROJECT MANAGER IF THE POLES EXHIBIT ADDITIONAL DEFLECTION.

NOTE 2: PROPOSED SIGNAL HEADS AT INTERSECTIONS OTHER THEN PAWNEE ROAD SHALL NOT INCLUDE BACKPLATES OR TETHER WIRES.

PROPOSED SIGNAL TIMING (SPECIAL QUEUE FLUSH PLAN)

Intersection	Offset	SPLITS							
		SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB
Stewart Street	40	-	89	-	23	-	89	-	38
US-35 EB Ramps	29	33	57	-	60	-	90	-	-
US-35 WB Ramps	6	-	115	-	35	20	95	-	35
Marietta Road	147	13	98	-	14	13	98	-	25
Winona Boulevard	8	15	104	-	31	15	104	-	31
Pawnee Road	2	21	93	-	36	32	82	-	36

ROS-159 SIGNAL UPGRADES 2020

DETAIL SHEET
RADAR DETECTOR LOCATION DETAILS

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 4/6/2021 TIME: 6:25:11 AM USER: lwilson
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REVIEWER
KRM 03/23/21

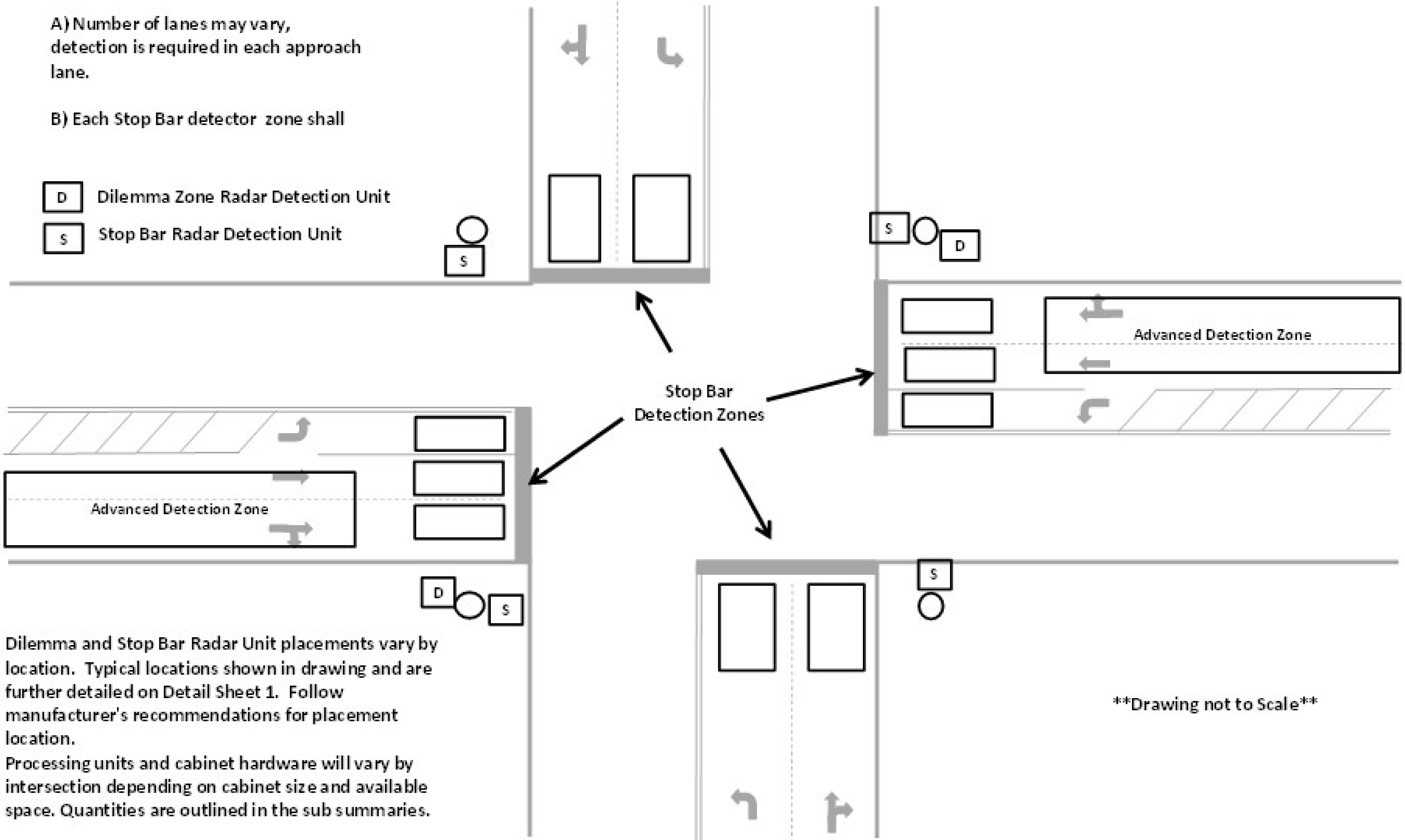
PROJECT ID
114216

SHEET 12 TOTAL 13

809-Advance and Stop Bar Radar General Layout

A) Number of lanes may vary, detection is required in each approach lane.

B) Each Stop Bar detector zone shall



Dilemma and Stop Bar Radar Unit placements vary by location. Typical locations shown in drawing and are further detailed on Detail Sheet 1. Follow manufacturer's recommendations for placement location.
Processing units and cabinet hardware will vary by intersection depending on cabinet size and available space. Quantities are outlined in the sub summaries.

Drawing not to Scale

DETAIL SHEET
RADAR DETECTION ZONE LAYOUT

ROS-159 SIGNAL UPGRADES 2020

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DESIGN AGENCY
CMT
CRAWFORD, MURPHY & TILLY, INC.

DESIGNER	LDW
REVIEWER	KRM 03/23/21
PROJECT ID	114216
SHEET 13	TOTAL 13