

LOCATION MAP

LATITUDE: 41°31'53" LONGITUDE: 82°49'32"



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

DESIGN DESIGNATION	OTT-163-31.29	OTT-163-31.70
CURRENT ADT (2024) .....	8600	11500
DESIGN YEAR ADT (2044) .....	9500	12000
DESIGN HOURLY VOLUME (2044) .....	1100	1400
DIRECTIONAL DISTRIBUTION .....	52%	53%
TRUCKS (24 HOUR B&C) .....	3%	4%
DESIGN SPEED .....	60 MPH	60 MPH
LEGAL SPEED .....	55 MPH	55 MPH
DESIGN FUNCTIONAL CLASSIFICATION:		

NHS PROJECT .....

DESIGN EXCEPTIONS

NONE REQUIRED

ADA DESIGN WAIVERS

NONE REQUIRED

UNDERGROUND UTILITIES

Contact Two Working Days  
Before You Dig

Before You Dig

OHIO 811, 8-1-1, or 1-800-362-2764  
(Non members must be called directly)

PLAN PREPARED BY:  
ODOT, DISTRICT 2  
317 EAST POE ROAD  
BOWLING GREEN, OHIO 43402

STATE OF OHIO

DEPARTMENT OF TRANSPORTATION

D02 TSG FY2025

TRAFFIC SIGNAL UPGRADE

OTTAWA COUNTY

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FEDERAL PROJECT NUMBER

NON-FEDERAL

RAILROAD INVOLVEMENT

NONE

PROJECT DESCRIPTION

A DISTRICT ALLOCATION FUNDED PROJECT TO MAINTAIN/UPGRADE THE EXISTING TRAFFIC SIGNALS ON SR-163 IN OTTAWA COUNTY AT THE NORTH AND SOUTH LEGS OF SR-269.

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

2023 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PLANS, CHANGES LISTED IN THE PROPOSAL, AND THE SUPPLEMENTAL SPECIFICATION 800 VERSION INDICATED ON THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

Pat McColley, P.E., S.I.  
District 02 Deputy Director

Pamela Boratyn  
Director, Department of Transportation

STANDARD CONSTRUCTION DRAWINGS							SUPPLEMENTAL SPECIFICATIONS	SPECIAL PROVISIONS
HL-30.11	7/21/23	TC-22.10	4/21/23				800-2023 7/19/24	
HL-30.21	4/17/20	TC-22.20	1/17/14				809 7/19/24	
HL-30.22	1/15/21	TC-81.22	7/21/23				825 7/19/24	
		TC-83.10	1/17/20				832 7/19/24	
ITS-60.10	1/15/21	TC-83.20	7/19/24				909 7/19/24	
		TC-85.20	4/21/23					
MT-95.30	7/19/19							
MT-95.31	7/19/19							
MT-95.45	7/21/23							
MT-96.26	1/18/19							
MT-101.90	7/17/20							
MT-105.10	1/17/20							
MT-120.00	7/19/24							
TC-12.31	4/15/22							
TC-21.21	1/20/23							

ENGINEER'S SEAL

ROADWAY



DESIGN AGENCY



DESIGNER

DEK

REVIEWER

JJM 12/05/24

PROJECT ID

110100

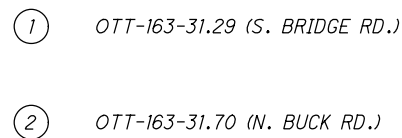
SHEET

P.1

TOTAL

27

## LOCATION MAP



UTILITIES

OTT-163-31.29 & OTT-163-31.70

CHARTER TELECOMMUNICATIONS  
3760 INTERCHANGE DR.  
COLUMBUS, OHIO 43204  
614-255-6340

ODOT DISTRICT 2 TRAFFIC  
317 E. POE RD.  
BOWLING, GREEN 43402  
419-353-8131

COLUMBIA GAS TRANSMISSION  
301 MAPLE STREET  
SUGAR GROVE, OHIO 43155  
740-746-2297

COLUMBIA GAS OF OHIO  
2901 E. MANHATTAN BLVD.  
TOLEDO, OHIO 43611  
419-539-6066

TOLEDO EDISON  
6099 ANGOLA ROAD  
HOLLAND, OHIO 43528  
419-249-5218

FRONTIER COMMUNICATIONS  
3126 N MCCORD RD  
TOLEDO, OHIO 43617  
419-841-7281

BUCKEYE CABLEVISION  
2700 OREGON RD.  
NORTHWOOD, OHIO 43519  
419-724-3713

SURVEYING PARAMETERS

PRIMARY PROJECT CONTROL MONUMENTS GOVERN ALL POSITION-  
ING ON ODOT PROJECTS. SEE TABLE BELOW CONTAINING  
PROJECT CONTROL INFORMATION.

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

OTT-163-31.29 & OTT-163-31.70

PROJECT CONTROL

POSITIONING METHOD: ODOT VRS  
MONUMENT TYPE: TYPE B

VERTICAL POSITIONING

ORTHOMETRIC HEIGHT DATUM: NAVD88  
GEOID: 18

HORIZONTAL POSITIONING

REFERENCE FRAME: NAD83 (2011)  
ELLIPSOID: GRS80  
MAP PROJECTION: LAMBERT CONFORMAL CONIC

COORDINATE SYSTEM: ODOT OCC LDP OTTAWA CO  
COMBINED SCALE FACTOR: 1.000023 (GRID COORDINATES)  
ORIGIN OF COORDINATE SYSTEM: 0,0

USE THE POSITIONING METHODS AND MONUMENT TYPE USED IN  
THE ORIGINAL SURVEY TO RESTORE ALL MONUMENTS RELATED  
TO PRIMARY PROJECT CONTROL THAT ARE DAMAGED OR  
DESTROYED BY CONSTRUCTION ACTIVITIES. RESTORE THE  
DAMAGED OR DESTROYED MONUMENTS IN ACCORDANCE WITH  
SUPPLEMENTAL SPECIFICATION 823.

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

GENERAL

ALL SIGNAL HEADS AT THE PROPOSED LOCATION SHOULD BE  
BLACK POLYCARBONATE PLASTIC WITH REFLECTIVE BORDERS.  
MAST ARM SIGNALS SHOULD BE RIGID MOUNTED.

WHENEVER ANY WORK IS TO BE PERFORMED ON THE JOB SITE  
THE ENGINEER SHALL BE NOTIFIED AT LEAST ONE WEEK PRIOR  
TO THE PROPOSED WORK SO INSPECTION SERVICES CAN BE SUP-  
PLIED. FIELD PROBLEMS THAT ARISE MUST BE BROUGHT TO THE  
ATTENTION OF THE ENGINEER FOR RESOLUTION. PRIOR TO THE  
START OF WORK THE CONTRACTOR IS EXPECTED TO FIELD  
REVIEW THE PROJECT AND FAMILIARIZE THEMSELVES WITH THE  
DIFFERENT TYPES OF WORK INVOLVED.

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM  
WORK FOR PLAN ITEMS SET UP TO BE USED "AS DIRECTED BY  
THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER.

SCOPE OF WORK:

OTT-163-31.29 & OTT-163-31.70

INSTALL NEW MAST ARMS FOR ALL DIRECTIONS OF TRAFFIC, WITH  
RIGID MOUNTED TRAFFIC SIGNALS AND BACKPLATES AS  
SPECIFIED. VEHICLE DETECTION, POWER SERVICE, CONTROLLER,  
PULL BOXES, CONDUIT AND WIRING SHALL BE INSTALLED AS  
SPECIFIED IN THE PLANS.

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CON-  
TROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL  
OPERATE SATISFACTORILY FOR A PERIOD OF 120 DAYS FOLLOW-  
ING 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: CONTROLLER, CABINET,  
UNINTERRUPTIBLE POWER SUPPLY, VEHICLE DETECTION  
EQUIPMENT, LED LAMP UNITS, NETWORK AND COMMUNICATION/  
INTERCONNECT EQUIPMENT.

CUSTOMARY MANUFACTURER'S GUARANTEES FOR THE FOREGOING  
ITEMS SHALL BE TURNED OVER TO THE STATE OR THE MAIN-  
TAINING 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.

WHERE OUTAGES OR MALFUNCTIONS 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  
AS PER CMS SECTION 107.15.

WHERE THE CONTRACTOR HAS FAILED TO OR CANNOT RESPOND  
TO AN OUTAGE OR SIGNAL EQUIPMENT MALFUNCTION, AT THESE  
LOCATIONS WITHIN HIS RESPONSIBILITY OR WITHIN PERIODS AS  
SPECIFIED ABOVE, ODOT MAY TAKE ANY ACTION NECESSARY.  
THIS ACTION MAY INCLUDE CONTROL OF THE INTERSECTION BY  
POLICE OFFICERS AND COMPLETE REMOVAL OF THE  
MALFUNCTIONING TRAFFIC CONTROL DEVICES AND INSTALLATION  
OF DEVICES TO RETURN THE INTERSECTION TO OPERATION. ANY  
SUBSEQUENT BILLINGS BY ODOT FOR THESE POLICE AND/OR  
MAINTENANCE BY ODOT SHALL BE DEDUCTED FROM MONIES DUE  
OR TO BECOME DUE THE CONTRACTOR IN ACCORDANCE WITH  
PROVISIONS OF CMS SECTION 105.15.

THE CONTRACTOR SHALL PROVIDE THE MAINTENANCE SERVICES  
ENTIRELY WITH HIS FORCES OR HE MAY CHOOSE TO ENTER INTO  
A MUTUALLY ACCEPTABLE AGREEMENT WITH THE LOCAL  
MAINTAINING AGENCY TO PROVIDE THE MAINTENANCE.

IF THE EXISTING TRAFFIC SIGNAL OPERATION CHANGES TO DUE  
TO THE LOSS OF VEHICLE DETECTION, THE CONTRACTOR SHALL  
IMMEDIATELY CONTACT DYLAN FOUKES AT (419) 409-1068 TO  
MAKE SIGNAL TIMING MODIFICATIONS TO INSURE THAT THE  
SIGNAL OPERATION DOES NOT COMPROMISE THE EFFICIENT FLOW  
OF TRAFFIC.

THE CONTRACTOR SHALL INFORM THE PROJECT ENGINEER, IN  
WRITING, OF THE MAINTENANCE METHOD SELECTED.

WHEN A TRAFFIC SIGNAL MUST BE TAKEN OUT OF SERVICE BY  
THE CONTRACTOR , DUE TO CONSTRUCTION PROCEDURES, THIS  
OUTAGE SHALL NOT INCLUDE THE HOURS OF 6:30 AM TO 8:30  
AM AND 3 PM TO 6 PM MONDAY THROUGH FRIDAY. WHERE A  
TRAFFIC SIGNAL IS OUT OF SERVICE DUE TO CONSTRUCTION  
PROCEDURES OR DUE TO AN OUTAGE OR MALFUNCTION OF  
EQUIPMENT AS DESCRIBED ABOVE, TRAFFIC SHALL BE DIRECTED  
BY AN OFF-DUTY LAW ENFORCEMENT OFFICER WITH PATROL CAR  
HIRED BY THE CONTRACTOR UNTIL SAID SIGNAL IS OPERATING  
AGAIN. ALL COSTS INCURRED IN USING POLICE OFFICERS SHALL  
BE THE RESPONSIBILITY OF THE CONTRACTOR.

INSPECTION

ALL CONSTRUCTION AND MATERIALS SHALL BE INSPECTED TO  
THE SATISFACTION AND APPROVAL OF DESIGNATED ODOT  
INSPECTOR(S). THE CONTRACTOR SHALL BE RESPONSIBLE FOR  
ALL NECESSARY COORDINATION AND PHASING OF WORK SUCH  
THAT INSPECTION SATISFACTORY TO ODOT INSPECTOR(S) IS  
ACHIEVED. ANY CONSTRUCTION FOUND UNACCEPTALBE OR NOT  
COORDINATED FOR INSPECTION, SHALL BE SUBJECT TO ALL  
REMOVAL, REMEDIATION, OR OTHER MODIFICATION DEEMED  
APPROPRIATE BY THE ODOT INSPECTOR(S). THE CONTRACTOR  
SHALL PERFORM ANY AND ALL WORK REQUIRED TO ACHIEVE  
APPROVED INSPECTION, AT NO ADDITIONAL COST.

SIGNAL ACTIVATION

PRIOR TO ACTIVATING THE NEW TRAFFIC SIGNAL TO STOP AND  
GO MODE AND/OR REMOVING THE EXISTING TRAFFIC SIGNAL  
FROM SERVICE, ALL ITEMS IN THE PROPOSED SIGNAL PLAN  
SHALL BE FULLY COMPLETED, (I.E., VEHICLE DETECTION,  
PEDESTRIAN SIGNAL HEADS, ETC). IF THERE ARE  
CONSTRUCTABILITY ISSUES (I.E., ROADWAY WIDENING, ETC.)  
THAT PREVENT THE SIGNAL FROM BEING COMPLETED PRIOR TO  
ACTIVATION, IT SHALL BE BROUGHT TO THE ATTENTION OF  
THE PROJECT ENGINEER AND DISTRICT TRAFFIC ENGINEER.  
THE DISTRICT TRAFFIC ENGINEER WILL THEN REVIEW, APPROVE  
OR REJECT PROPOSALS TO ACTIVATE THE TRAFFIC SIGNAL  
PRIOR TO COMPLETION.

THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER AND  
DISTRICT TRAFFIC ENGINEER AT LEAST 10 WORKING DAYS  
PRIOR TO SCHEDULING THE FINAL INSPECTION OF THE SIGNAL  
INSTALLATION. FINAL INSPECTION IS NOT CONSIDERED  
COMPLETE UNTIL DESIGNATED DISTRICT TRAFFIC PERSONNEL  
INSPECT THE TRAFFIC SIGNAL AND ISSUE WRITTEN APPROVAL .  
IF ISSUES ARE FOUND DURING THE FINAL INSPECTION THAT  
EFFECT THE SAFETY OF THE TRAVELING PUBLIC AND/OR THE  
EFFICIENCY OF THE INTERSECTION, THE SIGNAL SHALL NOT BE  
ACTIVATED ON THE PROPOSED DATE. ANY PUNCH LIST ITEMS  
THAT ARE FOUND SHALL BE CORRECTED AND REINSPECTED BY  
DISTRICT TRAFFIC PERSONNEL PRIOR TO FINAL ACCEPTANCE.  
ODOT FORCES SHALL ONLY ASSUME DAY TO DAY MAINTENANCE  
OF THE TRAFFIC SIGNAL AFTER FINAL WRITTEN ACCEPTANCE  
HAS BEEN ISSUED.

632 REMOVAL OF TRAFFIC SIGNAL INSTALLATION

TRAFFIC SIGNAL INSTALLATIONS, INCLUDING SIGNAL HEADS,  
CABLE, MESSENGER WIRE, STRAIN POLES, CABINET, CONTROLLER,  
ETC., SHALL BE REMOVED IN ACCORDANCE WITH CMS 632.26  
AND AS INDICATED ON THE PLANS. REMOVED ITEMS SHALL BE  
REUSED AS PART OF A NEW INSTALLATION ON THE PROJECT  
OR STORED ON THE PROJECT FOR SALVAGE BY (ODOT  
DISTRICT 2) IN ACCORDANCE WITH THE LISTING GIVEN HEREIN.

(ITEMS TO BE STORED)

OTT-163-31.29 (S. BRIDGE RD.) & OTT-163-31.70 (N. BUCK RD.)

-CONTROLLER  
-UPS

(ITEMS TO BE REUSED)

OTT-163-31.29 (S. BRIDGE RD.) & OTT-163-31.70 (N. BUCK RD.)

-COMMUNICATION/NETWORK EQUIPMENT AND RELATED  
COMPONENTS

DESIGN AGENCY



DESIGNER  
DEK

REVIEWER  
JJM 04/22/24

PROJECT ID  
110100

SHEET  
P.3

TOTAL  
27



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

UNDERDRAINS FOR PULLBOXES

REFERENCE TRAFFIC SCD HL-30.11 FOR DETAILS ABOUT DRAINING PULLBOXES. UNDERDRAINS FOR PULLBOXES SHALL BE USED AS DIRECTED BY THE ENGINEER AND SHALL BE PROVIDED WHERE THE LENGTH REQUIRED FOR A SATISFACTORY OUTLET DOES NOT EXCEED 20 FEET.

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 GROUND-MOUNTED CABINET SHALL BE A NEMA TS-2, TYPE 1, CABINET SIZE 7 SUPER R WITH 16 LOAD SWITCH BAYS, LED UNDER-SHELF LIGHTING, POWER HARNESSES FOR BOTH TS2 TYPE 1 AND TYPE 2 CONTROLLERS AND SHALL HAVE A MINIMUM OF THREE SHELVES.

THIS CABINET WILL HAVE TWO SEPARATE FULL-SIZED ENCLOSURES. ONE SIDE WILL BE FOR THE SIGNAL CONTROLLER AND THE OTHER FOR THE UPS.

EACH CABINET SHALL COME EQUIPPED WITH TWO 16-CHANNEL CABINET DETECTOR RACKS (CDR) INCLUDING BUS INTERFACE UNITS (BIU). THE LOOP DETECTOR TERMINATION PANEL FOR THE SECOND DETECTOR RACK SHALL BE OMITTED.

THE CABINET SHALL BE FURNISHED WITH AN EDI MMU AS ALLOWED ON THE TAP/APPROVED PRODUCTS LIST.

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

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

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

THE UPS SIDE OF THE CABINET SHALL HAVE A DOOR STOP MECHANISM AND THERMOSTATICALLY CONTROLLED FAN. ADDITIONALLY, THE CABINET SHALL BE BUILT WITH BATTERIES ALWAYS BELOW THE INVERTER TO AVOID POTENTIAL FURTHER BATTERY LEAKAGE ISSUES.

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

THE UPS FURNISHED SHALL BE AN ALPHA MANUFACTURED UNIT AND LISTED ON THE TRAFFIC AUTHORIZED PRODUCTS (TAP) LIST.

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

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

THIS ITEM SHALL INCLUDE A RED LED STATUS INDICATOR LAMP TO ALLOW MAINTENANCE PERSONNEL AND LAW ENFORCEMENT TO QUICKLY ASSESS WHETHER A TRAFFIC SIGNAL CABINET IS BEING POWERED BY A UPS. THE LED HOUSING SHALL BE NEMA 4X, IP65 OR IP66, RATED FOR OUTDOOR USE AND BE TAMPER/SHATTER RESISTANT. IT SHALL BE A DOMED ENCLOSURE CONTAINING A RED LENS WITH LED THAT IS VISIBLE FROM 100 FOOT MINIMUM. THE ENCLOSURE AND LED MODULE SHOULD BE PLACED ON THE SIDE OF THE UPS CABINET FACING TOWARDS THE MAINLINE ROADWAY AND SEALED FROM WATER INTRUSION. IT SHOULD BE WIRED USING MINIMUM 20GA STRANDED, INSULATED HOOKUP WIRE TO THE STATUS RELAY OUTPUTS OF

THE UPS. THE WIRES SHALL BE TERMINATED BY LUGS AT THE DISPLAY END AND PERMANENTLY LABELED "BACKUP POWER STATUS DISPLAY," WITH WIRE POLARITY INDICATED. THE RED LED SHALL ONLY ILLUMINATE TO INDICATE THE CABINET IS OPERATING UNDER UPS BACKUP POWER (THE "BACKUP" OPERATING CONDITION). THIS ITEM INCLUDES PROGRAMMING THE UPS STATUS RELAY OUTPUTS TO PRODUCE THE LAMP STATUS DISPLAYS. THESE STATUS DISPLAYS WILL BE SOLID 100% DUTY CYCLE (NOT FLASHING) DISPLAYS. THE OPERATING VOLTAGE OF THE LED LAMP SHALL BE 120V AC UNLESS OTHERWISE INDICATED.

SEEDING AND MULCHING

THE FOLLOWING QUANTITIES ARE PROVIDED TO PROMOTE GROWTH AND CARE OF PERMANENT SEEDED AREAS:

659, TOPSOIL	3 CU. YD.
659, SEEDING AND MULCHING	25 SQ. YD.
659, REPAIR SEEDING AND MULCHING	2 SQ. YD.
659, INTER-SEEDING	2 SQ. YD.
659, COMMERCIAL FERTILIZER	0.1 TON
659, WATER	1 M. GAL.

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES, AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE BASED ON THESE LIMITS.

809 STOP-LINE RADAR DETECTION, AS PER PLAN

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

- 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.

- THE CONTRACTOR SHALL INSTALL THE RADAR DETECTION PRIOR TO MILLING/DISABLING EXISTING LOOPS.
- THE INSTALLATION SHALL INCLUDE ALL CONTROLLER PROGRAMMING FOR COMPLETE INSTALLATION, WHICH INCLUDES MODIFICATIONS FOR REMOVAL OF EXISTING DETECTION.

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

809 ADVANCE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR ADVANCE DETECTION UNIT (MODEL SS-200E). 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.
- THE CONTRACTOR SHALL INSTALL THE RADAR DETECTION PRIOR TO MILLING/DISABLING EXISTING LOOPS.
- 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.

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.

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 NON-INTRUSIVE 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.

DESIGN AGENCY



DESIGNER

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LOCATIONS WHERE NON-INTRUSIVE DETECTION IS PROPOSED AND THE EXISTING VEHICLE DETECTION IS TO BE ABANDON, 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.

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.
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.

632 SIGNAL SUPPORT FOUNDATION

PRIOR TO ORDERING THE SIGNAL 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.

DUE TO THE FURTHER POSSIBILITY OF CONFLICT WITH EXISTING OR PROPOSED UNDERGROUND OBSTRUCTIONS (INCLUDING THE POSSIBILITY OF UNRECORDED OBSTRUCTIONS) WHICH COULD AFFECT THE LOCATION OF THE FOUNDATION FOR THIS ITEM, AND CONSEQUENTLY, THE DESIGN OF THE SUPPORT AND/OR ARMS, THE CONTRACTOR SHALL NOT PLACE FINAL ORDERS FOR THE ITEM UNTIL THE FOUNDATIONS HAVE BEEN INSTALLED, AT FINAL GRADE, AND THE CONTRACTOR HAS RECEIVED, FROM ENGINEER, WRITTEN NOTICE TO PROCEED WITH THE ORDERS FOR THE ITEM.

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

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

NO PAYMENTS FOR DELIVERED MATERIALS FOR THE FOUNDATION OR SUPPORT ITEMS SHALL BE MADE UNTIL THE FOUNDATIONS ARE IN PLACE, AND IF CHANGES IN THE DESIGN OF THIS ITEM ARE REQUIRED, NO PAYMENT SHALL BE MADE FOR THE ITEMS MANUFACTURED TO THE ORIGINAL DESIGN.

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

ITEM 524 DRILLED SHAFTS, AS PER PLAN

CONSTRUCT THE SIGNAL FOUNDATIONS PER CMS 632, TC-81.22 & TC-21.21, EXCEPT UTILIZE THE CHART BELOW AS GUIDANCE FOR EQUIPMENT AND DRILLING DEPTHS ABOVE OR INTO BEDROCK.

POLE LOCATION	36" DIAMETER, ABOVE BEDROCK (FT)	42" DIAMETER, ABOVE BEDROCK (FT)	42" DIAMETER, INTO BEDROCK (FT)
SP-1 @ OTT-163-31.70 (N. BUCK RD.), Page 15		11	2
SP-2 @ OTT-163-31.70 (N. BUCK RD.), Page 15		12	2
SP-1 @ OTT-163-31.29 (S. BRIDGE RD.), Page 11	15		
SP-2 @ OTT-163-31.29 (S. BRIDGE RD.), Page 11		15	1

THE FOLLOWING PAY ITEMS WILL BE CARRIED TO THE GENERAL SUMMARY:

- ITEM 524 DRILLED SHAFTS, 36" DIAMETER, ABOVE BEDROCK, AS PER PLAN15 FT.
- ITEM 524 DRILLED SHAFTS, 42" DIAMETER, ABOVE BEDROCK, AS PER PLAN38 FT.
- ITEM 524 DRILLED SHAFTS, 42" DIAMETER, INTO BEDROCK, AS PER PLAN5 FT.

DESIGN AGENCY



DESIGNER

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ITEM 614 MAINTAINING TRAFFIC

IN ADDITION TO ITEM 614 MAINTAINING TRAFFIC, IN THE CONSTRUCTION AND MATERIAL SPECIFICATIONS HANDBOOK, THE FOLLOWING SHALL APPLY:

THE CONSTRUCTION WORK NOTED HEREIN SHALL BE PERFORMED WHILE TRAFFIC IS MAINTAINED. THE MAINTENANCE OF TRAFFIC SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. NO TRAFFIC CONTROL ASSISTANCE OTHER THAN TECHNICAL GUIDANCE WILL BE PROVIDED BY THE STATE. ALL PROPOSED WORK SHALL BE PERFORMED ON THE SHOULDER IF POSSIBLE.

THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE TRAFFIC CONTROL IN ACCORDANCE WITH THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" FOR STREETS AND HIGHWAYS (OMUTCD).

NO DAYTIME LANE CLOSURE OR IMPACTS TO TRAFFIC ARE ALLOWED MEMORIAL DAY THRU LABOR DAY. FROM MEMORIAL DAY TO LABOR DAY, LANE CLOSURES ARE PERMITTED MON-THUR 7 PM-7AM, AND NO LANE CLOSURE ARE ALLOWED FRI-SUN. FROM LABOR DAY TO MEMORIAL DAY, THERE ARE NO RESTRICTIONS WHEN LANE CLOSURE CAN OCCUR.

NO WORK SHALL BE ALLOWED OVER A TRAFFIC LANE USING A BUCKET TRUCK, UNLESS A LANE CLOSURE IS BEING UTILIZED WITH THE APPROPRIATE STANDARD CONSTRUCTION DRAWING.

THE CONTRACTOR SHALL NOTIFY THE ENGINEER, THE RESPONSIBLE SAFETY ENFORCEMENT AGENCIES, AND THE OHIO DEPARTMENT OF TRANSPORTATION, DISTRICT 2 PUBLIC INFORMATION OFFICER, (419) 373-4428 NOT LESS THAN 24 HOURS PRIOR TO A SCHEDULED DISRUPTION OF TRAFFIC.

THE CONTRACTOR SHALL NOTIFY THE ODOT PERMIT OFFICE 14 DAYS PRIOR TO ANY MAINLINE TRAFFIC STOPPAGE (419-373-4414).

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH C&MS 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC.

HOLIDAY CLOSURES

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

CHRISTMAS	NEW YEARS
EASTER	MEMORIAL DAY
FOURTH OF JULY	LABOR 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	12:00 PM FRIDAY THROUGH 12:00 PM MONDAY
MONDAY	12:00 PM FRIDAY THROUGH 12:00 PM TUESDAY
TUESDAY	12:00 PM MONDAY THROUGH 12:00 PM WEDNESDAY
WEDNESDAY	12:00 PM TUESDAY THROUGH 12:00 PM THURSDAY
THURSDAY	12:00 PM WEDNESDAY THROUGH 12:00 PM MONDAY
FRIDAY	12:00 PM THURSDAY THROUGH 12:00 PM MONDAY
SATURDAY	12:00 PM FRIDAY THROUGH 12:00 PM MONDAY

NO EXTENSIONS OF TIME SHALL BE GRANTED FOR DELAYS IN MATERIAL DELIVERIES, UNLESS SUCH DELAYS ARE INDUSTRYWIDE, OR FOR LABOR STRIKES, UNLESS SUCH STRIKES ARE AREA WIDE.

SHOULD THE CONTRACTOR FAIL TO MEET ANY OF THESE REQUIREMENTS, THE CONTRACTOR SHALL BE ASSESSED LIQUIDATED DAMAGES IN ACCORDANCE WITH 108.07.

ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE DURING CONSTRUCTION OPERATIONS 24 HRS

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 C&MS 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:

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

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 C&MS 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 AS APPROVED 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 FOR LONG-TERM LANE CLOSURES/SHIFTS (FOR THE FIRST AND LAST DAY OF MAJOR CHANGES IN TRAFFIC CONTROL SETUP).

FOR OPERATIONS WITHOUT POSITIVE PROTECTION OCCURRING WITHIN 10 FEET OF AN OPEN TRAVELED LANE THAT MEET ALL OF THE FOLLOWING CRITERIA: ON A MULTI-LANE DIVIDED INTERSTATE, OTHER FREEWAY OR EXPRESSWAY; AND AN AUTHORIZED SPEED LIMIT OF 45 MPH OR GREATER THAT IS IN EFFECT AT THE TIME OF THE OPERATION; AND, AADT OF 50,000 (OR AADT OF 30,000 WITH 25% OR HIGHER PERCENT TRUCKS)

"WITHOUT POSITIVE PROTECTION" MEANS USE OF DRUMS, CONES, SHADOW VEHICLE, ETC. WITHOUT PROTECTION FROM PORTABLE BARRIER OR OTHER RIGID BARRIER ALONG THE WORK AREA. THIS PHRASE DOES NOT APPLY TO CASES WHERE POSITIVE PROTECTION IS REQUIRED. MOBILE OPERATIONS ARE REGARDED AS "WITHOUT POSITIVE PROTECTION". FOR WORK ZONES USING A COMBINATION OF BARRIER AND TEMPORARY TRAFFIC CONTROL DEVICES (CONES, DRUMS, ETC), THE DESIGNATION SHALL BE BASED UPON THE TYPE OF DEVICES USED IN THE AREA THAT WORKERS ARE LOCATED.

IF MULTIPLE ACTIVE LOCALIZED QUALIFYING WORK AREAS OCCUR WITHOUT POSITIVE PROTECTION, PER MAINLINE TRAFFIC DIRECTION, PROVIDE A UNIFORMED LEO AND OFFICIAL PATROL CAR IN ADVANCE OF: THE FIRST ACTIVE WORK AREA THAT DRIVERS WILL ENCOUNTER; OR THE ACTIVE WORK AREA Laterally Closest to the OPEN TRAVELED LANE; OR OTHER LOCATION AS APPROVED BY THE ENGINEER. THE UNIFORMED LEO AND OFFICIAL PATROL CAR MAY RELOCATE AMONG THE LISTED LOCATIONS AS APPROPRIATE AS THE OPERATIONS PROCEED IN THE LOCALIZED QUALIFYING WORK AREAS.

IN GENERAL, LEOS SHOULD BE POSITIONED IN ADVANCE OF AND ON THE SAME SIDE AS THE LANE RESTRICTION (OR AT THE POINT OF ROAD CLOSURE), AND TO MANUALLY CONTROL TRAFFIC MOVEMENTS THROUGH SIGNALIZED INTERSECTIONS IN WORK ZONES.

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.

ENSURE PROVIDED LEOS HAVE BEEN TRAINED APPROPRIATE TO THE JOB DECISIONS THEY ARE REQUIRED TO MAKE WHILE ON THE PROJECT, IN ACCORDANCE WITH C&MS 614.03.

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. 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 THAT 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 24 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 A LEO ARE INCLUDED WITH THE BID UNIT PRICE FOR ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE.

THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THESE SERVICES WITH:

OTTAWA COUNTY

OTTAWA COUNTY SHERIFF  
315 MADISON ST.  
PORT CLINTON, OH 43452  
419-734-4404

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.

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 IS 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.

DESIGN AGENCY



DESIGNER  
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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 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 CONST- RUCTION PROCEDURES, THIS OUTAGE SHALL NOT EXCEED 8 HOURS AND SHALL NOT INCLUDE THE HOURS OF 7AM TO 7PM. 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.

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.

NOTIFICATION OF TRAFFIC RESTRICTIONS

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 TO INFORM THE SPECIAL HAULING PERMITS SECTION (HAULING.PERMITS@DOT.OHIO.GOV) AND THE DISTRICT PUBLIC INFORMATION OFFICE (PIO). 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 SHALL LIST THE SPECIFIC LOCATION, TYPE OF WORK, ROAD STATUS, DATE AND TIME OF RESTRICTION, DURATION OF RESTRICTION, NUMBER OF LANES MAINTAINED, NUMBER OF LANES CLOSED, MINIMUM VERTICAL CLEARANCE, MINIMUM WIDTH OF DRIVABLE PAVEMENT, DETOUR ROUTES, IF APPLICABLE, AND ANY OTHER INFORMATION REQUESTED BY THE PROJECT ENGINEER.

NOTIFICATION OF TRAFFIC RESTRICTIONS TIME TABLE  
ITEM DURATION OF NOTICE DUE TO  
CLOSURE PERMITS & PIO

RAMP & >= 2 WEEKS 21 CALENDAR DAYS  
ROAD CLOSURES PRIOR TO CLOSURE

> 12 HOURS 14 CALENDAR DAYS  
& < 2 WEEKS PRIOR TO CLOSURE

<= 12 HOURS 4 CALENDAR DAYS  
PRIOR TO CLOSURE

LANE >= 2 WEEKS 14 CALENDAR DAYS  
CLOSURES & PRIOR TO CLOSURE  
RESTRICTIONS  
< 2 WEEKS 5 BUSINESS DAYS  
PRIOR TO CLOSURE

START OF N/A 14 CALENDAR DAYS  
CONSTRUCTION & PRIOR TO  
TRAFFIC PATTERN IMPLEMENTATION  
CHANGES

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

ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGNS, AS PER PLAN

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND REMOVE, WHEN NO LONGER NEEDED, A CHANGEABLE MESSAGE SIGN. THE SIGN SHALL BE OF A TYPE SHOWN ON A LIST OF APPROVED PCMS UNITS AVAILABLE ON THE OFFICE OF MATERIALS MANAGEMENT WEB PAGE. THE LIST CONTAINS CLASS A AND B UNITS WITH MINIMUM LEGIBILITY DISTANCES OF 800 FEET AND 650 FEET, RESPECTIVELY.

EACH SIGN SHALL BE TRAILER-MOUNTED AND EQUIPPED WITH A FUNCTIONAL DIMMING MECHANISM, TO DIM THE SIGN DURING DARKNESS, AND A TAMPER AND VANDAL PROOF ENCLOSURE. EACH SIGN SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ON-SITE PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT. THE SIGN SHALL ALSO BE CAPABLE OF BEING POWERED BY AN ELECTRICAL SERVICE DROP FROM A LOCAL UTILITY COMPANY. THE PCMS SHALL BE DELINEATED IN ACCORDANCE WITH C&MS 614.03.

PLACEMENT, OPERATION, MAINTENANCE AND ALL ACTIVATION OF THE SIGNS BY THE CONTRACTOR SHALL BE AS DIRECTED BY THE ENGINEER. THE PCMS SHALL BE LOCATED IN A HIGHLY VISIBLE POSITION YET PROTECTED FROM TRAFFIC. THE CONTRACTOR SHALL, AT THE DIRECTION OF THE ENGINEER, RELOCATE THE PCMS TO IMPROVE VISIBILITY OR ACCOMMODATE CHANGED CONDITIONS. WHEN NOT IN USE, THE PCMS SHALL BE TURNED OFF. ADDITIONALLY, WHEN NOT IN USE FOR EXTENDED PERIODS OF TIME, THE PCMS SHALL BE TURNED AWAY FROM ALL TRAFFIC.

THE ENGINEER SHALL BE PROVIDED ACCESS TO EACH SIGN UNIT AND SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ODOT PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT, AND TO REVISE SIGN MESSAGES, IF NECESSARY.

(THE CONTRACTOR SHALL IMPLEMENT A SYSTEM WHEREBY CHANGEABLE MESSAGES WILL BE IMPLEMENTED WITHIN 4 HOURS FOLLOWING TELEPHONE NOTIFICATION FROM THE PROJECT ENGINEER TO A DESIGNATED PHONE.)

ALL MESSAGES TO BE DISPLAYED ON THE SIGN WILL BE PROVIDED BY THE ENGINEER. A LIST OF ALL REQUIRED PRE-PROGRAMMED MESSAGES WILL BE GIVEN TO THE CONTRACTOR AT THE PROJECT PRECONSTRUCTION CONFERENCE. THE SIGN SHALL HAVE THE CAPABILITY TO STORE UP TO 99 MESSAGES. MESSAGE MEMORY OR PRE-PROGRAMMED DISPLAYS SHALL NOT BE LOST AS A RESULT OF POWER FAILURES TO THE ON-BOARD COMPUTER. THE SIGN LEGEND SHALL BE CAPABLE OF BEING CHANGED IN THE FIELD. THREE-LINE PRESENTATION FORMATS WITH UP TO SIX MESSAGE PHASES SHALL BE SUPPORTED. PCMS FORMAT SHALL PERMIT THE COMPLETE MESSAGE FOR EACH PHASE TO BE READ AT LEAST TWICE.

THE PCMS SHALL CONTAIN AN ACCURATE CLOCK AND PROGRAMMING LOGIC WHICH WILL ALLOW THE SIGN TO BE ACTIVATED, DEACTIVATED OR MESSAGES CHANGED AUTOMATICALLY AT DIFFERENT TIMES OF THE DAY FOR DIFFERENT DAYS OF THE WEEK.

(THE PCMS SHALL CONTAIN A CELLULAR TELEPHONE DATA LINK WHICH WILL (IN ACTIVE CELLULAR PHONE AREAS) ALLOW REMOTE SIGN ACTIVATION, MESSAGE CHANGES, MESSAGE ADDITIONS AND REVISIONS TO TIME OF DAY PROGRAMS. THE SYSTEM SHALL ALSO PERMIT VERIFICATION OF CURRENT AND PROGRAMMED MESSAGES. ONE REMOTE DATA INPUT DEVICE (LAPTOP COMPUTER PLUS MODEM OR EQUIVALENT) SHALL BE FURNISHED FOR USE BY THE DISTRICT TRAFFIC ENGINEER, OR EQUIVALENT, AND SHALL BE INSURED AGAINST THEFT.) THE PCMS UNIT SHALL BE MAINTAINED IN GOOD WORKING ORDER BY THE CONTRACTOR IN ACCORDANCE WITH THE PROVISIONS OF C&MS 614.07. THE CONTRACTOR SHALL, PRIOR TO ACTIVATING THE UNIT, MAKE ARRANGEMENTS, WITH AN AUTHORIZED SERVICE AGENT FOR THE PCMS, TO ASSURE PROMPT SERVICE IN THE EVENT OF FAILURE. ANY FAILURE SHALL NOT RESULT IN THE SIGN BEING OUT OF SERVICE FOR MORE THAN 12 HOURS, INCLUDING WEEKENDS. FAILURE TO COMPLY MAY RESULT IN AN ORDER TO STOP WORK AND OPEN ALL TRAFFIC LANES AND/OR IN THE DEPARTMENT TAKING APPROPRIATE ACTION TO SAFELY CONTROL TRAFFIC. THE ENTIRE COST TO CONTROL TRAFFIC, ACCRUED BY THE DEPARTMENT DUE TO THE CONTRACTOR'S NONCOMPLIANCE, WILL BE DEDUCTED FROM MONEYS DUE, OR TO BECOME DUE THE CONTRACTOR ON HIS CONTRACT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR 24-HOUR-PER-DAY OPERATION AND MAINTENANCE OF THESE SIGNS ON THE PROJECT FOR THE DURATION OF THE PHASES WHEN THE PLAN REQUIRES THEIR USE.

PAYMENT FOR THE ABOVE DESCRIBED ITEM SHALL BE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, FUELS, LUBRICATING OILS, SOFTWARE, HARDWARE AND INCIDENTALS TO PERFORM THE ABOVE DESCRIBED WORK.

ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN 4 SIGN MONTH ASSUMING 2 PCMS  
SIGN(S) FOR 2 MONTH(S)

DESIGN AGENCY



DESIGNER

DEK

REVIEWER

JJM 04/22/24

PROJECT ID

110100

SHEET

P.7

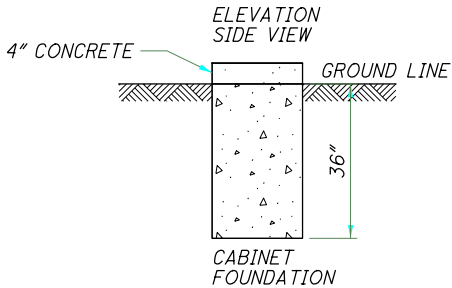
TOTAL

27

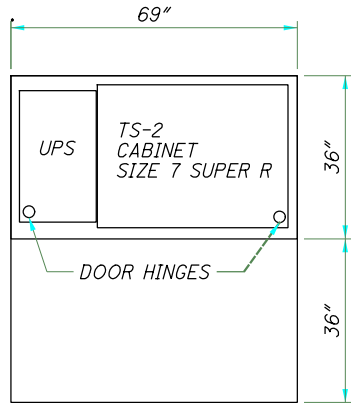


TS-2 SIZE 7 SUPER R CABINET DETAIL (TYP.)

CABINET FOUNDATION DETAIL



CABINET & WORK PAD DETAIL



PLAN VIEW

**NOTES:**

- 1) THE SIZE OF THE UPS FOUNDATION MAY VARY BASED ON THE CABINET SIZE PROVIDED.
- 2) UPS FOUNDATION ELEVATION SHOULD MATCH CABINET FOUNDATION ELEVATION.
- 3) THE UPS CABINET SHALL BE MOUNTED FLUSH UP AGAINST THE SIGNAL CABINET AND SEALED.
- 4) CONDUIT AND WIRING FROM THE SIGNAL CABINET TO THE UPS SHALL BE INSTALLED THROUGH THE CABINET RISER.

**SEPARATE BID ITEMS:**

633 CONTROLLER WORK PAD, AS PER PLAN  
633 CABINET FOUNDATION, AS PER PLAN  
633 UNINTERRUPTIBLE POWER SUPPLY (UPS), AS PER PLAN  
633 CABINET, TYPE TS-2, AS PER PLAN  
809 ATC CONTROLLER, AS PER PLAN



SHEET NUMBER													PART.	ITEM	ITEM	GRAND	UNIT	DESCRIPTION	SEE SHEET NO.
								4	5	6	7	10	01/SAF/21	ITEM	EXT	TOTAL			
																		EROSION CONTROL	
								3					3	659	00300	3	CY	TOPSOIL	
								25					25	659	10000	25	SY	SEEDING AND MULCHING	
								2					2	659	14000	2	SY	REPAIR SEEDING AND MULCHING	
								2					2	659	15000	2	SY	INTER-SEEDING	
								0.1					0.1	659	20000	0.1	TON	COMMERCIAL FERTILIZER	
								1					1	659	35000	1	MGAL	WATER	
								1,000					1,000	832	30000	1,000	EACH	EROSION CONTROL	
																		TRAFFIC SIGNALS	
								15					15	524	94703	15	FT	DRILLED SHAFTS, 36" DIAMETER, ABOVE BEDROCK, AS PER PLAN	5
								38					38	524	94803	38	FT	DRILLED SHAFTS, 42" DIAMETER, ABOVE BEDROCK, AS PER PLAN	5
								5					5	524	94805	5	FT	DRILLED SHAFTS, 42" DIAMETER, INTO BEDROCK, AS PER PLAN	5
												61	61	625	25504	61	FT	CONDUIT, 3", 725.051	
												38	38	625	25604	38	FT	CONDUIT, 4", 725.051	
												264	264	625	25906	264	FT	CONDUIT, JACKED OR DRILLED, 725.051, 4"	
												90	90	625	29000	90	FT	TRENCH	
												4	4	625	30706	4	EACH	PULL BOX, 725.08, 24"	
												12	12	625	31510	12	EACH	PULL BOX REMOVED	
												4	4	625	32000	4	EACH	GROUND ROD	
												90	90	625	36010	90	FT	UNDERGROUND WARNING/MARKING TAPE	
												2	2	625	76000	2	EACH	ARC FLASH CALCULATIONS AND LABEL, SIGNAL POWER SERVICE DISCONNECT AND SIGNAL CABINETS	
												8	8	630	80100	8	SF	SIGN, FLAT SHEET	
												8	8	630	81100	8	SF	SIGN ERECTED, FLAT SHEET	
												10	10	632	05006	10	EACH	VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, BLACK	
												2	2	632	05064	2	EACH	VEHICULAR SIGNAL HEAD, (LED), 4-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, BLACK	
												6	6	632	05086	6	EACH	VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, BLACK	
												18	18	632	25000	18	EACH	COVERING OF VEHICULAR SIGNAL HEAD	
												2,435	2,435	632	40500	2,435	FT	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG	
												1,210	1,210	632	40700	1,210	FT	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	
												400	400	632	68300	400	FT	POWER CABLE, 3 CONDUCTOR, NO. 6 AWG	
												600	600	632	69900	600	FT	SERVICE CABLE, 3 CONDUCTOR, NO. 4 AWG	
												2	2	632	70000	2	EACH	POWER SERVICE	
												2	2	632	71368	2	EACH	SIGNAL SUPPORT, TYPE TC-12.31 DESIGN 10 POLE, WITH MAST ARMS TC-81.22 DESIGN 13 AND DESIGN 12	
												1	1	632	71372	1	EACH	SIGNAL SUPPORT, TYPE TC-12.31 DESIGN 10 POLE, WITH MAST ARMS TC-81.22 DESIGN 13 AND DESIGN 13	
												1	1	632	72140	1	EACH	SIGNAL SUPPORT, TYPE TC-81.22, DESIGN 13	
												2	2	632	90101	2	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN	4
												2	2	633	65511	2	EACH	CABINET, TYPE TS-2, AS PER PLAN	4
												2	2	633	67101	2	EACH	CABINET FOUNDATION, AS PER PLAN	8
												2	2	633	67201	2	EACH	CONTROLLER WORK PAD, AS PER PLAN	8
												2	2	633	75001	2	EACH	UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN	4
												4	4	809	69001	4	EACH	ADVANCE RADAR DETECTION, AS PER PLAN	4
												5	5	809	69101	5	EACH	STOP LINE RADAR DETECTION, AS PER PLAN	4
												2	2	809	69123	2	EACH	ATC CONTROLLER, AS PER PLAN	5
																		MAINTENANCE OF TRAFFIC	
										24			24	614	11111	24	HOURL	LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE, AS PER PLAN	6
											4		4	614	18601	4	SNMT	PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN	7
														LS	614	11000	LS		INCIDENTALS
														LS	623	10000	LS		CONSTRUCTION LAYOUT STAKES AND SURVEYING
														LS	624	10000	LS		MOBILIZATION

GENERAL SUMMARY

DESIGN AGENCY



DESIGNER

DEK

REVIEWER

JJM 12/05/24

PROJECT ID

110100

SHEET

P.9

TOTAL

27

	SHEET NO.	LOCATIONS	625	625	625	625	625	625	625	625	630	630	632	632	632	632	632	632	632	632	632	632	632		
			CONDUIT, 3", 725.04	CONDUIT, 4", 725.04	CONDUIT, JACKED OR DRILLED, 725.051,3"	TRENCH	PULL BOX, 725.08, 24"	PULL BOX REMOVED	GROUND ROD	UNDERGROUND WARNING/MARKING TAPE	ARC FLASH CALCULATIONS AND LABEL	SIGN, FLAT SHEET	SIGN ERECTED, FLAT SHEET	VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN, BLACK	VEHICULAR SIGNAL HEAD, (LED), 4-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, BLACK	VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, BLACK	COVERING OF VEHICULAR SIGNAL HEAD	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG			POWER CABLE, 3 CONDUCTOR, NO. 6 AWG	SERVICE CABLE, 3 CONDUCTOR, NO. 4 AWG	POWER SERVICE	
			FT	FT	FT	FT	EACH	EACH	EACH	FT	EACH	SF	SF	EACH	EACH	EACH	EACH	FT	FT			FT	FT	EACH	
		OTT-163-31.29																							
	11	SIGNAL SUPPORT 2 TO PULLBOX 2	21			21	1		1	21		4	4	3	1	2	6	1005	520						
	11	PULLBOX 2 TO PULLBOX 1			142																				
	11	SIGNAL SUPPORT 1 TO PULLBOX 1	12			12	1	4	1	12				2			2					200	300	1	
	11	PULLBOX 1 TO CONTROLLER		18		9				9	1							120							
		OTT-163-31.70																							
	15	SIGNAL SUPPORT 2 TO PULLBOX 2	18			18	1		1	18		4	4	2	1	2	5	905	470						
	15	PULLBOX 2 TO PULLBOX 1			122																				
	15	SIGNAL SUPPORT 1 TO PULLBOX 1	10			10	1	8	1	10				3		2	5	405	220			200	300	1	
	15	PULLBOX 1 TO CONTROLLER		20		20				20	1														
TOTALS CARRIED TO GENERAL SUMMARY			61	38	264	90	4	12	4	90	2	8	8	10	2	6	18	2435	1210			400	600	2	
	SHEET NO.	LOCATIONS	632	632	632	632	633	633	633	633	809	809	809												
			SIGNAL SUPPORT, TYPE TC-12.31 DESIGN 10 POLE, WITH MAST ARMS TC-81.22 DESIGN 13 AND DESIGN 12	SIGNAL SUPPORT, TYPE TC-12.31 DESIGN 10 POLE, WITH MAST ARMS TC-81.22 DESIGN 13 AND DESIGN 13	SIGNAL SUPPORT, TYPE TC-81.22, DESIGN 13	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN	CABINET, TYPE TS-2, AS PER PLAN	CABINET FOUNDATION, AS PER PLAN	CONTROLLER WORK PAD, AS PER PLAN	UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN	ADVANCE RADAR DETECTION, AS PER PLAN	STOP LINE RADAR DETECTION, AS PER PLAN	ATC CONTROLLER, AS PER PLAN												
			EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH												
		OTT-163-31.29																							
	11	SIGNAL SUPPORT 2 TO PULLBOX 2	1								2														
	11	PULLBOX 2 TO PULLBOX 1																							
	11	SIGNAL SUPPORT 1 TO PULLBOX 1			1							2													
	11	PULLBOX 1 TO CONTROLLER				1	1	1	1	1			1												
		OTT-163-31.70																							
	15	SIGNAL SUPPORT 2 TO PULLBOX 2	1								1	1													
	15	PULLBOX 2 TO PULLBOX 1																							
	15	SIGNAL SUPPORT 1 TO PULLBOX 1		1							1	2													
	15	PULLBOX 1 TO CONTROLLER				1	1	1	1	1			1												
TOTALS CARRIED TO GENERAL SUMMARY			2	1	1	2	2	2	2	2	4	5	2												

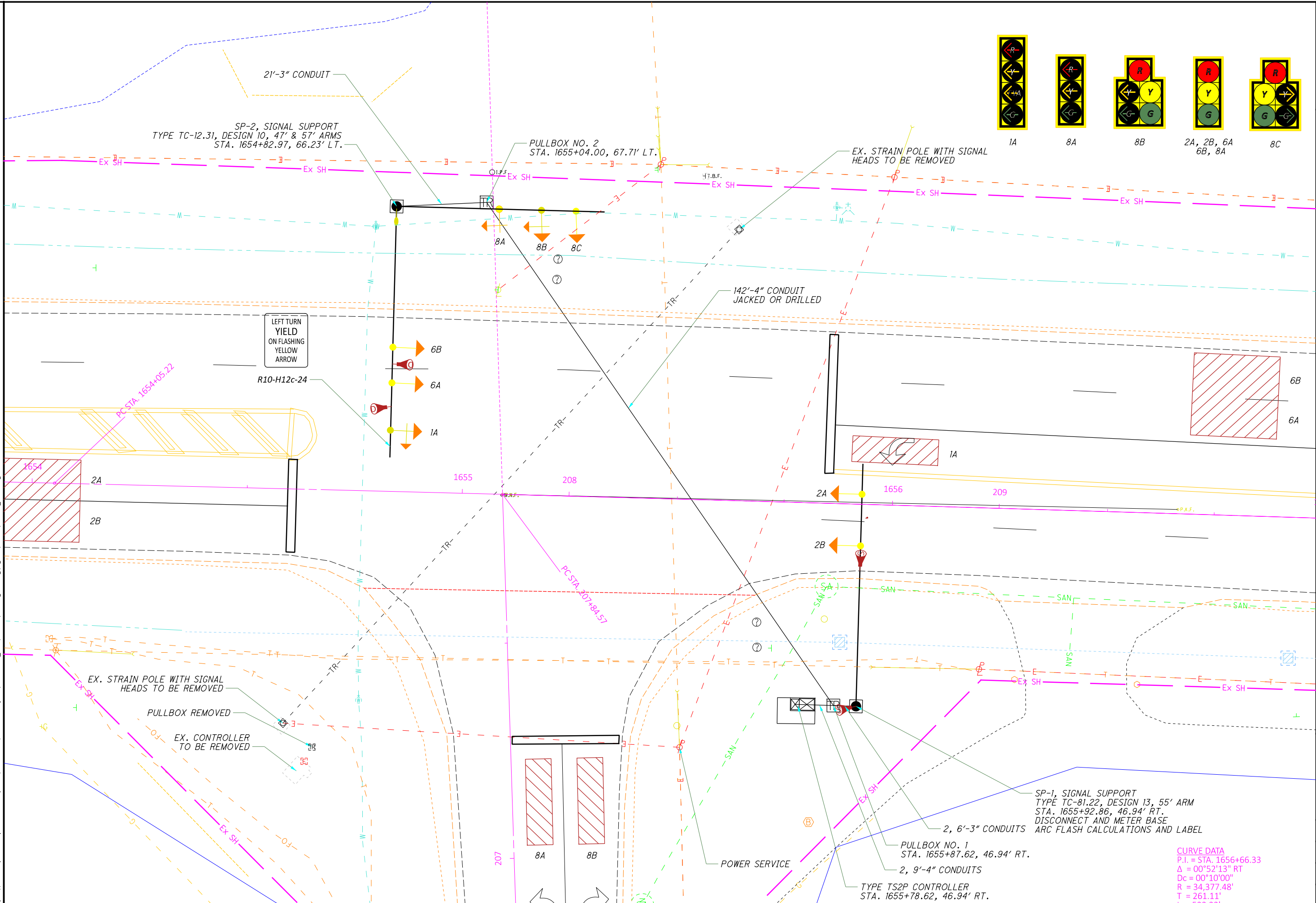
TRAFFIC SIGNAL SUBSUMMARY



DESIGN AGENCY  
DESIGNER  
DEK  
REVIEWER  
JMM 12/05/24  
PROJECT ID  
110100  
SHEET  
P.10

TOTAL  
27





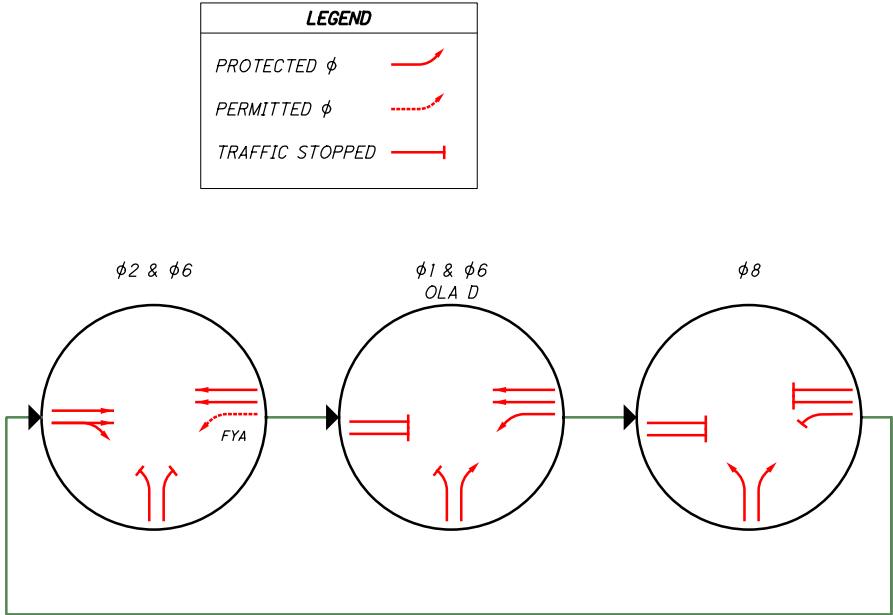
SIGNAL TIMING CHART (TEM FORM 496-3)

INTERSECTION: OTT-163-31.29    OTT-163 & SR-269 West										
MAINTAINING AGENCY: ODOT District 2										
START UP  START IN: ALL-RED FLASH TIME FOR: FLASH , ALL RED (SEC.): 9, 6 FIRST PHASE(S): 2 & 6 COLOR DISPLAYED: GREEN		DUAL ENTRY: ON			PHASES: 2 & 6					
		REST IN RED:			RING 1		RING 2			
		OVERLAP				A	B	C	D	
		PHASES				-	-	-	1	
INTERVAL OR FEATURE		CONTROLLER MOVEMENT NO.								
INTERSECTION MOVEMENT (PHASE)		1	2	3	4	5	6	7	8	
DIRECTION		WBL	EB	-	-	-	WB	-	NB	
MINIMUM GREEN (INITIAL) (SEC.)		7	20	-	-	-	20	-	10	
ADDED INITIAL *(SEC./ACTUATION)		-	-	-	-	-	-	-	-	
MAXIMUM INITIAL *(SEC.)		-	-	-	-	-	-	-	-	
PASSAGE TIME (PRESET GAP) (SEC.)		3	2	-	-	-	2	-	3	
TIME BEFORE REDUCTION *(SEC.)		-	-	-	-	-	-	-	-	
MINIMUM GAP *(SEC.)		-	-	-	-	-	-	-	-	
TIME TO REDUCE *(SEC.)		-	-	-	-	-	-	-	-	
MAXIMUM GREEN I (SEC.)		20	60	-	-	-	60	-	60	
MAXIMUM GREEN II (SEC.)		20	60	-	-	-	60	-	60	
YELLOW CHANGE (SEC.)		4.6	5.6	-	-	-	5.6	-	4.6	
ALL RED CLEARANCE (SEC.)		2	1	-	-	-	1	-	1.6	
DELAYED GREEN (LPI) ^ (SEC.)		-	-	-	-	-	-	-	-	
FLASHING YELLOW ARROW DELAY^ (SEC.)		3	-	-	-	-	-	-	-	
WALK (SEC.)		-	-	-	-	-	-	-	-	
PEDESTRIAN CLEARANCE (SEC.)		-	-	-	-	-	-	-	-	
RECALL	MAXIMUM (ON/OFF)	-	-	-	-	-	-	-	-	
	MINIMUM (ON/OFF)	-	ON	-	-	-	ON	-	-	
	PEDESTRIAN (ON/OFF)	-	-	-	-	-	-	-	-	
MEMORY (ON/OFF)		-	-	-	-	-	-	-	-	

NOTES:

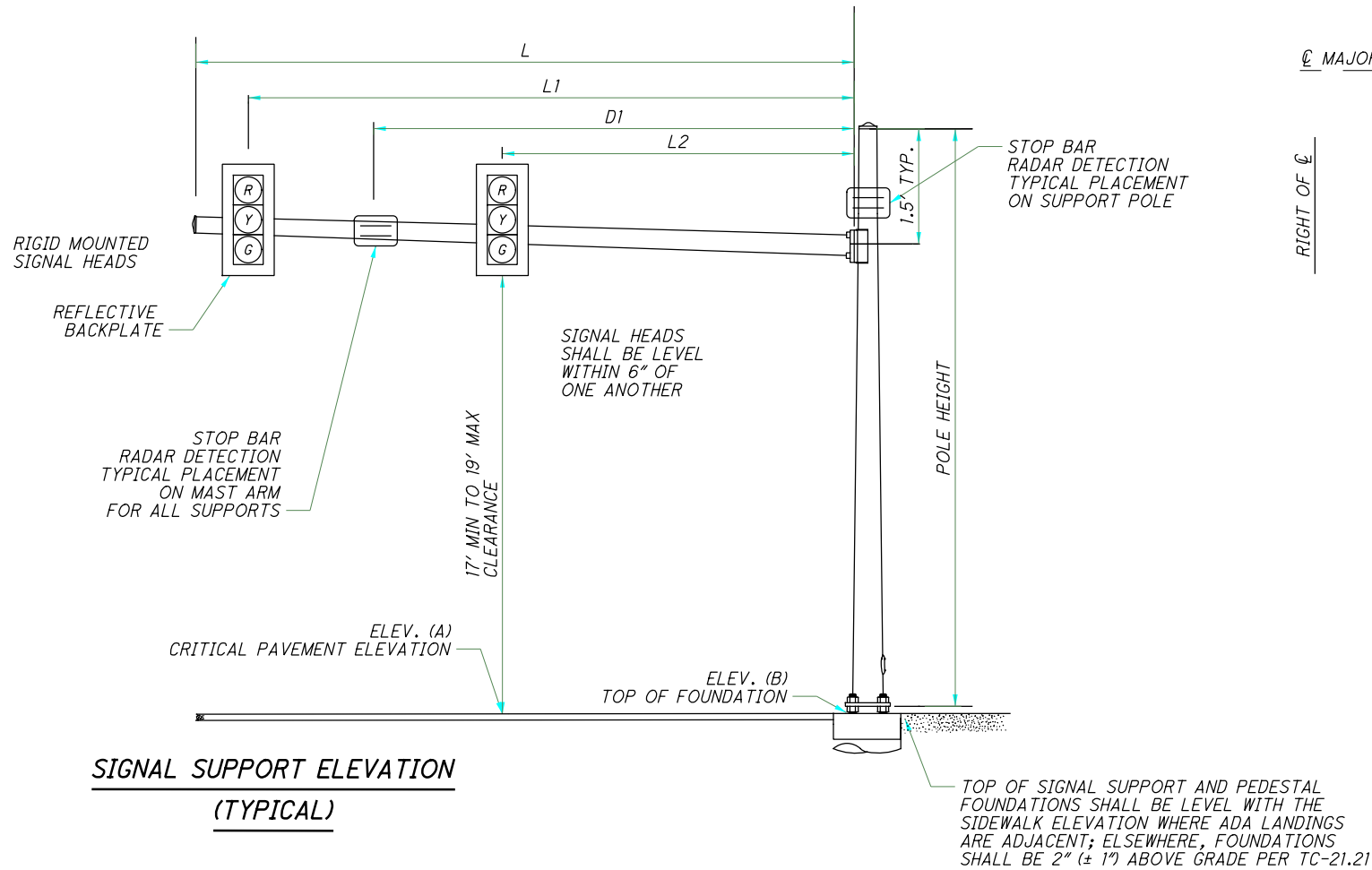
- ALL MOVEMENTS SHALL BE ACTUATED. THE PRIMARY THRU MOVEMENT SHOULD HAVE MIN RECALL ACTIVE TO REST IN GREEN.
- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PHASING DIAGRAM (TYPICAL)



RADAR DETECTION CHART

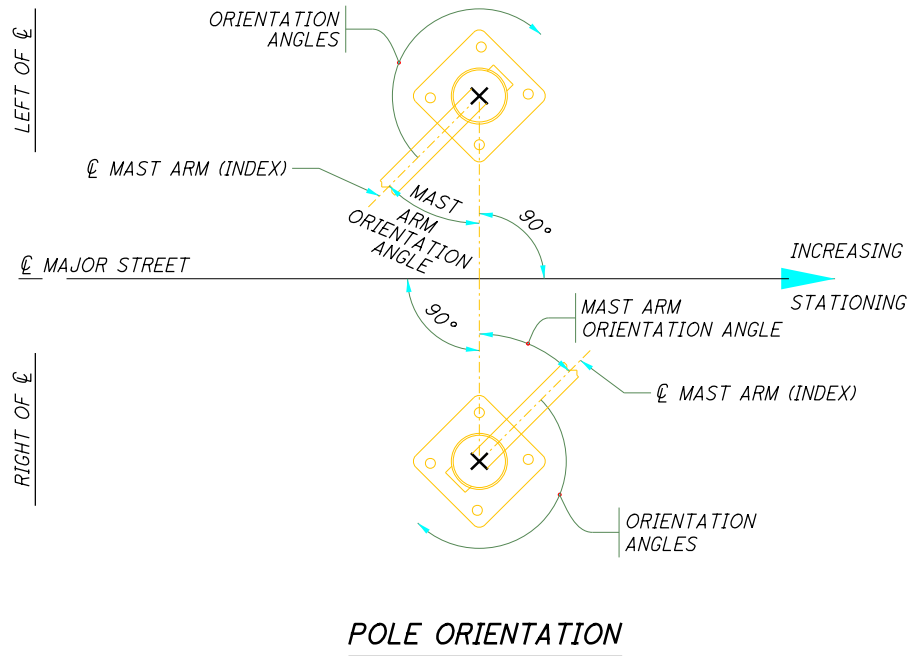
DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	DETECTOR NO.	PURPOSE	DETECTION ZONE LENGTH (FT)
1A	WB LEFT	PRESENCE	1	0	0	1	STOP-LINE	50
2A	EB THRU	PULSE	2	0	0	2	ADVANCE DETECTION	700
2B	EB THRU	PULSE	2	0	0	2	ADVANCE DETECTION	700
6A	WB THRU	PULSE	6	0	0	6	ADVANCE DETECTION	700
6B	WB THRU	PULSE	6	0	0	6	ADVANCE DETECTION	700
8A	NB LEFT	PRESENCE	8	0	0	8	STOP-LINE	50
8B	NB RIGHT	PRESENCE	8	10	0	8	STOP-LINE	50



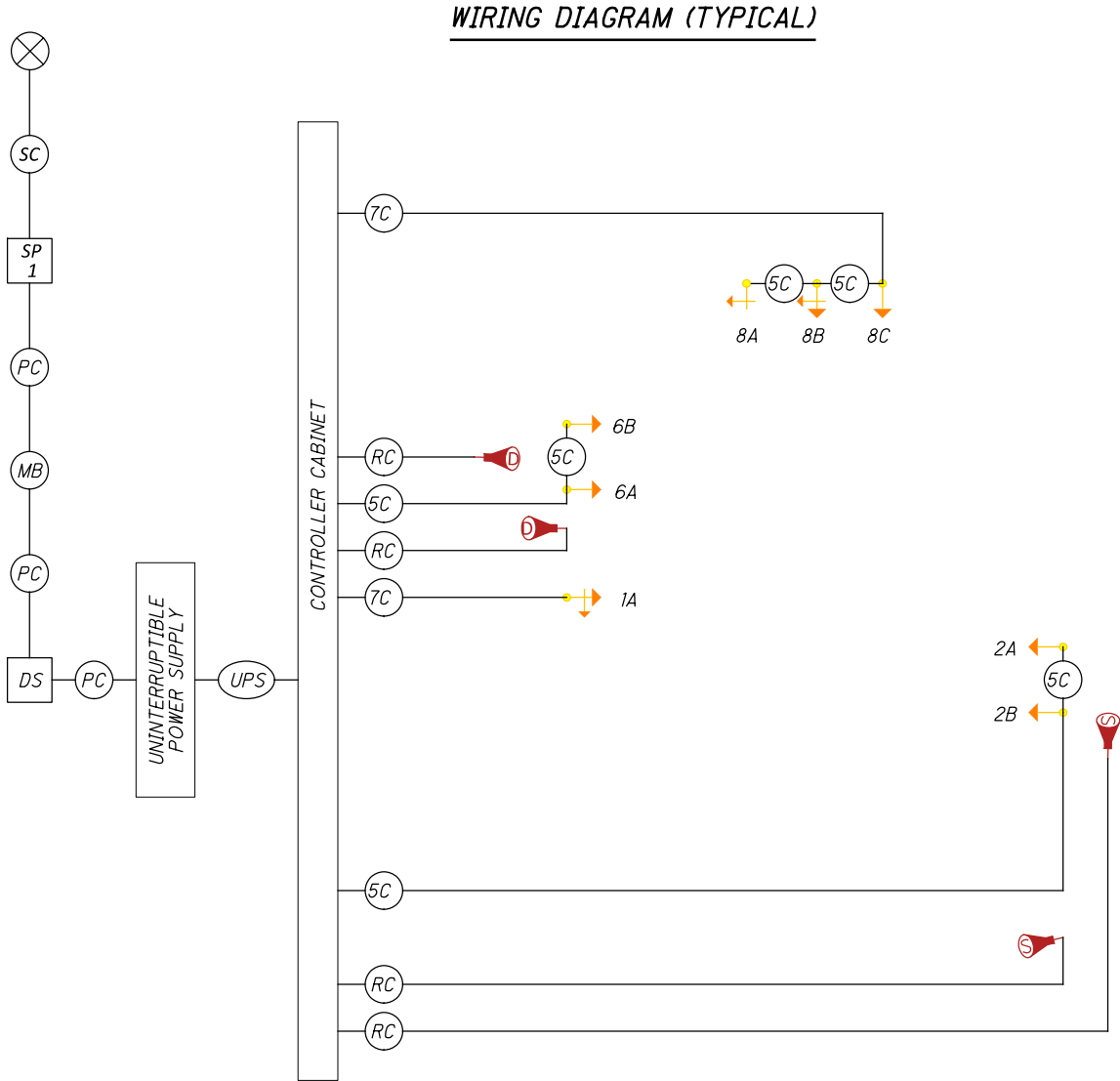
**SIGNAL SUPPORT ELEVATION**  
**(TYPICAL)**

**MAST ARM TABLE (TEM FIGURE 498-37 & 38)**

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS										ORIENTATION ANGLES FROM MAST ARM A						
			A (Pavt. Elev.)	B (Top of Found.)	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	D1	D2	MAST ARM A ANGLE	MAST ARM B ANGLE	POWER SERVICE	SIGNAL CABINET	BRACKET ARM	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
SP-1 A	1655+92.86	46.94' RT.	577.6	577.77	TC-81.22	13	22.5	21	55	48	36	-	0	30	0	-	-	-	-	-	-
SP-2 A	1654+82.97	66.23' LT.	577.98	578.15	TC-12.31	12	23.5	22	47	41	33	23	-	-	-	0	-	-	-	-	-
SP-2 B	1654+82.97	66.23' LT.	577.98	578.15	TC-12.31	13	23.5	22	57	51	40	32	46	36	270	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





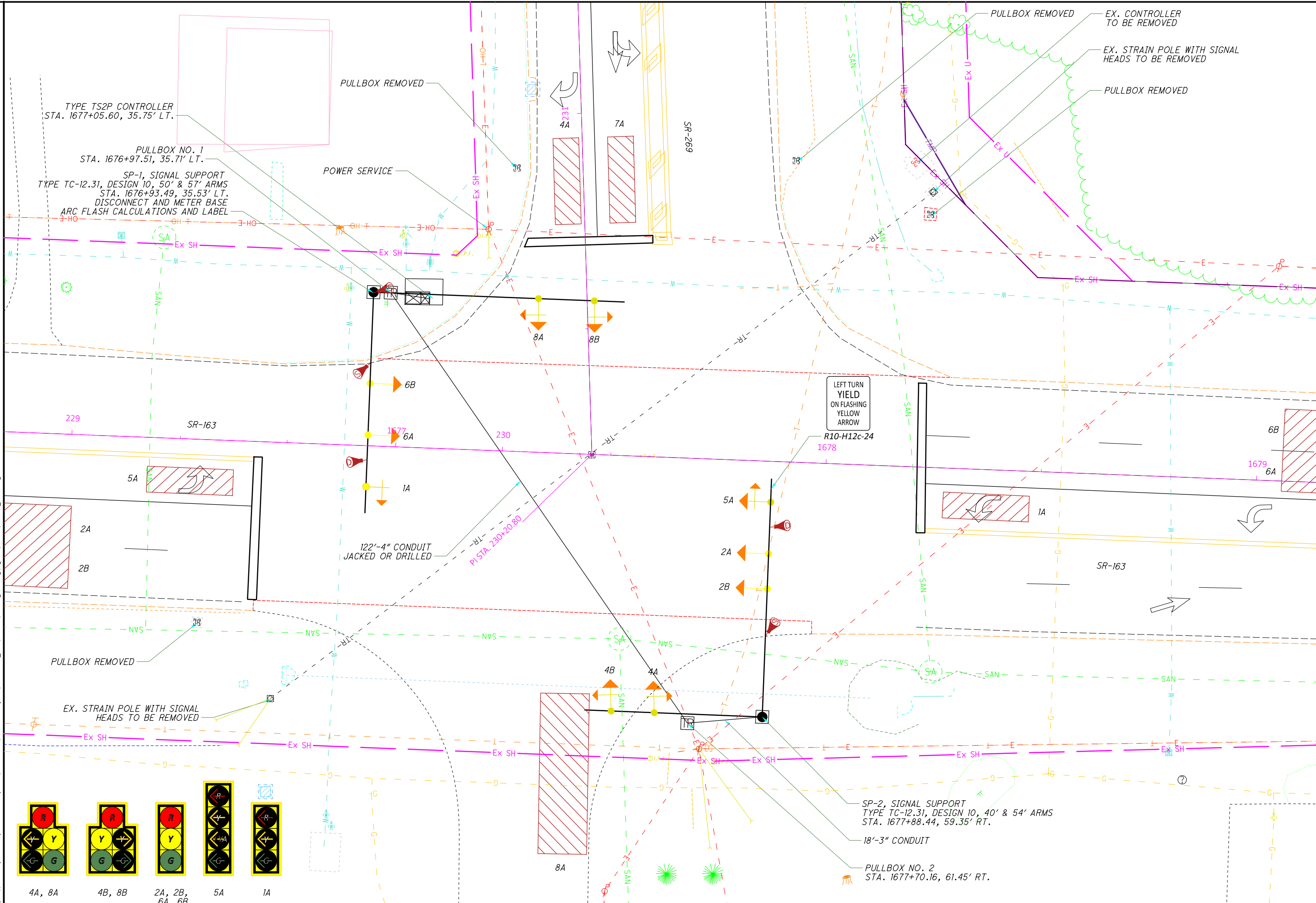
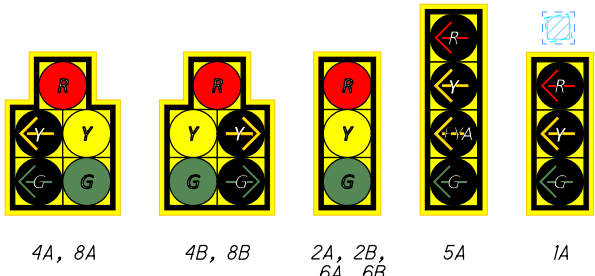


**FIELD WIRING HOOK-UP CHART (TEM FORM 496-16)**

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH	SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A (WB LT)	<--R---	1R	R	-	-	-	-
	<--Y---	1Y			-	-	
	<--FYA--	13G			-	-	
	<--G---	1G			-	-	
	-	-			-	-	
2A, B (EB)	R	2R	R	-	-	-	-
	Y	2Y			-	-	
	G	2G			-	-	
6A, B (WB)	R	6R	R	-	-	-	-
	Y	6Y			-	-	
	G	6G			-	-	
8A (WB)	<--R---	8R	R	-	-	-	-
	<--Y---	8Y			-	-	
	<--G---	8G			-	-	
				PEDESTRIAN MOVEMENTS			
8B (NB LT)	R	8R	R	-	-	-	-
	Y	8Y		-	-	-	
	G	8G		-	-	-	-
	<--Y---	8Y		-	-	-	
	<--G---	8G		-	-	-	
8C (NB RT)	R	8R	R	-	-	-	-
	Y	8Y		-	-	-	
	G	8G		-	-	-	-
	---Y-->	12Y		OVERLAPS			
	---G-->	12G		OLA D	---Y-->	NB RT/LS 12Y	OUT
					---G-->	NB RT/LS 12G	
LS = LOAD SWITCH				-	-	-	-
				-	-	-	-

**LEGEND**

	TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"		LUMINAIRE, CONVENTIONAL		SERVICE CABLE, 3 CONDUCTOR, NO. X AWG
	TRAFFIC SIGNAL, 2 UNIT, 3 UNIT, OR PHB HEAD 12"		2/C NO. XX AWG (LEAD-IN CABLE)		POWER CABLE, 2 CONDUCTOR, NO. X AWG
	TRAFFIC SIGNAL, 3 UNIT HEAD, 12" WITH ARROWS		VEHICLE LOOP DETECTOR		SIGNAL SUPPORT POLE NO. __
	PEDESTRIAN SIGNAL		SIGNAL CABLE, 5 CONDUCTOR, NO. XX AWG		METER BASE
	PEDESTRIAN PUSH BUTTON		SIGNAL CABLE, 7 CONDUCTOR, NO. XX AWG		NO. X AWG DISTRIBUTION CABLE
	DILEMMA ZONE RADAR DETECTION UNIT		RADAR DETECTION CABLE		SIGNAL CABLE, 4 CONDUCTOR, NO. XX AWG
	STOP LINE RADAR DETECTION UNIT		VIDEO CAMERA CABLE		DUAL LIGHTING/SIGNAL DISCONNECT SWITCH
	VIDEO DETECTION CAMERA		INTERCONNECT CABLE		FLASHER CABINET
	PTZ CAMERA		PHOTOELECTRIC CELL		UNINTERRUPTIBLE POWER SUPPLY CABLE
	ETHERNET RADIO		POWER SOURCE		HAND/ OFF/ AUTO SWITCH



HORIZONTAL  
SCALE IN FEET

0 5 10 20

TRAFFIC SIGNAL PLAN  
OTT-163-31.70 (N. BUCK RD.)

DESIGN AGENCY

DESIGNER	DEK
REVIEWER	JJM 04-22-24
PROJECT ID	110100
SHEET	P.15
TOTAL	27

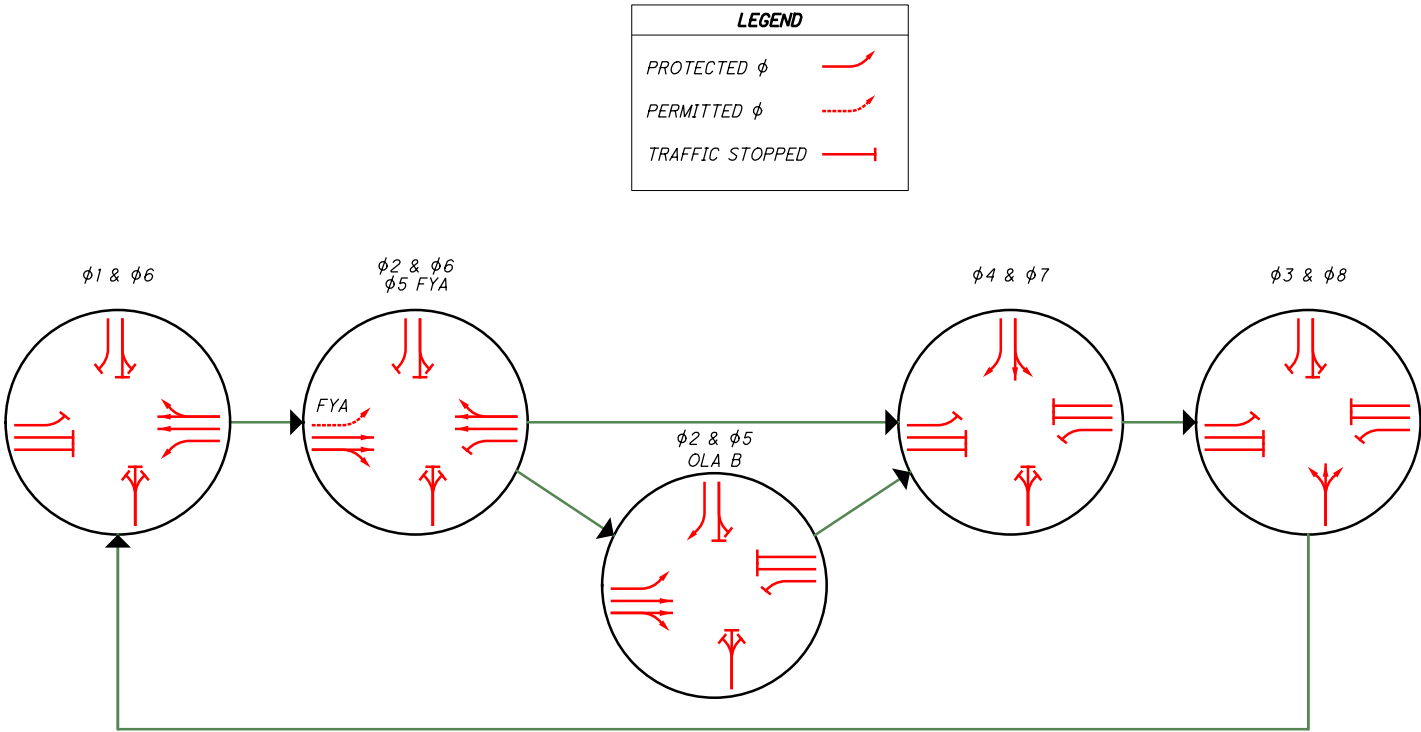
SIGNAL TIMING CHART (TEM FORM 496-3)

INTERSECTION: OTT-163-31.71    OTT-163 & SR-269 East										
MAINTAINING AGENCY: ODOT District 2										
START UP  START IN: ALL-RED FLASH TIME FOR FLASH / ALL RED (SEC.): 9, 6 FIRST PHASE(S): 2 & 6 COLOR DISPLAYED: GREEN			DUAL ENTRY: ON			PHASES: 2 & 6				
			REST IN RED:			RING 1 -		RING 2 -		
			OVERLAP				A	B	C	D
			PHASES				-	5	-	-
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.							
INTERSECTION MOVEMENT (PHASE)			1	2	3	4	5	6	7	8
DIRECTION			WBL	EB	-	SB	EBL	WB	-	NB
MINIMUM GREEN (INITIAL) (SEC.)			7	20	-	10	7	20	-	10
ADDED INITIAL *(SEC./ACTUATION)			-	-	-	-	-	-	-	-
MAXIMUM INITIAL *(SEC.)			-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP) (SEC.)			4	4	-	4	4	4	-	4
TIME BEFORE REDUCTION *(SEC.)			-	-	-	-	-	-	-	-
MINIMUM GAP *(SEC.)			-	-	-	-	-	-	-	-
TIME TO REDUCE *(SEC.)			-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)			20	60	-	40	20	60	-	20
MAXIMUM GREEN II (SEC.)			-	-	-	-	-	-	-	-
YELLOW CHANGE (SEC.)			4.7	5.6	-	5.5	5.6	5.6	-	3.4
ALL RED CLEARANCE (SEC.)			2.2	2.4	-	1.3	2.4	2.4	-	1.6
DELAYED GREEN (LPI) ^ (SEC.)			-	-	-	-	-	-	-	-
FLASHING YELLOW ARROW DELAY^ (SEC.)			3	-	-	-	3	-	-	-
WALK (SEC.)			-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE (SEC.)			-	-	-	-	-	-	-	-
RECALL	MAXIMUM (ON/OFF)	-	-	-	-	-	-	-	-	-
	MINIMUM (ON/OFF)	-	ON	-	-	-	ON	-	-	-
	PEDESTRIAN (ON/OFF)	-	-	-	-	-	-	-	-	-
MEMORY (ON/OFF)		-	-	-	-	-	-	-	-	-

NOTES:

- ALL MOVEMENTS SHALL BE ACTUATED. THE PRIMARY THRU MOVEMENT SHOULD HAVE MIN RECALL ACTIVE TO REST IN GREEN.
- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PHASING DIAGRAM (TYPICAL)

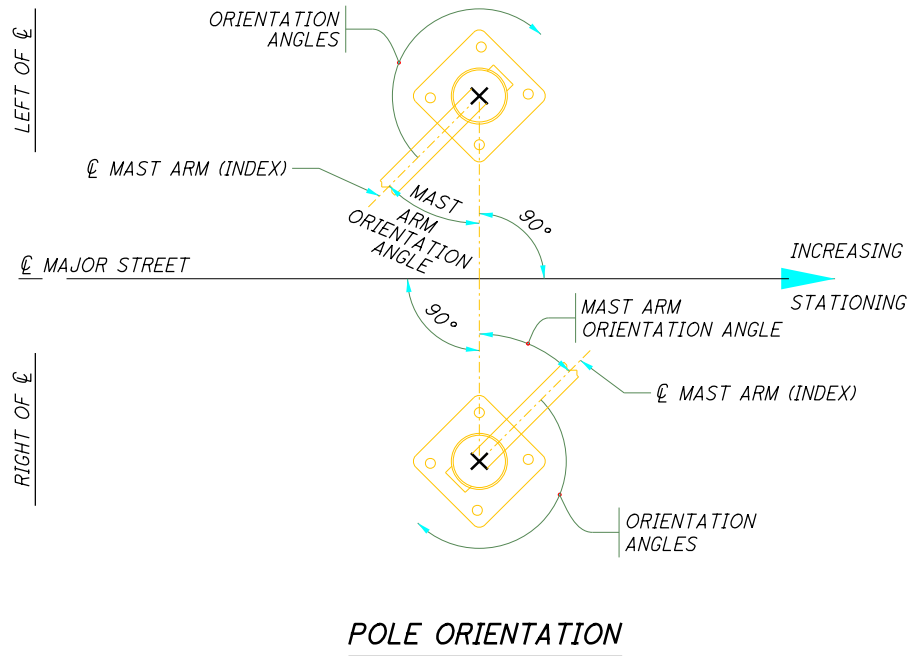
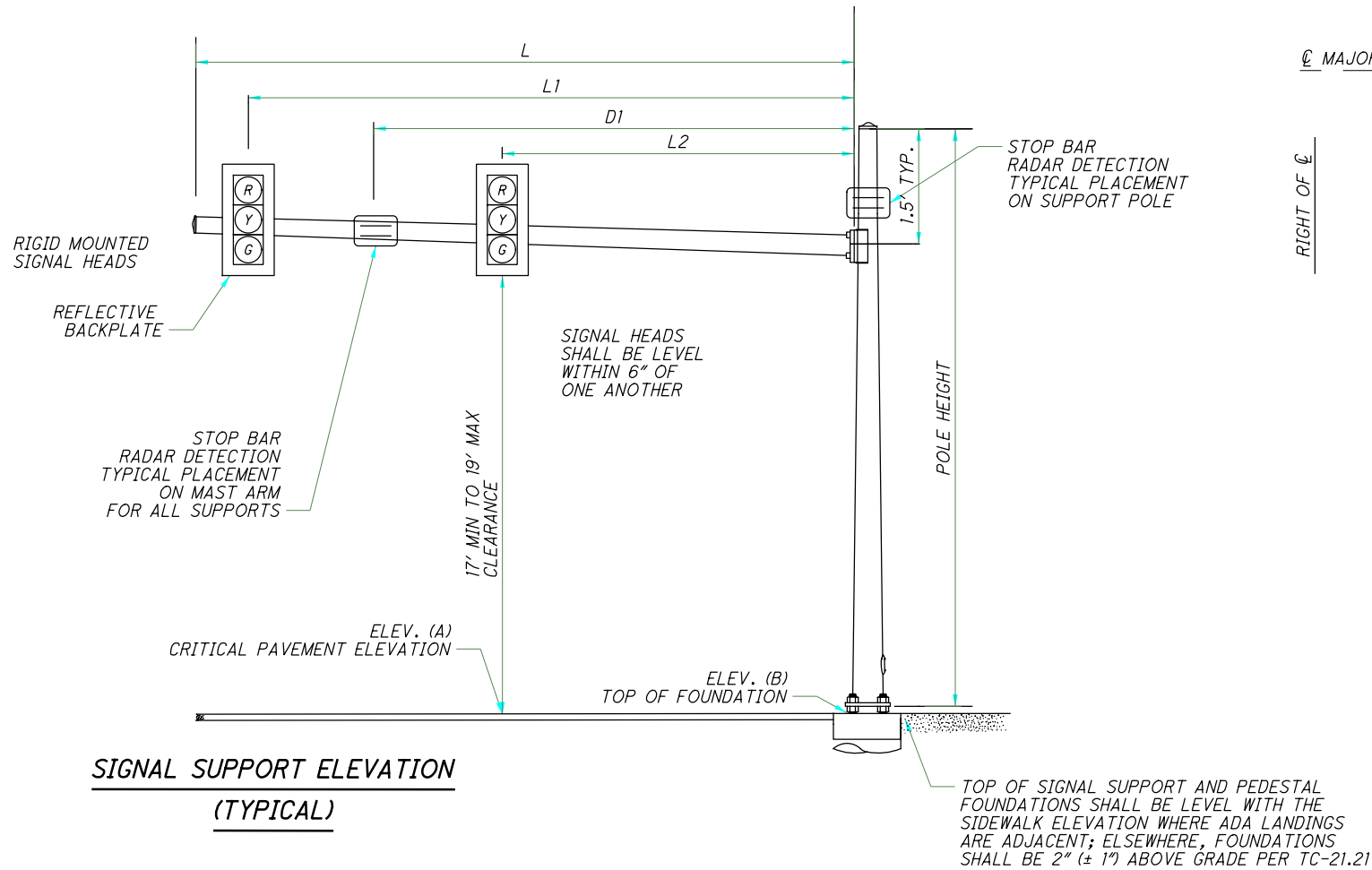


RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	DETECTOR NO.	PURPOSE	DETECTION ZONE LENGTH (FT)
1A	WB LEFT	PRESENCE	1	0	0	1	STOP-LINE	50
2A	EB THRU	PULSE	2	0	0	2	ADVANCE DETECTION	700
2B	EB THRU	PULSE	2	0	0	2	ADVANCE DETECTION	700
4A	SB THRU	PRESENCE	4	0	0	4	STOP-LINE	50
4B	SB RIGHT	PRESENCE	4	10	0	4	STOP-LINE	50
5A	EB LEFT	PRESENCE	5	0	0	5	STOP-LINE	50
6A	WB THRU	PULSE	6	0	0	6	ADVANCE DETECTION	700
6B	WB THRU	PULSE	6	0	0	6	ADVANCE DETECTION	700
8A	NB THRU	PRESENCE	8	0	0	8	STOP-LINE	50

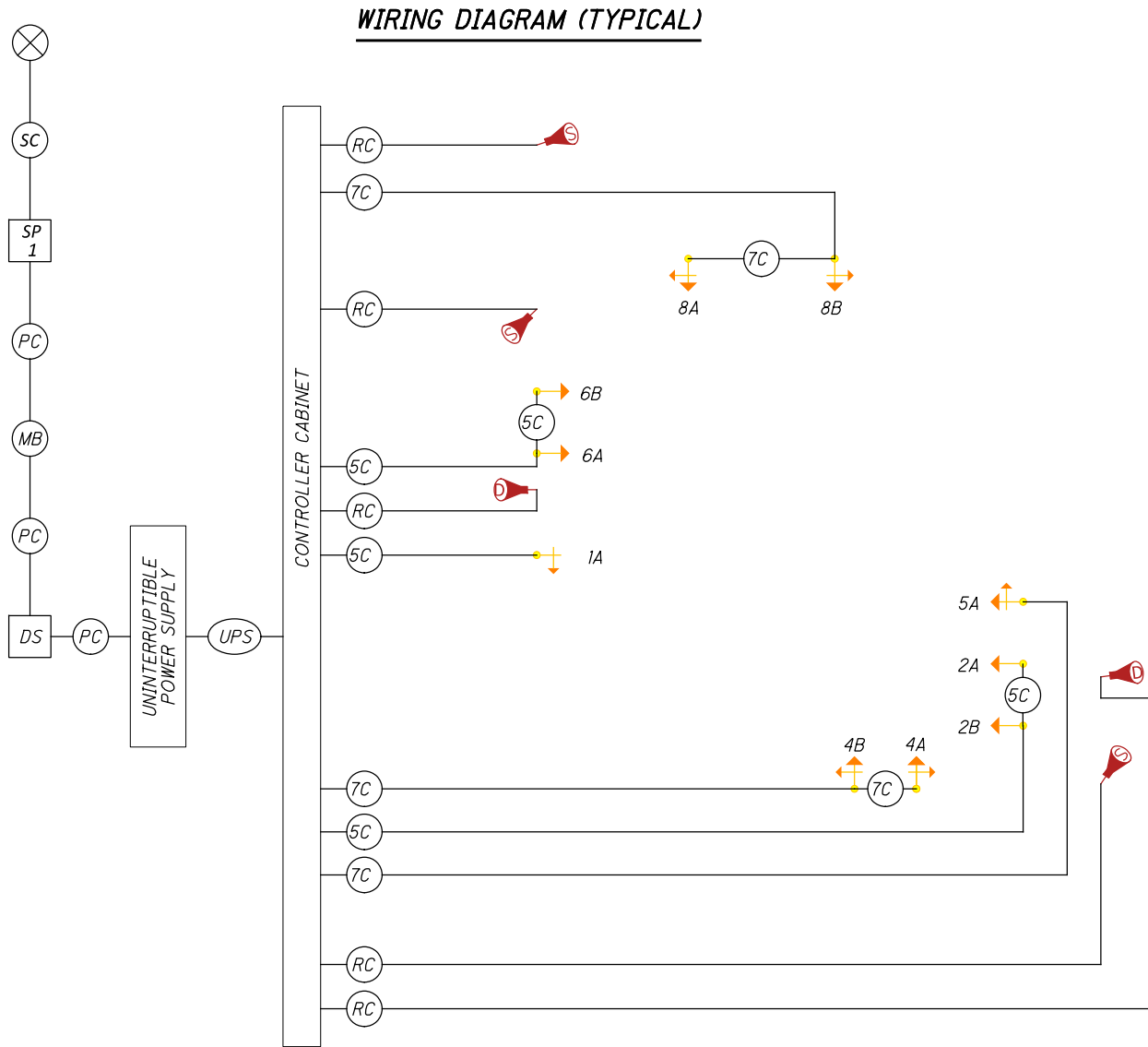






MAST ARM TABLE (TEM FIGURE 498-37 & 38)

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS										ORIENTATION ANGLES FROM MAST ARM A						
			A (Pavt. Elev.)	B (Top of Found.)	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	D1	D2	MAST ARM A ANGLE	MAST ARM B ANGLE	POWER SERVICE	SIGNAL CABINET	BRACKET ARM	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
SP-1 A	1676+93.49	35.53' LT.	577.44	577.61	TC-12.31	13	21.5	20	50	44	32	20	38	15	0	-	-	-	-	-	-
SP-1 B	1676+93.49	35.53' LT.	577.44	577.61	TC-12.31	13	21.5	20	57	50	37	-	0	-	-	270	-	-	-	-	-
SP-2 A	1677+88.44	59.35' RT.	577.98	578.15	TC-12.31	13	21.5	20	54	49	37	29	-	-	0	-	-	-	-	-	-
SP-2 B	1677+88.44	59.35' RT.	577.98	578.15	TC-12.31	12	21.5	20	40	34	24	-	43	18	-	270	-	-	-	-	-



**FIELD WIRING HOOK-UP CHART (TEM FORM 496-16)**

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH	SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A (WB LT)	<--R---	1R	R	8B (NB RT)	R	8R	R
	<--Y---	1Y			Y	8Y	
	<--G---	1G			G	8G	
2A, B (EB)	R	2R	R		<--Y-->	8Y	
	Y	2Y			<--G-->	8G	
	G	2G					
4A (SB LT)	R	4R	R	-	-	-	
	Y	4Y		-	-	-	
	G	4G					
	<--Y---	4Y					
	<--G---	4G					
4B (SB RT)	R	8R	R				
	Y	8Y					
	G	8G		PEDESTRIAN MOVEMENTS			
	---Y-->	10Y		-	-	-	
	---G-->	10G		-	-	-	
5A (EB LT)	<--R---	5R	R	-	-	-	
	<--Y---	5Y		-	-	-	
	<--FYA--	15G		-	-	-	
	<--G---	5G		-	-	-	
	-	-		-	-	-	
6A, B (WB)	R	6R	R	OVERLAPS			
	Y	6Y		OLA B	<--Y-->	SB RT/LS 10Y	OUT
	G	6G			<--G-->	SB RT/LS 10G	
8A (NB LT)	R	8R	R	-	-	-	
	Y	8Y					
	G	8G					
	<--Y---	8Y					
	<--G---	8G					
LS = LOAD SWITCH							

**LEGEND**

	TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"		LUMINAIRE, CONVENTIONAL		SERVICE CABLE, 3 CONDUCTOR, NO. X AWG
	TRAFFIC SIGNAL, 2 UNIT, 3 UNIT, OR PHB HEAD 12"		2/C NO. XX AWG (LEAD-IN CABLE)		POWER CABLE, 2 CONDUCTOR, NO. X AWG
	TRAFFIC SIGNAL, 3 UNIT HEAD, 12" WITH ARROWS		VEHICLE LOOP DETECTOR		SIGNAL SUPPORT POLE NO. __
	PEDESTRIAN SIGNAL		SIGNAL CABLE, 5 CONDUCTOR, NO. XX AWG		METER BASE
	PEDESTRIAN PUSH BUTTON		SIGNAL CABLE, 7 CONDUCTOR, NO. XX AWG		NO. X AWG DISTRIBUTION CABLE
	DILEMMA ZONE RADAR DETECTION UNIT		RADAR DETECTION CABLE		SIGNAL CABLE, 4 CONDUCTOR, NO. XX AWG
	STOP LINE RADAR DETECTION UNIT		VIDEO CAMERA CABLE		DUAL LIGHTING/SIGNAL DISCONNECT SWITCH
	VIDEO DETECTION CAMERA		INTERCONNECT CABLE		FLASHER CABINET
	PTZ CAMERA		PHOTOELECTRIC CELL		UNINTERRUPTIBLE POWER SUPPLY CABLE
	ETHERNET RADIO		POWER SOURCE		HAND/ OFF/ AUTO SWITCH



PROJECT DESCRIPTION

THIS EXPLORATION WAS PERFORMED FOR THE ADDITION OR REPLACEMENT OF OVERHEAD TRAFFIC SIGNAL SUPPORTS AT THE INTERSECTIONS OF SR 163 AND SR 269 AS WELL AS SR 163 AND N. BUCK ROAD IN DANBURY TOWNSHIP AND LAKESIDE, OTTAWA COUNTY, OHIO. THE PROJECT IS DESIGNATED AS D02 TSG FY2025, PID 110100.

HISTORIC RECORDS

A REVIEW OF ODOT RECORDS FOR THE PROJECT AREAS INDICATED THAT HISTORIC BORINGS HAVE BEEN PERFORMED WITHIN THE PROJECT AREAS. THE HISTORIC BORINGS INCLUDE THOSE THAT WERE PERFORMED AS PART OF THE FOLLOWING PROJECTS:

- OTT-53&163-(8.54-29.67) IN 1951.
- OTT-163-31.84 IN 1955.
- OTT-240-0.00 IN 1958. AT THAT TIME, SR 269 WAS IDENTIFIED AS SR 240.
- OTT-163-(31.07)(35.71)(36.08) IN 1962.

BORING NUMBERS WERE NOT ASSIGNED TO THE BORINGS, RATHER THEY WERE IDENTIFIED BY STATION AND OFFSET. THEREFORE, THE HISTORIC BORINGS ARE IDENTIFIED IN THIS DISCUSSION WITH A BORING NUMBER EQUAL TO THE HISTORIC STATION. THE BORINGS DID NOT INCLUDE SPT SAMPLING. RATHER THE BORINGS WERE AUGER PROBES THAT INCLUDED COLLECTED SAMPLES AT VARYING DEPTHS.

THE 1951 EXPLORATION INCLUDED BORINGS PERFORMED IN THE PROJECT AREAS ALONG 163, WHICH ARE IDENTIFIED AS B-253-0-51, B-255-0-51, AND B-256-0-51 NEAR THE SR 269 INTERSECTION, AS WELL AS B-277-0-51 IN THE VICINITY OF THE NORTH BUCK ROAD INTERSECTION. THESE BORINGS WERE EXTENDED TO DEPTH OF 8 FEET. VISUAL CLASSIFICATION WAS INCLUDED FOR EACH SAMPLE. HOWEVER, THE NOTES FOR THE BORINGS AT THE SR 269 INTERSECTION WERE ILLEGIBLE. THE SOIL PROFILE INCLUDED AN A-7-6 HATCH FOR THESE BORINGS. FOR BORING B-277-0-51, A SAMPLE FROM 3 TO 4 FEET WAS TESTED FOR MECHANICAL CLASSIFICATION (INDICATED AS A-6B). IN THE SOIL PROFILE, THE HATCH ABOVE AND BELOW THIS INTERVAL WAS SHOWN AS A-7-6.

THE 1955 EXPLORATION INCLUDED A BORINGS PERFORMED IN THE VICINITY OF THE NORTH BUCK ROAD INTERSECTION ALONG 163, IDENTIFIED AS B-277-0-55. THE BORING WAS EXTENDED TO A DEPTH OF 8 FEET. THE SOILS ENCOUNTERED IN THE BORING CONSISTED OF A-4A MATERIAL UNDERLYING THE TOPSOIL TO A DEPTH OF 0.8 FEET. CAUTION FOR THE A-4A SOILS IN THE SOIL PROFILE INCLUDED A NOTE INDICATING THIS MATERIAL WOULD BE “RUBBERY AND UNSTABLE” AT WATER CONTENTS WHICH EXCEED THE OPTIMUM. THE SOILS ENCOUNTERED UNDERLYING THE A-4A SOILS CONSISTED OF A-6B.

THE 1958 EXPLORATION INCLUDED BORINGS PERFORMED ALONG SR 269 IDENTIFIED AS B-118-0-58 AT THE SR 269 INTERSECTION, AS WELL AS B-143-0-58, B-143-1-58, B-143-2-58, AND B-143-3-58 AT THE NORTH BUCK ROAD INTERSECTION. BORINGS B-143-0-58 AND THE BORING B-143 OFFSET 12 FEET LEFT WERE EXTENDED TO A DEPTH OF 8 FEET. THE BORINGS B-143 AT CENTERLINE, OFFSET 5 FEET LEFT, AND OFFSET 5 FEET RIGHT WERE INDICATED TO BE FOR A PAVEMENT SURVEY OF THE EXISTING ROADWAY CONDITIONS AND SUBGRADE SOILS EXTENDING ONLY TO A DEPTH OF 3.5 FEET. THE SOILS ENCOUNTERED IN THE BORINGS INCLUDED A-6A AND A-7-6.

THE 1962 EXPLORATION INCLUDED A BORING PERFORMED ALONG SR 163 NEAR THE INTERSECTION WITH SR 269, WHICH IS IDENTIFIED AS B-255-0-62. THE BORING WAS TERMINATED AT A DEPTH OF 7 FEET WITH AN INDICATION OF REFUSAL ON “BOULDERS”. THE SOILS ENCOUNTERED IN THE BORING CONSISTED OF A-7-6 MATERIAL EXTENDING TO A DEPTH OF 3 FEET UNDERLAIN BY A-6A MATERIAL.

GEOLOGY

PUBLISHED GEOLOGIC MAPS FROM THE OHIO DEPARTMENT OF NATURAL RESOURCES (ODNR) INDICATE THAT THE PROJECT SITE IS LOCATED WITHIN THE HURON-ERIE LAKE PLAINS SECTION, IN THE MAUMEE LAKE PLAINS REGION. WITHIN THIS REGION, THE GEOLOGIC DEPOSITS CONSIST OF LATE WISCONSINAN LACUSTRINE CLAY DEPOSITED IN CALM WATER OR GLACIAL LAKES, WHICH IS MOSTLY LAMINATED AND COVERED IN PLACES WITH THIN ORGANIC DEPOSITS. THE CLAY IS UNDERLINED WITH WAVE-PLANED CLAYEY TILL OVER SILURIAN AND DEVONIAN-AGE CARBONATE BEDROCK DOMINATED BY DOLOMITE WITH OCCASIONAL LIMESTONE.

THE LACUSTRINE SOILS CONSIST OF HISTORIC LAKE DEPOSITS. THE GLACIAL TILL, ALSO REFERRED TO AS MORAINE, WAS DEPOSITED BY THE ADVANCE AND RETREAT OF GLACIERS. THE TILL MAY CONTAIN COBBLES AND/OR BOULDERS LEFT IN THE SOIL MATRIX. ADDITIONALLY, SEAMS OF GRANULAR SOILS MAY ALSO BE ENCOUNTERED WITHIN THE PREDOMINANTLY CLAYEY TILLS. THESE GRANULAR SEAMS MAY OR MAY NOT BE WATER BEARING.

THE BEDROCK IN THE PROJECT AREA IS BROADLY MAPPED ON THE “GEOLOGIC MAP OF OHIO” AS MONROE LIMESTONE. THE BEDROCK UNDERLYING THIS AREA IS PRIMARILY BASS ISLAND DOLOMITE FROM THE SILURIAN AND DEVONIAN PERIODS. THE BEDROCK IS RELATIVELY CLOSE TO THE SURFACE IN SOME AREAS, WHICH CAN INFLUENCE CONSTRUCTION PRACTICES.










REVIEW OF THE ODNR “INTERACTIVE KARST MAP” WEBSITE INDICATED THAT THE SITE IS IN AN AREA OF PROBABLE KARST, WITH THE CLOSEST MAPPED LOCATION OF KNOWN KARST IS APPROXIMATELY ONE MILE NORTHEAST.

NO MINES ARE MAPPED IN THE PROJECT AREAS. THE CLOSEST MINES ARE MAPPED APPROXIMATELY 2½ MILES EAST AND ARE INDICATED AS A SURFACE MINE.

THE USDA WEB SOIL SURVEY INDICATES THAT THE NEAR-SURFACE SOILS IN THE PROJECT AREA ARE MAPPED AS NAPPANEE SILTY CLAY LOAM (NPA). THE NPA SOILS ARE COMPRISED OF TILL FORMED ON LAKE PLAINS AND ARE CONSIDERED TO BE SOMEWHAT POORLY DRAINED WITH A MODERATELY LOW TO HIGH PERMEABILITY.

CONT. TO SHEET 2.

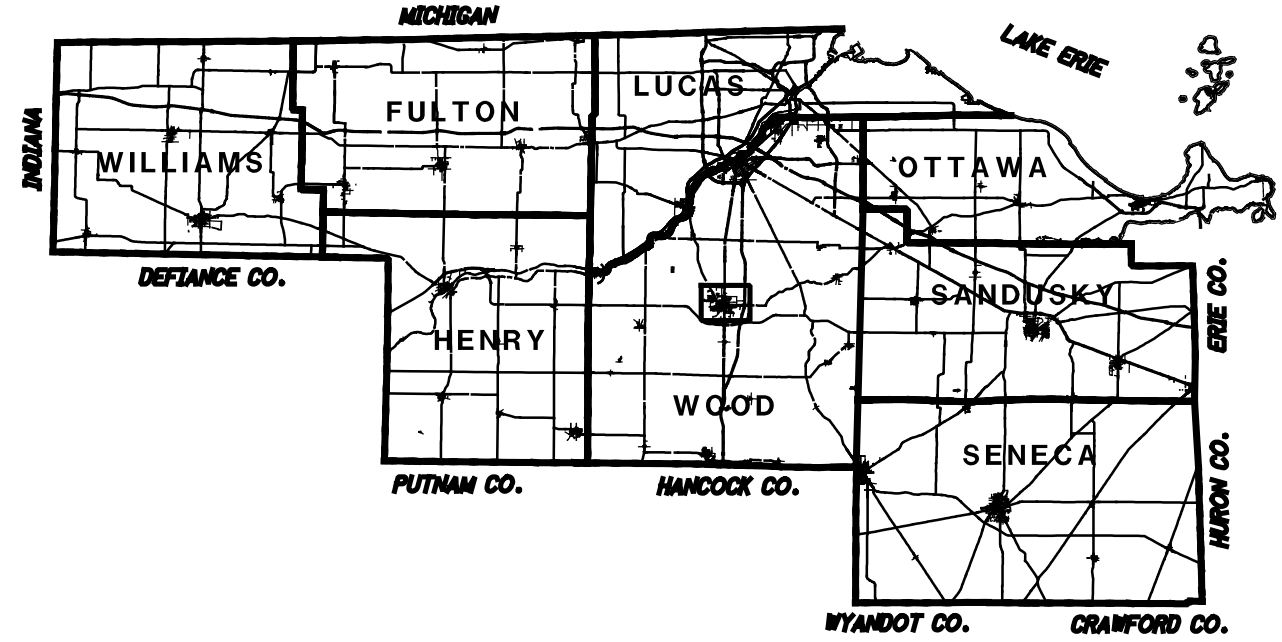
LEGEND

DESCRIPTION	ODOT CLASS	CLASSIFIED MECH./VISUAL	
 SANDY SILT	A-4A	1	1
 SILT AND CLAY	A-6A	6	3
 SILTY CLAY	A-6B	1	2
 CLAY	A-7-6	2	1
	TOTAL	10	7
 DOLOMITE	VISUAL		
 PAVEMENT OR BASE = X = APPROXIMATE THICKNESS	VISUAL		
 SOD AND TOPSOIL = X = APPROXIMATE THICKNESS	VISUAL		
 BORING LOCATION - PLAN VIEW.			
 HISTORIC BORING LOCATION - PLAN VIEW.			
WC	INDICATES WATER CONTENT IN PERCENT.		
N	INDICATES STANDARD PENETRATION RESISTANCE (NO DRILL ROD CALIBRATION CORRECTION)		
N <sub>60</sub>	INDICATES STANDARD PENETRATION RESISTANCE NORMALIZED TO 60% DRILL ROD ENERGY RATIO.		
X/D"	NUMBER OF BLOWS FOR STANDARD PENETRATION TEST (SPT): X/D" = NUMBER OF BLOWS (UNCORRECTED) FOR D" OF PENETRATION AT REFUSAL		
X/Y/Z/D"	NUMBER OF BLOWS FOR STANDARD PENETRATION TEST (SPT): X = NUMBER OF BLOWS FOR FIRST 6 INCHES (UNCORRECTED) Y = NUMBER OF BLOWS FOR SECOND 6 INCHES (UNCORRECTED) Z/D" = NUMBER OF BLOWS (UNCORRECTED) FOR D" OF PENETRATION AT REFUSAL		
SS	INDICATES A NON-PLASTIC SAMPLE.		
QU	UNCONFINED COMPRESSIVE STRENGTH (ASTM D 7012, METHOD C FOR ROCK)		

BEDROCK TEST SUMMARY				
BORING ID.	SAMPLE ELEVATION	SAMPLE DEPTH	QU (PSI)	LITHOLOGY
B-001-0-24	556.3' – 551.3'	24' – 29'	11,210	DOLOMITE
B-002-0-24	556.3' – 551.3'	21' – 26'	9,777	DOLOMITE
B-003-2-24	565.2' – 560.2'	12' – 17'	9,490	DOLOMITE

ORGANIC CONTENT BY LOSS ON IGNITION TEST				
BORING ID	SAMPLE ID	SAMPLE ELEVATION	SAMPLE DEPTH	LOI (%)
B-001-0-24	SS - 2	576.8' – 574.3'	3.5' – 6'	5.5
B-002-0-24	SS - 1	576.9' – 573.8'	0.5' – 3.5'	4.3

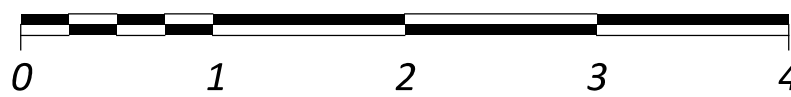
DISTRICT TWO



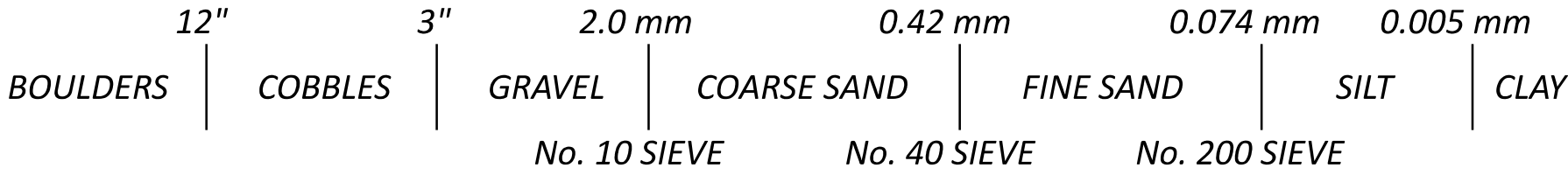
\* FOR SPECIFIC LOCATIONS SEE THE LOCATION MAP ON SHEET 2 OF THE PLANS.

LOCATION MAP

SCALE IN MILES

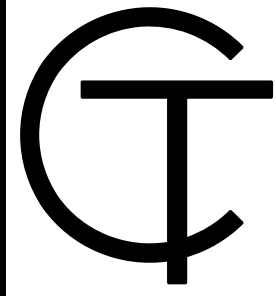


PARTICLE SIZE DEFINITIONS



RECON. - CO 11/13/24  
DRILLING - MG 11/22/24 - 11/23/24  
DRAWN - TLS 3/25  
REVIEWED - CPI 3/25

DESIGN AGENCY



DESIGNER

TLS

REVIEWER

CPI 03/19/25

PROJECT ID

110100

SUBSET

1

TOTAL

9

SHEET

P.19

TOTAL

27



**RECONNAISSANCE**

CT PERFORMED SITE RECONNAISSANCE ON NOVEMBER 13, 2024. OVERHEAD POWERLINES AND UNDERGROUND UTILITY MARKINGS WERE PRESENT NEARBY THE PROPOSED FOUNDATION LOCATIONS.

ROADWAY PAVEMENTS IN THE PROJECT AREAS APPEARED TO BE IN GOOD CONDITION. EXPOSED DRAIN TILE WAS PRESENT NEARBY BORING B-002-0-24.

**SUBSURFACE EXPLORATION**

THE BORINGS WERE DRILLED BY DLZ UNDER THE DIRECTION OF CT ON NOVEMBER 22 AND 23, 2024. THE BORINGS WERE PERFORMED AS ODOT TYPE E5 STRUCTURE BORINGS PER GEOTECHNICAL INVESTIGATIVE PROCEDURES OUTLINED IN OHIO DEPARTMENT OF TRANSPORTATION (ODOT) “SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS” (SGE). ALL BORINGS WERE EXTENDED TO AUGER REFUSAL ON BEDROCK AND INCLUDED A 5 FEET ROCK CORE RUN. THREE (3) TEST BORINGS, DESIGNATED AS BORINGS B-001-0-24 THROUGH B-003-0-24 WERE PERFORMED FOR THIS EXPLORATION. OFFSET BORINGS B-003-1-24 AND B-003-2-24 WERE PERFORMED APPROXIMATELY 3 FEET AND 6 FEET SOUTHWEST, RESPECTIVELY, OF B-003-0-24. THE OFFSET BORINGS WERE PERFORMED SINCE IT WAS UNSURE WHETHER REFUSAL IN B-003-0-24 WAS ON UNDERGROUND STRUCTURES/UTILITIES, OR BEDROCK. AFTER CONFIRMING THE PRESENCE OF BEDROCK ALSO AT THE REFUSAL DEPTH IN B-003-1-24 AND B-003-2-24, BORING B-003-2-24 INCLUDED ROCK CORING. THESE BORINGS ARE FULLY DESIGNATED IN ACCORDANCE WITH ODOT PROTOCOL, BUT THE “-0-24” OR “-24” PORTION OF THE NOMENCLATURE IS GENERALLY OMITTED IN THE DISCUSSIONS BELOW.

THE TEST BORINGS PERFORMED DURING THIS EXPLORATION WERE DRILLED WITH A TRUCK-MOUNTED CME 75 DRILL RIG UTILIZING 3¼-INCH INSIDE DIAMETER HOLLOW-STEM AUGERS. DURING AUGER ADVANCEMENT OF THE TEST BORINGS, SPLIT-SPOON DRIVE SAMPLES WERE GENERALLY TAKEN AT 2½-FOOT INTERVALS TO AUGER REFUSAL. THE CALIBRATED HAMMER/ROD ENERGY RATIO FOR THE TRUCK-MOUNTED CME 75 DRILL RIG UTILIZED IN THIS PROJECT IS 76.7 PERCENT, BASED ON CALIBRATION PERFORMED ON JANUARY 12, 2025. ROCK CORING WAS PERFORMED USING AN NQ CORE BARREL.

**EXPLORATION FINDINGS**

BASED ON THE RESULTS OF OUR FIELD AND LABORATORY TESTS, THE SUBSOILS ENCOUNTERED IN THE BORINGS UNDERLYING THE SURFACE MATERIALS CAN BE GENERALLY DESCRIBED AS COHESIVE SOILS TRANSITIONING FROM MEDIUM STIFF TO STIFF IN THE UPPER PROFILE, TO STIFF TO VERY STIFF CONSISTENCY, AND THEN TO VERY STIFF TO HARD CONSISTENCY WITH INCREASED DEPTH EXTENDING TO THE UNDERLYING BEDROCK. THE COHESIVE SOILS CONSISTED OF A-4A, A-6A, A-6B, AND A-7-6.

UNDERLYING THE COHESIVE SOILS, DOLOMITE BEDROCK WAS ENCOUNTERED. TOP OF ROCK WAS ENCOUNTERD IN BORINGS B-001, B-002, AND B-003 (ORIGINAL AND OFFSETS) AT DEPTHS OF 16 FEET, 18½ FEET, AND 11 FEET, RESPECTIVELY.

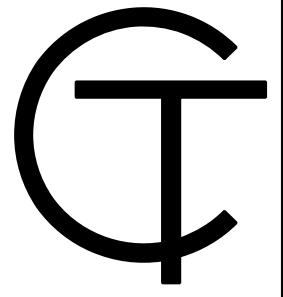
DURING THIS EXPLORATION, GROUNDWATER WAS INITIALLY ENCOUNTERED DURING DRILLING IN BORINGS B-001 AND B-002 AT THE TOP OF BEDROCK AT DEPTHS OF 16 FEET BELOW EXISTING GRADE (ELEV. 564.3) AND 18½ FEET (ELEV. 558.8), RESPECTIVELY. GROUNDWATER WAS NOT OBSERVED IN ANY OF THE BORINGS PRIOR TO CORING OPERATIONS. WATER WAS INTRODUCED AS PART OF THE CORING OPERATIONS.

**SPECIFICATIONS**

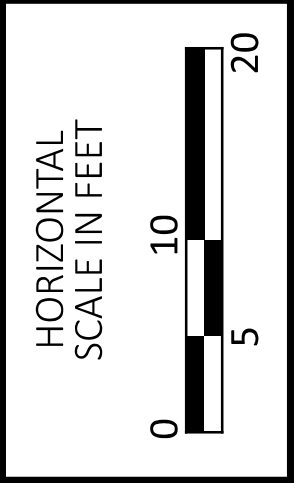
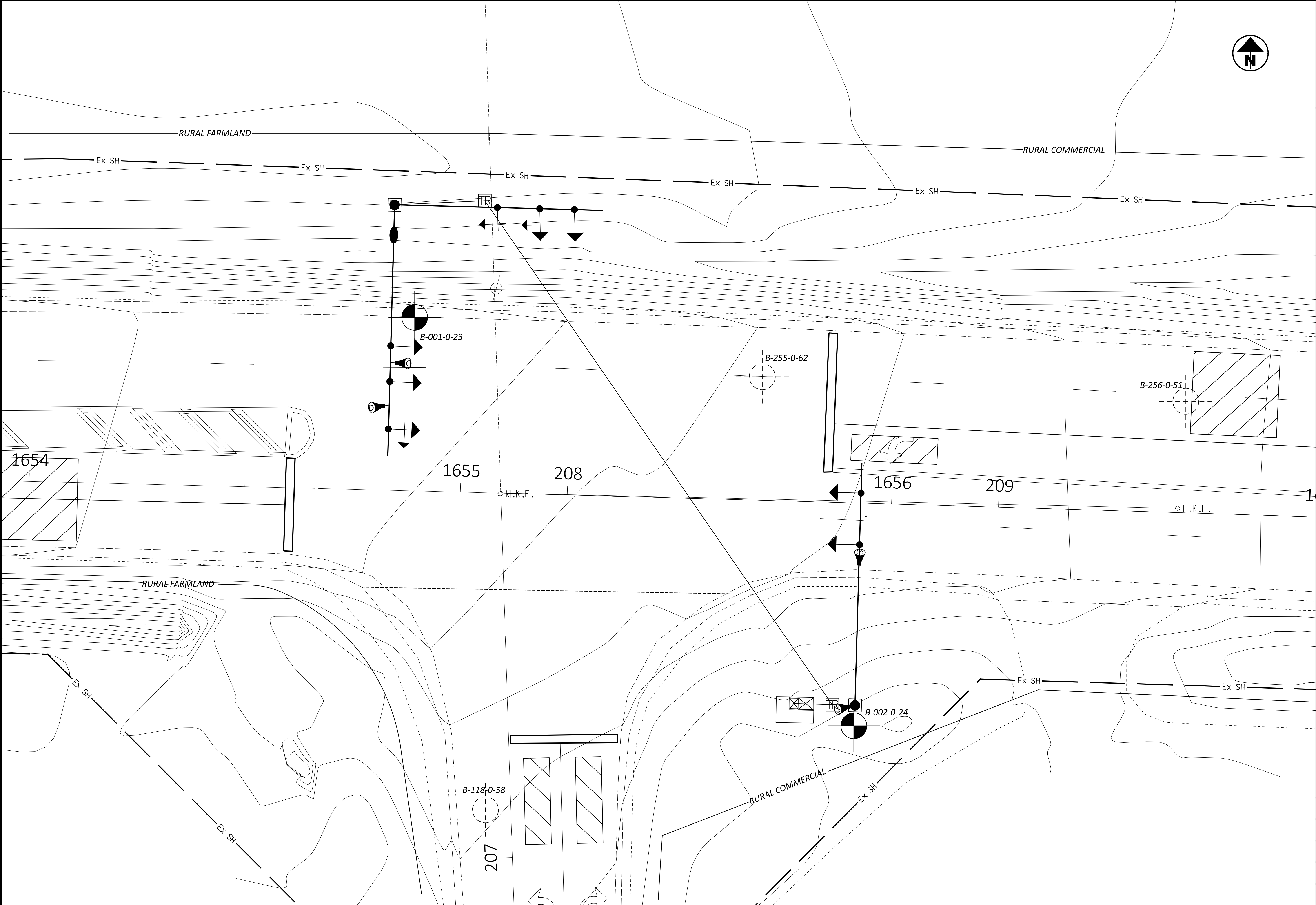
THIS GEOTECHNICAL EXPLORATION WAS PERFORMED IN ACCORDANCE WITH THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, OFFICE OF GEOTECHNICAL ENGINEERING, SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS (SGE), DATED JANUARY 2025.

**AVAILABLE INFORMATION**

THE SOIL, BEDROCK, AND GROUNDWATER INFORMATION COLLECTED FOR THIS SUBSURFACE EXPLORATION THAT CAN BE CONVENIENTLY DISPLAYED ON THE SOIL PROFILE SHEETS HAS BEEN PRESENTED. GEOTECHNICAL REPORTS, IF PREPARED, ARE AVAILABLE FOR REVIEW ON THE OFFICE OF CONTRACT SALES WEBSITE.

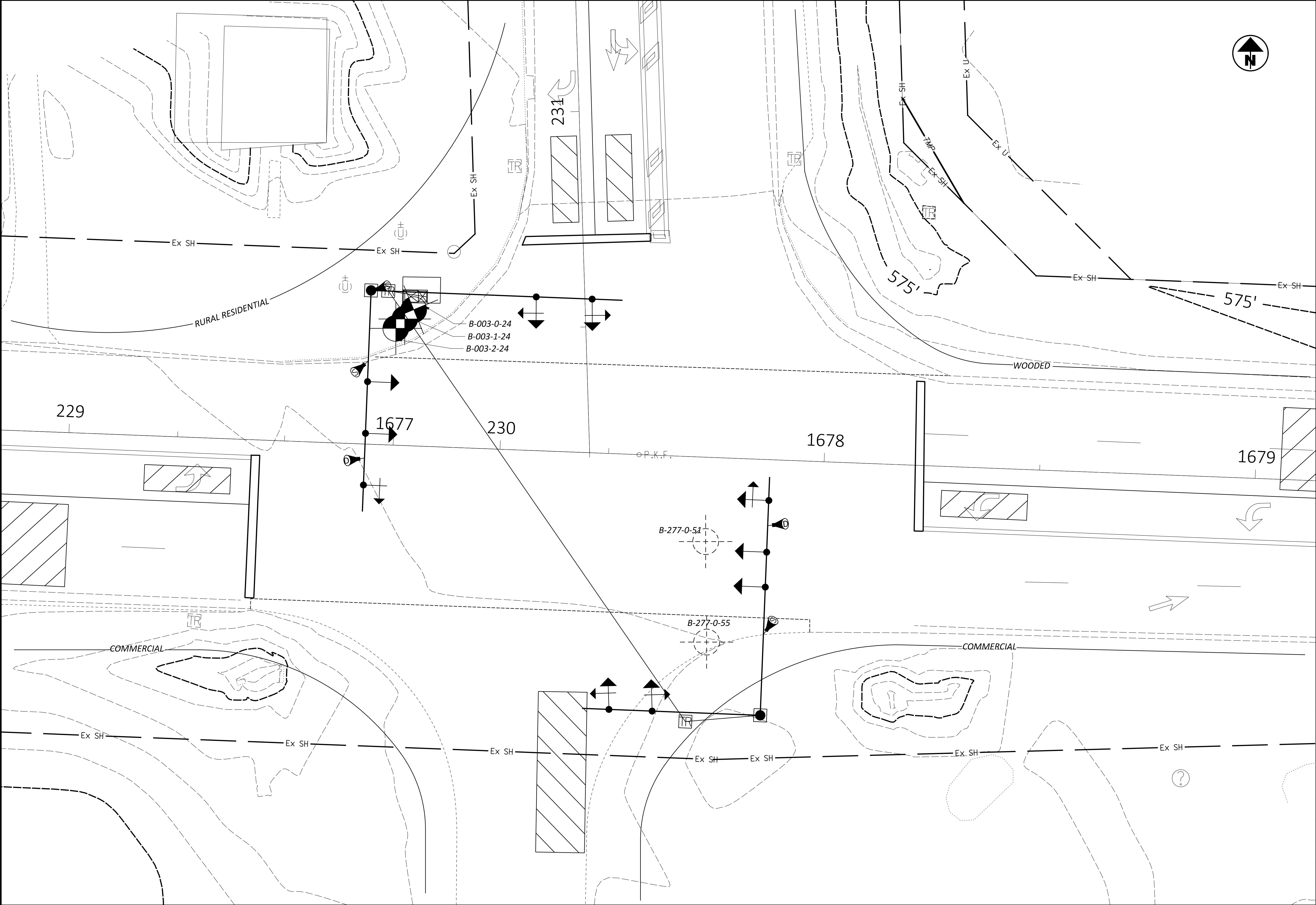
DESIGN AGENCY	
	
DESIGNER	
TLS	
REVIEWER	
CPI 03/19/25	
PROJECT ID	
110100	
SUBSET	TOTAL
2	9
SHEET	TOTAL
P.20	27



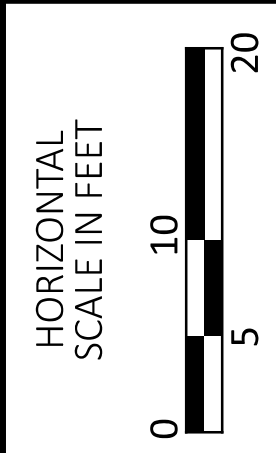


GEOTECHNICAL PROFILE - TRAFFIC SIGNALS  
OTT-163-31.29 (S. BRIDGE RD.)

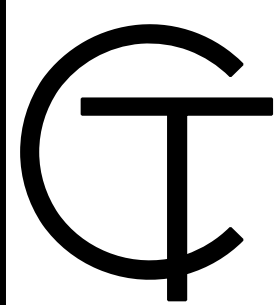
DESIGN AGENCY	
DT	
DESIGNER	
TLS	
REVIEWER	
CPI 03/19/25	
PROJECT ID	
110100	
SUBSET	TOTAL
3	9
SHEET	TOTAL
P.21	27



GEOTECHNICAL PROFILE - TRAFFIC SIGNALS  
OTT-163-31.70 (N. BUCK RD.)



DESIGN AGENCY



DESIGNER

TLS

REVIEWER

CPI 03/19/25

PROJECT ID

110100

SUBSET TOTAL

4 9

SHEET TOTAL

P.22 27



D02-TSG-FY2025

MODEL: Sheet PAPER: SIZE: 34x22 (in.)    DATE: 3/21/2025    TIME: 8:59:12 AM    USER: somogyi  
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PROJECT: D02 TSG FY2025		DRILLING FIRM / OPERATOR: DLZ / MG		DRILL RIG: DLZ CME 75 TRUCK 78		STATION / OFFSET: 1654+88, 43' LT.		EXPLORATION ID																
TYPE: TRAFFIC SIGNAL-SUPPORT		SAMPLING FIRM / LOGGER: DLZ / AM		HAMMER: AUTOMATIC HAMMER		ALIGNMENT: SR 163		B-001-0-24																
PID: 110100 SFN: N/A		DRILLING METHOD: 3.25" HSA / NQ		CALIBRATION DATE: 1/12/25		ELEVATION: 580.3 (NAVD88) EOB: 29.5 ft.		PAGE																
START: 11/22/24 END: 11/22/24		SAMPLING METHOD: SPT / NQ		ENERGY RATIO (%): 76.7		LAT / LONG: 41.531400, -82.829783		1 OF 1																
MATERIAL DESCRIPTION AND NOTES				ELEV.	DEPTHS	SPT/ RQD	N <sub>60</sub>	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (SI)	HOLE SEALED			
ASPHALT - 10 INCHES				580.3	1	2																		
				579.5	2	3	9	50	SS-1	2.75	-	-	-	-	-	-	-	-	-	-	-	-		
				579.0	3	4																		
					4	6	23	22	SS-2	1.75	1	11	8	28	52	38	20	18	24	A-6b (V)				
					5	12																		
AGGREGATE BASE - 5 INCHES				576.8	6	5																		
					7	11	35	83	SS-3	>4.5	12	8	15	22	43	28	17	11	14	A-6a (6)				
					8	16																		
					9	13	47	100	SS-4	>4.5	-	-	-	-	-	-	-	-	-	12	A-6a (V)			
					10	21																		
MEDIUM STIFF TO STIFF, GRAY, SILTY CLAY, LITTLE SAND, TRACE GRAVEL, MOIST					11	10	40	72	SS-5	>4.5	2	9	18	24	47	33	19	14	15	A-6a (9)				
					12	20																		
					13	16	51	100	SS-6	>4.5	-	-	-	-	-	-	-	-	-	8	A-6a (V)			
					14	24																		
					15																			
STIFF TO VERY STIFF, DARK BROWN/GRAY, SILTY CLAY, LITTLE SAND, TRACE GRAVEL, MOIST Qu = 1,370 PSF, (MODERATELY ORGANIC, LOI = 5.5%)				564.3	16	18	47	28	SS-7	-	-	-	-	-	-	-	-	5	Rock (V)					
					17	21																		
					18	16																		
					19	24	-	100	SS-8	-	-	-	-	-	-	-	-	-	-	11	Rock (V)			
					20	33																		
HARD, BROWN, SILT AND CLAY, SOME SAND, LITTLE GRAVEL, DAMP				556.3	21	0	78	33	SS-9	-	-	-	-	-	-	-	-	12	Rock (V)					
					22	13																		
					23	48																		
					24	50.1	-	100	SS-10	-	-	-	-	-	-	-	-	-	-	8	Rock (V)			
					25																			
@11": TRACE GRAVEL					26																			
					27																			
					28																			
					29																			
					30																			
@13.5": GRAY, Qu = 62.5 PSI = 9,000 PSF					31																			
					32																			
					33																			
					34																			
					35																			
DOLOMITE, GRAY, SEVERELY WEATHERED.					36																			
					37																			
					38																			
					39																			
					40																			
@18.5": GRAY/BROWN					41																			
					42																			
					43																			
					44																			
					45																			
@21": GRAY					46																			
					47																			
					48																			
					49																			
					50																			
DOLOMITE, GRAY, MODERATELY TO HIGHLY WEATHERED, STRONG, JOINTED-SLIGHTLY FRACTURED, NARROW, RQD = 82%, REC = 98%.					51																			
					52																			
					53																			
					54																			
					55																			
@26": Qu = 11,210 PSI					56																			
					57																			
					58																			
					59																			
					60																			
CORE					61																			
					62																			
					63																			
					64																			
					65																			

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/13/25 12:23 - X:\PROJECTS\242165\DOT.GPJ

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; PUMPED 8 CF CEMENT-BENTONITE GROUT

PROJECT: D02 TSG FY2025		DRILLING FIRM / OPERATOR: DLZ / MG		DRILL RIG: DLZ CME 75 TRUCK 78		STATION / OFFSET: 1655+93, 52' RT.		EXPLORATION ID										
TYPE: TRAFFIC SIGNAL-SUPPORT		SAMPLING FIRM / LOGGER: DLZ / AM		HAMMER: AUTOMATIC HAMMER		ALIGNMENT: SR 163		B-002-0-24										
PID: 110100 SFN: N/A		DRILLING METHOD: 3.25" HSA / NQ		CALIBRATION DATE: 1/12/25		ELEVATION: 577.3 (NAVD88) EOB: 26.0 ft.		PAGE										
START: 11/23/24 END: 11/23/24		SAMPLING METHOD: SPT / NQ		ENERGY RATIO (%): 76.7		LAT / LONG: 41.531668, -82.830154		1 OF 1										
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTH	SPT/ RQD	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)			ATTERBERG			ODOT CLASS (bl)	HOLE SEALED			
TOPSOIL - 5 INCHES STIFF TO VERY STIFF, BROWN, SILTY CLAY, LITTLE SAND, MOIST (MODERATELY ORGANIC, LOI = 4.3%)		577.3																
		576.9	1															
			2	1	9	72	SS-1	2.25	-	-	-	-	-	-	23	A-6b (V)		
			3	5														
		573.8	4	5	14	89	SS-2	4.25	0	3	6	23	68	48	24	24	A-7-6 (15)	
			5	6														
			6	7	24	100	SS-3	>4.5	2	7	16	25	50	29	17	12	14	A-6a (9)
		571.3	8	12														
@9.5": HARD			9	37	100	SS-4	>4.5	-	-	-	-	-	-	-	15	A-6a (V)		
			10	18														
			11															
			12	3	60	100	SS-5	>4.5	3	5	9	23	60	32	19	13	17	A-6a (9)
			13	32														
			14	6	35	100	SS-6	>4.5	-	-	-	-	-	-	-	9	A-4a (V)	
			15	17														
		563.8	16	10														
@16": Qu = 68.2 PSI = 9,820 PSF			17	12	35	100	SS-7	>4.5	7	9	19	42	23	25	16	9	12	A-4a (6)
			18	15														
			19	50/4"	-	100	SS-8	-	-	-	-	-	-	-	-	13	Rock (V)	
			20															
			21															
			22															
			23	97	97	NQ-1												
		551.3	24															
DOLOMITE, GRAY, MODERATELY TO HIGHLY WEATHERED, STRONG, JOINTED-SLIGHTLY FRACTURED, NARROW, RQD = 97%, REC = 97%. @21.3": Qu - 9777 PSI			25															
			26															
			27															
			28															
			29															
			30															
			31															
			32															

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/13/25 12:23 - X:\PROJECTS\242165\DOT.GPJ

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 7 CF CEMENT-BENTONITE GROUT

DESIGN AGENCY

DESIGNER

TLS

REVIEWER

CPI 03/19/25

PROJECT ID

110100

SUBSET

5

TOTAL

9

SHEET

P.23

TOTAL

27

GEOTECHNICAL PROFILE - TRAFFIC SIGNALS  
BORING LOGS B-001-0-24 & B-002-0-24



D02-TSG-FY2025

MODEL: Sheet PAPER: SIZE: 34x22 (in.)    DATE: 3/21/2025    TIME: 8:59:43 AM    USER: somogyi  
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PROJECT: D02 TSG FY2025		DRILLING FIRM / OPERATOR: _____		DLZ / MG		DRILL RIG: DLZ CME 75 TRUCK 78		STATION / OFFSET: 1677+04, 32' LT.		EXPLORATION ID	
TYPE: TRAFFIC SIGNAL-SUPPORT		SAMPLING FIRM / LOGGER: _____		DLZ / AM		HAMMER: AUTOMATIC HAMMER		ALIGNMENT: SR 163		B-003-0-24	
PID: 110100    SFN: N/A		DRILLING METHOD: 3.25" HSA				CALIBRATION DATE: 1/12/25		ELEVATION: 577.2 (NAVD88) EOB: 12.0 ft.		PAGE	
START: 11/22/24    END: 11/22/24		SAMPLING METHOD: SPT				ENERGY RATIO (%): 76.7		LAT / LONG: 41.531391, -82.822070		1 OF 1	
MATERIAL DESCRIPTION AND NOTES				ELEV.		REC SAMPLE		GRADATION (%)		ATTERBERG	
				577.2		ID		GR CS FS SI CL		WC	
TOPSOIL - 4 INCHES				DEPTHS		HP		GR			
				1		(tsf)					
STIFF, BROWN, CLAY, SOME SILT, TRACE SAND, MODERATELY ORGANIC, DAMP				2		28		- - -		10 A-7-6 (V)	
				3							
@3.5': STIFF TO HARD				4							
				5							
				6							
				7							
				8							
VERY STIFF TO HARD, BROWN, SILT AND CLAY, SOME SAND, TRACE GRAVEL, MOIST Qu = 49.3 PSI = 7,100 PSF				9		39		2 7 15 26 50		28 17 11	
				10							
@8.5': VERY STIFF, 'AND' SAND, LITTLE GRAVEL				11		83		17 19 16 21 27		29 17 12	
				12		5					
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D02-TSG-FY2025

MODEL: Sheet PAPER: 34x22 (in.)    DATE: 3/21/2025    TIME: 9:00:10 AM    USER: somorg/y  
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PROJECT: D02 TSG FY2025		DRILLING FIRM / OPERATOR:		DLZ / MG		DRILL RIG: DLZ CME 75 TRUCK 78		STATION / OFFSET: 1677+02, 30' LT.		EXPLORATION ID											
TYPE: TRAFFIC SIGNAL-SUPPORT		SAMPLING FIRM / LOGGER:		DLZ / AM		HAMMER: AUTOMATIC HAMMER		ALIGNMENT: SR 163		B-003-2-24											
PID: 110100    SFN: N/A		DRILLING METHOD: 3.25" HSA / NQ				CALIBRATION DATE: 1/12/25		ELEVATION: 577.2 (NAVD88) EOB: 17.0 ft.		PAGE											
START: 11/22/24    END: 11/22/24		SAMPLING METHOD: NQ				ENERGY RATIO (%): 76.7		LAT / LONG: 41.531379, -82.822082		1 OF 1											
SEE B-003-0-24		MATERIAL DESCRIPTION AND NOTES		ELEV.	SPT/ RQD	REC (%)	HP (tsf)	GRADATION (%)			HOLE										
				577.2	N <sub>60</sub>	ID	GR	CS	FS	SI	CL	LL	PL	WC	ODOT CLASS (g)	SEALED					
DOLOMITE, GRAY, MODERATELY TO HIGHLY WEATHERED, STRONG, JOINTED-SLIGHTLY FRACTURED, NARROW, RQD = 94%, REC = 94% @12' Qu - 9490 PSI		/		DEPTHS																	
				1																	
				2																	
				3																	
				4																	
				5																	
				6																	
				7																	
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				15																	
				16																	
17																					
EOB																					
560.2																					
565.2																					
TR																					

NOTES:    OFFSET 6 FT SW OF B-003-0-24.  
ABANDONMENT METHODS, MATERIAL S. QUANTITIES:    PUMPED 5 CF CEMENT-BENTONITE GROUT



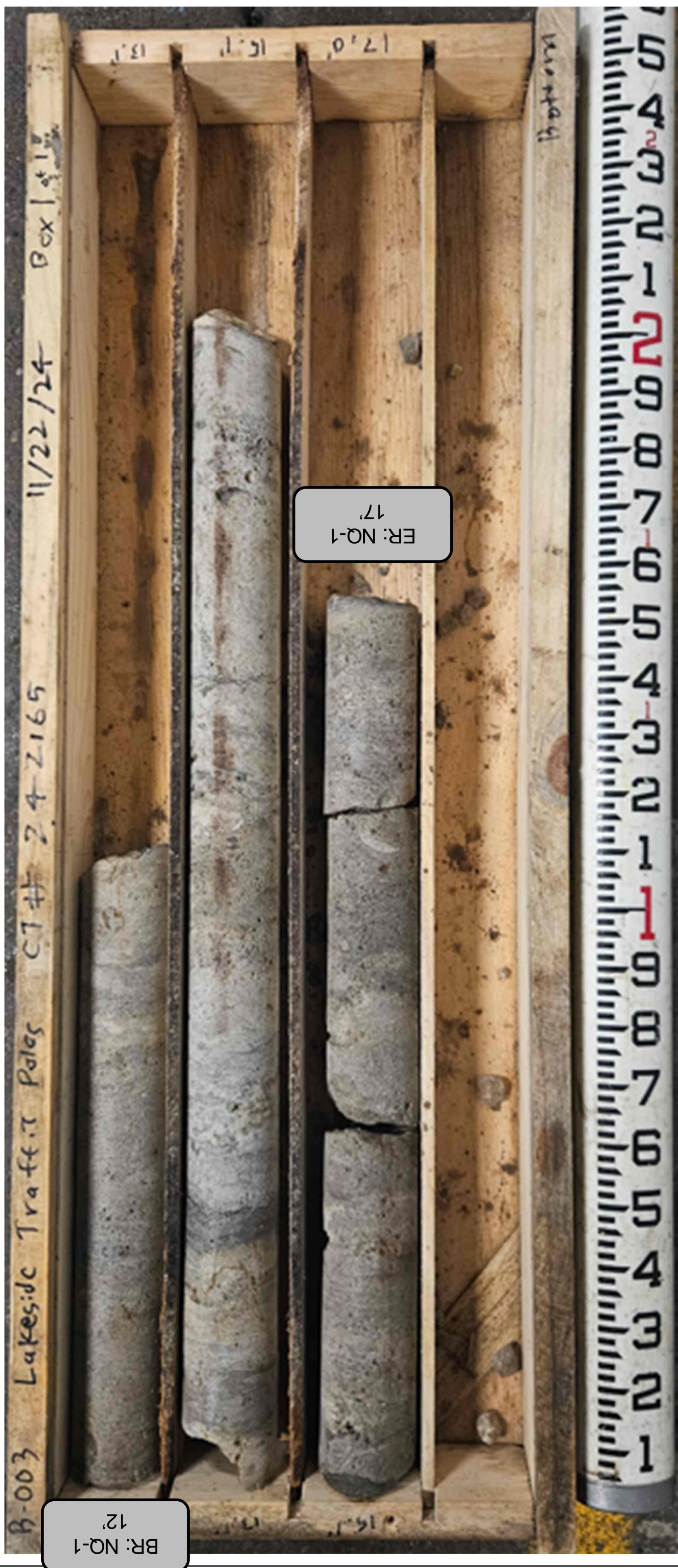




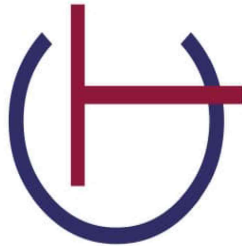


Office of Geotechnical Engineering

B-003-2-24



Core Date: November 22, 2024			Ground Surface Elevation: 577.2'		
Run #:	Depth	Elevation	Recovery	RQD	
NQ-1	12'    17'	565.2'    560.2'	56.5/60    94%	56.5/60    94%	
D02 TSG FY2025, PID 110100					



Prepared by:

CT Project No.: 242165

DESIGN AGENCY	
DT	
DESIGNER	TLS
REVIEWER	
CPI	03/19/25
PROJECT ID	110100
SUBSET	TOTAL
9	9
SHEET	TOTAL
P.27	27