

UTILITIES

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

<u>ERI US 250 & SR 13</u>	
COMMUNICATION FRONTIER COM 3126 NORTH McCORD TOLEDO, OH 43617 419.841.7281	COUNTY ERIE COUNTY SEWER 554 RIVER ROAD HURON, OH 44839 419.433.7303
ELECTRIC OHIO EDISON 2508 WEST PERKINS AVE SANDUSKY, OH 44870 419.627.6887	GAS COLUMBIA GAS OF OHIO 1800 BROAD AVENUE FINDLAY, OH 45840 419.427.3225
ELECTRIC OHIO EDISON TRANSMISSION 76 SOUTH MAIN STREET AKRON, OH 44308 330.805.3042	
<u>ERI US 250 & SR 113</u>	
COUNTY ERIE COUNTY SEWER 554 RIVER ROAD HURON, OH 44839 419.433.7303	TRAFFIC ODOT DISTRICT THREE 906 CLARK AVENUE ASHLAND, OH 44805 419.207.2868
WATER ERIE COUNTY WATER 2614 COLUMBUS AVENUE SANDUSKY, OH 44870 419.627.7666	COMMUNICATION FRONTIER COM 3126 NORTH McCORD TOLEDO, OH 43617 419.841.7281
COMMUNICATION FIRST ENERGY FIBER ERIC J. YOUNG 330.436.2151	
<u>HUR SR 61 & SR 601</u>	
COMMUNICATION FRONTIER COM 3126 NORTH McCORD TOLEDO, OH 43617 419.841.7281	GAS COLUMBIA GAS OF OHIO 1800 BROAD AVENUE FINDLAY, OH 45840 419.427.3225
ELECTRIC OHIO EDISON 2508 WEST PERKINS AVE SANDUSKY, OH 44870 419.627.6887	TRAFFIC ODOT DISTRICT THREE 906 CLARK AVENUE ASHLAND, OH 44805 419.207.2868
WATER NORTHERN OHIO RURAL WATER P.O. BOX 96 COLLINS, OH 44826 419.668.7213	

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

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

ALL UTILITIES TO REMAIN IN PLACE.

AROUND TRANSMISSION LINES: THE HIGHWAY CONTRACTOR WILL NEED TO USE EXTREME CAUTION WHILE WORKING AROUND ANY ENERGIZED CONDUCTOR. THE HIGHWAY CONTRACTOR MUST KNOW & COMPLY WITH OCCUPATIONAL SAFETY HEALTH ADMINISTRATION (OSHA), 29 CFR 1926 SUBPART CC, SAFE-WORKING CLEARANCES BETWEEN PERSONS OR ANY CONDUCTIVE OBJECT AND THE ENERGIZED BARE WIRES. THE CONDUCTORS ARE RATED ABOVE 50 KV.

AROUND DISTRIBUTION LINES: THE HIGHWAY CONTRACTOR WILL NEED TO USE EXTREME CAUTION WHILE WORKING AROUND ANY ENERGIZED CONDUCTOR. THE HIGHWAY CONTRACTOR MUST KNOW & COMPLY WITH OCCUPATIONAL SAFETY HEALTH ADMINISTRATION (OSHA), 29 CFR 1926 SUBPART CC, SAFE-WORKING CLEARANCES BETWEEN PERSONS OR ANY CONDUCTIVE OBJECT AND THE ENERGIZED BARE WIRES. THE CONDUCTORS ARE RATED BELOW 50 KV.

SURVEYING PARAMETERS

PRIMARY PROJECT CONTROL MONUMENTS GOVERN ALL POSITIONING ON ODOT PROJECTS. SEE SHEETS 26-27 OF THE PLANS FOR A TABLE CONTAINING PROJECT CONTROL INFORMATION.

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

PROJECT CONTROL: ERI US 250 & SR 13
POSITIONING METHOD: ODOT STANDARD VRS GNSS
MONUMENT TYPE: TYPE B

VERTICAL POSITIONING
ORTHOMETRIC HEIGHT DATUM: NAVD88
GEOID: GEOID18*

HORIZONTAL POSITIONING
REFERENCE FRAME: NAD83 (2011 ADJ, 2010.0)
ELLIPSOID: GRS 80

COORDINATE SYSTEM: O.D.O.T. ERI OCCS*
ERIE OCCS PROJECTION PARAMETERS:
PROJECTION: LAMBERT CONFORMAL CONIC
CENTRAL LATITUDE: N 41°24'00"
CENTRAL LONGITUDE: W 277°27'00"
FALSE NORTHING: 100,000 METERS
FALSE EASTING: 50,000 METERS
PROJECTION SCALE FACTOR: 1.000027
PROJECT COORDINATES SHOWN IN U.S. SURVEY FEET

PROJECT CONTROL: ERI US 250 & SR 113
POSITIONING METHOD: ODOT STANDARD VRS GNSS
MONUMENT TYPE: TYPE B

VERTICAL POSITIONING
ORTHOMETRIC HEIGHT DATUM: NAVD88
GEOID: GEOID18*

HORIZONTAL POSITIONING
REFERENCE FRAME: NAD83 (2011 ADJ, 2010.0)
ELLIPSOID: GRS 80

COORDINATE SYSTEM: O.D.O.T. ERI OCCS*
ERIE OCCS PROJECTION PARAMETERS:
PROJECTION: LAMBERT CONFORMAL CONIC
CENTRAL LATITUDE: N 41°24'00"
CENTRAL LONGITUDE: W 277°27'00"
FALSE NORTHING: 100,000 METERS
FALSE EASTING: 50,000 METERS
PROJECTION SCALE FACTOR: 1.000027
PROJECT COORDINATES SHOWN IN U.S. SURVEY FEET

PROJECT CONTROL: HUR SR 61 & SR 601
POSITIONING METHOD: ODOT STANDARD VRS GNSS
MONUMENT TYPE: TYPE B

VERTICAL POSITIONING
ORTHOMETRIC HEIGHT DATUM: NAVD88
GEOID: GEOID18*

HORIZONTAL POSITIONING
REFERENCE FRAME: NAD83 (2011 ADJ, 2010.0)
ELLIPSOID: GRS 80

COORDINATE SYSTEM: O.D.O.T. HURON OCCS*
HURON OCCS PROJECTION PARAMETERS:
PROJECTION: LAMBERT CONFORMAL CONIC
CENTRAL LATITUDE: N 41°18'00"
CENTRAL LONGITUDE: W 277°24'00"
FALSE NORTHING: 100,000 METERS
FALSE EASTING: 50,000 METERS
PROJECTION SCALE FACTOR: 1.000037
PROJECT COORDINATES SHOWN IN U.S. SURVEY FEET

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 CMS 623.

ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS ITEM 623 WILL GOVERN CONSTRUCTION SURVEYING ACTIVITY.

THE FOLLOWING MONUMENT VERIFICATION REPORT(S) WILL BE REQUIRED:

623.04a – PRECONSTRUCTION MONUMENT VERIFICATION AND REPORT - [LUMP SUM CARRIED TO GEN SUM]

623.04b – POST CONSTRUCTION MONUMENT VERIFICATION AND REPORT - [LUMP SUM CARRIED TO GEN SUM]

EXISTING PLANS

EXISTING PLANS ENTITLED ERI-250-10.65, ERI-250-11.82, HUR-61-22.00 MAY BE INSPECTED IN THE ODOT DISTRICT THREE OFFICE IN ASHLAND.

POWER SUPPLY FOR TRAFFIC SIGNALS

ELECTRIC POWER SHALL BE OBTAINED FROM THE UTILITY COMPANIES AT THE LOCATION INDICATED ON THE PLANS.
POWER SUPPLIED SHALL BE 120/240 VOLTS.

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.

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 180 DAYS FOLLOWING COMPLETION OF THE 10-DAY PERFORMANCE TEST. IN THE EVENT OF UNSATISFACTORY OPERATION THE CONTRACTOR SHALL CORRECT FAULTY INSTALLATIONS, MAKE REPAIRS AND REPLACE DEFECTIVE PARTS WITH NEW PARTS OF EQUAL OR BETTER QUALITY.

EQUIPMENT, MATERIAL AND LABOR COSTS INCURRED IN CORRECTING AN UNSATISFACTORY OPERATION SHALL BE BORNE BY THE CONTRACTOR.

THE GUARANTEE SHALL COVER THE FOLLOWING ITEMS OF THE TRAFFIC CONTROL SYSTEM: 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 MAINTAINING AGENCY FOLLOWING ACCEPTANCE OF THE EQUIPMENT.

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

DETECTION MAINTENANCE

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

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

LOCATIONS WHERE NON-INTRUSIVE DETECTION IS PROPOSED AND THE EXISTING VEHICLE DETECTION IS TO BE 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. DETECTION MAINTENANCE SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT WORK.

ITEM 659 – SEEDING AND MULCHING (ERI-250/113):

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

659	COMMERCIAL FERTILIZER	0.03	TON
659	LIME	0.04	ACRE
659	WATER	1.10	M GAL
659	REPAIR SEEDING AND MULCHING	10	SQ YD
659	INTERSEEDING	10	SQ YD
659	TOPSOIL	22	CU YD
659	SOIL ANALYSIS TEST	2	EACH
659	SEEDING AND MULCHING	198	SQ YD

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE BASED ON THESE LIMITS. QUANTITIES ARE CARRIED TO THE GENERAL SUMMARY.

WORK INSPECTION

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

ITEM 606 - GUARDRAIL REMOVED, AS PER PLAN (ERI-250/113):

THIS ITEM SHALL INCLUDE ALL LABOR, EQUIPMENT, AND MATERIALS NECESSARY TO PERFORM THE FOLLOWING WORK TO THE EXISTING GUARD RAIL RUN FOUND AT THE ERI-250/113 LOCATION.

1. REMOVE RAILING AND SIGN POSTS SUPPORTING THE RAILING.
2. REMOVE FLAT SHEET SIGN SUPPORTING EMBANKMENT AROUND GUARDRAIL.

PAYMENT SHALL BE AT THE UNIT PRICE BID FOR EACH FOOT OF ITEM 606 – GUARDRAIL REMOVED, AS PER PLAN.

UNDERDRAINS FOR PULLBOXES

REFERENCE TRAFFIC SCD HL-30.11 FOR DETAILS ABOUT DRAINING PULLBOXES. ALL PULLBOXES SHALL HAVE UNDERDRAINS INSTALLED. PROVIDE A WIRE MESH SCREEN AT BOTH ENDS OF AN UNDERDRAIN (INSIDE AND OUTSIDE THE PULL BOX). COORDINATE THE LOCATION OF THE OUTLET OF THE UNDERDRAIN WITH THE ENGINEER PRIOR TO INSTALLATION AND INSTALL PER HIS/HER DIRECTION.

THE FOLLOWING ESTIMATED QUANTITY, ASSUMING AN AVERAGE OF 20 FEET OF UNDERDRAIN MATERIAL PER PULL BOX, UNLESS SEPARATELY ITEMIZED AND DETAILED, IS CARRIED TO THE GENERAL SUMMARY AND IS TO INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, AND INCIDENTALS NEEDED TO COMPLETE THIS WORK:

ITEM 611 4" CONDUIT, TYPE E, AS PER PLAN220 FT.

ITEM 625 – ARC FLASH CALCULATIONS AND LABEL, POWER SERVICE

THE SPECIFICATIONS AND REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 825 SHALL APPLY TO THE POWER SERVICE FOR THE TRAFFIC SIGNAL & LIGHTING.

ITEM 625 – LUMINAIRE, CONVENTIONAL, SOLID STATE (LED), IES-II, 3000K, 11000 - 11500 LUMENS

IN ADDITION TO THE REQUIREMENTS OF ODOT’S CONSTRUCTION AND MATERIAL SPECIFICATIONS AND SUPPLEMENTAL SPECIFICATION 813 & 913, LUMINAIRES FOR CONVENTIONAL LIGHTING UNITS SHALL BE AS FOLLOWS:

1. LUMINAIRES SHALL BE
 - a. GE Evolve, 98W, Solid-State, Conventional type, IES Type II, 11,000 lumens, 120V L-N compatible input, must be on ODOT SS 813 Approved List, no photocell socket, grey enclosure, Catalog Number: ERLH 0 11 B3 30 D GRAY GLR
 - b. Autobahn Series ATBM, 81W, Solid-State, Conventional type, IES Type II , Medium distribution, 11,000 lumens, 120V L-N compatible input, must be on ODOT SS 813 Approved List, no photocell socket, 3000K, grey enclosure, Catalog Number: ATBM-P10-mvolt-R2- 2 or 4 Bolt Mounting-3K-
 - c. Cooper, Verdeon, 92W, Solid-State, Conventional type, IES Type II , Medium distribution, 11,341 lumens, 120V L-N compatible input, must be on ODOT SS 813 Approved List, no photocell socket, 3000K, grey enclosure, Catalog Number: VERD-CA2-90-730-u-T2- -AP-10K

PAYMENT WILL BE MADE AT THE UNIT BID PRICE FOR EACH C&MS ITEM 625, “LUMINAIRE, CONVENTIONAL, SOLID STATE (LED), IES-III, LED, 3000K, 11000 - 11500 LUMENS” FOR EACH LUMINAIRE WHICH SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, AND INCIDENTALS REQUIRED TO COMPLETE THIS ITEM IN A SATISFACTORY AND WORKMANLIKE MANNER.

ITEM 632 – REMOVAL OF TRAFFIC SIGNAL INSTALLATION

TRAFFIC SIGNAL INSTALLATIONS, INCLUDING SIGNAL HEADS, SIGNAL CABLE, POWER CABLE, PULL BOXES, MESSENGER WIRE, STRAIN POLES, CABINET, CONTROLLER, ETC., SHALL BE REMOVED IN ACCORDANCE WITH C&MS 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 IN ACCORDANCE WITH THE LISTING GIVEN HEREIN.

SALVAGE THE FOLLOWING EQUIPMENT FOR DISTRICT 3: CONTROLLER, CONFLICT MONITOR (MMU), RADAR DETECTORS, WAVETRONIX CABINET INTERFACE DEVICE, COMMUNICATIONS EQUIPMENT INCLUDING THE MODEM, RADIO, ANTENNA, AND UPS INVERTER. CONTACT CHARLIE LAUGHREY (419-207-7162) IN ORDER TO SCHEDULE DELIVERY OF SALVAGED ITEMS.

IN THE EVENT THE ITEMS STORED ON THE PROJECT FOR SALVAGE BY ODOT 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.

EXISTING UNINTERRUPTIBLE POWER (UPS) SUPPLY REMOVAL (ERI-250/113):

THE INSTALLATION OF THE PROPOSED CABINET AND UPS AT THE ABOVE-MENTIONED LOCATION MAY REQUIRE THE REMOVAL OF THE EXISTING UPS SYSTEM. IN THE CASE OF A POWER OUTAGE IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE POWER TO THE EXISTING TRAFFIC SIGNAL UNTIL THE MAIN POWER SOURCE IS RESTORED.

ITEM 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, THE CONTRACTOR SHALL MEET 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 SUPPORTS.

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 632 - POWER SERVICE, AS PER PLAN

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

1.THE METER BASE MOUNTING HEIGHT SHALL BE NO MORE THAN 5 FEET HIGH TO THE CENTER OF THE METER BASE FROM THE GROUND.

2.THE CONTRACTOR SHALL SUPPLY THE NECESSARY METER BASES.

3.ALL POWER SERVICES SHALL BE METERED. THE METER SHALL HAVE A LEVER OPERATED BYPASS.

4. ERI-250/13 & HUR-61/601: PROVIDE A FUSED DISCONNECT SWITCH PLACED BETWEEN THE METER BASE AND THE SIGNAL CABINET.

ERI-250/113: PROVIDE A SIGNAL FUSED DISCONNECT SWITCH AND A HIGHWAY LIGHTING DISCONNECT SWITCH PLACED BETWEEN THE METER BASE AND THE SIGNAL CABINET.

DISCONNECT SWITCH ENCLOSURES FURNISHED IN ACCORDANCE WITH CMS ITEM 632, POWER SERVICE, AS PER PLAN, SHALL INCLUDE A PADLOCK EQUAL TO MASTER NO. 4BKA OR WILSON BOHANNON 680, WITH LOCK BODY OF BRONZE OR BRASS AND KEYING SHALL BE TO THE STATE MASTER.

THE POWER SOURCE LOCATION SHALL BE INDICATED IN THE PLANS OR AS DETERMINED IN THE FIELD BY THE ENGINEER. THE CONTRACTOR SHALL CONTACT THE UTILITY COMPANY FOR INFORMATION REGARDING THE METER BASE INSTALLATION PRIOR TO THE ORDERING POLES. THE CONTRACTOR WILL BE RESPONSIBLE FOR REQUESTING AND SCHEDULING ANY INSPECTIONS OHIO EDISON MAY REQUIRE FOR THE POWER SERVICE HOOK UP. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT THE UTILITY COMPANY FOR THE ELECTRICAL SERVICE CONNECTION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR SPLICE POWER CABLE INTO THE UTILITY COMPANY’S CIRCUITS. THE VOLTAGE SUPPLIED SHALL BE NOMINALLY 120/240V. THE PHOTOCELL SHALL BE 1’ – 2’ ABOVE THE LCC ENCLOSURE.

A 4" THICK WORKPAD SHALL BE PROVIDED UNLESS IN AN OTHERWISE PAVED AREA. IN LEVEL AREAS, THE TOP OF THE PAD SHALL BE 1" ABOVE THE GROUND LINE. IN STEEPLY SLOPED AREAS THE PAD'S LOCATION SHALL BE ADJUSTED TO PROVIDE ACCESS AND DRAINAGE. THE CONCRETE PAD SHALL EXTEND IN FRONT OF THE RACK FOR A DEPTH OF 30" AND SHALL HAVE A WIDTH OF THE DISTANCE BETWEEN THE STEEL PIPE SUPPORTS.

WHEN THE PROJECT BEGINS AND THE CONTRACTOR HAS TAKEN OVER THE MAINTAINANCE OF THE EXISTING SYSTEM, THEY SHALL PROVIDE ALL REQUIRED LAYOUTS AND LOCATIONS OF THE EXISTING AND PROPOSED ELECTRICAL CIRCUITS WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL LOCATE AND MARK THE UNDERGROUND ELECTRICAL CIRCUITS, SIGNAL CABLE, LOOPS AND LOOP LEAD INS DURING THE DURATION OF THE PROJECT. THIS WORK SHOULD BE CONSIDERED INCIDENTAL TO POWER SERVICE, AS PER PLAN. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS AND THE PAYING OF ALL FEES. THE CONTRACTOR SHALL PAY ALL POWER CHARGES UNTIL THE SIGNAL IS ACCEPTED BY THE MAINTAINING AGENCY. PAYMENT WILL BE MADE AT THE UNIT BID PRICE FOR EACH C&MS ITEM 625, "POWER SERVICE, AS PER PLAN" WHICH SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND INCIDENTALS REQUIRED TO COMPLETE THIS ITEM IN A SATISFACTORY AND WORKMANLIKE MANNER.

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

IN ADDITION TO THE REQUIREMENTS OF C&MS 632 AND 732, THE FOLLOWING REQUIREMENTS SHALL APPLY:

1. SIGNAL HEADS AND VISORS SHALL BE CONSTRUCTED OF BLACK POLYCARBONATE PLASTIC WITH VISORS AS SPECIFIED AND MEET ITE SPECIFICATIONS.
2. PROPER EXTERIOR COLORS SHALL BE OBTAINED BY USE OF COLORED PLASTIC MATERIAL RATHER THAN PAINTING.
3. THE ENTRANCE FITTING SHALL BE OF THE TRI-STUD DESIGN WITH SERRATED RINGS IN ORDER TO ACHIEVE POSITIVE LOCKING.
4. ALL SIGNAL HEADS SHALL BE RIGIDLY MOUNTED TO THE MAST ARM WITH THE YELLOW MODULE LOCATED IN FRONT OF THE MAST ARM.
5. WHERE SPECIFIED IN PLANS, ALUMINUM BACKPLATES SHALL BE IN ACCORDANCE WITH THE C&MS AND INCLUDE A FLUORESCENT YELLOW REFLECTIVE BORDER.
6. THE LIGHT EMITTING DIODE (LED) MODULES SHALL MEET THE REQUIREMENTS OF C&MS 732.04-C AND BE LONG LIFE LED MODULES WITH A MINIMUM 15 YEAR WARRANTY. THE CONTRACTOR SHALL PROVIDE ODOT, IN WRITING, WITH THE LED MANUFACTURER NAME, 400 TRAFFIC SIGNALS TRAFFIC ENGINEERING MANUAL (JANUARY 15, 2016) OCTOBER 23, 2002 4-77 SERIAL NUMBER, PART NUMBER, DESCRIPTION OF LAMP, AND DATE OF MANUFACTURE FOR ALL LED UNITS THAT ARE TO BE USED IN THE SIGNAL HEAD PRIOR TO INSTALLATION, FOR ACCEPTANCE AND WARRANTY PURPOSES.
7. EACH LENS CLIP THAT HOLDS THE LED SIGNAL LAMP IN PLACE SHALL BE FASTENED TO THE SIGNAL HEAD HOUSING DOOR BY USE OF A 3/4" LONG STAINLESS STEEL SOCKET SET SCREW AND STAINLESS STEEL NUT. THE VISOR SHALL BE ATTACHED BY USE OF 3/4" LONG STAINLESS STEEL SOCKET SECT SCREW AND STAINLESS STEEL NUT.
8. SIGNAL HEADS SHALL HAVE A MINIMUM WALL THICKNESS OF 0.117 INCHES.
9. SIGNAL HEADS SHALL INCLUDE CUTAWAY TYPE VISORS UNLESS OTHERWISE SPECIFIED IN THE PLANS.
10. APPLY A BEAD OF SILICONE TO THE SIGNAL HEAD, WASHER, AND ENTRANCE ADAPTER SERRATIONS TO PREVENT WATER INTRUSION. ALSO, FILL THE SPACE BETWEEN CONCENTRIC SERRATION RINGS ON THE TOP OF THE SIGNAL HEAD TO COMPLETELY EXCLUDE WATER FROM THE SPACE BETWEEN THE CONCENTRIC RINGS.
11. BALANCE ADJUSTERS SHALL NOT BE USED ON ONE-WAY HEADS OR TETHERED HEADS.

PAYMENT FOR ITEM 632 VEHICULAR SIGNAL HEAD, LED, BLACK, (BY TYPE), WITH BACKPLATE, AS PER PLAN SHALL BE MADE FOR COMPLETE SIGNAL HEAD FURNISHED AND INSTALLED, INCLUDING ALL LABOR, EQUIPMENT, MATERIALS, AND NEW ATTACHMENT HARDWARE.

ITEM 633 –CABINET, TYPE TS2, 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 6 WITH A 12" RISER AND WITH 16 LOAD SWITCH BAYS, LED UNDER-SHELF LIGHTING, POWER HARNESSSES FOR BOTH TS2 TYPE 1 AND TYPE 2 CONTROLLERS AND SHALL HAVE A MINIMUM OF THREE SHELVES.

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 MMU2-16LE EDI AS ALLOWED ON THE TAP/APPROVED PRODUCTS LIST.

PROVIDE A HAND/OFF/AUTO SWITCH WITHIN THE SIGNAL CONTROLLER CABINET AND DEDICATED CIRCUIT BREAKER FOR HIGHWAY LIGHTING. DEDICATE ONE LEG OF THE 120 POWER SERVICE TO THE TRAFFIC SIGNAL AND ONE LEG TO THE HIGHWAY LIGHTING. DO NOT POWER LIGHTS THROUGH THE UPS.

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.

MAINTENANCE OF EXISTING SYSTEM

WHEN THE PROJECT BEGINS, THE CONTRACTOR SHALL PROVIDE ALL REQUIRED LAYOUTS AND LOCATIONS OF THE EXISTING AND PROPOSED ELECTRICAL CIRCUITS WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL LOCATE AND MARK THE UNDERGROUND ELECTRICAL CIRCUITS DURING THE DURATION OF THE PROJECT.

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

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

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

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

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

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

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

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

THIS ITEM SHALL INCLUDE A RED LED STATUS INDICATOR LAMP TO ALLOW MAINTENANCE PERSONNEL AND LAW ENFORCEMENT TO QUICKLY ASSESS WHETHER A TRAFFIC SIGNAL CABINET IS BEING POWERED BY A UPS. THE LED HOUSING SHALL BE NEMA 4X, IP65 OR IP66, RATED FOR OUTDOOR USE AND BE TAMPER/ SHATTER RESISTANT. IT SHALL BE A DOMED ENCLOSURE CONTAINING A RED LENS WITH LED THAT IS VISIBLE FROM 100 FOOT MINIMUM. THE ENCLOSURE AND LED MODULE SHOULD BE PLACED ON THE SIDE OF THE UPS CABINET FACING TOWARDS THE MAINLINE ROADWAY AND SEALED FROM WATER INTRUSION. IT SHOULD BE WIRED USING MINIMUM 20GA STRANDED, INSULATED HOOKUP WIRE TO THE STATUS RELAY OUTPUTS OF THE UPS. THE WIRES SHALL BE TERMINATED BY LUGS AT THE DISPLAY END AND PERMANENTLY LABELED "BACKUP POWER STATUS DISPLAY," WITH WIRE POLARITY INDICATED. THE RED LED SHALL ONLY ILLUMINATE TO INDICATE THE CABINET IS OPERATING UNDER UPS BACKUP POWER (THE "BACKUP" OPERATING CONDITION). THIS ITEM INCLUDES PROGRAMMING THE UPS STATUS RELAY OUTPUTS TO PRODUCE THE LAMP STATUS DISPLAYS. THESE STATUS DISPLAYS WILL BE SOLID 100% DUTY CYCLE (NOT FLASHING) DISPLAYS. THE OPERATING VOLTAGE OF THE LED LAMP SHALL BE 120V AC UNLESS OTHERWISE INDICATED.

ITEM 633 – CONTROLLER ITEM, MISC.: COMMUNICATIONS

THE EXISTING ETHERNET RADIO UNIT SHALL BE REMOVED AND REINSTALLED IN THE NEW CABINET. PROVIDE A NEW ANTENNA FOR THE SALVAGED MODEM.

PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH COMMUNICATIONS, APP, IN PLACE, ALL CONNECTIONS MADE AND WIRING COMPLETED, TESTED AND ACCEPTED.

ITEM 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:

1. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
2. ALL REQUIRED INPUTS CARDS SHALL BE INCLUDED IN THE TRAFFIC CABINET AND SHALL BE COMPATIBLE WITH CALTRANS, NEMA TS1 AND NEMA TS2 DETECTOR RACKS. THE CARDS SHALL PROVIDE TRUE PRESENCE DETECTOR CALLS OR CONTACT CLOSURE TO THE TRAFFIC CONTROLLER.
3. THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MAST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.
4. SURGE PROTECTION DEVICES, AS RECOMMENDED BY THE MANUFACTURER SHALL BE INCLUDED BOTH AT THE POLE WHERE THE UNIT IS LOCATED TO PROTECT THE UNIT AND IN THE TRAFFIC CABINET TO PROTECT THE CABINET ELECTRONICS.
5. THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ONSITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.
6. A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MINIMUM 7 FEET).
7. THE POWER SUPPLY AND COMMUNICATION MODULES SHALL BE SECURED TO A SINGLE PANEL THAT CAN BE MOUNTED INTERIOR TO THE TRAFFIC CABINET. THE PANEL SHALL INCLUDE MODULAR-PLUG STYLE CONNECTIONS FOR UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD-WIRED TO THE COMMUNICATION MODULES, AS NECESSARY.
8. THE CONTRACTOR SHALL INSTALL THE RADAR DETECTION PRIOR TO MILLING/DISABLING EXISTING LOOPS.
9. THE INSTALLATION SHALL INCLUDE ALL CONTROLLER PROGRAMMING FOR COMPLETE INSTALLATION, WHICH INCLUDES MODIFICATIONS FOR REMOVAL OF EXISTING DETECTION.

PAYMENT FOR ITEM 809 ADVANCE RADAR DETECTION, AS PER PLAN SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH UNIT, COMPLETE AND IN PLACE INCLUDING ALL REQUIRED CABINET HARDWARE, MOUNTING BRACKETS, CABLES, CONDUIT, CONNECTIONS TESTED AND ACCEPTED, AND ANY OTHER NECESSARY HARDWARE TO ESTABLISH A FULLY FUNCTIONAL DETECTION SYSTEM.

ITEM 809 – STOP-LINE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR ADVANCE DETECTION UNIT (MODEL SS-200E). THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING:

1. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
2. ALL REQUIRED INPUTS CARDS SHALL BE INCLUDED IN THE TRAFFIC CABINET AND SHALL BE COMPATIBLE WITH CALTRANS, NEMA TS1 AND NEMA TS2 DETECTOR RACKS. THE CARDS SHALL PROVIDE TRUE PRESENCE DETECTOR CALLS OR CONTACT CLOSURE TO THE TRAFFIC CONTROLLER.
3. THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MAST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.
4. SURGE PROTECTION DEVICES, AS RECOMMENDED BY THE MANUFACTURER SHALL BE INCLUDED BOTH AT THE POLE WHERE THE UNIT IS LOCATED TO PROTECT THE UNIT AND IN THE TRAFFIC CABINET TO PROTECT THE CABINET ELECTRONICS.
5. THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ONSITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.
6. A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MINIMUM 7 FEET).
7. THE POWER SUPPLY AND COMMUNICATION MODULES SHALL BE SECURED TO A SINGLE PANEL THAT CAN BE MOUNTED INTERIOR TO THE TRAFFIC CABINET. THE PANEL SHALL INCLUDE MODULAR-PLUG STYLE CONNECTIONS FOR UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD-WIRED TO THE COMMUNICATION MODULES, AS NECESSARY.
8. THE CONTRACTOR SHALL INSTALL THE RADAR DETECTION PRIOR TO MILLING/DISABLING EXISTING LOOPS.
9. THE INSTALLATION SHALL INCLUDE ALL CONTROLLER PROGRAMMING FOR COMPLETE INSTALLATION, WHICH INCLUDES MODIFICATIONS FOR REMOVAL OF EXISTING DETECTION.

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

ITEM 809 – ATC CONTROLLER, AS PER PLAN (PROGRAM AND INSTALL ONLY)

ALL REQUIREMENTS OF SS 809 SHALL BE FOLLOWED, ALONG WITH THE ADDITIONAL DESCRIPTION AS STATED BELOW. THE ATC CONTROLLER WILL BE PROVIDED BY THE DISTRICT WITHOUT PROGRAMMING. IN THE CASE OF A 332/336 CABINET TYPE, THE CONTROLLER WILL BE PROVIDED WITH THE POWER CORD.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROGRAMMING THE CONTROLLER TO THE PROPOSED CONDITIONS ACCORDING TO THE PLANS. ODOT WILL NOT BE RESPONSIBLE FOR THE PROGRAMMING.

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

PAYMENT SHALL BE MADE ONCE THE CONTROLLER IS PROGRAMMED, INSTALLED, TESTED, FUNCTIONING ACCORDING TO THE PLANS, AND SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS TO COMPLETE THE WORK.

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:
- 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.
 - PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR IN METALLIC CONDUITS (725.04) IN ADDITION TO THE CONDUCTORS SPECIFIED AND BOND THE CONDUIT TO THIS GROUNDING CONDUCTOR.
 - 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.
 - 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.
 - IF MULTIPLE CONDUIT RUNS BEGIN AND END AT THE SAME POINTS, ONLY ONE EQUIPMENT GROUNDING CONDUCTOR IS REQUIRED.
 - 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.
 - 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.
 - CONDUITS.
 - 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.
 - THE 725.05 CONDUIT SHALL HAVE THE INSIDE AND OUTSIDE DIAMETERS OF THE CONDUIT DEBURRED AT ALL TERMINATION POINTS.
 - BOTH ENDS OF METALLIC CONDUIT SHALL BE BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.
 - 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.
 - WIRE FOR GROUNDING AND BONDING.
 - 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:
 - USE 4 AWG BETWEEN THE POWER SERVICE AND SUPPORTS, POLES, PEDESTALS, CONTROLLER OR FLASHER CABINETS.
 - 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.
 - 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.
 - 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.
 - 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.
- GROUND ROD.
 - 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.
 - THE TYPICAL GROUNDING CONDUCTOR (GROUND WIRE) SHALL BE 4 AWG INSULATED, COPPER.
 - 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:

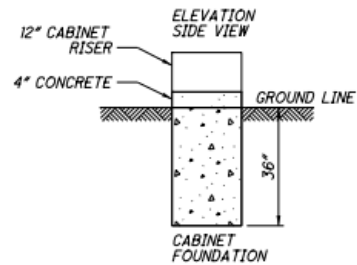
COND. NO.	COLOR	VEHICLE SIGNAL	PEDESTRIAN SIGNAL
1	BLACK	GREEN BALL	#1 WALK
2	WHITE	AC NEUTRAL	AC NEUTRAL
3	RED	RED BALL	#1 DW/FDW
4	GREEN	EQUIPMENT GROUND	EQUIPMENT GROUND
5	ORANGE	YELLOW BALL	#2 DW/FDW
6	BLUE	GREEN ARROW	#2 WALK
7	WHITE/BLACK STRIPE	YELLOW ARROW	NOT USED

- POWER SERVICE AND DISCONNECT SWITCH.
 - 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.
 - THE SERVICE NEUTRAL (AC-) SHALL ONLY BE CONNECTED TO GROUND AT THE PRIMARY POWER SERVICE DISCONNECT SWITCH.
 - 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.
 - 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.
- PAYMENT – ALL MATERIALS AND WORK REQUIRED TO COMPLETE THE EFFECTIVE GROUND FAULT CURRENT PATH SYSTEM ARE INCIDENTAL TO THE CONDUCTORS INSTALLED BY CONTRACT.

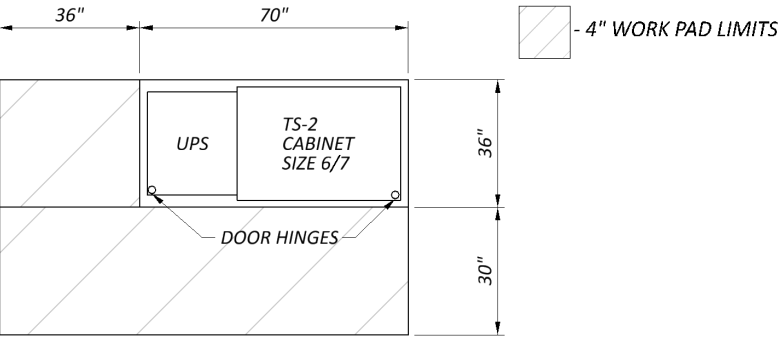
TS-2 SIZE 6/7 CABINET DETAIL (TYP.)

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

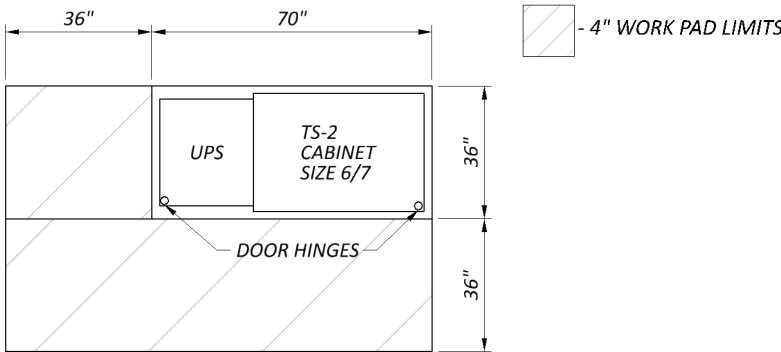
CABINET FOUNDATION DETAIL



ERI-250/113:



ERI-250/13 & HUR-61/601



ITEM 625 – SPECIAL. MAINTAIN EXISTING LIGHTING

EXISTING ROADWAYS WHICH ARE TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF THIS PROJECT AND WHICH ARE LIGHTED SHALL HAVE THE LIGHTING MAINTAINED AS DESCRIBED HEREIN.

BEFORE ANY WORK IS STARTED IN THE IMMEDIATE VICINITY OF THE EXISTING LIGHTING CIRCUITS, REPRESENTATIVES OF ODOT, THE MAINTAINING AGENCY AND THE CONTRACTOR SHALL MAKE A VISUAL INSPECTION OF THE EXISTING ROADWAY LIGHTING CIRCUITS TO BE MAINTAINED. DURING THIS INSPECTION, A WRITTEN RECORD OF THE CONDITION OF EXISTING LIGHTING SHALL BE MADE BY ODOT'S REPRESENTATIVE. THIS WRITTEN REPORT SHALL NOTE INDIVIDUAL LUMINAIRES WHICH ARE NOT IN WORKING ORDER, INDIVIDUAL POLES WHICH ARE NOT STANDING, AND INDIVIDUAL CIRCUITS WHICH ARE NOT IN WORKING ORDER. THE COMPLETED REPORT SHALL BE SIGNED BY THE REPRESENTATIVES OF ODOT, THE MAINTAINING AGENCY AND THE CONTRACTOR.

IF, AS A RESULT OF THIS INSPECTION, IT IS DETERMINED THAT THE CONDITION OF THE EXISTING SYSTEM IS BELOW THAT REQUIRED FOR THE SAFETY OF THE TRAVELING PUBLIC, THEN THE MAINTAINING AGENCY SHALL MAKE THE REPAIRS NECESSARY TO RETURN THE SYSTEM TO AN ACCEPTABLE CONDITION. FOLLOWING THESE REPAIRS, THE SYSTEM SHALL AGAIN BE INSPECTED AND A REPORT SHALL BE MADE AND SIGNED AS OUTLINED HEREIN.

WHEN THE EXISTING SYSTEM IS IN AN ACCEPTABLE CONDITION, IT SHALL BE TURNED OVER TO THE CONTRACTOR WHO SHALL THEN BE REQUIRED TO MAINTAIN THE EXISTING LIGHTING TO THE CONDITION OUTLINED IN THIS REPORT WITH THE EXCEPTION OF KNOCKDOWNS DUE TO TRAFFIC ACCIDENTS.

REPLACEMENT OF KNOCKED DOWNED UNITS SHALL BE DONE ONLY WHEN THE ENGINEER HAS DETERMINED THAT THE REPLACEMENT OF THE KNOCKED DOWN UNIT IS NECESSARY AND SHALL BE PAID SEPARATELY ON A UNIT BASIS.

BETTERMENTS SHALL BE COVERED IN ITEMS OF WORK PERTAINING TO THE CONSTRUCTION OF PERMANENT IMPROVEMENT.

WHEN THE SEQUENCE OF CONSTRUCTION ACTIVITIES REQUIRES, OR SHOULD THE CONTRACTOR DESIRE, THE REMOVAL OF THE EXISTING LIGHTING BEFORE THE NEW LIGHTING IS OPERATIONAL, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY LIGHTING OF THIS PORTION OF THE ROADWAY.

PRIOR TO INSTALLING SUCH LIGHTING, THE CONTRACTOR SHALL PREPARE AND SUBMIT FOUR SETS OF THE TEMPORARY LIGHTING PLAN TO THE ENGINEER FOR REVIEW AND APPROVAL.

THIS PLAN SHALL SHOW LOCATIONS OF POLES, LENGTHS OF BRACKET ARMS, STYLES OF LUMINAIRES, MOUNTING HEIGHTS, WIRING METHODS AND OTHER PERTINENT INFORMATION. THE TEMPORARY LIGHTING SHALL PROVIDE AN AVERAGE INITIAL INTENSITY OF 1.2 FOOTCANDLES WITH AN AVERAGE TO MINIMUM UNIFORMITY NOT TO EXCEED 3:1. MOUNTING HEIGHT OF TEMPORARY LUMINAIRES SHALL NOT BE LESS THAN 30 FEET, AND THE MINIMUM OVERHEAD CONDUCTOR CLEARANCE SHALL BE 20 FEET. TEMPORARY OVERHEAD CONSTRUCTION SHALL NOT BE LESS THAN GRADE "B" FOR STRENGTH REQUIREMENTS AS DEFINED BY THE NATIONAL ELECTRIC SAFETY CODE. WOOD POLES WITH OVERHEAD WIRING MAY BE USED. HOWEVER, TEMPORARY LIGHTING SHALL MEET FEDERAL AND STATE SAFETY CRITERIA. IF BREAKAWAY POLES ARE USED TO MEET THESE CRITERIA, THEN UNDERGROUND WIRING SHALL BE USED. RECONDITIONED OR USED MATERIALS MAY BE FURNISHED FOR TEMPORARY LIGHTING.

ALL MATERIALS NECESSARY TO COMPLETE THE TEMPORARY LIGHTING SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. WHEN NO LONGER NEEDED, THE TEMPORARY LIGHTING INSTALLATION SHALL BE REMOVED AND PROPERLY DISPOSED OF BY THE CONTRACTOR.

THE MAINTAINING AGENCY WILL PAY FOR ELECTRICAL ENERGY CONSUMED BY EXISTING POWER SERVICES AND BY PROPOSED PERMANENT POWER SERVICES AFTER ACCEPTANCE OF THE LIGHTING WORK. THE CONTRACTOR WILL PAY FOR ELECTRICAL ENERGY, INSTALLATION, REMOVAL AND MAINTENANCE OF ANY TEMPORARY POWER SERVICES.

THE LUMP SUM PRICE BID FOR ITEM SPECIAL "MAINTAIN EXISTING LIGHTING" SHALL INCLUDE PAYMENT FOR ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO MAINTAIN THE EXISTING LIGHTING AS SPECIFIED HEREIN.

ITEM 632 – TEST HOLE PERFORMED

IT IS ANTICIPATED THAT THE CONTRACTOR WILL ENCOUNTER UNDERGROUND UTILITIES WHILE EXCAVATING FOR SIGNAL SUPPORT FOUNDATIONS OR SIMILAR FOUNDATIONS. AFTER ACCURATELY IDENTIFYING THE PROPOSED LOCATION OF THE FOUNDATION, AS SHOWN IN THE PLANS AND AFTER MODIFYING THAT LOCATION, IF NECESSARY, BASED ON THE FIELD MARKING OF UNDERGROUND UTILITY LOCATION, THE CONTRACTOR DISCOVERS A UTILITY CONFLICT DURING THE EXCAVATION OPERATION, THE CONTRACTOR WILL BE COMPENSATED FOR EACH PARTIAL FOUNDATION EXCAVATION ACCORDING TO THE BID PRICE. BEFORE THE CONTRACTOR BEGINS THE EXCAVATION AT THE MODIFIED LOCATION, THE CONTRACTOR SHALL VERIFY THAT THERE WILL BE NO OVERHEAD UTILITY CONFLICTS RESULTING FROM THE NEW SIGNAL SUPPORT LOCATION. NEW SUPPORT LOCATIONS ARE TO BE APPROVED BY THE ENGINEER.

THE WORK WILL INCLUDE BACKFILLING, COMPACTING, AND RESTORATION OF THE EXCAVATION TO THE SITE'S ORIGINAL CONDITION.

EXCAVATIONS SHALL NOT BE LEFT OPEN OVERNIGHT.

PAYMENT FOR THIS ITEM SHALL BE AT THE UNIT PRICE BID PER EACH ITEM 632 TEST HOLE PERFORMED TO BE USED AT THE DIRECTION OF THE ENGINEER.