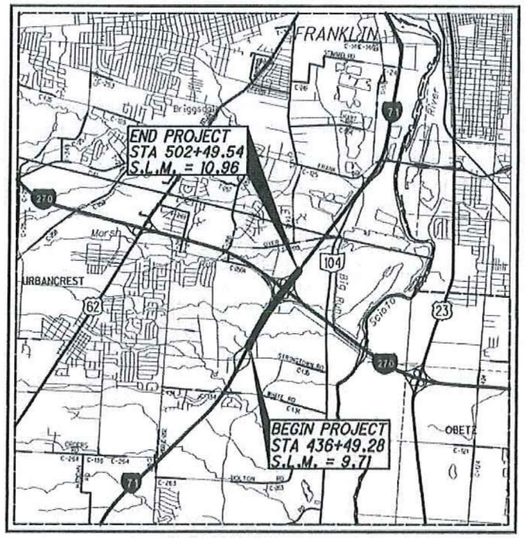


LOCATION MAP

LATITUDE: 39°53'06" LONGITUDE: 83°02'43"

SCALE IN MILES
0 1 2 3 4

N

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

DESIGN DESIGNATION

	IR-71
CURRENT ADT (2016)	109,090
DESIGN YEAR ADT (2036)	144,790
DESIGN HOURLY VOLUME (2036)	12,680
DIRECTIONAL DISTRIBUTION	0.58
TRUCKS (24 HOUR B&C)	0.22
Td	0.13
DESIGN SPEED	70 MPH
LEGAL SPEED	65 MPH
DESIGN FUNCTIONAL CLASSIFICATION:	
URBAN INTERSTATE	
NHS PROJECT	YES

DESIGN EXCEPTIONS

DESIGN FEATURES	APPROVED	SHEET NUMBERS
HORIZONTAL CURVE RADIUS	11/17/2016	80 -83
SSD	11/17/2016	80 -83

PLAN PREPARED BY:

TranSystems

1105 SCHROCK ROAD, SUITE 400, COLUMBUS, OH 43229

STATE OF OHIO

DEPARTMENT OF TRANSPORTATION

FRA-71-9.71
PART 2

CITY OF COLUMBUS
CITY OF GROVE CITY
JACKSON TOWNSHIP
FRANKLIN COUNTY

FOR PART 1, SEE FRA-71-9.62

INDEX OF SHEETS: SEE SHEET 2

ENGINEERS SEAL: FOR ROADWAY	ENGINEERS SEAL: FOR STRUCTURES	ENGINEERS SEAL: FOR SIGNAL & LIGHTING
STATE OF OHIO · WALID A. ANTONIOS · E-63799 · REGISTERED PROFESSIONAL ENGINEER	STATE OF OHIO · NABIL F. FARAH · E-54420 · REGISTERED PROFESSIONAL ENGINEER	STATE OF OHIO · HENRI JOSEPH FOUCHER · E-66947 · REGISTERED PROFESSIONAL ENGINEER
SIGNED: DATE: 01-13-2017	SIGNED: DATE: 01-13-2017	SIGNED: DATE: 01-13-2017

TRANSYSTEMS
FRA-270-0014 (IR-270 UNDER RAMP A)
RETAINING WALLS

ENGINEERS SEAL: FOR SIGNING	ENGINEERS SEAL: FOR STRUCTURES & NOISEWALLS
STATE OF OHIO · EMILIE M. WORLEY · E-71927 · REGISTERED PROFESSIONAL ENGINEER	STATE OF OHIO · TROY T. KYLE · E-69311 · REGISTERED PROFESSIONAL ENGINEER
SIGNED: DATE: 01-13-2017	SIGNED: DATE: 01-13-2017

BURGESS & NIPLE
FRA-71-0953 (IR-71 UNDER STRINGTOWN RD)
FRA-71-1050A (RAMPS D & B OVER RAMP A)
NOISEWALL 1, 2 & 3
SIGNING PLANS

ENGINEERS SEAL: FOR NOISEWALL
STATE OF OHIO · BRENT B. DOWNING · E-62886 · REGISTERED PROFESSIONAL ENGINEER
SIGNED: DATE: 01-17-2017

E.L. ROBINSON
NOISEWALL 7

ENGINEERS SEAL: FOR PAVEMENT MARKING
STATE OF OHIO · MICHAEL A. HOBBS · E-68713 · REGISTERED PROFESSIONAL ENGINEER
SIGNED: DATE: January 16, 2017

GPD
PAVEMENT MARKING PLANS

STANDARD CONSTRUCTION DRAWINGS					SUPPLEMENTAL SPECIFICATIONS	SPECIAL PROVISIONS
		SEE PART 1			SEE PART 1	SEE PART 1

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE FULL DEPTH REPLACEMENT AND RECONFIGURATION OF THE INTERCHANGES OF IR-270 AND STRINGTOWN RD WITH IR-71 SOUTHBOUND. A NEW RAMP MOVEMENT IS BEING ADDED TO REMOVE THE SOUTHBOUND WEAVE BETWEEN THE TWO INTERCHANGES. WORK INCLUDES ONE REPLACEMENT BRIDGE AND ONE NEW BRIDGE. DRAINAGE, LIGHTING, AND NOISEWALLS ARE ALSO INCLUDED.

PROJECT EARTH DISTURBED AREA: 44.02 ACRES
ESTIMATED CONTRACTOR EARTH DISTURBED AREA: 4.60 ACRES
NOTICE OF INTENT EARTH DISTURBED AREA: 48.62 ACRES

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE OHIO REVISED CODE.

2016 SPECIFICATIONS

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

MAINTENANCE OF TRAFFIC ENDORSEMENT

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

PLAN CERTIFIED AS TO COMPLETENESS AND QUALITY

Walid Antonios	2/24/2017
SIGNATURE	DATE
TRANSYSTEMS	PROJECT MANAGER
FIRM	TITLE

UNDERGROUND UTILITIES
CONTACT BOTH SERVICES
CALL TWO WORKING DAYS
BEFORE YOU DIG
CALL
1-800-362-2764
(TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY
OIL & GAS PRODUCERS UNDERGROUND PROTECTION SERVICE CALL: 1-800-925-0988

APPROVED Jack R. Marchbanks
DATE 2/24/17 DISTRICT DEPUTY DIRECTOR

APPROVED _____
DATE _____ DIRECTOR, DEPARTMENT OF TRANSPORTATION

E-3353

FEDERAL PROJECT NO.	PID NO.	CONSTRUCTION PROJECT NO.	RAILROAD INVOLVEMENT
E170(982)	104799		NONE

FRA-71-9.71
PART 2

1
504

..\303.02 - Sheets\Title Sheet 1/12/2017 4:17:29 PM tmelchert

MAINTENANCE OF TRAFFIC SIGNAL INSTALLATION

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC SIGNAL INSTALLATIONS WITHIN THE PROJECT UNDER THE FOLLOWING CIRCUMSTANCES:

1. EXISTING SIGNAL INSTALLATION 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 THE CONTRACTOR'S OPERATIONS FIRST DISTURB THE INSTALLATION UNTIL THE INSTALLATION HAS BEEN SUBSEQUENTLY REMOVED OR MODIFIED AND THE WORK IS ACCEPTED.
2. NEW SIGNAL INSTALLATION OR DEVICE, INSTALLED BY THE CONTRACTOR: THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THIS FROM THE TIME OF INSTALLATION UNTIL THE WORK IS ACCEPTED.

THE CONTRACTOR SHALL CORRECT AS QUICKLY AS POSSIBLE ALL OUTAGES OR MALFUNCTIONS AND PROVIDE THE MAINTAINING AGENCY AND THE ENGINEER SUCH WITH THE NAME(S) AND PHONE NUMBER(S) OF THE CONTRACTORS REPRESENTATIVE(S) TO RECEIVE ALL CALLS AND DISPATCH THE NECESSARY MAINTENANCE FORCES TO CORRECT OUTAGES. SUCH A PERSON OR PERSONS MUST GIVE PROMPT ATTENTION TO THESE CALLS AND BE 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 IN SERVICE WITHIN FOUR HOURS AFTER THE CONTRACTOR HAS BEEN NOTIFIED OF AN OUTAGE.

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

IF POLES AND/OR CONTROLLERS ARE DAMAGED AND MUST BE REPLACED, THE CONTRACTOR SHALL MAKE TEMPORARY REPAIRS AS NECESSARY TO BRING THE SIGNAL BACK INTO OPERATION WITHIN THE ALLOWED 8 HOUR TIME 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 LOCAITON. 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 THE COLLECTION OF ANY COMPENSATION FOR THIS WORK FROM THOSE PARTIES RESPONSIBLE FOR THE DAMAGE.

MAINTENANCE OF TRAFFIC SIGNAL INSTALLATION (CONT.)

WHERE THE CONTRACTOR HAS FAILED 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 COSTS FOR POLICE SERVICES AND MAINTENANCE SERVICES BY THE PROVIDING AGENCY FORCES SHALL BE DEDUCTED FROM MONIES DUE OR TO BECOME DUE THE CONTRACTOR IN ACCORDANCE WITH PROVISIONS OF SECTION 105.15.

ANY VEHICULAR TRAFFIC SIGNAL HEAD EITHER NEW OR EXISTING THAT 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 AND REPLACED;
4. A DIAGNOSIS OR 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.

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.

NEW TRAFFIC SIGNAL INSTALLATION

THIS WORK CONSISTS OF FURNISHING AND INSTALLING TRAFFIC SIGNAL EQUIPMENT, COMPLETE AND READY FOR SERVICE. THIS WORK ALSO INCLUDES NECESSARY EXCAVATION AND BACKFILL, DISPOSAL OF DISCARDED MATERIALS, RESTORATION OF DISTURBED FACILITIES AND SURFACES TO A CONDITION EQUAL TO THAT EXISTING BEFORE THE WORK STARTED, AND ELECTRICAL TESTING AS SPECIFIED.

PULL BOXES, CONDUITS, GROUND RODS, AND CABLE SPLICING KITS REQUIRED FOR TRAFFIC SIGNAL EQUIPMENT INSTALLATIONS ARE SPECIFIED IN ITEM 625.

BEFORE ANY WORK IS STARTED ON THE TRAFFIC SIGNAL, THE DISTRICT 6 TRAFFIC ENGINEER (740-833-8198) AND THE CONTRACTORS REPRESENTATIVE SHALL REVIEW AND RESOLVE ANY POTENTIAL PROBLEMS AT THE LOCATION WHERE THE NEW SIGNAL WILL BE CONSTRUCTED.

ALL OF THE REQUIRED PERMANENT SIGNS SHALL BE ERECTED AND THE REQUIRED PERMANENT PAVEMENT MARKINGS SHALL BE IN PLACE PRIOR TO THE FINAL ACCEPTANCE OF THE TRAFFIC SIGNAL.

PRIOR TO THE FINAL ACCEPTANCE OF THE COMPLETED TRAFFIC SIGNAL, THE DISTRICT 6 ROADWAY SERVICES REPRESENTATIVE AND THE CONTRACTORS REPRESENTATIVE, SHALL INSPECT AND RESOLVE ANY EXISTING PROBLEMS PRIOR TO THE ACCEPTANCE OF EACH NEW SIGNAL BY THE OHIO DEPARTMENT OF TRANSPORTATION.

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 625 - BRACKET ARM, 20', AS PER PLAN

BRACKET ARMS SHALL BE FURNISHED AS PER 625 EXCEPT THAT THE BRACKET ARMS SHALL BE PAINTED TO MATCH THE SIGNAL SUPPORTS. BRACKET ARMS SHALL BE MONOTUBE, TAPERED ELLIPTICAL ARMS. THE RISE OF THE BRACKET ARM SHALL NOT EXCEED 30°, MEASURED FROM THE VERTICAL CENTER OF THE ARM AT THE ATTACHMENT END TO THE VERTICAL CENTER OF THE ARM AT THE OPPOSITE END.

PAYMENT SHALL BE AS PER ITEM 625.

ITEM 625 - LUMINAIRE, CONVENTIONAL, SOLID STATE (LED), AS PER PLAN (120 VOLT)

THE CONTRACTOR SHALL FURNISH AND INSTALL COOPER NVN-AE-04-E-U-T3R, GE ERS2025GIX40EGRAYXXX, LEOTEK EC7-24M-MV-NW-3-GY-700-RPB-WL, OR APPROVED EQUAL. LUMINAIRES SHALL OPERATE ON 120 VOLT/60 HERTZ CIRCUITS.

LUMINAIRES SHALL BE AS PER ITEM 625 EXCEPT THAT THE LUMINAIRES AT EACH INTERSECTION SHALL RUN OFF A SINGLE PHOTOELECTRIC CELL. THE LUMINAIRE AND ALL MOUNTING HARDWARE SHALL BE PAINTED TO MATCH THE SIGNAL SUPPORT.

MEASUREMENT AND PAYMENT SHALL BE PER ITEM 625.

ITEM 630 - SIGN, FLAT SHEET, AS PER PLAN
ITEM 630 - SIGN HANGER ASSEMBLY, MAST ARM MOUNTED, AS PER PLAN
ITEM 630 - SIGN SUPPORT ASSEMBLY, POLE MOUNTED, AS PER PLAN

THE REQUIREMENTS OF THE SPECIFICATION INCLUDING PAINTING, APPLY TO ALL PERMANENT SIGNS WHETHER THEY ARE GROUND MOUNTED ON POSTS OR POLE SUPPORTS, OR OVERHEAD MOUNTED ON MAST ARMS. THIS SPECIFICATION SHALL NOT APPLY TO TEMPORARY SIGNS.

ALL VISIBLE ELEMENTS OF SIGN MOUNTING SYSTEMS, E.G. SIGN BACKING ASSEMBLIES, SUPPORT POSTS, STAINLESS STEEL BANDING, BACK OF ALL SIGNS STC., SHALL BE PAINTED SIMILAR TO FEDERAL SPECIFICATION 595-B COLOR #27040, BLACK WHENEVER PAYMENT FOR THOSE ITEMS IS MADE UNDER THIS ITEM OF WORK. NUTS AND BOLTS NEED NOT BE PAINTED.

ALL PAINTING SHALL BE PERFORMED UNDER CONTROLLED ENVIRONMENTAL CONDITIONS, AND IN ACCORDANCE WITH ALL MANUFACTURER'S RECOMMENDATIONS PERTAINING TO SURFACE PREPARATION, MATERIAL HANDLING, AND APPLICATION. PRIOR TO PAINTING, PAINT SAMPLE SHALL BE SUBMITTED FOR REVIEW.

ALL REGULATORY AND TRAFFIC CONTROL SIGNS SHALL COMPLY WITH OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, STATE REQUIREMENTS AND LOCAL REQUIREMENTS.

PAYMENT SHALL BE AS PER ITEM 630.

ITEM 632 - POWER SERVICE, AS PER PLAN

THE CONTRACTOR SHALL CONTACT THE METER SECTION OF AMERICAN ELECTRIC POWER (AEP) FOR INFORMATION REGARDING THE METER BASE INSTALLATION PRIOR TO ORDERING POLES. THE CONTRACTOR WILL BE RESPONSIBLE FOR REQUESTING AND SCHEDULING ANY INSPECTIONS THE POWER COMPANY MAY REQUIRE FOR THE POWER SERVICE HOOK UP. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT THE POWER COMPANY FOR THE ELECTRICAL SERVICE CONNECTION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR SPLICE POWER CABLE INTO THE POWER COMPANY'S CIRCUITS.

THE VOLTAGE SUPPLIED SHALL BE NOMINALLY 120 VOLTS. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS AND THE PAYING OF ALL FEES WITH THE EXCEPTION OF NORMAL MONTHLY ENERGY CHARGES. WHERE THERE IS AN EXISTING TRAFFIC SIGNAL THAT IS BEING REPLACED, THE CONTRACTOR SHALL COORDINATE WITH THE POWER COMPANY TO CONTINUE BILLING ON THE EXISTING DISTRICT 6 ACCOUNT. WHERE A NEW SIGNAL IS BEING INSTALLED, THE CONTRACTOR SHALL ESTABLISH THE ACCOUNT IN THE DISTRICT'S NAME FROM THE ONSET.

THE POWER SERVICE ADDRESS FOR THE PROPOSED TRAFFIC SIGNAL SHALL REMAIN THE SAME AS THE EXISTING ACCOUNT.

CALCULATED SSS CHECKED WAA

TRAFFIC SIGNAL GENERAL NOTES

FRA-71-9.71 PART 2

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 MEET WITH THE PROJECT ENGINEER TO LOCATE THE PROPOSED SUPPORT LOCATIONS TO INSURE THERE ARE NO CONFLICTS WITH UTILITIES. IF THERE ARE ISSUES, THE PROJECT ENGINEER SHALL PROVIDE GUIDANCE AS TO THE RELOCATION OF THE SUPPORT POLES.

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

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

TRAFFIC SIGNAL INSTALLATIONS, INCLUDING SIGNAL HEADS, CABLE, 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 DISPOSED OF OR DELIVERED TO ODOT D-6 TRAFFIC, IN ACCORDANCE WITH THE LISTING GIVEN HEREIN.

> SEE ITEMIZED LIST IN TRAFFIC SIGNAL REMOVAL PLAN

ITEM 632 - VEHICULAR SIGNAL HEAD, (LED), BLACK, (BY TYPE), 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF CMS 632 AND 732, THE FOLLOWING 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. ALL UPPER SIGNAL SUPPORT HARDWARE AND PIPING UP TO AND INCLUDING THE WIRE INLET FITTING SHALL BE FERROUS METAL.
4. THE ENTRANCE FITTING SHALL BE OF THE TRI-STUD DESIGN WITH SERRATED RINGS IN ORDER TO ACHIEVE POSITIVE LOCKING.
5. ALL SIGNAL HEADS SHALL BE RIGIDLY MOUNTED TO THE MAST ARM WITH THE YELLOW LENS LOCATED IN FRONT OF THE MAST ARM.
6. ALUMINUM BACKPLATES SHALL BE IN ACCORDANCE WITH THE C&MS AND INCLUDE A FLUORESCENT YELLOW REFLECTIVE BORDER.
7. THE LIGHT EMITTING DIODE (LED) SIGNAL LAMP UNITS SHALL MEET THE REQUIREMENTS OF CMS 732.04-C. THE CONTRACTOR SHALL PROVIDE ODOT, IN WRITING, WITH THE LED MANUFACTURER NAME, 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.
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.

ITEM 632 - VEHICULAR SIGNAL HEAD, (LED), BLACK, (BY TYPE), 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN (CONT.)

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. BEFORE CLOSING SERRATIONS, APPLY A BEAD OF ROOM-TEMPERATURE VULCANIZING (RTV) SILICONE TO ALL SERRATED SURFACES AND THEN TIGHTEN. RTV SILICONE SHALL BE WHITE TO FACILITATE VISUAL INSPECTION. ON HEADS WITH DUAL CONCENTRIC SERRATED RINGS, COMPLETELY FILL THE SPACE BETWEEN THE RINGS WITH RTV SILICONE.
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), 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN SHALL BE MADE FOR COMPLETE SIGNAL HEAD FURNISHED AND INSTALLED, INCLUDING ALL LABOR, EQUIPMENT, MATERIALS, AND NEW ATTACHMENT HARDWARE.

ITEM 632 - PEDESTRIAN SIGNAL HEAD (LED), (COUNTDOWN), TYPE D2, AS PER PLAN

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

1. SIGNAL HEADS AND VISORS SHALL BE CONSTRUCTED OF BLACK POLYCARBONATE PLASTIC AND MEET ITE SPECIFICATIONS.
2. PROPER EXTERIOR COLORS SHALL BE OBTAINED BY USE OF COLORED PLASTIC MATERIAL RATHER THAN PAINTING.
3. PIPE, SPACERS AND FITTINGS CONSTRUCTED OF POLYCARBONATE PLASTIC MAY BE USED IN LIEU OF GALVANIZED STEEL OR ALUMINUM.
4. THE PEDESTRIAN SIGNAL HEAD SHALL BE OF THE LED COUNTDOWN TYPE.
5. NEW ATTACHMENT HARDWARE AND FITTINGS SHALL USED.
6. THE LIGHT EMITTING DIODE (LED) SIGNAL LAMP UNITS SHALL MEET THE REQUIREMENTS OF C&MS 732.04-C. THE CONTRACTOR SHALL PROVIDE ODOT, IN WRITING, WITH THE LED MANUFACTURER NAME, 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. PEDESTRIAN SIGNAL HEAD SHALL BE MOUNTED TO PEDESTAL POLES USING A 2-PIECE HINGED BRACKET.

PAYMENT FOR ITEM 632 PEDESTRIAN SIGNAL HEAD (LED), (COUNTDOWN), TYPE D2, AS PER PLAN SHALL BE MADE FOR THE NUMBER OF COMPLETE SIGNAL HEAD FURNISHED AND INSTALLED, INCLUDING ALL LABOR, EQUIPMENT, MATERIALS AND NEW ATTACHMENT HARDWARE.

ITEM 632 - (COMBINATION) SIGNAL SUPPORT, TYPE TC-81.21, (BY SIZE), AS PER PLAN

TRAFFIC SIGNAL SUPPORTS SHALL BE AS PER ITEM 632 EXCEPT THAT THE SUPPORT POLES AND ARMS SHALL HAVE A CIRCULAR CROSS SECTION AND SHALL BE TAPERED TUBES HAVING A TRUE AND CONTINUOUS TAPER. MULTI-SIDED OR FLUTED POLES AND POLES HAVING A TAPERED EFFECT ACCOMPLISHED WITH THE USE OF REDUCERS WILL NOT BE ACCEPTED. ARM LENGTH SHALL BE AS SPECIFIED BUT ARMS FORTY FEET IN LENGTH OR LESS SHALL BE OF ONE PIECE CONSTRUCTION. ARMS MORE THAN FORTY FEET LONG MAY BE CONSTRUCTED IN NO MORE THAN TWO PIECES.

BOLT COVERS SHALL BE PROVIDED. ANCHOR BOLTS SHALL BE ORIENTED AS REQUIRED BY THE PLANS HOWEVER THE FORMED TOP OF THE SUPPORT FOUNDATION SHALL BE ORIENTED SQUARE TO THE ADJACENT SIDEWALK WHERE APPLICABLE.

ALL SIGNAL CABLES SHALL BE RUN INSIDE THE POLES. STANDARD DRAWING TC-83.10 IS HEREBY MODIFIED TO PROHIBIT THE USE OF EXTERNAL CONDUIT RISERS FOR SIGNAL CABLING, OR ANY OTHER USE.

THE CONTRACTOR SHALL PROVIDE ALL NECESSARY ATTACHMENTS OR CONNECTIONS TO THE POLES. ADDITIONAL WIRING HOLES IN THEP POLE SHALLE BE DRILLED, REAMED, OR HOLE SAWED. FLAME CUTTING (OXYACETYLENE OR ELECTRICAL ARC) WILL NOT BE ACCEPTED. ALL CUT EDGES OR OTHER DEFECTS IN THE ZINC COATING SHALL BE CLEANED AND COVERED WITH TWO COATS OF ZINC RICH REPAIR PAINT MATCHING THE FACTORY FINISH. BRACKETS AND APPURTENCES SHALL BE SECURELY ATTACHED WITH STAINLESS STEEL SCREWS OF SUFFICIENT SIZE FOR THE INTENDED LOADING. STAINLESS STEEL BANDING SHALL NOT BE USED UNLESS SPECIFICALLY AUTHORIZED BY THESE PLANS AND SPECIFICATIONS OR DIRECTED BY THE ENGINEER. ALL BANDING, WHERE USED, SHALL BE FACTORY PAINTED TO MATCH THE SIGNAL SUPPORTS.

DESIGN CRITERIA

IN ADDITION TO THE REQUIREMENTS OF ITEM 632, SIGNAL SUPPORT STRUCTURES SHALL BE DESIGNED AND CONSTRUCTED BY THE SUPPLIER TO SUPPORT THE LOADS CAUSED BY THE SIGNS, SIGNALS, AND OTHER EQUIPMENT THAT THE PLAN REQUIRES THE CONTRACTOR TO INSTALL. THE USE OF STANDARD ODOT DESIGN DESIGNATIONS SUCH AS THOSE DESCRIBED ON STANDARD DRAWING TC-81.21, AND ANY DETAILS PROVIDED IN THIS PLAN, ARE INTENDED TO PROMOTE UNIFORMITY OF DESIGN AND ORE NOT WARRANTED TO BE STRUCTURALLY ADEQUATE. TO THE MAXIMUM EXTENT PRACTICABLE, THE CONTRACTOR AND SUPPLIER SHALL PROVIDE A STRUCTURALLY ADEQUATE SUPPORT THAT UTILIZES STANDARD ODOT ANCHOR BOLT SIZING AND SPACING.

THE MAST ARM SUPPORT POLE ASSEMBLY, AND THE MAST ARM ASSEMBLY SHALL BE MADE BY THE SAME MANUFACTURER AND DESIGNED AND SOLD AS A UNIT.

ALL PRE-DRILLED HOLES FOR ALL ITEMS SHALL BE DEBURRED AND FREE OF ALL SHARP EDGES . ALL OUTSIDE WELDS SHALL BE ROLLED OR GROUND SMOOTH. ALL INSIDE WELDS SHALL BE VOID OF SHARP EDGES. ANY STRUCTURAL FASTENER (3/4" OR GREATER) SHALL BE GALVANIZED PER ASTM 153 AND SHALL BE MADE OF HIGH STRENGTH CARBON STEEL. ANY OTHER FASTENER (LESS THAN 3/4") SHALL BE STAINLESS STEEL. ALL VISIBLE FASTENERS SHALL MATCH THE COATING OF THE STRUCTURE.

ITEM 632 - (COMBINATION) SIGNAL SUPPORT, TYPE TC-81.21, (BY SIZE), AS PER PLAN (CONT.)

FINISH

POLES AND ARMS, INCLUDING BASE AND FLANGE PLATES, BOLT COVERS, HANDHOLES, AND WIRE ENTRANCES, SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH 711.02. ALL VISIBLE ELEMENTS OF THE SIGNAL SUPPORT, AND ANY OTHER PORTS REQUIRED TO BE COATED, SHALL BE GALVANIZED AND THEN POWDER-COATED . ALL POINTING SHALL BE PERFORMED UNDER CONTROLLED ENVIRONMENTAL CONDITIONS, AND IN ACCORDANCE WITH THE PAINT MANUFACTURER'S RECOMMENDATIONS PERTAINING TO SURFACE PREPARATION, MATERIAL HANDLING, AND APPLICATION. THE TOP FINISH COAT OF POINT SHALL BE SIMILAR TO FEDERAL SPECIFICATION 595-B COLOR #27040, BLACK. PAINT SAMPLES SHALL BE SUBMITTED WITH THE SIGNAL SUPPORT SHOP DRAWINGS FOR REVIEW.

THE INSIDE OF EACH SIGNAL SUPPORT POLE ASSEMBLY, EACH MAST ARM ASSEMBLY, AND OTHER SIGNAL SUPPORT ACCESSORIES SHALL BE COATED WITH GALVANIZING MATERIAL. THE INSIDE AREA FORMED BY THE GUSSETS, POLE, AND POLE FLANGE PLATE SHALL BE COATED TO PROTECT THE AREA FROM CORROSION. IT IS TO BE NOTED THAT SOME TYPE OF OPENING SHALL BE REQUIRED TO COAT THE GUSSET AREA. THIS OPENING SHALL NOT HAMPER THE STRUCTURAL INTEGRITY OF THE FLANGE ASSEMBLY.

ALL EXTERIOR SURFACES OF THE SIGNAL SUPPORT POLE SHAFT ASSEMBLY, MAST ARM ASSEMBLY, ALL BOLT COVERS, ALL CLAMPS, CLEVIS-TO-CLEVIS UNIVERSAL, WIRE ENTRANCE, ALL HONDHOLE COVERS, LUMINAIRE AND VIDEO BRACKETS, POLE AND ARM CAPS, SIGNAL HEAD HANGERS AND WEATHERHEADS SHALL HAVE A COATING PROPERLY APPLIED TO THEM. EXTERIOR SURFACES OF ALL FASTENER BOLTS/SCREWS, WASHERS, NUTS, AND OTHER ATTACHMENT HARDWARE SHALL HAVE A COATING APPLIED TO THEM. FASTENER THREADS SHALL NOT BE CLOGGED WITH COATING MATERIAL.

ALL COATED ITEMS SHALL BE SHIPPED IN A MANNER TO MINIMIZE DAMAGE IN TRANSIT. SURFACES SHOULD BE PROTECTED BY FOAM PADDING, BY WRAPPING IN CARDBOARD, BY SPIRAL WRAPPING WITH WAX PAPER, BY CRATING, BY A COMBINATION OF METHODS, OR BY ANY OT HER METHOD SELECTED BY THE MANUFACTURER WHICH WILL INSURE DELIVERY OF UNDAMAGED MATERIALS. MATERIALS DAMAGED IN TRANSIT CAUSED BY IMPROPER PACKAGING OR IMPROPER TRANSIT HANDLING SHALL BE REJECTED . THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING MATCHING PAINT COATING MATERIAL FOR TOUCH-UP WORK IDENTICAL TO THE ORIGINAL COATING PLACED ON THE STRUCTURE.

EACH COATING LAYER SHALL BE PROPERLY CURED BEFORE THE APPLICATION OF THE NEXT COAT. THE APPLICATION PROCEDURE SHALL BE SUCH TO GUARANTEE A FINISH THAT WILL NOT SCALE, FLAKE OR PEEL, AND WILL RETAIN ITS COLOR BRIGHTNESS AND FRESH, ATTRACTIVE APPEARANCE FOR 10 YEARS WITHOUT DULLING OR FADING.

PAYMENT

THIS ITEM OF WORK SHALL BE MEASURED AS EACH COMPLETE SIGNAL SUPPORT, IN PLACE IN ESSENTIALLY A VERTICAL POSITION UNDER FULL PLAN LOADING. ALL LABOR, EQUIPMENT, AND MATERIALS NECESSARY TO PICKUP, TRANSPORT, STORE, ERECT, ADJUST, AND REPAIR THE SIGNAL SUPPORT AND ANCHOR BOLTS SHALL BE INCLUDED FOR PAYMENT IN THE BID ITEM.

PAYMENT SHALL BE AS PER ITEM 632.

CALCULATED SSS CHECKED WAA

TRAFFIC SIGNAL GENERAL NOTES

FRA-71-9.71 PART 2

ITEM 632 - PEDESTAL, MISC.: 6', TRANSFORMER BASE
ITEM 632 - PEDESTAL, MISC.: 17', TRANSFORMER BASE

PEDESTALS SHALL BE AS PER THE DETAILS IN THIS PLAN. ALL EXTERIOR SURFACES SHALL BE COATED IN ACCORDANCE WITH THE FINISH SECTION REQUIREMENTS OF ITEM 632 (COMBINATION) SIGNAL SUPPORT, TYPE TC-81-21 (BY SIZE), AS PER PLAN.

PAYMENT SHALL BE AS PER ITEM 632.

ITEM 632 - PEDESTRIAN PUSHBUTTON, AS PER PLAN

IN ADDITION TO THE REQU IREMENTS OF 632.09 AND 732.06, THE PUSHBUTTONS SHALL INCLUDE A CONFIRMATION TONE WHEN PRESSED.

THE EXTERIOR PUSHBUTTON HOUSING SHALL BE BLACK TO MATCH THE SIGNAL SUPPORTS.

A CLEAR BEAD OF SILICONE SEALANT SHALL BE APPLIED TO THE TOP OF THE PUSHBUTTON HOUSING (1 INCH EACH SIDE OF TOP CENTER) AGAINST THE POLE TO PREVENT WATER FROM ENTERING THE BACK OF THE PUSHBUTTON HOUSING. ONE ALUMINUM SIGN SHALL BE SUPPLIED WITH EACH PUSHBUTTON. THE BOTTOM OF THE SIGN SHALL BE MOUNTED JUST ABOVE THE TOP OF THE PUSHBUTTON. MOUNT THE CENTER OF THE PUSHBUTTON 42" ABOVE THE PEDESTRIAN PATHWAY SURFACE.

THE BACK OF ALL SIGNS, MOUNTING HARDWARE, AND SUPPORT ASSEMBLIES MOUNTED ON EITHER THE SIGNAL SUPPORTS OR PEDESTAL SUPPORTS SHALL BE COATED TO MATCH THE RESPECTIVE SUPPORT. FINISH REQUIREMENTS SHALL BE IN ACCORDANCE WITH THAT LISTED FOR THE SUPPORT, PEDESTAL, OR LIGHT POLE USED FOR ATTACHMENT.

PAYMENT SHALL BE AS PER ITEM 632.

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

THE ELECTRICAL TRAFFIC CONTROL EQUIPMENT PROVIDED SHALL MEET THE FOLLOWING SPECIFICATIONS AND BE MANUFACTURED BY EAGLE TRAFFIC CONTROL SYSTEMS. THE EQUIPMENT PROVIDED AS PART OF THIS CONTRACT SHALL BE THE LATEST MODEL, CURRENTLY UNDER PRODUCTION AND NEW. THE CONTROLLER CABINET AND ACCESSORIES SHALL MEET THE NEMA TS-2, 1992 STANDARD FOR ACTUATED CONTROLLER UNITS. THE CATALOG NUMBER FOR THE GROUND MOUNTED P CABINET SHALL BE EL 720 SIZE 7 (SIZE R). THE CABINET SHALL BE ALUMINUM WITH THE NATURAL ALUMINUM FINISH INSIDE AND OUTSIDE. THE LOAD BAY SHALL BE THE TF5016 OR NEWER, WITH 16 LOAD SWITCH POSITIONS. PROVIDE ONLY THE EXACT NUMBER OF LOAD SWITCHES REQUIRED. EACH LOAD SWITCH SHALL HAVE LIGHT EMITTING DIODES (LEDS) FOR THE CONTROLLER OUTPUT AND LOAD SWITCH OUTPUT. ALSO PROVIDE 8 FLASH RELAY POSITIONS (BUT ONLY SUPPLY THE EXACT NUMBER OF RELAYS NEEDED FOR EACH SPECIFIC INTERSECTION), 1 NEMA 2-CIRCUIT FLASHER, AND AN MMU MONITOR. 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. WHERE LOOP DETECTORS ARE SPECIFIED, THE CABINET SHALL INCLUDE THE EXACT NUMBER OF FOUR CHANNEL DETECTOR CARDS WITH SOFTWARE REQUIRED FOR EACH INTERSECTION. THE CABINET SHALL BE EQUIPPED WITH A CABINET POWER SUPPLY (CPS). THE POLICE PANEL ON THE OUTSIDE OF THE CABINET DOOR SHALL HAVE A FLASH SWITCH, A SWITCH FOR AUTOMATIC/MANUAL OPERATION, SIGNAL ON/OFF SWITCH AND A MANUAL PUSHBUTTON WITH A MINIMUM CORD LENGTH OF 10 FEET.

ITEM 633 - CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS2, AS PER PLAN (CONT.)

THE TECHNICIAN PANEL ON THE INSIDE OF THE CABINET DOOR SHALL INCLUDE A FLASH SWITCH, A STOP TIME SWITCH, AND AN EQUIPMENT ON/OFF SWITCH. A CABINET DOOR OPEN SWITCH AND A CABINET LIGHT ON / OFF SWITCH SHALL ALSO BE SUPPLIED.

THE CONTROLLER CABINET SHALL ALSO INCLUDE:

A. SLIDE-OUT LAPTOP SHELF
B. INTERIOR, UNDERSHELF LED CABINET LIGHTING, INCLUDING A MINIMUM OF 2 PANELS OF 6 HIGH-INTENSITY LED'S EACH AND A DOOR-ACTIVATED SWITCH. THE LED PANELS SHALL BE MOUNTED IN LOCATIONS TO MAXIMIZE LIGHT ON THE CABINET EQUIPMENT.
C. A GOOSENECK/ADJUSTABLE LIGHT FIXTURE WITH AN LED LAMP. THE ADJUSTABLE LIGHT FIXTURE SHALL BE MOUNTED ON THE LOWER RIGHT SIDE OF THE CONTROLLER CABINET.
D. A MINIMUM OF TWO (2) GFCI PROTECTED RECEPTACLES
E. A MINIMUM OF SIX (6) SURGE PROTECTED (NON-GFCI)RECEPTACLES

CONTROLLER CABINET LABELING TO IDENTIFY THE WIRING AND FUNCTION DETECTOR LEAD-IN CABLE:
PHASE NUMBER SERVICE, DIRECTION, MOVEMENT TYPE, AND LOOP PLAN NUMBER.

SIGNAL HEAD FIELD WIRING:
PHASE NUMBER, DIRECTION, MOVEMENT TYPE, AND COLOR (RED, YELLOW, GREEN, YELLOW ARROW, GREEN ARROW) OR PEDESTRIAN MOVEMENT.

THE CONTROLLER TIMER SHALL BE THE SIEMENS M52 (OR MOST CURRENT MODEL) NEMA TS-2 TYPE 2 AND COME EQUIPPED WITH ALL INTERNAL COMPONENTS TO MAKE IT FULLY SYSTEM READY FOR THE TACTICS SYSTEM, INCLUDING THE INTERNAL MODEM. EACH CONTROLLER TIMER SHALL HAVE 6 MODES OF COORDINATION, ADAPTIVE TRAFFIC CONTROL, REPORTS, PREEMPTION / PRIORITY, DIAGNOSTICS AND INTERNAL TIME BASE CONTROL. THE CONTROLLER SHALL INCLUDE A "PORT 3 MODULE" AND AN ETHERNET PORT.

FOR FUTURE EXPANSION AND SYSTEM COMPATIBILITY, THE CONTROLLER UNIT SHALL BE PROGRAMMED TO ALLOW FOR MASTER (SEMARC), LOCAL (SEPAC), OR DUAL-BOOT (SEMARC/SEPAC) OPERATION. IT SHALL ALSO BE PROVIDED WITH ALL PROGRAMMING AND EQUIPMENT NEEDED TO COMMUNICATE WITH THE EXISTING COORDINATED SYSTEM ON STRINGTOWN ROAD.

EACH CONDUIT ENTRANCE TO THE CABINET SHALL BE SEALED WITH A RUBBER PIPE/CONDUIT SEAL GASKET. THE SEAL SHALL BE OF A MATERIAL AND TYPE TIGHTLY FITTING AND ABLE TO SEAL OUT WATER, INSECTS, RODENTS, AND DIRT. THE SEAL SHALL BE EASILY REMOVED FOR SERVICE INSTALLATIONS OR COBLE REPLACEMENTS. ALL STREET LIGHTS INSTALLED ON THE COMBINATION SIGNAL SUPPORTS SHALL BE WIRED TO A 120 VOLT CIRCUIT CONTROL LED AT THE SIGNAL CONTROLLER CABINET AT EACH INTERSECTION. THIS ITEM SHALL ALSO INCLUDE THE FOLLOWING:
1) INSTALL IN THE CONTROLLER CABINET A THIRD CIRCUIT BREAKER (30 AMP), AND A 2-POLE LIGHTING CONTACTOR ON THE CABINET SIDE PANEL (ELECTRICALLY HELD, OPEN STYLE);
2) PHOTOCELL AND 3 POSITION: ON-OFF-AUTO SWITCH ROTED AS PER ODOT SPECIFICATIONS. PHOTOCELL SHALL BE INSTALLED ON THE SIGNAL SUPPORT PROXIMATE TO THE SIGNAL CONTROLLER AND INCLUDE ALL WIRING TO THE CONTROLLER; AND
3) ALL WIRING FOR LIGHTING TO BE CONTROLLED BY A SINGLE DISCONNECT SWITCH FOR THE SIGNAL. (TWO 30 AMP FUSES-ONE FOR LIGHTING, ONE FOR SIGNAL.)

ITEM 633 - CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS2, AS PER PLAN (CONT.)

THE CONTRACTOR SHALL PROVIDE THE CABINET WIRING DIAGRAM/PLANS IN PDF FORMAT TO ODOT DISTRICT 6 TRAFFIC.

THE GROUND MOUNTED CONTROL CABINET SHALL BE FURNISHED WITH A POWDER COATED FINISH TO MATCH THE SIGNAL SUPPORTS.

PROVIDE ON ARC FLASH HAZARD WARNING SIGN ON THE OUTSIDE FRONT DOOR OF THE ENCLOSURE IN ACCORDANCE WITH THE 2014 NATIONAL ELECTRICAL CODE PARAGRAPH 110.16.

PAYMENT FOR ITEM 633 - CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS2, AS PER PLAN, WILL BE AT THE CONTRACT BID PRICE COMPLETE AND IN PLACE AND CONNECTIONS TESTED AND ACCEPTED.

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

IN ADDITION TO THE REQUIREMENTS OF CMS 633 AND 733, A CABINET RISER (8 INCH MINIMUM) AND ANCHOR BOLTS SHALL BE PROVIDED WITH THE BASE MOUNTED CABINET. 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, A DOOR THAT SECURELY CLOSES OVER THE POWER CORD, AND AN LED LIGHT THAT INDICATES LINE POWER IS AVAILABLE.

THE UPS OUTPUT NOTIFICATIONS FOR ON BATTERY, BATTERY 2 HOUR TIMER, AND LOW BATTERY SHALL BE WIRED INTO THE TRAFFIC SIGNAL CABINET BACK PANEL TO PROVIDE SPECIAL STATUS ALARMS FOR EACH OUTPUT INTO THE SIGNAL CONTROLLER. SPECIAL STATUS ALARMS SHALL BE PROGRAMMED INTO THE 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 IR66, 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 FEET MINIMUM. THE ENCLOSURE AND LED LAMP UNIT SHALL BE PLACED ON THE STREET-SIDE OF THE CABINET OR CENTERED ON THE TOP SURFACE OF THE UPS CABINET 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 ALSO 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.

A BATTERY BALANCER SHALL BE FURNISHED AND INSTALLED WITH THE SYSTEM.

ITEM 633 - UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN (CONT.)

THIS ITEM SHALL INCLUDE THE INSTALLATION OF THE ALPHA POWER AGENT REMOTE BATTERY MANAGEMENT SYSTEM FURNISHED WITH ALL EQUIPMENT AND SOFTWARE TO BRING THE SYSTEM TO FULL OPERATING CAPABILITIES. THE SOFTWARE PROVIDED SHALL BE THE "NO SOFTWARE" OPTION USING THE SITE CONTROLLER'S INTERNAL WEB INTERFACE AND THE "LOOKOUT" SOFTWARE.

THE CABINET SHALL BE FURNISHED AND INSTALLED WITH THE ALPHA BATTERY SLIDER SHELVES.

THE CABINET'S EXTERIOR FINISH SHALL MATCH THE COLOR OF THE MAIN TRAFFIC SIGNAL CONTROLLER CABINET. THIS ITEM OF WORK SHALL ALSO INCLUDE FURNISHING AND INSTALLING A FOUNDATION AND WORK PAD OF APPROPRIATE SIZE TO ACCOMMODATE THE UPS CABINET.

PAYMENT SHALL BE PER ITEM 633 AND INCLUDE ALL CONNECTIONS, WIRING, AND MISCELLANEOUS MATERIALS NEEDED FOR FULL OPERATION OF THE UPS SYSTEM.

ITEM 632 - INTERCONNECT, MISC.: REROUTING INTERCONNECT CABLE

THE CONTRACTOR SHALL DISCONNECT EXISTING INTERCONNECT CABLE FROM THE LOCAL CONTROLLER CABINET AND PULL BACK TO THE LOCATIONS INDICATED ON THE PLAN. CONTRACTOR SHALL STRIP AWAY INTEGRAL MESSENGER WIRE, IF PRESENT, PRIOR TO REINSTALLATION. CABLE SHALL BE HANDLED SO AS TO CAUSE NO DAMAGE TO THE OUTER JACKET. THE EXISTING CABLE SHALL BE INSPECTED BY THE PROJECT ENGINEER PRIOR TO REINSTALLATION.

THE EXISTING CABLE SHALL THEN BE REROUTED TO THE NEW CONTROLLER CABINET LOCATION VIA NEW CONDUIT AND PULL BOX INSTALLATIONS AS INDICATED IN THE PLANS. ALL ENTRIES INTO PULL BOXES, CONDUIT SYSTEMS, FOUNDATIONS OR OTHER ENCLOSURES SHALL BE FREE OF SHARP EDGES AND BE COVERED WITH INSULATED BUSHINGS. NO SPLICES WILL BE ALLOWED.

PAYMENT WILL BE AT THE CONTRACT UNIT PRICE PER LUMP SUM OF C&MS ITEM 632, "INTERCONNECT CABLE, MISC.: REROUTING INTERCONNECT CABLE" IN PLACE, COMPLETE, ALL CONNECTIONS MADE, TESTED AND ACCEPTED.

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.

CALCULATED SSS CHECKED WAA

TRAFFIC SIGNAL GENERAL NOTES

FRA-71-9.71 PART 2

GROUNDING AND BONDING (CONT.)

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 ¾ 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.

GROUNDING AND BONDING (CONT.)

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.

PAINT CHIP SUBMITTAL

PRIOR TO ANY PAINTING, THE CONTRACTOR SHALL SUBMIT PAINT SAMPLES TO BOTH THE ENGINEER AND GROVE CITY OFFICIALS. PAINT SAMPLES SHALL BE REPRESENTATIVE OF THE COLOR, TYPE AND MANUFACTURER THAT WILL BE USED FOR FINISHING THE VARIOUS ITEMS. THE ENGINEER AND GROVE CITY OFFICIALS SHALL REVIEW THE PAINT SAMPLES PRIOR TO COMMENCEMENT OF THE FINISHING PROCESS.

PAINT SAMPLES SHALL BE SUBMITTED FOR ALL PROPOSED TRAFFIC SIGNAL ITEMS CALLED FOR IN THIS PLAN SET, INCLUDING, SIGNAL SUPPORTS, SIGNAL HEADS, PEDESTRIAN HEADS, PUSHBUTTONS, SIGNS, BRACKET ARMS, LUMINAIRES AND CONTROLLER CABINETS. ANY COST ASSOCIATED WITH PROVIDING PAINT SAMPLES SHALL BE INCIDENTAL TO THE INDIVIDUAL ITEMS TO BE PAINTED.

ITEM 809 - ADVANCE RADAR DETECTION

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 (MIN. 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 A UP TO FOUR (4) SENSOR CABLES.ADDITIONAL SENSORS MAY BE HARD-WIRED TO THE COMMUNICATION MODULES, AS NECESSARY.
- PRIOR TO PROGRAMMING, THE CONTRACTOR SHALL CONTACT THE ODOT DISTRICT 6 DISTRICT TRAFFIC ENGINEER AT 740-833-8198. A DISTRICT 6 TRAFFIC DEPARTMENT REPRESENTATIVE SHALL BE PRESENT DURING THE PROGRAMMING OF THE SYSTEM.

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

ITEM 809 - STOP-BAR RADAR DETECTION

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 (MIN. 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 A UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD-WIRED TO THE COMMUNICATION MODULES, AS NECESSARY.
- PRIOR TO PROGRAMMING, THE CONTRACTOR SHALL CONTACT THE ODOT DISTRICT 6 DISTRICT TRAFFIC ENGINEER AT 740-833-8198. A DISTRICT 6 TRAFFIC DEPARTMENT REPRESENTATIVE SHALL BE PRESENT DURING THE PROGRAMMING OF THE SYSTEM.

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

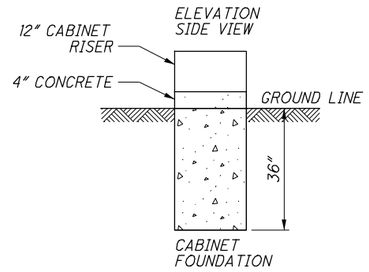
CALCULATED SSS CHECKED WAA

TRAFFIC SIGNAL GENERAL NOTES

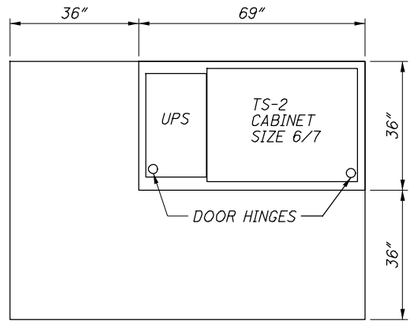
FRA-71-9.71 PART 2

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

CABINET FOUNDATION DETAIL



CABINET & WORK PAD DETAIL



PLAN VIEW

SEPARATE BID ITEMS:

633 CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET TYPE TS2, AS PER PLAN
633 CABINET FOUNDATION, AS PER PLAN
633 CONTROLLER WORK PAD, AS PER PLAN
633 UNINTERRUPTIBLE POWER SUPPLY (UPS), AS PER PLAN

NOTES:

1) THE SIZE OF THE FOUNDATION MAY VARY BASED ON THE CABINET SIZE PROVIDED.

2) UPS FOUNDATION ELEVATION SHALL 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.

5) ASSOCIATED STATION GIVEN IN PLAN SHEETS IS IN REFERENCE TO THE CENTER OF THE TRAFFIC SIGNAL CONTROLLER LOCATION.

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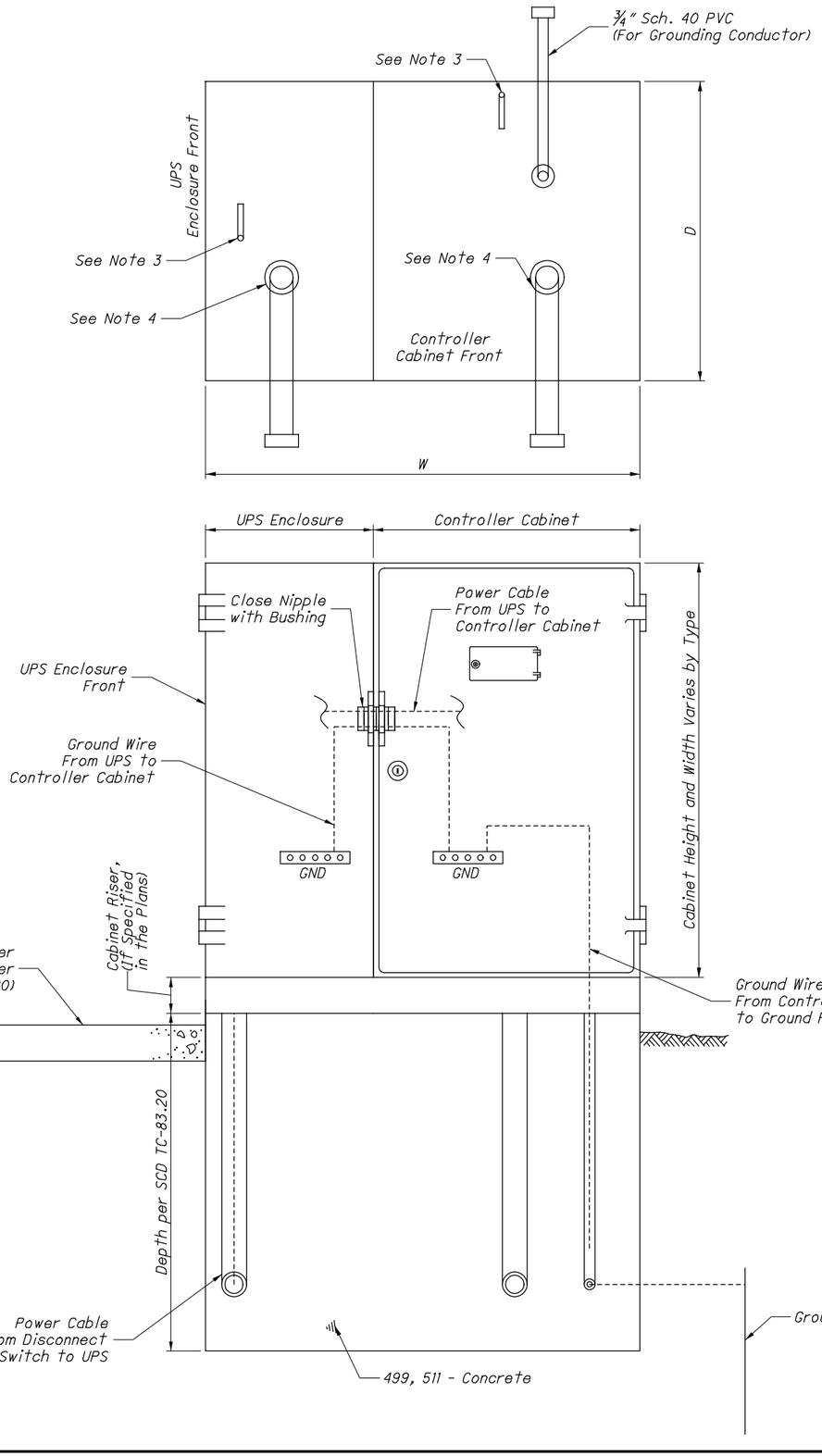


NOTES:

1. The Uninterruptible Power Supply (UPS) enclosure shall be mounted flush up against the traffic signal cabinet and sealed with silicone. The Contractor shall be responsible for providing the necessary power cable between the UPS unit and signal cabinet.

2. The UPS should be placed on the opposite side of the pull box on a 332/336 cabinet (per Standard Construction Drawing (SCD) TC-83.20). The UPS placement for a NEMA cabinet varies, placement should provide adequate access with respect to slope, guardrail spacing, etc.

3. The size, number, and location of anchor bolts shall be in accordance with the manufacturer's recommendations.

4. The size, number, and orientation of conduit ells shall be as shown in the plan, except that a ¾" schedule 40 PVC shall be installed in each foundation.

5. 1/2" preformed joint filler as per CMS 705.03 shall be used between foundations and adjacent paved areas.

6. See SCD TC-83.20 for further details.

TYPE	W (IN.)	D (IN.)	FOUNDATION CONCRETE (CU. YD.)
TS-1	60	24	1.23
TS-2	70	36	2.16
2070/170	50	36	1.54

THIS DRAWING REPLACES PIS 208320 DATED 04-20-2012.

OFFICE OF ROADWAY ENGINEERING

DESIGNED XXX REVIEWED XXX

REVISION DATE 07-18-2014 CHECKED CHECKED

PIS NUMBER 208320

PLAN INSERT SHEET

UNINTERRUPTIBLE POWER SUPPLY (UPS) AND CONTROLLER CABINET FOUNDATION

FRA-71-9.71 PART 2

1 / 1

330 504

MATERIAL SPECIFICATIONS FOR BBS GENERATOR POWER PANEL EQUIPMENT

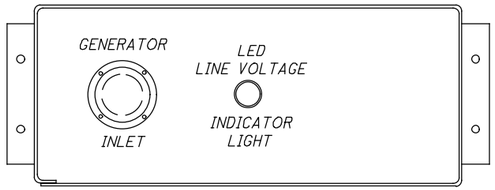
GENERATOR INLET - The inlet shall be 30 amp, 125/250V, locking, four (4) wire grounding and meet the NEMA configuration number L14-30-P 30A 125/250V specification. The inlet shall be a Hubbell catalog #2715.

LINE VOLTAGE GENERATOR SWITCH - The switch shall be 30 amp, 125/250V AC, two (2) pole, three (3) position (On, Off, On). The switch shall be a Hubbell catalog #1388.

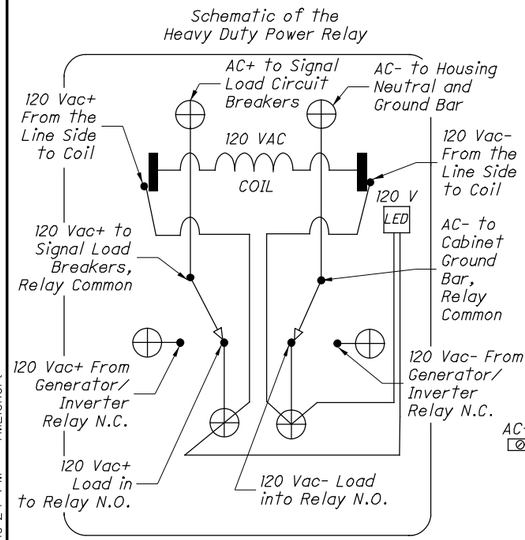
LINE VOLTAGE INDICATOR LIGHT - The indicator light shall be 125V AC light emitting diode with a red lens.

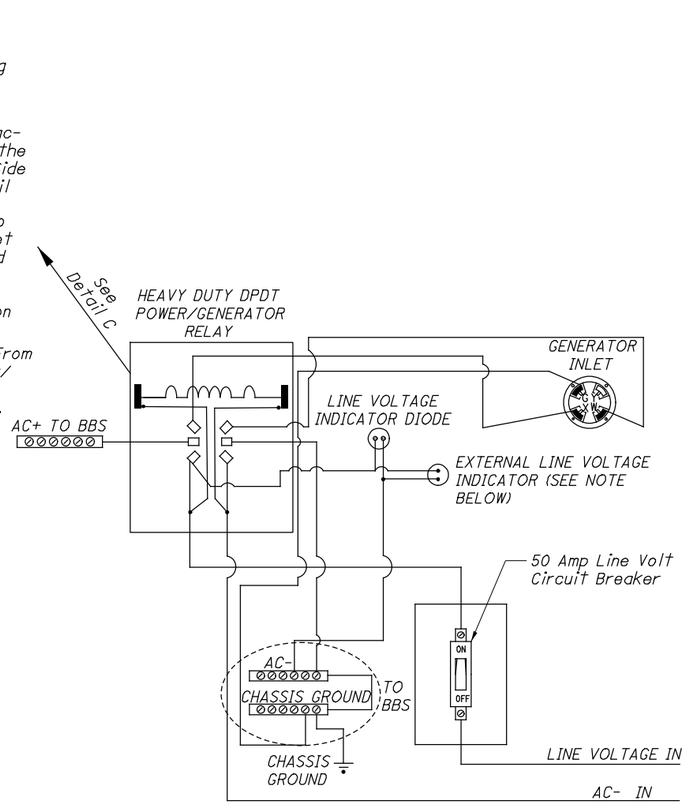
LINE VOLTAGE CIRCUIT BREAKER - The circuit breaker shall be single pole single throw and a minimum of 30 amps. The amperage shall be increased to accomodate greater loads, if necessary. The gauge of the power cable shall be of proper size per N.E.C.

EXTERNAL LINE VOLTAGE INDICATOR LIGHT - The indicator light shall be a 1" waterproof NEMA 4X or IP66 LED lamp with a green lens.



FRONT VIEW OF GENERATOR POWER PANEL



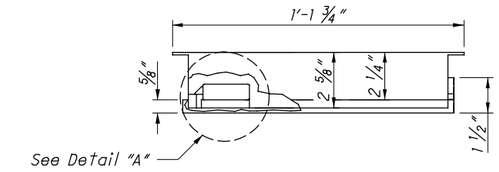


DETAIL "C"
SCHEMATIC OF THE H.D.
DPDT GEN / POWER RELAY

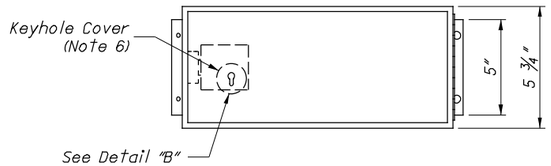
ELECTRICAL HOOKUP DETAIL FOR THE BBS GENERATOR POWER PANEL

NOTE: EXTERNAL LINE VOLTAGE INDICATOR LIGHT required when called for in the plans.
EXTERNAL LINE VOLTAGE INDICATOR LIGHT shall be located on the enclosure exterior for visibility from the adjacent roadway when all cabinet, and generator panel doors are closed.

GENERATOR POWER PANEL ENCLOSURE



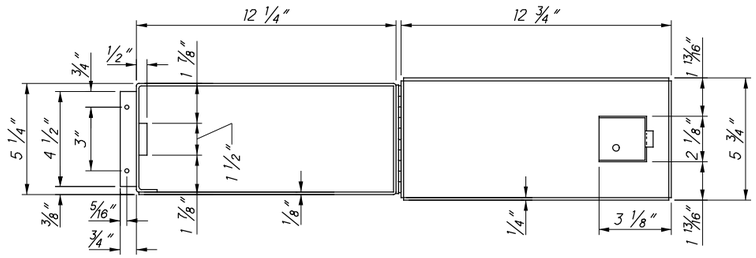
TOP VIEW



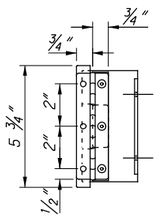
FRONT VIEW CLOSED DOOR

NOTES:

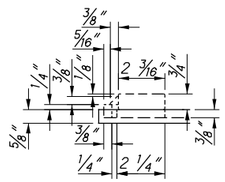
1. The enclosure shall be constructed of 1/8" thick alumimum.
2. The lock shall be the standard police door type, keyed with the standard flasher door skeleton key.
3. The door shall be sealed with a foam rubber gasket to prevent moisture from entering the enclosure.
4. The enclosure shall be mounted onto the outside of the controller cabinet with non-accessible bolts and sealed with a high quality silicon caulk at all surfaces touching the cabinet.
5. The hinge shall be of stainless steel or equivalent corrosive-resistant material.
6. Keyhole shall be covered with a movable circular aluminum or brass cover with top pivot pin.



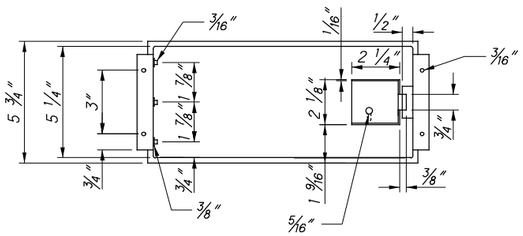
FRONT VIEW OPEN DOOR



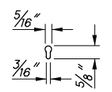
RIGHT SIDE VIEW
CLOSED DOOR



DETAIL "A"



BACK VIEW CLOSED DOOR



DETAIL "B"

THIS DRAWING REPLACES PIS 203012 DATED 04-20-2012.

PLAN INSERT SHEET

BATTERY BACKUP SYSTEM (BBS)
GENERATOR POWER PANEL

FRA-71-9.71
PART 2

1 / 1

331
504

OFFICE OF ROADWAY ENGINEERING

DESIGNED XXX | REVIEWED XXX

REVISION DATE 07-18-2014 | CHECKED CHECKED

PIS NUMBER 203012

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SHEET NUM.											PART.			ITEM	ITEM EXT	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
								333	334										
								4						625	00450	4	EACH	CONNECTION, FUSED PULL APART	
								4						625	00460	4	EACH	CONNECTION, UNFUSED PULL APART	
								2						625	18401	2	EACH	BRACKET ARM, 20', AS PER PLAN	325
								315						625	23304	315	FT	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE	
								220						625	23400	220	FT	NO. 10 AWG POLE AND BRACKET CABLE	
								178						625	25400	178	FT	CONDUIT, 2", 725.04	
								154						625	25500	154	FT	CONDUIT, 3", 725.04	
								906						625	25900	906	FT	CONDUIT, JACKED OR DRILLED, 3", 725.04	
								2						625	26253	2	EACH	LUMINAIRE, CONVENTIONAL, SOLID STATE (LED), AS PER PLAN (120 VOLT)	325
								151						625	29000	151	FT	TRENCH	
								4						625	30700	4	EACH	PULL BOX, 725.08, 18"	
								1						625	30706	1	EACH	PULL BOX, 725.08, 24"	
								7						625	32000	7	EACH	GROUND ROD	
								151						625	36000	151	FT	PLASTIC CAUTION TAPE	
								1						630	79101	1	EACH	SIGN HANGER ASSEMBLY, MAST ARM, AS PER PLAN	325
								6						630	79501	6	EACH	SIGN SUPPORT ASSEMBLY, POLE MOUNTED, AS PER PLAN	325
								63.75						630	80101	63.75	SF	SIGN, FLAT SHEET, AS PER PLAN	325
								9						632	05007	9	EACH	VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN (BLACK)	326
								1						632	05087	1	EACH	VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN (BLACK)	326
								2						632	20731	2	EACH	PEDESTRIAN SIGNAL HEAD (LED), TYPE D2, COUNTDOWN, AS PER PLAN	326
								10						632	25000	10	EACH	COVERING OF VEHICULAR SIGNAL HEAD	
								2						632	25010	2	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD	
								2						632	26001	2	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN	327
								1						632	28200	1	EACH	DISCONNECT SWITCH WITH ENCLOSURE	
								1,460						632	40700	1,460	FT	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	
								LS						632	62830	LS		INTERCONNECT, MISC.: REROUTING INTERCONNECT CABLE	327
								3						632	64010	3	EACH	SIGNAL SUPPORT FOUNDATION	
								3						632	64020	3	EACH	PEDESTAL FOUNDATION	
								500						632	65200	500	FT	LOOP DETECTOR LEAD-IN CABLE	
								50						632	68300	50	FT	POWER CABLE, 3 CONDUCTOR, NO. 6 AWG	
								228						632	69500	228	FT	SERVICE CABLE, 2 CONDUCTOR, NO. 6 AWG	
								1						632	70001	1	EACH	POWER SERVICE, AS PER PLAN	325
								1						632	70400	1	EACH	CONDUIT RISER, 2" DIAMETER	
									1					632	80503	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 11, AS PER PLAN	326
									1					632	81071	1	EACH	COMBINATION SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 11, AS PER PLAN	326
									1					632	81091	1	EACH	COMBINATION SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 13, AS PER PLAN	326
									2					632	90010	2	EACH	PEDESTAL, MISC.: 6', TRANSFORMER BASE	327
									1					632	90010	1	EACH	PEDESTAL, MISC.: 17', TRANSFORMER BASE	327
									1					632	90101	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN	326
									1					633	01551	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS2, AS PER PLAN	327
									1					633	67101	1	EACH	CABINET FOUNDATION, AS PER PLAN	329
									1					633	67201	1	EACH	CONTROLLER WORK PAD, AS PER PLAN	329
									1					633	75001	1	EACH	UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN	327
									2					809	69000	2	EACH	ADVANCE RADAR DETECTION	328
									2					809	69100	2	EACH	STOP-BAR RADAR DETECTION	328

TOTALS CARRIED TO GENERAL SUMMARY

CALCULATED SSS CHECKED HJF

TRAFFIC SIGNAL SUBSUMMARY

FRA-71-9.71
PART 2

SHEET NO.	REF FROM	REF TO	SIDE	625 CONNECTION, FUSED PULL APART EACH	625 CONNECTION, UNFUSED PULL APART EACH	625 BRACKET ARM, 20', AS PER PLAN EACH	625 NO. 8 AWG 600 VOLT DISTRIBUTION CABLE FT	625 NO. 10 AWG POLE AND BRACKET CABLE FT		625 CONDUIT, 2", 725.04 FT	625 CONDUIT, 3", 725.04 FT	625 CONDUIT, 3", 725.04, JACKED OR DRILLED FT	625 LUMINAIRE, CONVENTIONAL, SOLID STATE (LED), AS PER PLAN (120 VOLT) EACH	625 TRENCH FT		625 PULL BOX, 725.08, 18" EACH	625 PULL BOX, 725.08, 24" EACH	625 GROUND ROD EACH	625 PLASTIC CAUTION TAPE FT	630 SIGN HANGER ASSEMBLY, MAST ARM, AS PER PLAN EACH	630 SIGN SUPPORT ASSEMBLY, POLE MOUNTED, AS PER PLAN EACH	630 SIGN, FLAT SHEET, AS PER PLAN SF	632 VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN (BLACK) EACH	632 VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN (BLACK) EACH	632 PEDESTRIAN SIGNAL HEAD (LED), TYPE D2, COUNTDOWN, AS PER PLAN EACH	632 COVERING OF VEHICULAR SIGNAL HEAD, AS PER PLAN EACH	632 COVERING OF PEDESTRIAN SIGNAL HEAD EACH	632 PEDESTRIAN PUSHBUTTON, AS PER PLAN EACH	632 DISCONNECT SWITCH WITH ENCLOSURE EACH	632 SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG FT	632 INTERCONNECT, MISC.: REROUTING INTERCONNECT CABLE LS	632 SIGNAL SUPPORT FOUNDATION EACH	632 PEDESTAL FOUNDATION EACH	632 LOOP DETECTOR LEAD-IN CABLE FT	632 POWER CABLE, 3 CONDUCTOR, NO. 6 AWG FT	632 SERVICE CABLE, 2 CONDUCTOR, NO. 6 AWG FT	632 POWER SERVICE, AS PER PLAN EACH	632 CONDUIT RISER, 2" DIAMETER EACH
336	CONT'LR	SB-1A	LT							8	24			8			1	1	8											1								1
336	SP-1		LT	2	2	1		110					1					1			1	12.50	2	1		3			1								
336	SP-1	SB-1A	LT							9	27			9					9																		
336	SB-1A	SB-5A	LT							39	78			39		1			39																		
336	SB-1A	SB-2A	LT									333																									
336	SP-2		RT															1		1	2	15.00	4		1	4	1			1						
336	PS-2	SB-2A	RT							36				18				1	18			8.75					1				1	200				
336	SB-2A	SP-2	RT								10			5					5																		
336	SB-2A	SB-4A	RT									276				1																					
336	SB-4A	SP-4	RT								15			5		1			5																		
336	SP-4		RT	2	2	1		110					1					1			2	6.25	2		1	2	1			1						
336	PS-4	SB-4A	RT							28				14				1	14			8.75					1				1	300				
336	SB-4A	EX PB	RT							48				48					48																		
336	PS-3		LT															1			1	12.50	1			1						1				
336	PS-3	SB-3A	LT							10				5		1			5																		
336	SB-3A	SB-5A	LT									297																									
336	CONT'LR	4D, 6A-6B, A	LT & RT																												244						
336	CONT'LR	4A-4C	LT & RT																												418						
336	CONT'LR	2A-2C, B	LT & RT																												608						
336	CONT'LR	6C	LT & RT																												190						
336	CONT'LR	POWER SRV.	LT																																50	228	1	
336	CONT'LR	SP-1	LT				50																														
336	CONT'LR	SP-4	LT & RT				265																														
	CONT'LR	pw																																			
TOTALS TO SIGNAL SUBSUMMARY				4	4	2	315	220		178	154	906	2	151		4	1	7	151	1	6	63.75	9	1	2	10	2	2	1	1460		3	3	500	50	228	1	1

CALCULATED SSS CHECKED HJF

SIGNAL ESTIMATED QUANTITIES

TRAFFIC SIGNAL

FRA-71-9.71
PART 2

333
504

...\Stage 3 92615_CQ001 Signal Est Quantities 6/15/2017 1:51:54 PM ssoprasseuth

SHEET NO.	REF		SIDE	632 SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 11, AS PER PLAN	632 COMBINATION SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 12, AS PER PLAN	632 COMBINATION SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 13, AS PER PLAN	632 PEDESTAL, MISC.: 6', TRANSFORMER BASE	632 PEDESTAL, MISC.: 17', TRANSFORMER BASE	632 REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN	633 CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS2, AS PER PLAN	633 CABINET FOUNDATION, AS PER PLAN	633 CONTROLLER WORK PAD, AS PER PLAN	633 UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN		809 ADVANCE RADAR DETECTION	809 STOP-BAR RADAR DETECTION
	FROM	**TO**		EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH		EACH	EACH
336	CONT'LR	SB-1A	LT							1	1	1	1			
336	SP-1		LT			1									1	1
336	SP-1	SB-1A	LT													
336	SB-1A	SB-5A	LT													
336	SB-1A	SB-2A	LT													
336	SP-2		RT	1												
336	PS-2	SB-2A	RT				1									
336	SB-2A	SP-2	RT													
336	SB-2A	SB-4A	RT													
336	SB-4A	SP-4	RT													
336	SP-4		RT		1										1	1
336	PS-4	SB-4A	RT				1									
336	SB-4A	EX PB	RT													
336	PS-3		LT					1								
336	PS-3	SB-3A	LT													
336	SB-3A	SB-5A	LT													
336	CONT'LR	4D, 6A-6B, A	LT & RT													
336	CONT'LR	4A-4C	LT & RT													
336	CONT'LR	2A-2C, B	LT & RT													
336	CONT'LR	6C	LT & RT													
336	CONT'LR	POWER SRV.	LT						1							
336	CONT'LR	SP-1	LT													
336	CONT'LR	SP-4	LT & RT													
TOTALS TO SIGNAL SUBSUMMARY				1	1	1	2	1	1	1	1	1	1		2	2

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CALCULATED SSS
CHECKED HJF

TRAFFIC SIGNAL ESTIMATED QUANTITIES

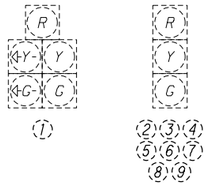
FRA-71-9.71
PART 2

ITEM 632 - REMOVAL OF TRAFFIC SIGNAL INSTALLATION

DESCRIPTION OF ITEM TO BE REMOVED BY CONTRACTOR	REMOVE AND	
	* DELIVER	DISPOSE
(8) - VEH. SIGNAL HEAD, 3-SEC, 12" LENS, 1-WAY		X
(1) - VEH. SIGNAL HEAD, 5-SEC, 12" LENS, 1-WAY		X
(3) - STRAIN POLES		X
(4) - FOUNDATIONS		X
(4) - PULL BOXES		X
(1) - GROUND MTD CONTROLLER w/ UPS	X	
(2) - PEDESTRIAN SIGNAL HEADS	X	
(5) - SIGNS (POLE MTD)		X
(1) - SIGN (SPAN WIRE MTD)		X
MESSENGER WIRE		X
SIGNAL CABLE AND WIRE		X

* TO BE DELIVERED TO D6 TRAFFIC

EX. VEHICULAR TRAFFIC SIGNAL HEAD CONFIGURATION



MARLANE DR

EX. UTILITY POLE X=1845096, Y=684665) (DND)

EX. AERIAL INTERCONNECT (DND)

EX. STRAIN POLE SUPPORT W/ SUPPLEMENTAL SIGNAL HEAD W/ "NO PED" SIGN (REMOVE)

EX. PULL BOX (REMOVE)

EX. GRD. MTD. SIGNAL CONTROLLER W/ UPS (REMOVE)

EX 12" GC0032 002

6" CSMP (COLUMBIA GAS)

EX. LIGHT POLE (DND)

EX. LOOP DETECTORS (REMOVE)

IR-71 SB EXIT RAMP

PC STA. 101+44.22

℄ CONST IR-71 SB RAMP B

EX. PULL BOX (REMOVE)

EX. POWER SOURCE

N 15° 57' 27" E

EX. STRAIN POLE W/ SUPPLEMENTAL SIGNAL HEAD W/ "NO PED" SIGN W/ "STOP HERE TO ACTUATE SIGNAL" SIGN (REMOVE)

℄ STRINGTOWN RD STA 19+16.46 = ℄ RAMP B STA 100+00.00

EX. OVERHEAD SIGN SUPPORT (DND)

℄ CONST STRINGTOWN RD.

STRINGTOWN RD.

EX. LOOP DETECTORS (ABANDON)

EX. CONDUIT W/ EX SIGNAL WIRES (APPROXIMATE LOCATION) (REMOVE LLI & ABANDON CONDUIT)

EX. AERIAL INTERCONNECT (REROUTE UNDERGROUND IN NEW CONDUIT)

EX. PULL BOX (REMOVE)

DAYS INN MOTEL

EX. PULL BOX (REMOVE)

EX. STRAIN POLE SUPPORT W/ SUPPLEMENTAL SIGNAL HEAD W/ PEDESTRIAN SIGNAL HEAD W/ "NO PED" SIGN (REMOVE)

EX. SIGN (SPAN WIRE MTD) (REMOVE)

EX. LOOP DETECTOR (ABANDON)

EX. INTERCONNECT IN CONDUIT
PULL BACK EX. 6-PAIR, NO. 19 AWG INTERCONNECT CABLE AND REROUTE UNDERGROUND IN NEW CONDUIT

EX. PULL BOX (DND)
PULL BACK EX. 6-PAIR, NO. 19 AWG INTERCONNECT CABLE AND REROUTE UNDERGROUND IN NEW CONDUIT

EX. INTERCONNECT IN CONDUIT (DND)

EX. OVERHEAD SIGN SUPPORT (DND)

EX. OVERHEAD SIGN SUPPORT (REMAIN)
OVERHEAD SIGNAL SPAN ATTACHMENT (REMOVE)
PEDESTRIAN SIGNAL HEAD (REMOVE)
W/ "NO PED" SIGN (REMOVE)

EX. AERIAL INTERCONNECT (REROUTE UNDERGROUND IN NEW CONDUIT)

IR-71 SB ENTRANCE RAMP

ONLY

THRU

MATCH LINE STA. 21+75, STRINGTOWN RD. SEE BELOW

MATCH LINE STA. 21+75, STRINGTOWN RD. SEE SHEET ABOVE

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"		
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"		
SIGNAL SUPPORT POLE		
PEDESTRIAN SIGNAL		
PEDESTRIAN PUSH BUTTON		
PEDESTAL SUPPORT		

	PROP	EXIST
LUMINAIRE, CONVENTIONAL		
CONTROLLER CABINET AND WORK PAD (TS-2)		
TRAFFIC PULL BOX		
DILEMMA ZONE RADAR DETECTION UNIT (RADZ)		
STOP BAR RADAR DETECTION UNIT (RSBD)		
DETECTOR LOOP		
DETECTION ZONE		

SIGNAL PLAN NOTES:

1. REMOVE EXISTING SPAN WIRE SIGNAL INSTALLATION AS SHOWN ON PLANS.
2. THE EXISTING TRAFFIC SIGNAL SHALL NOT BE REMOVED UNTIL THE PROPOSED SIGNAL IS IN PLACE AND OPERATIONAL.
3. EXISTING TRAFFIC SIGNAL AND INTERCONNECT INFORMATION SHOWN WAS OBTAINED FROM THE FRA-71-9.53 PROJECT PLANS.

HORIZONTAL SCALE IN FEET 0 10 20 40

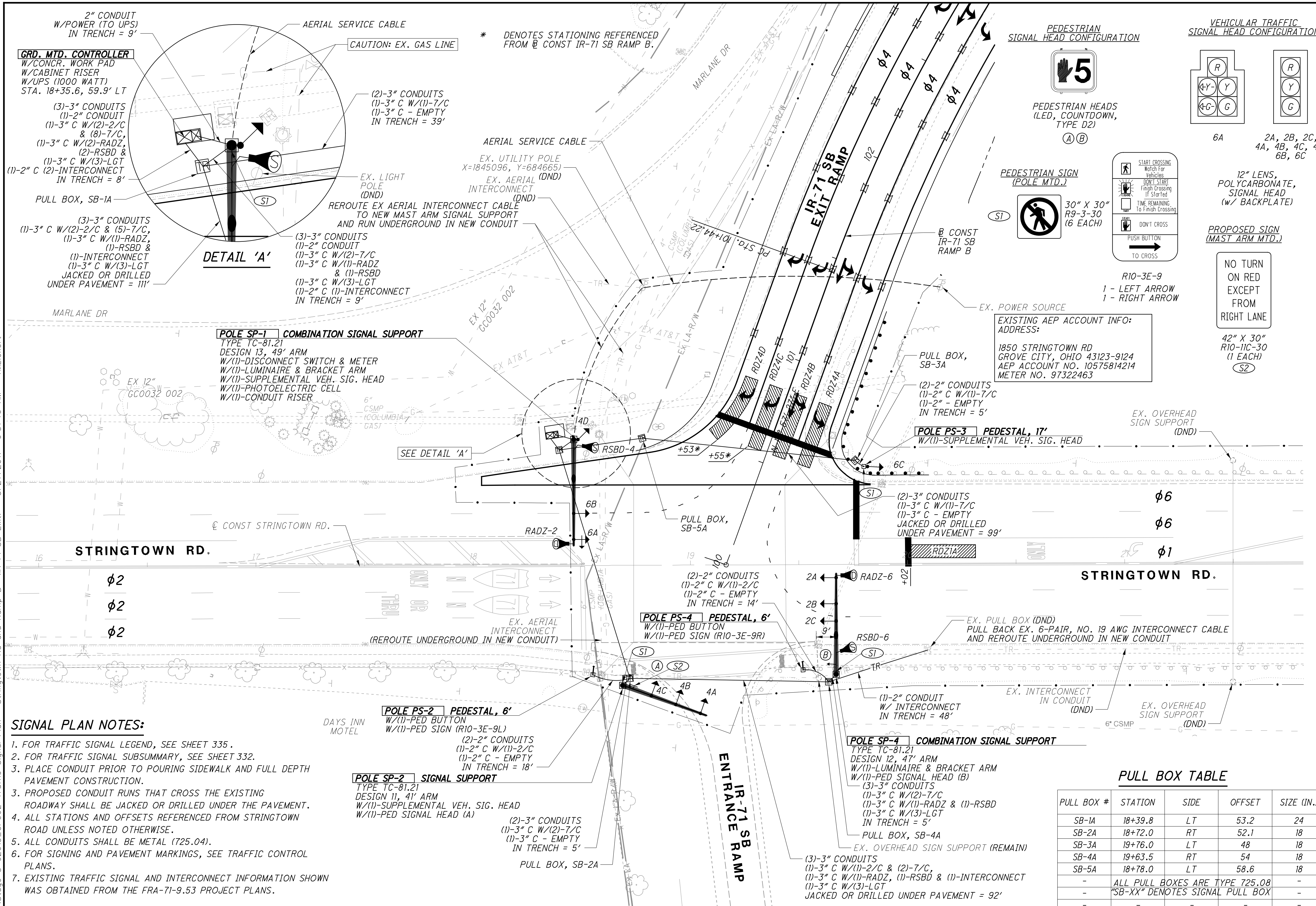
CALCULATED SSS CHECKED HJF

TRAFFIC SIGNAL REMOVAL PLAN
STRINGTOWN RD AND IR-71 SB RAMP B

FRA-71-9.71 PART 2

335 504

\Stage 3 92615_CM001 Signal Removal Plan 3/27/2017 9:31:37 AM TMElchert



SIGNAL PLAN NOTES:

1. FOR TRAFFIC SIGNAL LEGEND, SEE SHEET 335.
2. FOR TRAFFIC SIGNAL SUBSUMMARY, SEE SHEET 332.
3. PLACE CONDUIT PRIOR TO POURING SIDEWALK AND FULL DEPTH PAVEMENT CONSTRUCTION.
3. PROPOSED CONDUIT RUNS THAT CROSS THE EXISTING ROADWAY SHALL BE JACKED OR DRILLED UNDER THE PAVEMENT.
4. ALL STATIONS AND OFFSETS REFERENCED FROM STRINGTOWN ROAD UNLESS NOTED OTHERWISE.
5. ALL CONDUITS SHALL BE METAL (725.04).
6. FOR SIGNING AND PAVEMENT MARKINGS, SEE TRAFFIC CONTROL PLANS.
7. EXISTING TRAFFIC SIGNAL AND INTERCONNECT INFORMATION SHOWN WAS OBTAINED FROM THE FRA-71-9.53 PROJECT PLANS.

PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
SB-1A	18+39.8	LT	53.2	24
SB-2A	18+72.0	RT	52.1	18
SB-3A	19+76.0	LT	48	18
SB-4A	19+63.5	RT	54	18
SB-5A	18+78.0	LT	58.6	18
-	ALL PULL BOXES ARE TYPE 725.08			-
-	"SB-XX" DENOTES SIGNAL PULL BOX			-
-	-	-	-	-

CALCULATED SSS
CHECKED HJF

TRAFFIC SIGNAL & INTERCONNECT PLAN
STRINGTOWN RD AND IR-71 SB RAMP B

FRA-71-9.71
PART 2

SIGNAL TIMING CHART (TEM FORM 496-3)

INTERSECTION: STRINGTOWN ROAD & IR-71 SOUTHBOUND RAMPS
MAINTAINING AGENCY: ODOT D-6

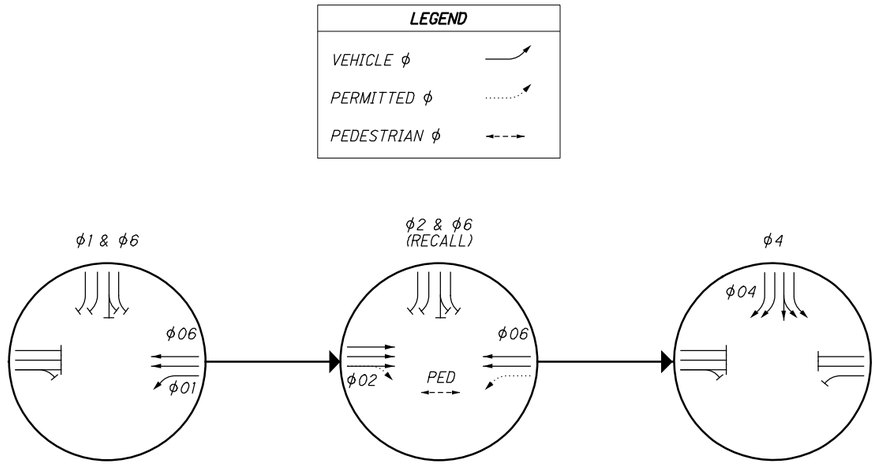
START UP			DUAL ENTRY: YES		PHASES:			2 & 6	
START IN: 2 & 6 YELLOW/RED FLASH			REST IN RED: 2 & 6		RING 1	-		RING 2	-
TIME FOR FLASH OR ALL RED: -			OVERLAP			A	B	C	D
FIRST PHASE(S): 2 & 6									
COLOR DISPLAYED: GREEN			PHASES			-	-	-	-
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			1	2	3	4	5	6	7	8
DIRECTION			WB LT	EB	-	SB	-	WB	-	-
MINIMUM GREEN (INITIAL)		(SEC.)	7	25	-	15	-	25	-	-
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	3.7	5	-	5	-	5	-	-
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	20	40	-	53	-	40	-	-
MAXIMUM GREEN II		(SEC.)	20	40	-	53	-	40	-	-
YELLOW CHANGE		(SEC.)	4	4	-	4	-	4	-	-
ALL RED CLEARANCE		(SEC.)	2	2	-	2	-	2	-	-
WALK		(SEC.)	-	8	-	-	-	-	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	15	-	-	-	-	-	-
RECALL	MAXIMUM	(ON/OFF)	-	-	-	-	-	-	-	-
	MINIMUM	(ON/OFF)	OFF	ON	-	OFF	-	ON	-	-
	PEDESTRIAN	(ON/OFF)	OFF	OFF	-	OFF	-	OFF	-	-
MEMORY		(ON/OFF)	OFF	OFF	-	OFF	-	OFF	-	-

*VOLUME DENSITY CONTROLS

NOTES:

1. THE CONTRACTOR SHALL TRANSFER ALL EXISTING COORDINATION DATA FROM THE EXISTING CONTROLLER TO THE PROPOSED CONTROLLER.
2. ALL MOVEMENTS SHALL BE ACTUATED. THE PRIMARY THRU MOVEMENT SHOULD HAVE MIN RECALL ACTIVE TO REST IN GREEN.
3. COUNTDOWN PEDESTRIAN SIGNALS SHALL GO TO ZERO ON YELLOW PER OMUTCD FIGURE 4E-2.
4. 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.
5. ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PHASING DIAGRAM (TYPICAL)



RADAR DETECTION CHART (TEM FORM 496-4)

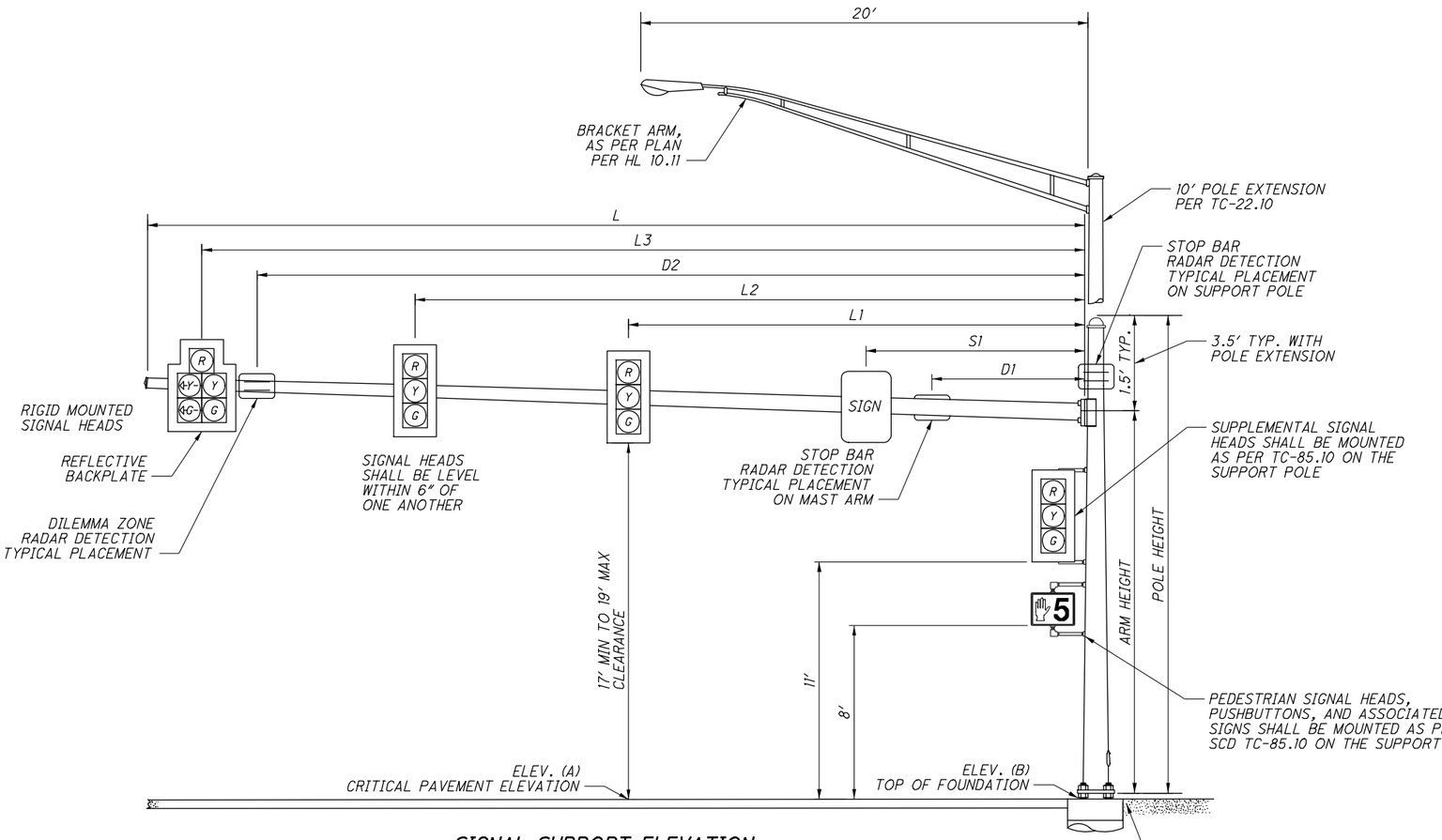
DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)
RDZ1A	WB LT	PRESENCE	1	3	1	CALL/EXTEND PHASE 1	6 X 30
RDZ2A	EB THRU	PRESENCE	2	-	-	CALL/EXTEND PHASE 2	-
RDZ2B	EB THRU	PRESENCE	2	-	-	CALL/EXTEND PHASE 2	-
RDZ2C	EB THRU	PRESENCE	2	-	-	CALL/EXTEND PHASE 2	-
RDZ4A	SB LT	PRESENCE	4	-	-	CALL/EXTEND PHASE 4	6 X 30
RDZ4B	SB TH/LT	PRESENCE	4	-	-	CALL/EXTEND PHASE 4	6 X 30
RDZ4C	SB RT	PRESENCE	4			CALL/EXTEND PHASE 4	6 X 30
RDZ4D	SB RT	PRESENCE	4	10	4	CALL/EXTEND PHASE 4	6 X 30
RDZ6A	WB THRU	PRESENCE	6	-	-	CALL/EXTEND PHASE 6	-
RDZ6B	WB THRU	PRESENCE	6	-	-	CALL/EXTEND PHASE 6	-

NOTE: DILEMMA ZONE SPEED THRESHOLD >30 MPH

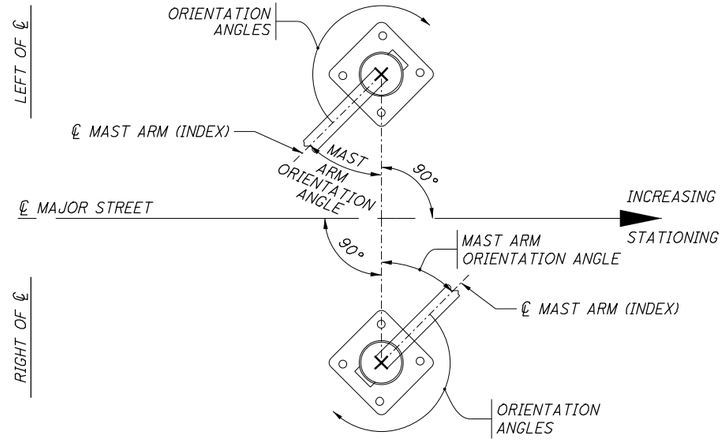
CALCULATED SSS CHECKED HJF

TRAFFIC SIGNAL PLAN DETAILS
STRINGTOWN RD AND IR-71 SB RAMP B

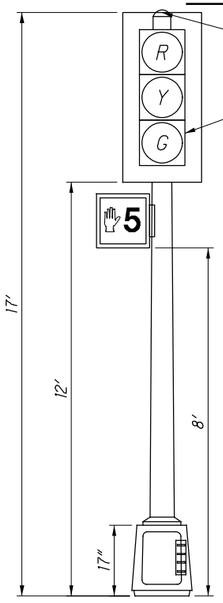
FRA-71-9.71
PART 2



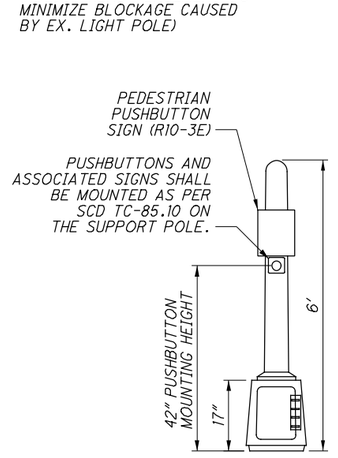
SIGNAL SUPPORT ELEVATION (TYPICAL)



POLE ORIENTATION



17' PEDESTAL DETAIL



6' PEDESTAL DETAIL

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

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM							
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	D1	D2	S1	MAST ARM A ANGLE	PEDESTRIAN PUSHBUTTON	PEDESTRIAN SIGNAL	SUPPLEMENTAL VEHICULAR SIGNAL HEAD	POWER SERVICE	-	BRACKET ARM	HANDHOLE	-
							FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	-	DEG	DEG	DEG	-	DEG	DEG	-
SP-1	18+46.5	58.0' LT	786.55	785.23	TC-81.21	13	34.5	21	49	34	46	-	5	48	-	0	-	-	225	180	-	0	180	-
SP-2	18+68.6	55.3' RT	786.6	787.1	TC-81.21	11	21.5	20	41	14	26	38	-	-	5	110	-	250	-	-	-	-	180	-
SP-4	19+66.9	50.6' RT	788.89	789.25	TC-81.21	12	33.5	20	47	25	33	45	10	46	-	0	-	0	-	-	-	0	180	-
PS-2	18+54.9	50.4' RT	FLUSH W/ WALK		PEDESTAL	PEDESTAL	6'	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	180	-
PS-4	19+51.7	48.5' RT	N.A.	789.37	PEDESTAL	PEDESTAL	6'	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	180	-
PS-3	19+80	45.1' LT	789.11	789.28	PEDESTAL	PEDESTAL	17'	-	-	-	-	-	-	-	-	-	-	-	270	-	-	-	180	-

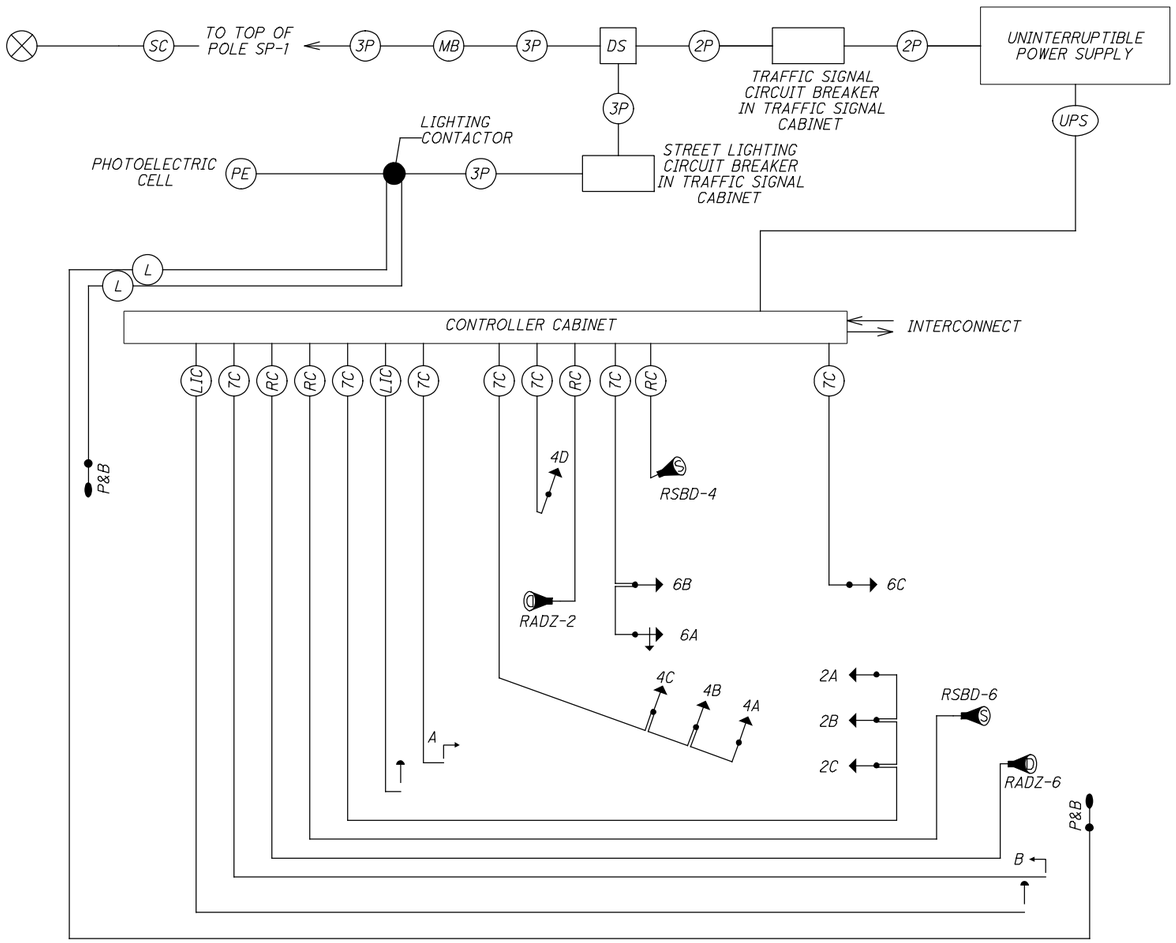
NOTES:
1. STATIONING AND OFFSET BASED ON STRINGTOWN RD.
2. SIGNAL SUPPORT SP-1 AND SP-4 ARE COMBINATION LIGHTING TYPE POLES.

CALCULATED SSS CHECKED HJF

TRAFFIC SIGNAL PLAN DETAILS STRINGTOWN RD AND IR-71 SB RAMP B

FRA-71-9.71 PART 2

WIRING DIAGRAM (TYPICAL)



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

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
6A	R	6	
	Y	6	
	G	6	R
(WB LT)	<--Y---	1	
	<--G---	1	
2A, 2B, 2C	R	2	
	Y	2	
	G	2	R
(EB)	-	-	
	-	-	
4A, 4B, 4C, 4D	R	4	
	Y	4	
	G	4	R
(SB)	-	-	
	-	-	
6B, 6C	R	6	
	Y	6	R
(WB)	G	6	
-	-	-	
	-	-	
	-	-	-
-	-	-	
	-	-	
-	-	-	
	-	-	-
-	-	-	
LS = LOAD SWITCH			

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
-	-	-	
	-	-	
	-	-	-
-	-	-	
	-	-	
-	-	-	
	-	-	-
-	-	-	
	-	-	
	-	-	-
-	-	-	
	-	-	
	-	-	-
-	-	-	
	-	-	
	-	-	-
PEDESTRIAN MOVEMENTS			
A-B SOUTH	W DW	2 2	OUT
-	-	-	
-	-	-	-
-	-	-	
-	-	-	-
-	-	-	
OVERLAPS			
-	-	-	
	-	-	-
-	-	-	
	-	-	-

ALL SUPPLEMENTAL SIGNAL HEADS SHALL BE WIRED TO THEIR OWN LOAD SWITCH AND NOT MONITORED.

LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- LUMINAIRE, CONVENTIONAL, SOLID STATE (LED), AS PER PLAN (120 VOLT)
- (7C) SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- (LIC) 2/C NO. 14 AWG (LEAD-IN CABLE)
- (RC) RADAR DETECTION CABLE
- (PE) PHOTOELECTRIC CELL
- POWER SOURCE
- (SC) SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- (2P) POWER CABLE, 2 CONDUCTOR, NO. 6 AWG
- (3P) POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- (SP 1) SIGNAL SUPPORT POLE NO. __
- (MB) METER BASE
- (L) (3)-NO. 8 AWG DISTRIBUTION CABLE (LIGHTING)
- (DS) LIGHTING/SIGNAL DISCONNECT SWITCH
- (UPS) UNINTERRUPTIBLE POWER SUPPLY CABLE

CALCULATED SSS CHECKED HJF

TRAFFIC SIGNAL PLAN DETAILS
STRINGTOWN RD AND IR-71 SB RAMP B

FRA-71-9.71
PART 2

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