

Illinois Tollway M-ITS Base Sheet Revisions

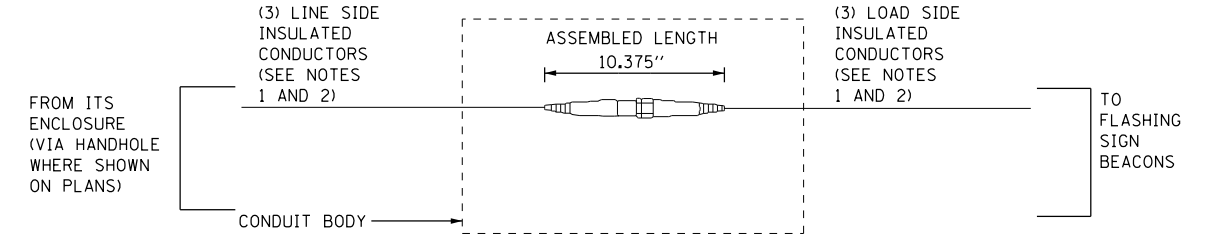
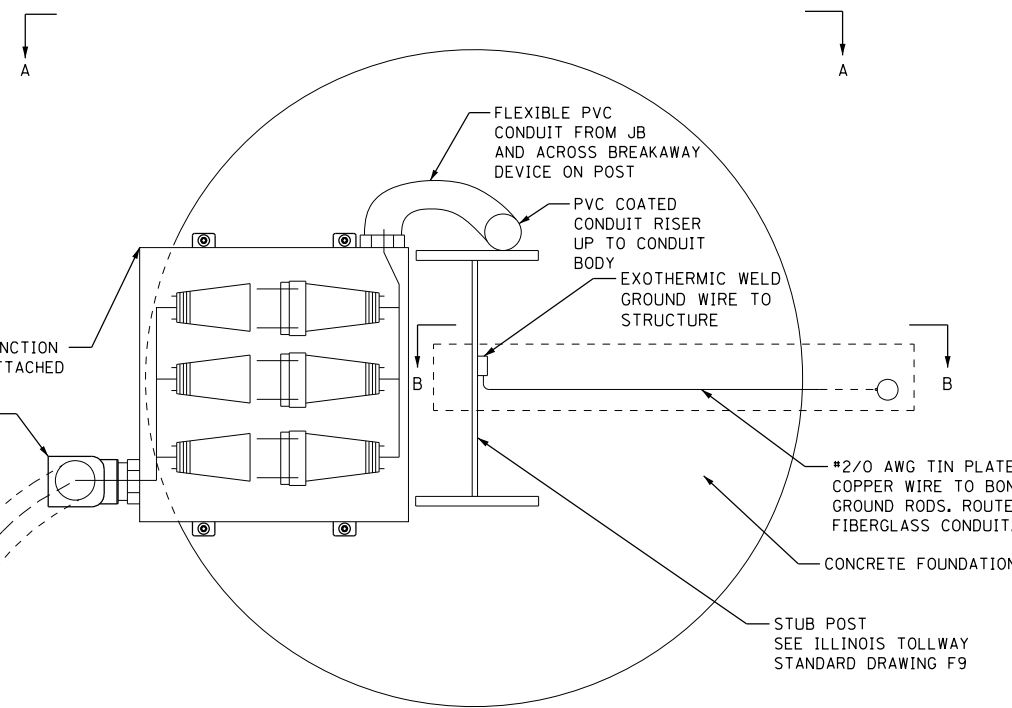
Section M Base Sheet Drawings		
Drawing	Modification Summary	Effective: 2021-03-01
	New Sheet Retired Standard	
Pole Assembly (ITS)-Series 1000		
M-ITS-1000	Elevation Views Pole Mounted ITS Element Assembly	
	<ul style="list-style-type: none"> . Sheet 1of3: Added title for one section detail; Added note on wires from solar panels to battery box then to ITS enclosure then Cat6 cables to ITS devices installed on the ITS pole . Sheet 2of3: Added title for ITS Disconnect Switch Cast-in place . Sheet 3of3: Added new assembly detail for ITS Disconnect Switch Pre-cast (simplified installation) 	
M-ITS-1001	General Notes Pole Mounted ITS Element Assembly	
	<ul style="list-style-type: none"> . Added Note 22.: Cables shall enter poles through a gromet. Gromet size shall be chosen so that the center hole forms a water tight seal around the cables 	
Dynamic Message Sign (ITS)-Series 1100		
M-ITS-1103	DMS Front Access-Cantilever Electrical Plan	
	<ul style="list-style-type: none"> . Revised assembly details for DMS Type 2 Cantilever pushed further away so the edge of the DMS clears Lane 1 	
M-ITS-1104	DMS Front Access-Butterfly Electrical Plan	
	<ul style="list-style-type: none"> . Revised assembly details for DMS Butterfly Type 2 Front Access pushed further away to the edge of the DMS clears Lane 1 	
Cabinet Wiring (ITS)-Series 1200		
M-ITS-1200 to M-ITS-1213	<p>M-ITS-1200: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-MVDS) M-ITS-1201: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-MVDS) M-ITS-1202: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (3-MVDS) M-ITS-1203: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-CCTV camera) M-ITS-1204: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-CCTV and 1-MVDS) M-ITS-1205: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-CCTV camera and 2-MVDS) M-ITS-1206: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-CCTV and 3-MVDS) M-ITS-1207: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-CCTV cameras) M-ITS-1208: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-CCTV Cameras and 1-MVDS) M-ITS-1209: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-CCTV cameras and 2-MVDS) M-ITS-1210: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-CCTV cameras and 3-MVDS) M-ITS-1211: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-MVDS) Solar Generator and FOC M-ITS-1212: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-MVDS) Solar Generator and FOC M-ITS-1213: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (3-MVDS) Solar Generator and FOC</p>	
	<ul style="list-style-type: none"> . Revised to show the fiber optic conduit and power conduit interface with the ITS Enclosure for location and size . Added Note 13: Fiber cable shall run straight down from the Gator patch through the left most conduit. Power cable shall be pulled through the conduit to the right of the fiber conduit. No slack shall be placed in the cabinet, slack shall be put in power and fiber optic handholes . Revised layout to remove Cohu Surge Suppressor Part AS . Revised details for Part V to remove dash line for DITEK surge suppressor . Revised description for Item V to remove Cohu camera . Revised Item AQ to remove reference to Cohu PoE power injector . Remove Item AS for Cohu PoE injector not required anymore . Revised Note 4: to say Not used 	
M-ITS-1217	Cabinet Wiring Diagram In Pavement Detection System AP, PoE and Injector ITS Assembly	
	<ul style="list-style-type: none"> . Revised to show the fiber optic conduit and power conduit interface with the ITS Enclosure for location and size . Added Note 13: Fiber cable shall run straight down from the Gator patch through the left most conduit. Power cable shall be pulled through the conduit to the right of the fiber conduit. No slack shall be placed in the cabinet, slack shall be put in power and fiber optic handholes . Added Note to Designer: The DSE shall specify the Gator Patch length per site 	
Roadway Weather Information System (ITS)-Series 1300		
M-ITS-1300	RWIS Pole, Sensor Mounting Detail	
	<ul style="list-style-type: none"> . Added Note 8: Wind sensor can be installed on the secondary pole if primary pole is close to tree line . Added Note 9: All cables installed in a pole shall use a grommet to connect to ITS device installed on the pole 	
M-ITS-1302	Typical RWIS Site Installation Plan	
	<ul style="list-style-type: none"> . Added Note 5: Note to Designer: In the event the Primary and Secondary poles cannot be installed within the 40 foot maximum radius of the bridge deck, the DSE shall consult with the Tollway and GEC on an alternate placement solution . Added Note 6: Note to Designer: Installation of the Primary and Secondary pole for bridge installation: pole to be installed near immediate entrance of the bridge so non-invasive laser temperature sensor can monitor bridge deck temperature and bridge approach temperature 	

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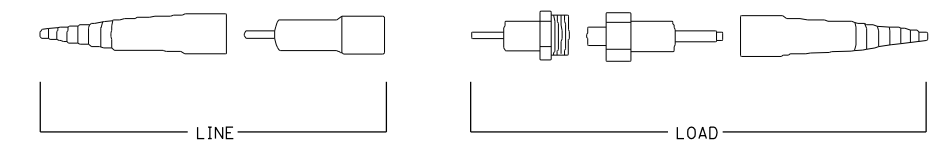
Section M Base Sheet Drawings	
Drawing	Modification Summary
Effective: 2020-03-01	
Solar Powered Generator (ITS)-Series 1400	
M-ITS-1400	Solar Power Generator Details
	. Added Note to Designer: The simplified solar power arrangement shall only be used for a maximum of 3 MVDS. For all other arrangements use the 1400 Series
Tower Mounted CCTV (ITS)-Series 1500	
M-ITS-1500	ITS Details Tower Mount Camera Details
	. Added note to Designer: The 2 CCTV shall be placed on the leg facing the roadway with a clear field of view . Added Note 23: The CCTV cameras shall be mounted on the same tower leg with an Axis T92B62 mounting arm with T94A01D pendant kit, or equivalent as approved by the engineer. There will be 24in vertical spacing between the cameras
M-ITS-1503	. Removed details for Part AS: removed PoE power injector . Remove Item AS: removed reference to Cohu PoE injector
Flashing Sign Beacon (ITS)-Series 1700	
M-ITS-1700	Flashing Sign Beacon Installation Breakaway Electrical Detail
	. Added details for power cable disconnect box Breakaway . Added details for the 4 flashing lights installed on the static sign with flashing sequence and light mounting details onto the sign . Added Note 1: see plans for required conductor sizes . Added Note 2: All three conductors shall be in one harness . Added Note 3: As an alternative to the conduit body on fondation, use thermoplastic junction boxes . Added Note 4: Slack in line side cable shall be provided in handhole . Added Note to Designer: Install new CCTV within 500 feet upstream of the static beacon sign . Added note to Designer: If an existing ITS enclosure lies within the immediate proximity of the flashing sign then power can be connected to that enclosure, otherwise install a new ITS enclosure near the flashing sign
M-ITS-1701	Cabinet Layout and Wiring ITS Pole Mounted Enclosure
	. Added wires for second pair of flashing lights and connection to the circuit breakers . Added Item AT: ELTEC FS-4 DC Flasher . Added Item AU: 9 PIN Harness for FS-4 . Rved dashline for DITEK surge supressor for Cohu camera . Revised Item V: removed reference to DITEK for Cohu camera . Revised Item AS to say N/A
IPDC Facility (ITS)-Series 1800	
M-ITS-1815	IPDC and Combination Plaza/IPDC Concrete Foundation
	. Added new sheet for IPDC and Combination Plaza/IPDC Concrete Foundation details
Conduit Details at Integral Abutment Bridge (ITS)-Series 1900	
M-ITS-1900	Conduit Details at Integral Abutment Bridge with MSE Wall (Sheet 3)
	. Added material type for ITS conduit attached to bridge: PVC coated steel or FRE conduit per plan
100 FT. Monopole (ITS)-Series 2000	
M-ITS-2000	100 FT. Monopole Closed Circuit Television (CCTV) Camera Tower
	. Sheet 1of4: Added details for ITS and support for ITS Enclosure foundation: 16" Dia. X 4' @ 3000PSI Circular Concrete Foundation . Sheet 4of4: Added details to install the ITS Enclosure and ITS Disconnect Switch onto the concrete slab of 100 foot monotube
Video Power Junction Box (ITS)-Series 2100	
M-ITS-2100	Video Power Junction Box Model A: 4 PoE CCTV arrangment without communication switch
	. New drawing created to standardize Video Power Junction Box arrangment - Without Cisco switch when the box is installed and can use Cat 6 cables when distance is less than 300 feet from Plaza Communication room
M-ITS-2101	Video Power Junction Box Model B: 4 PoE CCTV arrangment Cosco 4000 switch
	. New drawing created to standardize Video Power Junction Box arrangment - With Cisco 4000 switch when the box is installed at a distance greater than 300 feet from the Cisco switch in the Plaza Communication Room

NOTE TO DESIGNER

THIS BASE SHEET SHOWS TYPICAL NEW CONSTRUCTION BUT IT IS NOT A STANDARD DRAWING. IT REQUIRES COMPLETION BY THE DESIGNER PRIOR TO INSERTION INTO A CONTRACT, MICROSTATION FILES AND THE "CADD STANDARDS MANUAL" ARE AVAILABLE ON THE ILLINOIS TOLLWAY WEBSITE. THE DESIGNER SHALL ACCEPT THE RESPONSIBILITY OF THE DESIGN OF THIS SHEET UPON ITS COMPLETION AND INSERTION INTO A CONTRACT. ALL "NOTE TO DESIGNER" BOXES SHALL BE REMOVED BY THE DESIGNER PRIOR TO INSERTION OF THE SHEET INTO THE PLAN SET.



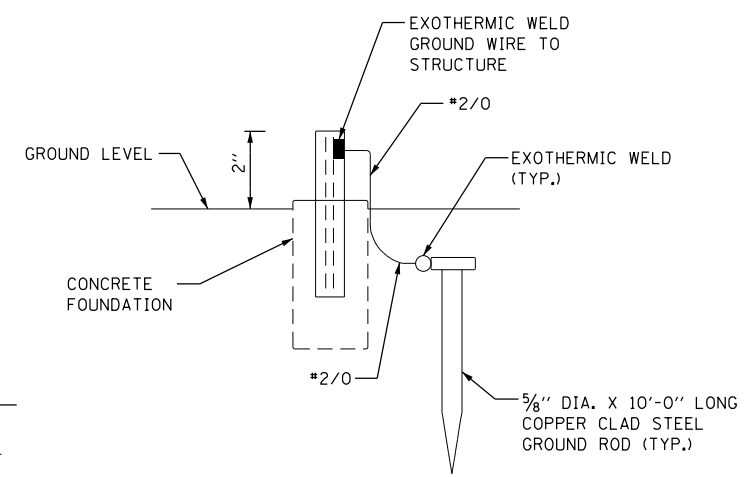
NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



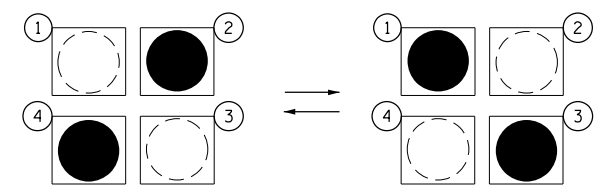
NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS EXPLODED VIEW

DIRECTION OF TRAVEL ↑

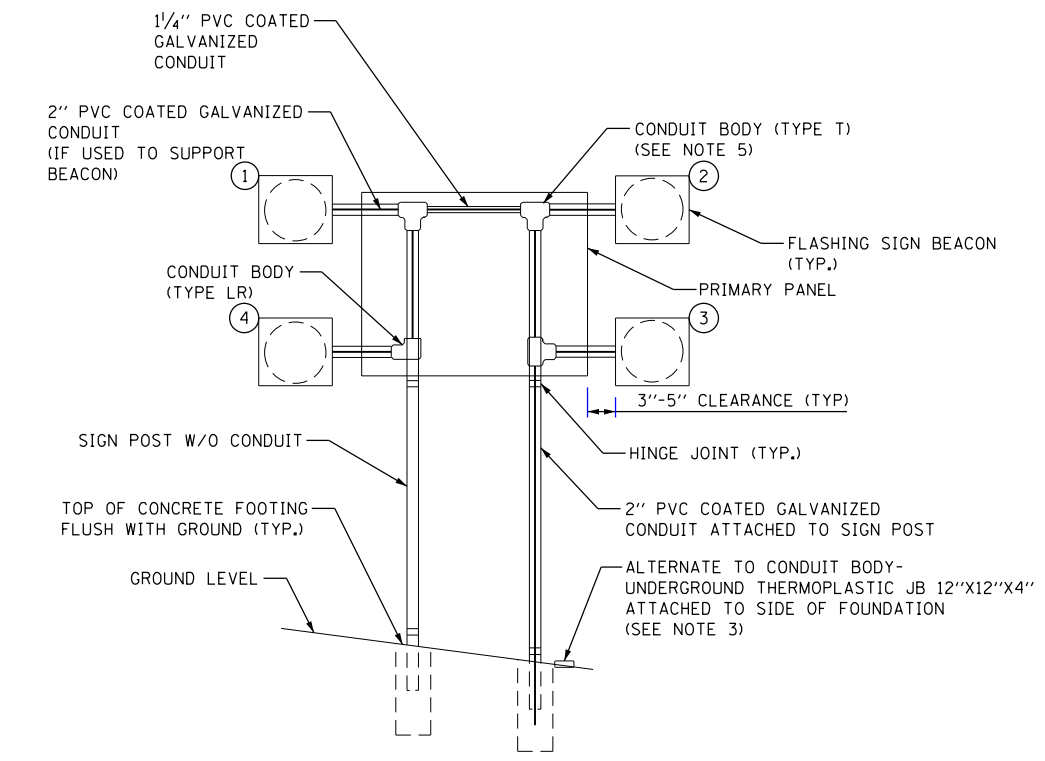
60" 2" UNDERGROUND PVC COATED GALVANIZED STEEL



SECTION B-B
SCALE: N.T.S.



FLASHING SEQUENCE



ELEVATION A-A
SCALE: N.T.S.

NOTE TO DESIGNER

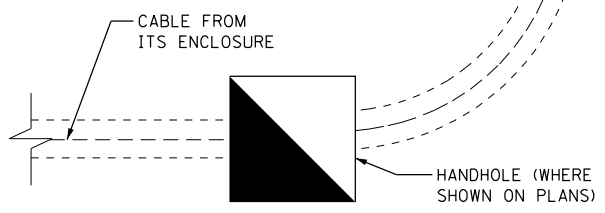
IF AN EXISTING ITS CABINET LIES WITHIN THE IMMEDIATE PROXIMITY OF THE FLASHING BEACON EQUIPMENT, POWER CAN BE CONNECTED THROUGH THAT CABINET. OTHERWISE, A SEPARATE ITS CABINET IS REQUIRED.

NOTE TO DESIGNER

INSTALL A NEW CCTV WITHIN 500 FEET UPSTREAM OF THE FLASHING BEACON CABINET IF THERE IS NO EXISTING CCTV WITHIN 500 FEET OF THE NEW SITE.

TYPICAL PLAN AT FLASHING BEACON
SCALE: N.T.S.

- NOTES:**
1. SEE PLANS FOR REQUIRED CONDUCTOR SIZES.
 2. ALL THREE CONDUCTORS SHALL BE IN ONE HARNESS.
 3. AS AN ALTERNATE TO THE CONDUIT BODY ON FOUNDATION, USE THERMOPLASTIC JUNCTION BOXES (CARLON PART NO. E989UUN OR APPROVED EQUAL)
 4. SLACK IN LINE SIDE CABLE SHALL BE PROVIDED IN HANDHOLE.

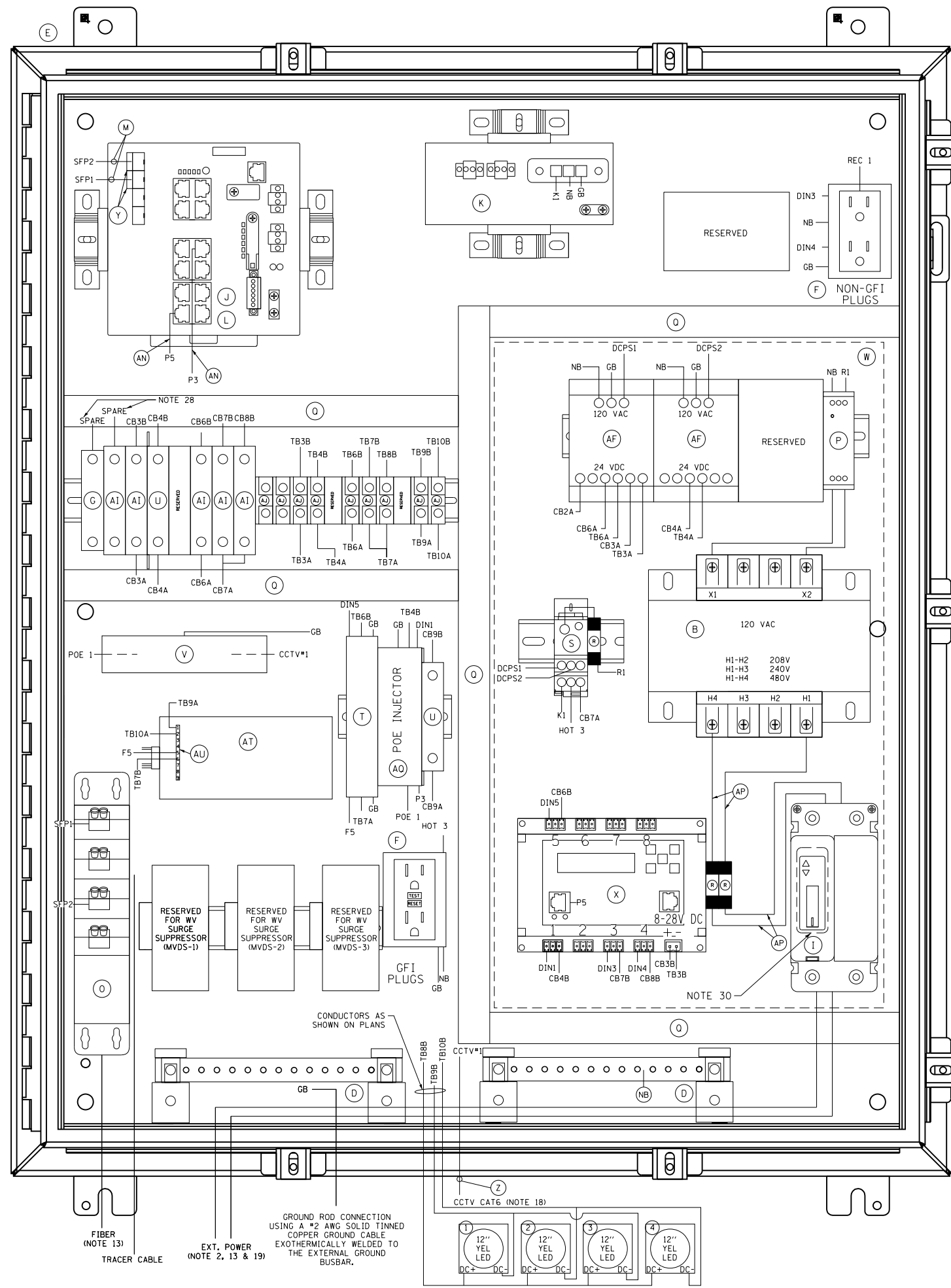


M-ITS-1700



FLASHING SIGN BEACON
INSTALLATION BREAKAWAY
ELECTRICAL DETAIL

DATE
3-01-2021



- | ITEM | DESCRIPTION |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A | NOT USED FOR THIS SHEET APPLICATION |
| B | CONTROL POWER TRANSFORMER, 1000VA, 208/240/480-120VAC, 1PH SQUARE D/CLASS 9070 - T1000 D95 |
| C | NOT USED FOR THIS SHEET APPLICATION |
| D | TWO (2) GROUNDING BAR SYSTEM HOFFMAN/PGS2K, BONDED OR SEPARATED AS REQUIRED. |
| E | NEMA 4X STAINLESS STEEL, 36"H X 30"W X 12"D ENCLOSURE WITH 33"x27" PANEL, HOFFMAN/A36H3012S56LP & A36P30 |
| F | TWO DUPLEX 120V RECEPTACLES, ONE GFCI AND NON-GFI (SEE NOTE 9) HUBBELL/GFR5362 & BR20WR |
| G | 24VDC, 1P, 15A CIRCUIT BREAKER SCHNEIDER ELECTRIC/MGN61510 |
| H | NOT USED FOR THIS SHEET APPLICATION |
| I | 480V, 2P, 30A CIRCUIT BREAKER WITH TERMINAL SHIELD EATON/HFD2030L & 625B229G07 |
| J | NETWORK SWITCH CISCO IE-4000-8T4G-E |
| K | CISCO POWER SUPPLY, PWR-IE170W-PC-AC= |
| L | IP SERVICES LICENSE: L-IE4000-RTU= |
| M | 2 METER - SMFO LC-LC DUPLEX JUMPERS, CORNING/040402R5Z200Q2M |
| N | NOT USED FOR THIS SHEET APPLICATION |
| O | SMF PATCH PANEL WITH LC CONNECTORS FIBER CONNECTIONS G420U08LAN-XXX-0 |
| P | 120VAC SURGE SUPPRESSOR, MOUNTED ON DIN RAIL COOPER CROUSE HINDS/MA15/D/1/S1 OR APPROVED EQUAL |
| Q | PANDUIT WIRING DUCT (OR EQUIVALENT) PANDUIT/FIX2LG6 WITH COVER-CILG6 |
| R | 10 AMP FUSE, GOULD (MERSEN)/ATM-10 |
| S | SPLICE BLOCK, ALTECH/38041 |
| T | 24VAC/VDC SURGE SUPPRESSOR, MOUNTED ON DIN RAIL MTL INSTRUMENTS/ZB24580 |
| U | 5A CIRCUIT BREAKER, ALLEN BRADLEY/1492-SPMIB050 |
| V | CAT6 PoE+ SURGE SUPPRESSOR: USE AXIS T8061 FOR AXIS PoE CAMERA. |
| W | CLEAR POLY METHYL METHACRYLATE (PMMA, PLEXIGLAS) SAFETY COVER ENCOMPASSING ITEMS AF, P, S, R, B, X, & I. (THE INSTALLER SHALL PERMANENTLY AFFIX A LABEL STATING "DANGER 480 VAC" OR "DANGER 240 VAC" OR "DANGER 120 VAC" FOR 120 VAC AS FIELD CONDITIONS WARRANT.) |
| X | POWER CONTROLLER, 8-CHANNEL DIN ETHERNET RELAY DIGITAL LOGGERS/DIN 4 |
| Y | (2) CISCO GLC-LX-SM-RGD = 1 GBPS SM SFP MODULES |
| Z | CATEGORY 6 CABLE, 23 AWG, OUTDOOR RATED CABLE BELDEN/7953A |
| AA | SENSOR SURGE SUPPRESSION, WAVETRONIX - CLICK-200 OR ISS ZONE BARRIER ZB24510 |
| AB | NOT USED FOR THIS SHEET APPLICATION |
| AC | NOT USED FOR THIS SHEET APPLICATION |
| AD | NOT USED FOR THIS SHEET APPLICATION |
| AE | RS-232 / RS-485 TO ETHERNET CONVERTOR WAVETRONIX - CLICK-301 OR ISS-MOXA P5150A, 0K-35A |
| AF | AC/DC POWER SUPPLY, 24VDC WAVETRONIX - CLICK-204 OR ISS LAMBDA DSP100-24 |
| AG | NOT USED FOR THIS SHEET APPLICATION |
| AH | NOT USED FOR THIS SHEET APPLICATION |
| AI | 2A CIRCUIT BREAKER, ALLEN BRADLEY/1492-SPMIB020 |
| AJ | TERMINAL BLOCK, ALLEN BRADLEY/1492-CD8 |
| AK | MVDS ASSEMBLY (NOT SHOWN), SEE SPECIAL PROVISIONS WAVETRONIX (SMART SENSOR HDSS-126) OR ISS (SX-300) |
| AL | TRANSFORMER COVERS, SQUARE D/9070FSC2 |
| AM | 5-CONDUCTOR JUMPER (Tx, Rx, GND, RTS, CTS), RS-232 SERIAL COMMUNICATIONS (APPLICABLE TO ISS/MOXA) |
| AN | INDOOR/OUTDOOR RATED CAT6 (1000MBS, TEMPERATURE HARDENED) THESE ARE THE CAT6 CABLES ROUTED INSIDE CABINET |
| AO | MVDS CABLE, WAVETRONIX - WX-SS-706-60 OR ISS G4-CBL-60 |
| AP | #10 AWG |
| AQ | PoE INJECTOR AXIS T8144 |
| AR | T-BUS CONNECTOR (WAVETRONIX) |
| AS | NOT USED FOR THIS SHEET APPLICATION |
| AT | ELTEC FS-4 DC FLASHER |
| AU | 9 PIN HARNESS FOR FS-4 |

- NOTES:
- ALL POWER WIRING SHALL BE RHH/RHW WITH WIRE TERMINALS OR TINNED.
 - CONTRACTOR TO VERIFY CORRECT TRANSFORMER TAPS ARE USED BASED ON INCOMING POWER SOURCE.
 - ALL CABLES AND EQUIPMENT SHALL BE PROPERLY DRESSED AND LABELED. ALL CONDUITS SHALL BE PROPERLY PLUGGED WITH DUCT SEAL PUTTY (RAINBOW TECHNOLOGIES OR EQUIVALENT).
 - NOT USED FOR THIS SHEET APPLICATION.
 - EACH 120VAC OUTLET, PS OR TRANSFORMER (ITEM F, K, L, & AF) SHALL BE FED FROM A SEPARATE INPUT LINE.
 - THE DIN RAIL(S) FOR ITEMS J & K SHALL BE INSTALLED WITH THE CENTER LINE NO LESS THAN 5 INCHES FROM ANY OBSTACLE ABOVE AND NO LESS THAN 4 INCHES FROM ANY OBSTACLE BELOW. ALL DIN RAIL SHALL BE GROUNDED.
 - ALL CABLES INSTALLED WITHIN THE CABINET AND POLE SHALL BE OUTDOOR RATED.
 - WIFI COMMUNICATION SHALL BE DISABLED ON DIN ETHERNET RELAY.
 - THE GFI OUTLETS LOAD SHALL NOT BE CONNECTED TO ANY OTHER LOAD IN THE ENCLOSURE. THE 1900 QUAD BOX GFIS ARE INTENDED TO BE UTILIZED FOR EXTERNAL EQUIPMENT ONLY. EACH OUTLETS TAB SHALL BE BROKEN SO THEY ARE INDEPENDENT.
 - ALL BREAKERS SHALL BE LABELED (E.G. CAMERA-AC, CAMERA-DC, DIN RELAY-AC, DIN RELAY-DC, CELL MODEM-AC ETC.).
 - NOT USED FOR THIS SHEET APPLICATION
 - USE THE MOUNTING TABS ON THE IP RELAY UNIT TO MOUNT THE UNIT DIRECTLY TO THE BACK PLATE. REFER TO THE IP RELAY WIRING TABLE FOR WIRING DETAILS.
 - ALL CABLES SHALL ENTER THE ENCLOSURE FROM THE BOTTOM. ALL POWER AND COMMUNICATION CABLE SLACK SHALL BE PLACED IN THE HANDHOLE.
 - POWER FEED TO THE CISCO IE4000 SWITCH SHALL BE FROM THE 120VAC INPUT WHEN THE ENCLOSURE IS AC POWERED.
 - NOT USED FOR THIS SHEET APPLICATION
 - IF A SOLAR GENERATOR IS CONNECTED, THEN ITEM P AND THE SECONDARY SIDE OF ITEM B SHALL BE CONNECTED UNTIL A FINAL AC CONNECTION IS MADE.
 - ITEM X IS USED TO CONTROL POWER TO THE CAMERAS AND DETECTORS. ALL 120VAC CONNECTIONS ON ITEM X SHALL BE PROTECTED.
 - CABLES TO BE ROUTED THROUGH POLE.
 - WHEN A 24VDC TO 120VAC POWER GENERATOR IS CONNECTED, THEN THE 480VAC TO 120VAC STEP DOWN TRANSFORMER IS BYPASSED.
 - NOT USED FOR THIS SHEET APPLICATION
 - NOT USED FOR THIS SHEET APPLICATION
 - DIN RAIL SHALL BE INSTALLED AS ILLUSTRATED ON DRAWING. DIN RAIL SHALL BE GROUNDED TO THE GROUND BUS.
 - BOND NEUTRAL AND GROUND BUSES TOGETHER, WHEN REQUIRED. TIE THE ENCLOSURE INTO THE GROUND BUS.
 - ITEM W SHALL BE FORMED AND MOLDED TO FIT AROUND THE AREA DENOTED BY THE DASHED LINE. THE PLEXIGLASS SHALL BE MOUNTED TO THE BACKPLATE WITH SUFFICIENT AIR HOLES TO ALLOW HEAT TO ESCAPE THE AREA. THERE SHALL ALSO BE OPENINGS ON THE BOTTOM TO ALLOW CABLES TO BE PASSED FROM THE AC SECTION TO THE OTHER SECTIONS OF THE ENCLOSURE.
 - ITEM AL SHALL BE PLACED ON ITEM B.
 - ALL INTERNAL ENCLOSURE ROUTED AND TERMINATED CAT6 CABLE SHALL BE TEMPERATURE RATED.
 - ALL INTERNAL 24VAC, 120VAC (STARTING ON SECONDARY SIDE OF ITEM B) AND ANY DC VOLTAGE POWER FEEDS USE #16 AWG CABLE.
 - SPARE BREAKER RESERVED.
 - ALL CONDUIT EXITING THE BOTTOM OF THE CABINET SHALL BE INSTALL IN-LINE WITH THE EQUIPMENT IT IS CONNECTED TO. THE CABLES SHALL BE INSTALLED IN A NEAT AND PROFESSIONAL MANNER.
 - PROVIDE WINDOW IN PMMA SHIELD FOR ACCESS TO BREAKER. MOUNT BREAKER FLUSH WITH PMMA SHIELD USING MOUNTING BRACKET.

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DESIGNER SHALL SPECIFY THE GATOR PATCH CABLE LENGTH PER SITE AND UPDATE ITEM (O) TO INCLUDE THIS LENGTH.

M-ITS-1701
SHEET 1 OF 1

CABINET LAYOUT AND WIRING
ITS POLE MOUNTED ENCLOSURE
(1-CCTV AND FLASHING SIGN
BEACON)

DATE: 3-01-2021



FIBER (NOTE 13)
TRACER CABLE

EXT. POWER (NOTE 2, 13 & 19)

GROUND ROD CONNECTION USING A #2 AWG SOLID TINNED COPPER GROUND CABLE EXOTHERMICALLY WELDED TO THE EXTERNAL GROUND BUSBAR.

