## ABBREVIATIONS

| | |
|---|---|
| A | AMPERES |
| AC | ALTERNATING CURRENT |
| AIC | AMPERE INTERRUPTING CAPACITY |
| ALUM | ALUMINUM |
| AMP | AMPERES |
| AWG | AMERICAN WIRE GAUGE |
| CAT. | CATALOG |
| CAT | CATEGORY |
| CCTV | CLOSED CIRCUIT TELEVISION |
| CDT(S) | CONDUIT(S) |
| CIP | CAST IN PLACE |
| COMM | COMMUNICATION(S) |
| DC | DIRECT CURRENT |
| DIA | DIAMETER |
| DMS | DYNAMIC MESSAGE SIGN |
| EA | EACH |
| EMT | ELECTRICAL METALLIC TUBING |
| FDN | FOUNDATION |
| FMC | LIQUIDTIGHT FLEXIBLE METAL CONDUIT |
| FO | FIBER OPTIC CABLE |
| FTP | FIBER TERMINATION PANEL |
| GFCI | GROUND FAULT CIRCUIT INTERRUPTER |
| GND | GROUND |
| HAR | HIGHWAY ADVISORY RADIO |
| H.S. | HIGH STRENGTH |
| HSS | HOLLOW STRUCTURAL STEEL |
| IP | INTERNET PROTOCOL |
| ITS | INTELLIGENT TRANSPORTATION SYSTEM |
| ITSF–XX | ITS FIBER OPTIC CABLE WITH XX STRANDS |
| ITSS | INTELLIGENT TRANSPORTATION SYSTEM STATION |
| LC | LUCENT CONNECTOR |
| LCS | LANE–USE CONTROL SIGNAL |
| LED | LIGHT EMITTING DIODE |
| MAX | MAXIMUM |
| MIN | MINIMUM |
| MRVDS | MICROWAVE RADAR VEHICLE DETECTOR SUBSYSTEM |
| MVDS | MAGNETOMETER VEHICLE DETECTION SUBSYSTEM |
| NEC | NATIONAL ELECTRICAL CODE |
| NEMA | NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION |
| NOAA | NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION |
| OD | OUTER DIAMETER |
| PAWANET | PORT AUTHORITY WIDE AREA NETWORK |
| PCRMC | PVC COATED RIGID METAL CONDUIT |
| POE | POWER OVER ETHERNET |
| PTZ | PAN–TILT–ZOOM |
| PVC | POLYVINYL CHLORIDE |
| PWR | POWER |
| REQD | REQUIRED |
| RGS | RIGID METAL CONDUIT |
| RMC | RIGID METAL CONDUIT |
| RNMC–XX | RIGID NONMETALLIC CONDUIT, SCHEDULE XX |
| RPU | REMOTE PROCESSING UNIT |
| RTMS | REMOTE TRAFFIC MICROWAVE SENSOR |
| RWIS | ROAD WEATHER INFORMATION SUBSYSTEM |
| SC | SUBSCRIBER CONNECTOR |
| SCC | SYSTEMS CONTROL CABINET |
| SFP | SMALL FORM–FACTOR PLUGGABLE |
| SM | SINGLE MODE |
| SPD | SURGE PROTECTION DEVICE |
| SS | STAINLESS STEEL |
| STD | STANDARD |
| TD | TRAFFIC DETAILS |
| TDS | TRAFFIC DETECTION SUBSTATION |
| TS | THERMOSTAT |
| TTS | TRAVEL TIME SUBSYSTEM |
| TVSS | TRANSIENT VOLTAGE SURGE SUPPRESSION |
| TYP | TYPICAL |
| UPS | UNINTERRUPTIBLE POWER SUPPLY |
| UL | UNDERWRITERS' LABORATORIES |
| UV | ULTRAVIOLET |
| V | VOLTS |
| VAC | VOLTAGE ALTERNATING CURRENT |
| VIDS | VIDEO DETECTION SUBSYSTEM |
| VIF | VERIFY IN FIELD |
| VSLS | VARIABLE SPEED LIMIT SIGN |
| W | WATT(S) |
| W/ | WITH |
| WAP | WIRELESS ACCESS POINT |
| WIM | WEIGH–IN–MOTION |
| WTS | WIRELESS TRAFFIC SENSOR (IN–PAVEMENT WIRELESS SENSOR) |
| XFMR | TRANSFORMER |

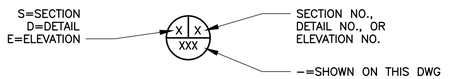
## NOTES

1. GENERAL NOTES APPLY TO INTELLIGENT TRANSPORTATION SYSTEMS (ITS) DRAWINGS INCLUDED UNDER THIS CONTRACT, REFER TO DISCIPLINE SPECIFIC AND INDIVIDUAL DRAWINGS FOR ADDITIONAL NOTES. THE SCOPE OF WORK FOR EQUIPMENT INSTALLATION SHALL BE AS SHOWN ON THE CONTRACT DRAWINGS.
2. THE CONTRACT DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW ALL DETAILS OF CONSTRUCTION. BASEPLAN INFORMATION IS TO APPROXIMATE SCALE AND HAS BEEN TAKEN FROM THE BEST AVAILABLE AS–BUILT INFORMATION. EXISTING CONDITIONS, LOCATIONS OF EQUIPMENT TO BE INSTALLED AND EXACT ROUTINGS OF CONDUIT SHALL BE VERIFIED IN THE FIELD PRIOR TO ANY FABRICATION, ORDERING MATERIAL OR PERFORMING WORK. DEVIATIONS FROM THE LOCATIONS SHOWN ON THE CONTRACT DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. LOCATIONS OF EQUIPMENT AND DEVICES AND ALL DETAILS OF WORK SHALL BE COORDINATED TO ACHIEVE A COMPLETE, FUNCTIONAL INSTALLATION.
3. STRUCTURAL, ARCHITECTURAL, TRAFFIC, AND CIVIL INFORMATION SHOWN WITHIN THE TRAFFIC STANDARD DETAILS ARE FOR REFERENCE ONLY. REFER TO THE APPROPRIATE SECTIONS OF THE CONTRACT DRAWINGS FOR ALL PROPER DIMENSIONING, ROADWAY ALIGNMENTS, AND STRUCTURAL ASPECTS.
4. UNLESS OTHERWISE NOTED, EQUIPMENT TO BE FURNISHED AND INSTALLED UNDER THIS CONTRACT IS SHOWN IN HEAVY LINES. EXISTING INFRASTRUCTURE (CABLE AND CONDUIT INCLUDED) TO REMAIN OR INSTALLED UNDER OTHER CONTRACTS BY OTHERS IS SHOWN IN LIGHT LINES.
5. SUBMIT A WORK PLAN WITH SCHEDULE AND DURATIONS OF WORK 14 WORKING DAYS IN ADVANCE TO THE ENGINEER FOR APPROVAL. NO WORK MAY BE PERFORMED WITHOUT AN APPROVED SCHEDULE. WORK SHALL NOT DISRUPT THE AUTHORITY'S STANDARD OPERATIONS WITHOUT WRITTEN CONSENT.
6. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE DISCIPLINE SPECIFIC AUTHORITY HAVING JURISDICTION AND THE MOST CURRENT ACCEPTED VERSIONS OF THE OSHA REGULATIONS, ADA AND ALL OTHER CODES AND REGULATIONS WHICH WOULD HAVE JURISDICTION IF THE PANYNJ/PATH WERE A PRIVATE CORPORATION.
7. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST AUTHORITY ACCEPTED VERSION OF THE NATIONAL ELECTRICAL CODE.
8. EQUIPMENT & MATERIALS TO BE FURNISHED AND INSTALLED SHALL BE NEW AND BEAR UL LISTING AND LABELING WHERE SUCH A STANDARD HAS BEEN ESTABLISHED FOR THAT TYPE OF EQUIPMENT/MATERIAL.
9. CAUTION SHOULD BE EXERCISED TO PREVENT DAMAGE WHEN WORKING ADJACENT TO EXISTING INFRASTRUCTURE INCLUDING BUT NOT LIMITED TO STRUCTURAL, MECHANICAL AND ELECTRICAL EQUIPMENT. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING OR REPLACING, AT NO COST TO THE AUTHORITY, ANY DAMAGES CAUSED BY THEIR ACTIVITIES TO NEW OR EXISTING EQUIPMENT. THE REMEDIATION SHALL BE TO THE COMPLETE SATISFACTION OF THE ENGINEER.
10. MAINTAIN THE INTEGRITY OF ALL CIRCUITS IN SERVICE THAT MAY BE AFFECTED BY THE WORK OF THIS CONTRACT. IDENTIFY ALL SOURCES OF POWER AND DE–ENERGIZE REQUIRED CIRCUITS BEFORE WORKING WITH THEM. PERFORM ALL DISCONNECTIONS AND INTERRUPTIONS OF ELECTRICAL SERVICE ACCORDING TO THE CONSTRUCTION STAGING SUBMITTED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. ANY SCHEDULE OF INTERRUPTIONS AND SHUTDOWNS, INDICATING AFFECTED AREAS, SHALL BE KEPT TO A MINIMUM. THE SCHEDULE SHALL BE SUBMITTED A MINIMUM OF TWO WEEKS BEFORE ANY ANTICIPATED INTERRUPTION. THE SCHEDULE WILL BE APPROVED BY THE ENGINEER BEFORE ANY INTERRUPTION IS PERMITTED. PORT AUTHORITY PERSONNEL TO DISCONNECT ALL EXISTING ACTIVE EQUIPMENT AS NEEDED.
11. WHILE POWER REQUIREMENTS FOR THE EQUIPMENT SHOWN ON THE DRAWINGS HAVE PREVIOUSLY BEEN DETERMINED TO BE ADEQUATE, THE CONTRACTOR SHALL RE–VERIFY THE POWER REQUIREMENTS PRIOR TO ANY INSTALLATION. IF ADDITIONAL CAPACITIES ARE REQUIRED, THE CONTRACTOR SHALL SUBMIT A REQUEST TO THE ENGINEER IN WRITING.
12. UNLESS OTHERWISE NOTED, ALL POWER WIRE SHALL BE 600V, 1/C COPPER, TYPE USE–RHH–RHW WITH OUTER JACKET ACCORDING TO SPECIFICATION SECTION 16120. ALL THE AFOREMENTIONED CABLES SHALL CONFORM TO UL44. SEE LIST OF APPROVED MANUFACTURERS.
13. ALL CONDUITS SHALL CONTAIN AN INSULATED GROUND WIRE BONDED TO ALL ENCLOSURES AND SIZED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEC.
14. ANY PORTION OF A CABLE OR WIRE DAMAGED DURING INSTALLATION SHALL BE REPLACED WITHOUT ADDITIONAL COST TO THE AUTHORITY. NO ADDITIONAL SPLICES SHALL BE INTRODUCED TO REPAIR CABLES. LUBRICATE AS REQUIRED.
15. ALL SPLICING AND TERMINATING MATERIALS SHALL BE COMPATIBLE. SEE LIST OF APPROVED MANUFACTURERS. NO SPLICES EXCEPT THOSE SHOWN ON THE DRAWINGS ARE PERMITTED.
16. UNLESS OTHERWISE NOTED, ALL WIRING SHALL BE INSTALLED IN RACEWAYS OR CONDUITS. ALL CONDUIT ENTRIES FROM BOTTOM AND SIDES SHALL BE THREADED AND SEALED. TOP PENETRATIONS ARE NOT PERMITTED FOR EXPOSED OUTDOOR LOCATIONS.
17. UNLESS OTHERWISE NOTED, ALL OUTDOOR EXPOSED CONDUITS SHALL BE MINIMUM 1" DIAMETER PVC COATED RIGID METALLIC CONDUIT. ALL CONDUIT RUNS SHALL BE RUN PARALLEL OR PERPENDICULAR TO STRUCTURAL BEAMS. OUTDOOR EXPOSED CONDUIT BODIES SHALL BE PVC COATED RIGID METAL. FASTENERS AND SUPPORTS SHALL BE STAINLESS STEEL AND SHALL BE RATED FOR USE WITH THE ASSOCIATED CONDUIT TYPE. FASTENERS SHALL INCLUDE SHAKE–PROOF (EXTERNAL STAR) LOCK WASHERS. ALL BOLTS SHALL HAVE LOCK WASHERS, ELASTIC STOP NUTS IN ADDITION TO REGULAR NUTS. CONDUITS CROSSING EXPANSION JOINTS OR SEISMIC JOINTS SHALL BE EQUIPPED WITH EXPANSION/DEFLECTION FITTINGS. THE USE OF SPLIT COUPLINGS AND EMT CONDUIT ARE NOT PERMITTED.
18. CUT STEEL CONDUIT ENDS SQUARE, REAM SMOOTH AND PAINT MALE THREADS OF FIELD THREADED CONDUIT WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH CONDUIT COUPLINGS.
19. JUNCTION BOXES, PULL BOXES, AND ENCLOSURES SHALL BE NEMA 4X STAINLESS STEEL FOR OUTDOOR USE. LOCATE AS INDICATED ON THE CONTRACT DRAWINGS OR WHEREVER NECESSARY, PER NEC, TO FACILITATE PULLING AND SPLICING OF WIRE. COORDINATE LOCATION WITH EXISTING INFRASTRUCTURE. COVERS OF JUNCTION AND PULL BOXES SHALL BE ACCESSIBLE.
20. SUPPORT PANELS, JUNCTION AND PULL BOXES INDEPENDENTLY WITH NO WEIGHT BEARING ON CONDUITS.
21. ALL UNUSED OPENINGS IN CONDUIT BOXES, DISCONNECT SWITCHES, CABINETS PANELBOARDS, ETC., SHALL BE CLOSED IN A MANNER APPROVED BY THE ENGINEER AND IN ACCORDANCE WITH THE NEC.
22. UPDATE PANEL DIRECTORIES FOR PANELS WITH REVISED OR ADDED CIRCUITS.
23. CONDUIT SIZES ARE BASED UPON SPECIFIC MANUFACTURER'S CABLE AND WIRE DIAMETERS. FINAL CONDUIT INSTALLED SHOULD BE SIZED IN ACCORDANCE WITH THE NEC AND BASED UPON THE ENGINEER APPROVED MANUFACTURER'S CABLE DIAMETERS.
24. ALL RIGID METAL CONDUIT (RMC) SHALL BE GALVANIZED ACCORDING TO SPECIFICATION SECTION 16110.

## LEGEND:

| SYMBOL (EXISTING / NEW) | DESCRIPTION |
|---|---|
| ☒ | COMMUNICATIONS HANDHOLE |
| J | JUNCTION BOX |
| PA C | COMMUNICATIONS MANHOLE |
| PA E | ELECTRICAL MANHOLE |
| | TRAFFIC SIGNAL CONTROLLER CABINET |
| | INSTALLATIONS |
| — C — / — C — | COMMUNICATIONS CONDUIT |
| — FO — | FIBER OPTIC CABLE |
| | CABINETS/ENCLOSURE |
| 3–3" ●⊗⊖ | UNDERGROUND CONCRETE ENCASED DUCTBANK |

3 – INDICATES # OF CONDUITS
3" – INDICATES SIZE OF CONDUITS
● – INDICATES CABLES TO BE INSTALLED
⊗ – INDICATES CABLES TO BE REMOVED AND INSTALLED
⊖ – INDICATES EXISTING CABLES
– INDICATES BOTTOM OF DUCTBANK
– INDICATES VIEWING DIRECTION




## LIST OF MANUFACTURERS

| SPEC. SECTION | EQUIPMENT | MANUFACTURERS | SPEC. SECTION | EQUIPMENT | MANUFACTURERS |
|---|---|---|---|---|---|
| 16110 | CONDUIT RGS | 1. ALLIED TUBE AND CONDUIT<br>2. TRIANGLE PWC INC.<br>3. WHEATLAND TUBE CO.<br>OR APPROVED EQUAL | 16190 | SUPPORTING DEVICES | 1. APPLETON<br>2. B–LINE SYSTEMS INC.<br>3. COOPER INDUSTRIES INC.<br>OR APPROVED EQUAL |
| 16110 | CONDUIT RGS PVC COATED | 1. PERMACOTE<br>2. ROBROY INDUSTRIES<br>3. KOR–KAP<br>NO SUBSTITUTION PERMITTED | 16190 | CABLE SUPPORTS, SLEEVE AND SEALS | 1. B–LINE SYSTEMS<br>2. O.Z. GEDNEY, DIV. OF GENERAL SIGNAL<br>3. THUNDERLINE/LINK SEAL<br>OR APPROVED EQUAL |
| 16120 | WIRES AND CABLES | 1. AMERICAN INSULATED WIRE CORP.<br>2. OKONITE COMPANY<br>3. PRYSMIAN CABLES AND SYSTEMS (FORMERLY PIRELLI)<br>OR APPROVED EQUAL | 16450 | GROUNDING | 1. HARGER<br>2. ERICO PRODUCTS<br>3. O.Z. GEDNEY, DIV. OF GENERAL SIGNAL<br>OR APPROVED EQUAL |
| 16120 | CABLE SPLICING AND TERMINATION | 1. BURNDY CORPORATION<br>2. CADWELD (ERICO PRODUCTS INC.)<br>3. THOMAS & BETTS CORPORATION<br>OR APPROVED EQUAL | 16475 | OVERCURRENT PROTECTIVE DEVICES | 1. GENERAL ELECTRIC COMPANY<br>2. CUTLER HAMMER<br>3. SQUARE D COMPANY<br>OR APPROVED EQUAL |
| 16133 | CONTROL PANELS, ENCLOSURES/CABINETS AND TERMINAL BOXES | 1. HOFFMAN ENGINEERING INC.<br>2. ROBROY INDUSTRIES<br>OR APPROVED EQUAL | 16140 | WIRING DEVICES | 1. COOPER INDUSTRIES INC.<br>2. GENERAL ELECTRIC COMPANY<br>3. HUBBELL INC.<br>OR APPROVED EQUAL |
| 16135 | BOXES AND FITTINGS | 1. APPLETON ELECTRIC<br>2. COOPER INDUSTRIES INC.<br>3. HUBBELL INC.<br>OR APPROVED EQUAL | | | |

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ENGINEERING DEPARTMENT

**PANYNJ**

**Traffic Standard Details**

TRAFFIC

Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# ITS GENERAL NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS



| DES | DRN | CHK |
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Date 7/29/2013

Contract Number

Drawing Number **TD500.01**

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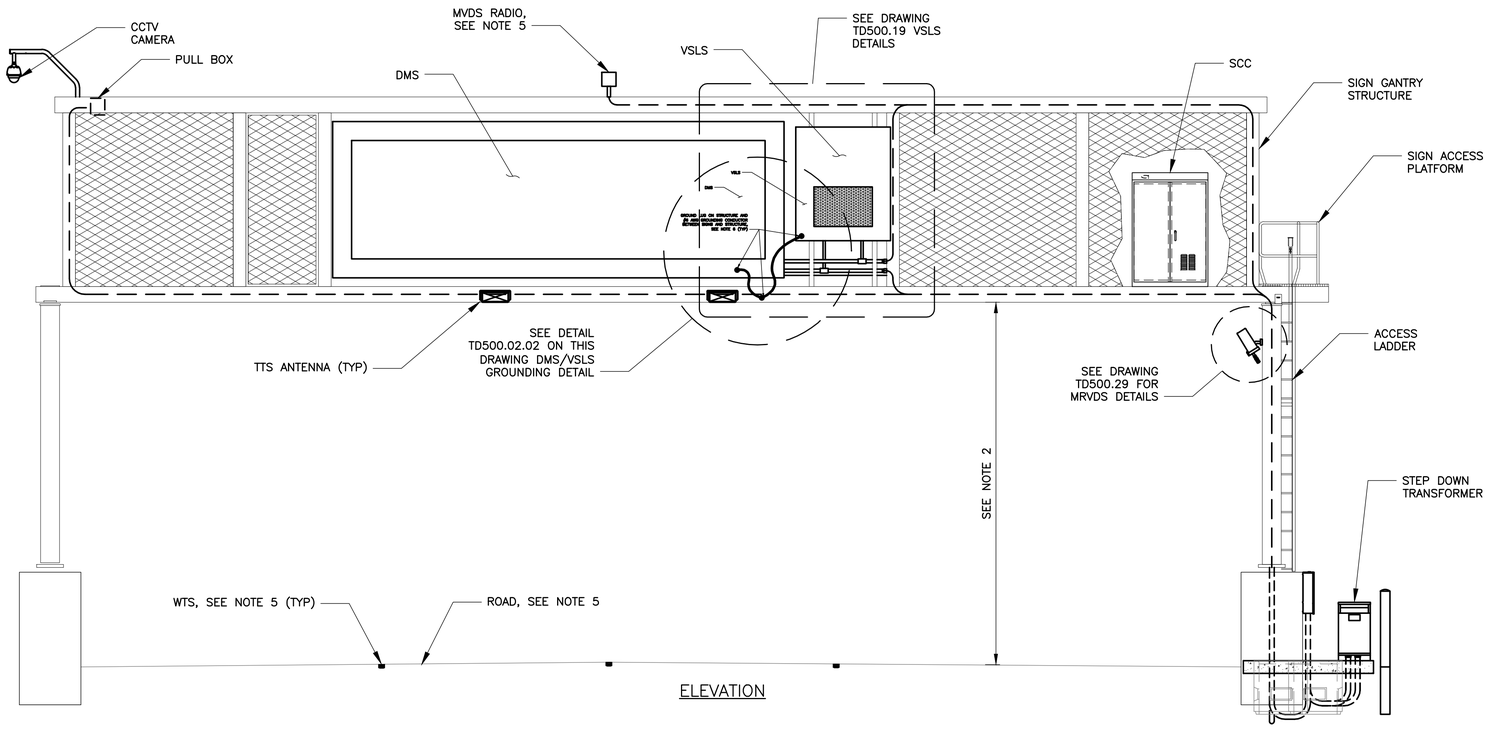
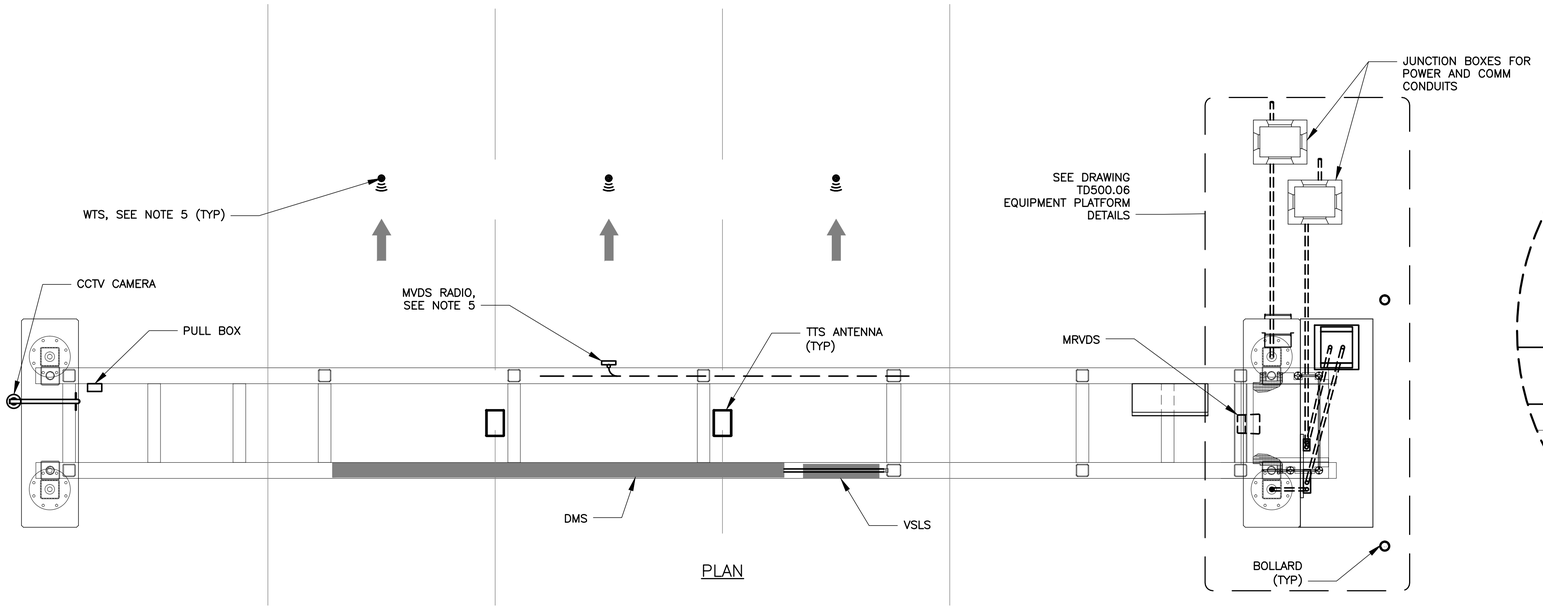



ELEVATION

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. THE MINIMUM HEIGHT OF THE SIGN STRUCTURE SHALL BE AS SHOWN ON THE STRUCTURAL DRAWINGS.
3. FOR INFORMATION ON THE WIDTH OF THE ROADWAY AND SHOULDERS SEE THE CIVIL DRAWINGS.
4. THE DIRECTION OF INCOMING SERVICE CABLES WILL VARY. SEE UTILITY DRAWINGS FOR DETAILS.
5. INSTALL WTS IN ROADWAY AS SHOWN ON THE CONTRACT DRAWINGS. SEE DRAWINGS TD500.22 AND TD500.23 FOR DETAILS.
6. FURNISH AND INSTALL GROUNDING LUG ON SIGN STRUCTURE AND GROUNDING WIRE/BOND JUMPER BETWEEN DMS AND SIGN STRUCTURE.

NOTES TO DESIGNER (REMOVE FROM DRAWING)




PLAN

GANTRY MOUNT DMS TD500.02.01

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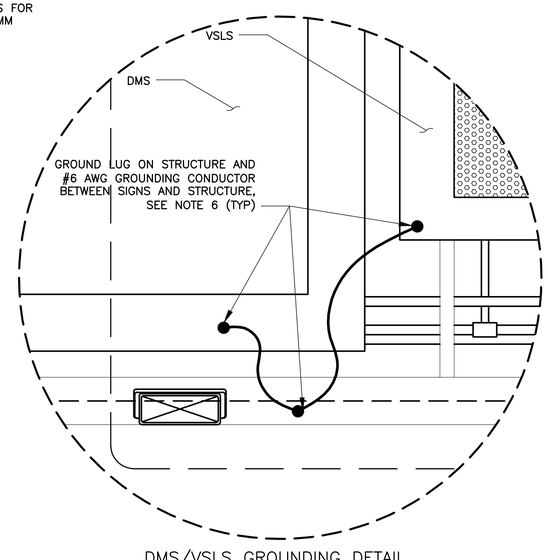


DMS/VSLS GROUNDING DETAIL TD500.02.02

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**PANYNJ Traffic Standard Details**

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Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

## GANTRY DMS DETAILS - 1



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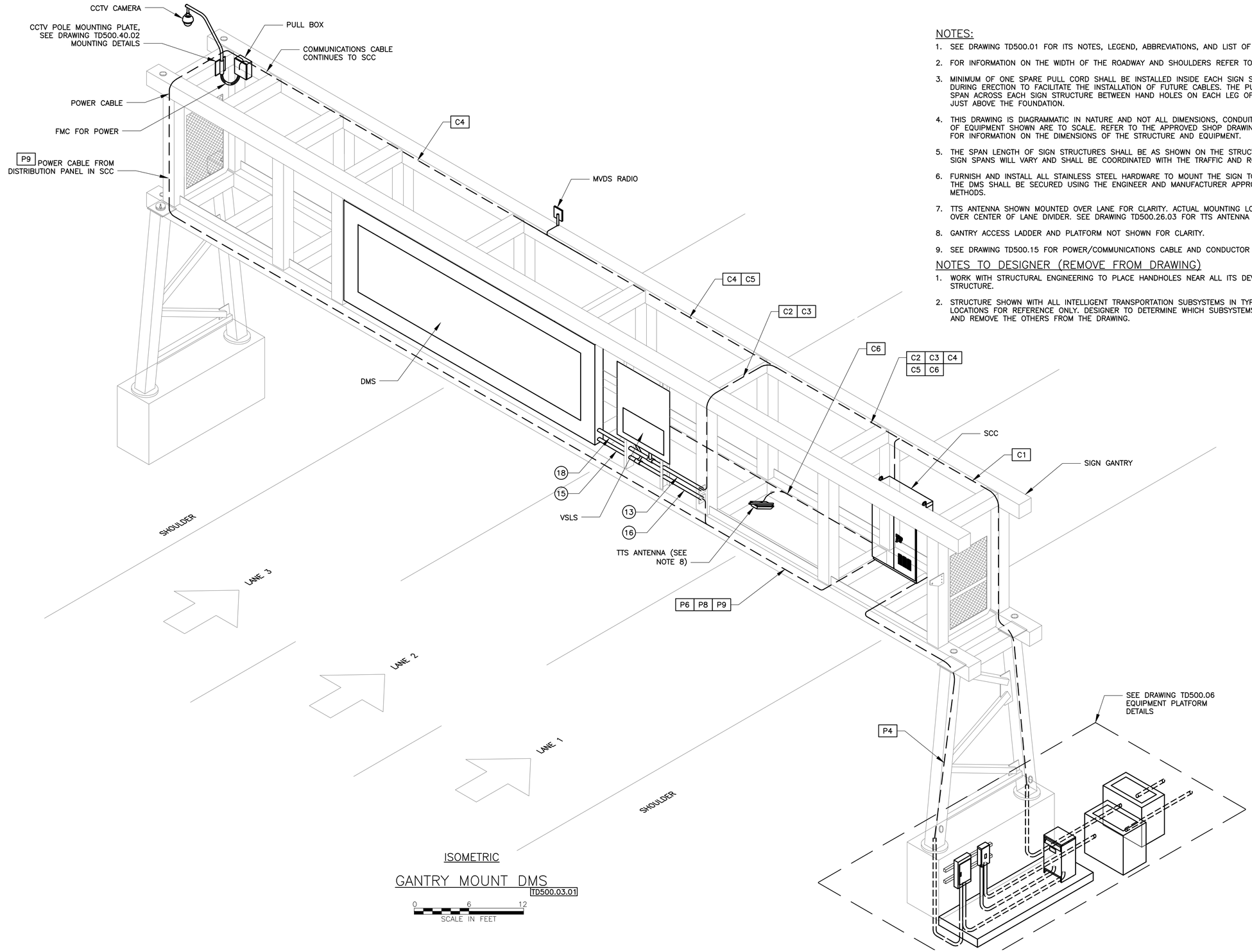


ISOMETRIC

GANTRY MOUNT DMS

TD500.03.01

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NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. FOR INFORMATION ON THE WIDTH OF THE ROADWAY AND SHOULDERS REFER TO THE CIVIL DRAWINGS.
3. MINIMUM OF ONE SPARE PULL CORD SHALL BE INSTALLED INSIDE EACH SIGN STRUCTURE CHORD DURING ERECTION TO FACILITATE THE INSTALLATION OF FUTURE CABLES. THE PULL CORDS SHALL SPAN ACROSS EACH SIGN STRUCTURE BETWEEN HAND HOLES ON EACH LEG OF THE END FRAME JUST ABOVE THE FOUNDATION.
4. THIS DRAWING IS DIAGRAMMATIC IN NATURE AND NOT ALL DIMENSIONS, CONDUITS, OR THE LOCATION OF EQUIPMENT SHOWN ARE TO SCALE. REFER TO THE APPROVED SHOP DRAWINGS AND CUT SHEETS FOR INFORMATION ON THE DIMENSIONS OF THE STRUCTURE AND EQUIPMENT.
5. THE SPAN LENGTH OF SIGN STRUCTURES SHALL BE AS SHOWN ON THE STRUCTURAL DRAWINGS. SIGN SPANS WILL VARY AND SHALL BE COORDINATED WITH THE TRAFFIC AND ROADWAY DRAWINGS.
6. FURNISH AND INSTALL ALL STAINLESS STEEL HARDWARE TO MOUNT THE SIGN TO THE STRUCTURE. THE DMS SHALL BE SECURED USING THE ENGINEER AND MANUFACTURER APPROVED MEANS AND METHODS.
7. TTS ANTENNA SHOWN MOUNTED OVER LANE FOR CLARITY. ACTUAL MOUNTING LOCATION SHALL BE OVER CENTER OF LANE DIVIDER. SEE DRAWING TD500.26.03 FOR TTS ANTENNA MOUNTING DETAILS.
8. GANTRY ACCESS LADDER AND PLATFORM NOT SHOWN FOR CLARITY.
9. SEE DRAWING TD500.15 FOR POWER/COMMUNICATIONS CABLE AND CONDUCTOR SCHEDULES.

NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. WORK WITH STRUCTURAL ENGINEERING TO PLACE HANDHOLES NEAR ALL ITS DEVICES ON GANTRY STRUCTURE.
2. STRUCTURE SHOWN WITH ALL INTELLIGENT TRANSPORTATION SUBSYSTEMS IN TYPICAL MOUNTING LOCATIONS FOR REFERENCE ONLY. DESIGNER TO DETERMINE WHICH SUBSYSTEMS ARE WARRANTED AND REMOVE THE OTHERS FROM THE DRAWING.



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INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

GANTRY DMS DETAILS - 2



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Contract Number

Drawing Number TD500.03

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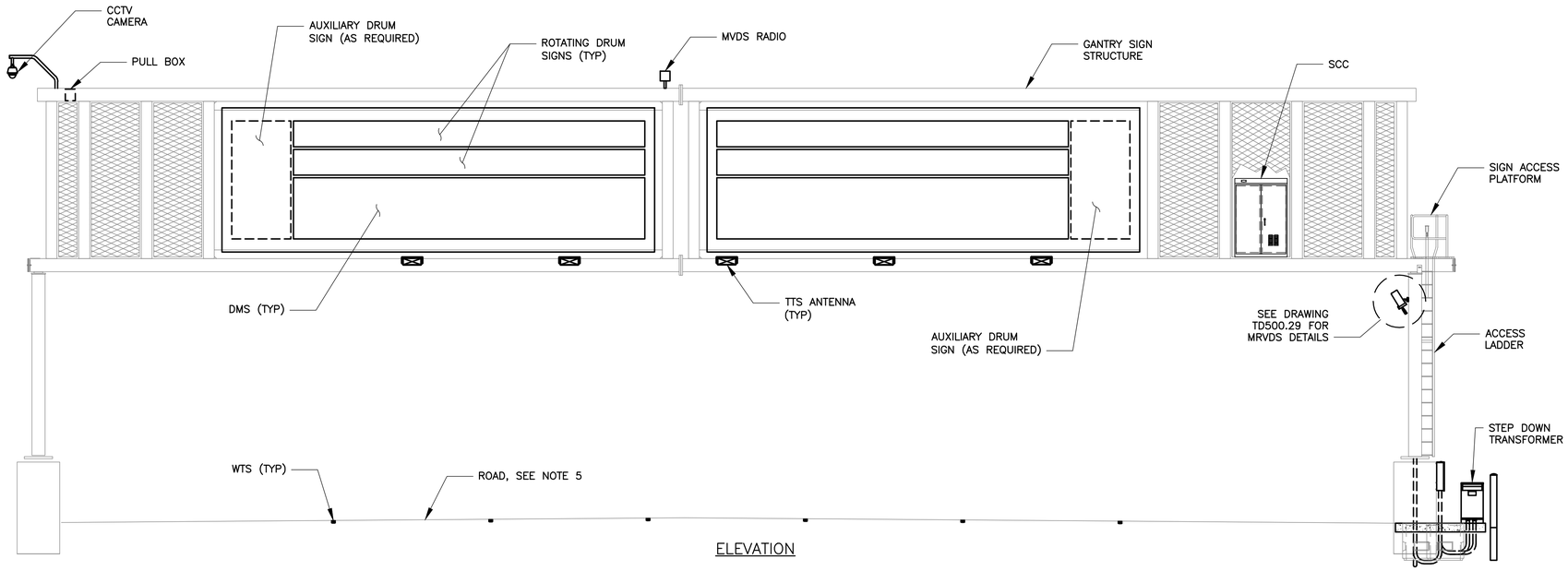
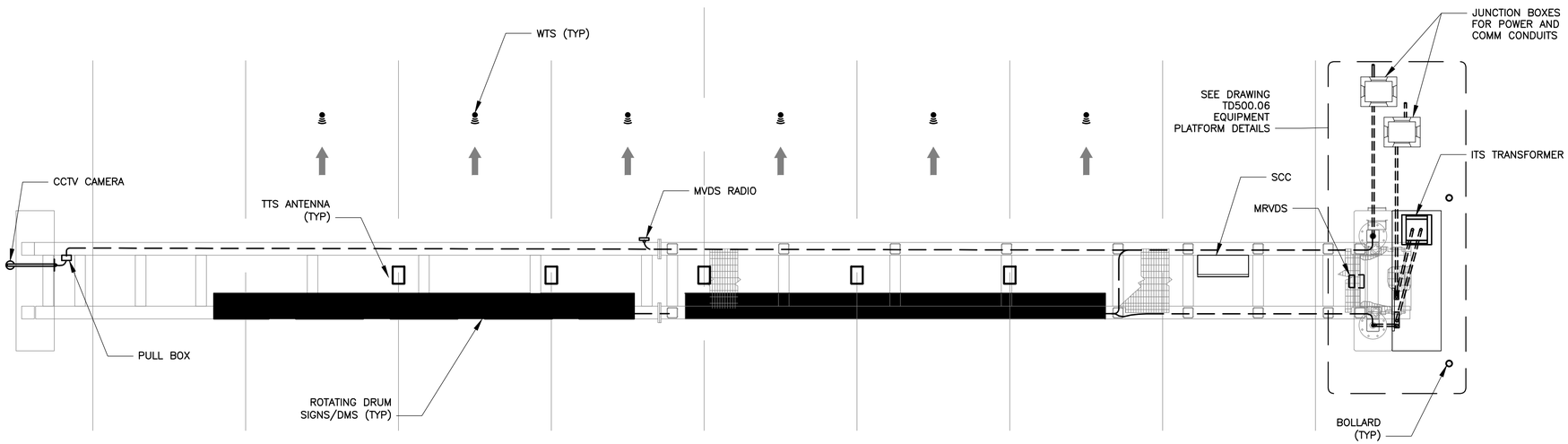



ELEVATION




PLAN

# GANTRY MOUNT HYBRID DRUM SIGN

TD500.04.01

0 6 12

SCALE IN FEET

## NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. FOR INFORMATION ON THE WIDTH OF THE ROADWAY AND SHOULDERS SEE THE CIVIL DRAWINGS.
3. MINIMUM OF ONE SPARE PULL CORD SHALL BE INSTALLED INSIDE EACH SIGN STRUCTURE CHORD DURING ERECTION TO FACILITATE THE INSTALLATION OF FUTURE CABLES. THE PULL CORDS SHALL SPAN ACROSS EACH SIGN STRUCTURE BETWEEN HAND HOLES ON EACH LEG OF THE END FRAME JUST ABOVE THE FOUNDATION.
4. THIS DRAWING IS DIAGRAMMATIC IN NATURE AND NOT ALL DIMENSIONS, CONDUITS, OR THE LOCATION OF EQUIPMENT SHOWN ARE TO SCALE. REFER TO THE APPROVED SHOP DRAWINGS AND CUT SHEETS FOR INFORMATION ON THE DIMENSIONS OF THE STRUCTURE AND EQUIPMENT.
5. THE SPAN LENGTH OF SIGN STRUCTURES SHALL BE AS SHOWN ON THE STRUCTURAL DRAWINGS. SIGN SPANS WILL VARY AND SHALL BE COORDINATED WITH THE TRAFFIC AND ROADWAY DRAWINGS.
6. FURNISH AND INSTALL ALL STAINLESS STEEL HARDWARE TO MOUNT THE SIGN TO THE STRUCTURE. THE SIGNS SHALL BE SECURED USING THE ENGINEER AND MANUFACTURER APPROVED MEANS AND METHODS.
7. TTS ANTENNA NOT SHOWN FOR CLARITY. SEE DRAWING TD500.26.03 FOR DETAILS.

## NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. WORK WITH STRUCTURAL ENGINEERING TO PLACE HANDHOLES NEAR ALL ITS DEVICES ON GANTRY STRUCTURE.
2. VSLS IS TYPICALLY NOT INSTALLED ON HYBRID DRUM SIGNS, UNLESS WARRANTED.
3. GANTRY SHOWN WITH ALL INTELLIGENT TRANSPORTATION SUBSYSTEMS IN TYPICAL MOUNTING LOCATIONS FOR REFERENCE ONLY. DESIGNER TO DETERMINE WHICH SUBSYSTEMS ARE WARRANTED AND REMOVE THE OTHERS FROM THE DRAWING.



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ENGINEERING DEPARTMENT

PANYNJ Traffic Standard Details

TRAFFIC

Title

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

GANTRY HYBRID DRUM SIGN DETAILS - 1



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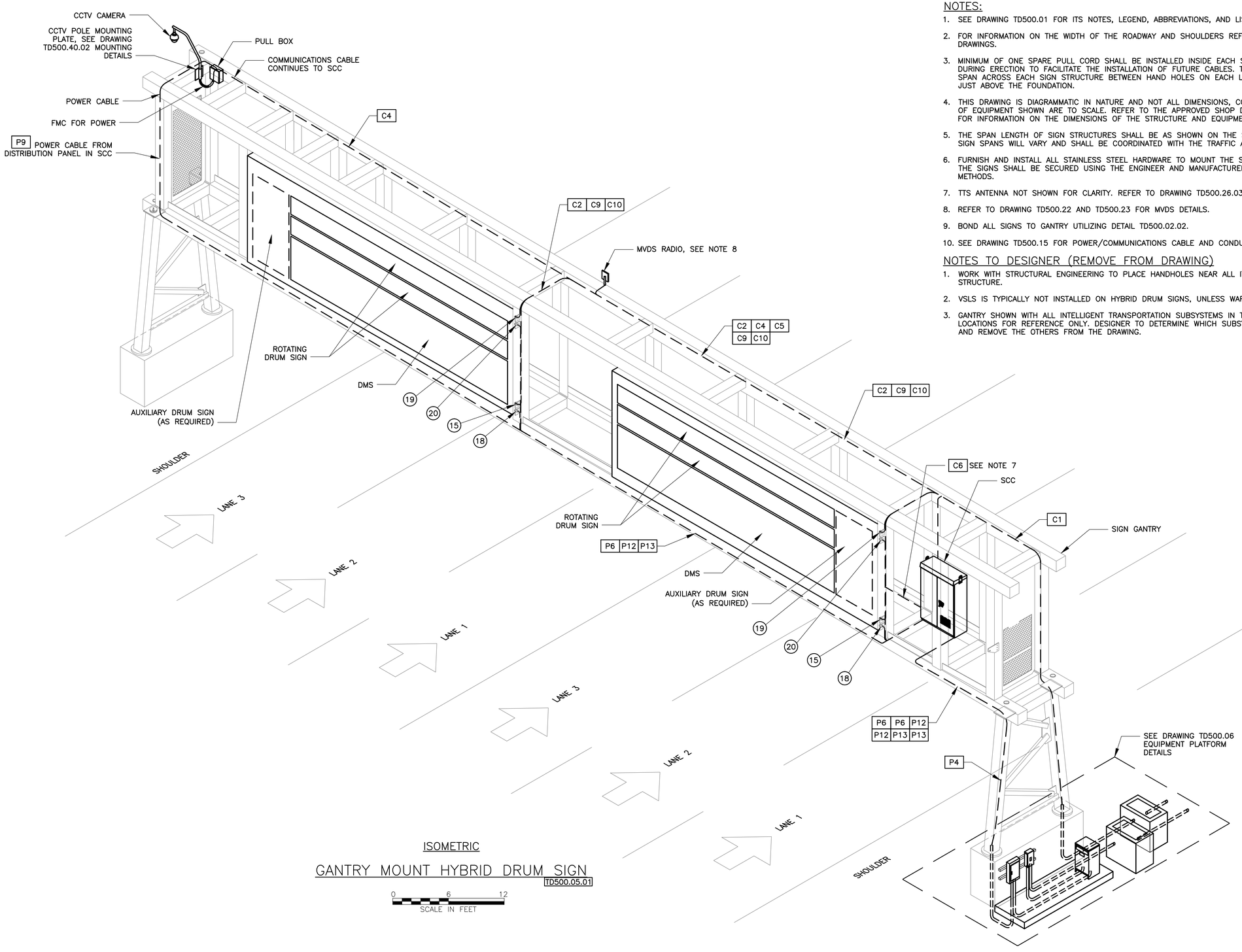


ISOMETRIC

GANTRY MOUNT HYBRID DRUM SIGN

TD500.05.01

0 6 12

SCALE IN FEET

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. FOR INFORMATION ON THE WIDTH OF THE ROADWAY AND SHOULDERS REFER TO THE CIVIL DRAWINGS.
3. MINIMUM OF ONE SPARE PULL CORD SHALL BE INSTALLED INSIDE EACH SIGN STRUCTURE CHORD DURING ERECTION TO FACILITATE THE INSTALLATION OF FUTURE CABLES. THE PULL CORDS SHALL SPAN ACROSS EACH SIGN STRUCTURE BETWEEN HAND HOLES ON EACH LEG OF THE END FRAME JUST ABOVE THE FOUNDATION.
4. THIS DRAWING IS DIAGRAMMATIC IN NATURE AND NOT ALL DIMENSIONS, CONDUITS, OR THE LOCATION OF EQUIPMENT SHOWN ARE TO SCALE. REFER TO THE APPROVED SHOP DRAWINGS AND CUT SHEETS FOR INFORMATION ON THE DIMENSIONS OF THE STRUCTURE AND EQUIPMENT.
5. THE SPAN LENGTH OF SIGN STRUCTURES SHALL BE AS SHOWN ON THE STRUCTURAL DRAWINGS. SIGN SPANS WILL VARY AND SHALL BE COORDINATED WITH THE TRAFFIC AND ROADWAY DRAWINGS.
6. FURNISH AND INSTALL ALL STAINLESS STEEL HARDWARE TO MOUNT THE SIGN TO THE STRUCTURE. THE SIGNS SHALL BE SECURED USING THE ENGINEER AND MANUFACTURER APPROVED MEANS AND METHODS.
7. TTS ANTENNA NOT SHOWN FOR CLARITY. REFER TO DRAWING TD500.26.03 FOR DETAILS.
8. REFER TO DRAWING TD500.22 AND TD500.23 FOR MVDS DETAILS.
9. BOND ALL SIGNS TO GANTRY UTILIZING DETAIL TD500.02.02.
10. SEE DRAWING TD500.15 FOR POWER/COMMUNICATIONS CABLE AND CONDUCTOR SCHEDULES.

NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. WORK WITH STRUCTURAL ENGINEERING TO PLACE HANDHOLES NEAR ALL ITS DEVICES ON GANTRY STRUCTURE.
2. VSLS IS TYPICALLY NOT INSTALLED ON HYBRID DRUM SIGNS, UNLESS WARRANTED.
3. GANTRY SHOWN WITH ALL INTELLIGENT TRANSPORTATION SUBSYSTEMS IN TYPICAL MOUNTING LOCATIONS FOR REFERENCE ONLY. DESIGNER TO DETERMINE WHICH SUBSYSTEMS ARE WARRANTED AND REMOVE THE OTHERS FROM THE DRAWING.



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INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

# GANTRY HYBRID DRUM SIGN DETAILS - 2



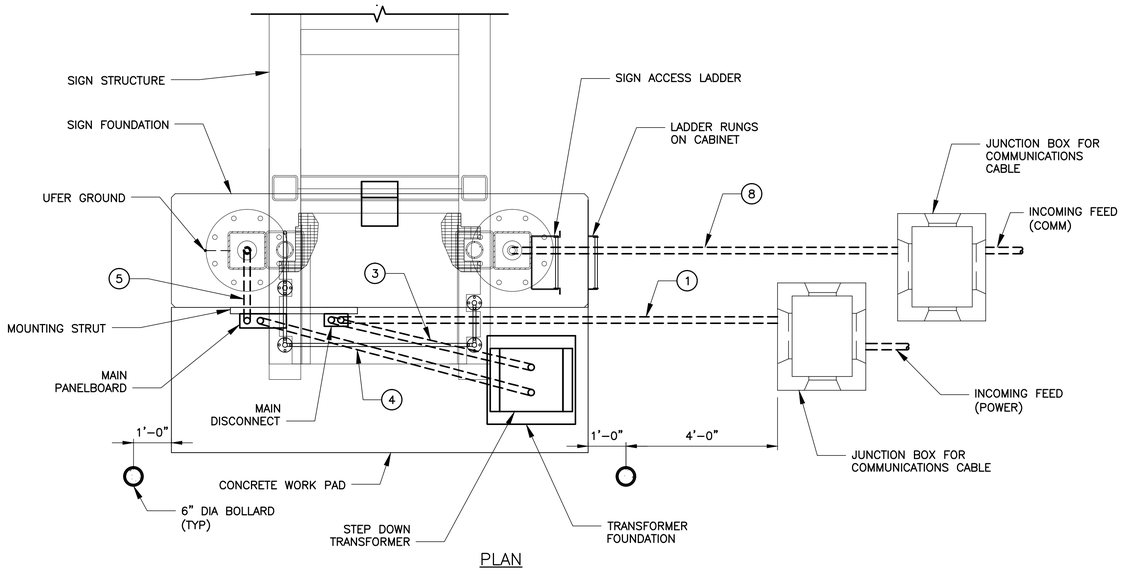
| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

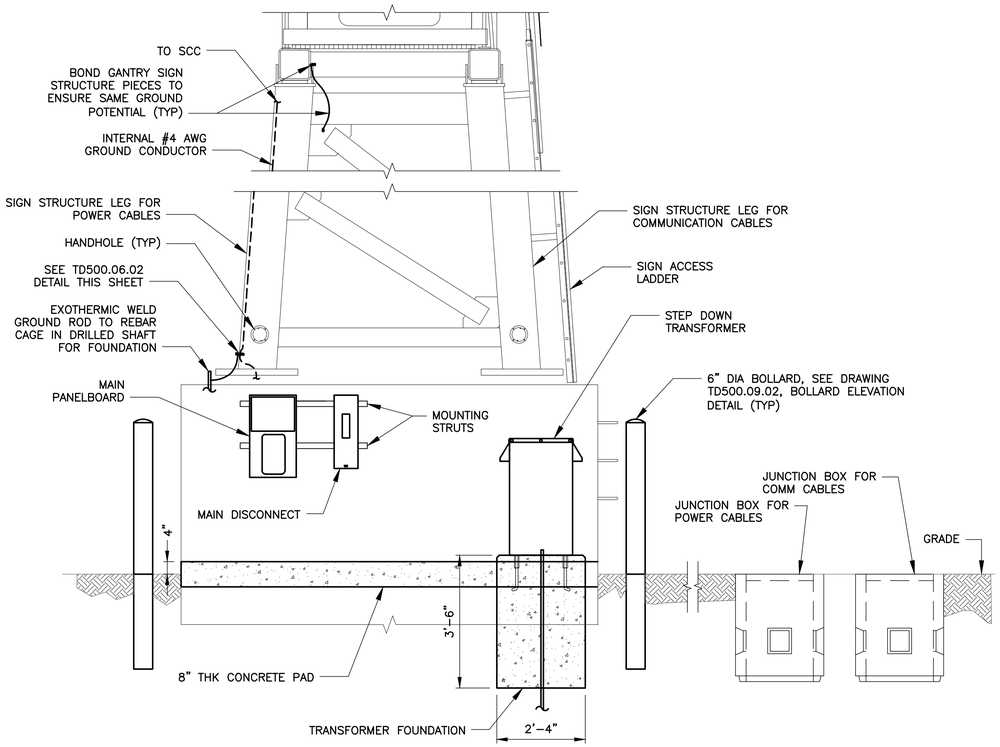
Contract Number

Drawing Number TD500.05

PID#




PLAN




ELEVATION

## DMS/HYBRID SIGN EQUIPMENT PLATFORM

TD500.06.01

0 2 4

SCALE IN FEET

## NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. THE STEP DOWN TRANSFORMER SHALL BE INSTALLED ON THE SIDE OF THE FOUNDATION OPPOSITE TRAFFIC.
3. THERE SHALL BE A MINIMUM OF 3' OF CLEARANCE BETWEEN AND IN FRONT OF ALL ELECTRICAL EQUIPMENT.
4. THE HEIGHT OF THE SIGN FOUNDATION ABOVE GRADE WILL VARY FROM SITE TO SITE. THE BOTTOM OF ANY ELECTRICAL EQUIPMENT MOUNTED TO THE SIGN FOUNDATION SHALL BE A MINIMUM OF 24" ABOVE THE CONCRETE WORK PAD.
5. THE ELECTRICAL EQUIPMENT MOUNTED TO THE SIGN FOUNDATION FACE SHALL BE LEFT JUSTIFIED AND SEPARATED BY 6", AT A MINIMUM, BETWEEN PANELS.
6. SEE ADDITIONAL CONDUIT ROUTING DETAILS ON DRAWINGS TD500.02 THROUGH TD500.05. SEE DRAWING TD500.15 FOR CONDUIT AND CABLE SCHEDULES.
7. JUNCTION BOX SHALL BE INSTALLED A MINIMUM OF 2 FEET FROM WORK PAD.
8. ALL GROUNDING HARDWARE SHALL BE STAINLESS STEEL.
9. WHERE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IS NOT SHOWN ON THE DRAWINGS, PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.
10. SCC SHALL BE GROUNDED THROUGH AN INTERNAL GROUND CONDUCTOR TAPPED TO THE SIGN STRUCTURE LEG. TRANSFORMER, MAIN PANELBOARD, AND MAIN DISCONNECT SHALL BE TAPPED TO THE SIGN STRUCTURE LEG VIA GROUND CONDUCTOR INSTALLED INSIDE THE CONDUIT. SIGN STRUCTURE SHALL BE GROUNDED TO THE GROUND ROD INSTALLED INSIDE THE FOUNDATION AS SHOWN ON THE TD500.06.02 UFER GROUND DETAIL.
11. GROUND ROD SHALL BE INSTALLED INSIDE THE CONCRETE FOUNDATION AND ATTACHED TO DRILLED SHAFT AT TWO PLACES, MINIMUM 12" APART. GROUND ROD SHALL BE ATTACHED TO DRILLED SHAFT USING COMPRESSION GROUND TAP CONNECTOR, AS MANUFACTURED BY BLACKBURN OR APPROVED EQUAL. GROUND ROD SHALL HAVE SLIGHT "S" BEND TO AVOID INTERFERENCE WITH ANCHOR BOLTS. GROUND ROD SHALL NOT BE EXTENDED BEYOND 3" ABOVE FINISHED FOUNDATION PEDESTAL. ALTERNATIVE GROUND CONNECTION METHODS SHALL BE SUBMITTED FOR APPROVAL TO THE ENGINEER.
12. ALL GROUNDING CONDUCTORS SHALL HAVE GREEN OUTER INSULATION.

## NOTES TO DESIGNER (REMOVE FROM DRAWING)

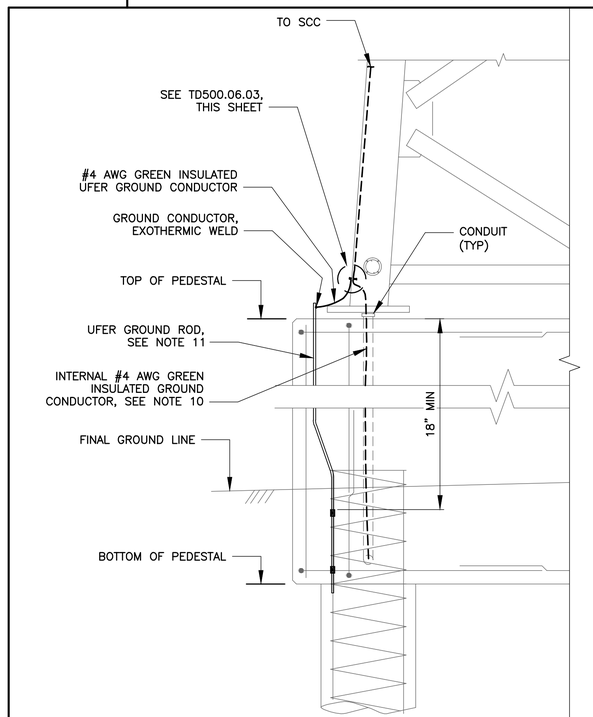
1. PASS THE FOLLOWING TYPICAL NOTES ON TO THE CIVIL ENGINEER DESIGNING THE EQUIPMENT PADS:

1.1. THE CONCRETE WORK PAD SHALL BE A MINIMUM OF 8" THICK AND SHALL HAVE AN EXPOSED LIP OF 4" ABOVE GRADE. IT SHALL BE CONSTRUCTED WITH A LAYER OF WWF6 x 6–W11 x W11 FABRIC ALONG ITS BOTTOM. THE SIZE AND DEPTH OF THE CONCRETE WORK PAD WILL VARY DEPENDING ON FIELD CONDITIONS. A 6" LAYER OF AGGREGATE COARSE BASE SHALL BE INSTALLED UNDER THE WORK PAD. A FOUNDATION FOR THE SCC AND TRANSFORMER SHALL BE PROVIDED ALONG WITH THE WORK PAD, INCLUDING ANCHOR BOLTS, SIZED AS REQUIRED BY THE MANUFACTURER.

1.2. CONSTRUCT THE CONCRETE WORK PAD WITH AN EXPANSION JOINT IN–LINE WITH POINT WHERE THE PAD MAKES A 90° BEND AROUND THE SIGN FOUNDATION.

1.3. EQUIPMENT PLATFORM SHALL BE CONSTRUCTED WITH A 2% SLOPE. FOUNDATIONS SHALL BE CAST SEPARATELY AND RAISED 2" ABOVE CONCRETE PLATFORM.

2. COORDINATE THE PLACEMENT OF THE IN FOUNDATION GROUND ROD WITH THE CIVIL ENGINEER IN CHARGE OF FOUNDATION DESIGN.



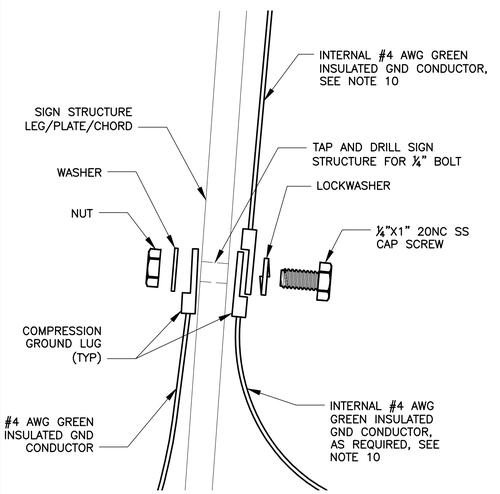

ELEVATION

## DRILLED SHAFT PEDESTAL UFER GROUND

TD500.06.02

0 2 4

SCALE IN FEET




## SIGN GROUNDING DETAIL

TD500.06.03

0 1 2 3

SCALE IN INCHES



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# DMS/HYBRID SIGN EQUIPMENT PLATFORM



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number TD500.06

PID#

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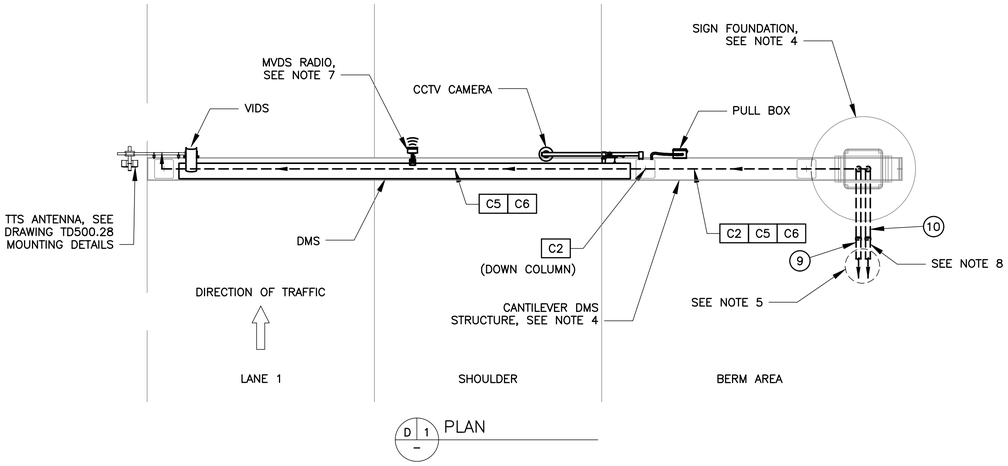
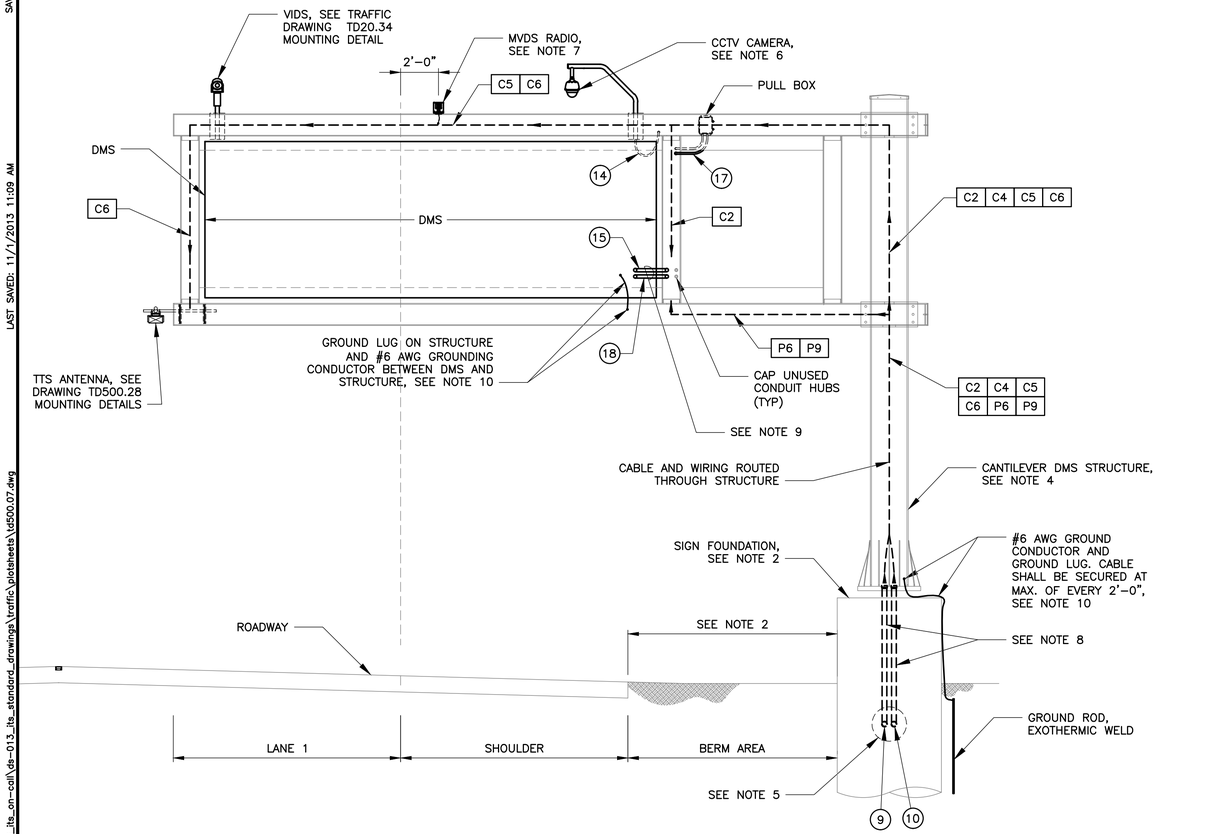



D 1 – PLAN




E 1 – FRONT ELEVATION

CANTILEVER TD500.07

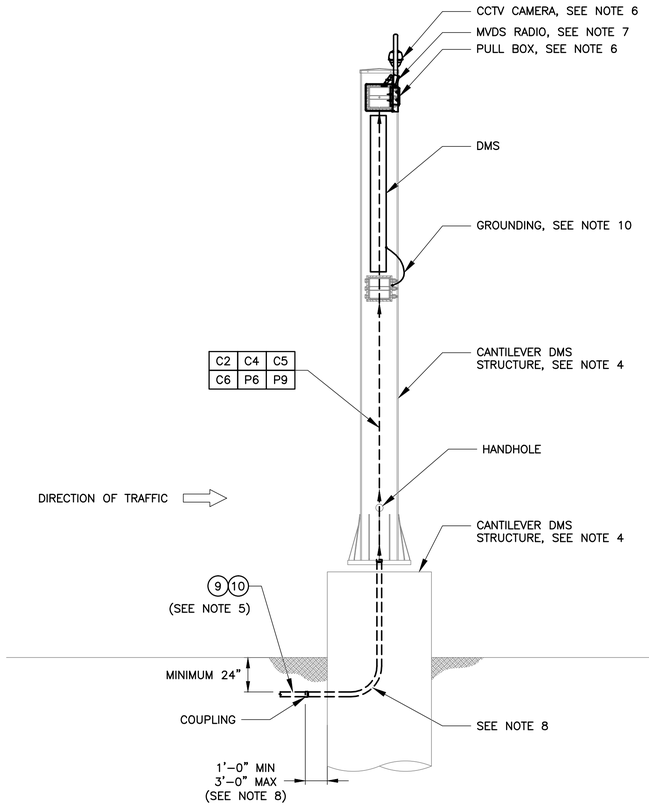
0 4 8
SCALE IN FEET

## NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. SEE CIVIL DRAWINGS FOR LOCATION AND INSTALLATION OF GUIDE RAIL.
3. THREE (3) WIRELESS TRAFFIC SENSORS SHALL BE INSTALLED ALONG THE CENTERLINE OF EACH TRAVEL LANE OF TRAFFIC AS SHOWN ON THE DRAWINGS. SEE DRAWINGS TD500.22 AND TD500.23 FOR MORE INFORMATION.
4. FOR DETAILS OF THE CANTILEVER SIGN STRUCTURE AND FOUNDATION SEE STRUCTURAL DRAWINGS.
5. POWER AND COMMUNICATIONS CONDUITS SHALL CONTINUE AS SHOWN ON THE ITS DRAWINGS. SEE DRAWING TD500.09 FOR ADDITIONAL DETAILS ON THE EQUIPMENT PAD. CONDUIT(S) MAY BE MODIFIED TO ENTER THE SIGN FOUNDATION FROM AN ALTERNATE DIRECTION FROM THAT SHOWN ON THIS DETAIL WHERE APPROVED BY THE ENGINEER.
6. THE CCTV CAMERA MOUNT AND PULL BOX SHALL BE FURNISHED AND INSTALLED ON THE REAR OF THE CANTILEVER STRUCTURE IN SIMILAR FASHION TO THE DETAILS SHOWN ON DRAWING TD500.37.
7. SEE DRAWING TD500.22 AND TD500.23 FOR INSTALLATION DETAILS OF MVDS RADIO.
8. CONDUITS 9 AND 10 SHALL TRANSITION FROM RNMC TO PCRMC AS THEY ENTER THE SIGN STRUCTURE FOUNDATION. GROUND CONDUIT AS REQUIRED PER NEC.
9. CONDUITS 13 AND 18 SHALL BE INSTALLED UTILIZING LB TYPE FITTINGS BETWEEN THE STRUCTURE AND DMS.
10. FURNISH AND INSTALL GROUNDING LUG ON SIGN STRUCTURE AND GROUNDING WIRE/BONDING JUMPER BETWEEN DMS AND SIGN STRUCTURE.

## NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. WORK WITH STRUCTURAL ENGINEERING TO PLACE HANDHOLES NEAR ALL ITS DEVICES ON STRUCTURE.
2. STRUCTURE SHOWN WITH ALL INTELLIGENT TRANSPORTATION SUBSYSTEMS IN TYPICAL MOUNTING LOCATIONS FOR REFERENCE ONLY. DESIGNER TO DETERMINE WHICH SUBSYSTEMS ARE WARRANTED AND REMOVE THE OTHERS FROM THE DRAWING.




E 2 – FRONT ELEVATION

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# CANTILEVER DMS DETAILS



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number **TD500.07**

PID#

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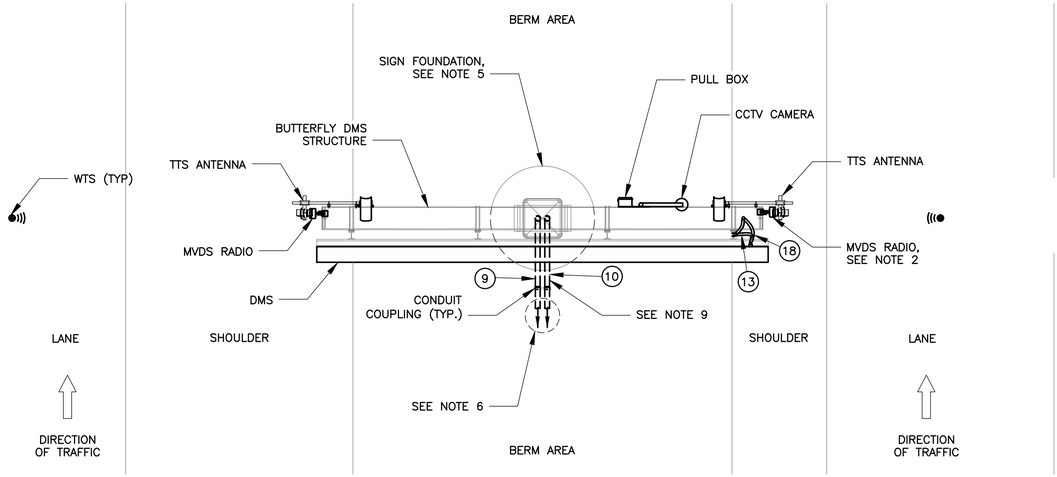
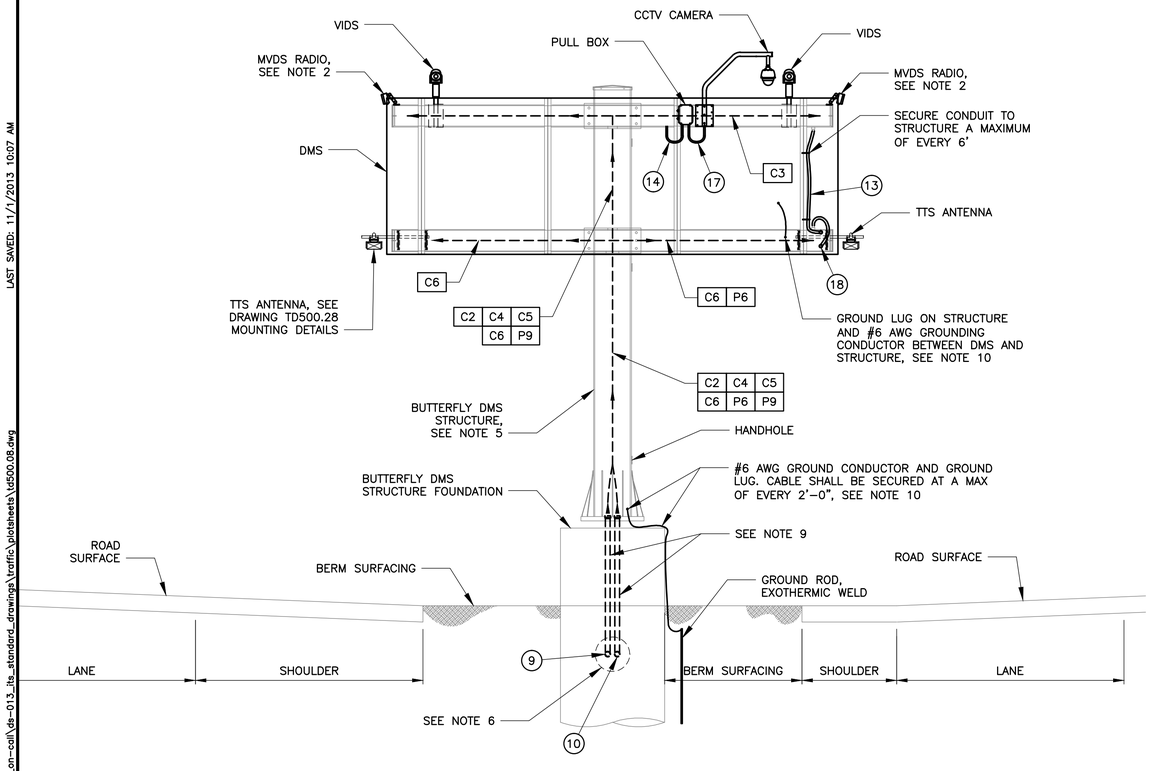



## NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. SEE DRAWINGS TD500.22 AND TD500.23 FOR MVDS INSTALLATION DETAILS.
3. SEE CIVIL DRAWINGS FOR LOCATION OF GUIDE RAIL.
4. THREE (3) WIRELESS TRAFFIC SENSORS SHALL BE INSTALLED ALONG THE CENTERLINE OF EACH TRAVEL LANE. SEE DRAWING TD500.23 FOR DETAILS.
5. FOR DETAILS OF THE BUTTERFLY SIGN STRUCTURE AND FOUNDATION SEE STRUCTURAL DRAWINGS.
6. POWER AND COMMUNICATIONS CONDUIT SHALL CONTINUE AS SHOWN ON THE ITS DRAWINGS. SEE DRAWING TD500.09 FOR ADDITIONAL DETAILS ON THE EQUIPMENT PAD. CONDUIT(S) MAY BE MODIFIED TO ENTER THE SIGN FOUNDATION FROM AN ALTERNATE DIRECTION FROM THAT SHOWN ON THIS DETAIL WHERE APPROVED BY THE ENGINEER.
7. THE CCTV CAMERA AND PULL BOX SHALL BE MOUNTED AND INSTALLED SIMILAR TO THE DETAILS SHOWN ON DRAWING TD500.40. FINAL LOCATIONS TO BE COORDINATED WITH THE ENGINEER.
8. DIMENSIONS OF LANES, SHOULDERS AND CHARACTERISTICS OF ROADWAY WILL VARY DEPENDING ON FIELD CONDITIONS. SEE CIVIL DRAWINGS FOR LOCATIONS TO INSTALL BUTTERFLY DMS STRUCTURES.
9. CONDUITS 9 AND 10 SHALL TRANSITION FROM RNMC TO PCRMC AS THEY ENTER THE SIGN STRUCTURE FOUNDATION. GROUND CONDUIT AS REQUIRED PER NEC.
10. FURNISH AND INSTALL GROUNDING LUG ON SIGN STRUCTURE AND GROUNDING WIRE/BONDING JUMPER BETWEEN DMS AND SIGN STRUCTURE.
11. SEE DRAWING TD500.15 FOR CONDUIT AND CABLE SCHEDULES.

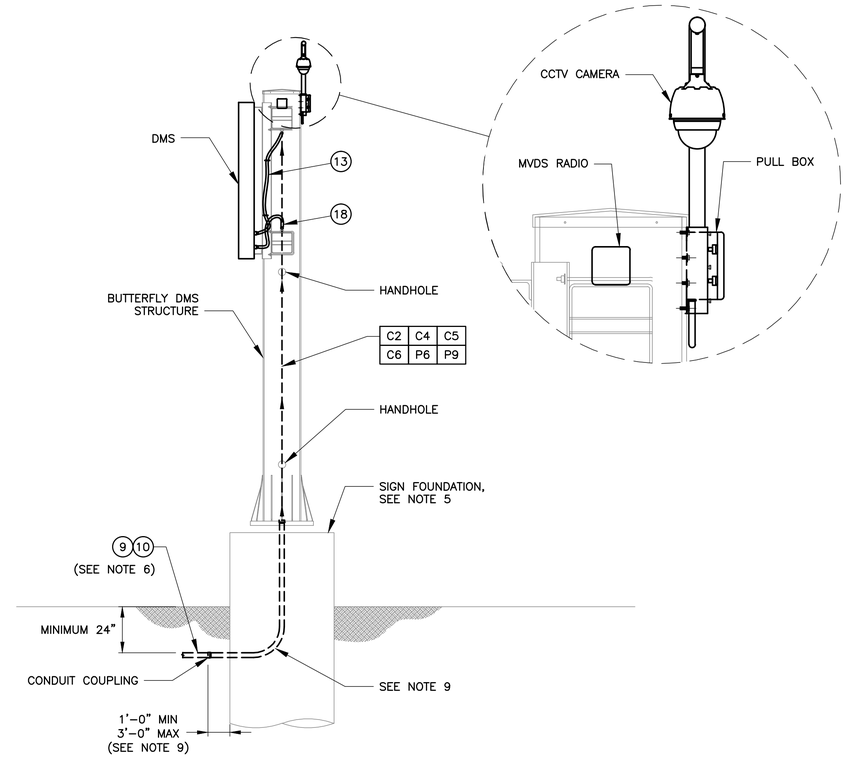
## NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. WORK WITH STRUCTURAL ENGINEERING TO PLACE HANDHOLES NEAR ALL ITS DEVICES ON STRUCTURE.
2. STRUCTURE SHOWN WITH ALL INTELLIGENT TRANSPORTATION SUBSYSTEMS IN TYPICAL MOUNTING LOCATIONS FOR REFERENCE ONLY. DESIGNER TO DETERMINE WHICH SUBSYSTEMS ARE WARRANTED AND REMOVE THE OTHERS FROM THE DRAWING.




BUTTERFLY SIGN
TD500.08

0 4 8
SCALE IN FEET

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Title
**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# BUTTERFLY DMS DETAILS



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number **TD500.08**

PID#

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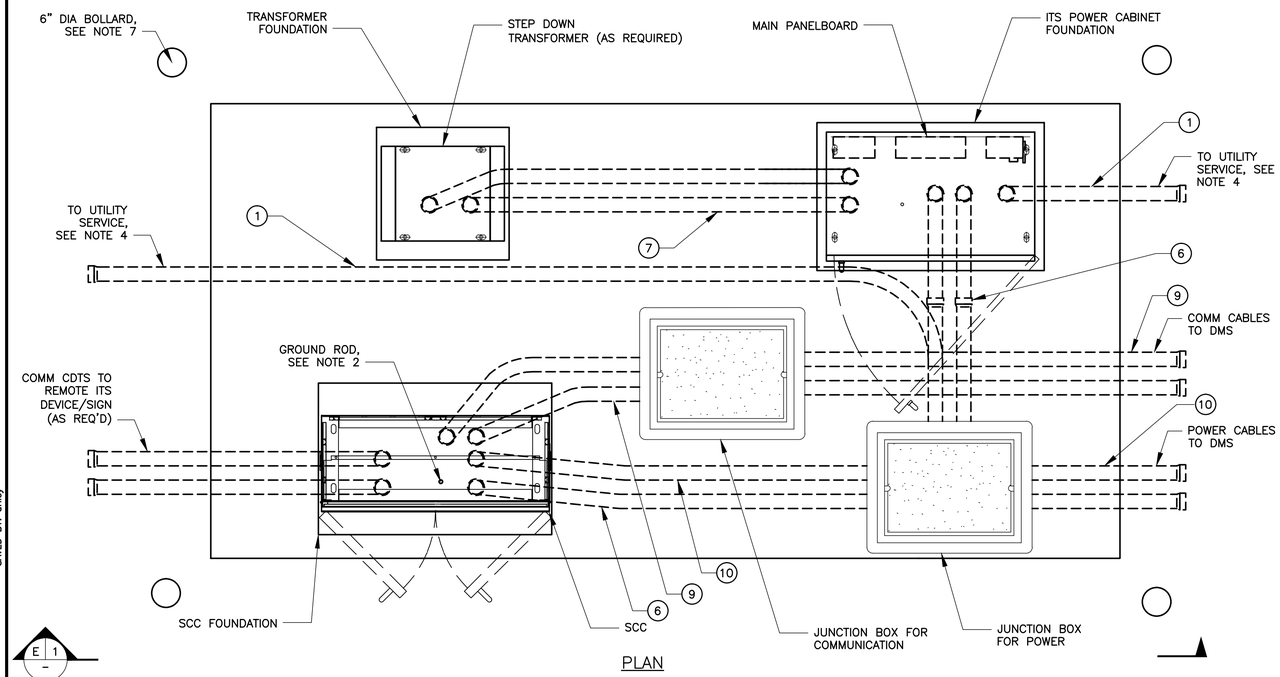
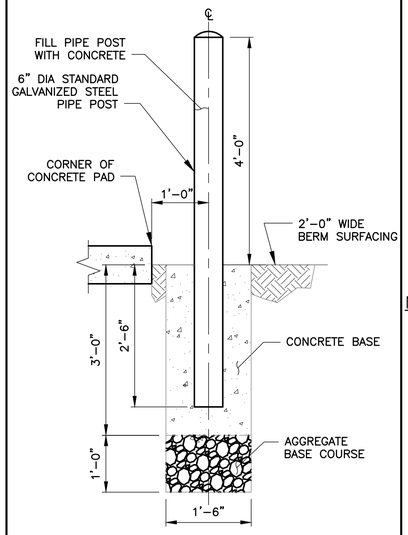



PLAN




BOLLARD ELEVATION DETAIL TD500.09.02

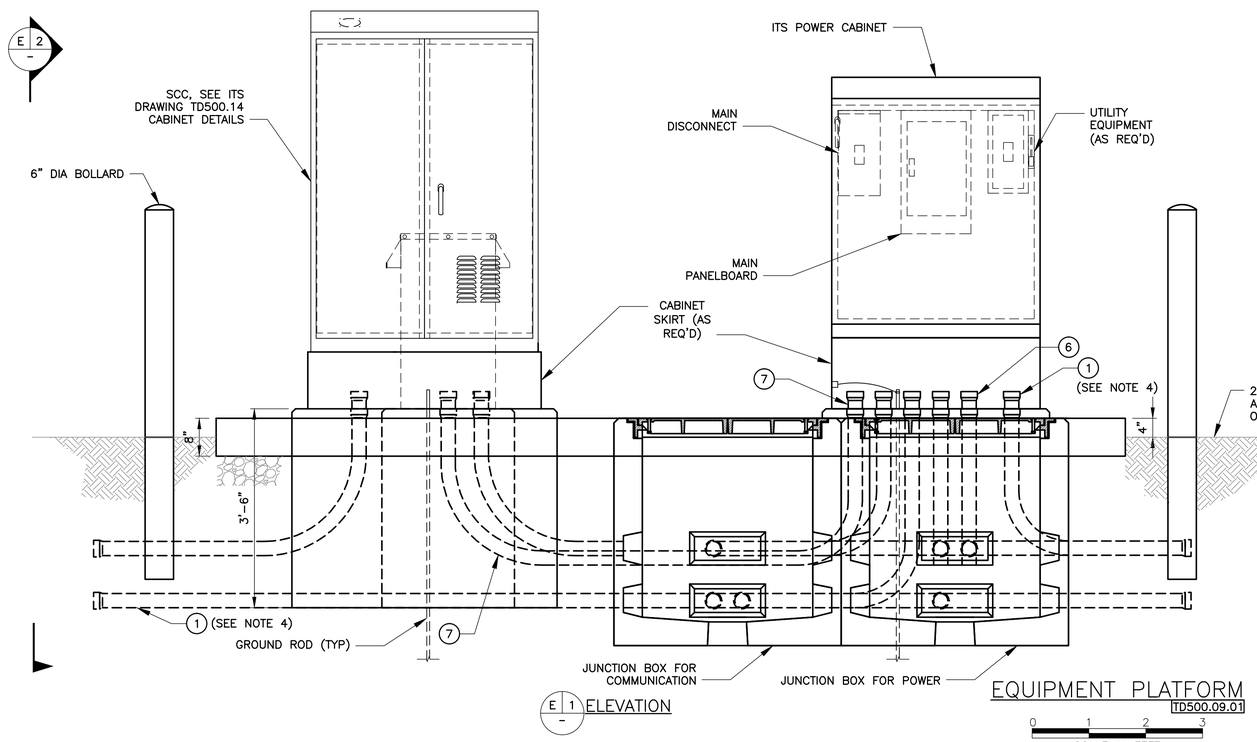
SCALE IN FEET

## NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. INSTALL A 10' X 3/4" GROUND ROD THROUGH THE FOUNDATION OF THE LOAD CENTER. SEE SECTION 16450 OF THE STANDARD SPECIFICATIONS FOR MORE INFORMATION.
3. THE STEP DOWN TRANSFORMER AND MAIN DISCONNECT WITH ASSOCIATED WIRING SHALL BE INSTALLED WHERE REQUIRED AND DIRECTED ON THE DRAWINGS.
4. EITHER CONDUIT MAY BE USED TO PULL CABLES DEPENDING ON THE DIRECTION FROM WHICH THE INCOMING UTILITY SERVICE ENTERS THE INSTALLATION SITE.
5. ALL CONDUIT SHOWN ON THIS SHEET SHALL BE 3" RNMC-40 UNLESS NOTED OTHERWISE.
6. SPARE CONDUIT(S) NOT LABELED OR IDENTIFIED ON THIS SHEET SHALL BE 3" RNMC-40 AND BE CAPPED FOR FUTURE USE. USE AS DIRECTED ON THE CONTRACT DRAWINGS.
7. SPARE CONDUIT SHALL BE STUBBED AND CAPPED APPROXIMATELY 18"-24" AWAY FROM WORK PAD AND ANY FOUNDATIONS.
8. SEE DRAWING TD500.15 FOR CONDUIT AND CABLE SCHEDULES.

## NOTES TO DESIGNER (REMOVE FROM DRAWING)

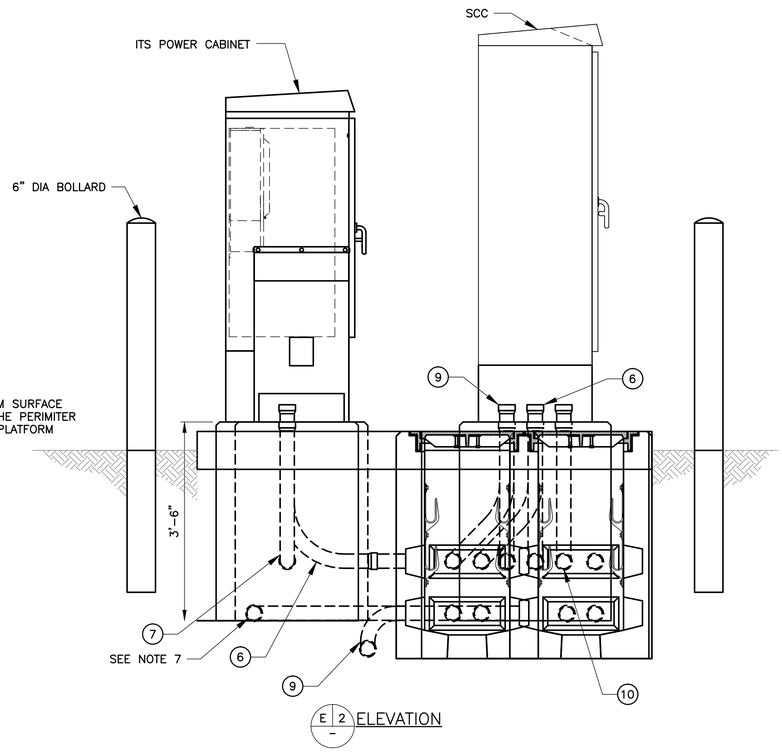
1. A TYPICAL BOLLARD LAYOUT FOR PROTECITON OF EQUIPMENT IS SHOWN. WORK WITH CIVIL ENGINEERING TO PROVIDE THE FINAL LAYOUT. SEE TD500.09.02 FOR TYPICAL BOLLARD DETAIL.
2. PASS THE FOLLOWING TYPICAL NOTES ON TO THE CIVIL ENGINEER DESIGNING THE EQUIPMENT PAD AND BOLLARDS:
   - 2.1. THE CONCRETE WORK PAD SHALL BE A MINIMUM OF 8" THICK AND SHALL HAVE AN EXPOSED LIP OF 4" ABOVE GRADE. IT SHALL BE CONSTRUCTED WITH A LAYER OF WWF6 X 6-W11 X W11 FABRIC ALONG THE BASE. THE SIZE AND DEPTH OF THE CONCRETE WORK PAD WILL VARY DEPENDING ON FIELD CONDITIONS.
   - 2.2. A 6" LAYER OF AGGREGATE BASE COURSE SHALL BE INSTALLED UNDER THE CONCRETE WORK PAD.
   - 2.3. ALL EQUIPMENT PLATFORMS SHALL BE CONSTRUCTED WITH 2% SLOPE. EQUIPMENT FOUNDATIONS SHALL BE LEVEL AND RAISED 1-2" ABOVE PLATFORM AND SHALL BE CONSTRUCTED WITH ANCHOR BOLTS TO SECURE EQUIPMENT TO FOUNDATION.
3. COORDINATE THE PLACEMENT OF THE IN FOUNDATION GROUND ROD WITH THE CIVIL ENGINEER IN CHARGE OF FOUNDATION DESIGN.




E 1 – ELEVATION

EQUIPMENT PLATFORM TD500.09.01

SCALE IN FEET




E 2 – ELEVATION

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# CANTILEVER/BUTTERFLY DMS EQUIPMENT PAD DETAILS



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |
| Date | 7/29/2013 | |
| Contract Number | | |
| Drawing Number | TD500.09 | |
| PID# | | |

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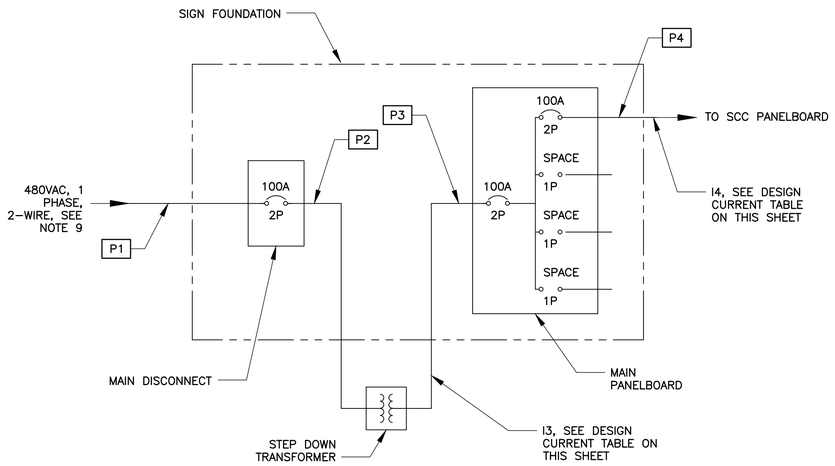



## SINGLE DMS SIGN 480VAC POWER SOURCE

TD500.10.02

| SCC PANELBOARD DESIGN LOAD (VA)* | | | |
|---|---|---|---|
| EQUIPMENT | LEG A | LEG B | TOTAL |
| DMS | 6667 | 4445 | 11112 |
| UPS | – | 2222 | 2222 |
| SPARE | 2933 | 2933 | 5866 |
| TOTAL | 9600 | 9600 | 19200 |

| DESIGN CURRENT (A) | | | | | |
|---|---|---|---|---|---|
| I1 | I2 | I3 | I4 | I5 | I6 |
| 80 | 156 | | 56 | 25 | 15 |

| MAIN DISCONNECT | | |
|---|---|---|
| POWER DISTRIBUTION FOR: | CIRCUIT BREAKER: | ENCLOSURE: |
| 120/240VAC | SQUARE D # FAL22100 | SQUARE D # FA100RB |
| 480VAC | SQUARE D # FAL24100 | SQUARE D # FA100RB |

## POWER DESIGN VALUES

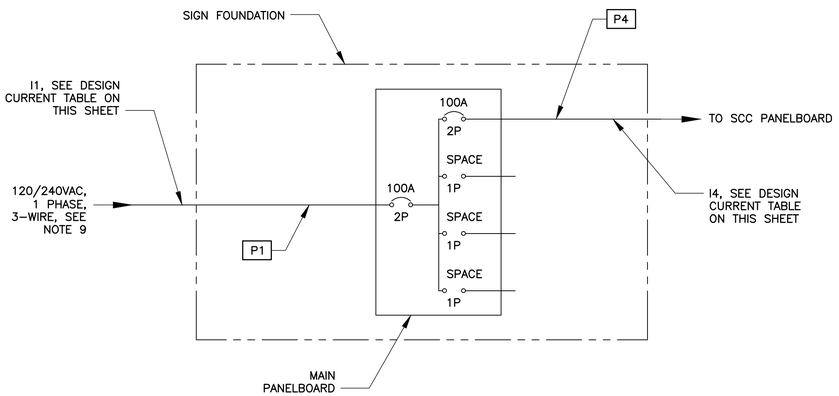
TD500.10.03

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. SEE THE RESPECTIVE ITS DRAWINGS FOR LOCATIONS OF ITS EQUIPMENT AND ROUTING OF CONDUIT IDENTIFIED ON THIS DRAWING.
3. REFER TO PANEL SCHEDULES FOR EXACT EQUIPMENT AND CIRCUIT BREAKER LAYOUTS.
4. JUNCTION BOXES AND CONDUIT SHALL BE INSTALLED AS REQUIRED ON THE CONTRACT DRAWINGS FOR POWER DISTRIBUTION.
5. ALL REQUIRED EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH ARTICLE 250 OF THE NEC WHETHER SPECIFICALLY IDENTIFIED OR NOT.
6. SEE DMS INSTALLATION DETAILS FOR INFORMATION ON CONDUITS AND CABLES AS WELL AS EQUIPMENT SHOWN ON THIS SHEET.
7. FOR DETAILS ON THE TYPE OF ELECTRONIC EQUIPMENT INSTALLED IN THE SCC, SEE DRAWING TD500.14.
8. SEE DRAWING TD500.11 FOR COMMUNICATIONS DIAGRAM.

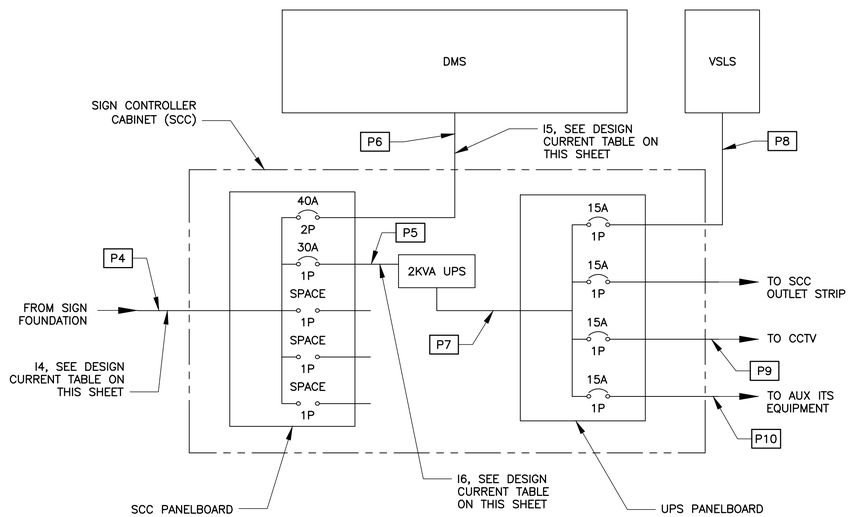
NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. THE POWER DISTRIBUTION DIAGRAMS ARE BASED UPON TYPICAL DESIGN LOADS. DESIGNER SHALL FINALIZE ALL VALUES BASED UPON ACTUAL MANUFACTURERS LOADS UTILIZED AS THE BASIS FOR THE DESIGN.
2. POWER EQUIPMENT, SUCH AS METER CABINETS, SHALL BE COORDINATED WITH THE UTILITY HAVING JURISDICTION. OTHER POWER EQUIPMENT SHALL BE AS SHOWN ON DRAWINGS TD500.06 AND TD500.09.
3. CURRENT AND LOAD VALUES PROVIDED FOR USE IN DESIGN. ALL WIRES SHALL BE SIZED TO ACCOMMODATE A 3% MAXIMUM VOLTAGE DROP. FOR 120/240 VOLT DISTRIBUTION, VOLTAGE DROP SHALL BE PERFORMED AT 120 VOLTS, ASSUMING FULL DESIGN CURRENT RETURNING ON THE NEUTRAL CONDUCTOR.
4. IDENTIFY WHERE ADDITIONAL BREAKERS ARE NECESSARY TO POWER ADDITIONAL SCCs AS REQUIRED BY THE DESIGN.
5. I2 DESIGNATION AND VALUES RESERVED FOR A GANTRY SIGN STRUCTURE WITH TWO (2) FULL MATRIX DMS SIGNS.




## SINGLE DMS 120/240VAC POWER SOURCE

TD500.10.01




## SINGLE DMS ONE-LINE DIAGRAM

TD500.10.04

Sheet 10 of 44

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**PANYNJ Traffic Standard Details**

*TRAFFIC*

Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# DMS POWER DISTRIBUTION DIAGRAMS



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date **7/29/2013**

Contract Number

Drawing Number **TD500.10**

PID#

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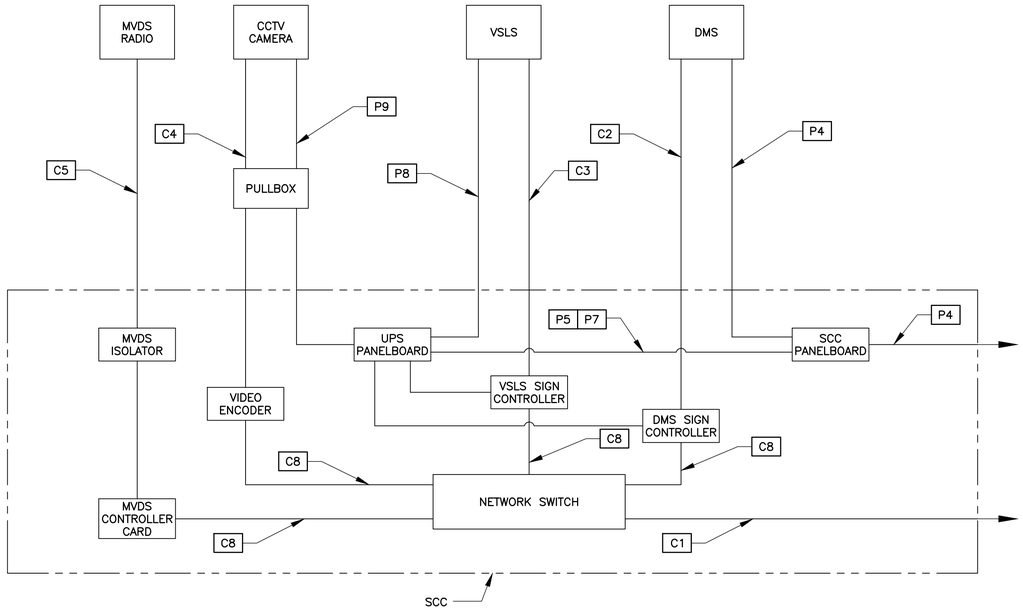


ITSS COMMUNICATIONS BLOCK DIAGRAM

TD500.11

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. SEE THE RESPECTIVE ITS DRAWINGS FOR LOCATIONS OF ITS EQUIPMENT AND ROUTING OF CONDUIT IDENTIFIED ON THIS DRAWING.
3. FOR CCTV INSTALLATION DETAILS, SEE DRAWINGS TD500.39 THROUGH TD500.42.
4. FOR CLARITY, NOT ALL POWER CABLE INSIDE THE SCC CABINET HAS BEEN SHOWN. SEE DRAWING TD500.12 FOR POWER DIAGRAMS.
5. SEE DRAWING TD500.15 FOR CONDUIT AND CABLE SCHEDULES.

NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. POWER EQUIPMENT, SUCH AS METER CABINETS, SHALL BE COORDINATED WITH THE UTILITY HAVING JURISDICTION. OTHER POWER EQUIPMENT SHALL BE AS SHOWN ON DRAWINGS TD500.06 AND TD500.09.
2. TYPICAL BLOCK DIAGRAM IS SHOWN. ADD OR DELETE COMPONENTS AS WARRANTED BY THE DESIGN.



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# DMS COMMUNICATIONS DIAGRAM

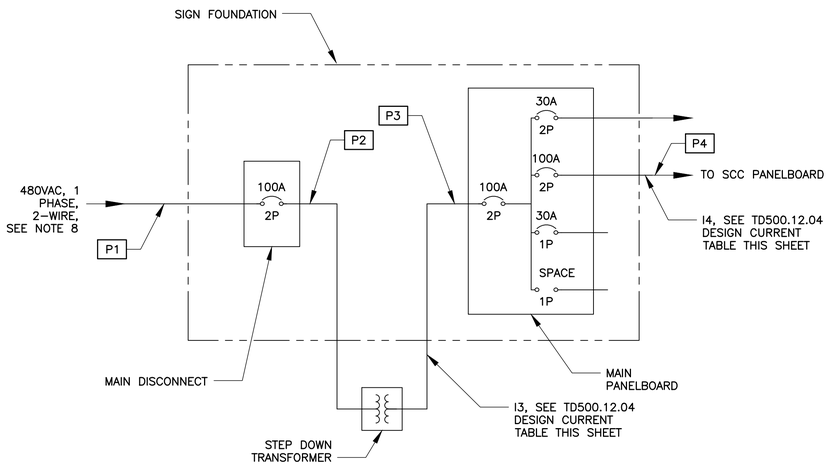


| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |
| Date | | 7/29/2013 |

Contract Number

Drawing Number TD500.11

PID#




## HYBRID DRUM SIGN 480VAC POWER SOURCE
TD500.12.01

## SCC PANELBOARD DESIGN LOAD (VA)*

| EQUIPMENT | LEG A | LEG B | TOTAL |
|---|---|---|---|
| DMS | 4200 | 2800 | 7000 |
| UPS | – | 2000 | 2000 |
| DRUM HEATER | 3300 | 2700 | 6000 |
| SPARE | 4875 | 4875 | 9750 |
| TOTAL | 12375 | 12375 | 24750 |

## DESIGN CURRENT (A)

| I1 | I2 | I3 | I4 | I5 | I6 |
|---|---|---|---|---|---|
| 62 | 115 | 62 | 30 | 25 | 19 |

## MAIN DISCONNECT

| POWER DISTRIBUTION FOR: | CIRCUIT BREAKER: | ENCLOSURE: |
|---|---|---|
| 120/240VAC | SQUARE D # FAL22100 | SQUARE D # FA100RB |
| 480VAC | SQUARE D # FAL24100 | SQUARE D # FA100RB |

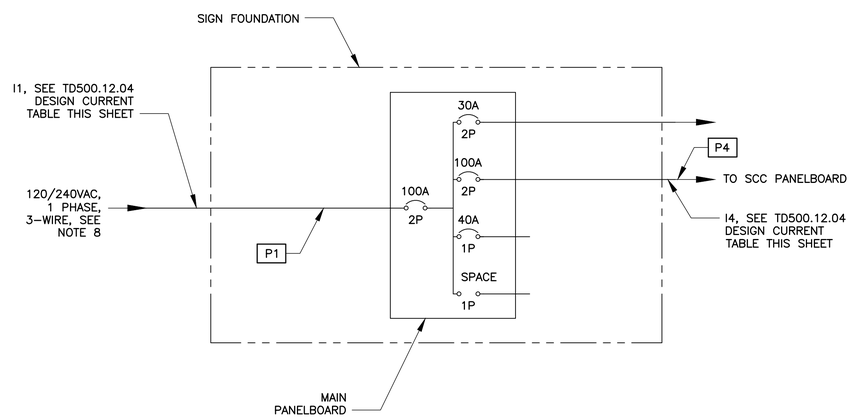
## POWER DESIGN VALUES
(SEE NOTE 12) TD500.12.04

NOTES:

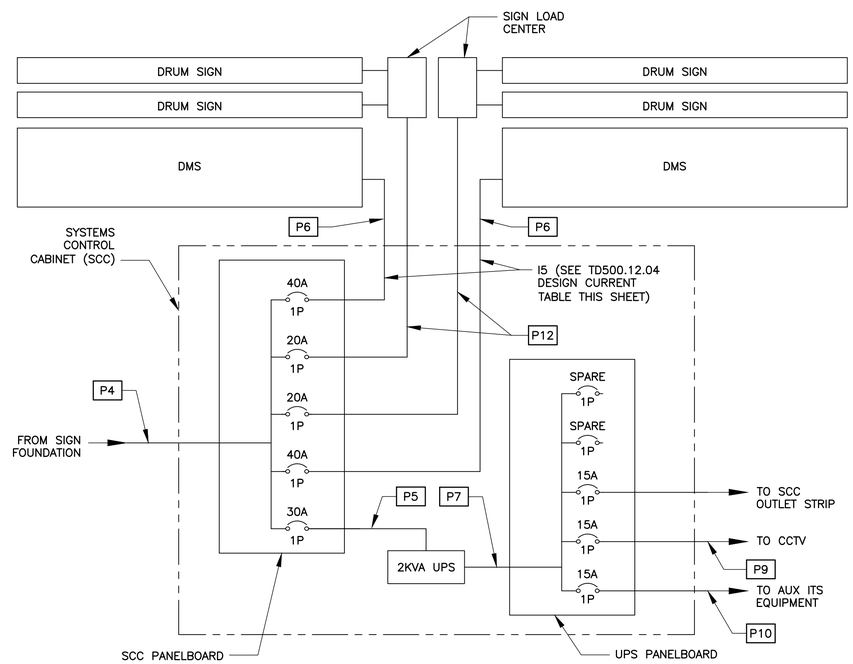
1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. SEE THE RESPECTIVE ITS DRAWINGS FOR LOCATIONS OF ITS EQUIPMENT AND ROUTING OF CONDUIT IDENTIFIED ON THIS DRAWING.
3. REFER TO PANEL SCHEDULES FOR EXACT EQUIPMENT AND CIRCUIT BREAKER LAYOUTS.
4. JUNCTION BOXES AND CONDUIT SHALL BE INSTALLED AS REQUIRED ON THE CONTRACT DRAWINGS FOR POWER DISTRIBUTION.
5. ALL REQUIRED EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH ARTICLE 250 OF THE NEC WHETHER SPECIFICALLY IDENTIFIED OR NOT.
6. SEE HYBRID DRUM INSTALLATION DETAILS FOR INFORMATION ON CONDUITS AND CABLES AS WELL AS EQUIPMENT SHOWN ON THIS SHEET.
7. A 100A MAIN BREAKER SHALL BE INSTALLED IN THE PANELBOARD FOR 480VAC SERVICE, WHERE DIRECTED ON THE CONTRACT DRAWINGS OR BY THE ENGINEER.
8. FOR DETAILS ON THE TYPE OF ELECTRONIC EQUIPMENT INSTALLED IN THE SCC SEE STANDARD DRAWING TD500.14.
9. SEE STANDARD DRAWING TD500.13 FOR COMMUNICATIONS DIAGRAM.

NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. THE POWER DISTRIBUTION DIAGRAMS ARE BASED UPON TYPICAL DESIGN LOADS. DESIGNER SHALL FINALIZE ALL VALUES BASED UPON ACTUAL MANUFACTURERS LOADS UTILIZED AS THE BASIS FOR THE DESIGN.
2. POWER EQUIPMENT, SUCH AS METER CABINETS, SHALL BE COORDINATED WITH THE UTILITY HAVING JURISDICTION. OTHER POWER EQUIPMENT SHALL BE AS SHOWN ON DRAWINGS TD500.06 AND TD500.09.
3. CURRENT AND LOAD VALUES PROVIDED FOR USE IN DESIGN. ALL WIRES SHALL BE SIZED TO ACCOMMODATE A 3% MAXIMUM VOLTAGE DROP. FOR 120/240 VOLT DISTRIBUTION, VOLTAGE DROP SHALL BE PERFORMED AT 120 VOLTS, ASSUMING FULL DESIGN CURRENT RETURNING ON THE NEUTRAL CONDUCTOR.




## HYBRID DRUM SIGN 120/240VAC POWER SOURCE
TD500.12.02




## HYBRID DRUM SIGN ONE-LINE DIAGRAM
TD500.12.03



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# HYBRID DRUM SIGN POWER DISTRIBUTION DIAGRAMS



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Date 7/29/2013

Contract Number

Drawing Number TD500.12

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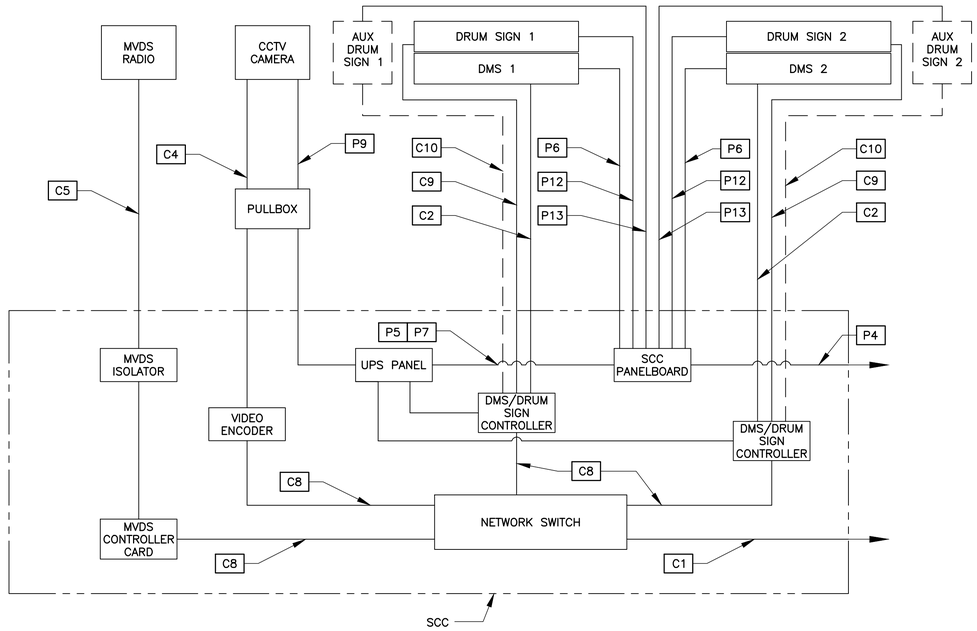


HYBRID DRUM SIGN INSTALLATION BLOCK DIAGRAM TD500.13

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. SEE THE RESPECTIVE ITS DRAWINGS FOR LOCATIONS OF ITS EQUIPMENT AND ROUTING OF CONDUIT IDENTIFIED ON THIS DRAWING.
3. FOR CCTV INSTALLATION DETAILS, SEE DRAWINGS TD500.39 THROUGH TD500.42.
4. FOR CLARITY, NOT ALL POWER CABLE INSIDE THE SCC CABINET HAS BEEN SHOWN. SEE DRAWING TD500.12 FOR POWER DIAGRAMS.
5. SEE DRAWING TD500.15 FOR CONDUIT AND CABLE SCHEDULES.

NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. POWER EQUIPMENT, SUCH AS METER CABINETS, SHALL BE COORDINATED WITH THE UTILITY HAVING JURISDICTION. OTHER POWER EQUIPMENT SHALL BE AS SHOWN ON DRAWINGS TD500.06 AND TD500.09.
2. TYPICAL BLOCK DIAGRAM IS SHOWN. ADD OR DELETE COMPONENTS AS WARRANTED BY THE DESIGN.



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# HYBRID DRUM SIGN COMMUNICATIONS DIAGRAM



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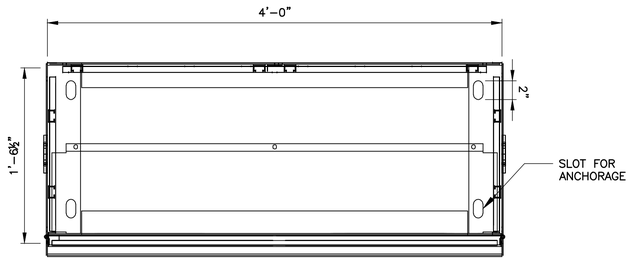
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number TD500.13

PID#

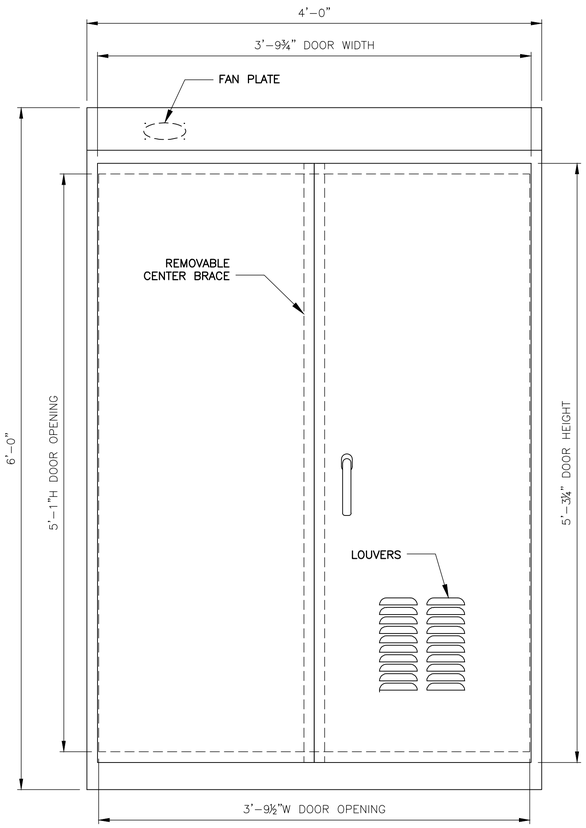



PLAN

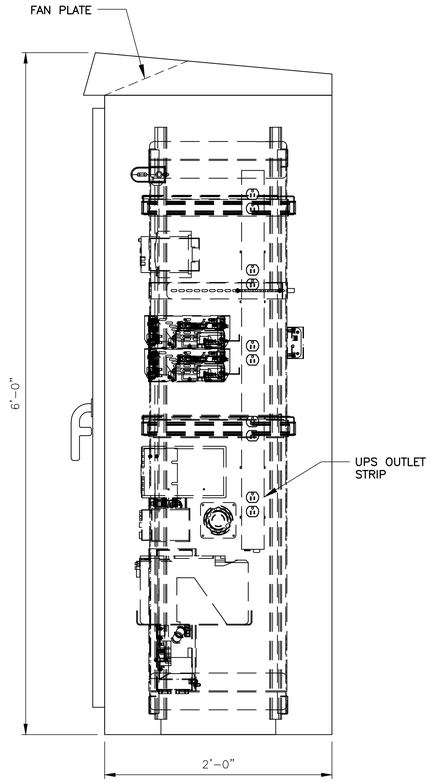
SCC BOTTOM VIEW TD500.14.03

0 .5 1 2

SCALE IN FEET




FRONT ELEVATION




SIDE ELEVATION

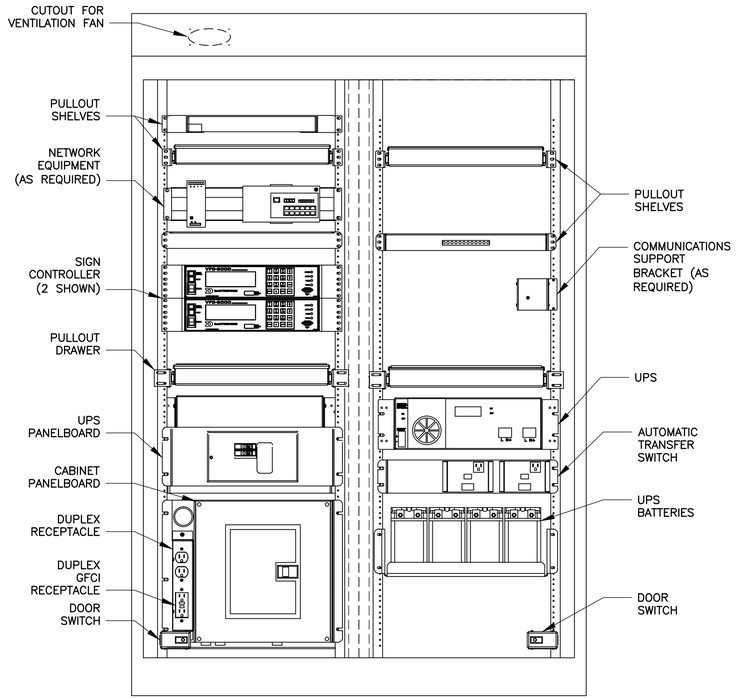
SYSTEMS CONTROL CABINET (SCC) TD500.14.01

0 .5 1 2

SCALE IN FEET

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. THE SCC SHALL BE A FREE STANDING DOUBLE DOOR, VENTED, .125" THICK ALUMINUM CABINET WITH TWO INTERNAL 19" EQUIPMENT RACKS THAT STAND AT LEAST 5'–6" HIGH.
3. THE CONFIGURATION AND DETAILS OF THE CABINET ANCHOR BOLT PATTERN SHALL BE AS PROVIDED BY THE CABINET MANUFACTURER.
4. WHERE THE CABINET IS MOUNTED ON A GANTRY STRUCTURE, PROVIDE AN ENCLOSED BASED TO MINIMIZE DEBRIS FROM ENTERING THROUGH THE BOTTOM OF THE CABINET.
5. CONDUITS ENTERING THE BOTTOM OF THE SCC SHALL BE STUBBED A MINIMUM OF 3" INTO THE BOTTOM OF THE CABINET.
6. SEE THE ITS DRAWINGS FOR POSITIONING THE SCC.
7. THE SCC EQUIPMENT SHALL BE SELECTED ON A PER SITE BASIS. THE EQUIPMENT DETAILED ON THIS SHEET IS A DIAGRAMMATIC REPRESENTATION OF WHAT WOULD TYPICALLY BE INSTALLED.
8. SCC(S) MAY BE USED FOR MULTIPLE FUNCTIONS AND PURPOSES. THE SCC SHOWN ON THIS SHEET IS CONFIGURED FOR A DMS INSTALLATION. THE SCC MAY HAVE HARDWARE REMOVED OR ADDED AS REQUIRED BY THE DRAWINGS.
9. WHERE AN SCC IS MOUNTED TO A CONCRETE FOUNDATION, INSTALL A 1/4" RUBBER GASKET AROUND THE BASE OF THE CABINET ENCLOSURE AND THE JOINT BETWEEN THE CABINET BASE AND CABINET.
10. FOR GROUND MOUNT APPLICATIONS, CONDUIT ENDS SHALL BE SEALED WITH GREAT STUFF FIRE PROOF FOAM, OR APPROVED EQUAL, AS A RODENT BLOCKER AFTER CABLE AND WIRING INSTALLATION.
11. WHERE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IS NOT SHOWN ON THE CONTRACT DRAWINGS, PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH THE NEC.




FRONT ELEVATION

SCC EQUIPMENT LAYOUT TD500.14.02

0 .5 1 2

SCALE IN FEET

Sheet 14 of 44

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PANYNJ Traffic Standard Details

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Title

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

# SYSTEMS CONTROL CABINET DETAILS



| DES | DRN | CHK |
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Date 7/29/2013

Contract Number

Drawing Number TD500.14

PID#

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## POWER CABLES

| DESIGNATION | CABLES | FROM | TO |
|---|---|---|---|
| P1 | SEE NOTE 3 | METER CABINET | MAIN DISCONNECT\MAIN PANELBOARD |
| P2 | 2 – #2 AWG + #4 AWG GND | MAIN DISCONNECT | TRANSFORMER |
| P3 | 3 – #3/0 AWG + #4 AWG GND | TRANSFORMER | MAIN PANELBOARD |
| P4 | 3 – #2 AWG + #4 AWG GND | MAIN PANELBOARD | SCC PANELBOARD |
| P5 | 2 – #12 AWG + #12 AWG GND | SCC PANELBOARD | UPS |
| P6 | 3 – #4 AWG + #6 AWG GND | SCC PANELBOARD | DMS |
| P7 | 2 – #12 AWG + #12 AWG GND | UPS | UPS PANELBOARD |
| P8 | 2 – #10 AWG + #10 AWG GND | UPS PANELBOARD | VSLS |
| P9 | 2 – #14 AWG + #14 AWG GND | UPS PANELBOARD | CCTV CAMERA |
| P10 | 2 – #14 AWG + #14 AWG GND | UPS PANELBOARD | AUX ITS EQUIPMENT |
| P11 | #4 AWG GND | VARIOUS | GND ROD |
| P12 | 2 – #8 AWG + #8 AWG GND | SCC PANELBOARD | DRUM SIGN |
| P13 | 2 – #8 AWG + #8 AWG GND | SCC PANELBOARD | AUX DRUM SIGN |
| P14 | 2 – #14 AWG + #14 AWG GND | UPS PANELBOARD | AUX ITS EQUIPMENT |

## COMMUNICATIONS CABLES

| DESIGNATION | CABLES | FROM | TO |
|---|---|---|---|
| C1 | INCOMING FIBER | PAWANET | SCC |
| C2 | (1) 6–FIBER OPTIC MULTIMODE CABLE | SCC | DMS |
| C3 | (1) 6–FIBER OPTIC MULTIMODE CABLE | SCC | VSLS |
| C4 | (1) 4 TWISTED PAIR #24 AWG (OUTDOOR NETWORK CABLE) | SCC | CCTV |
| C5 | (1) 4 TWISTED PAIR #24 AWG (OUTDOOR NETWORK CABLE) | SCC | MVDS RADIO |
| C6 | (1) COAXIAL CABLE | SCC | TTS ANTENNA |
| C7 | AS RECOMMENDED BY THE MANUFACTURER | SCC | ITS DEVICE |
| C8 | ETHERNET PATCH CORD (SEE NOTE 4) | VARIES | NETWORK SWITCH |
| C9 | AS RECOMMENDED BY THE MANUFACTURER | SCC | DRUM SIGN |
| C10 | AS RECOMMENDED BY THE MANUFACTURER | SCC | AUX DRUM SIGN |

## CONDUITS

| DESIGNATION | SIZE AND TYPE | CABLES |
|---|---|---|
| 1 | 3" RNMC–40 | P1 |
| 2 | 2" PCRMC | P1 |
| 3 | 2" PCRMC | PXX |
| 4 | 2½" PCRMC | P3 |
| 5 | 2" PCRMC | P4 |
| 6 | 2" PCRMC | P1 P4 |
| 7 | 3" RNMC–40 | P2 P3 |
| 8 | 3" RNMC–40 | C1 |
| 9 | 3" RNMC–40 | C2 C4 C5 C6 |
| 10 | 3" RNMC–40 | P6 P9 |
| 11 | 2" FMC | P8 |
| 12 | 2" FMC | C3 |
| 13 | 2" PCRMC | C2 C3 |
| 14 | 2" FMC | C4 |
| 15 | 2" FMC | P6 |
| 16 | 2" PCRMC | P6 P8 |
| 17 | 2" FMC | P9 |
| 18 | 2" FMC | C2 |
| 19 | 2" FMC | P12 P13 |
| 20 | 2" FMC | C9 C10 |

LEGEND:

P## / C## — ITEMS SHOWN DASHED MAY VARY BY INSTALLATION.

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. UNLESS OTHERWISE NOTED, POWER AND COMMUNICATION CABLES SHALL BE OF THE MAKE AND MODEL AS DESCRIBED IN SPECIFICATION SECTIONS 16120, 16126, AND 16127.
3. SIZE AND QUANTITY OF THE INCOMING SERVICE WIRES SHALL BE COORDINATED WITH THE UTILITY HAVING JURISDICTION.
4. ETHERNET PATCH CORDS SHALL BE RATED CAT5E OR BETTER AND SHALL BE TERMINATED WITH FACTORY RJ45 CONNECTORS. FIELD TERMINATED PATCH CABLING IS NOT ACCEPTABLE.



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INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

# POWER/ COMMUNICATIONS CABLE AND CONDUIT SCHEDULES



| DES | DRN | CHK |
|---|---|---|
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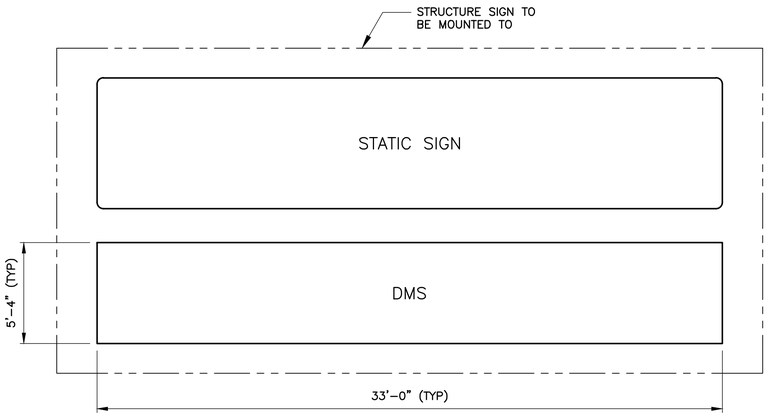
Date 7/29/2013

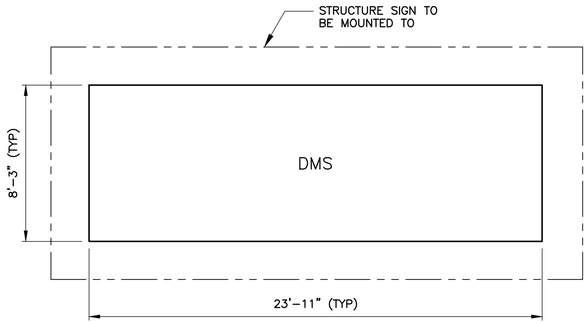
Contract Number

Drawing Number TD500.15

PID#




CONFIGURATION – 1



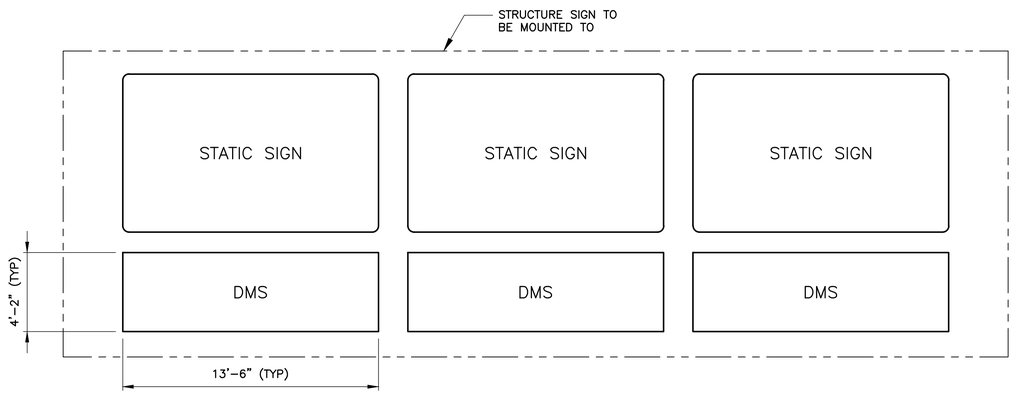

CONFIGURATION – 2

# TUNNEL SIGN STRUCTURE LAYOUT

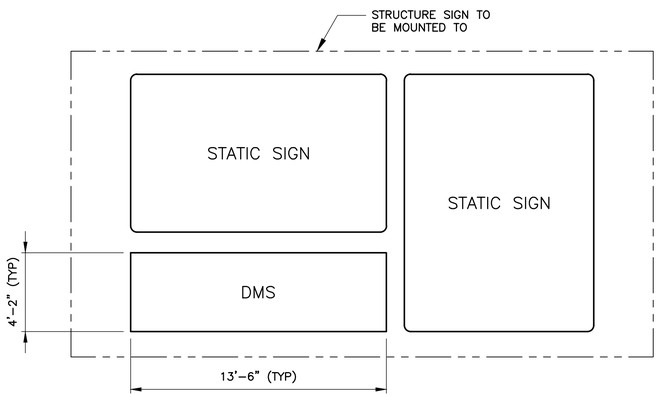
TD500.16.01

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. REFER TO DMS CONFIGURATION LIST ON TD500.18 FOR STANDARD SIGN MODEL NUMBERS.
3. SEE DRAWINGS TD500.02 TO TD500.08 FOR TYPICAL SIGN MOUNTING DETAILS.




CONFIGURATION – 3




CONFIGURATION – 4

# OVERHEAD AIRPORT SIGN STRUCTURE LAYOUT

TD500.16.02

Sheet 16 of 44

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INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

DMS CONFIGURATIONS - 1



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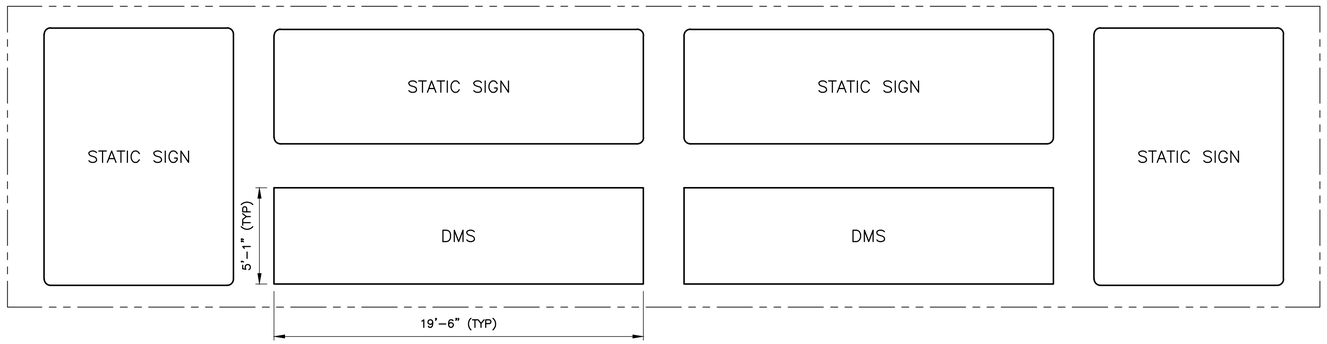
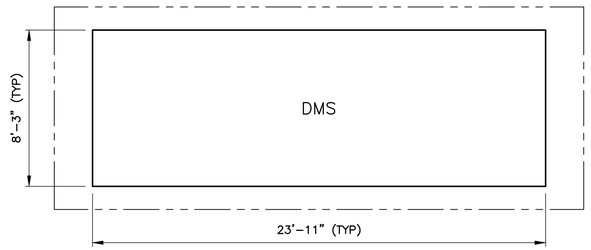


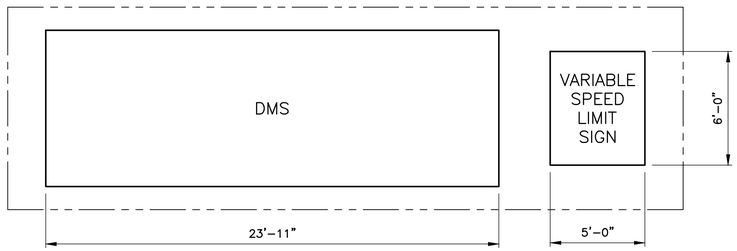

CONFIGURATION – 5

NOTES:

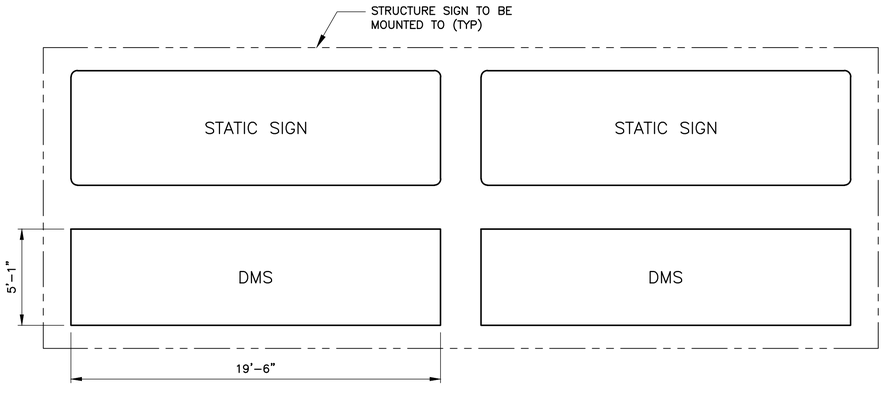
1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. REFER TO DMS CONFIGURATION LIST ON TD500.18 FOR STANDARD SIGN MODEL NUMBERS.
3. SEE DRAWINGS TD500.02 TO TD500.08 FOR TYPICAL SIGN MOUNTING DETAILS.



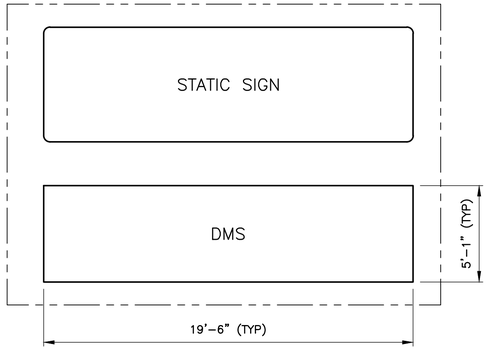

CONFIGURATION – 6




CONFIGURATION – 7




CONFIGURATION – 8




CONFIGURATION – 9

OVERHEAD BRIDGE SIGN STRUCTURE LAYOUT
TD500.17.01

Sheet 17 of 44

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DMS CONFIGURATIONS-2



| DES | DRN | CHK |
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Date 7/29/2013

Contract Number

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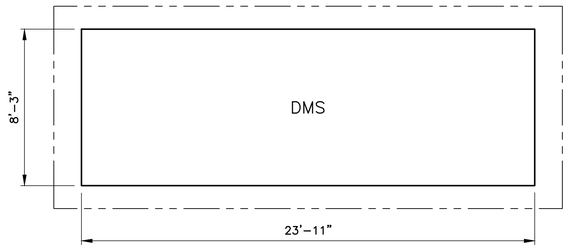
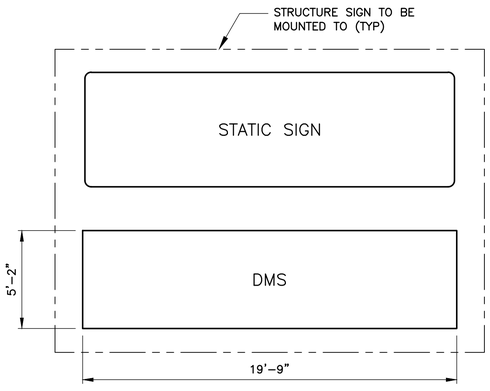



CONFIGURATION – 10




CONFIGURATION – 11

BUTTERFLY/CANTILEVER SIGN STRUCTURE LAYOUT

TD500.18.01

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. SEE DRAWINGS TD500.02 TO TD500.08 FOR TYPICAL SIGN MOUNTING DETAILS.
3. DMS SIGNS SHALL BE MANUFACTURED BY DAKTRONICS OR APPROVED EQUAL. MODEL NUMBERS AS SPECIFED IN THE TABLE ON THIS DRAWING.

## DMS CONFIGURATIONS LIST

| CONFIGURATION NO. | DMS TYPE | ACCESS TYPE | NO. OF LINES | DIMENSIONS (HXWXD) | MODEL NO. |
|---|---|---|---|---|---|
| CONFIGURATION 1 | DMS | REAR ACCESS | 2 LINES | 4'–8"x31'–11"x1'–3" | VF–2329–64x480–20–RGB |
| CONFIGURATION 2 | DMS | REAR ACCESS | 3 LINES | 8'–3"x23'–11"x1'–3" | VF–2329–96x336–20–RGB |
| CONFIGURATION 3 | DMS | FRONT ACCESS | 2 LINES | 2'–1"x13'–6"x1'–1" | VF–2320–16x192–20–RGB |
| CONFIGURATION 4 | DMS | FRONT ACCESS | 2 LINES | 2'–1"x13'–6"x1'–1" | VF–2320–16x192–20–RGB |
| CONFIGURATION 5 | DMS | REAR ACCESS | 2 LINES | 4'–8"x19'–5"x1'–3" | VF–2329–64X288–20–RGB |
| CONFIGURATION 6 | DMS | REAR ACCESS | 3 LINES | 8'–3"x23'–11"x1'–3" | VF–2329–96x336–20–RGB |
| CONFIGURATION 7 | DMS | REAR ACCESS | 3 LINES | 8'–3"x23'–11"x1'–3" | VF–2329–96x336–20–RGB |
| | VSLS | REAR ACCESS | – | 2'–1"x3'–1" | VF–2329–32X48–20–RGB |
| CONFIGURATION 8 | DMS | REAR ACCESS | 2 LINES | 4'–8"x19'–5"x1'–3" | VF–2329–64X288–20–RGB |
| CONFIGURATION 9 | DMS | REAR ACCESS | 2 LINES | 4'–8"x19'–5"x1'–3" | VF–2329–64X288–20–RGB |
| CONFIGURATION 10 | DMS | FRONT ACCESS | 3 LINES | 8'–3"x23'–11"x1'–1" | VF–2320–96x336–20–RGB |
| CONFIGURATION 11 | DMS | FRONT ACCESS | 2 LIINES | 4'–8"x19'–5"x1'–3" | VF–2320–64x288–20–RGB |



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Title

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

# DMS CONFIGURATIONS - 3



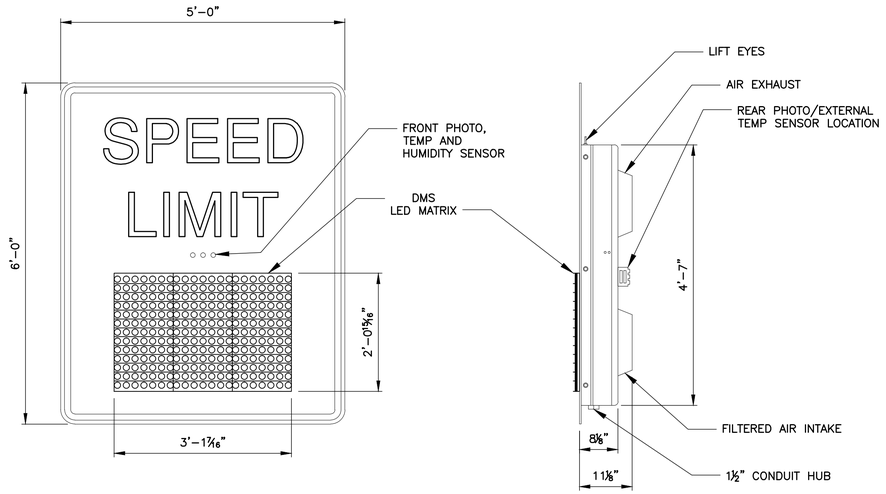
| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number TD500.18

PID#



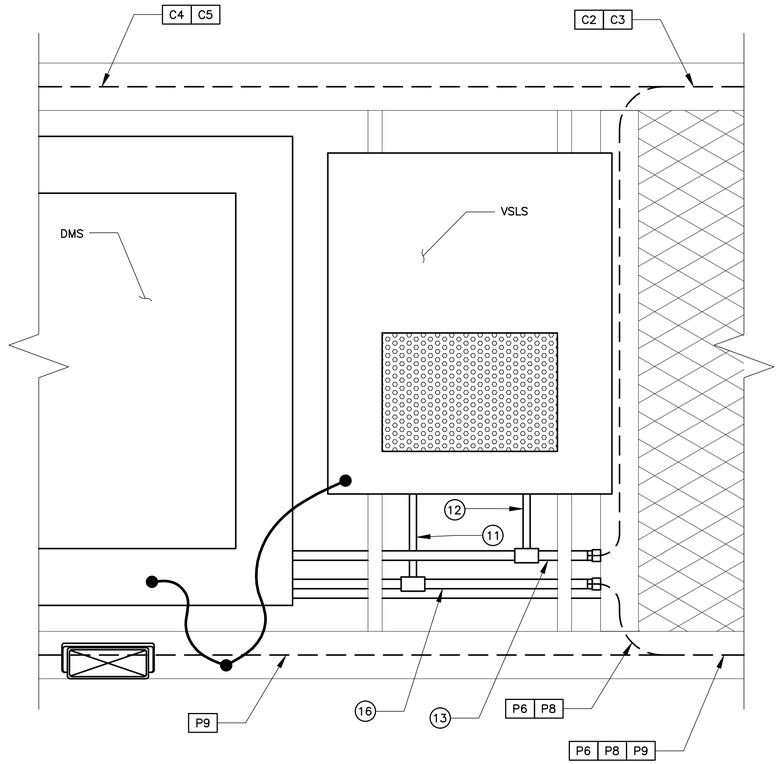

FRONT VIEW SIDE VIEW

VSLS DETAILS TD500.19.01

0 1 2 3
SCALE IN FEET

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. VSLS TO BE FABRICATED IN ACCORDANCE WITH THE MUTCD STANDARDS SECTION 2B-13 FOR VARIABLE SPEED LIMIT SIGNS.




VSLS CONDUIT DETAILS TD500.19.01

0 1 2 3
SCALE IN FEET

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# VARIABLE SPEED LIMIT SIGN DETAILS



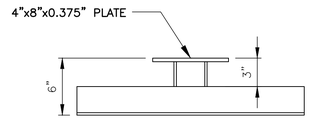
| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

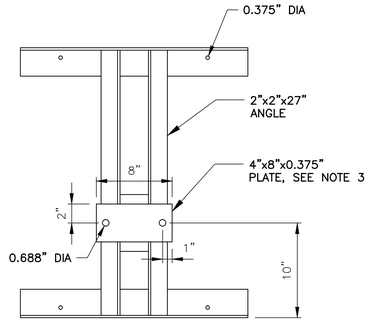
Contract Number

Drawing Number **TD500.19**

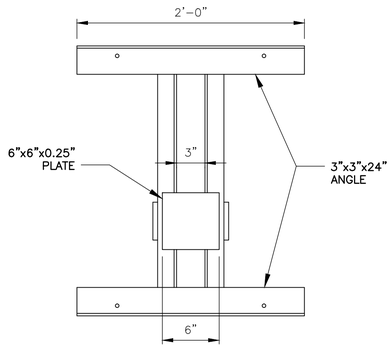
PID#



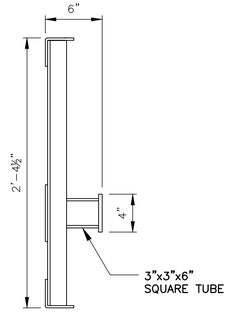

PLAN




REAR ELEVATION




FRONT ELEVATION




SIDE ELEVATION

# LCS MOUNTING BRACKET

TD500.20.02

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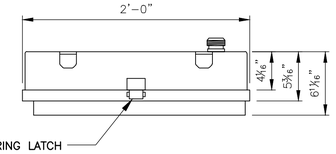
SCALE IN FEET

## NOTES:

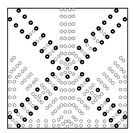
1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. LANE-USE CONTROL SIGNAL CABINET SHALL BE CONSTRUCTED OF CORROSION RESISTANT ALUMINUM. FACE SHALL BE CONSTRUCTED OF IMPACT RESISTANCE ⅛" THICK POLYCARBONATE.
3. SUBMIT ANCHORAGE SHOP DRAWINGS WITH THE LANE-USE CONTROL SIGNAL MOUNTING BRACKET TO THE ENGINEER FOR APPROVAL.
4. SIGNALS TO BLANKOUT WHEN TURNED OFF TO ELIMINATE CONFUSION.
5. INTEGRATED SOLID STATE POWER SUPPLY WITH OPERATION AT 120VAC.
6. UNLESS OTHERWISE NOTED, ALL HARDWARE SHALL BE STAINLESS STEEL.

## NOTES TO DESIGNER (REMOVE FROM DRAWING)

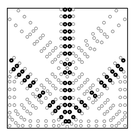
1. WORK WITH STRUCTURAL ENGINEERING TO PROVIDE MOUNTING BRACKET CALCULATIONS. CALCULATIONS SHALL BE SIGNED AND STAMPED BY AN ENGINEER CERTIFIED IN THE STATE OF THE INSTALLATION.



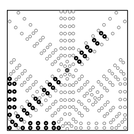

PLAN



RED



AMBER



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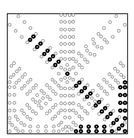

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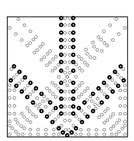
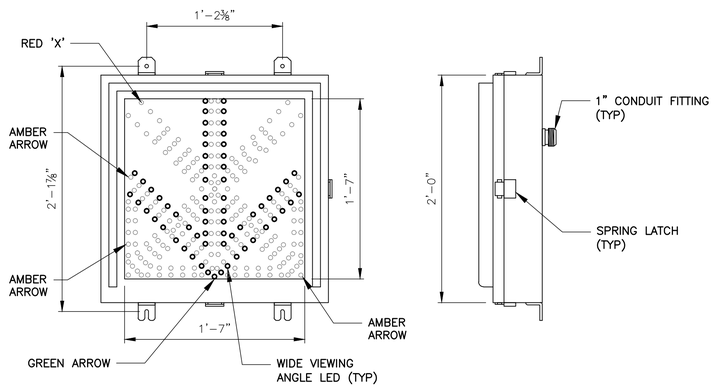


GREEN




FRONT ELEVATION



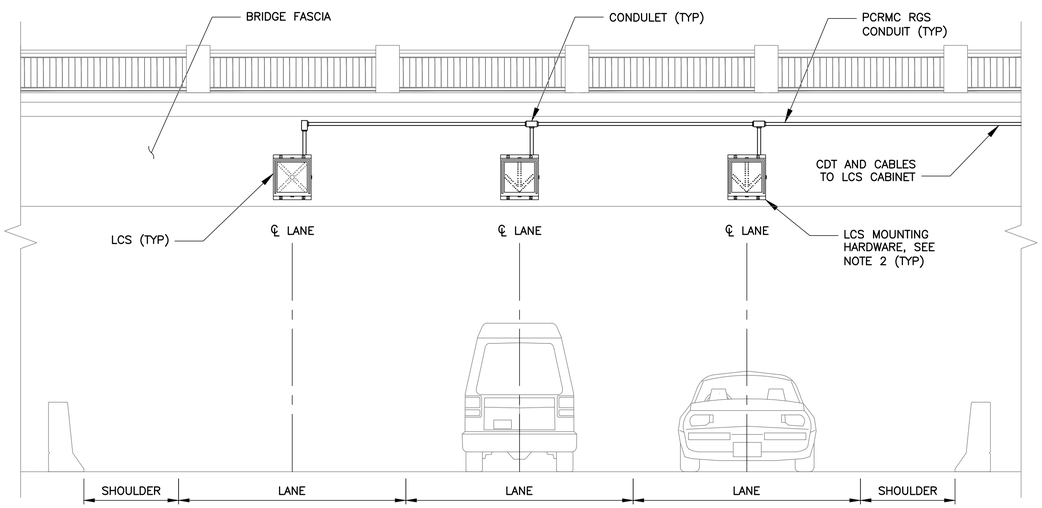

SIDE ELEVATION

# LANE-USE CONTROL SIGNAL DETAILS

TD500.20.01

0 .5 1 2

SCALE IN FEET




# LANE-USE CONTROL SIGNAL ON STRUCTURE - ELEVATION

TD500.20.03

0 4 8

SCALE IN FEET

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Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

## LANE-USE CONTROL SIGNAL DETAILS - 1



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |
| Date | 7/29/2013 | |
| Contract Number | | |
| Drawing Number | TD500.20 | |
| PID# | | |

SAVED BY: driley

LAST SAVED: 11/1/2013 3:56 PM

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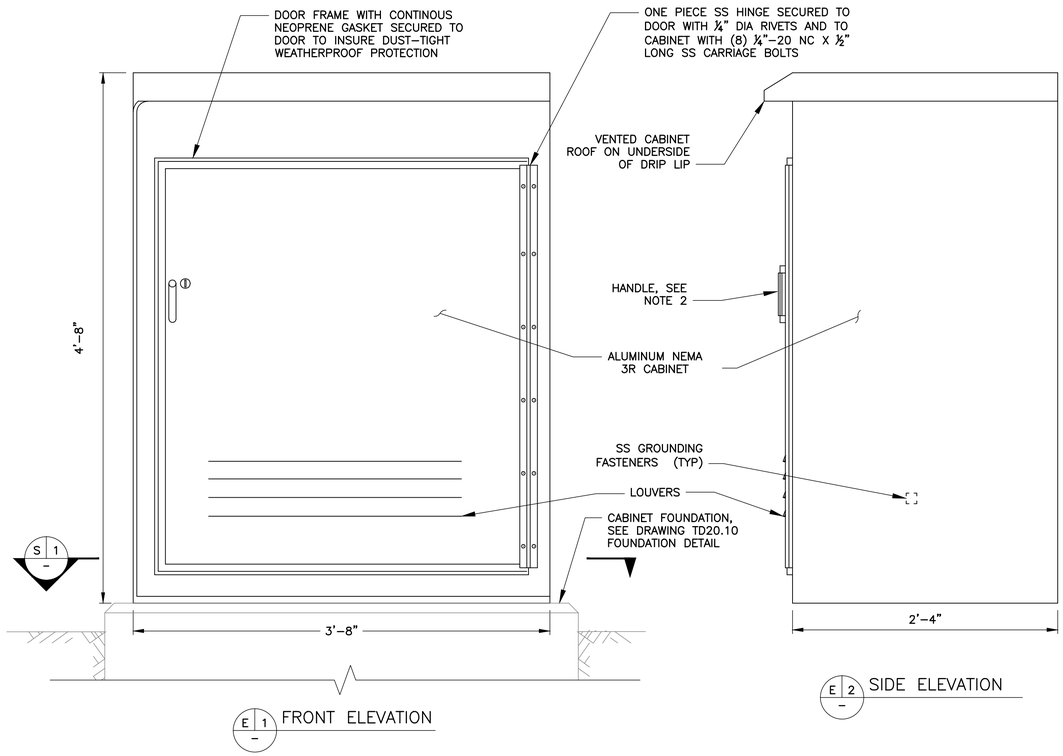
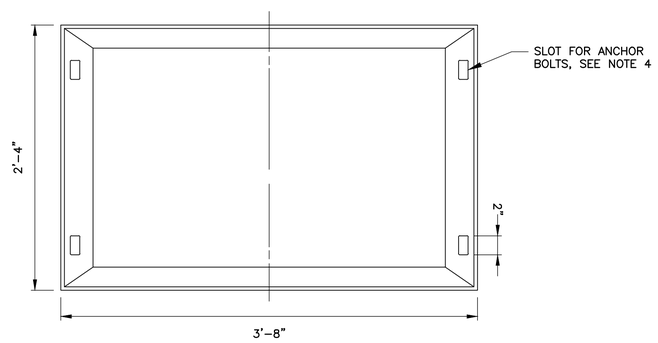



FRONT ELEVATION

SIDE ELEVATION




BOTTOM VIEW / ANCHOR BOLT LAYOUT

## LCS CONTROLLER CABINET

TD500.21.01

0 .5 1 2

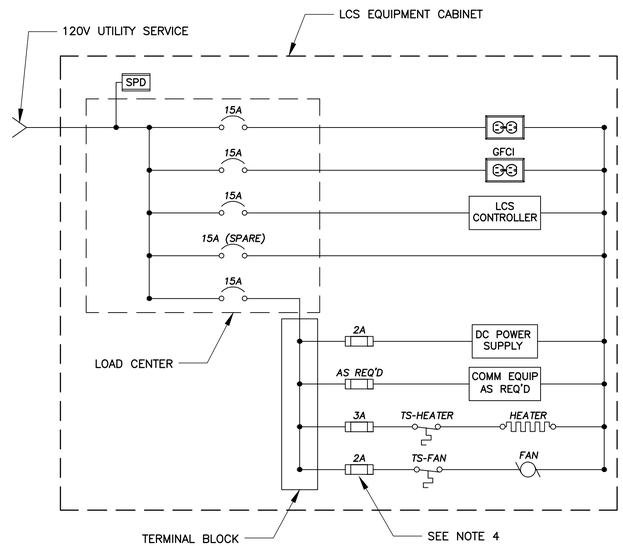
SCALE IN FEET

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. SECURE CABINET DOOR WITH A TUMBLER LOCK NO. 15481 ARS AND KEYED FOR NO.2 AVAILABLE FROM CORBIN LOCK CO., NEW BRITAIN, CT. HANDLE SHALL INCLUDE A PAD LOCKABLE HASP.
3. FUSES SHALL BE PROVIDED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
4. DIMENSIONS MAY VARY BY MANUFACTURER. COORDINATE ANCHOR BOLT LAYOUT PRIOR TO POURING FOUNDATION.
5. INSTALL ALUMINUM VENT WITH SCREEN UNDER FRONT LIP ABOVE DOOR.
6. WHERE A CABINET IS NOT INSTALLED ADJACENT TO A SIDEWALK, INCLUDE A CONCRETE PAD 50"W X 24"L X 4"D IN FRONT OF THE CABINET.
7. UNLESS OTHERWISE NOTED. ALL HARDWARE SHALL BE STAINLESS STEEL.

NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. THE LANE–USE CONTROL SIGNAL EQUIPMENT SHALL BE SELECTED ON A PER SITE BASIS. TYPICALLY, THE SIGNAL CONTROLLER WILL INTERFACE WITH THE FACILITY OPERATIONS CENTER GUI TO CONTROL AND DISPLAY ALL SIGNALS. OVERRIDE CONTROLS SHALL BE INCLUDED LOCALLY IN EACH OF THE LANE–USE CONTROL SIGNAL CABINETS.




## CONTROLLER CABINET POWER DIAGRAM

TD500.21.02



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|---|---|---|---|

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INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

# LANE-USE CONTROL SIGNAL DETAILS - 2



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number TD500.21

PID#

SAVED BY: driley

LAST SAVED: 11/1/2013 1:06 PM

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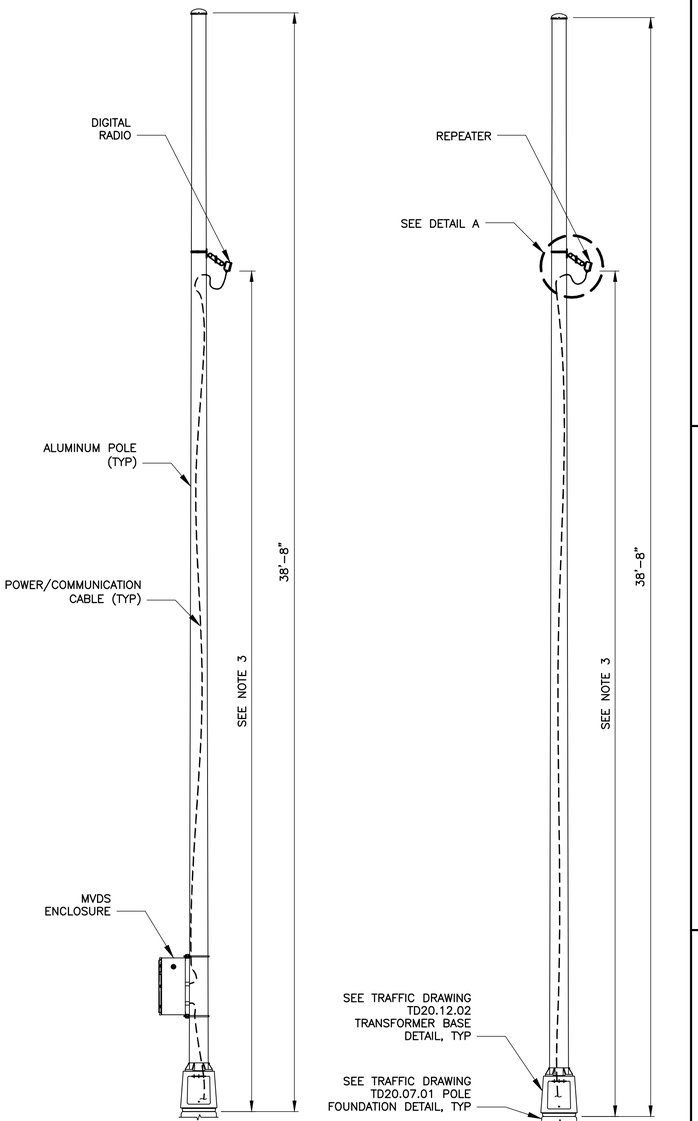
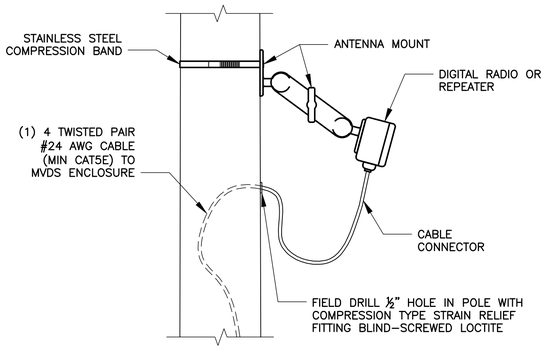
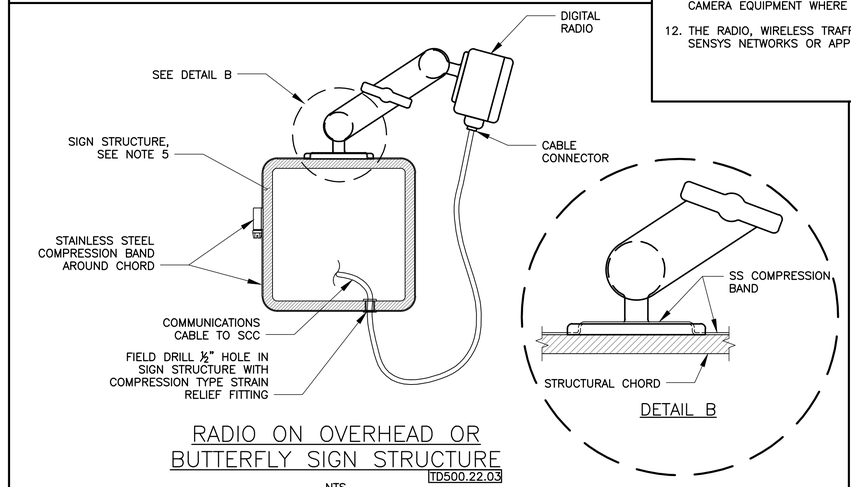



RADIO/REPEATER – POLE MOUNTED
TD500.22.01

0 3 6
SCALE IN FEET




DETAIL A
NTS

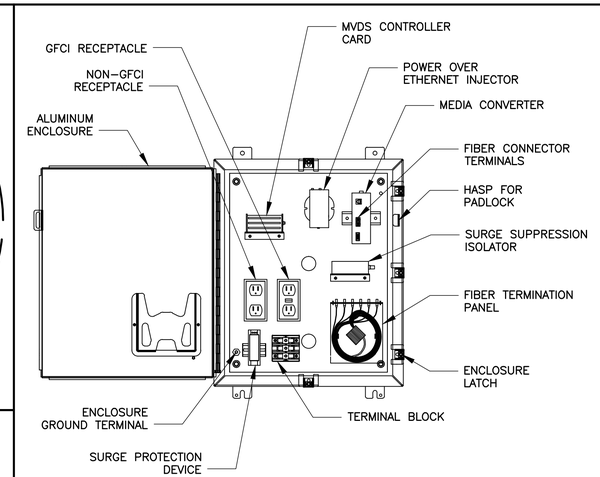



RADIO ON OVERHEAD OR BUTTERFLY SIGN STRUCTURE
TD500.22.03

NTS

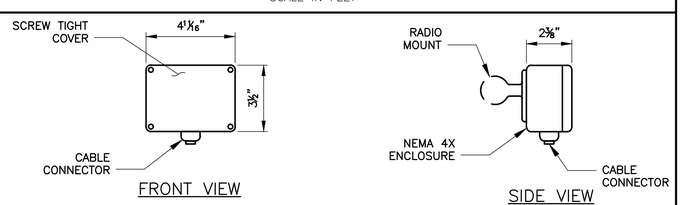
NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. COMPRESSION DOUBLE JOINT MOUNT HARDWARE SHALL BE AS PROVIDED BY RADIO/REPEATER MANUFACTURER.
3. HEIGHT OF INSTALLATION FOR THE RADIO AND REPEATER SHALL BE A MINIMUM OF 28'-0" ABOVE GRADE. SEE CONTRACT DRAWINGS FOR LOCATIONS.
4. PROVIDE PRE-MANUFACTURED FIBER JUMPER CABLES AND SC FIBER CONNECTORS AS REQUIRED BETWEEN EQUIPMENT IN ITS ENCLOSURE.
5. SEE STRUCTURAL CONTRACT DRAWINGS FOR FINAL LOCATION OF RADIO WHEN INSTALLED ON SIGN STRUCTURE.
6. CABLE CONNECTOR SHALL BE AS SUPPLIED BY RADIO MANUFACTURER OR APPROVED EQUAL. CONTRACTOR SHALL INSTALL CONNECTOR AS DIRECTED BY THE MANUFACTURER. THE CONTRACTOR SHALL NOT ATTEMPT TO DISASSEMBLE THE CONNECTOR WITHOUT THE EXTRACTION TOOL SPECIFIED BY THE MANUFACTURER. THE CONNECTOR SHALL BE REPLACED AT NO EXPENSE TO THE AUTHORITY IN THE EVENT IT IS DAMAGED IN ANYWAY BY IMPROPER ASSEMBLY OR INSTALLATION. WRAP CONNECTOR AND APPROXIMATELY 3" OF THE CABLE WITH A SINGLE HALF-LAPPED LAYER OF VINYL ELECTRICAL TAPE.
7. NO WIRING OR CABLES SHALL BE REQUIRED FOR THE REPEATER. INSTALL IN LOCATIONS AS SHOWN ON THE CONTRACT DRAWINGS.
8. TRAFFIC SENSORS SHALL BE INSTALLED SUCH THAT THE DIRECTION MARKING POINTS IN THE DIRECTION OF TRAFFIC FOR THE LANE IN WHICH IT IS INSTALLED.
9. SEE CONTRACT DRAWINGS FOR TYPE AND ROUTING OF POWER AND COMMUNICATIONS CABLING BACK TO THE SCC.
10. LOCATION OF EQUIPMENT WITHIN THE POLE MOUNTED ITS ENCLOSURE IS DIAGRAMMATIC. FINAL PLACEMENT MAY REQUIRE MODIFICATIONS BASED ON EQUIPMENT APPROVED FOR USE.
11. THE POLE MOUNTED MVDS ENCLOSURE SHALL HAVE MVDS EQUIPMENT ARRANGED TO ACCOMMODATE ADDITIONAL CCTV CAMERA EQUIPMENT WHERE SHOWN ON THE CONTRACT DRAWINGS. SEE TD500.39 FOR CCTV CAMERA EQUIPMENT.
12. THE RADIO, WIRELESS TRAFFIC SENSOR, CONTROLLER CARD, AND WIRELESS REPEATER SHALL BE AS MANUFACTURED BY SENSYS NETWORKS OR APPROVED EQUAL.



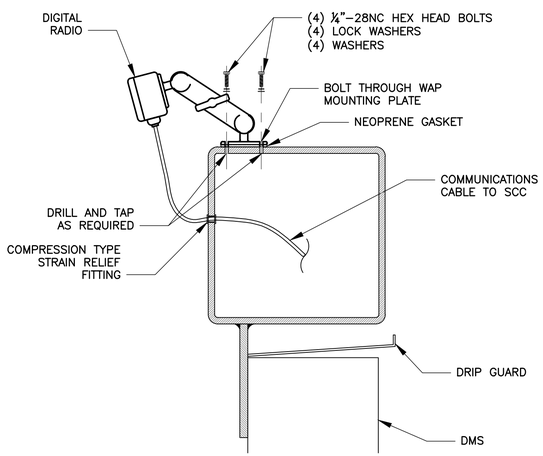

POLE MOUNTED MVDS ENCLOSURE
TD500.22.05

0 .5 1 2
SCALE IN FEET



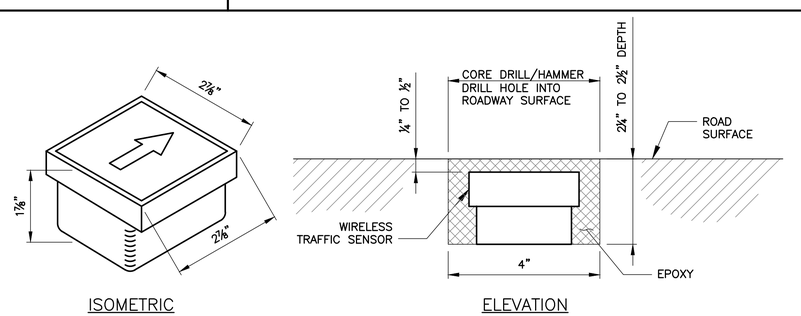

MVDS DIGITAL RADIO
TD500.22.02

0 .25 .5 1
SCALE IN FEET




RADIO ON CANTILEVER SIGN STRUCTURE
TD500.22.04

NTS




WIRELESS TRAFFIC SENSOR DETAIL
TD500.21.06

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|---|---|---|---|

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Title
INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

# MAGNETOMETER VEHICLE DETECTION SUBSYSTEM - 1



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |
| Date | | 7/29/2013 |
| Contract Number | | |
| Drawing Number | | TD500.22 |
| PID# | | |

LAST SAVED: 11/1/2013 1:10 PM SAVED BY: driley
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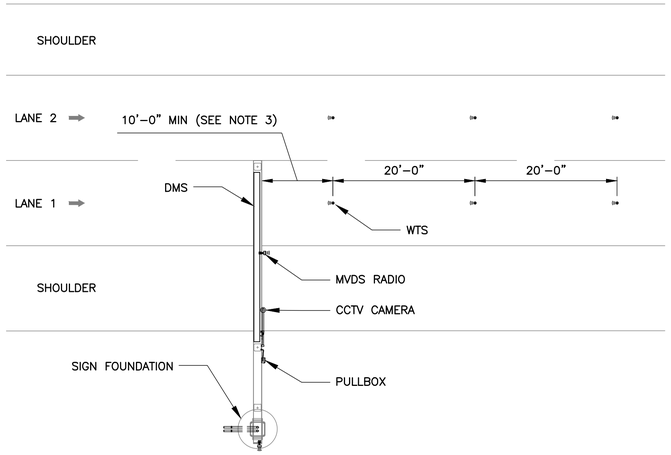
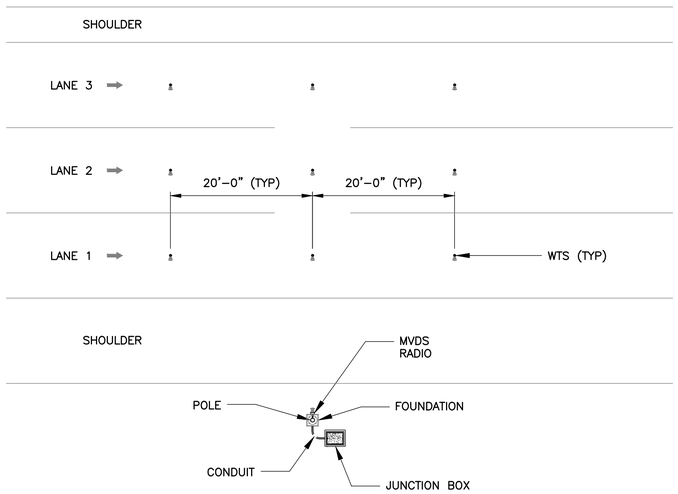



CANTILEVER SIGN GENERAL SITE PLAN TD500.23.01

0 12 24
SCALE IN FEET




POLE MOUNTED GENERAL SITE PLAN TD500.23.03

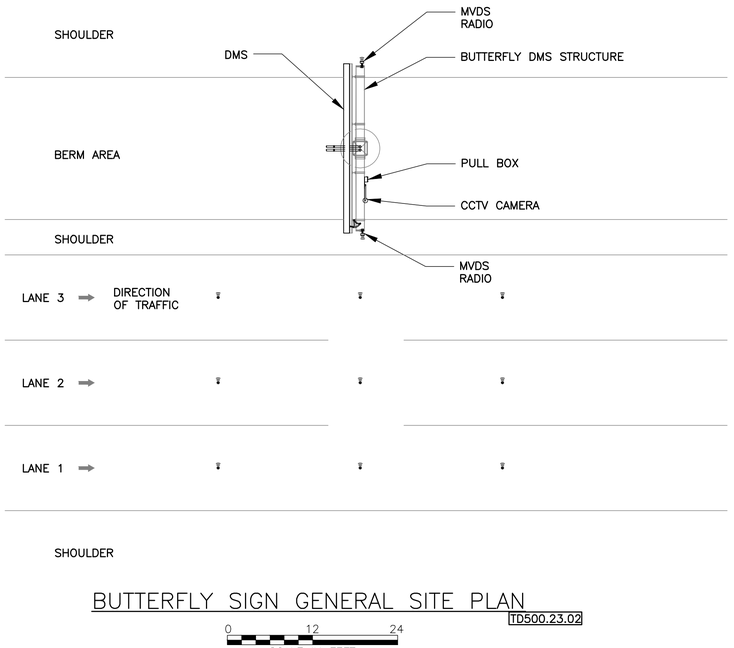
0 12 24
SCALE IN FEET

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. SENSORS SHALL BE INSTALLED ALONG THE CENTERLINE OF THE TRAVELED LANES.
3. THE NEAREST TRAFFIC SENSOR SHALL BE INSTALLED NO LESS THAN 10FT FROM SIGN STRUCTURES OR THE RADIO.
4. ROADWAY AND LANE CONFIGURATIONS WILL VARY IN THE FIELD. SEE THE CIVIL CONTRACT PLANS FOR DIMENSIONS OF LANES, SHOULDERS, AND MEDIAN.

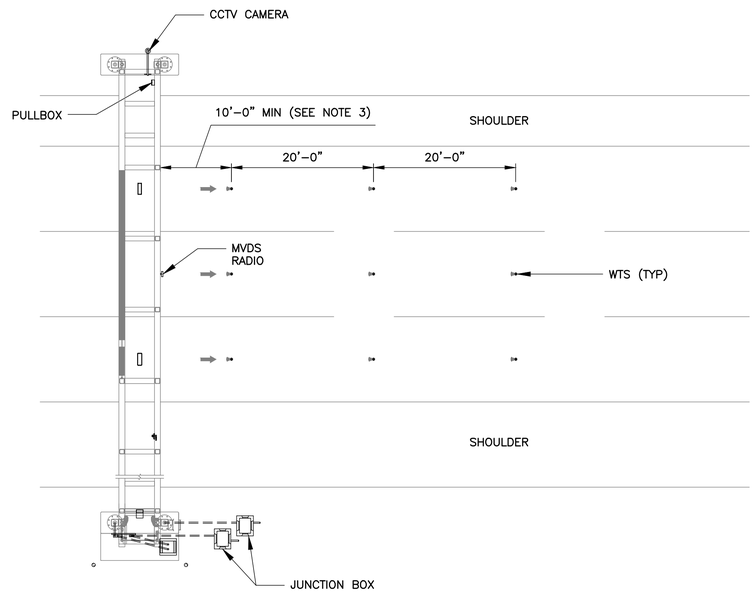
NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. TYPICAL MVDS LAYOUTS SHOWN. COORDINATE DESIGN WITH ACTUAL ROAD GEOMETRY.
2. LEFT HAND SIDED CANTILEVER MVDS INSTALLATIONS SHALL MIRROR THAT OF RIGHT HAND SIDED CANTILEVER INSTALLATIONS AS SHOWN ON THIS DRAWING.




BUTTERFLY SIGN GENERAL SITE PLAN TD500.23.02

0 12 24
SCALE IN FEET




SINGLE DMS SIGN GENERAL SITE PLAN TD500.23.04

0 12 24
SCALE IN FEET

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| No. | Date | Revision | Approved |
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Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# MAGNETOMETER VEHICLE DETECTION SUBSYSTEM - 2



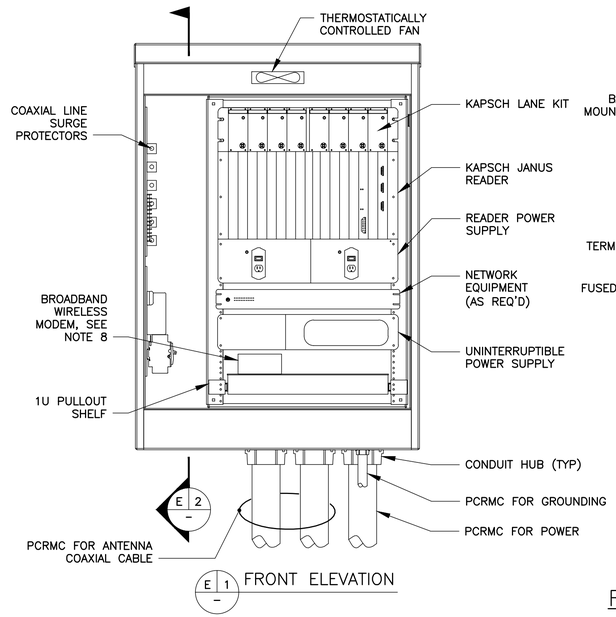
| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

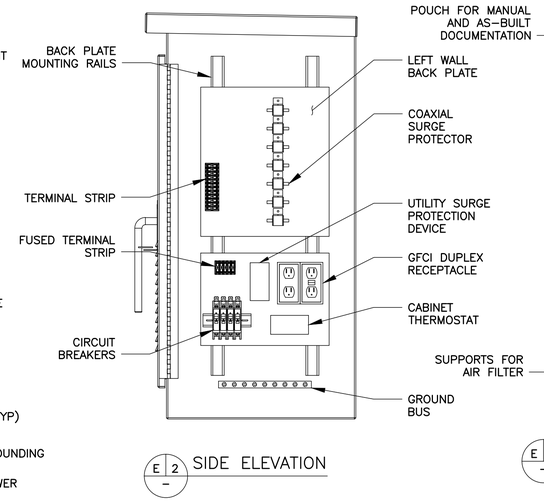
Date **7/29/2013**

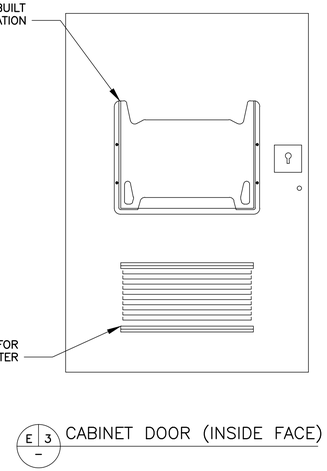
Contract Number

Drawing Number **TD500.23**

PID#



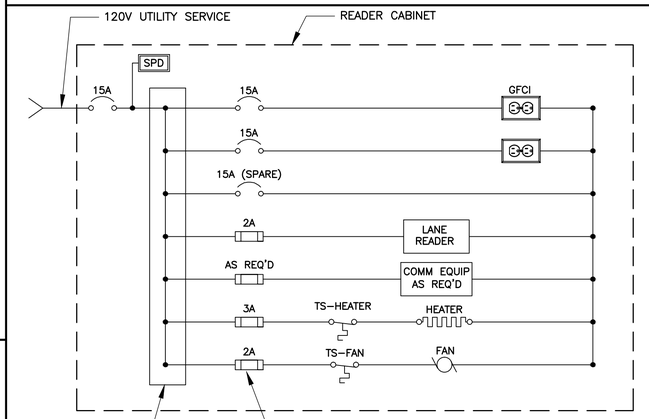

# READER CABINET EQUIPMENT LAYOUT

TD500.24.01

0 .5 1 2
SCALE IN FEET

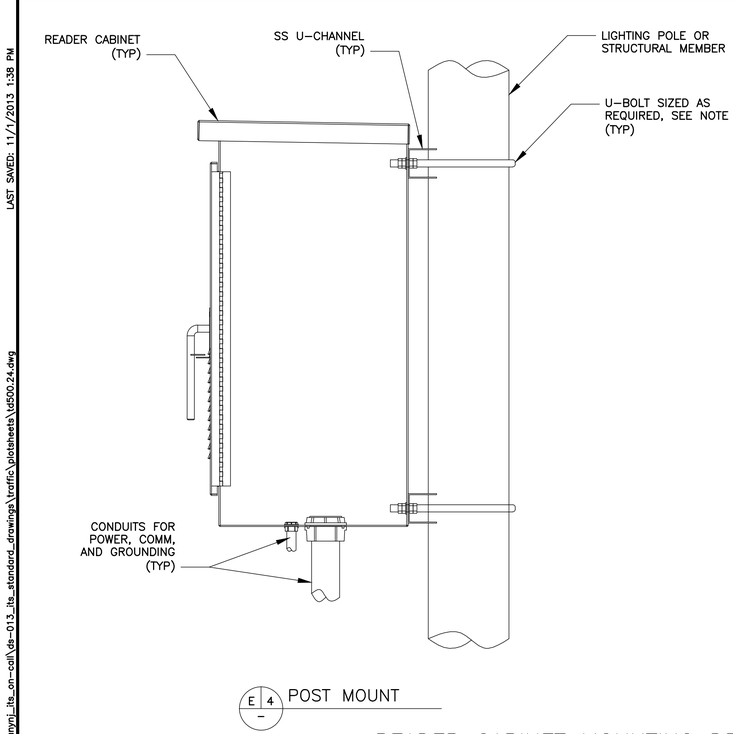
NOTES:

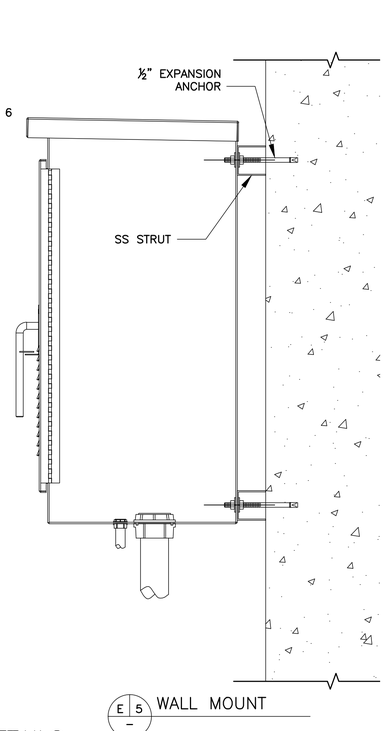
1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. CONDUIT ENTERING OR EXITING THE CABINET SHALL BE THROUGH THE BOTTOM AND SHALL NOT ENTER THE TOP OR SIDES OF THE CABINET. CONDUITS SHALL BE SECURED WITH CONDUIT HUBS AND SEALED WITH NON-SHRINK UV RESISTANT SILICONE.
3. CABINET DOOR SHALL BE SECURED AT A MINIMUM WITH A THREE POINT LATCH SYSTEM WITH ROLLERS OR PINS. CABINET DOOR HANDLE SHALL HAVE PROVISIONS FOR PADLOCKING.
4. LANE KITS, READER CPU MODULES, READER COMMUNICATION MODULES, AND POWER SUPPLIES SHALL BE AS MANUFACTURED BY KAPSCH OF MISSISSAUGA, ONTARIO, CANADA.
5. CABINET SHALL BE A NEMA TYPE 3R ENCLOSURE CONSTRUCTED OF .125" THICK ALUMINUM ALLOY TYPE 5052-H32 WITH A WEATHER GASKETED, FULL PIANO HINGED, VENTED DOOR WITH FILTER.
6. UNLESS OTHERWISE NOTED, ALL HARDWARE SHALL BE STAINLESS STEEL.
7. FUSE SIZES SHOWN VARY ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
8. FURNISH 2-1/2" FIELD DRILLED HOLES FOR THE WIRELESS MODEM ANTENNAS. COORDINATE HOLE LOCATIONS WITH THE TTS INTEGRATOR. NO HOLES SHALL BE DRILLED IN THE TOP OF THE ENCLOSURE. IN ADDITION, HOLES SHALL BE WEATHERPROOFED, SEALED, AND THE ENCLOSURE SHOULD REMAIN AS NEMA 3R.




# READER CABINET POWER DIAGRAM

TD500.24.03




# READER CABINET MOUNTING DETAILS

TD500.24.02

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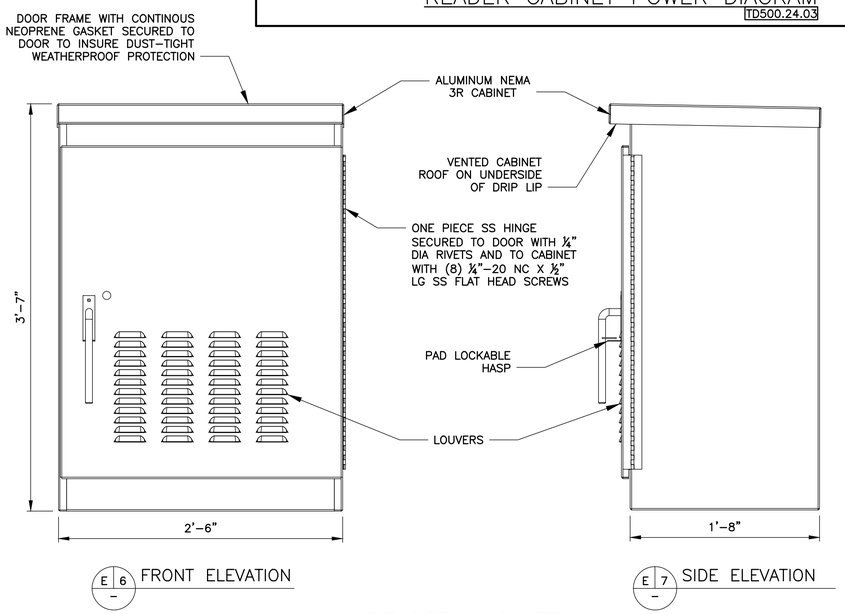
SCALE IN FEET




# READER CABINET

TD500.24.04

0 .5 1 2
SCALE IN FEET

Sheet 24 of 44

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*ENGINEERING DEPARTMENT*

**PANYNJ Traffic Standard Details**

*TRAFFIC*

Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

## TRAVEL TIME SUBSYSTEM DETAILS - 1



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number **TD500.24**

PID#

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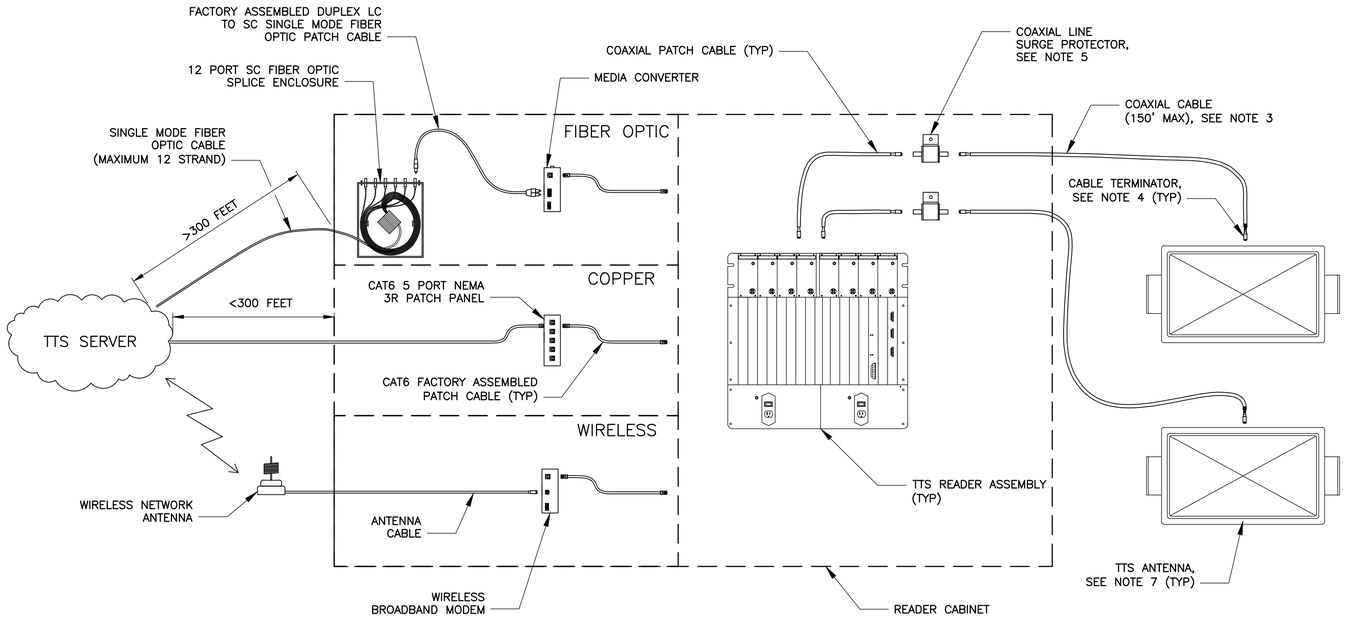
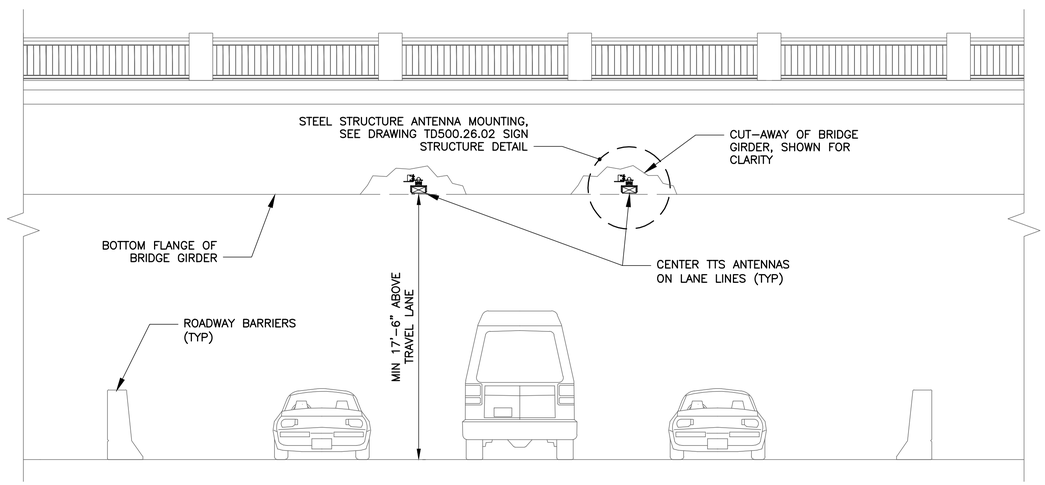



## COMMUNICATIONS BLOCK DIAGRAM
TD500.25.01

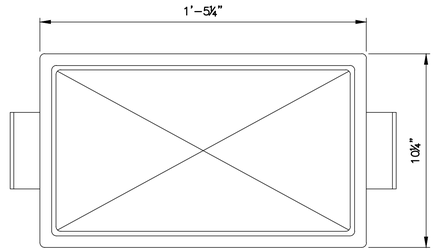



## TYPICAL OVERPASS SITE PLAN
TD500.25.02

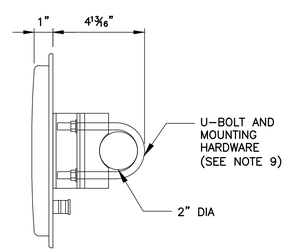
0 4 8
SCALE IN FEET

NOTES:

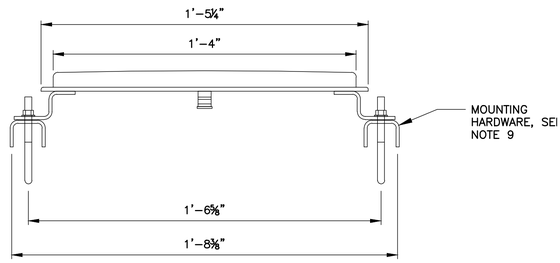
1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. TTS ANTENNA SHALL BE AS MANUFACTURED BY KAPSCH MODEL VRC.
3. COAXIAL CABLE SHALL BE ANDREW HELIAX FSJ4-50B OR APPROVED EQUAL.
4. COAXIAL CABLE SHALL BE TERMINATED WITH ANDREW TYPE N MALE CONNECTORS OR APPROVED EQUAL.
5. COAXIAL LINE SURGE PROTECTORS SHALL BE A POLYPHASER IS-50NX-C2 OR APPROVED EQUAL.
6. THE MINIMUM CLEARANCE BETWEEN THE ANTENNA AND ROADWAY SURFACE SHALL BE 17'-6", UNLESS SHOWN OTHERWISE ON CONTRACT DRAWINGS.
7. COMMUNICATIONS BLOCK DIAGRAM DEPICTS THE CONNECTION OF ONLY TWO LANE KITS/ANTENNAS. TTS READERS ASSEMBLIES MAY ACCOMMODATE UP TO EIGHT LANE KITS/ANTENNAS PER LOCATION.
8. COMMUNICATIONS FOR EACH SITE SHALL BE AS SHOWN ON CONTRACT DRAWINGS.
9. MOUNTING HARDWARE AND U-BOLT ARE SUPPLIED BY ANTENNA MANUFACTURER.




D 1 — PLAN




E 1 — SIDE ELEVATION




E 2 — FRONT ELEVATION

## ANTENNA DETAILS
TD500.25.03

0 .25 .5 1
SCALE IN FEET

Sheet 25 of 44

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|---|---|---|---|

*ENGINEERING DEPARTMENT*

**PANYNJ Traffic Standard Details**

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Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# TRAVEL TIME SUBSYSTEM DETAILS - 2



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date **7/29/2013**

Contract Number

Drawing Number **TD500.25**

PID#

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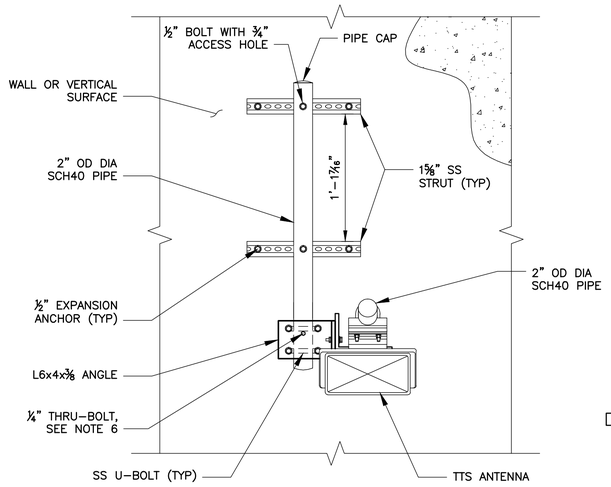
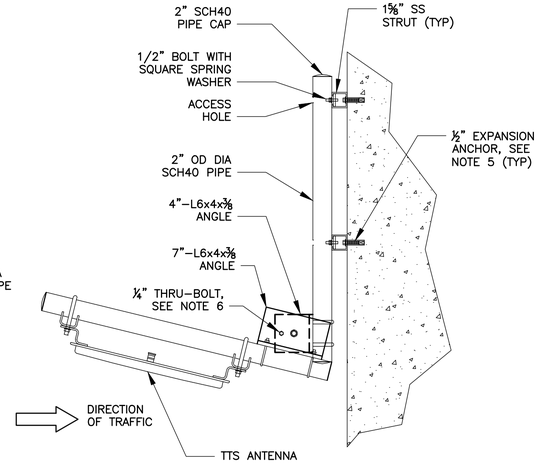



E 1 – FRONT ELEVATION



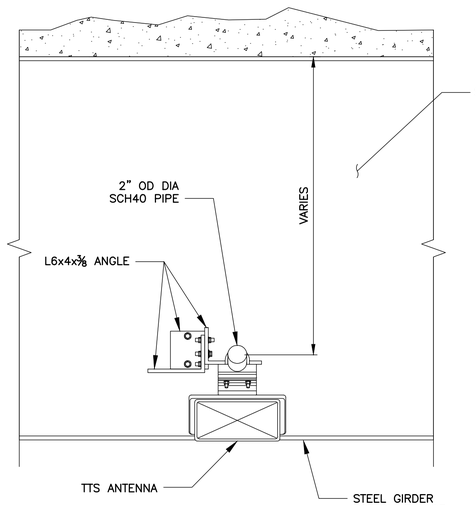

E 2 – SIDE ELEVATION

## CONCRETE FASCIA

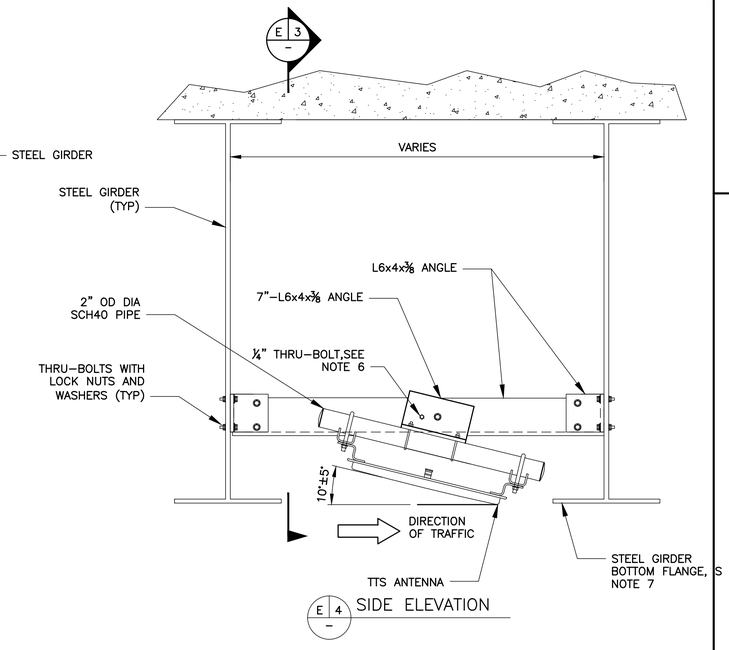
TD500.26.01

0 .5 1 2

SCALE IN FEET




E 3 – FRONT ELEVATION




E 4 – SIDE ELEVATION

## STEEL STRUCTURE

TD500.26.02

0 .5 1 2

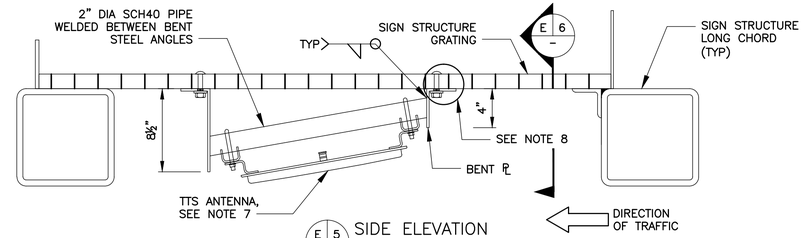
SCALE IN FEET

NOTES:

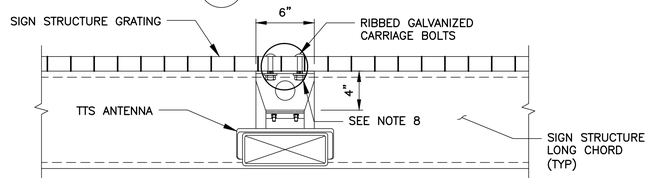
1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. ALL HARDWARE ATTACHING ANTENNA FRAMES AND STRUCTURAL MEMBERS SHALL BE STAINLESS STEEL. U-BOLTS SHALL BE PROPERLY SIZED TO ACCOMMODATE 2" SCHEDULE 40 GALVANIZED PIPE.
3. ANCHOR BOLTS SHALL BE AS MANUFACTURED BY HILTI AND HAVE A MINIMUM DIAMETER OF ¼".
4. UNLESS OTHERWISE NOTED ALL PIPE FOR MOUNTING BRACKETS SHALL BE ASTM A53 SCHEDULE 40 STEEL, AND ALL STEEL ANGLES SHALL BE A MINIMUM ASTM A36.
5. SUBMIT ALL ANTENNA MOUNTING DETAILS TO THE ENGINEER FOR APPROVAL. DETAIL ALL EMBEDMENT DEPTHS FOR ANCHORAGE HARDWARE.
6. FIELD DRILL ¼" THRU-BOLTS TO SECURE ANTENNA MOUNTS AFTER FINAL ANGLES AND MOUNTING HEIGHTS HAVE BEEN DETERMINED.
7. FINAL ANTENNA HEIGHTS MAY NOT EXTEND BELOW BRIDGE OR SIGN STRUCTURE STRUCTURAL ELEMENTS.
8. PROVIDE STEEL PLATES TO ADJUST ANTENNA ANGLE AS NECESSARY.

NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. WORK WITH STRUCTURAL ENGINEERING TO PROVIDE CALCULATIONS FOR ALL ANTENNA MOUNTING DETAILS. CALCULATIONS SHALL BE SIGNED AND STAMPED BY AN ENGINEER CERTIFIED IN THE STATE OF THE INSTALLATION. DETAIL ALL EMBEDMENT DEPTHS FOR ANCHORAGE HARDWARE.




E 5 – SIDE ELEVATION



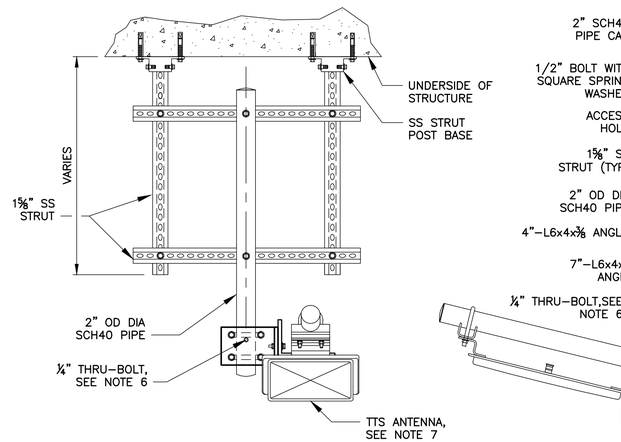

E 6 – FRONT ELEVATION

## SIGN STRUCTURE

TD500.26.03

0 .5 1 2

SCALE IN FEET




E 7 – FRONT ELEVATION




E 8 – SIDE ELEVATION

## UNDERDECK

TD500.26.04

0 .5 1 2

SCALE IN FEET

Sheet 26 of 44

**THE PORT AUTHORITY OF NY & NJ**

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*ENGINEERING DEPARTMENT*

**PANYNJ Traffic Standard Details**

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Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# TRAVEL TIME SUBSYSTEM DETAILS - 3



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |
| Date | | 7/29/2013 |

Contract Number

Drawing Number **TD500.26**

PID#

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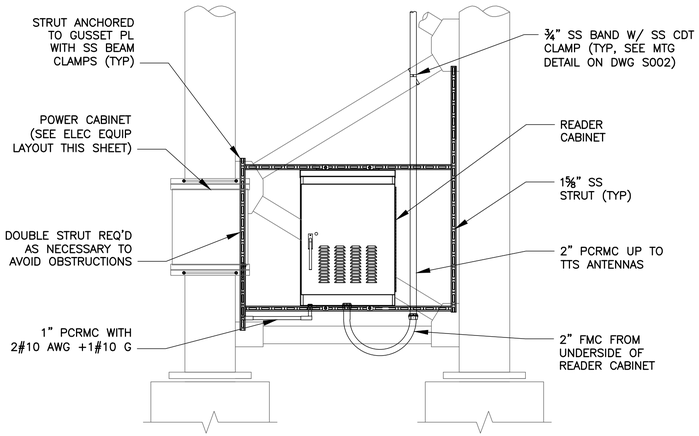
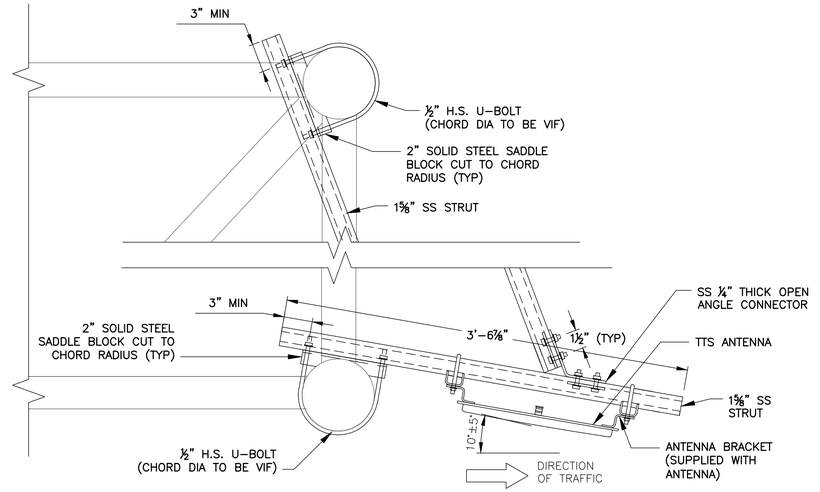



READER CABINET MOUNTING DETAIL TD500.27.02

0 2 4
SCALE IN FEET

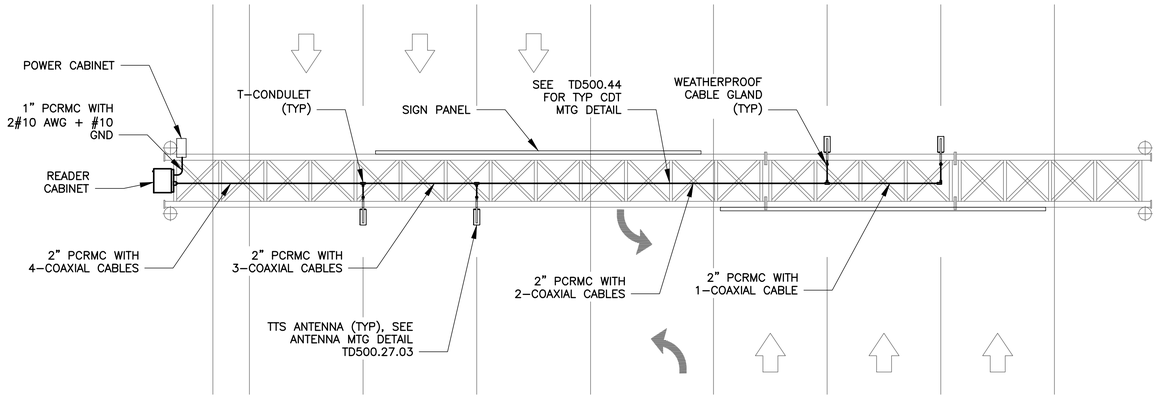
## NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. THE CLEARANCE BETWEEN THE ANTENNA AND ROADWAY SURFACE SHALL BE MINIMUM 17'. ANTENNAS SHALL NOT BE INSTALLED WHERE CLEARANCE IS SMALLER.
3. HIGH STRENGTH U-BOLTS SHALL CONFORM TO ASTM A325X, TYPE 1, WITH NUTS AND WASHERS CONFORMING TO ASTM F436. ALL BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.

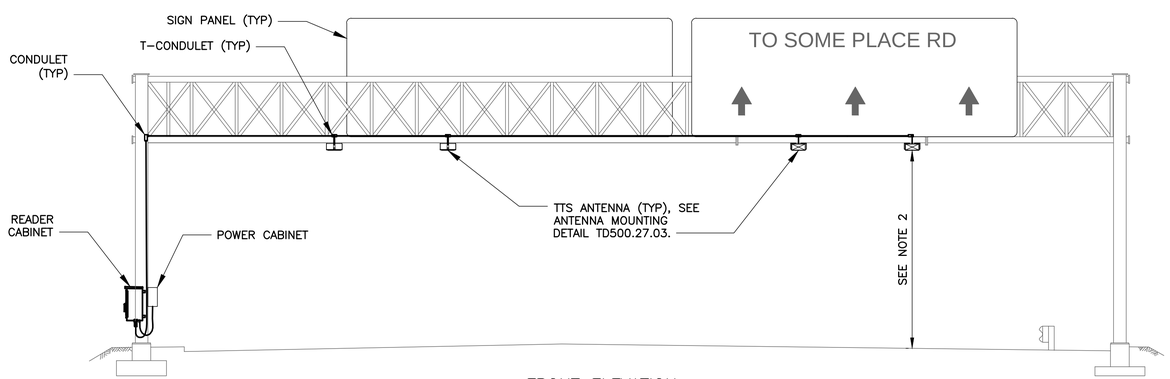



ANTENNA MOUNTING DETAIL TD500.27.03

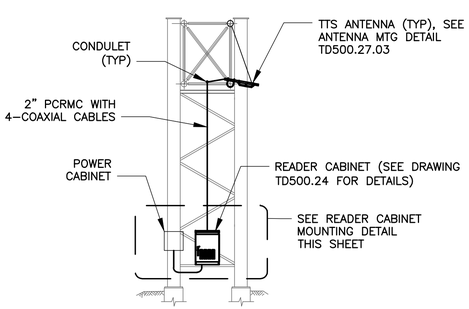
0 .5 1 2
SCALE IN FEET




PLAN VIEW




FRONT ELEVATION




SIDE ELEVATION

OVERHEAD SIGN STRUCTURE INSTALLATION TD500.27.01

0 8 16
SCALE IN FEET

Sheet 27 of 44

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*ENGINEERING DEPARTMENT*

**PANYNJ Traffic Standard Details**

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

**TRAVEL TIME SUBSYSTEM DETAILS - 4**



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number **TD500.27**

PID#

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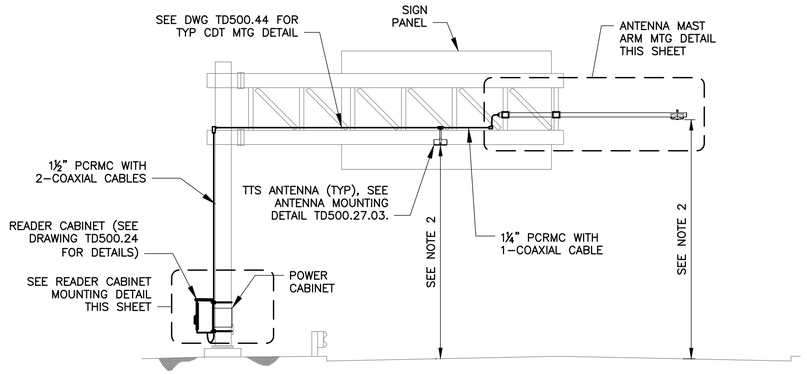


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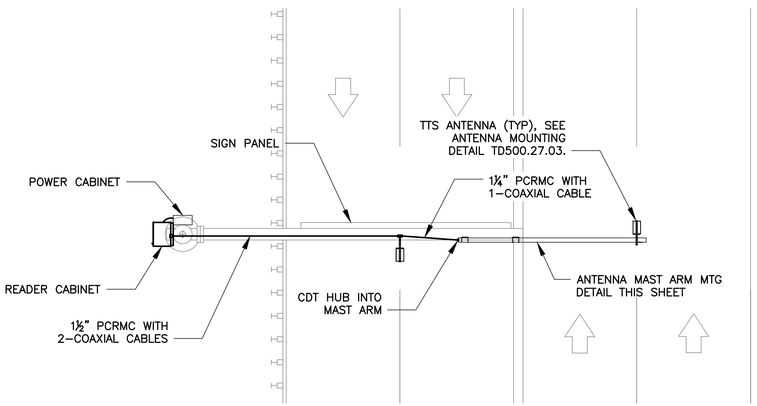
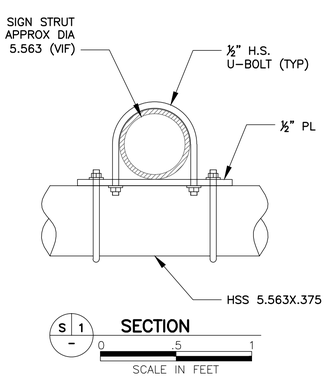



PLAN VIEW

CANTILEVER SIGN STRUCTURE INSTALLATION TD500.28.01

0 8 16
SCALE IN FEET




S 1 – SECTION

0 .5 1
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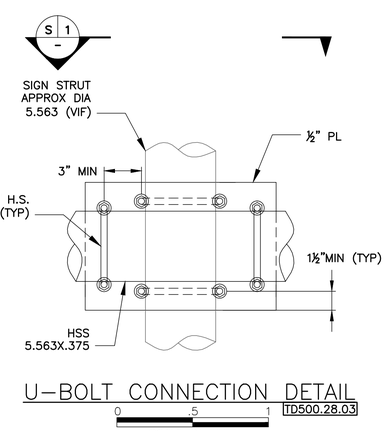


U–BOLT CONNECTION DETAIL TD500.28.03

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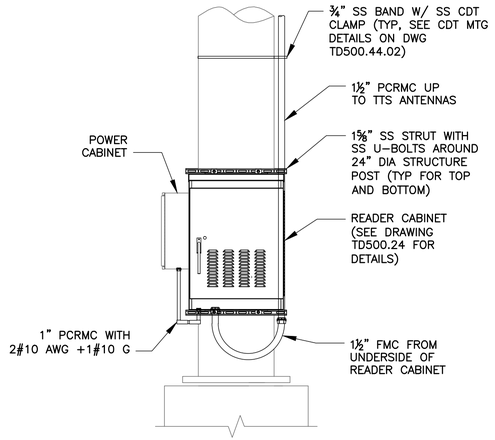
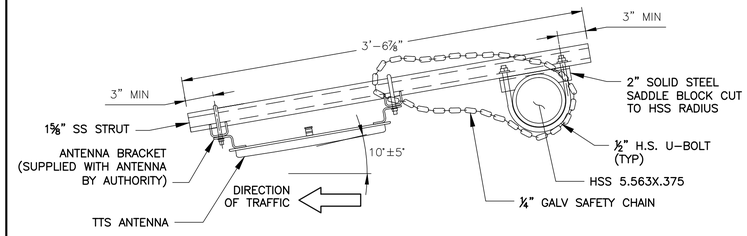



FRONT DETAIL ELEVATION TD500.28.02

0 2 4
SCALE IN FEET

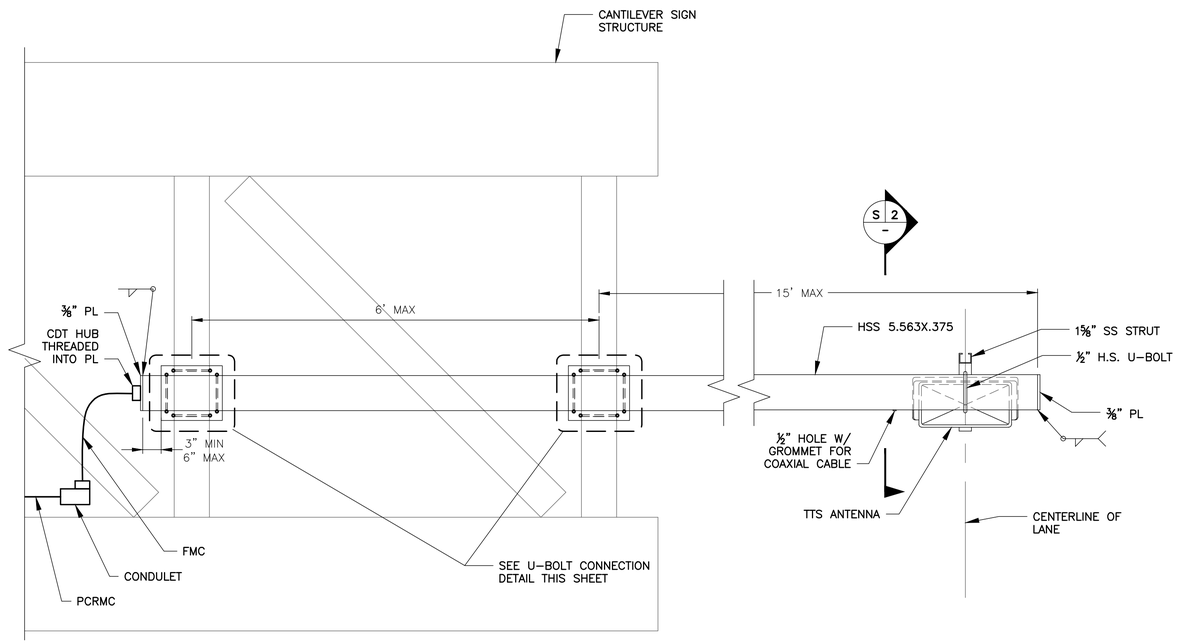
## NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. THE CLEARANCE BETWEEN THE ANTENNA AND ROADWAY SURFACE SHALL BE MINIMUM 17'. ANTENNAS SHALL NOT BE INSTALLED WHERE CLEARANCE IS SMALLER.
3. UNLESS OTHERWISE NOTED, ALL HOLLOW STRUCTURAL SECTIONS SHALL BE ASTM A500 GRADE B FY=42KSI.
4. UNLESS OTHERWISE NOTED, ALL PLATES SHALL BE ASTM A36 STEEL.
5. UNLESS OTHERWISE NOTED, ALL HARDWARE SHALL BE 304 STAINLESS STEEL WITH LOCKING NUTS AND WASHERS.
6. HIGH STRENGTH U–BOLTS SHALL CONFORM TO ASTM A325X, TYPE 1, WITH NUTS AND WASHERS CONFORMING TO ASTM F436. ALL BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
7. SUBMIT ALL ANTENNA MOUNTING DETAILS TO THE ENGINEER FOR APPROVAL.




S 2 – SECTION

0 .5 1 2
SCALE IN FEET




CANTILEVER STRUCTURE
ANTENNA MAST ARM MOUNTING ELEVATION TD500.27.04

0 1 2
SCALE IN FEET

Sheet 28 of 44

**THE PORT AUTHORITY OF NY & NJ**

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*ENGINEERING DEPARTMENT*

**PANYNJ Traffic Standard Details**

*TRAFFIC*

Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

**TRAVEL TIME SUBSYSTEM DETAILS - 5**



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number **TD500.28**

PID#

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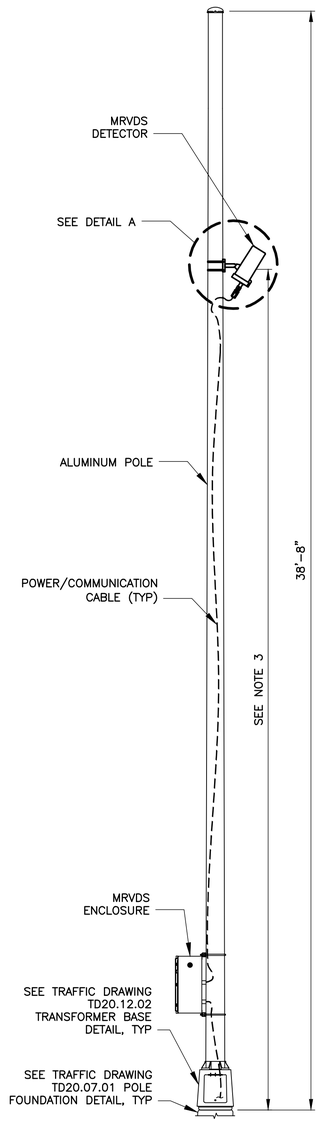
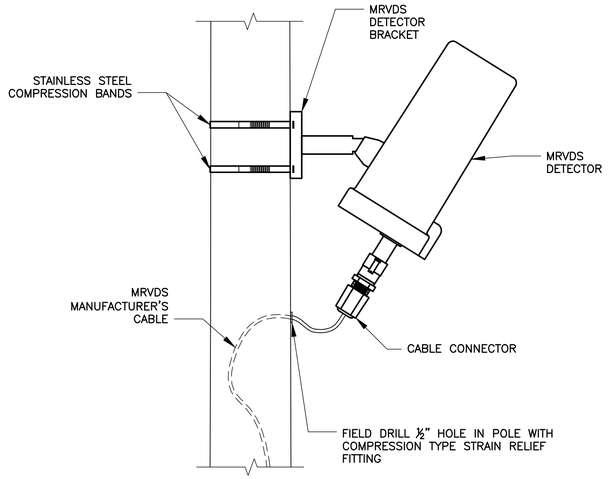



MRVDS – POLE MOUNTED TD500.29.01

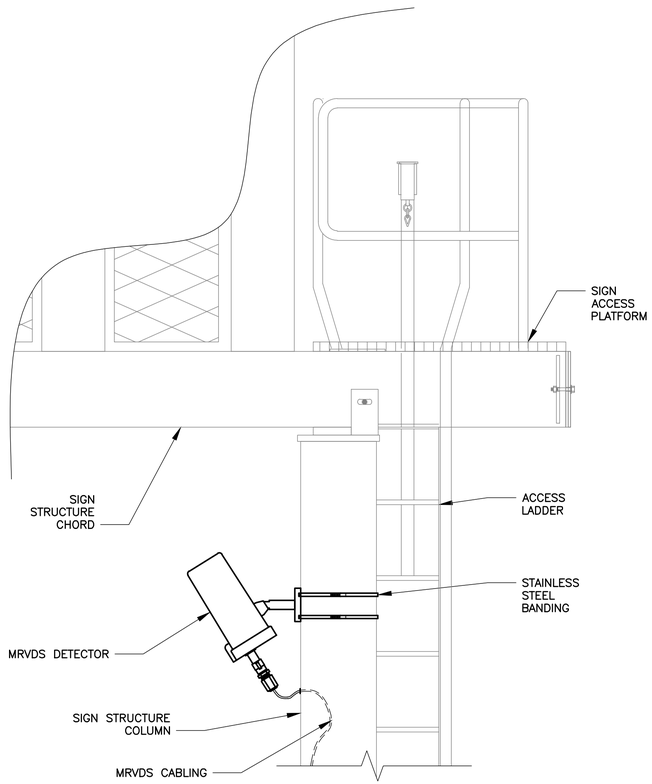
0 3 6

SCALE IN FEET




DETAIL A

NTS

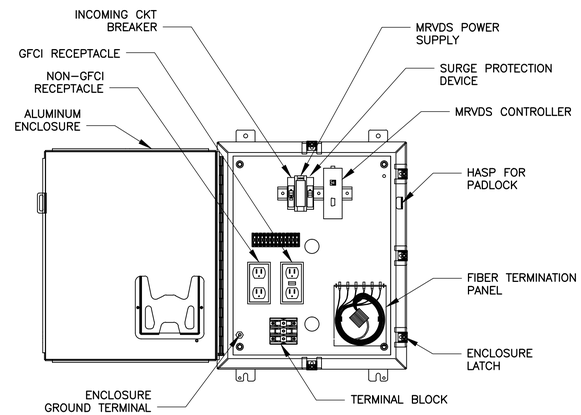



MRVDS DETECTOR ON SIGN STRUCTURE TD500.29.02

NTS

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. MOUNTING HARDWARE SHALL BE AS PROVIDED BY MRVDS MANUFACTURER.
3. HEIGHT OF INSTALLATION FOR THE MRVDS UNIT SHALL BE BASED UPON THE MANUFACTURER'S RECOMMENDATION GIVEN THE SITE GEOGRAPHY, SET BACK, AND SPECIFIED LANE COVERAGE. SUBMIT FINAL LAYOUT, WITH DIMENSIONS, TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.
4. COORDINATE MRVDS CABLE ROUTING AND STRUCTURE PENETRATIONS WITH THE STRUCTURAL CONTRACT DRAWINGS WHEN INSTALLED ON SIGN STRUCTURES.
5. CABLE CONNECTOR SHALL BE AS SUPPLIED BY MANUFACTURER. CONTRACTOR SHALL INSTALL CONNECTOR AS DIRECTED BY THE MANUFACTURER TO PROVIDE A WEATHERPROOF SEAL AROUND THE CABLE.
6. LOCATION OF EQUIPMENT WITHIN THE POLE MOUNTED ITS ENCLOSURE IS DIAGRAMMATIC. FINAL PLACEMENT MAY REQUIRE MODIFICATIONS BASED ON EQUIPMENT APPROVED FOR USE.
7. THE MRVDS SENSOR AND CONTROLLER CARD SHALL BE FROM THE SAME MANUFACTURER.




POLE MOUNTED MRVDS ENCLOSURE TD500.29.03

0 .5 1 2

SCALE IN FEET

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|---|---|---|---|

ENGINEERING DEPARTMENT

PANYNJ
Traffic Standard
Details

TRAFFIC

Title

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

# MICROWAVE RADAR VEHICLE DETECTOR SUBSYSTEM



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number TD500.29

PID#

SAVED BY: driley

LAST SAVED: 11/1/2013 2:07 PM

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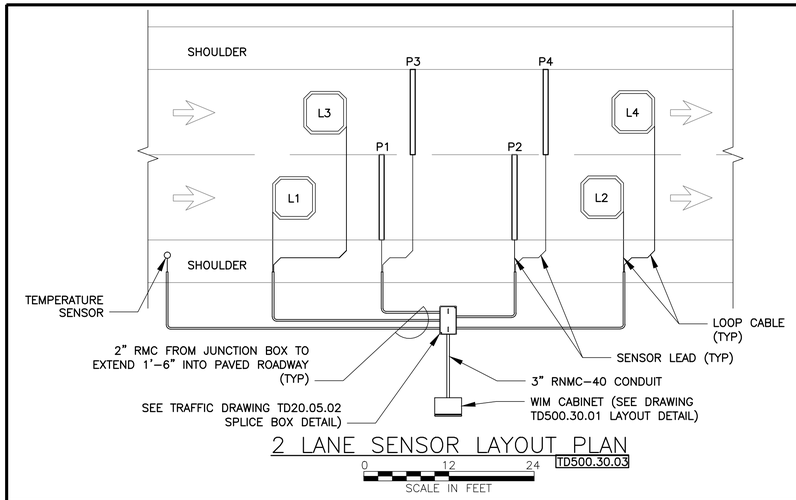
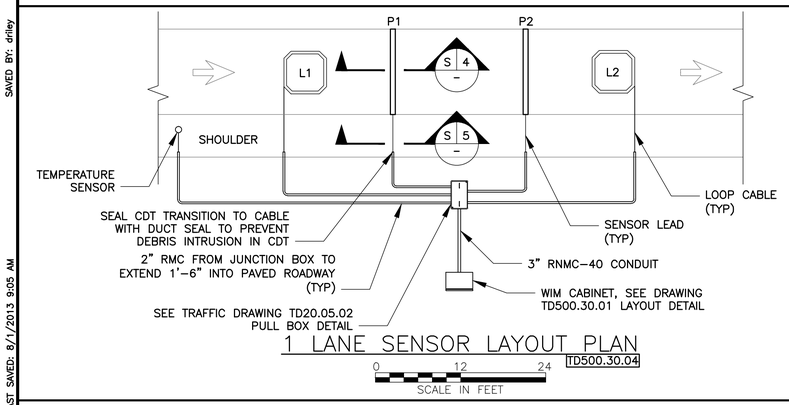


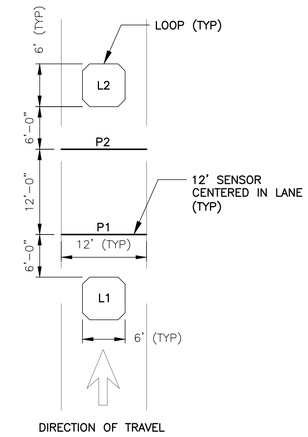

## 2 LANE SENSOR LAYOUT PLAN TD500.30.03

0 12 24
SCALE IN FEET




## 1 LANE SENSOR LAYOUT PLAN TD500.30.04

0 12 24
SCALE IN FEET

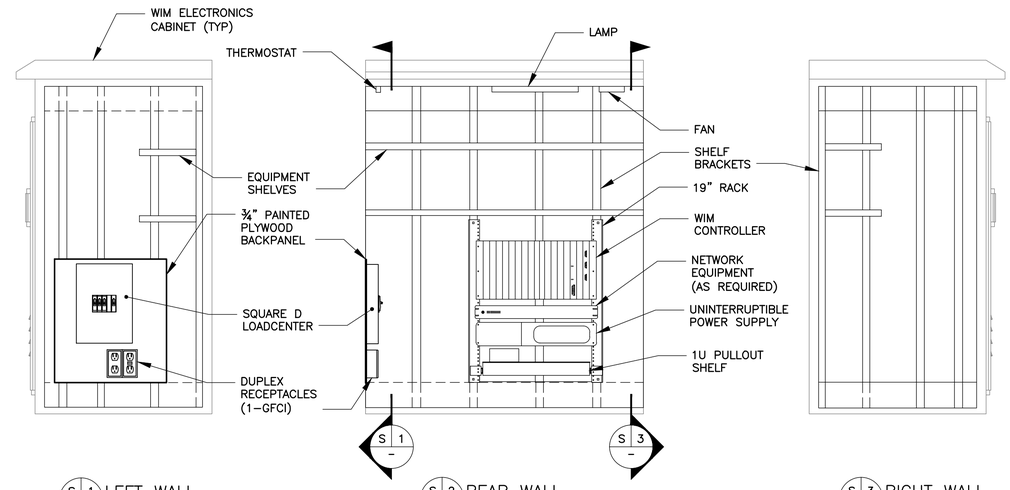



## TYPICAL SENSOR LAYOUT PLAN FOR WEIGH–IN–MOTION SITES TD500.30.02

0 12 24
SCALE IN FEET

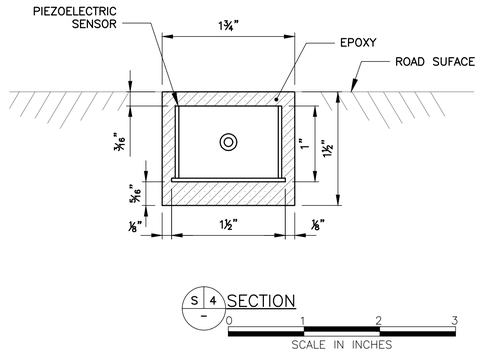
NOTES:

1. IDENTIFY EACH LOOP AND PIEZOELECTRIC SENSOR WITH DURABLE IDENTIFICATION TAGS. AFFIX THE LETTERS AS FOLLOWS:
   a) TAG THE LEADING LOOP AS "L1" AND LEADING PIEZOELECTRIC SENSOR AS "P1"(RIGHT MOST TRAVELING LANE) AND TAG THE ENDING LOOP AS "L2" AND THE ENDING PIEZOELECTRIC SENSOR AS "P2" IN THE SAME LANE.
   b) IDENTIFY LOOPS AND SENSORS IN GROUPS, WITH THE LEADING LOOP AND SENSOR IN THE DIRECTION OF TRAVEL ALWAYS IDENTIFIED BY THE FIRST NUMBER IN THE GROUP. ASSIGN THE GROUPS BY LANE, IN ASCENDING NUMERICAL ORDER, OUTWARD TOWARD THE LEFT MOST TRAVELING LANE.
   c) DESIGNATE ADDITIONAL LOOPS AND SENSORS IN THE OPPOSITE DIRECTION IN A SIMILAR FASHION, WITH THE RIGHT MOST LANE IDENTIFIED WITH THE NEXT NUMERICAL NUMBER AND ASCENDING TO THE LEFT MOST TRAVELING LANE.
2. TYPICAL SENSOR SPACING IS SHOWN. ACTUAL SENSORS SHALL BE SPACED ACCORDING TO THE ROAD GEOMETRY AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. USE THIN WALLED PLASTIC TUBING TO CONTAIN THE SENSOR LEAD WIRE. INSTALL THE TUBING FROM THE END OF THE SENSOR SLOT TO A POINT 6–12 INCHES INSIDE THE JUNCTION BOX OR CONDUIT END.
4. PROVIDE EACH SENSOR WITH A SUFFICIENT LENGTH OF SHIELDED LEAD CABLE FOR TERMINATION AT THE CONTROLLER IN THE WIM CABINET WITHOUT SPLICING.
5. INSTALL TEMPERATURE SENSOR IN SHOULDER PER MANUFACTURER'S RECOMMENDATION. SUPPLY ONE TEMPERATURE SENSOR PER WIM CABINET.
6. REFER TO TRAFFIC STANDARD DETAILS TD20.26 FOR LOOP DETECTOR INSTALLATION DETAILS.
7. CCTV AND STILL CAMERAS MAY BE INSTALLED AS PART OF THE WIM SYSTEM. INSTALL ALL CAMERAS AS SHOWN ON THE CONTRACT DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

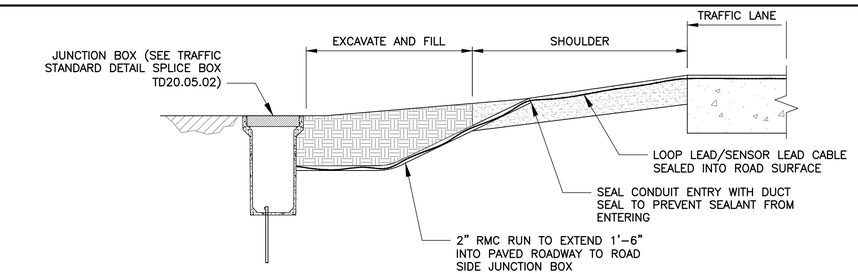



## WIM CABINET EQUIPMENT LAYOUT TD500.30.01

0 1 2
SCALE IN FEET




0 1 2 3
SCALE IN INCHES




## LOOP LEAD/SENSOR LEAD CABLE ROUTING DETAILS TD500.30.05

0 2 4
SCALE IN FEET

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|---|---|---|---|

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**PANYNJ**
**Traffic Standard Details**

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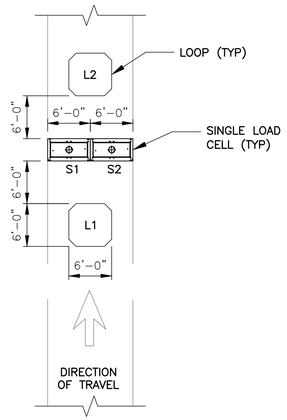
Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

**WEIGH-IN-MOTION DETAILS - 1 (PIEZOELECTRIC SENSOR)**

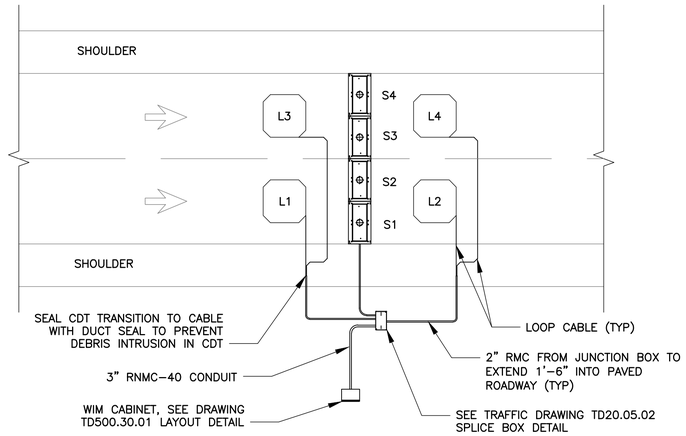


| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |
| Date | | 7/29/2013 |
| Contract Number | | |
| Drawing Number | | TD500.30 |
| PID# | | |




## SINGLE LANE LOAD CELL LAYOUT PLAN
TD500.31.01

0 12 24
SCALE IN FEET




## 2 LANE LOAD CELL LAYOUT PLAN
TD500.31.02

0 12 24
SCALE IN FEET

NOTES:

1. IDENTIFY EACH LOOP AND SINGLE LOAD CELL SENSOR WITH DURABLE IDENTIFICATION TAGS. AFFIX THE LETTERS AS FOLLOWS:

a) TAG THE LEADING LOOP AS "L1" (RIGHT MOST TRAVELING LANE) AND TAG THE ENDING LOOP AS "L2" IN THE SAME LANE.

b) TAG THE RIGHT MOST SINGLE LOAD CELL SENSOR AS "S1" AND THE LEFT MOST SINGLE LOAD CELL AS "S2" IN THE SAME LANE. REPEAT THE TAGGING PROCESS FOR ANY ADDITIONAL LANES.

c) IDENTIFY LOOPS AND SENSORS IN GROUPS, WITH THE LEADING LOOP AND SENSOR IN THE DIRECTION OF TRAVEL ALWAYS IDENTIFIED BY THE FIRST NUMBER IN THE GROUP. ASSIGN THE GROUPS BY LANE, IN ASCENDING NUMERICAL ORDER, OUTWARD TOWARD THE LEFT MOST TRAVELING LANE.

d) DESIGNATE ADDITIONAL LOOPS AND SENSORS IN THE OPPOSITE DIRECTION IN A SIMILAR FASHION, WITH THE RIGHT MOST LANE IDENTIFIED WITH THE NEXT NUMERICAL NUMBER AND ASCENDING TO THE LEFT MOST TRAVELING LANE.

2. TYPICAL LAYOUT IS SHOWN. TYPE AND NUMBER OF SENSORS MAY BE REQUIRED TO SUIT SITE CONDITIONS AND MANUFACTURER'S RECOMMENDATION.

3. TYPICAL SENSOR SPACING IS SHOWN. ACTUAL SENSORS SHALL BE SPACED ACCORDING TO THE ROAD GEOMETRY AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

4. MAKE ALL CONNECTIONS BETWEEN SENSORS CABLES AND LEAD CABLES IN JUNCTION BOX.

5. CABLES MUST BE PROTECTED BY PVC SLEEVES WHERE THEY CROSS PAVEMENT JOINTS/CRACKS.

6. FOUNDATION SHOWN IS REPRESENTATIVE OF A TYPICAL LOAD CELL. VARIATIONS MAY BE REQUIRED AS DICTATED BY LOCAL GEOTECHNICAL CONDITIONS. SUBMIT ALL FOUNDATION DETAILS TO THE ENGINEER FOR APPROVAL.

7. INSTALL 1⅛"x16" EPOXY COATED DOWELS IN 1¼"x8" DEEP HOLE AT 16" ON CENTER. SECURE DOWELS WITH HILTI HVAA EPOXY OR APPROVED EQUAL.

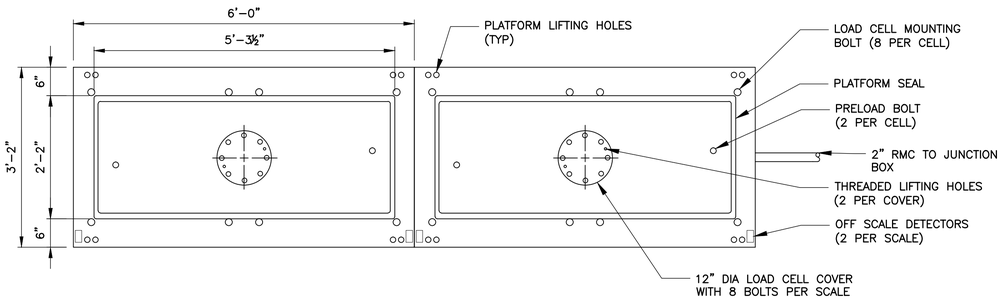
8. REFER TO TRAFFIC STANDARD DETAILS TD500.33 FOR WIM CABINET EQUIPMENT LAYOUT.

9. REFER TO TRAFFIC STANDARD DETAILS TD20.26 FOR LOOP DETECTOR INSTALLATION.

10. DRAIN PIPE SHALL BE MIN 3% SLOPED TOWARD DRAINAGE PIT.

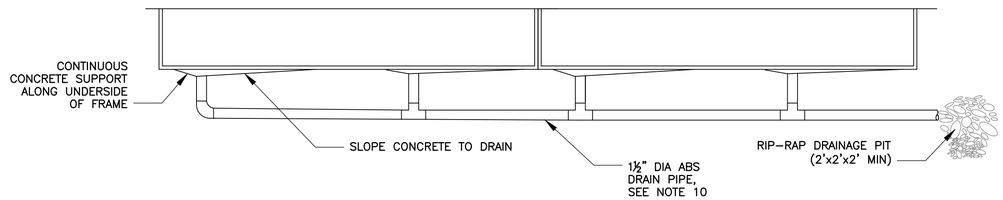
NOTES TO DESIGNER (REMOVE FROM DRAWING)

1. CCTV AND STILL CAMERAS MAY BE INSTALLED AS PART OF THE WIM SYSTEM. VERIFY ALL CAMERAS ARE SHOWN ON THE CONTRACT DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.



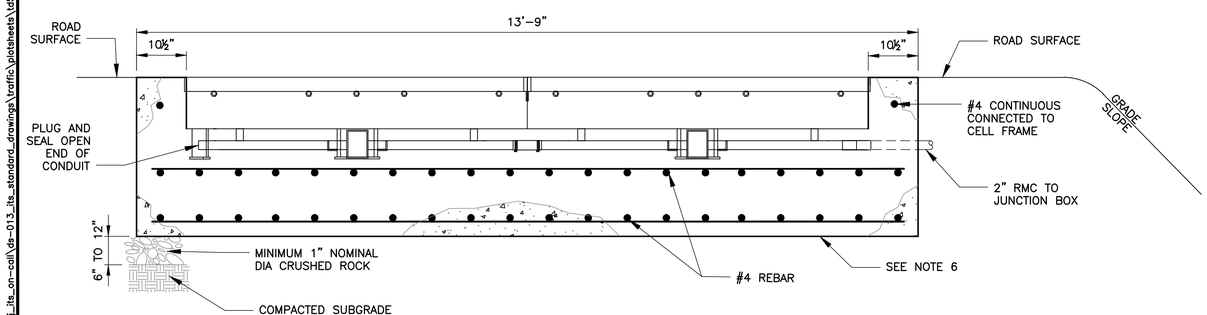

## SINGLE LOAD CELL PLAN
TD500.31.03

0 1 2 3
SCALE IN FEET



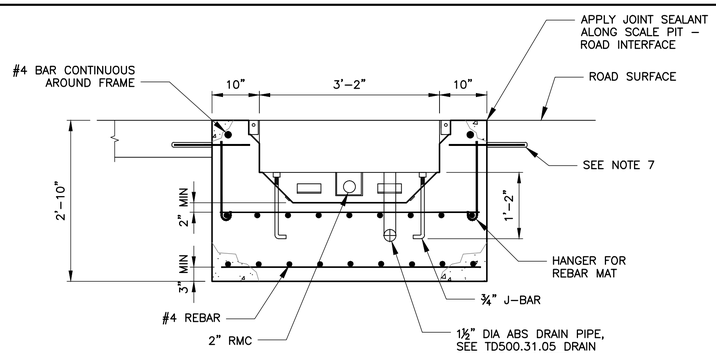

## DRAIN DETAIL
TD500.31.05

0 1 2 3
SCALE IN FEET




## SINGLE LOAD CELL SIDE VIEW
TD500.31.04

0 1 2 3
SCALE IN FEET




## SINGLE LOAD CELL SIDE VIEW
TD500.31.06

0 1 2 3
SCALE IN FEET

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|---|---|---|---|

*ENGINEERING DEPARTMENT*

**PANYNJ Traffic Standard Details**

*TRAFFIC*

Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# WEIGH-IN-MOTION DETAILS - 2 (SINGLE LOAD CELL SENSOR)



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number **TD500.31**

PID#

SAVED BY: drley

LAST SAVED: 11/1/2013 2:25 PM

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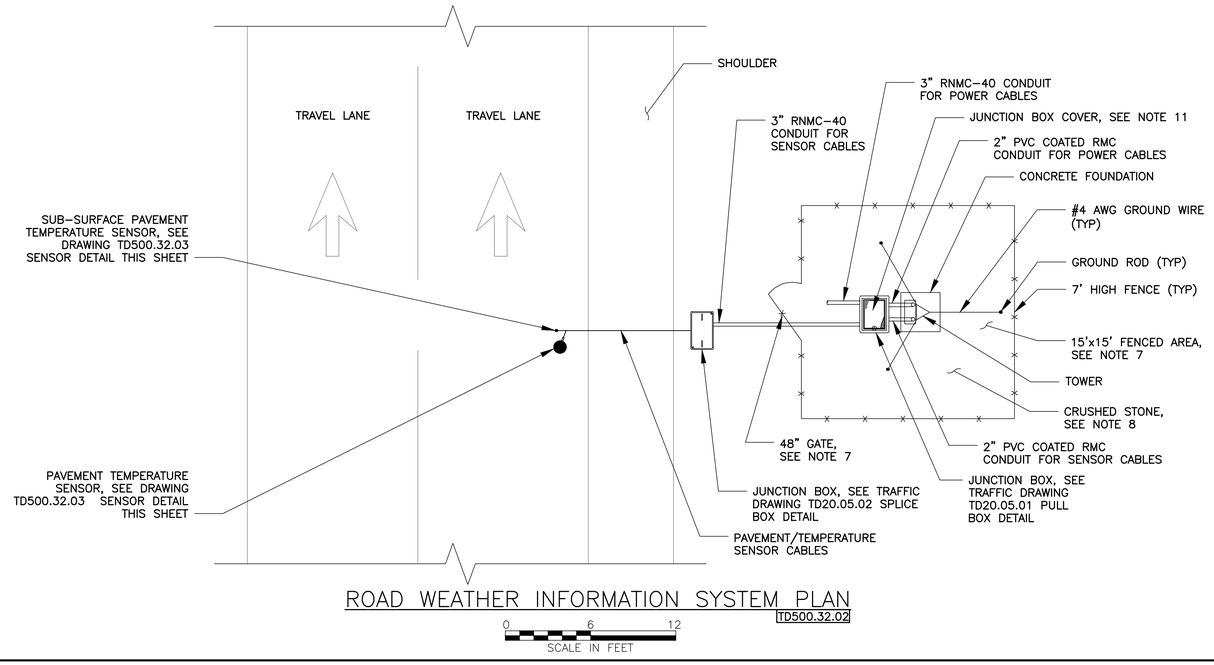


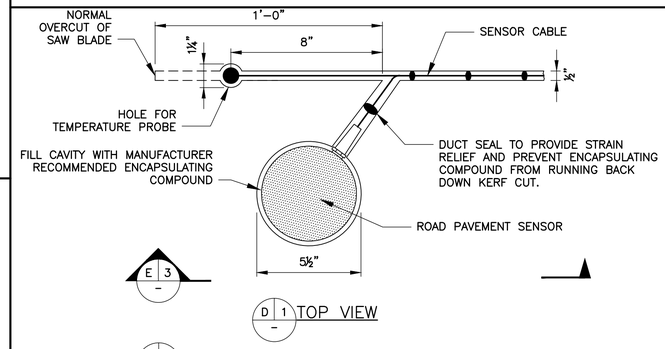

## ROAD WEATHER INFORMATION SYSTEM PLAN

TD500.32.02

0 6 12
SCALE IN FEET

NOTES:

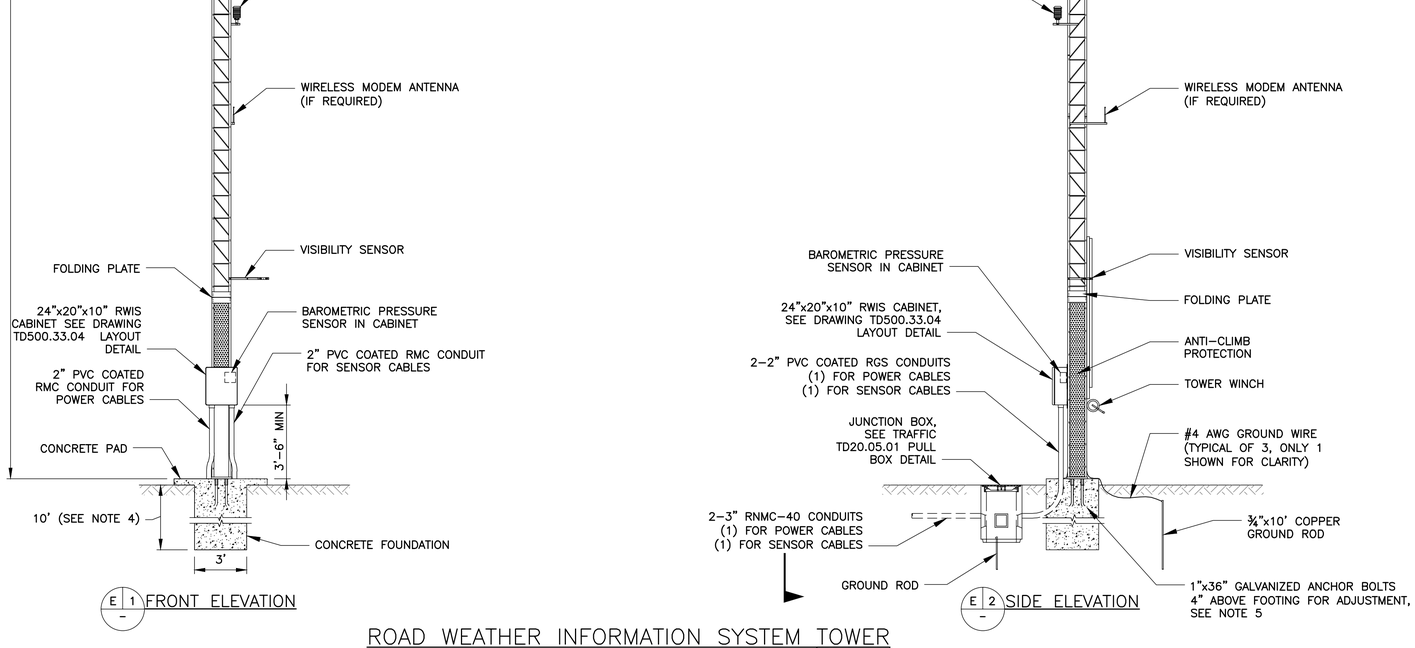
1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. ROAD WEATHER INFORMATION SYSTEM TOWER SHALL BE INSTALLED AT LEAST 30 FEET AWAY FROM THE NEAREST TRAVELING LANES TO AVOID INACCURATE WIND SPEED CALCULATIONS. SLIGHT RELOCATIONS ARE PERMITTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND APPROVAL OF THE ENGINEER.
3. GROUND RESISTANCE SHOULD MEET CRITERIA IN SPECIFICATION SECTION 16450, AS SPECIFIED BY THE MANUFACURER, OR AS SPECIFIED IN THE NEC. WHICHEVER IS MOST STRINGENT.
4. TYPICAL FOUNDATION DETAIL SHOWN. FOUNDATION SHALL BE DESIGNED BASED UPON THE LOCAL GEOTECHNICAL CONDITIONS. SUBMIT ALL FOUNDATION DETAILS TO THE ENGINEER FOR APPROVAL.
5. TYPE SIZE AND NUMBER OF ANCHOR BOLTS SHALL BE DETERMINED BY THE RWIS MANUFACTURER.
6. BOTH ENDS OF THE CONDUITS BETWEEN JUNCTION BOXES AND THE RWIS CABINET SHOULD BE SEALED WITH FOAM OR WIRE MESH TO PREVENT RODENT INTRUSION.
7. FENCE AND GATE SHALL BE GALVANIZED COATED EXCEPT FOR PORT FACILITIES WHERE IT SHALL BE ALUMINUM COATED. REFER TO SPECIFICATION SECTION 02832, METALLIC-COATED STEEL CHAIN LINK FENCE AND GATES FOR FURNISHING AND INSTALLATION REQUIREMENTS.
8. FENCED AREA SHALL BE COVERED WITH A WEED BLOCKING MATERIAL AND A 6" THICK LAYER OF CRUSHED STONE.
9. PAVEMENT AND SUB-SURFACE TEMPERATURE SENSORS SHALL BE LOCATED IN THE TRAVEL LANE AS PER THE MANUFACTURER'S RECOMMENDATIONS.
10. MAXIMUM CABLE DISTANCE BETWEEN SENSORS (TEMPERATURE AND PAVEMENT) AND THE RWIS CABINET IS 5000 FEET.
11. JUNCTION BOX COVER TO BE EMBOSSED WITH THE FOLLOWING 2" LETTERS: "PA E/C"




## ROAD PAVEMENT AND SUBSURFACE PAVEMENT TEMPERATURE SENSOR DETAILS

TD500.32.03

0 .25 .5 1
SCALE IN FEET




## ROAD WEATHER INFORMATION SYSTEM TOWER

TD500.32.01

0 4 8
SCALE IN FEET

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| No. | Date | Revision | Approved |
|---|---|---|---|

*ENGINEERING DEPARTMENT*

**PANYNJ Traffic Standard Details**

*TRAFFIC*

Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# ROAD WEATHER INFORMATION SUBSYSTEM DETAILS - 1



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |
| Date | | 7/29/2013 |
| Contract Number | | |
| Drawing Number | | TD500.32 |
| PID# | | |

SAVED BY: driley
LAST SAVED: 8/1/2013 1:49 PM
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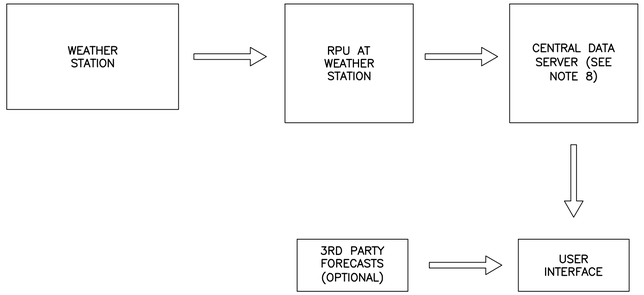


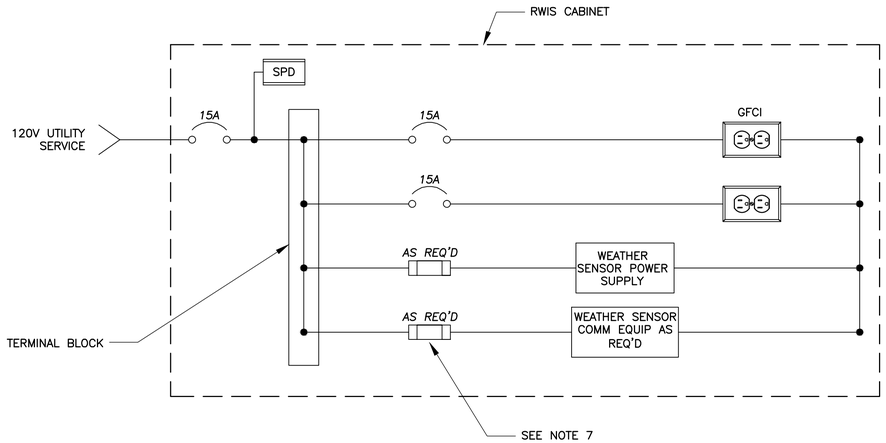

TD500.33.02

## NOTES:

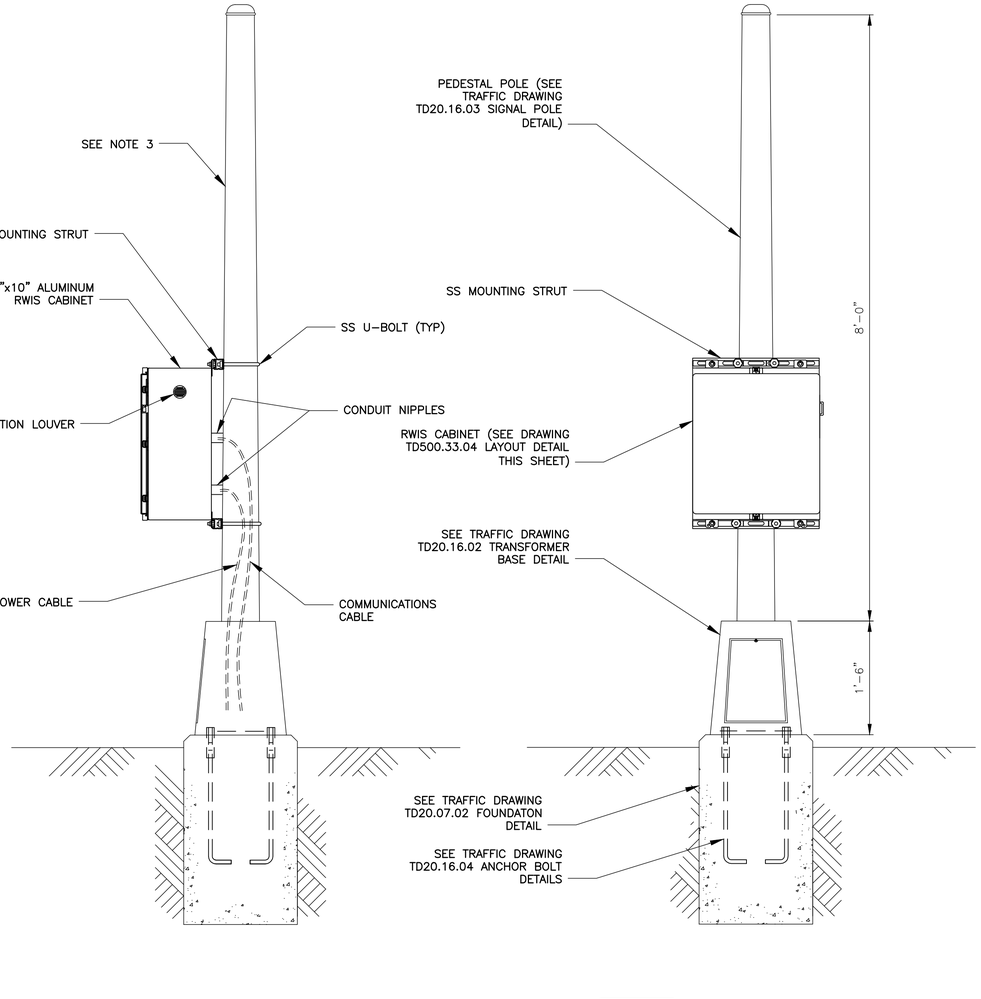
1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. ARRANGEMENT OF EQUIPMENT WITHIN THE RWIS CABINET IS DIAGRAMMATIC. FINAL PLACEMENT AND EQUIPMENT MAY REQUIRE MODIFICATIONS BASED ON THE SENSORS, AND RWIS MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS.
3. POLE MOUNTED RWIS CABINET SHALL BE USED AT PLACES ONLY WHERE PAVEMENT SENSORS ARE INSTALLED. POLE SHALL BE INSTALLED AT A MINIMUM 10 FEET AWAY FROM EDGE OF THE NEAREST TRAVELING LANE.
4. THE RWIS CABINET SHALL BE ORIENTED TO OPEN PERPENDICULAR TO THE NEAREST TRAVEL LANE TO ALLOW FOR MAINTENANCE PERSONNEL TO SEE ONCOMING TRAFFIC WITH THE CABINET OPEN.
5. SECURE THE RWIS CABINET TO THE POLE UTILIZING STAINLESS STEEL U-BOLTS. CABLING SHALL ENTER THROUGH FIELD DRILLED AND TAPPED 1" ALUMINUM CONDUIT NIPPLES. SEAL CONDUIT PENETRATIONS WITH NON-SHRINK UV RESISTANT SILICONE TO PREVENT WATER FROM ENTERING THE ENCLOSURE AND POLE. ALL HARDWARE SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED.
6. PROVIDE GROUNDING CONDUCTORS FOR POLE AND CABINET IN ACCORDANCE WITH THE NEC.
7. FUSES SHALL BE PROVIDED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
8. THE COLLECTION AND STORAGE OF DATA ON THE CENTRAL SERVER SHALL BE COORDINATED WITH THE MANUFACTURER AND ENGINEER. FINAL LOCATION OF THE CENTRAL SERVER SHALL BE DETERMINED PRIOR TO THE START OF ANY WORK.

## NOTES TO DESIGNER (REMOVE FROM DRAWING)

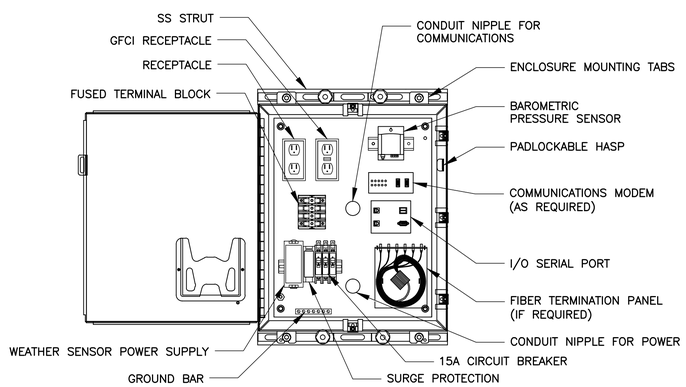
1. COORDINATE THE FINAL LOCATION OF THE CENTRAL SERVER WITH THE AUTHORITY.




TD500.33.03




TD500.33.01




TD500.33.04

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| No. | Date | Revision | Approved |
|---|---|---|---|

*ENGINEERING DEPARTMENT*

**PANYNJ Traffic Standard Details**

*TRAFFIC*

Title

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# ROAD WEATHER INFORMATION SUBSYSTEM DETAILS - 2



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number **TD500.33**

PID#

SAVED BY: driley

LAST SAVED: 11/1/2013 2:37 PM

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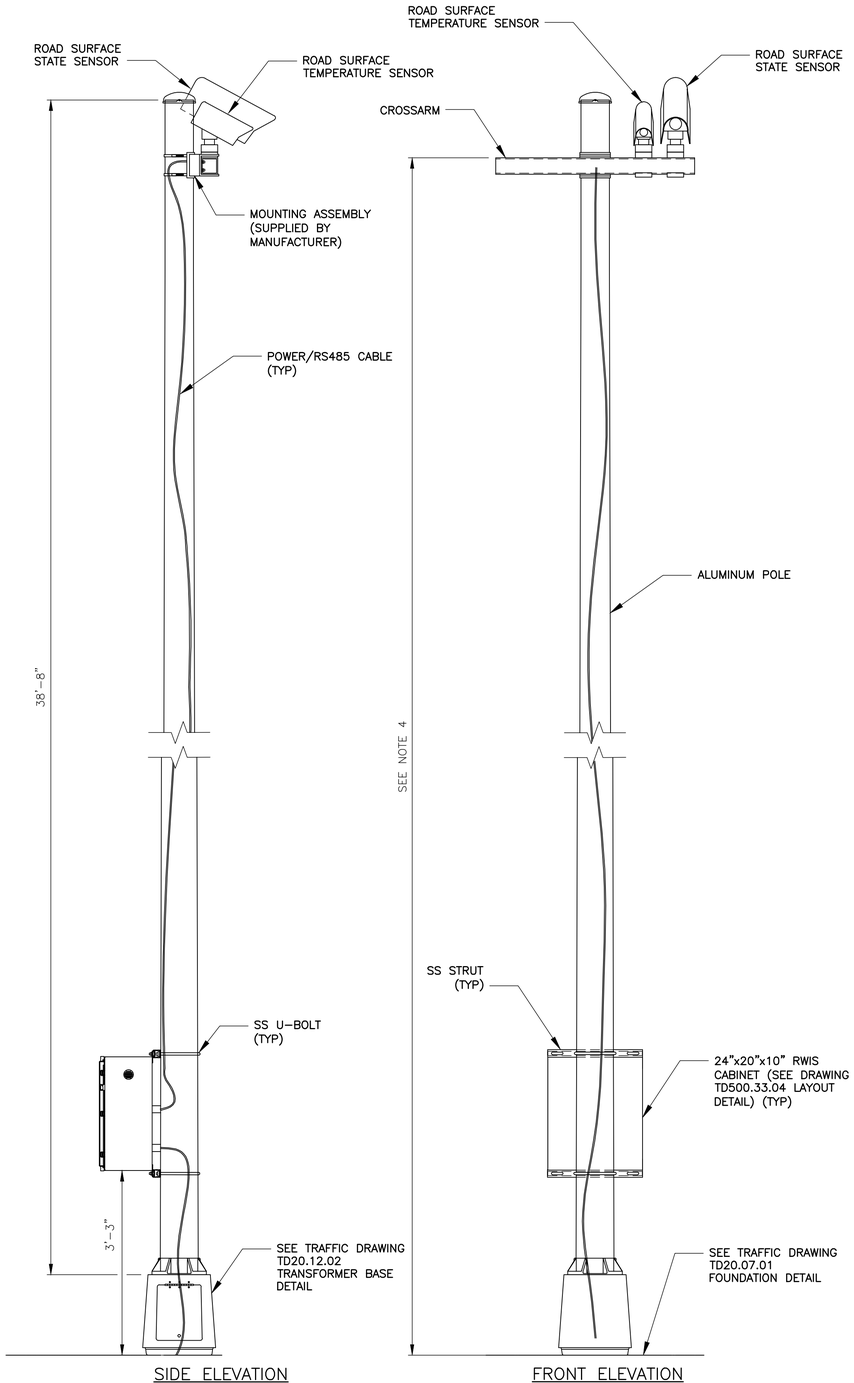
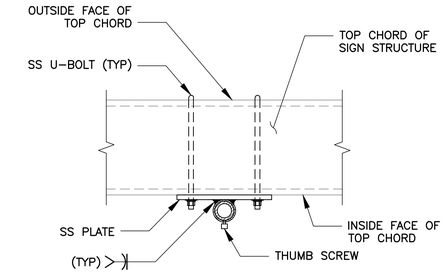



POLE MOUNTED NON-INTRUSIVE SENSOR

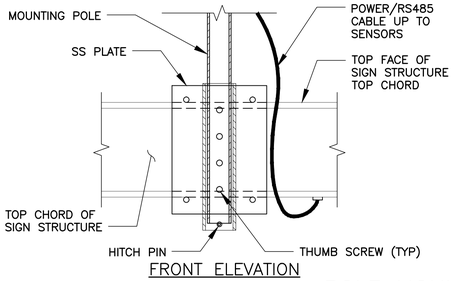
TD500.34.01

0 1 2

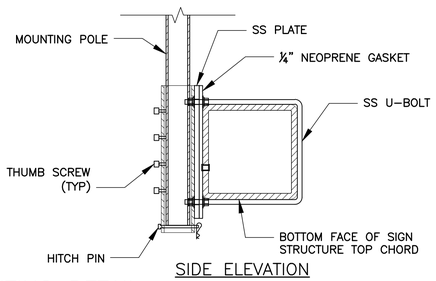
SCALE IN FEET




PLAN VIEW




FRONT ELEVATION




SIDE ELEVATION

POLE MOUNTING DETAIL

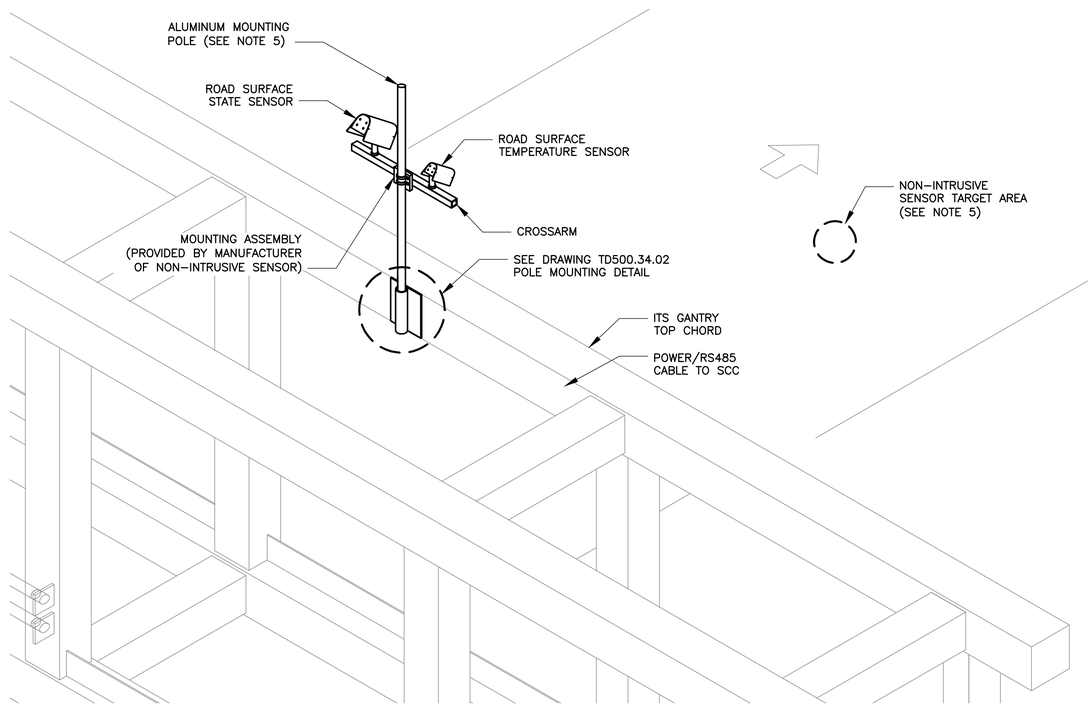
TD500.34.02

0 .5 1 2

SCALE IN FEET

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. THIS DETAIL IS TO BE USED FOR NON-INTRUSIVE SENSOR INSTALLATION ON THE POLE OR ITS GANTRY ONLY.
3. THE ROAD SURFACE STATE AND TEMPERATURE SENSORS SHALL BE POSITIONED TO HAVE A LINE OF SITE OF THE PAVEMENT SURFACE TARGET AREA.
4. THE SENSOR MOUNTING HEIGHT AND POLE SET BACK DISTANCE FROM EDGE OF THE NEAREST TRAVELING LANE SHALL BE AS RECOMMENDED BY THE MANUFACTURER TO PROVIDE A CLEAR AND UNOBSTRUCTED VIEW OF THE PAVEMENT.
5. THE POLE HEIGHT SHALL BE DETERMINED BASED ON THE ITS GANTRY HEIGHT AND SENSOR'S MOUNTING HEIGHT AS RECOMMENDED BY THE MANUFACTURER TO PROVIDE A CLEAR AND UNOBSTRUCTED VIEW OF THE PAVEMENT.
6. PROVIDE GROUNDING CONDUCTORS FOR POLE AND CABINET IN ACCORDANCE WITH THE NEC.
7. ALL HARDWARE AND MATERIAL SHALL BE STAINLESS STEEL.




ITS GANTRY MOUNTED SENSOR DETAIL

TD500.34.03

0 .5 1 2

SCALE IN FEET

Sheet 34 of 44

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ENGINEERING DEPARTMENT

PANYNJ Traffic Standard Details

TRAFFIC

Title

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

# ROAD WEATHER INFORMATION SUBSYSTEM DETAILS - 3



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number TD500.34

PID#

SAVED BY: driley

LAST SAVED: 11/1/2013 2:42 PM

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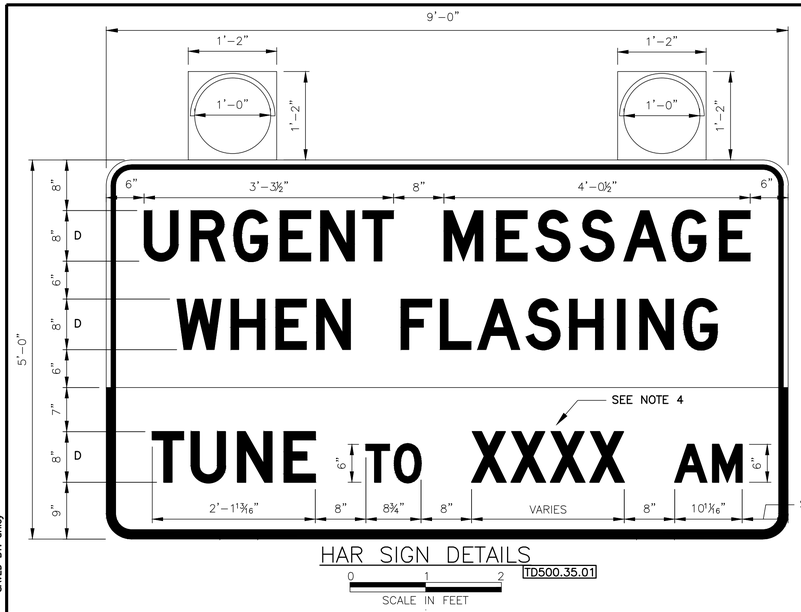



TOP SECTION

BORDER: 7/8", INSET: 5/8"

LEGEND AND BORDER: BLACK

BACKGROUND AND INSET: YELLOW

BOTTOM SECTION

BORDER: 1½", NO INSET

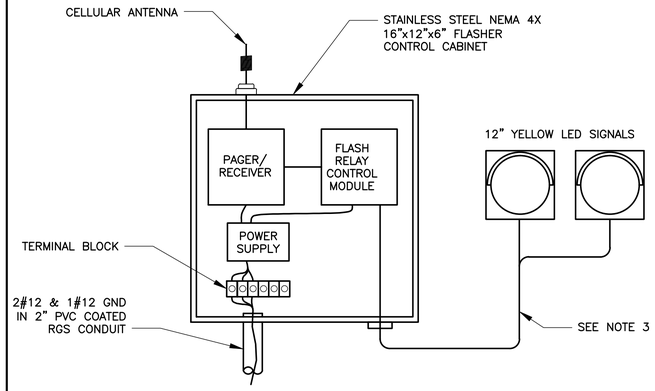
LEGEND AND BORDER: WHITE

BACKGROUND: BLUE

HAR SIGN DETAILS TD500.35.01

0 1 2

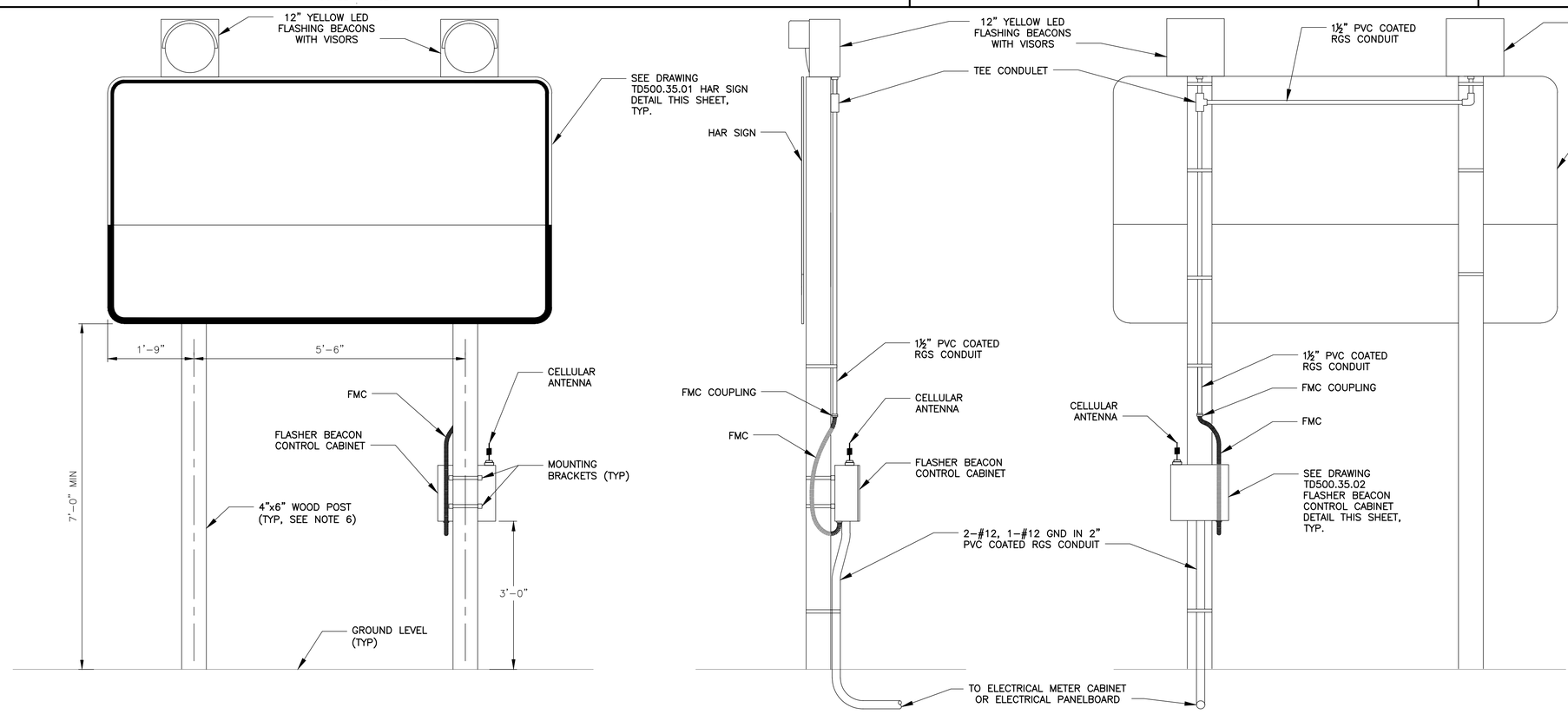
SCALE IN FEET




FLASHER BEACON CONTROL CABINET LAYOUT TD500.35.02

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. UNLESS OTHERWISE NOTED, ALL HARDWARE SHALL BE STAINLESS STEEL.
3. POWER CABLE TO LED SIGNALS MUST NOT BE LESS THAN #12 AWG.
4. HAR SIGN SHALL BE COORDINATED WITH FCC APPROVED FREQUENCY. THE MESSAGE SHALL BE CENTERED BASED ON THE APPROVED FREQUENCY CHARACTERS.
5. LED SIGNAL FLASHING RATE SHALL BE BASED ON MUTCD STANDARDS SECTION 4L.
6. SEE TRAFFIC DRAWING TD30.22 FOR WOOD POST INSTALLATION AND SIGN PANEL ATTACHMENT DETAILS.




HIGHWAY ADVISORY RADIO FLASHER BEACON SIGN TD500.35.03

0 1 2 3

SCALE IN FEET



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INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

# HIGHWAY ADVISORY RADIO DETAILS - 1 (SIGN DETAILS)



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|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number TD500.35

PID#

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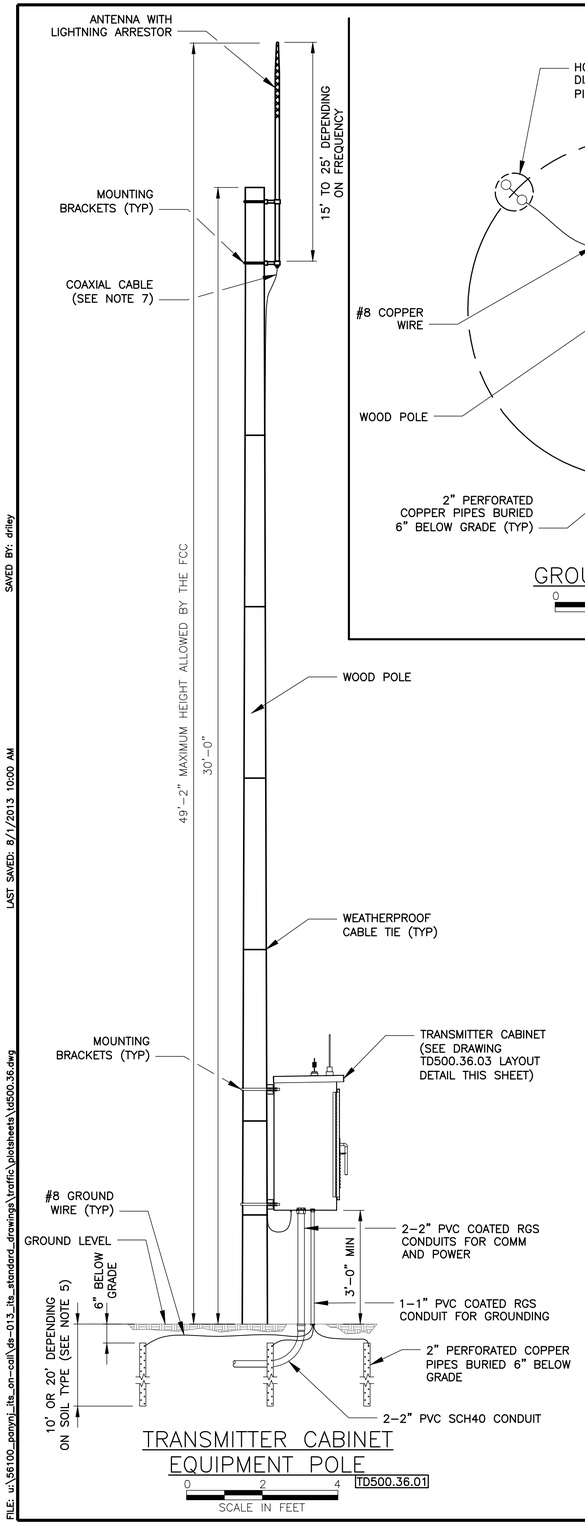
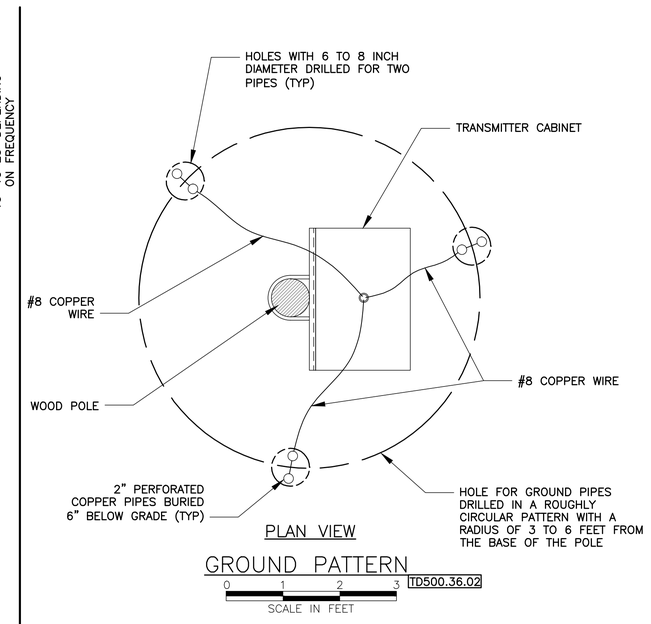



## TRANSMITTER CABINET EQUIPMENT POLE

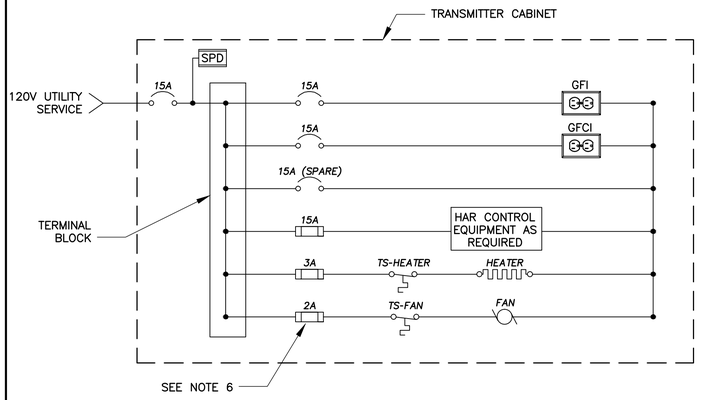
TD500.36.01




PLAN VIEW

## GROUND PATTERN

TD500.36.02

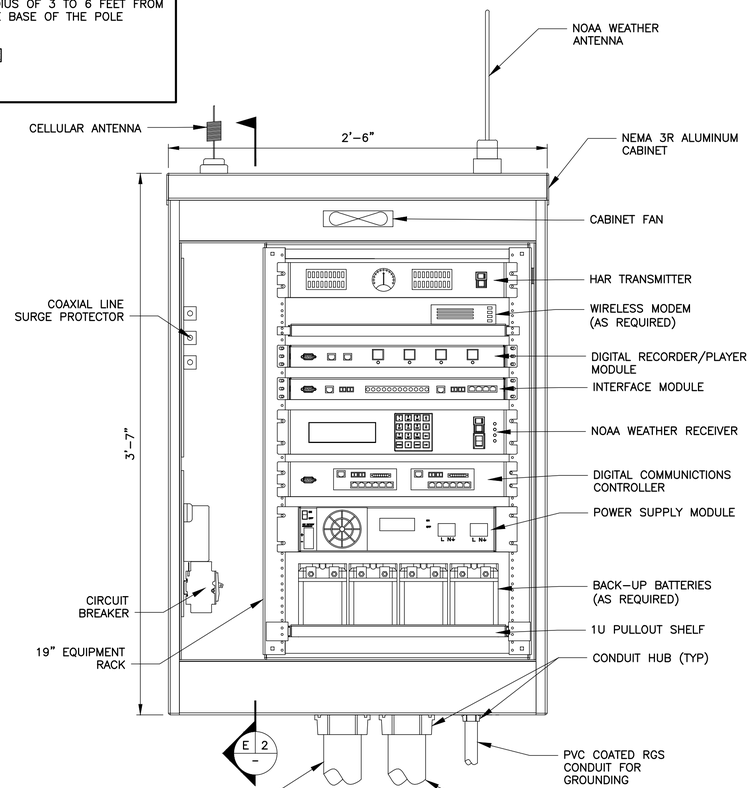



## TRANSMITTER CABINET POWER DIAGRAM

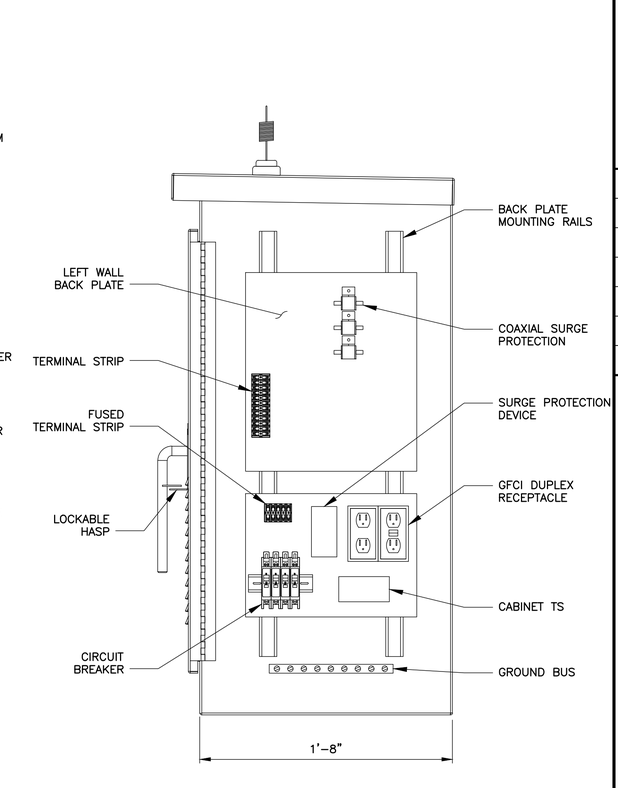
TD500.36.04

### NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. CONDUIT ENTERING OR EXITING THE CABINET SHALL BE THROUGH THE BOTTOM AND SHALL NOT ENTER THE TOP OR SIDES OF THE CABINET. CONDUITS SHALL BE SECURED WITH CONDUIT HUBS AND SEALED WITH NON-SHRINK UV RESISTANT SILICONE.
3. UNLESS OTHERWISE NOTED, ALL HARDWARE SHALL BE STAINLESS STEEL.
4. EQUIPMENT INSIDE THE TRANSMITTER CABINET SHALL BE AS REQUIRED BY THE MANUFACTURER.
5. SOIL CONDITION AND MANUFACTURER SPECIFICATIONS MAY REQUIRE THE USE OF AN ALTERNATE GROUNDING SYSTEM. SUBMIT GROUNDING SYSTEM LAYOUT TO THE ENGINEER FOR APPROVAL.
6. FUSE SIZES SHOWN VARY ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. COAXIAL CABLE SHALL BE BELDEN 9913 OR APPROVED EQUAL.




E 1 FRONT ELEVATION




E 2 SIDE ELEVATION

## TRANSMITTER CABINET EQUIPMENT LAYOUT

NTS

TD500.36.03

Sheet 36 of 44

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# HIGHWAY ADVISORY RADIO DETAILS - 2 (TRANSMITTER DETAILS)



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number **TD500.36**

PID#

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LAST SAVED: 8/1/2013 10:00 AM

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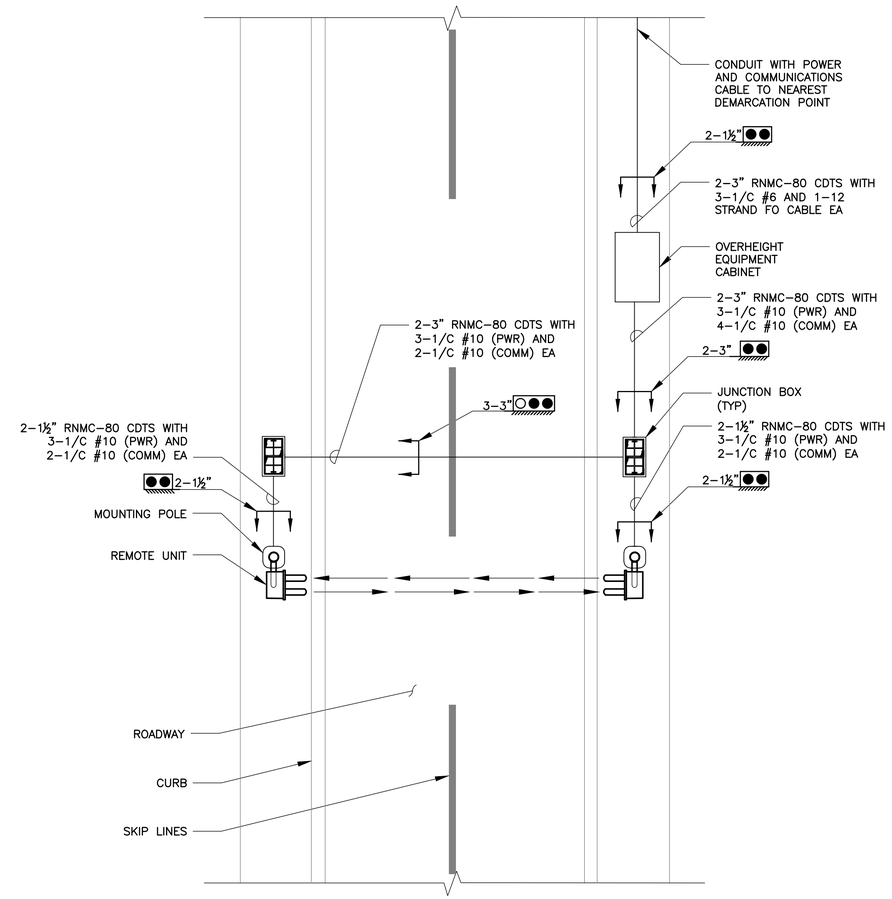



## TYPICAL SITE PLAN

TD500.37.01

0 4 8

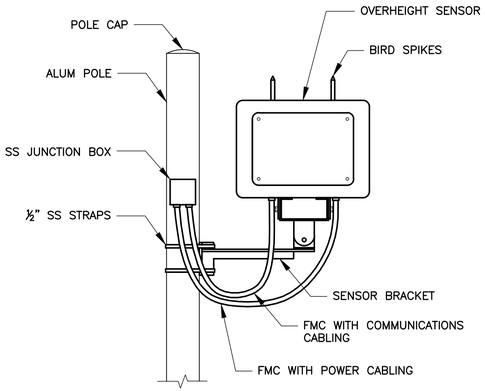
SCALE IN FEET

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. FINAL PLACEMENT OF OVERHEIGHT SENSOR BEAM HEIGHTS SHALL BE FIELD DETERMINED BASED UPON CONDITIONS AND STRUCTURES DESIGNATED FOR OVERHEIGHT PROTECTION.
3. VERIFY WITH THE ENGINEER IF ANY FUTURE ROAD RESURFACING PROJECTS ARE SCHEDULED THAT MAY AFFECT THE FINAL PAVEMENT/SENSOR HEIGHT.
4. CONDUITS TO BE INSTALLED IN ACCORDANCE WITH DETAILS SHOWN ON TRAFFIC DRAWING TD20.06.

NOTES TO DESIGNER (REMOVE FROM DRAWING):

1. THE TYPICAL SITE PLAN DETAILS A ROADWAY PROTECTED WITH OVERHEIGHT SENSORS MOUNTED ON STANDARD ALUMINUM TRAFFIC SIGNAL POLES SPECIFICALLY DESIGNATED FOR SUPPORTING THE SENSORS. ALTERNATE SUPPORTING METHODS MAY BE UTILIZED WHERE SENSORS ARE AFFIXED TO EXISTING STRUCTURES UTILIZING THE STANDARD SS STRAPS OR STRUCTURAL ANCHORAGES AVAILABLE FROM THE MANUFACTURER. DETAIL AS NECESSARY.
2. THE OVERHEIGHT EQUIPMENT SENSORS SHALL COMMUNICATE TO DESIGNATED WARNING EQUIPMENT USING STANDARD CONTACT CLOSURES. TYPICALLY, COMBINATIONS OF EITHER WARNING BEACONS, WARNING SIRENS, AND WARNING SIGNAGE SHALL BE UTILIZED TO NOTIFY MOTORISTS OF THEIR OVERHEIGHT CONDITION AND ADDITIONALLY INSTRUCTING THEM OF AN ALTERNATE ROUTE (IF AVAILABLE).
3. MULTIPLE COMBINATIONS OF SENSORS MAY BE REQUIRED AT THE SAME LOCATIONS DUE TO RAMP PAVEMENT HEIGHT VARIATIONS. VERIFY ALL PAVEMENT HEIGHTS ARE ACCOUNTED FOR.

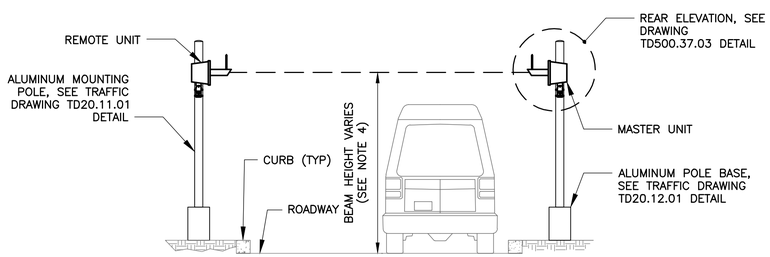



## REAR ELEVATION DETAIL

TD500.37.03

0 1 2

SCALE IN FEET

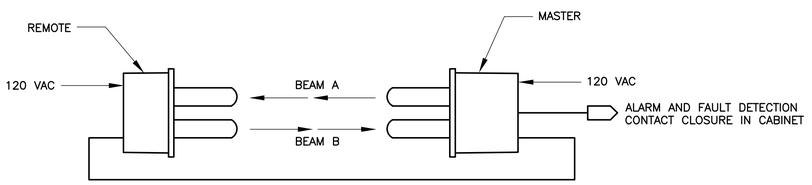



## TYPICAL ELEVATION

TD500.37.02

0 4 8

SCALE IN FEET




## OVERHEIGHT WIRING DIAGRAM

NTS

TD500.37.04

Sheet 37 of 44

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# OVERHEIGHT DETECTION DETAILS - 1



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date **7/29/2013**

Contract Number

Drawing Number **TD500.37**

PID#

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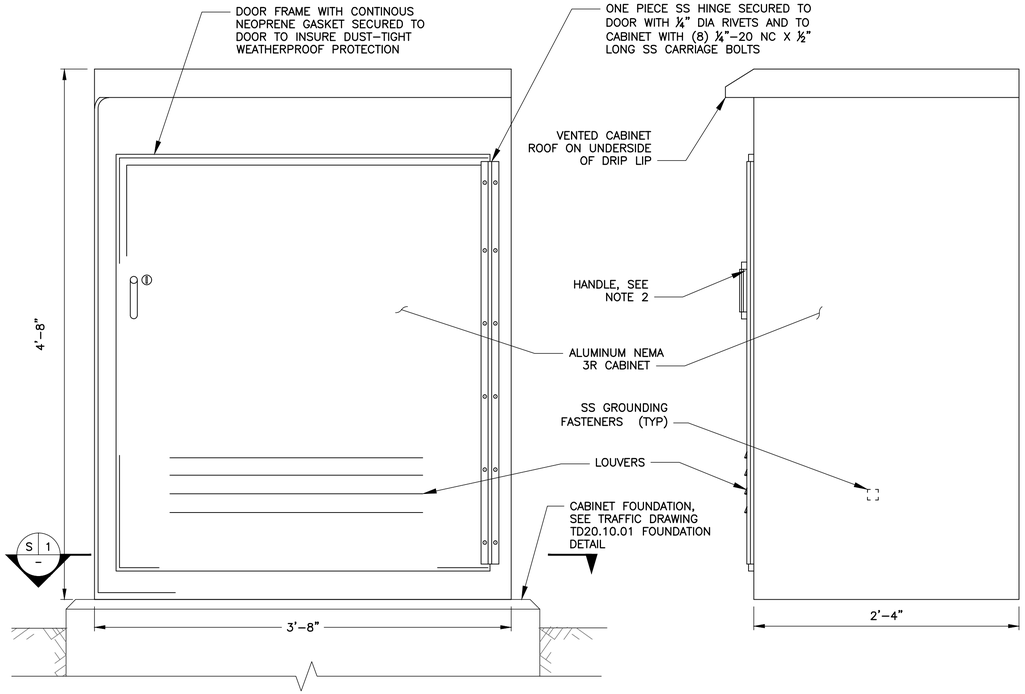
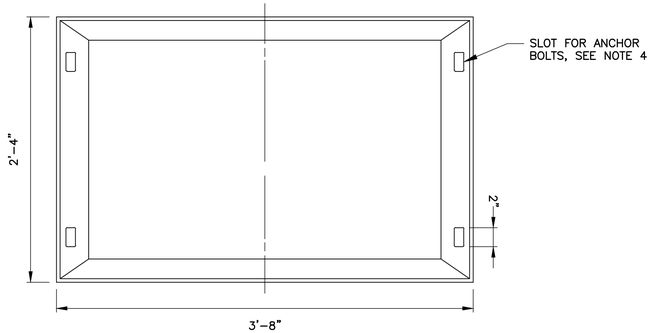



E 1 – FRONT ELEVATION

E 2 – SIDE ELEVATION

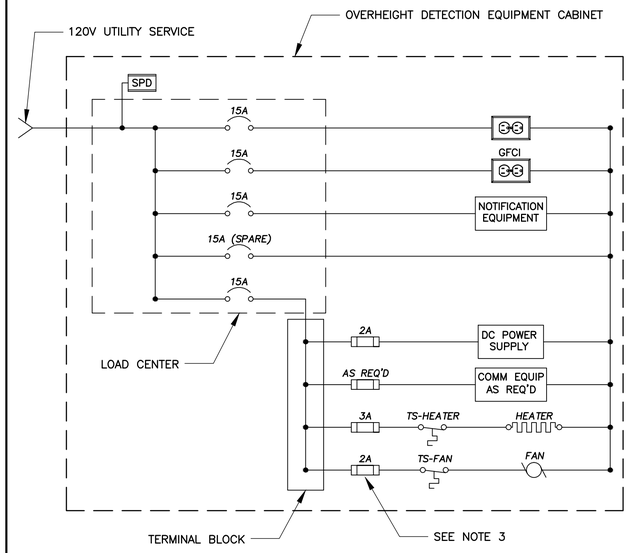



S 1 – BOTTOM VIEW / ANCHOR BOLT LAYOUT

## OVERHEIGHT DETECTION CABINET

TD500.38.01

0 .5 1 2
SCALE IN FEET




## OVERHEIGHT DETECTION CABINET POWER DIAGRAM

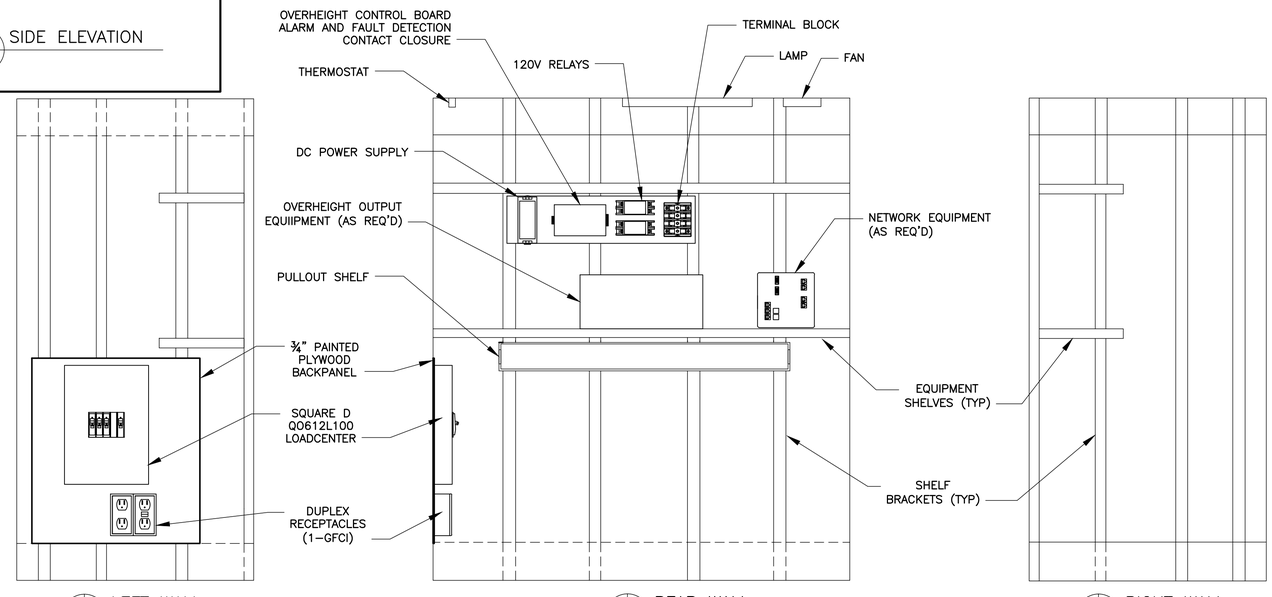
TD500.38.03

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. SECURE CABINET DOOR WITH A TUMBLER LOCK NO. 15481 ARS AND KEYED FOR NO.2 AVAILABLE FROM CORBIN LOCK CO., NEW BRITAIN, CT. HANDLE SHALL INCLUDE A PAD LOCKABLE HASP.
3. FUSES SHALL BE PROVIDED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
4. DIMENSIONS MAY VARY BY MANUFACTURER. COORDINATE ANCHOR BOLT LAYOUT PRIOR TO POURING FOUNDATION.
5. INSTALL ALUMINUM VENT WITH SCREEN UNDER FRONT LIP ABOVE DOOR.
6. WHERE A CABINET IS NOT INSTALLED ADJACENT TO A SIDEWALK, INCLUDE A CONCRETE PAD 50"W X 24"L X 4"D IN FRONT OF THE CABINET.
7. SUPPLY ALL WALL MOUNTED CABINETS WITH A CLOSED BOTTOM.

NOTES TO DESIGNER (REMOVE FROM DRAWING):

1. THE OVERHEIGHT NOTIFICATION EQUIPMENT SHALL BE SELECTED ON A PER SITE BASIS. TYPICALLY, A SIGN CONTROLLER AND WARNING BEACONS WILL BE TRIGGERED BY A STANDARD CONTACT CLOSURE FROM THE SENSORS TO ALERT THE OVERHEIGHT MOTORIST.




E 3 – LEFT WALL

E 4 – REAR WALL

E 5 – RIGHT WALL

## OVERHEIGHT DETECTION CABINET EQUIPMENT LAYOUT

TD500.38.02

0 .5 1 2
SCALE IN FEET

Sheet 38 of 44

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

## OVERHEIGHT DETECTION DETAILS - 2

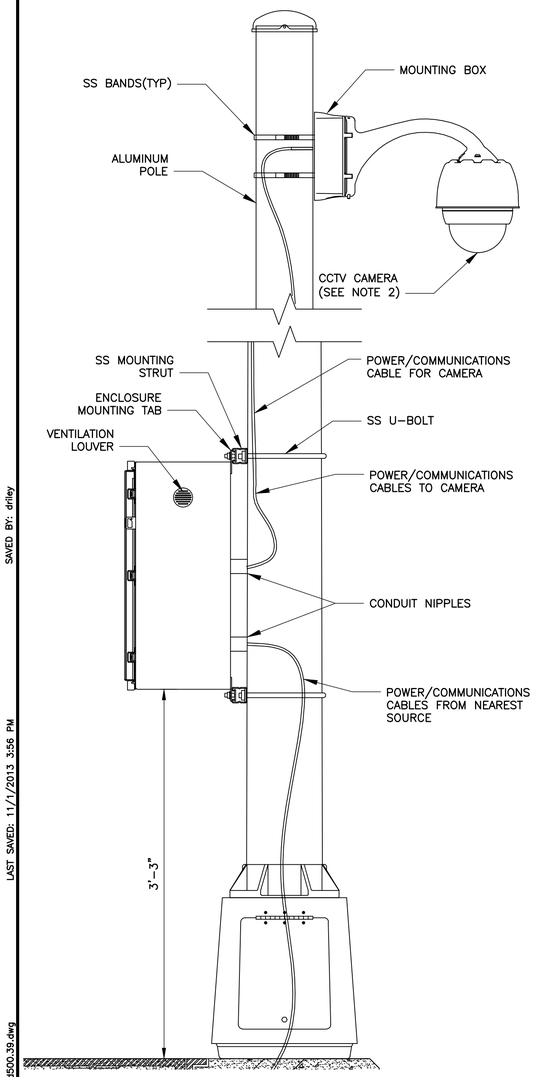


| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |
| Date | | 7/29/2013 |

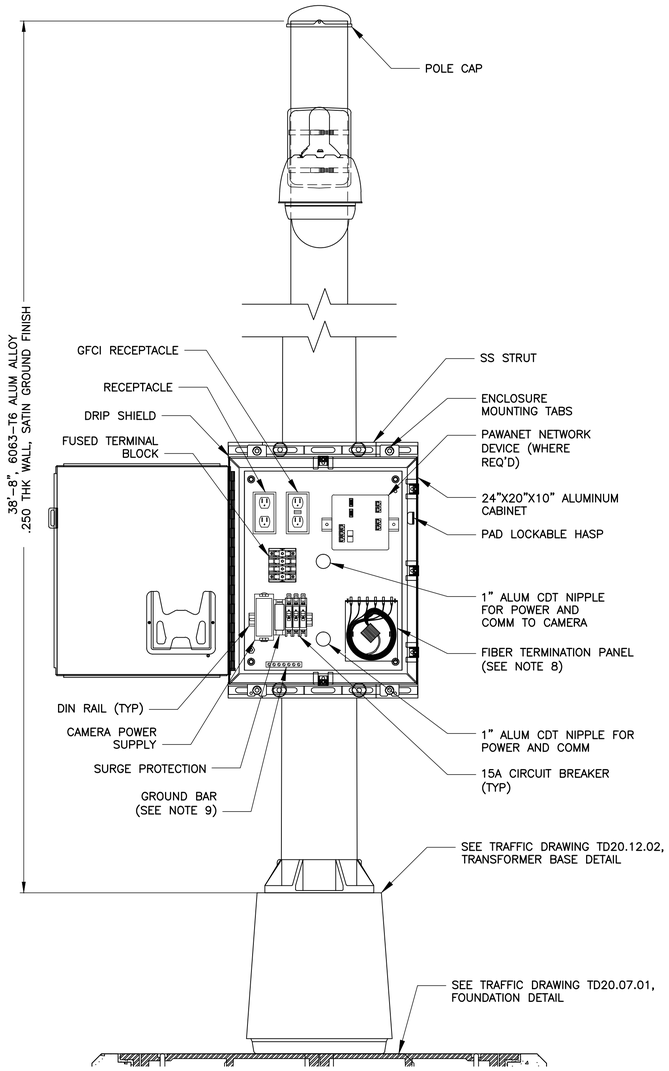
Contract Number

Drawing Number **TD500.38**

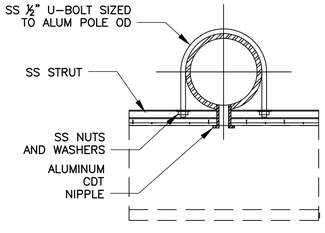
PID#




SIDE ELEVATION




FRONT ELEVATION




PLAN

## POLE MOUNTED CCTV CAMERA – CABINET LAYOUT/MOUNTING DETAILS

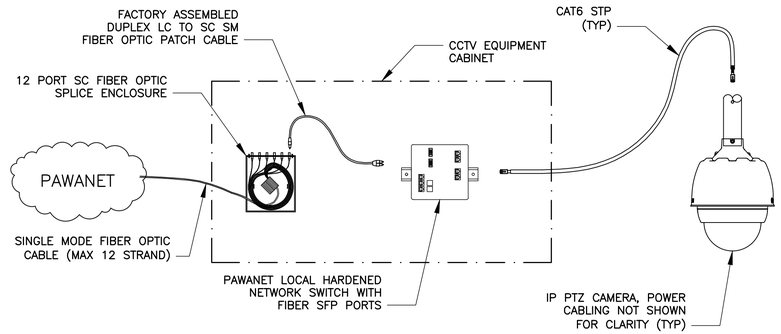
TD500.39.01

0 .5 1 2

SCALE IN FEET

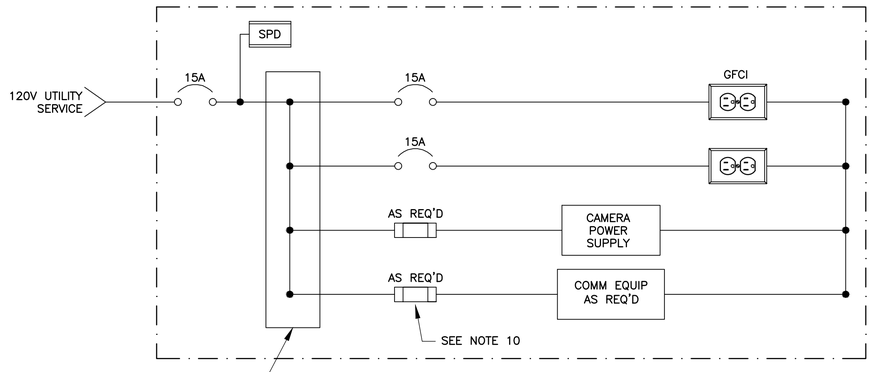
NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. THE TRAFFIC SURVEILLANCE CCTV CAMERA SHALL BE A DAY/NIGHT COLOR MODEL HOUSED IN AN ENVIRONMENTALLY SEALED ENCLOSURE. THE CAMERA SHALL HAVE PAN, TILT, AND ZOOM CAPABILITIES TO ADJUST FOR THE DESIRED FIELD OF VIEW.
3. THE CAMERA SHALL BE MOUNTED ON A QUICK DISCONNECT MAST FOR EASE OF MAINTENANCE.
4. CCTV CAMERA MOUNTING HEIGHT SHALL BE SELECTED TO PROVIDE THE OPTIMAL FIELD OF VIEW. POLE HEIGHT SHALL BE A MINIMUM OF 38'–8" UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
5. SECURE THE CABINET TO THE POLE UTILIZING STAINLESS STEEL U–BOLTS. CABLING SHALL ENTER THROUGH FIELD DRILLED AND TAPPED 1" ALUMINUM CONDUIT NIPPLES. ALL OTHER HARDWARE SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED. SEAL CONDUIT PENETRATIONS WITH NON–SHRINK UV RESISTANT SILICONE TO PREVENT WATER FROM ENTERING THE ENCLOSURE AND POLE.
6. ORIENT THE CCTV CABINET TO OPEN PERPENDICULAR TO EDGE OF THE NEAREST TRAVELING LANE WHEN INSTALLED NEAR ROADWAYS TO ALLOW FOR MAINTENANCE PERSONNEL TO SEE ONCOMING TRAFFIC WITH THE CABINET OPEN.
7. ARRANGEMENT OF EQUIPMENT WITHIN THE CCTV CAMERA POLE MOUNTED CABINET IS DIAGRAMMATIC. FINAL PLACEMENT MAY REQUIRE MODIFICATIONS BASED ON EQUIPMENT APPROVED FOR USE BY THE ENGINEER.
8. FURNISH AND INSTALL FIBER JUMPER CABLES AND SC FIBER CONNECTORS TO CONNECT EQUIPMENT IN THE CABINET TO THE FIBER TERMINATION PANEL AS REQUIRED.
9. FURNISH AND INSTALL GROUNDING CONDUCTORS FOR POLE AND CABINET IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
10. FURNISH AND INSTALL FUSES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.




COMMUNICATIONS BLOCK DIAGRAM

TD500.39.02




CCTV CABINET POWER DIAGRAM

TD500.39.03

## CAMERA SCHEDULE

| CAMERA NO. | LOCATION | VIEW | MOUNTING TYPE | REFERENCE DWG NO. |
|---|---|---|---|---|
| 1 | RT. 495 MP2.0 | EASTBOUND TRAFFIC | 40' POLE | TD002 |
| 2 | RT. 495 MP2.0 | WESTBOUND TRAFFIC | SIGN STRUCTURE | TD003 |
| 3 | SAMPLE | SAMPLE | SAMPLE | SAMPLE |

SAMPLE CAMERA SCHEDULE

TD500.39.04

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# CCTV SURVEILLANCE SYSTEM DETAILS (POLE MOUNT)



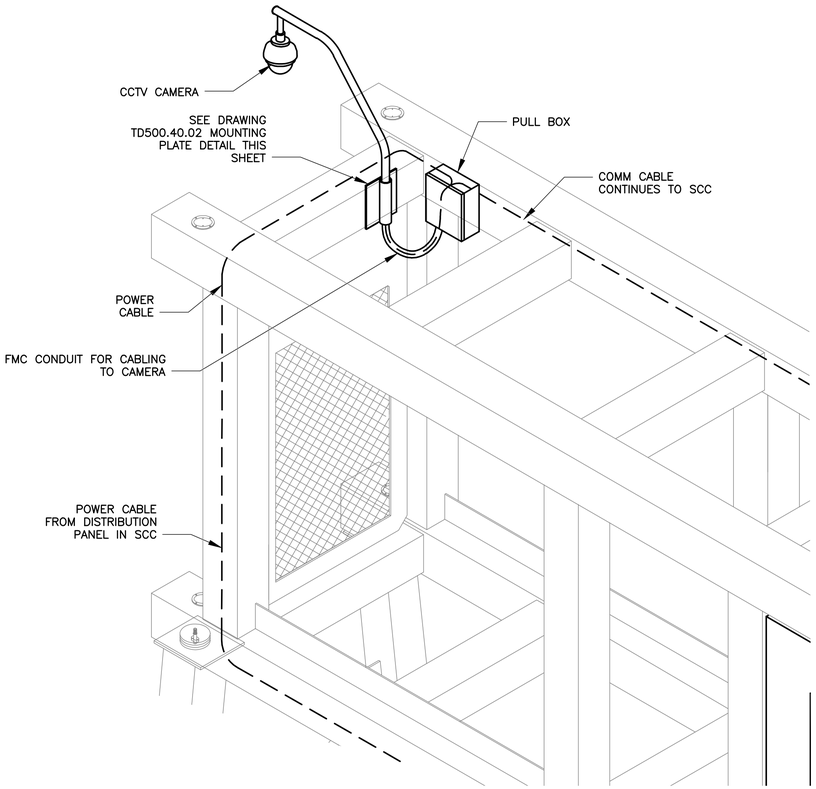
| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

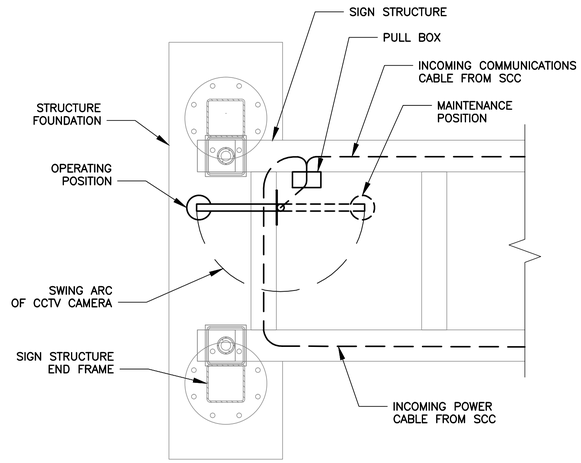
Contract Number

Drawing Number **TD500.39**

PID#




ISOMETRIC VIEW




PLAN VIEW

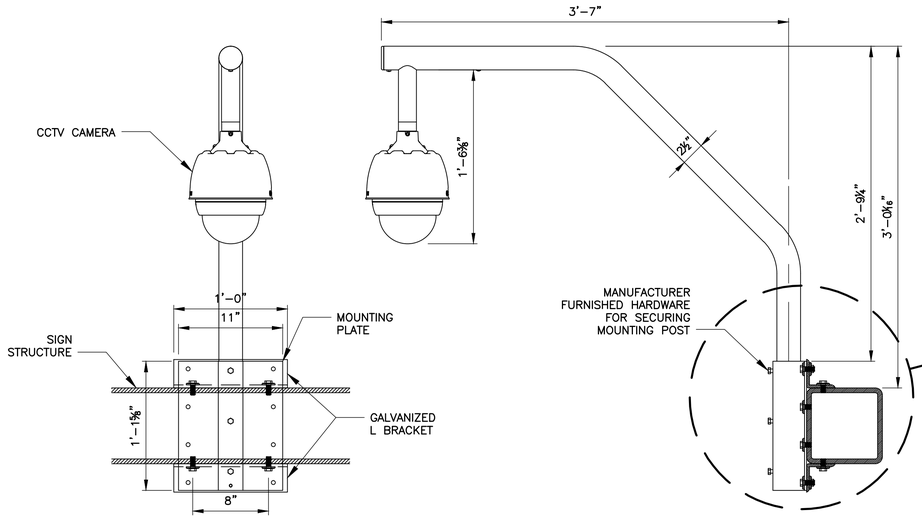
## CCTV CAMERA MOUNTING – SIGN STRUCTURE

TD500.40.01

0 2 4
SCALE IN FEET

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. THE CCTV CAMERA MOUNT SHALL ALLOW THE CAMERA TO BE LOWERED OR REMOVED WHEN IN MAINTENANCE POSITION.
3. THE CCTV CAMERA SHALL BE MOUNTED AT A MINIMUM HEIGHT OF 1'–0" ABOVE THE SIGN STRUCTURE.
4. IF THE CAMERA VIEW IS OBSTRUCTED BY LOCATING THE CAMERA AS SHOWN ON THESE DRAWINGS, SUBMIT AN ALTERNATE LOCATION FOR APPROVAL BY THE ENGINEER.
5. THE CAMERA MOUNT SHALL BE FURNISHED WITH HARDWARE FROM THE MANUFACTURER TO SECURE THE CAMERA MOUNTING POST INSIDE OF THE SLEEVE ON THE CAMERA MOUNTING PLATE.
6. A ¼" THICK NEOPRENE PAD SHALL BE FURNISHED AND INSTALLED BETWEEN THE CAMERA MOUNTING PLATE AND THE SIGN CHORD. IT SHALL BE LARGE ENOUGH TO COVER THE CONTACT SURFACE BETWEEN THE MOUNTING PLATE AND SIGN CHORD.
7. BOLTS SECURING THE MOUNTING PLATE SHALL NOT PROTRUDE INSIDE THE SIGN CHORD FURTHER THAN 1/16".
8. MOUNTING HARDWARE FOR SECURING THE CAMERA MOUNT TO THE SIGN STRUCTURE SHALL BE STAINLESS STEEL TYPE 304 ASTM A193 GRADE B8.
9. ANGLE BRACKETS FOR SECURING THE CAMERA MOUNT TO THE SIGN STRUCTURE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM A36 AND BE HOT DIP GALVANIZED.




FRONT ELEVATION

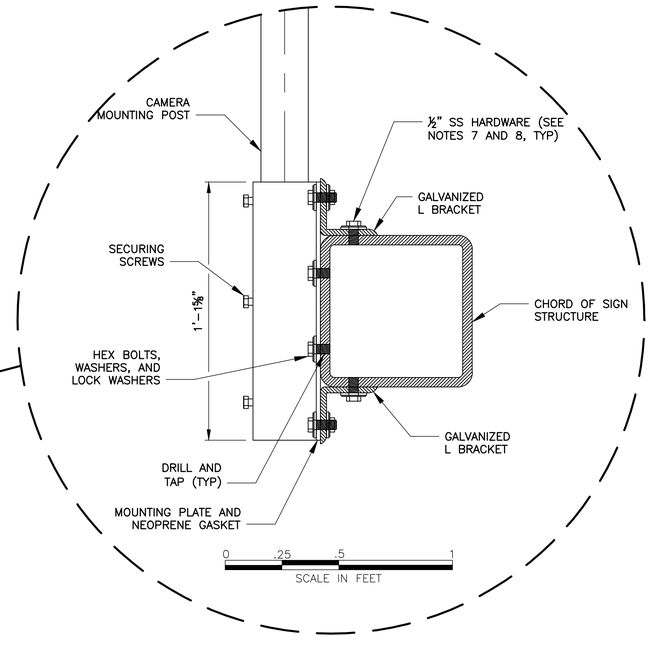



SIDE ELEVATION

## MOUNTING DETAIL

TD500.40.02

0 .5 1 2
SCALE IN FEET




0 .25 .5 1
SCALE IN FEET

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*ENGINEERING DEPARTMENT*

**PANYNJ Traffic Standard Details**

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# CCTV SURVEILLANCE SYSTEM DETAILS (STRUCTURE/GANTRY MOUNT)

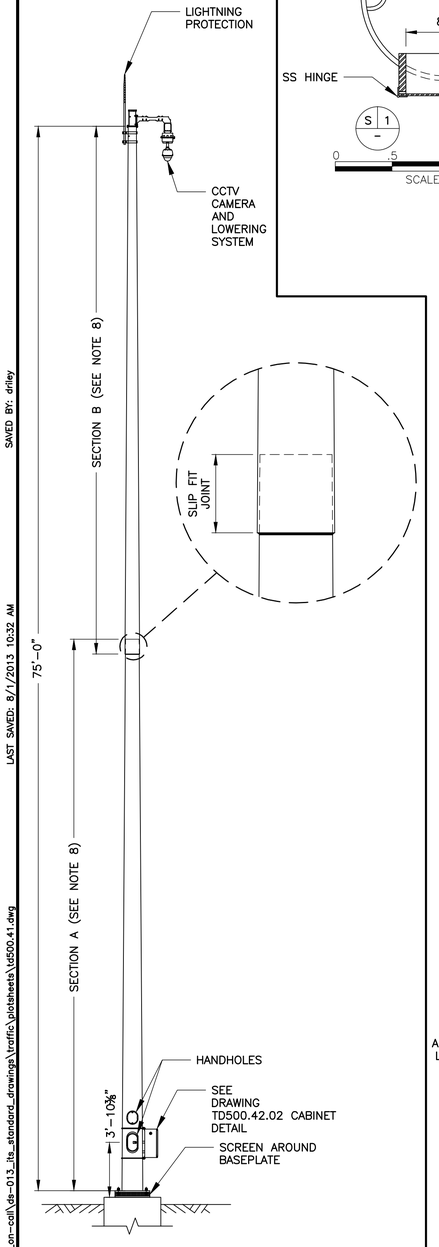


| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |
| Date | | 7/29/2013 |

Contract Number

Drawing Number **TD500.40**

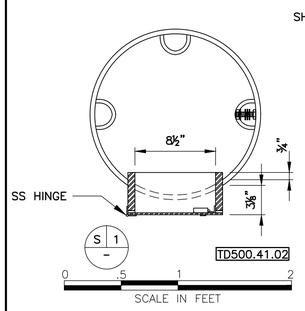
PID#

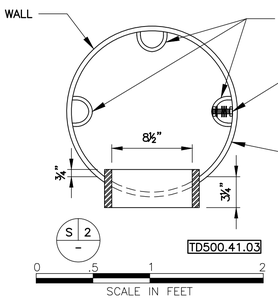


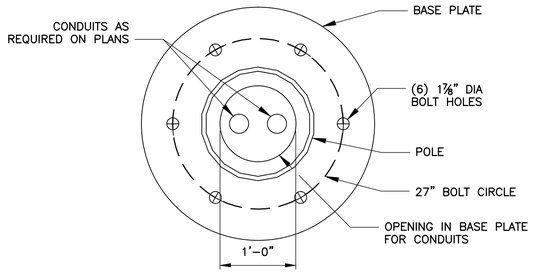

## 75' CAMERA POLE WITH LOWERING DEVICE

TD500.41.01

SCALE IN FEET




## BASE PLATE DETAIL

TD500.41.04

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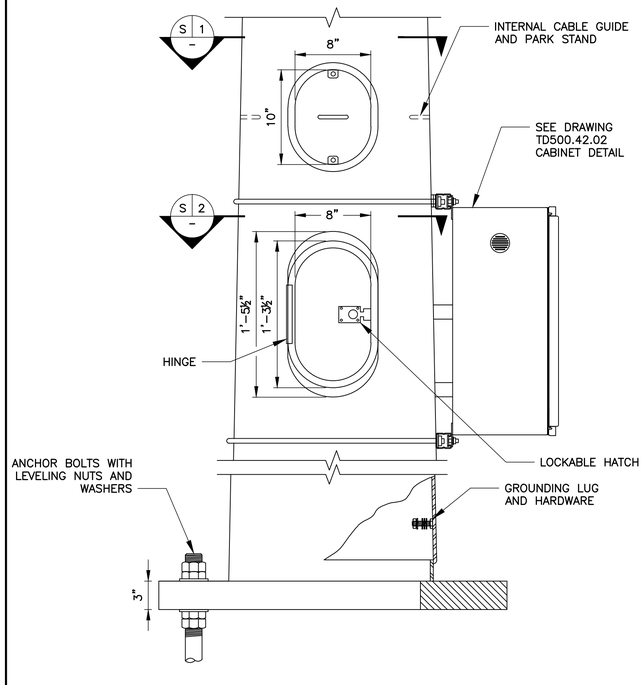


## BASE PLATE AND HANDHOLE DETAILS

TD500.41.05

0 .5 1 2

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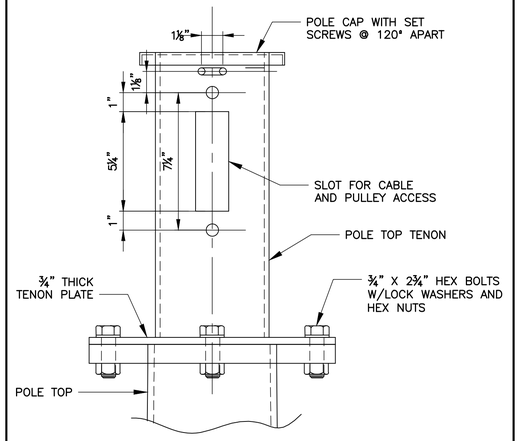


## TOP CONNECTION DETAIL

TD500.41.06

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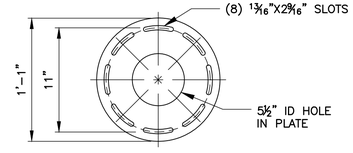


## TENON PLATE DETAIL

TD500.41.07

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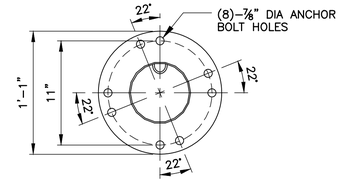
SCALE IN FEET

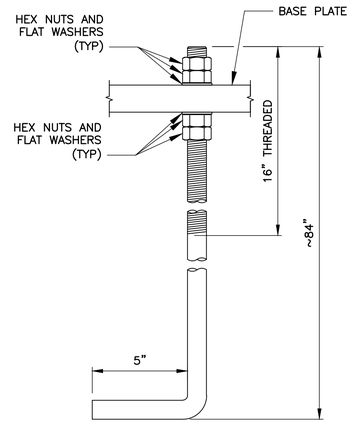



## TOP PLATE DETAIL

TD500.41.08

0 .5 1 2

SCALE IN FEET




## ANCHOR BOLT DETAIL

TD500.41.09

0 .25 .5 1

SCALE IN FEET

NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. ALL 75' CAMERA POLES SHALL BE DESIGNED AND FABRICATED TO ADEQUATELY SUPPORT THE WEIGHT OF THE CCTV CAMERA, MAST ARM WITH LOWERING ASSEMBLY, AND TENON. THE POLE SHALL HAVE THE CAPABILITY TO WITHSTAND 110 MPH WIND VELOCITY WITH A 1.3 GUST FACTOR GIVEN THE AFOREMENTIONED EQUIPMENTS' WEIGHT AND EFFECTIVE PROJECTED AREA. PROVIDE MANUFACTURER CERTIFICATION THAT HIGHMAST POLES HAVE BEEN FABRICATED IN ACCORDANCE WITH CURRENT AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS. ENSURE MAXIMUM HORIZONTAL DEFLECTION AT THE TOP OF THE POLE COMPLETELY ASSEMBLED WITH CCTV CAMERA AND ALL FIXTURES ATTACHED DOES NOT EXCEED 2" FROM THE CENTERLINE DUE TO A 40 MPH WIND WITH A 1.3 GUST FACTOR (PER AASHTO APPENDIX C WIND PRESSURE FORMULA).
3. FURNISH AND INSTALL A PAD LOCKABLE HASP AND STAINLESS STEEL HINGE 8" X 14" HANDHOLE DOOR, A SCREW COVER FOR THE UPPER 8" X 10" HANDHOLE, AND NEOPRENE DOOR GASKETS FOR BOTH HANDHOLES.
4. DETAILS ARE SCHEMATIC. MODIFICATIONS ARE PERMITTED. ALL POLE MOUNTED CCTV EQUIPMENT WILL BE APPROVED BY THE ENGINEER THROUGH THE SHOP DRAWING PROCESS PRIOR TO ORDERING, FABRICATION, OR ACCEPTANCE OF ANY INSTALLATION. PROVIDE DESIGN CALCULATIONS WITH ALL SHOP DRAWINGS.
5. A STAINLESS STEEL SCREEN, DOUBLE-WRAPPED AROUND THE BASE OF THE POLE IS REQUIRED. THE STAINLESS SCREEN SHALL HAVE NO MORE THAN ½" OPENINGS, AND SHALL BE HELD TOGETHER WITH STAINLESS STEEL NUTS, BOLTS, AND FLAT WASHERS. GROUTING UNDER THE POLE IS NOT PERMITTED.
6. ALL WELDING SHALL BE DONE WITH E-80XX CONSUMABLE ELECTRODES.
7. POLE SHALL BE FABRICATED FROM HIGH-STRENGTH, LOW-ALLOY STEEL CONFORMING TO ASTM A572, GRADE 65. THE POLE FINISH SHALL BE HOT-DIP GALVANIZED PER ASTM A123.
8. STEEL POLE SHALL CONSIST OF TWO INDIVIDUAL STEEL SECTIONS AND CONTAIN ONLY ONE LONGITUDINAL SEAM WELD.
9. BOLT HEADS AND NUTS SHALL BE HEXAGONAL.
10. COORDINATE TENON SLOT AND BOLT HOLES FOR LOWERING DEVICE ARM WITH MANUFACTURER TO VERIFY THAT THERE IS A POSITIVE SEAT OF THE CCTV DIVIDED MAST ARM TO THE TENON POLE ASSEMBLY.
11. ANCHOR BOLT MATERIAL SHALL BE ASTM F1554.
12. ALL STAINLESS STEEL HARDWARE SHALL BE TYPE 304.
13. WELDING SHALL CONFORM TO THE ANSI/AWS D1.1 STRUCTURAL WELDING CODE-STEEL, WELDING INSPECTION AND FULL PENETRATION WELD NONDESTRUCTIVE TESTING SHALL CONFORM TO AWS D1.1.
14. WHERE SEPARATE EQUIPMENT GROUNDING CONDUCTOR IS NOT SHOWN, FURNISH AND INSTALL AN EQUIPMENT GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.



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ENGINEERING DEPARTMENT

PANYNJ

Traffic Standard Details

TRAFFIC

Title

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

# CCTV SURVEILLANCE SYSTEM DETAILS (POLE MOUNT W/ LOWERING DEVICE - 1)



| DES | DRN | CHK |
|---|---|---|
| Designed by | Drawn by | Checked by |

Date 7/29/2013

Contract Number

Drawing Number TD500.41

PID#

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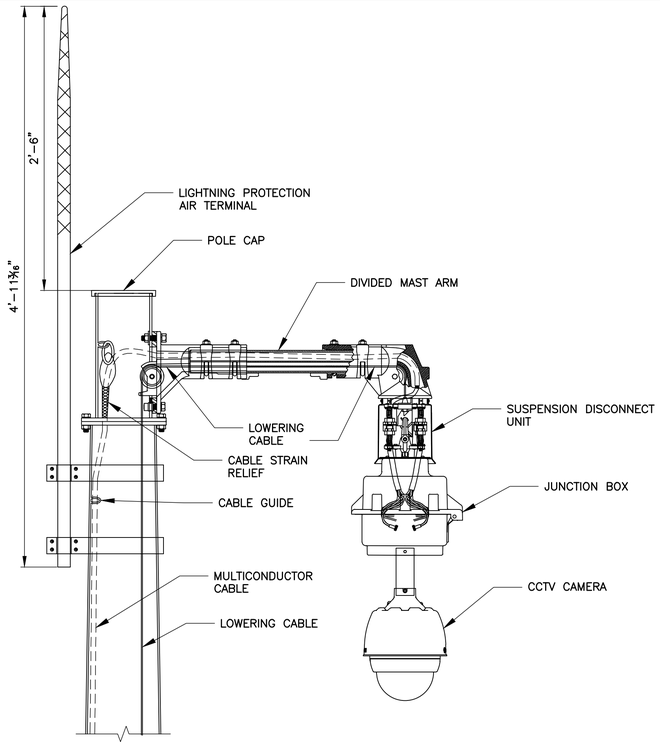


## LOWERING DEVICE DETAIL

TD500.42.01

0 .5 1 2

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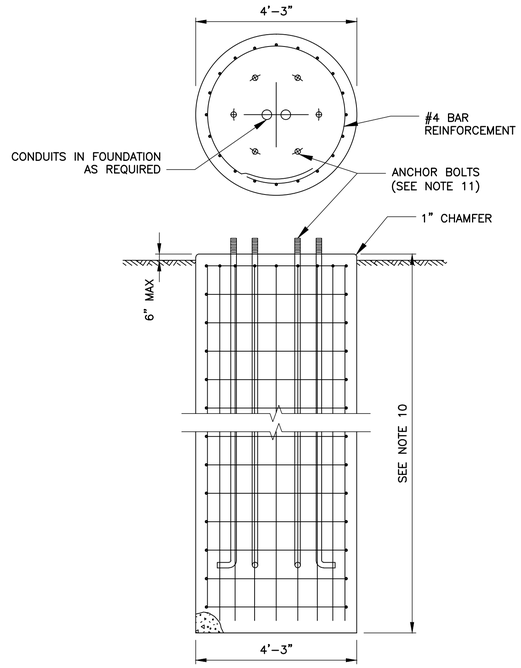
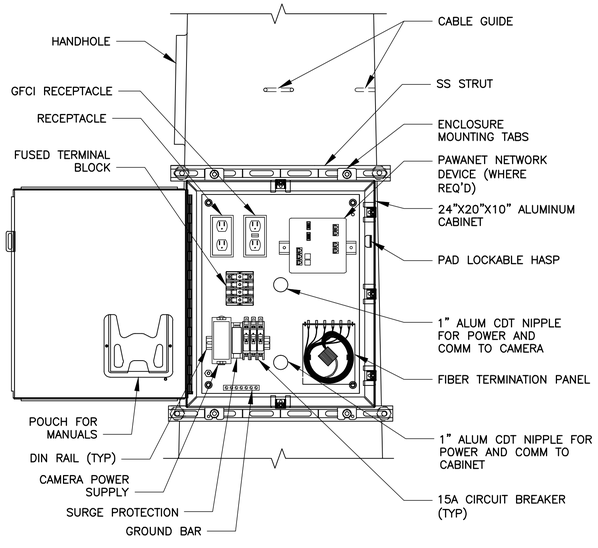



## FOUNDATION DETAIL

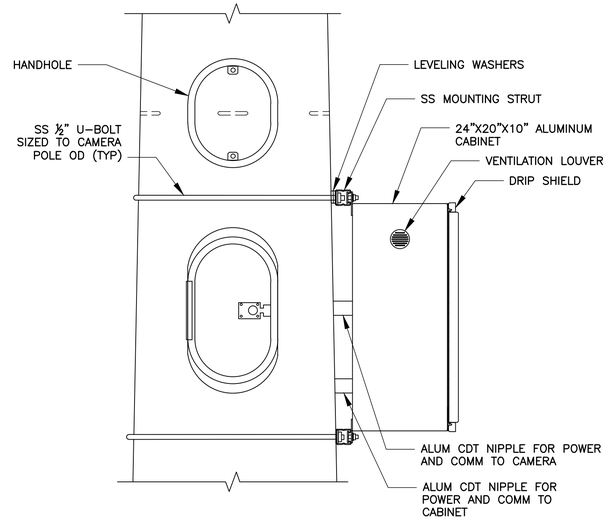
TD500.42.04

0 2 4

SCALE IN FEET




FRONT ELEVATION




SIDE ELEVATION

## POLE MOUNTED CABINET

TD500.42.02

0 .5 1 2

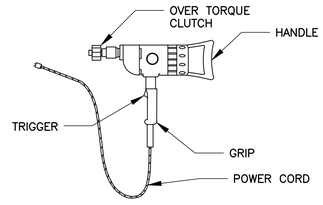
SCALE IN FEET

NOTES:

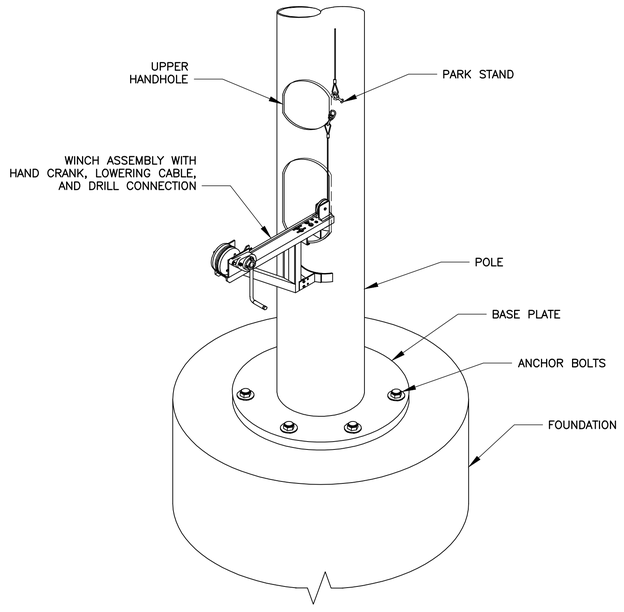
1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. FURNISH AND INSTALL SEALED, SELF LUBRICATED BEARINGS, OIL TIGHT BRONZE BEARINGS OR SINTERED BRONZE BUSHINGS WITH ALL PULLEYS FOR THE CAMERA LOWERING DEVICE AND PORTABLE LOWERING TOOL.
3. ENSURE THE LOWERING CABLE HAS A MINIMUM OF 1/8" DIAMETER STAINLESS STEEL AIRCRAFT CABLE WITH A MINIMUM BREAKING STRENGTH OF 1740 POUNDS WITH (7) STRANDS OF 19 WIRE EACH.
4. PROTECT ALL ELECTRICAL AND VIDEO COAXIAL CONNECTIONS BETWEEN THE FIXED AND LOWERABLE PORTION OF THE SUSPENSION DISCONNECT UNIT FROM EXPOSURE TO THE WEATHER WITH A WATERPROOF SEAL TO PREVENT DEGRADATION OF THE ELECTRICAL CONTACTS.
5. THE COMPOSITE SIGNAL CABLE SHALL CONTAIN THE FOLLOWING (AT A MINIMUM):

5.1. (1) RG6 75Ω COAXIAL CABLE OR (1) CATEGORY 5E CABLE
5.2. (3) #16 AWG POWER CABLES
5.3. (2) #18 AWG TWISTED PAIR WITH DRAIN

6. INTERFACE AND LOCKING COMPONENTS SHALL BE MADE OF STAINLESS STEEL.
7. ENSURE THE SUSPENSION DISCONNECT UNIT HAS LOAD CAPACITY OF 200 POUNDS WITH A MINIMUM OF 4 TO 1 SAFETY FACTOR.
8. SUPPLY AN ADAPTOR FOR A STANDARD 1/2" ELECTRIC DRILL CHUCK.
9. SUBMIT WINCH ASSEMBLY AND CAMERA CABINET ENCLOSURE MOUNTING DETAILS FOR APPROVAL.
10. THE LIGHTNING ROD SHALL BE ATTACHED TO THE POLE WITH A GROUNDING LUG EITHER UNDERNEATH THE POLE TOP DOME OR DIRECTLY TO THE POLE SHAFT. WHEN CONNECTED TO THE POLE SHAFT THE GROUNDING LUG SHALL BE WELDED TO THE POLE. COPPER CABLE CONNECTING THE ROD TO THE POLE SHALL BE BARE-COPPER.
11. THE DRILLED SHAFT LENGTH AND DIAMETER SHOWN IS REPRESENTATIVE OF A TYPICAL 75' CCTV CAMERA POLE FOUNDATION. LARGER DRILLED SHAFT DIAMETERS MAY BE REQUIRED AS DICTATED BY LOCAL GEOTECHNICAL CONDITIONS. SUBMIT ALL FOUNDATION DETAILS TO THE ENGINEER FOR APPROVAL.
12. POLE FABRICATOR SHALL FURNISH AND INSTALL STEEL ANCHOR BOLT TEMPLATE FOR FOUNDATION CONSTRUCTION.




1/2" REVERSIBLE DRILL




WINCH ASSEMBLY DETAIL

## LOWERING ASSEMBLY DETAIL

TD500.42.03

0 1 2 3

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Sheet 42 of 44

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**PANYNJ Traffic Standard Details**

*TRAFFIC*

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# CCTV SURVEILLANCE SYSTEM DETAILS (POLE MOUNT W/ LOWERING DEVICE - 2)



| DES | DRN | CHK |
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Date 7/29/2013

Contract Number

Drawing Number **TD500.42**

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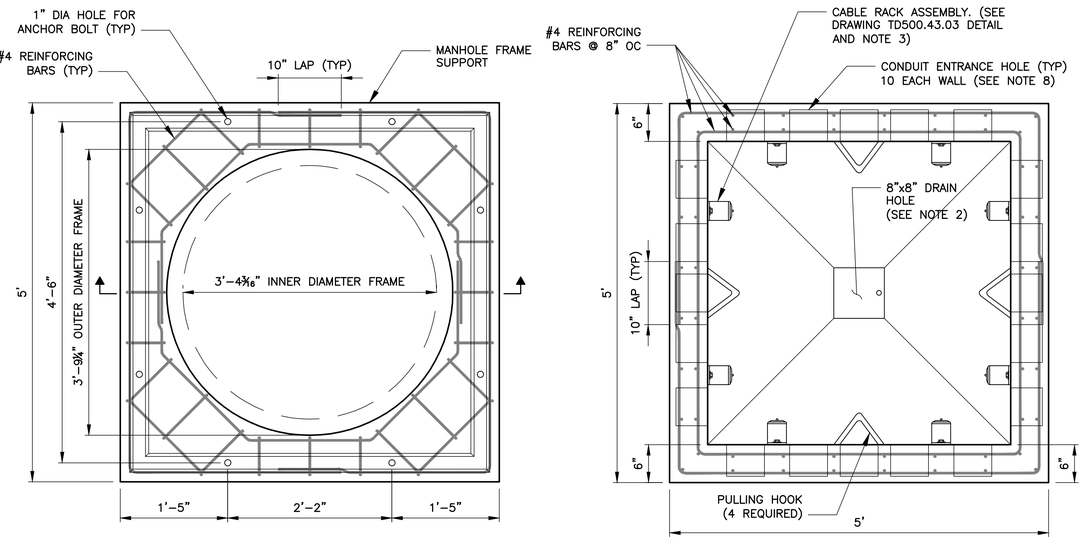
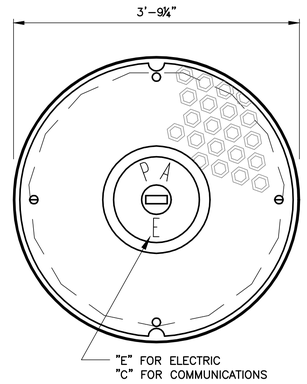
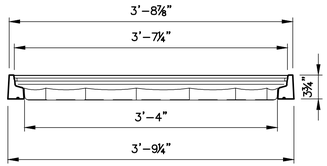






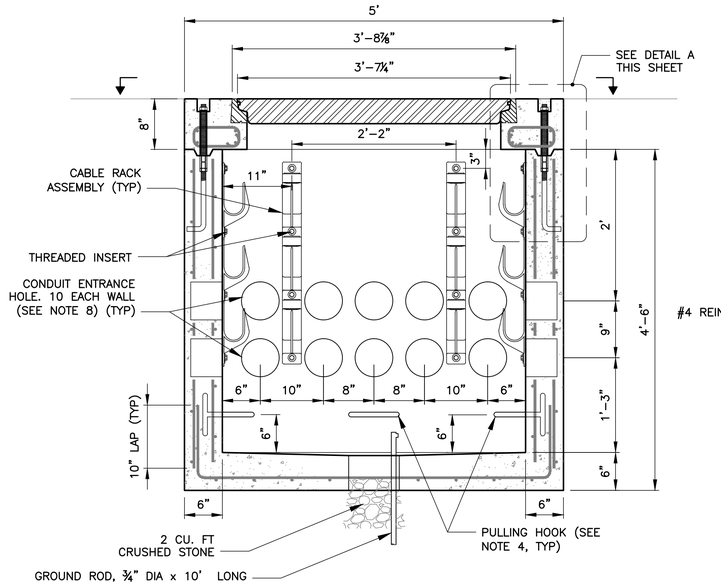
MANHOLE COVER
TD500.43.02



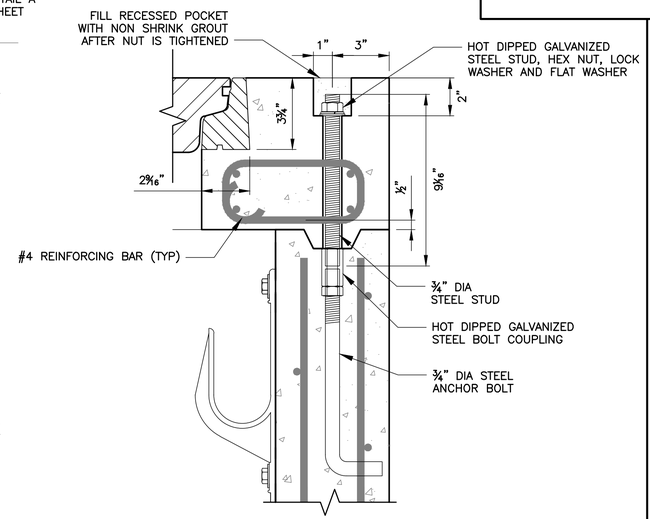



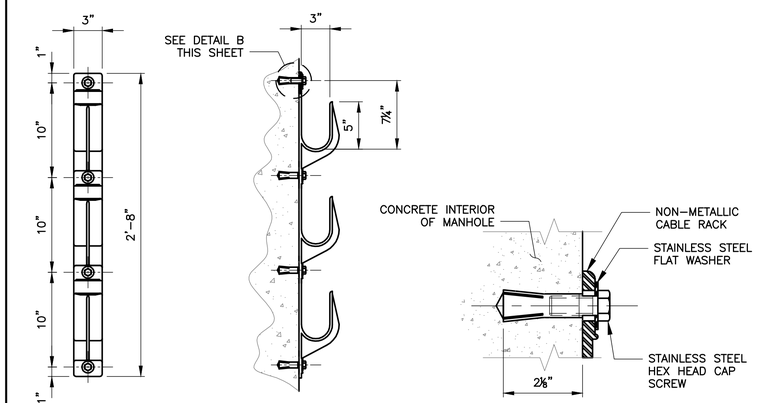

## NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. BOTTOM OF MANHOLES SHALL BE SLOPED TOWARDS THE DRAIN HOLE.
3. CABLE RACK SHALL BE MODEL 3SR3 AS MANUFACTURED BY UNDERGROUND DEVICES, INC. OR APPROVED EQUAL. EACH RACK SHALL BE FURNISHED WITH ALL NECESSARY HARDWARE FOR INSTALLATION INCLUDING BUT NOT LIMITED TO DROP-IN ANCHORS, WASHERS, HEX HEAD SCREWS, LOCKS AND SETTING TOOLS. THE RACKS SHALL BE CONSTRUCTED OF A NON-METALLIC MATERIAL SUCH AS POLYCARBONATE AND HAVE A MINIMUM OF FOUR (4) POINTS OF ATTACHMENT. A TOTAL OF EIGHT (8) CABLE RACKS SHALL BE INSTALLED PER MANHOLE.
4. PULLING HOOKS SHALL BE 3/4" DIA HOT DIPPED GALVANIZED STEEL. PULLING HOOKS SHALL BE WELDED TO REINFORCED. PAINT WELDED AREA WITH A ZINC-RICK EPOXY PAINT.
5. MANHOLE FRAME AND COVER SHALL BE CONSTRUCTED OF FRP COMPOSITE MATERIALS WITH FRAME AND COVER SURPASSING THE LOADING REQUIREMENTS OF H-20 AND EN124. A LIFTING TOOL SHALL BE SUPPLIED WITH EACH MANHOLE. THE MANHOLE COVER SHALL SIT FLUSH IN FRAME WITH THE TOP OF THE MANHOLE AND SHALL HAVE LETTERS PA E/C PRINTED ON IT.
6. ANCHOR BOLTS FOR SECURING THE MANHOLE TOP TO THE BASE SHALL CONFORM TO ASTM A307 CLASS A. THREADING SHALL BE 8 THREADS PER INCH, NC CLASS 2 AND SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153.
7. MANHOLE SHALL BE CONSTRUCTED WITH CLASS A CONCRETE WITH AIR ENTRAINMENT.
8. THE MANHOLE SHALL BE CONSTRUCTED WITH CONDUIT KNOCKOUTS SIZED AS SHOWN ON THIS SHEET. A MINIMUM OF FORTY (40) KNOCKOUTS SHALL BE AVAILABLE, DIVIDED AMONG THE FOUR WALLS OF THE MANHOLE. ALTERATIONS TO THE ORIENTATION SHOWN ON THIS SHEET FOR THE KNOCKOUTS SHALL BE APPROVED THROUGH THE SHOP DRAWING REVIEW PROCESS.
9. THE CAP OF THE MANHOLE SHALL BE SECURED TO THE BASE OF THE MANHOLE AT A MINIMUM OF EIGHT (8) LOCATIONS USING ANCHOR BOLTS AS SHOWN IN DETAIL A.
10. GROUND RODS SHALL BE 3/4"X10' LONG.




MANHOLE DETAILS
TD500.43.01




CABLE RACK ASSEMBLY
TD500.43.03

Sheet 43 of 44

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

## MANHOLE DETAILS



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Date 7/29/2013

Contract Number

Drawing Number **TD500.43**

PID#

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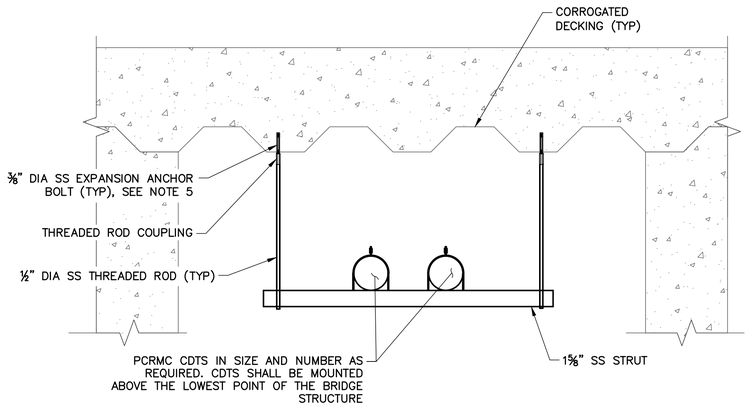
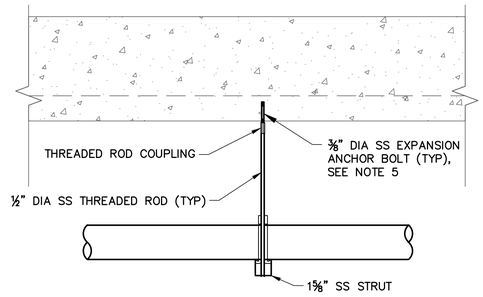



FRONT VIEW




PARTIAL SIDE VIEW

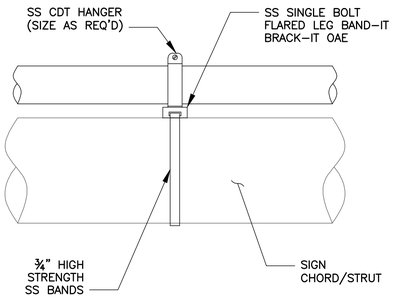
## CONDUIT HANGER DETAIL – CONCRETE GIRDER

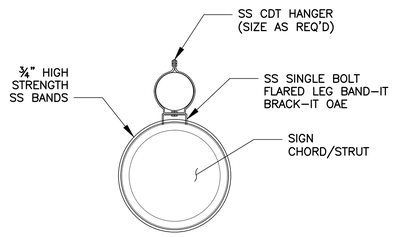
TD500.44.01

NTS

## NOTES:

1. SEE DRAWING TD500.01 FOR ITS NOTES, LEGEND, ABBREVIATIONS, AND LIST OF MANUFACTURERS.
2. NO EQUIPMENT SHALL BE MOUNTED BELOW THE BOTTOM FLANGE OF ANY BRIDGE GIRDER.
3. ANY PENETRATIONS THROUGH STEEL NEED TO BE COORDINATED WITH STRUCTURAL AND APPROVED BY THE ENGINEER.
4. UNLESS OTHERWISE NOTED, ALL STEEL ANGLES AND PLATES SHALL BE ASTM A36.
5. USE HILTE KWIK BOLT 3 EXPANSION ANCHORS WITH MINIMUM OF 2" EMBEDMENT IN SOLD CONCRETE; OR APPROVED EQUAL.

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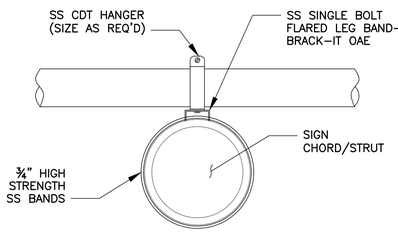


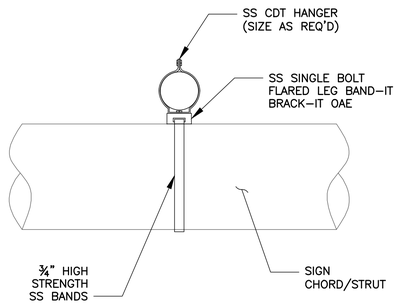


PERPENDICULAR INSTALLATION

## CONDUIT MOUNTING DETAILS

TD500.44.02

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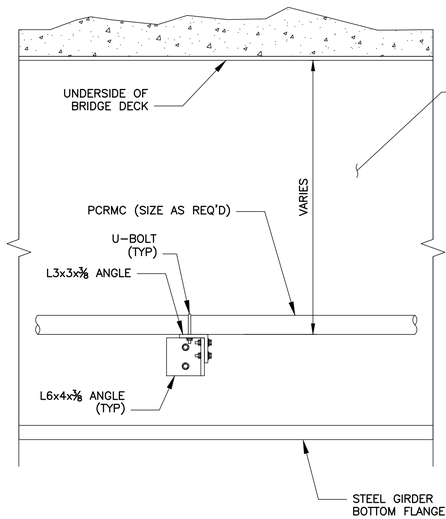
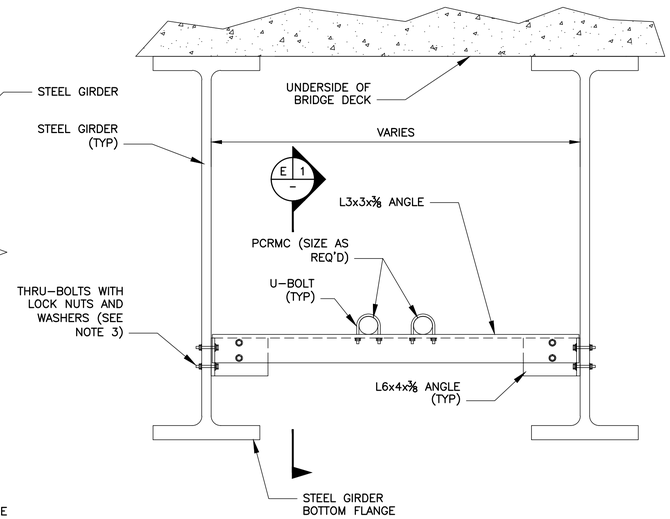



E 1 – FRONT ELEVATION




E 2 – SIDE ELEVATION

## CONDUIT HANGER DETAIL – STEEL GIRDER

TD500.44.03

0 .5 1 2

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Sheet 44 of 44

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**PANYNJ Traffic Standard Details**

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**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**

# CONDUIT MOUNTING DETAILS



| DES | DRN | CHK |
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| Designed by | Drawn by | Checked by |

Date **7/29/2013**

Contract Number

Drawing Number **TD500.44**

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