GENERAL NOTES:

1. For location where pole foundation is lower than roadway, mount CCTV cabinet on pole.
2. Install CCTV Pole at location shown in Plans.
3. If included, install guardrail at location shown in Plans and in accordance with Design Standards Index 400.

See Note 2

See Note 3
Dome Type CCTV Camera

For Ground Mounted Cabinet (See Index 18101)

Concrete

CCTV Cabinet

For Pole Mounted Cabinet (See Index 18108)

For Grounding (See Index 18102)

STAINLESS STEEL POLE

Concrete

CCTV Cabinet

For Pole Mounted Cabinet (See Index 18108)

For Grounding (See Index 18102)

CONCRETE POLE

Dome Type CCTV Camera

For Ground Mounted Cabinet (See Index 18101)
1/2" ETP Alloy 110 Copper Air Terminal (Class II) UL-96A Listed

Bond #2 AWG Tin-Plated Bare Solid Copper Ground Wire To Camera Support Base As Required.

For Concrete Poles That Do Not Have Embedded Ground Wire, Install #2 AWG Tin-Plated Bare Solid Copper Wire. Clamp Ground Rod B To Air Terminal. A Steel Pole May Be Used As A Grounding Conductor If It Has Sufficient Cross-Sectional Area To Equal The Conductivity Of Main Lightning Conductors Per NFPA 780 And A Minimum Wall Thickness Of 1/8" Or Greater.

1/2" x 10 PVC Conduit Sleeve Shall Be Provided To Protect Any External Ground Wire From Mechanical Damage. Conduits Are Sealed To Prevent Water Intrusion.

Wire Screen

Concrete

STEELE CCTV POLE

CONCRETE CCTV POLE

#3 AWG To Ground Rod C As Required

#2 AWG To Ground Rod D As Required

Pull Box

Conduit For Grounding Conductors

UL-96A Listed Air Terminal (Class II)

"ETP Alloy 110 Copper

2" Min, 8" Max. Ground Rod A Primary Ground Rod Assembly (See Inset A)

Exothermic Weld

Conduit For Grounding Conductors

Ground Rod B

Finished Grade

Concrete

3/4" Diameter By 20' Long Copper-Clad Steel Ground Rods Driven Into Undisturbed Earth

Ground Rod B

Finished Grade

Concrete

3/4" Diameter By 20' Long Copper-Clad Steel Ground Rods Driven Into Undisturbed Earth

2" Min, 8" Max. Ground Rod A Primary Ground Rod Assembly (See Inset A)

Exothermic Weld

Pull Box

Ground Rod B

Finished Grade

Concrete

3/4" Diameter By 20' Long Copper-Clad Steel Ground Rods Driven Into Undisturbed Earth

#3 AWG To Ground Rod C As Required

#2 AWG To Ground Rod D As Required
Per NFPA 780-4.16.3
Minimum Contact Area
Surface Base Of 8 Square-Inch
Air Terminal (Class II)
ETP Alloy 110 Copper
Copper Ground Wire. Bond To Air Terminals
#2 AWG Tin-Plated Bare Solid Copper Ground Wire. Bond To Air Terminals

Guardrail (if shown in Plans)

2' Min

2' Min

2' Min

#2 AWG Tin-Plated Bare Solid Copper Ground Wire. Bond To Air Terminals

Guardrail (if shown in Plans)

2' Min

4' Min

2' Min

4' Min

2' Min

ETP Alloy 110 Copper
Air Terminal (Class II)
Surface Base Of 8 Square-Inch
Minimum Contact Area
Per NFPA 780-4.16.3

ETP Alloy 110 Copper
Air Terminal (Class II)
Surface Base Of 8 Square-Inch
Minimum Contact Area
Per NFPA 780-4.16.3

ETP Alloy 110 Copper
Air Terminal (Class II)
Surface Base Of 8 Square-Inch
Minimum Contact Area
Per NFPA 780-4.16.3

ETP Alloy 110 Copper
Air Terminal (Class II)
Surface Base Of 8 Square-Inch
Minimum Contact Area
Per NFPA 780-4.16.3
GROUNDED ROD ARRAY PLACEMENT
(Typical)
20' RODS, 40' SPACING

GROUNDING AND LIGHTNING PROTECTION
GROUNDING AND LIGHTNING PROTECTION

GROUND ROD ARRAY PLACEMENT
(Communication Tower)
20' RODS, 40' SPACING

GROUND ROD ARRAY PROFILE
(Communication Tower)

"Sphere Of Influence With Ground Ring"

Communications Tower

Ground Rod A
Primary Ground Rod A

Ground Rod B

Ground Rod C

Ground Rod D

Ground Rod E

Ground Rod F

#2 AWG (Typical)

Foundation: Communication Tower

#2 AWG 12' Min./36' Max. From Foundation

Ground Rod A
Primary Ground Rod A

Ground Rod B

Ground Rod E

Ground Rod F

12' (Typical)

GROUND ROD ARRAY PLACEMENT
(Communication Tower)
20' RODS, 40' SPACING

GROUND ROD ARRAY PROFILE
(Communication Tower)

8" MAX.
2" MIN.

8" Diameter By 20' Long Copper-Clad Steel Ground Rods Driven Into Undisturbed Earth

8" Diameter By 20' Long Copper-Clad Steel Ground Rods Driven Into Undisturbed Earth

Foundation: Communication Tower

#2 AWG (Typical)

Ground Rod B

Ground Rod E

Ground Rod F

Ground Rod D

#2 AWG (Typical)

Foundation: Communication Tower

#2 AWG 12' Min./36' Max. From Foundation

Ground Rod A
Primary Ground Rod A

Ground Rod B

Ground Rod E

Ground Rod F

12' (Typical)
GENERAL NOTES:

1. Cabinet layout is for pole or base mounted installations.
2. All dimensions and scale are approximate.
3. The minimum CCTV cabinet dimensions shall be 36” H x 24” W x 22” D.
4. Conduit entrances are in bottom of cabinet.
5. There shall be front and rear doors. Both doors shall have the hinged side next to the pole when pole mounted.
6. Cabinet layout represents preferred placement of typical devices. Project-specific designs may not include all components illustrated here.
DESCRIPTION:

**REVISION NO.**

**SHEET NO.**

**INDEX NO.**

**DESIGN STANDARDS**

FY 2016-17

**CCTV BLOCK DIAGRAM**

**LEGEND**

- ----- Data
- ------- Ethernet
- -------- Power
- --- TVSS Transient Voltage Surge Suppressor

Single Mode Fiber Optic Ethernet 100/1000 Base FX

Surge Suppressor

Transient Voltage Power Ethernet Data TVSS

RS-232 Local Management Port Access Maintenance

Terminal Server Video Encoder Ethernet Switch

CCTV Camera

Composite TVSS

RS-232/422/485 Serial Data

Maintenance Access Local Management Port RS-232

May Be One Or More Devices

Power Distribution Assembly

For Portable Tools

GFI Convenience Outlet(s)

Electric Utility AC Service

From Electric Utility Ethernet 10/100 Base TX/RX Single Mode Fiber Optic

Power Supplies Optional

Optional Power Supplies

10/100 Base TX/RX Ethernet For Equipment Power TVSS Protection For Equipment Power

10/100 Base TX/RX Ethernet TVSS

Cabinet

Supplies

Optional

Assembly

For Portable Tools
GENERAL NOTES:

1. Contractor shall splice fiber optic cables in cabinet to preterminator patch panel.
2. Furnish and install TVSS protection on all video, data, and power cabling in cabinet.
3. Ensure that all electronic equipment power is protected and conditioned with TVSS devices.
4. Sizes and types of conduits and innerducts for network communications between the pullbox and cabinet are stated in the contract documents.
5. See Index 18100 for grounding requirements.
6. All network communications conduits and ducts shall be sealed with approved waterproof duct plugs and seals.
GENERAL NOTES:

1. Contractor shall splice fiber optic cables in cabinet to preterminated patch panel.

2. Furnish and install TVSS protection on all cabling in cabinet.

3. Furnish and install secondary TVSS protection on outlets for equipment in cabinet.

4. Sizes and types of conduits and innerducts for network communications between the pull box and cabinet are stated in the contract documents.

5. Ensure that equipment cabinet is bonded to CCTV pole grounding system.

6. All network communications conduits and ducts shall be sealed with approved waterproof duct plugs and seals.

7. Pole mounted cabinets shall be mounted with hinges next to the pole.
GENERAL NOTES:

1. Lowering device to be shipped ready for pole attachment to include 100 ft. of composite power and signal cable pre-wired to lowering device at the factory.

2. The lowering device manufacturer shall supply both a portable lowering tool with a manual hand crank and a half-inch chuck variable-speed reversible industrial-duty electric drill that matches the winch's manufacturer-recommended revolutions per minute. One lowering tool per every 10 lowering devices is required.

3. The lowering device manufacturer shall provide an on-site installation inspection and operator instruction and certification. This ensures the product is assembled correctly and that all necessary persons are trained in the proper, safe operation of the system. Before erecting the first pole the contractor must contact the lowering device supplier and schedule a manufacturer's representative to be on-site.


5. Camera to be mounted to camera junction box and stabilizing weight via 1/2" Standard NPT Pipe Thread.

6. Use air terminal extension when the pole top junction box is wider than top of pole.

7. The stainless steel device lowering cable shall be installed inside the pole within a 1/2" diameter PVC conduit.

8. All communication and power cables must be neatly bundled and secured.


10. See Index 18113 for concrete pole details and Index 18111 for steel pole details.

Use a Camera Lowering Device listed on the Approved Product List (APL).

All communication and power cables must be neatly bundled and secured.

See Index 18113 for concrete pole details and Index 18111 for steel pole details.
GENERAL NOTES:

1. Verify the pole type, the dimensions of the pole at the pole of installation of the camera mount, and angle with respect to the roadway before manufacturing camera mount assembly.

2. Design camera mounting arm and connection to the pole according to FDOT Structures Manual (current edition).

3. No field welding shall be permitted.

4. Mounting bracket arm shall be level after installation.

5. The contractor shall submit shop drawings for the proposed fixed mounting arm, signed and sealed by a Professional Engineer registered in the State of Florida, to the Engineer for review and approval.

6. See Index 18113 for concrete pole details and Index 18111 for steel pole details.

7. Galvanized pipe connections and conduit every joints shall be sealed in accordance with Section 630 of the Standard Specifications.
FOUNDATION NOTES:

1. Concrete Class IV (Drilled Shaft) with a minimum 6000 psi compressive strength at 28 days for all environment classifications.
2. Reinforcing Steel: ASTM A615 Grade 60.
3. Anchor Bolts: ASTM F1554 Grade 55 with ASTM A563 Grade A heavy hex nuts and plate washers. ASTM F2329 galvanization.
4. Install Anchor Bolts in accordance with Section 649-5 of the Specifications.
5. Foundation applies to slopes 1:4 or flatter.
6. The Foundation for the CCTV structure shall be constructed in accordance with Section 455 of the Specifications except that no payment for the foundation shall be made under Section 455.

INSTALLATION NOTES:

3. Cable Supports: Electrical Cable Guides and Eyebolts.
   a. Locate top and bottom cable guides within the pole aligned with each other.
   b. Position one cable guide 2" below the handhole.
   c. Position other cable guide 1" directly below the top of the tenon.
   d. Position Park Stands 2" below the top of the handhole.
2. Lowering Device Installation Notes:
   a. Place the lowering cable that moves within the pole in an interior conduit to prevent it from tangling or interfering with any electrical wire that is in the pole. Ensure that any electrical wire within the pole is routed securely and free from slack.
   b. Mount lowering arm perpendicular to the roadway or as shown in the plans. Position CCTV pole so that the camera can be safely lowered without requiring lane closures.
   c. Coordinate all lowering device hardware requirements (including Tenon, Tenon mounting plates, parking stands, etc.) with lowering device manufacturer.
3. Pole Installation Notes:
   a. Install pole plumb.
   b. The pole shall not be erected until the foundation concrete has achieved 70% of the minimum specified 28 day compressive strength.
4. Refer to Index No. 18108 for conduit and cabinet mounting details.

POLE NOTES:

1. The pole shall be round or 16 sided or more with a constant taper of 0.14 inches per foot.
2. Pole shaft may be either One or Two sections (with telescopic field spliced).
3. Use only circumferential welds at base.
4. Up to two longitudinal seam welds are permitted.
5. Longitudinal seam welds within 6" of circumferential welds shall be complete penetration welds. Longitudinal seam welds on female section of telescopic field splices shall be complete penetration welds for the splice length plus six inches. All other areas, size the partial penetration welds to at least 60% of the pole tube thickness.
7. Identification tag: Furnish each pole with a 2x4" (max.) aluminum identification tag, secured to pole with stainless steel screws. Locate inside pole and visible from handhole. Provide Financial Project ID, pole height, manufacturer's name, yield strength (fy of steel) and pole base wall thickness.
8. Except for Anchor Bolts, all bolt hole diameters shall be equal to the bolt diameter plus 1/16", prior to galvanizing. Hole diameters for anchor bolts shall not exceed the bolt diameter plus 1/8".
9. This Design Standard is considered fully detailed and no shop drawings are necessary. Submit Shop Drawings for minor modifications not detailed in the plans.
10. Pole Material Specifications:
   a. Pole:
      - ASTM A1011 Grade 50, 55, 65 or 65 (less than 1/4") or ASTM A572 Grade 50, 60 or 65 (greater than or equal to 1/4") or ASTM A505 Grade A (55 ksi yield) or Grade B (60 ksi yield).
   b. Steel Plates and Pole Cap: ASTM A36 or ASTM A709 Grade 30.
   c. Weld Metal: E70XX.
   d. Bolts: ASTM A495 Type 1.
      - Nuts: ASTM A563.
      - Washers: F436.
   e. Handhole frame: ASTM A709 Grade 36 or ASTM A36.
   f. Handhole cover: ASTM A1011 Grade 50, 55, 60 or 65.
   g. Stainless steel screws: AISI Type 316.
   h. Galvanization:
      - Nuts, bolts and washers: ASTM F2329.
      - All other steel: ASTM A123.
   11. Additional wire access holes not shown in this Design Standard shall not exceed 7/8" in diameter.
   12. Verify CSL access tubes will not interfere with anchor bolt installation before excavating the shaft. When CSL access tube locations conflict with anchor bolt locations, move the CSL access tube locations to the maximum circumference of the reinforcing cage. Notify the Engineer before excavating the shaft if the CSL access tube locations cannot be moved out of conflict with anchor bolt locations.

GENERAL NOTES
### SHAFT DESIGN TABLE

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<th>Pole Overall Height (ft)</th>
<th>Shaft Diameter</th>
<th>Shaft Length</th>
<th>Longitudinal Reinforcement</th>
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### BASE PLATE AND ANCHOR BOLT DESIGN TABLE

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<th>Base Plate Diameter (in.)</th>
<th>Base Plate Thickness (in.)</th>
<th>Anchor Bolt Circle (in.)</th>
<th>No. Bolts</th>
<th>Anchor Bolt Diameter (in.)</th>
<th>Anchor Bolt Embedment (in.)</th>
<th>Minimum Anchor Bolt Projection (in.)</th>
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### POLE DESIGN TABLE

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* Diameter Measured Flat to Flat
STEEL CCTV POLE

SECTION A-A

BASE PLATE AND ANCHORAGE ELEVATION

(Conduits, Reinforcement, and CSL Tubes Not Shown)

SECTION C-C

JOINT WELD DETAIL

SECTION D-D

(16-Sided Pole Shown, 18-Sided and Round Pole Similar)

BASE PLATE AND FOUNDATION DETAILS

(Conduits and CSL Tubes Not Shown)
Provide Cover Plate
Steel Chain Mounted or Hinge Mounted With Pad Lock Tab

Handhole Frame
(2) Park Stands
(Inside Shaft Wall)
1" x 22" x 1/2" Ensure Handhole Is Designed For Use With The Portable Lowering Tools That Are Used To Operate The Lowering Device System
Identification Tag (See Pole Notes)
1/2" Drill & Tap Hole In Handhole Rim, Supplied With 1/2" x 3" Bolt
(2) Cable Guides For Wire Tie Off
1/2" Nut Holder With Fastener at 180° From Handhole Interior of Pole

POLE DETAILS

HANDHOLE DETAIL
1/2" x 3" W X 1/2" H Plate
Typical
1/2" Ø Rod with 1" Inner Ø
Bend rod to allow 1/2" legs, similar to Cable Guide Detail

POLE TOP PLATE DETAIL
(12) 1/2" x 3" Slots
Cable Guide For Wire Tie Off
1/2" Tenon Plate

POLE STAND DETAIL
1/2" Ø Eye Bolt with 1" Inner Ø
EYE BOLT OPTION
1/2" Ø Rod with 1" Inner Ø
ROD OPTION

POLE TENON ASSEMBLY DETAIL
POLE WITHOUT LOWERING DEVICE
(Interior of Pole)
At 180° From Handhole

POLE WITH LOWERING DEVICE
(POLE WITHOUT LOWERING DEVICE)
Working Park Stand
(2) Park Stands
(TOP PLATE DETAIL)
(2) Cable Guides For Wire Tie Off
1" Plate
Pole Wall
1" Ø Hole
1/2" Stainless Steel Hex Head Screws, Typ.
Tack Welded Cover Clip Typ.
Handhole Cover Plate 1/2" Thick
(8) 1/4" Ø Holes Equally Spaced
Partial Penetration Weld

POLE CAP PLATE
(PARTIAL PENETRATION WELD)

CABLE GUIDE DETAIL
1" Ø Hole

Note: Install all handhole and opening covers prior to shipping. For Poles with Lowering Device, install Pole Cap Plate when Tenon Assembly is not installed.
LOWERING DEVICE INSTALLATION NOTES:

1. Place the lowering cable that moves within the pole in an internal conduit to prevent it from tangling or interfering with any electrical wire that is in the pole. Ensure that any electrical wire within the pole is routed securely and free from slack.

2. Mount lowering arm perpendicular to the roadway or as shown in the plans. Position CCTV pole so that the camera can be safely lowered without requiring lane closures.

3. Coordinate all lowering device hardware requirements (including Tenon, Tenon mounting plates, parking stand, etc.) with lowering device manufacturer.

POLE NOTES:

1. Pole Material Specifications:
   a. Pole: Use Class VI Concrete with 6 ksi minimum strength at transfer.
   c. Reinforcing Steel: ASTM A615 Grade 60.
   d. Spiral Reinforcing: ASTM A1064 Cold-Drawn.
   e. Bolts: ASTM F1554, Grade 55.
   g. Nuts: ASTM A563, Grade A Heavy Hex.
   h. Steel plates and Pole Cap: ASTM A36 or ASTM A709 Grade 50.
   i. Galvanization: Bolts, nuts and washers: ASTM F2329
      Washers: ASTM F436.
   j. Spiral Reinforcing: ASTM A1064 Cold-Drawn.
   k. Prestressing Strands: ASTM A416 Grade 270 low relaxation.
   l. Reinforcing Steel: ASTM A615 Grade 60.

2. The pole shall be round or 12-sided.

3. Cut the tip end of the prestressed strand first or simultaneously with the butt end.

4. Place the lowering arm perpendicular to the roadway or as shown in the plans.

5. For reinforcing steel, lap splice to consist of a 3'-0" lap length at each splice. No more than two opposing rebars to be spliced at the same cross section. Stagger lap splices as needed.

6. Provide a Class 3 surface finish in accordance with Specification Section 400.

7. Provide a 3" minimum cover.

8. Provide handleless and coupler cover plates made of non-corrosive materials. Attach cover plates to poles using lead anchors or threaded inserts embedded in the poles in conjunction with round headed chrome plated screws.

9. Provide identification markings on the poles where indicated on the following sheets. Include the following information using inset numerals with 1" height or as approved in the Producers' Quality Control Program: Financial Project ID, Pole Manufacturer, Pole Length.

10. Install pole plumb.

11. Tie ground wires to the interior of reinforcing steel as necessary to prevent displacement during concreting operations.

12. This Design Standard is considered fully detailed and no shop drawings are necessary. Submit Shop Drawings for minor modifications not detailed in the plans.

13. Storage, Handling and Erection locations shown may vary within ± 3".

GENERAL NOTES
POLE CONFIGURATION

TOP VIEW

POLE DESIGN TABLE*

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PORE DESIGN TABLES

12-SIDED POLE DESIGN TABLE

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</table>

* Diameter Measured Flat to Flat

** Total taper applies to pole, strands, and reinforcing.

*** For 12-Sided Pole and Round Pole Option 2 Stress prestressed strand to 70% of Ultimate before Transfer.
For Round Pole, Option 1 Stress Prestressed strand to 60% of Ultimate before Transfer.
SPIRAL REINFORCING ELEVATION
(Strands, Holes, and Fixtures Not Shown)

POLE ELEVATION
(Strands and Reinforcing Not Shown)

STRAND LEGEND
* - Prestressed Strand
\( \Delta \) - (4) #5 Rebar (Shown) or (6) #4 Rebar

Note:
Strands and Rebar shown are continuous from Tip End to Butt End.
CONCRETE CCTV POLE

**SECTION B-B**

- **TENON COVER**
  - Provide a Tenon Cap and Fix to the Tenon Wall with 3/8" Ø x 20 Hex Head Cap Set Screw, Equally Spaced.
  - (4) 3/8" Ø Hole
  - (2) 3/8" Ø x 18" Cap Plate
  - (4) 3/8" Ø Nut with Flat Washer

**SECTION D-D - PARK STAND DETAIL**

- **TOP OF POLE DETAIL**
  - (3) 1/2" Ø Eye Bolt with 1/2" Collar Nut
  - 1/2" Ø x 30" SCH 40 Pipe

**CAP PLATE DETAIL**

- 1/2" Ø Hole
- 1/2" Cap Plate

**HANDBOle DETAIL**

- 1/2" Ø x 2 1/2" Min. Insert to Be Cast into Pole (See Note 2)

**Notes:**
1. Install all handhole and opening covers prior to shipping.
2. Install 1/2" Ø x 9" long stud with hex nut in insert before shipment.
3. As an alternate, embed (4) 3/8" Ø x 18" stainless steel threaded rods with a threaded nut. At top of rod, thread a coupling nut to attach plate w/ (6) 1/8" x 1/2" stainless steel bolts.
4. Handhole frame may be Cast Aluminum 356.2.
NOTES:
1. Install DMS Foundation at location shown in Plans.
2. Extend Catwalk from DMS to outer edge of paved shoulder but not less than four feet in length.
3. If included, Install guardrail at location shown in Plans and in accordance with Design Standards Index 400.

1/8" ETP Alloy 110 Copper Air Terminal (Class II)
Surface Base of 8 Square-Inch Minimum Contact Area
Per NFPA 780-4.16.3

See Note 2

See Note 3

See Note 1

19'-6" Min. Clearance

Shoulder

Ground Line

TYPICAL ELEVATION VIEW
CANTILEVER SIGN STRUCTURE

TYPICAL PLAN VIEW
DMS SPAN SIGN STRUCTURE

GENERAL LAYOUT
**NOTES:**

1. Conductors for grounding shall be connected to steel framework that has been cleaned to base metal by use of bonding plates having contact area of not less than 8 square inches or by welding or brazing. Yellowing and tagging the steel structure to accept a threaded connector is also an acceptable method.

2. If steel framework is to be drilled and tapped to accept threaded connector, the threaded connector shall be galvanized and have at least 5 threads fully engaged and secured with a jam nut to the connector, the threaded connector shall be galvanized and have at least 5 threads fully engaged and secured with a jam nut to the connector, or brazing. Drilling and tapping the steel structure to accept a threaded connector is also an acceptable method.

3. Bends in the conduit shall not be less than the minimum bending radius for the cable contained in the conduit.

4. Conduit and handrail design and installation shall comply with AISC, AASHTO, and OSHA requirements as applicable.

5. All data, fiber optic and power cables for the DMS shall be completely enclosed within the sign structure or in conduit.

6. Permanently stamp/mark foundation to conduit locations.

7. Transition conduit in foundation to underground conduit with appropriate reducer outside the limits of the foundation.
NOTES:
1. DMS Cabinet may be pole or ground mounted depending on project requirements.
2. See sheet 4 for additional conduits for grounding. The number and placement of conduits are approximate.
3. Field adjust pole-mounted DMS cabinet height to achieve best access for maintenance personnel given site conditions as directed by the Engineer. Avoid conflicts with stiffeners, handhole and maintenance of anchor bolts.

Chord

Handrail

Post

Calwalk

Bottom Truss Chord

Pole Mounted Cabinet

Ground Mounted Cabinet

Access Door

Door Hinge

DMS

Door Latch / Handle

2-3' Threaded Couplings For Rigid Metal Conduit

3-2' Threaded Couplings For Power and Communications

2-2' Rigid Metal Conduits With Std Sweeps

Handhole

Top Of Conduits

Conduit Entrance Location

Communications Cable Separately Power And

Two J-Hooks To Support

Removable Top Plate

Air Terminal

Back Truss Chord

Removable Top Plate

Two J-Hooks To Support Separately Power And

Communications Cable

Conduit Entrance Location

Per DMS Manufacturer

Wire Screen - See Spec. 649-6

Fiber Optic Pull Box Or Fiber Optic Splice Box

(See Index 17700)

2-3' PVC Grounding Conduit

Power Conduit (2" PVC) To Power Service Assembly

Fiber Optic Communications Conduit (2" PVC) (As Shown On Plans)

Fiber Optic Communications Conduit (2" PVC)

Spare Conduit (2" PVC)

Spare Conduit (2" PVC)

Grounding Conduit (2" PVC)

Grounding Conduit (2" PVC)

Fiber Optic Pull Box Or Fiber Optic Splice Box

(See Index 17700)

Transition Conduit Outside Foundation

11 Gauge Handhole Cover

0.5" Hole, Typ.

Handhole Frame

1/2" Stainless Steel Hex Head Screws, Typ.

Cover Clips, Typ. Tack Welded

1/2" Stainless Steel Hex Head Screws, Typ.

Cover Clips, Typ. Tack Welded

Partial Penetration Weld

Full Penetration Weld

A

A

A

A

SECTION A-A

(Thru Handhole)

1/4" Dia. Stainless Steel Hex Head Screws, Typ.

Tack Welded Cover Clips, Typ.

4" x 10" Handhole Frame Made Continuous With A Full Penetration Weld

31 Gauge Handhole Cover

1/2" Stainless Steel Hex Head Screws, Typ.

Handhole Frame

4" Partial Penetration Weld

Weld Full Penetration

8

7

5

4

3

2

1

A

A

A

A

A

A

A
Dynamic Message Sign Walk-In

**TYPICAL GROUND ROD DETAIL**

- **#2 AWG Tin-Plated Bare Solid Copper Wire**: To Air Terminal
- **Ground Rod B**: Primary Ground Rod Assembly (See Inset A)
- **Ground Rod A**: Sign Structure Foundation
- **Finished Grade**: 2' Min.
- **Power Service Assembly**: (As Shown on Plans)
- **Fiber Optic Communication Conduit**: (2" PVC) (As Shown on Plans)
- **Grounding Conduit**: (2" PVC)
- **Pass Box**: Exothermic Weld
- **Ground Wire to DMS Cabinet**: Solid Copper Ground Wire
- **Ground Wire From DMS Cabinet**: To Ground Rod
- **#2 AWG Tin-Plated Bare Solid Copper Wire**: Continuous To Air Terminal
- **Ground Wire To Air Terminal**: From DMS Cabinet To Ground Rod
- **Cabinet To Ground Rod**: Ground Wire
- **Pull Box**: Ground Rod With
- **#2 AWG Tin-Plated Bare Solid Copper Wire**: To Air Terminal And Ground Wire. Bond
- **Bare Solid Copper**: #2 AWG Tin-Plated
- **Ground Rod With**: Ground Wire To DMS Cabinet
- **Cabinet To Ground Rod**: Ground Wire From DMS
- **Ground Rod B**: (As Required)
- **Ground Rod D**: As Required
- **Ground Rod C**: As Required
- **Ground Rod A**: Sign Structure Foundation

**INSET 'A'**

- **#2 AWG Tin-Plated Bare Solid Copper Wire**: To Pole Mounted or Ground Mounted Cabinet
- **Pole Mounted Cabinet**: Mounted or Grounded Wire to Pole
- **Bare Solid Copper**: #2 AWG Tin-Plated
- **Pole Mounted Cabinet**: Mounted Cabinet
- **Ground Rod A**: Sign Structure Foundation
- **Ground Rod D**: As Required
- **Ground Rod B**: (See Inset A)
- **Ground Rod C**: As Required
- **#2 AWG Tin-Plated Bare Solid Copper Wire**: To Pole Mounted or Ground Mounted Cabinet

**GROUND ROD PLACEMENT DETAIL**

- **20 Radians Each "Sphere of Influence"**
- **Sign Structure Foundation**: Ground Rod D
- **Ground Rod C**: To Ground Rod B,
- **Bare Copper Wire**: #2 AWG Tin-Plated
- **Ground Rod B**: As Required
- **Ground Rod A**: Sign Structure Foundation
- **Finished Grade**: 2' Min.
- **CABINET**
- **Mounted**
- **Power Service Assembly**: (2" PVC) To Power Conduit
- **Fiber Optic Communication Conduit**: (2" PVC) To Power Conduit
- **Grounding Conduit**: (2" PVC)
- **Spare Conduit**: (2" PVC)
- **Driven Into Undisturbed Earth**: Copper-Clad Steel Ground Rods
- **Diameter By 20' Long**: Copper-Clad Steel Ground Rods
- **Driven Into Undisturbed Earth**
- **Exothermic Weld**: 36" Max.
- **Min.**: 12"
NOTES


2. DMS and Hanger Design Wind Speed: 150 miles per hour. Maximum DMS weight for design: 4300 lb.

3. Shop drawings including the DMS connection are required and fabrication shall not begin until these shop drawings are approved.

4. Locate the sign horizontal on the structure as shown in the plans. Vertically center the sign enclosure with the centerline of the truss.

5. Before erection, after both the delivery of the DMS and the steel truss, the contractor shall carefully measure the exact locations for field drilling the 1/2" bolt holes in the vertical hangers and horizontal mounting members attached to the sign enclosure. Field locate holes to allow vertical hanger placement as shown on the plans with no conflicts with gusset or splice plates.

6. All steel items shall be galvanized as follows:
   - All nuts, bolts and washers [ASTM A 123]
   - All other steel items [ASTM A 122]

7. All bolt holes shall be equal to the bolt diameter plus 1/8", prior to galvanizing.

8. All bolts shall have single self-locking nuts, or locking nut system, installed in accordance with the manufacturer's recommendations.

9. Cost of the installation of the DMS on truss including the vertical hanger, associated members, and hardware shall be incidental to the cost of the sign structure.

10. Threaded couplings shall be located on sign side of column above the sign structure.

HANGER LOCATION DETAIL

(Cantilever Sign Structure Shown, Span Sign Structure Similar)
**DESCRIPTION:**

REVISION

LAST

REV 30
07/01/14

REV

FY 2016-17

INDEX

NO.

DESIGN STANDARDS

18300

SHEET

6 of 9

DYNAMIC MESSAGE SIGN WALK-IN

6061-T6 Structural Aluminum Zee 4.5x1.3x3.58 Horizontal Member Attached To The Internal Framework And Included With The DMS Sign

ASTM A325, Gr.2F Steel W6x9 Hanger @ 5 (Max) Spacing

Back Face Of DMS Sign Enclosure

Truss Chord

Dia. + strides

2-½" Ø ASTM A325 Bolts

Field Drill Holes And Provide Lock Nuts

ALUMINUM ZEE 4X3.13X3.58 6061-T6 STRUCTURAL DMS SIGN ENCLOSURE BACK FACE @ 5' (MAX) SPACING

2-½" ASTM A325 U-BOLTS

HANGERS WITH MATCHING LOCK NUTS

See Truss Data Sheet

3-ZEE BUMPS EQUIVALENT

END VIEW

SECTION A-A

SECTION B-B

SECTION C-C

END VIEW
NOTES:

1. Provide single ethernet connection from the managed field ethernet switch to either the sign controller interface in cabinet or sign controller in sign enclosure.
2. Locate cabinet as shown in plans.
3. Serial data link is for communications directly to the DMS controller.
4. Cabinet must include at least one breaker to control all cabinet power.
5. AC service entrance may be located in cabinet or sign housing.
6. UPS equipment location may vary. Diagram indicates functional requirements that uninterrupted power must be available in cabinet and sign housing.

SIGN AND CABINET WIRING DIAGRAM

LEGEND

- Data
- Ethernet
- Power
- SPD (Surge Protection Device)

FIELD TECH COMPUTER
(Temporary Service Connection)
LEFT SIDE VIEW
FRONT VIEW
POLE MOUNTED CABINET
RIGHT SIDE VIEW

NOTES:
1. Cabinet layout is for pole or ground mounted installations.
2. All dimensions and equipment locations are approximate.
3. Conduit entrances are at bottom of cabinet.
4. Minimum number of duplex outlets is three, (2) SPD protected and (1) GFI protected.
5. Either an access controller or local access panel shall be provided to provide full access to DMS for control, programming and troubleshooting.
6. Load centers shall be sized for connected equipment and convenience outlets with at least one main disconnect and three circuit breakers.
7. Batteries and UPS may be located in sign housing or cabinet.
8. Power Distribution Assembly component layout, orientation and location may vary.

POLE MOUNTED CABINET

CABINET LAYOUT 1