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.
Dome Type CCTV Camera
(See Index 18107)
For Ground Mounted Cabinet
(See Index 18101)
For Pole Mounted Cabinet
(See Index 18108)
For Grounding (See Index 18102)
Concrete

CCTV Cabinet

STEEL POLE

Dome Type CCTV Camera
(See Index 18107)
For Ground Mounted Cabinet
(See Index 18101)
For Pole Mounted Cabinet
(See Index 18108)
For Grounding (See Index 18102)
Concrete

CCTV Cabinet

CONCRETE POLE
**GROUNDING AND LIGHTNING PROTECTION**

**STELL CCTV POLE**

- **2" Min.**
- **1/2" Diameter by 20' Long Copper-Clad Steel Ground Rods Driven Into Undisturbed Earth**
- **Conduit for Grounding Conductors**
- **Finished Grade**
- **Concrete**
- **Wire Screen**
- **Primary Ground Rod Assembly (See Inset A)**
- **Conduit for Grounding Conductors**
- **Ground Rod A Primary Ground Rod Assembly (See Inset A)**
- **Pull Box**
- **Exothermic Weld**

**CONCRETE CCTV POLE**

- **2" Min.**
- **1/2" Diameter by 20' Long Copper-Clad Steel Ground Rods Driven Into Undisturbed Earth**
- **Conduit for Grounding Conductors**
- **Finished Grade**
- **Concrete**
- **Wire Screen**
- **Primary Ground Rod Assembly (See Inset A)**
- **Conduit for Grounding Conductors**
- **Ground Rod A Primary Ground Rod Assembly (See Inset A)**
- **Pull Box**
- **Exothermic Weld**

**Requirements**

- For Concrete Poles that Do Not Have Embedded Ground Wire, Install #2 AWG Tin-Plated Bare Copper Wire, Clamp To Air Terminal And Ground Rod With Exothermic Welds.
- #2 Wire May Be Routed Internally or Externally According To Project Requirements.
- #2 AWG Tin-Plated Bare Solid Copper Wire To Ground Rod C As Required.

**NOTE:**

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

- Ground Rod B As Required.
- Ground Rod B As Required.
- Ground Rod B As Required.
- Ground Rod B As Required.

**INDEX NO. 18102**

**DESIGN STANDARDS**

**REV NO.**

**DESCRIPTION:**

- STEEL CCTV POLE
- CONCRETE CCTV POLE

**LAST REVISION 07/01/14**

**2016**
Per NFPA 780-4.16.3
Minimum Contact Area
Surface Base Of 8 Square-Inch
ETP Alloy 110 Copper
Copper Ground Wire. Bond To Air Terminals
#2 AWG Tin-Plated Bare Solid Copper Ground Wire. Bond To Air Terminal
Guardrail (if shown in Plans)

AIR TERMINAL PLACEMENT
(Lowering Device Pole)

AIR TERMINAL PLACEMENT
(Span DMS)

AIR TERMINAL PLACEMENT
(Cantilever DMS)
GROUND ROD ARRAY PLACEMENT
(Typical)
20' RODS, 40' SPACING

Ground Rod C

Primary Ground Rod A

Ground Rod B

Ground Rod D

Foundation: CCTV or DMS Pole

"Sphere Of Influence: 120 Degree"

GROUND ROD ARRAY PLACEMENT
(Typical Modified)
20' RODS, 40' SPACING

Ground Rod C

Primary Ground Rod A

Ground Rod B

Ground Rod D

Foundation: CCTV or DMS Pole

"Modified Sphere Of Influence: 90 Degree"

INSET "A"

#2 AWG Tin-Plated
Bare Solid Copper Wire Continuous To
Air Terminal

#2 AWG Tin-Plated
Bare Solid Copper Wire To Ground,
Rocks B, C And D As Required (Connections
May Be Combined)

#2 AWG Tin-Plated
Bare Solid Copper Wire To Pole Mounted
Or Ground Mounted Cabinet

20' RODS, 40' SPACING (Typical)

20' RODS, 40' SPACING (Typical Modified)
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.

PROJECT-SPECIFIC DESIGNS MAY NOT INCLUDE ALL COMPONENTS ILLUSTRATED HERE.
GENERAL NOTES:

1. Contractor shall splice fiber optic cables in cabinet to preterminater 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 inerducts 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.
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 prewired 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 1½" 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 1½" 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.
CAMERA MOUNTING WITH FIXED BRACKET

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.

CAMERA MOUNTING DETAILS
FOUNDATION NOTES:

1. Concrete Class IV (Drilled Shaft) with a minimum 4,000 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:

1. 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 splice).

3. Use only circumscribed 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 90% of the pole tube thickness.


7. Identification tag:
   a. Furnish each pole with a 2" x 4" (max.) aluminum identification tag, secured to pole with stainless steel screws.
   b. Locate inside pole and visible from handhole.
   c. 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, 60 or 65 (less than 1/4")
        - ASTM A572 Grade 50, 60 or 65 (greater than or equal to 1/4")
        - ASTM A585 Grade A (55 ksi yield) or Grade B (60 ksi yield).
    b. Steel Plates and Pole Cap: ASTM A36 or ASTM A709 Grade 50.
    c. Weld Metal: E7014.
    d. Bolts: ASTM A325, Type 1.
       - Nuts: ASTM A563.
       - Washers: ASTM 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: A416 Type 316.
    h. Galvanization:
       - Nuts, bolts and washers: ASTM F2329.
       - All other steel: ASTM A325.

11. Additional wire access holes not shown in this Design Standard shall not exceed 1/2" 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 avoid interference with 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.
Provide Cover Plate
Steel Chain Mounted or Hinge Mounted With Pad Lock Tab

(2) Park Stands (inside Shaft Wall)

7" x 22" x 1½" ensure handhole is designed for use with the portable lowering tool that are used to operate the lowering device system

Identification Tag (See Pole Notes)

½" Ø drill & tap hole in handhole rim supplied with ½" Ø x 3" bolt

(2) Cable Guides For Wire Tie Off

½" Nut Holder with Fastener at 180° from handhole (interior of pole)

TOP PLATE DETAIL

SECTION F-F

POLE DETAILS

POLE TENON ASSEMBLY DETAIL

(POLE WITHOUT LOWERING DEVICE)

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.

POLE CAP PLATE

(POLE WITH LOWERING DEVICE)

TOP PLATE DETAIL

SECTION E-E

HANDHOLE DETAIL

EYE BOLT OPTION

ROD OPTION

PARK STAND DETAIL

CABLE GUIDE DETAIL
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 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; Nuts: ASTM A563, Grade A Heavy Hex; Washers: ASTM F436.
   f. Steel plates and Pole Cap: ASTM A36 or ASTM A709 Grade 50.
   g. Galvanization: Bolts, nuts and washers: ASTM F2329.
   h. All other steel: ASTM A123.

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. For spiral reinforcing, one turn is required for spiral splices and two turns are required at the top and bottom of poles.

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 handhole 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
**CONCRETE CCTV POLE**

**POLE DESIGN TABLES**

**12-SIDED POLE DESIGN TABLE**

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* Diameter measured flat to flat

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* 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.
**REVISION NO.**

**DESCRIPTION:**

* Spiral wire may be wrapped in two directions given that an equivalent area of spiral wire is provided to that shown in this standard and the cover requirements are met.

---

**POLE ELEVATION**

(Strands and Reinforcing Not Shown)

---

**SECTION A-A**

**STRAND PATTERN 1**

(12 - SIDED)

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**SECTION A-A**

**STRAND PATTERN 2**

(12 - SIDED)

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**SECTION A-A**

**STRAND PATTERN 3**

(ROUND - OPTION 1)

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**SECTION A-A**

**STRAND PATTERN 4**

(ROUND - OPTION 2)

---

*Note: Strands and Rebar shown are continuous from Tip End to Butt End.*

---

**CONCRETE CCTV POLE**

---

**INDEX NO.**

18113

---

**SHEET NO.**

3 of 4

---

**DATE:** 07/01/13

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**REVISON:** 07/01/13

---

**DESCRIPTION:**

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**DESIGN STANDARDS**

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2016

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**Diameter, Plan Location, and Layout: 6/30/16**

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**Top of Pole Detail Without Lowering Device**

**Notes:**
1. Install all handhole and opening covers prior to shipping.
2. Install ½" Ø x 5' long stud with hex nut in insert before shipment.
3. As an alternate, embed (4) ½" Ø x 18' stainless steel threaded rods with a threaded nut to attach plate w/ (4) ½" Ø x 18' stainless steel bolts.
4. Handhole frame may be Cast Aluminum 356.2.

**Top of Pole Detail With Lowering Device**

**Notes:**
1. Install all handhole and opening covers prior to shipping.
2. Install ½" Ø x 5' long stud with hex nut in insert before shipment.
3. As an alternate, embed (4) ½" Ø x 18' stainless steel threaded rods with a threaded nut to attach plate w/ (4) ½" Ø x 18' stainless steel bolts.
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**Handhole Detail**

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**Cap Plate Detail**

**Notes:**
1. Install all handhole and opening covers prior to shipping.
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**Handhole Detail**

**Notes:**
1. Install all handhole and opening covers prior to shipping.
2. Install ½" Ø x 5' long stud with hex nut in insert before shipment.
3. As an alternate, embed (4) ½" Ø x 18' stainless steel threaded rods with a threaded nut to attach plate w/ (4) ½" Ø x 18' 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.

TYPICAL PLAN VIEW
DMS CANTILEVER SIGN STRUCTURE

TYPICAL PLAN VIEW
DMS SPAN SIGN STRUCTURE

TYPICAL ELEVATION VIEW
CANTILEVER SIGN STRUCTURE

TYPICAL ELEVATION VIEW
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. Soldering and tapping 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 threaded connector is also an acceptable method. Drilling and tapping the steel structure to accept a having contact area of not less than 8 square inches or by welding or brazing. Soldering 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. Catwalk 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 encased 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.

3-9
18300
2' Max
Transition Conduit Outside Foundation
Finished Grade (Varies)
Wire Screen - See Spec. 649-6
Top Of Conduits
Std Sweeps
Conduits With
2-2" Rigid Metal

1'-0"
Back Truss Chord
Per DMS Manufacturer
Conduit Entrance Location
Communications Cable
Separately Power And
Two J-Hooks To Support
Removable Top Plate
Air Terminal
Handrail
Post
Graing
Catwalk
Bottom Truss Chord

Pole Mounted Cabinet

Ground Mounted Cabinet

Fiber Optic Pull Box Or
Fiber Optic Splice Box
(See Index 17700)

Power Conduit (2" PVC) To Power Service Assembly
Spare Conduit (2" PVC)
Grounding Conduit (2" PVC)

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

TYPICAL DMS CONDUIT DETAIL
CANTILEVER/SPAN SIGN STRUCTURE

11 Gauge Handhole Cover

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HANGER LOCATION DETAIL
(Cantilever Sign Structure Shown, Span Sign Structure Similar)

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 5/8" bolt holes in the vertical hangers and horizontal mounting member 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 A123
   All other steel items: ASTM A722

7. All bolt holes shall be equal to the bolt diameter plus 1/6", 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 truss.

Quantity and Spacing of The Members Will Be Dictated By Locations Of Truss Connection Plates, Splices And 5'-0" (Max.) Spacing
6061-T6 Structural Aluminum Zee 4x1.3x3.58
Horizontal Member Attached To The Internal Framework And Included With The DMS Sign

DMS Sign Enclosure

ASTM A320, Gr.26 Steel W6x9
Hanger @ 5' (Max) Spacing

2-½" Ø ASTM A325 Bolts
Field Drill Holes And Provide Lock Nuts

2-½" Ø U-Bolts

2-½" Ø ASTM A325 U-Bolts

Back Face Of DMS Sign Enclosure

Truss Chord

2-½" Ø U-Bolts

Holes For 2-½" Ø U-Bolts

Truss Chord

Holes For 2-½" Ø U-Bolts

3 Zee Beam Equal Spaced

See Truss Data Sheet

BACK VIEW

SECTION B-B

SECTION C-C

SECTION A-A

END VIEW

6 " ±

6 " ±

Lock Nuts

Galvanized With Matching

2-½" Ø Bolts

Holes For

2-½" Ø Bolts

Truss Chord

2-½" Ø U-Bolts

Holes For

2-½" Ø U-Bolts

HDU Holes And Provide 2-½" Ø ASTM A325 Bolts

Holes For Matching

2½"

2½"
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.
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 center 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.