<table>
<thead>
<tr>
<th>CELL / MODEL NAME</th>
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<tr>
<td>OSF-A-1</td>
<td>General plan and elevation</td>
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<td>OSF-A-1-DMS</td>
<td>Alternate general plan and elevation for DMS</td>
<td>2/17/2017</td>
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<td>OSF-A-1-VMS</td>
<td>General plan and elevation for front access VMS</td>
<td>2/17/2017</td>
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<tr>
<td>OSF-A-2</td>
<td>Truss details</td>
<td>2/17/2017</td>
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<td>OSF-A-2-DMS</td>
<td>Alternate truss details for DMS</td>
<td>2/17/2017</td>
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<tr>
<td>OSF-A-2-VMS</td>
<td>Truss details for front access VMS</td>
<td>2/17/2017</td>
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<tr>
<td>OSF-A-2A</td>
<td>Truss details, aluminum truss and steel post</td>
<td>2/17/2017</td>
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<tr>
<td>OSF-A-2A-VMS</td>
<td>Truss details for front access VMS</td>
<td>2/17/2017</td>
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<tr>
<td>OSF-A-3</td>
<td>Juncture details</td>
<td>2/17/2017</td>
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<td>OSF-A-3-VMS</td>
<td>Juncture details for front access VMS</td>
<td>2/17/2017</td>
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<tr>
<td>OSF-A-4</td>
<td>Type I-F-A truss support</td>
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<td>OSF-A-4-VMS</td>
<td>Type I-F-A support post for front access VMS</td>
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<td>OSF-A-5</td>
<td>Type II-F-A and III-F-A truss support</td>
<td>2/17/2017</td>
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<tr>
<td>OSF-A-5-DMS</td>
<td>Alternate Type III-F-A truss support for DMS</td>
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<tr>
<td>OSF-A-6</td>
<td>Aluminum walkway details</td>
<td>2/17/2017</td>
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<tr>
<td>OSF-A-6-DMS</td>
<td>Alternate aluminum walkway details for DMS</td>
<td>2/17/2017</td>
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<tr>
<td>OSF-A-6S</td>
<td>Alternate steel walkway details</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>OSF-A-7</td>
<td>Walkway details</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>OSF-A-7-DMS</td>
<td>Alternate walkway details for DMS</td>
<td>2/17/2017</td>
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<tr>
<td>OSF-A-7S</td>
<td>Alternate steel walkway details</td>
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<td>OSF-A-8</td>
<td>Handrail details</td>
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<td>OSF-A-9</td>
<td>Drilled shaft foundation detail</td>
<td>2/17/2017</td>
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<td>OSF-A-9-VMS</td>
<td>Drilled shaft for front access VMS</td>
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<tr>
<td>OSF-A-D</td>
<td>Damping device</td>
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</tr>
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</table>
**GENERAL NOTES**

- **DESIGN:** AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. ("AASHTO Specifications")
- **CONSTRUCTION:** Current (at time of letting) Illinois Department of Transportation Standard Specifications for Road and Bridge Construction. Supplemental Specifications and Special Provisions. ("Standard Specifications")

**LOADING:**
- 90 M.P.H. WIND VELOCITY
- WALKWAY LOADING: Dead load plus 500 lbs. concentrated live load.

**FIELD UNITS**
- F = 33,000 lb.ft.
- fy = 60,000 p.s.i. (reinforcement)

**FABRICATORS FOR ALUMINUM TRUSSES:** All bolts noted as "high strength" must satisfy the requirements of AASHTO M184 (AASHTO A325), or alternate, and must have mating lock nuts. Threaded studs for splices (at Members Interfering) must satisfy the requirements of ASTM A499. ASTM A193, Grade B7, or alternate, and must have mating lock nuts. Bolts and lock nuts not required to be high strength must satisfy the requirements of ASTM A307. All bolts and lock nuts must be hot dip galvanized per AASHTO M22. The lock nuts must have zinc or steel inserts. A stainless steel flat washer conforming to ASTM A240 Type 302 or 304, is required under both head and nut or under both nuts where threaded studs are used. High strength bolt installation shall conform to Article 505.04 (f) (2)d of the IDOT Standard Specifications for Road and Bridge Construction. Rotational capacity (PR05) testing of bolts will not be required.

**U-BOLTS AND EYEBOLTS:** U-Bolts and Eyebolts must be produced from ASTM A576 Type 304L, 316 or 316L. Galvanized after fabrication in accordance with AASHTO M111. Painting is not required. Bridge Construction. Rotational capacity (PR05) testing of bolts will not be permitted.

**FASTENERS FOR ALUMINUM TRUSSES:** All bolts noted as "high strength" must satisfy the requirements of AASHTO M184 (AASHTO A325), or alternate, and must have mating lock nuts. Threaded studs for splices (at Members Interfering) must satisfy the requirements of ASTM A499. ASTM A193, Grade B7, or alternate, and must have mating lock nuts. Bolts and lock nuts not required to be high strength must satisfy the requirements of ASTM A307. All bolts and lock nuts must be hot dip galvanized per AASHTO M22. The lock nuts must have zinc or steel inserts. A stainless steel flat washer conforming to ASTM A240 Type 302 or 304, is required under both head and nut or under both nuts where threaded studs are used. High strength bolt installation shall conform to Article 505.04 (f) (2)d of the IDOT Standard Specifications for Road and Bridge Construction. Rotational capacity (PR05) testing of bolts will not be required.

**GENERAL PLAN & ELEVATION - ALUMINUM TRUSS & STEEL POST**

**STATE OF ILLINOIS**

**DEPARTMENT OF TRANSPORTATION**

**BUTTERFLY SIGN STRUCTURES**

**TOTAL BILL OF MATERIAL**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE I-F-A</td>
<td>Foot</td>
<td></td>
</tr>
<tr>
<td>OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE II-F-A</td>
<td>Foot</td>
<td></td>
</tr>
<tr>
<td>OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE III-F-A</td>
<td>Foot</td>
<td></td>
</tr>
<tr>
<td>GEOMETRIC SHAPE CONCRETE FOUNDATIONS</td>
<td>Cu. Yds.</td>
<td></td>
</tr>
</tbody>
</table>

**SIGN WIND LOADING DIAGRAM**

Parameters shown are basis for I.D.O.T. Standards. Specifications not within dimensional limits shown require special analysis for all components.

**TOTAL BILL OF MATERIAL**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE I-F-A</td>
<td>Foot</td>
<td></td>
</tr>
<tr>
<td>OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE II-F-A</td>
<td>Foot</td>
<td></td>
</tr>
<tr>
<td>OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE III-F-A</td>
<td>Foot</td>
<td></td>
</tr>
<tr>
<td>GEOMETRIC SHAPE CONCRETE FOUNDATIONS</td>
<td>Cu. Yds.</td>
<td></td>
</tr>
</tbody>
</table>
**Elevation A2** and dimension D2 not used when butterfly structure is mounted on right side of the shoulder.

**TYPICAL PLAN**
Looking in Direction of Traffic
Sign support structure may be subject to damaging vibrations and oscillations when signs are not in place during erection or maintenance of the structure. To avoid these vibrations and oscillations, consideration should be given to attaching temporary blank sign panels to the structure.

**TYPICAL ELEVATION**
Looking in Direction of Traffic
After adjustments to level truss and ensure adequate vertical clearance, all top and bottom leveling nuts shall be tightened against the base plate with a minimum torque of 200 lb-ft. Stainless steel washers shall then be placed around the perimeter of the base plate. Secure to base plate with stainless steel banger.

**DESIGN WIND LOADING DIAGRAM**
Parameters shown are basis for I.D.O.T. Standards installations not within dimensional limits shown require special analysis for all components.

**NOTE:** Trusses shall be shipped individually with adequate provision to prevent detrimental motion during transport. This may require ropes between horizontals and diagonals or energy dissipating (elastic) ties to the vehicle. The contractor is responsible for maintaining the configuration and protection of the trusses.

<table>
<thead>
<tr>
<th>Total Sign Area</th>
<th>Access door and walkway location right or left end</th>
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<tr>
<td>30'-0” (See Table)</td>
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**TOTAL BILL OF MATERIAL**

<table>
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<tr>
<th>OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE</th>
<th>FT</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td>OVERHEAD SIGN STRUCTURE WALKWAY TYPE</td>
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<tr>
<td>DRILLED SHAFT CONCRETE FOUNDATIONS</td>
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</table>

**STATE OF ILLINOIS**

**DEPARTMENT OF TRANSPORTATION**

**BUTTERFLY SIGN STRUCTURES – ALTERNATE PLAN & ELEVATION**

<table>
<thead>
<tr>
<th>FOR DMS - ALUMINUM TRUSS &amp; STEEL POST</th>
</tr>
</thead>
</table>

**GENERAL NOTES**

**DESIGN:** AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaire and Traffic Signals. (Standard Specifications)

**CONSTRUCTION:** Current (at time of letting) Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, Supplemental Specifications and Special Provisions. ("Standard Specifications")

**LOADING:** 90 M.P.H. WIND VELOCITY

**WIND LOADING:** 30 p.s.f. normal to DMS Cabinet Area and truss elements not behind sign loading diagram.

**MAX WIND LOADING:** Dead load plus 500 lbs. concentrated live load.

**DESIGN STRESSES**

**FIELD UNITS**

**WELDING:** All welds to be continuous unless otherwise shown. All welding to be done in accordance with current AWS D1.1 and D1.2 Structural Welding Codes (Steel and Aluminum) and the Standard Specifications.

**MATERIALS:** Aluminum Alloys as shown throughout plans. All Structural Steel Pipe shall be ASTM A53 Grade B or A36, Grade B or C. If A500 pipe is substituted for A36, then the outside diameter shall be as detailed and wall thickness greater than or equal to A53.

**Parameters shown are basis for I.D.O.T. Standards**

**LOADING:** 90 M.P.H. WIND VELOCITY

**WIND LOADING:** 30 p.s.f. normal to DMS Cabinet Area and truss elements not behind sign loading diagram.

**MAX WIND LOADING:** Dead load plus 500 lbs. concentrated live load.

**DESIGN STRESSES**

**FIELD UNITS**

**WELDING:** All welds to be continuous unless otherwise shown. All welding to be done in accordance with current AWS D1.1 and D1.2 Structural Welding Codes (Steel and Aluminum) and the Standard Specifications.

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**Parameters shown are basis for I.D.O.T. Standards**

**LOADING:** 90 M.P.H. WIND VELOCITY

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**DESIGN STRESSES**

**FIELD UNITS**

**WELDING:** All welds to be continuous unless otherwise shown. All welding to be done in accordance with current AWS D1.1 and D1.2 Structural Welding Codes (Steel and Aluminum) and the Standard Specifications.

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**Parameters shown are basis for I.D.O.T. Standards**
** Elevation A2 and dimension D2 not used when butterfly structure is mounted on right side of the shoulder.

Note:
- Trusses shall be shipped individually with adequate provision to prevent detrimental motion during transport. This may require ropes between horizontals and diagonals or energy dissipating (elastic) ties to the vehicle. The contractor is responsible for maintaining the configuration and protection of the trusses.
- After adjustments to level trusses and insure adequate vertical clearance, all top and bottom leveling nuts shall be tightened against the base plate with a minimum torque of 200-300 ft- lb. Stainless steel mesh shall then be placed around the perimeter of the base plate. Secure to base plate with stainless steel banding.
- Centerline sign must be located at centerline of column.
- Total truss length to match VMS length.

** Area
- Butterfly Length (20' max)
- Total truss length to match VMS length.
- Stainless steel mesh shall then be placed around the perimeter of the base plate. Secure to base plate with stainless steel banding.

** Distance
- Distance between horizontals and diagonals.

** Dimensions
- Dimensions of trusses.

** Elevation
- Elevation above ground level.

** Location
- Location of trusses.

** Number
- Number of trusses.

** Total Bill of Material

<table>
<thead>
<tr>
<th>Structure Number</th>
<th>Station</th>
<th>Total</th>
<th>Elev. A1</th>
<th>Elev. A2</th>
<th>Dim. D1</th>
<th>Dim. D2</th>
<th>Os</th>
<th>Total Sign Area</th>
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<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Wind Loading Diagram

Parameters shown are based for I-ZOT Standards. Installations not within dimensional limits shown require special analysis for all components.

** Welding
- All welds to be continuous unless otherwise shown. All welding to be done in accordance with current AWS D1.1 and D1.2 Structural Welding Codes (Steel and Aluminum) and the Standard Specifications.

** Design wind loading diagram

** Elevation A2 and dimension D2 not used when butterfly structure is mounted on right side of the shoulder.

Note:
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- Centerline sign must be located at centerline of column.
- Total truss length to match VMS length.

** Area
- Butterfly Length (20' max)
- Total truss length to match VMS length.
- Stainless steel mesh shall then be placed around the perimeter of the base plate. Secure to base plate with stainless steel banding.

** Distance
- Distance between horizontals and diagonals.

** Dimensions
- Dimensions of trusses.

** Elevation
- Elevation above ground level.

** Location
- Location of trusses.

** Number
- Number of trusses.
Note: There are twice as many horizontal diagonals as there are vertical diagonals.

**TRUSS UNIT TABLE**

<table>
<thead>
<tr>
<th>Truss Type</th>
<th>Dimension (a)</th>
<th>Dimension (b)</th>
<th>Dimension (c)</th>
<th>Limits for Panel Spacing (P1)</th>
<th>Up &amp; Low Chord</th>
<th>Verticals; Horizontals; Interior Diagonals</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-F-A</td>
<td>24'</td>
<td>54'</td>
<td>16'</td>
<td>36' min. to 48' max</td>
<td>5&quot;</td>
<td>9/16&quot;</td>
</tr>
<tr>
<td>II-F-A</td>
<td>38'</td>
<td>66'</td>
<td>22'</td>
<td>42' min. to 54' max</td>
<td>5/16&quot;</td>
<td>3/4&quot;</td>
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<tr>
<td>III-F-A</td>
<td>44'</td>
<td>84'</td>
<td>27'</td>
<td>48' min. to 66' max</td>
<td>7/8&quot;</td>
<td>3/4&quot;</td>
</tr>
</tbody>
</table>

For Section B-B and Section C-C, see Base Sheet OSF-A-3.

For sign and walkway brackets, see Base Sheets OSF-A-6 and OSF-A-7.
### Structure Number | Station | Truss Type | L1 | L2 | Number of Panels Unit 1 | Panel Length (P1) | Number of Panels Unit 2 | Panel Length (P2) |
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Truss Type Dimension</td>
<td>Dimension</td>
<td>Dimension</td>
<td>Limits for Panel Spacing (P)</td>
<td>Up &amp; Low Chord</td>
<td>Verticals Horizontals</td>
<td>Verticals, Horizontals, and Interior Diagonals</td>
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</tr>
<tr>
<td>III-F-A</td>
<td>36&quot;</td>
<td>88&quot;</td>
<td>21&quot;</td>
<td>48&quot; min. to 66&quot; max</td>
<td>P</td>
<td>N</td>
<td>S</td>
<td></td>
</tr>
</tbody>
</table>

*P = \((6 - 3 - 6) / 2\) Panels

**Note:**
- There are twice as many horizontal diagonals as there are vertical diagonals.
- In front and back face shall alternate.
- Verticals; Horizontals;
- Reverse direction & ends of truss. See isometric view.
- For sign and walkway brackets, see Base Sheets OSF-A-6-DMS and OSF-A-7-DMS.
There are twice as many horizontal diagonals as there are vertical diagonals.

Drilling holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment.

Stainless steel shims shall be placed as shown in Detail T if needed to compensate for alignment variations between horizontal and diagonal planes beyond adjustment provided by angles. Thicker shims may be used subject to shims performing properly.

Tube to grating gap may vary from 0 to ½ max to align walkway, allow for camber, etc.

Cross bars and Angle connections required at horizontals only.

Provide two stainless steel washers and nuts required per bolt. U-bolt and Angle connections required at Horizontals only.

Main Bearing Bars (MBB) shall be 1½" x 1½" on 1½" centers and conform to ASTM B221 Alloy 6061-T6. Cross bars (CB) shall be 1½" x 1½" on 4" centers and conform to ASTM B221 Alloy 6065-T5 or 6061-T6.

Aluminum grating with modified "t" sections for main bearing bars shall meet the following requirements:
- Main bars shall conform to ASTM B221 Alloy 6061-T6 and have a minimum section modulus equal to 0.075"^3 per lb per bar, a depth of 1½", spaced on 1½" centers.
- Cross bars shall conform to ASTM B221 Alloy 6065-T5 or 6061-T6 and spaced on 4" centers.

Sign manufacturer must design and supply hardware for connection of VMS to WF(A-N)4's. Bolts must be stainless steel or hot dip galvanized high strength per IDOT specifications.
**Typical Truss Unit**

*ISOMETRIC VIEW*

**TYPICAL TRUSS UNIT**

**ASTM 6061 Alloy 6061 Temper T6**

**BUTTERFLY END JOINT DETAIL**

- Contractor may alternatively use standard aluminum drive-fit cap to close ends.

**POST END JOINT DETAIL**

**TRUSS INTERIOR JOINT DETAIL**

- The edge of diagonal member shall be cut back to facilitate throat thickness per AWS D1.1, Fig 3.2

**SPlicing Flange**

ASTM 6061, Alloy 6061-T6

or ASTM B209, Alloy 6061-T651

* To fit O.D. of Chord with maximum gap of 1/4".

**NOTE:**

- High strength bolts with locknuts or (if members interfere) threaded studs with two locknuts, plus stainless steel washers under head and nut. See table.

**TABLE**

<table>
<thead>
<tr>
<th>Type</th>
<th>Dia.</th>
<th>W</th>
<th>W1</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-F-A</td>
<td>5/8&quot;</td>
<td>3/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
</tbody>
</table>

**FED. AID PROJECT**

- STATE OF ILLINOIS
- DEPARTMENT OF TRANSPORTATION
- BUTTERFLY SIGN STRUCTURES - TRUSS DETAILS FOR
- FRONT ACCESS VMS - ALUMINUM TRUSS & STEEL POST

---

**FILE NAME**

- USER NAME

**PLOT DATE**

- 2-17-2017

**REVISED**

- 2-17-2017

**DESIGNED**

- 2-17-2017

**CHECKED**

- 2-17-2017

**DRAWN**

- 2-17-2017

**TOTAL SHEETS**

- 1

**SHEET NO.**

- 2
Collar I.D. shall be manufactured to correspond to O.D. of actual galvanized post and stainless steel sleeve plus ¥ (1/8") Max. Gap between post and collar at any location equals ¥ before tightening bolts.

**SECTION B-B**

Bolts, washers (including contourd washers), and locknuts shall be stainless steel.

**DETAIL B**

Two locations (For details not shown, see Detail C)

**Section C-C**


**TABLE OF STAINLESS STEEL SLEEVE**

<table>
<thead>
<tr>
<th>Truss Type</th>
<th>Post Size</th>
<th>Upper &amp; Lower Connection Bolt Diameter</th>
<th>Bolts</th>
<th>Hole in Cap Plate</th>
<th>Collar Thickness</th>
<th>Side Bolts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-8-A</td>
<td>1&quot; (125#/4)</td>
<td>1/4&quot;</td>
<td>4</td>
<td>1/4&quot;</td>
<td>¥</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>1-8-A</td>
<td>2&quot; (125#/8)</td>
<td>1/8&quot;</td>
<td>4</td>
<td>1/8&quot;</td>
<td>¥</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>1-8-A</td>
<td>2&quot; (125#/8)</td>
<td>1/8&quot;</td>
<td>4</td>
<td>1/8&quot;</td>
<td>¥</td>
<td>1/8&quot;</td>
</tr>
</tbody>
</table>
Washers = y

DETAIL C

USER NAME = FED. AID PROJECT
FILE NAME = 4-9-1
B1
1
between post and collar at any location equals 8" before tightening bolts.

Holes in galvanized steel sleeve = bolt Ø + 5/8".
Holes in stainless steel sleeve = bolt Ø + 3/16".

DETAIL A

SECTION B-B

Bolts, washers (including contoured washers), and locknuts shall be stainless steel.

SECTION C-C

Two locations (Two locations maximum....(180° apart)....X-ray or UT 100%)
Anchor rods shall conform to ASTM F1554 Grade 105. Galvanize the upper 18" (minimum***) and associated AASHTO M291, Grade A, C or DH heavy hex nuts and hardened washers per AASHTO M232. No welding shall be permitted on rods. Provide a nut at bottom, a hexagon locknut and washer above base plate and a leveling nut and washer below base plate. Nuts shall each be tightened with 200 lb.-ft. minimum torque against base plate. Before or after threading, but before galvanizing, each anchor rod shall be ultrasonically tested (UT) by a Level II or III inspector, qualified in accordance with ANSI guidelines, to insure no rejectable flaws exist in the upper 18" (tension criteria). Cost of testing included in "Drilled Shaft Concrete Foundations".

Butt welded joint in post is only allowed for post heights (H) over 20 ft. in length. It used, weld procedure must be preapproved by Engineer and joint shall receive 100% RT or UT (tension criteria) at Contractor's expense.

For UT, grind top of anchor rods and insert before galvanizing. Provide 8" x 45° cover. Outside corners = 2W radius. Provide 4-3/8" holes for ½" - 20 round head hot dip galvanized or stainless steel machine screws. (See cover details.)

Anchor rods shall conform to ASTM F1554 Grade 105. Galvanize the upper 18" (minimum***) and associated AASHTO M291, Grade A, C or DH heavy hex nuts and hardened washers per AASHTO M232. No welding shall be permitted on rods. Provide a nut at bottom, a hexagon locknut and washer above base plate and a leveling nut and washer below base plate. Nuts shall each be tightened with 200 lb.-ft. minimum torque against base plate. Before or after threading, but before galvanizing, each anchor rod shall be ultrasonically tested (UT) by a Level II or III inspector, qualified in accordance with ANSI guidelines, to insure no rejectable flaws exist in the upper 18" (tension criteria). Cost of testing included in "Drilled Shaft Concrete Foundations".

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Provide 8" x 45° cover. Outside corners = 2W radius. Provide 4-3/8" holes for ½" - 20 round head hot dip galvanized or stainless steel machine screws. (See cover details.)

Anchor rods shall conform to ASTM F1554 Grade 105. Galvanize the upper 18" (minimum***) and associated AASHTO M291, Grade A, C or DH heavy hex nuts and hardened washers per AASHTO M232. No welding shall be permitted on rods. Provide a nut at bottom, a hexagon locknut and washer above base plate and a leveling nut and washer below base plate. Nuts shall each be tightened with 200 lb.-ft. minimum torque against base plate. Before or after threading, but before galvanizing, each anchor rod shall be ultrasonically tested (UT) by a Level II or III inspector, qualified in accordance with ANSI guidelines, to insure no rejectable flaws exist in the upper 18" (tension criteria). Cost of testing included in "Drilled Shaft Concrete Foundations".

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Butt welded joint in post is only allowed for post heights (H) over 20 ft. in length. It used, weld procedure must be preapproved by Engineer and joint shall receive 100% RT or UT (tension criteria) at Contractor's expense.
**TYPICAL FRONT ELEVATION**

With lights and handrail omitted for clarity.

Truss Grating Length (TGL) = \( L - \left( \frac{39.2}{2} + 6" \right) \)

Walkway and truss grating dimensions are nominal and vary (width ±0.25", depth ±0.5") based on available standard widths.

**SECTION A-A**

Handrail and walkway grating shall span a minimum of three brackets between splices.

**Notes:**
- Space walkway brackets WFA-NA4x3.06 and sign brackets WFA-NA4x1.79 for efficiency and within limits shown.
- \( f = 12" \) maximum, 4" minimum (end of sign to \( g \) of nearest bracket)
- \( g = 12" \) maximum, 4" minimum (end of walkway to \( h \) of nearest bracket)
- \( h = 6" \) maximum (distance from \( g \) to \( h \) of sign and/or walkway support brackets, WFA-NA4x1.79 or WFA-NA4x3.06)

**BRACKET TABLE**

<table>
<thead>
<tr>
<th>Sign Panel Width</th>
<th>Number of Brackets Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Than 60&quot;</td>
<td>2</td>
</tr>
<tr>
<td>60&quot; - 72&quot;</td>
<td>3</td>
</tr>
<tr>
<td>72&quot; - 84&quot;</td>
<td>4</td>
</tr>
<tr>
<td>84&quot; - 96&quot;</td>
<td>5</td>
</tr>
<tr>
<td>96&quot; - 120&quot;</td>
<td>6</td>
</tr>
</tbody>
</table>

**PLAN**

WALKWAY AND HANDRAIL SKETCH

(Road plan beneath truss varies)

**BRACKET TABLE**

<table>
<thead>
<tr>
<th>Structure Number</th>
<th>Station</th>
<th>WGL</th>
<th>ED</th>
<th>TGL</th>
<th>WGL1</th>
<th>ED1</th>
<th>TGL1</th>
</tr>
</thead>
</table>

For details of handrail, handrail joint, safety chain and Details F and G, see Base Sheet OSF-A-8.

For details of sign placement, sign/walkway brackets, truss and walkway gratings, grating splices and Section B-B, see Base Sheet OSF-A-7.

If walkway bracket at safety chain location is behind sign, add angle to bracket. See alternate safety chain attachment on base sheet OSF-A-8.

Notes:
- Space walkway brackets WFA-NA4x3.06 and sign brackets WFA-NA4x1.79 for efficiency and within limits shown.
- \( f = 12" \) maximum, 4" minimum (end of sign to \( g \) of nearest bracket)
- \( g = 12" \) maximum, 4" minimum (end of walkway to \( h \) of nearest bracket)
- \( h = 6" \) maximum (distance from \( g \) to \( h \) of sign and/or walkway support brackets, WFA-NA4x1.79 or WFA-NA4x3.06)

If walkway bracket at safety chain location is behind sign, add angle to bracket. See alternate safety chain attachment on base sheet OSF-A-8.

Notes:
- Space walkway brackets WFA-NA4x3.06 and sign brackets WFA-NA4x1.79 for efficiency and within limits shown.
- \( f = 12" \) maximum, 4" minimum (end of sign to \( g \) of nearest bracket)
- \( g = 12" \) maximum, 4" minimum (end of walkway to \( h \) of nearest bracket)
- \( h = 6" \) maximum (distance from \( g \) to \( h \) of sign and/or walkway support brackets, WFA-NA4x1.79 or WFA-NA4x3.06)
Bracket and grating dimensions are nominal and will vary based on actual DMS cabinet dimensions plus manufacturer's mounting devices.

**Design Length (L1)**

- Truss Grating Length (TGL)
- Number
- Structure

<table>
<thead>
<tr>
<th>Station</th>
<th>TGL</th>
<th>TGL1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Truss Grating Splice**

- Truss Grating Length (TGL1)
- Design Length (L1)
- Column and Cabinet

**Notes**

- Space walkway brackets and sign brackets WT6x5.40 for efficiency and within limits shown.

**Safety Chain, typ.**

- Grating splices and handrail joints placed as needed.
- Truss grating to facilitate inspection shall run full length (center to center of support frames) ±12" on overhead trusses. Cost of truss grating is included in Butterfly Sign Structure.

**BRACKET TABLE**

<table>
<thead>
<tr>
<th>WT6x5.40</th>
<th>ASTM B308, Alloy 6061-T6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign Width</td>
<td>Greater Than Less Than or Equal To</td>
</tr>
<tr>
<td>Number Required</td>
<td>2'-0&quot;</td>
</tr>
<tr>
<td>2'-0&quot;</td>
<td>1</td>
</tr>
<tr>
<td>3'-0&quot;</td>
<td>1</td>
</tr>
<tr>
<td>4'-0&quot;</td>
<td>1</td>
</tr>
<tr>
<td>5'-0&quot;</td>
<td>1</td>
</tr>
</tbody>
</table>

**TYPICAL FRONT ELEVATION**

**With handrail omitted for clarity.**

For Section B-B see Base sheet OSF-A-7-DMS.

For Section B-B and Grating Splice Details, see Base Sheet OSF-A-7-DMS.

Maximum DMS weight = 5000 lbs.

4'-2" maximum cabinet depth includes depth of cabinet plus connection to WF6x5.40

Maximun DMS weight = 5000 lbs.

**For Handrail Splice Details, see sheet OSF-A-8-DMS.**

**Walkway and truss grating width dimensions are nominal and may vary ±1/2" based on available standard width.**

**Dynamic Message Sign Cabinet**

**DMS Length**

**3'-0" Aluminum walkway grating**

**Handrail, see sheet OSF-A-8-DMS**

**Butterfly may be located in shoulder area.**

**Road plan beneath truss varies.**

**Walkway may be located at right or left end of truss.**

**WALKWAY AND HANDRAIL SKETCH**

**PLAN**

**STATE OF ILLINOIS**

**DEPARTMENT OF TRANSPORTATION**

**BUTTERFLY SIGN STRUCTURES - ALTERNATE**

**ALUMINUM WALKWAY DETAILS FOR DMS**

**DSF-A-6-DMS**

2-17-2017
WALKWAY DETAILS - ALUMINUM TRUSS & STEEL POST

BUTTERFLY SIGN STRUCTURES - ALTERNATE STEEL

Top of WF(A-N)4x3.06 (Sign Support Only)

Top of WF(A-N)4x1.79 (Walkway Support Only)

Attachment for safety chain

***Alternate angle each end

Safety Chain Tie-downs

Grating lighting fixtures. (If required)

Length as required for light fixture supports.

Sign Structure Butterfly

Walkway and truss grating dimensions are nominal and may vary (width ±1/8", depth ±1/16") based on available standard widths.

**Use and location of handrail joint or grating splices are optional, based on lengths needed and material availability.

Notes:

Space walkway brackets WF(A-N)4x3.06 and sign brackets WF(A-N)4x1.79 for efficiency and within limits shown:

f = 12'-0" minimum, 6" maximum (End of sign to ≤ of nearest bracket)

g = 12'-0" maximum, 4" minimum (End of walkway to ≥ of nearest bracket)

If walkway bracket at safety chain location is behind sign, add angle to bracket. See alternate safety chain attachment on Base Sheet OSF-A-8:

For details of sign placement, sign/walkway brackets, truss and walkway gratings, grating splices and Section B-B, see Base Sheet OSF-A-7S.

For details of handrail, handrail joint, safety chain and Details F and G, see Base Sheet OSF-A-8.

For details of walkway bracket at safety chain location is behind sign, add angle to bracket. See alternate safety chain attachment on Base Sheet OSF-A-8:

Handrail and walkway grating shall span a minimum of three brackets between splices:

Truss grating to facilitate inspection shall run full length of cantilevers. Cost of truss grating is included in "Overhead Sign Structure Butterfly".

TGL = L - (F + End Distance + G)
Drilling holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment.

Stainless steel shims shall be placed as shown in Detail T if needed to compensate for alignment variations between horizontal and diagonal pipes. Thicker shims may be used for alignment.</p>

If Handrail Joint present, weld angle to WF6(A-N) properly at each horizontal and diagonal pipe. Stainless steel shims shall be placed as shown in "Shimming Detail."
NOTES:
The foundation dimensions shown in the Foundation Design Table are based on the presence of mostly cohesive soils with an average Unconfined Compressive Strength (Qu) of at least 1.25 tsf, which must be determined by previous soil investigations at the jobsite. When other conditions are indicated, the boring data will be included in the plans and the foundation dimensions shown in the Foundation Data Table will be the result of site-specific designs.

If the conditions encountered are different than those indicated, the Contractor shall notify the Engineer to determine if the foundation dimensions need to be modified. It dimensions “B” or “F” are revised by more than 12” by the Contractor, “as-built” plans shall be prepared and submitted to the Engineer to determine if the foundation dimensions need to be modified. If dimensions “B” or “F” are modified, no sonotubes or decomposable forms shall be used below the lower conduit entrance.

Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints. Backfill shall be placed per Article 902 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Concrete Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".


<table>
<thead>
<tr>
<th>Number</th>
<th>Station</th>
<th>Structure Type</th>
<th>Shaft Diameter</th>
<th>Elevation Top</th>
<th>Elevation Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1</td>
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<td></td>
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<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DEPARTMENT OF TRANSPORTATION
STATE OF ILLINOIS
Grind anchor rod to bright finish at ground clamp location before installing clamp.


Notes:
The foundation dimensions shown in the Foundation Design Table are based on the presence of mostly cohesive soils with an average unconfined compressive strength (Qu) of at least 1.25 tsf, which must be determined by previous soil investigations at the jobsite. When other conditions are indicated, the boring data will be included in the plans and the foundation dimensions shown in the Foundation Data Table will be the result of site-specific designs.

If the conditions encountered are different than those indicated, the Contractor shall notify the Engineer to determine if the foundation dimensions need to be modified. If dimensions "B" or "F" are revised by more than 12" by the Contractor, "as-built" plans shall be prepared and submitted to the District Bureau of Operations for future reference.

Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints. Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Concrete Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Concrete Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

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If the conditions encountered are different than those indicated, the Contractor shall notify the Engineer to determine if the foundation dimensions need to be modified. If dimensions "B" or "F" are revised by more than 12" by the Contractor, "as-built" plans shall be prepared and submitted to the District Bureau of Operations for future reference.

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Concrete shall be placed monolithically, without construction joints. Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Concrete Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Concrete Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Concrete Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Concrete Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

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Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

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Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Concrete Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Concrete Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

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Concrete shall be placed monolithically, without construction joints.

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A normal surface finish followed by a Concrete Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.
**General Notes**

Damper: One damper per truss. (33 lbs. Stockbridge-type Aluminum-2W minimum between ends of weights)

Materials: Aluminum tubes shall be ASTM B221 alloy 6061 (temper T6)

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**Plan Detail**

- **Device Connection Detail**
  - Top Chord to Cross Tube U-Bolt Detail
    - Tube U-Bolt Detail (Typical)
      - Top Chord
      - Cross Tubes
      - Mounting Tube
      - Damping Device

---

**Section A-A**

- **Damping Device Mounting Detail**
  - Tube U-Bolt Detail (Typical)
    - Top Chord
    - Cross Tubes
    - Mounting Tube
    - Damping Device

---

**General Notes**

- **Device Connection Detail**
  - Top Chord to Cross Tube U-Bolt Detail
    - Tube U-Bolt Detail (Typical)
      - Top Chord
      - Cross Tubes
      - Mounting Tube
      - Damping Device