GENERAL NOTES:

1. The contractor shall field verify that the height of the signals above the roadway compliance with the code eligibility requirements as shown on Sheet 2 of 13 prior to drilling holes for tether and span wire eyebolts.
2. Drilled span wire eyebolts in a common line between poles without supports.
3. Poles shall be fabricated, galvanized, and assembled in accordance with the specifications as called for on the roadway plans.
4. Caissons shall be placed against undisturbed soil, and caisson holes shall be backfilled with flow-fill concrete and held in place until the concrete has reached full strength.
5. Caisson concrete shall be placed in the required strength prior to installing span wire and tether cables.
6. Welding of steel shall continue to the requirements of ANSI/AWS D1.1. All areas to be welded shall be grinded to bright metal, and welds and required testing shall be completed before any material is calibrated. All conformance welds shall be non-destructively tested using the enhanced magnetic particle method in accordance with subsection 509.24(a) of the standard specifications. The acceptance criteria is stated in Table 509.24 of ANSI/AWS D1.1. All conformance welds within 5 inches of full penetration circumferential groove welds and all full penetration groove welds shall be inspected as specified above, and no welds which do not meet the minimum requirements shall be used.
7. All electrical connections to the signals shall be grounded in accordance with applicable electrical codes.
8. Working drawings shall be submitted to the Engineer for review in accordance with subsection 509.22 of the standard specifications.
9. Definitions:
   - E.D. = Outside Diameter
   - I.D. = Inside Diameter
   - NPS = Nominal Pipe Size

DESIGN DATA

SPAN WIRE EYEBOLTS ARE BASED ON THE SIGN AND SIGNAL LOCATIONS SHOWN ON SHEET 2.

SPAN WIRE LOADING IS BASED ON THE SIGN AND SIGNAL LOCATIONS SHOWN ON SHEET 2.

THE DESIGN LOAD ASSUMES THAT SIGNS ARE INSTALLED WITHIN THE ROADWAY PAVEMENT WITH THE FOLLOWING PAVEMENT MATERIAL:

SOIL (D) = NO. 95 OR 96

A DESIGN LOAD FOR THE SPAN WIRE EYEBOLTS IS BASED ON THE SIGN AND SIGNAL LOCATIONS SHOWN ON SHEET 2.

SPAN WIRE AND TETHER CABLES SHALL BE 1" Ø. TETHER WIRE EYEBOLTS SHALL BE 0.5" Ø.

CONTRACT THE ENGINEER IF ANY OF THE FOLLOWING SOIL CONDITIONS ARE ENCOUNTERED DURING DRILLING:

1. Caissons will not be installed within the roadway pavement.
2. The soil will not support the weight of the drilling rig.
3. The soils tested are not homogeneous.
4. The bearing capacity is insufficient.

SPAN WIRE STRUCTURES HAVE BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGN STRUCTURES, AND PAVEMENT signals, footing designs, 2011 CDOT Construction manual, with current updates (2015). A DESIGN WIND VELOCITY OF 100 MPH HAS BEEN USED IN THE DESIGN.

A VARIOUS FACTOR OF 1.25 HAS BEEN USED IN THE DESIGN.

MATERIAL DATA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>STANDARD</th>
<th>NOTES</th>
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<tbody>
<tr>
<td>SPAN AND TETHER WIRES</td>
<td>A475</td>
<td>SEE NOTE 1</td>
</tr>
<tr>
<td>SPAN POLE</td>
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<td>SEE NOTE 2</td>
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<td>EYEBOLTS</td>
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<td>SEE NOTE 5</td>
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<tr>
<td>MOUNTING BRACKETS</td>
<td>A500/501</td>
<td>SEE NOTE 6</td>
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<tr>
<td>POLES, BARS, AND PLATES</td>
<td>VARIOUS</td>
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<tr>
<td>CEMENT CONCRETE</td>
<td>COLUMN</td>
<td>SEE NOTE 8</td>
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</table>

NOTES:

1. Span wire shall be seven wire strand, Zinc-Coated Steel wire stranded, Grade 2A, Tether wire shall be 0.50" Diameter, Zinc-Coated Steel wire stranded, Grade 2A.
2. Span wire Ø shall be coated or seamless steel pipe conforming to the specifications of ASTM A53 grade B, ASTM A500 grade B, or equivalent.
3. Span wire Ø shall be 1.0" Ø. Tether wire Ø shall be 0.50" Ø.
4. Poles, bars, and plates shall comply with the dimensional tolerances that are specified in ASTM A500, A36, and A572 as applicable.
5. Certified mill test reports including complete laboratory test results, weld inspection reports, and enhanced magnetic particle test reports shall be submitted to the Engineer for review. The inspection reports shall be conducted in accordance with the following requirements:
   - Mill test reports shall be certified by the manufacturer.
   - Weld inspection reports shall be certified by a qualified inspector.
   - Magnetic particle test reports shall be certified by a qualified inspector.
   - The inspection reports shall be submitted within 30 days of fabrication.

ROADWAY TRAFFIC SIGNAL PLANS SHALL SHOW:

1. Span wire details and locations (horizontal and vertical).
2. Length of span wire between span pole supports.
3. Traffic signal and location details along seeing span wire.
4. Span wire pole selection charts.
5. Line location under span wires.
6. Full height of span poles.
7. Pipe size and material.
8. Distance between poles.
9. Caisson size and material.
10. Location and orientation angles.

INDEX

1. SPAN WIRE GENERAL NOTES
2. SPAN WIRE DETAILS (1 or 2)
3. SPAN WIRE DETAILS (3 or 4)
4. SPAN WIRE DETAILS (5 or 6)
5. FOUNDATION DETAILS
6. EXAMPLES
7. SINGLE SPAN SELECTION CHARTS
8. DOUBLE SPAN SELECTION CHARTS (1 of 4)
9. DOUBLE SPAN SELECTION CHARTS (2 of 4)
10. DOUBLE SPAN SELECTION CHARTS (3 of 4)
11. DOUBLE SPAN SELECTION CHARTS (4 of 4)
12. DOUBLE SPAN-WIRE SELECTION CHARTS (1 of 2)
13. DOUBLE SPAN-WIRE SELECTION CHARTS (2 of 2)

SINGLE SPAN

DOUBLE SPAN

SECTION LETTER OR DETAIL NUMBER IDENTIFICATION

CROSS REFERENCE DRAWING NUMBER OF DRAWING, REFERENCE IS TO SAME SHEET

SHEET NO. 1 OF 13

TYPICAL SPAN WIRE SIGNALS

STANDARD PLAN NO. S-614-41

Issued: Safety & Traffic Engineering Branch July 4, 2012

Colorado Department of Transportation
2825 W. Howard Pl.
Denver, Colorado 80204
Phone (303) 757-5043
Fax (303) 757-9219

Safety & Traffic Engineering Branch KCM/RLD
1. 15'-0" LUMINAIRE ARM SHAFT WALL THICKNESS = 0.1793".
   LENGTH TAPER = 0.14 IN./FT.; DIAMETER AT ARM SIMPLEX PLATE = 4.679".

2. 10'-0" LUMINAIRE ARM SHAFT WALL THICKNESS = 0.1793".
   LENGTH TAPER = 0.14 IN./FT.; DIAMETER AT ARM SIMPLEX PLATE = 4.066".

3. THE 30'-0" OR 40'-0" HEIGHT IS MEASURED FROM THE EDGE OF SHOULDERS ON ARM FORM LINE TO THE CENTER OF THE LUMINAIRE ARM ASSEMBLY.
   SHOULDER FORM LINE TO THE CENTER OF LUMINAIRE. POLE ASSEMBLY SHALL BE AT SUFFICIENT LENGTH TO OBTAIN MOUNTING HEIGHT, WITH MAXIMUM PERMISSIBLE MAST ARM RISE OF 2'-0" FROM TOP OF POLE TO CENTER OF LUMINAIRE.

ARMS LENGTHS FOR BOTH LUMINAIRE = 2.796". TYPICAL TAPERED SECTION TIP DIAMETER OF END OF GUSSET PLATE POINT OF TANGENCY AT STRAIN POLE GUSSET PLATE Ò 2"ß ACCESS HOLE TOP PLATE GUSSET PLATE BOTTOM PLATE LUMINAIRE ARM Ò 2"ß ACCESS HOLE AND BOTTOM PLATES Ò LUMINAIRE ARM, SIMPLEX PLATE TAP HOLES IN POLE SIMPLEX PLATE (TOTAL 3).

‡"ß HOLE IN ARM ƒ"ß H.S. BOLT THROUGH CABLE 4" Ø CONTROL CABLE STRAND VICE WEATHERHEAD 4" CLAMP-ON WIRES ARE PULLED TO PREVENT WIRE DAMAGE WHEN GRIND TO ROUND INSIDE EDGES (6" CENTERLINE RADIUS) 4" O.D. PIPE, 90° ELBOW UPPER CONTROL CABLE PENETRATION DETAIL.

Comments

Date:

R-X

Computer File Information

Sheet Revisions

Colorado Department of Transportation

Issued By: Safety & Traffic Engineering Branch

STANDARD PLAN NO.

S-614-41

Sheet No. 4 of 13

www.codot.gov/library/traffic/traffic-standards/2012-s-standard-plans
CAISSON DETAILS

<table>
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<th>CAISSON DETAILS</th>
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SHOE AND FIN PLATE DETAILS

BEARING PLATE DETAILS

FINISHED GRADE

TOP OF CAISSON

STRAIN POLE / CAISSON

PLATES (TOT. 3)

SHOE AND FIN PLATE (TOT. 3)

FIN PLATE
EXAMPLE 1:

SELECT THE STRAIGHT POLE SIZE, SPAN-WIRE DIAMETERS, AND CAISSON DEPTH FOR A SINGLE SPAN INSTALLATION FOUND IN COHESIONLESS SOIL AS SHOWN ABOVE.

SOLUTION:

1. DETERMINE THE LOAD KEY AS SHOWN HEREON OR ON SHEETS 7 TO 13.
2. DETERMINE THE SPAN POLE SIZE BY USING SINGLE SPAN SPAN POLE SELECTION CHART ON SHEET 7.
3. DETERMINE THE SPAN POLE DIAMETERS BY USING THE SINGLE SPAN SPAN-WIRE SELECTION CHART ON SHEET 7.
4. DETERMINE THE CAISSON DEPTH BY USING THE TABLE ON SHEET 5.

EXAMPLE 2:

SELECT THE STRAIGHT POLE SIZE, SPAN-WIRE DIAMETERS, AND CAISSON DEPTH FOR A DOUBLE SPAN INSTALLATION IN COHESIONLESS SOIL AS SHOWN ABOVE.

EXAMPLE 3:

SELECT THE STRAIGHT POLE SIZE, SPAN-WIRE DIAMETERS, AND CAISSON DEPTH FOR CAISSONS FOR A DOUBLE SPAN INSTALLATION FOUND IN COHESIONLESS SOIL AS SHOWN ABOVE.

LOAD KEY

- 5 SIGNALS AND 4 SIGN MAX.
- 4 SIGNALS AND 4 SIGN MAX.
- 3 SIGNALS AND 3 SIGN MAX.
- 2 SIGNALS AND 2 SIGN MAX.
- 1 SIGNAL AND 1 SIGN MAX.
DOUBLE SPAN STRAIN POLE SELECTION CHART FOR 90° ≤ α < 100°

LOAD KEY

- 17" VS PIPE
- 14" VS PIPE
- 12" VS PIPE
- 10" VS PIPE
- 8" VS PIPE
- 6" VS PIPE

FOR STRAIN POLE A
EXAMPLE 2, STEP 2

SPAN LENGTH (L) IN FT

SPAN LENGTH (L) IN FT