GENERAL NOTES:

1. The contractor shall verify that the height of the signals above the roadway surface meets the clearance requirements as shown on Sheet 2 of 13 prior to drilling holes for tether and span wire eyebolts.

2. Orient span wire holes on a straight line between poles without kinks.

3. Poles shall be not-hot-dip galvanized in accordance with the section 503.24 of the standard specifications as called for on the roadway plans.

4. Caissons shall be placed against undisturbed earth. Wet or caving holes shall be backfilled with flow-fill and redrilled after a three day curing period without the use of a casing.

5. Caisson concrete shall reach 80% of the required strength prior to installing span wire and tether cables.

6. Welding of steel shall conform to the requirements of ANSI/AWS D1.6. All areas to be welded shall be ground to bright metal. All welding and required testing shall be complete before any material is galvanized. All circumferential welds shall be non-destructively tested using the emulsified magnetic particle method. In accordance with subsection 503.24 of the standard specifications, the acceptance criteria is stated in Table 6.3 of ANSI/AWS D1.6. All longitudinal welds within 6 inches of full penetration circumferential groove welds and full penetration groove welds shall be inspected as specified above. Maximum weld undercut shall be 0.01 inches.

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 503.22 of the standard specifications.

9. Definitions:

   ID = Inside Diameter
   OD = Outside Diameter
   NPS = Nominal Pipe Size

   NOTES:
   1. Span wire shall be seven wire strand zinc-coated steel wire, utilities grade or better. Tether wire shall be 7/16" seven wire strand zinc-coated steel wire, utilities grade or better.
   2. Strain pole shall be welded or seamless steel pipe conforming to the specifications of ASTM A53 grade B, A500 grade B, or A106 grade B.
   3. Span wire eyebolts shall be 1/4" tether wire eyebolts. Tether shall be 3/8".
   4. Poles, bars and plates shall comply with the dimensional tolerances that are specified in ASTM A500, A501, A55, A6, as applicable.
   5. Certified mill test reports, including Charpy V-notch (CVN) test results, weld inspection reports, and enhanced magnetic particle test reports shall be submitted to the engineer. These are to be provided with all reports.
   6. Caissons shall be constructed with air entrained (5 to 8%) concrete in accordance with Section 503 of the standard specifications.

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

THE DESIGNS HEREIN ASSUME THAT SIGNALS ARE INSTALLED WITHIN THE ROADWAY PRISM WITH:

- SOIL DENSITY = 110 LB./CU.FT
- SOIL COHESION = 750 LB./SQ.FT
- SOIL 0 ANGLE = 30 DEG. FOR MEDIUM DENSE COHESIONLESS SOIL
- GRADE OR BETTER. TETHER WIRE SHALL BE 1/2"""
- EYEBOLTS SHALL BE 1/4" ""
- POLES, BARS AND PLATES SHALL COMPLY WITH THE DIMENSIONAL TOLERANCES THAT ARE SPECIFIED IN ASTM A500, A501, A55, A6, AS APPLICABLE.
- CERTIFIED MILL TEST REPORTS, INCLUDING CHARPY V-NOTCH (CVN) TEST RESULTS, WELD INSPECTION REPORTS, AND ENHANCED MAGNETIC PARTICLE TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER.
- THE FOUNDATION SOILS ARE NOT HDMDGENDUS.
- FIRM BEDROCK IS ENCOUNTERED.
- THE SOIL HAS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY.
- THE SITE WON'T SUPPORT THE WEIGHT OF THE DRILLING RIG.
- STRAIN POLES WILL NOT BE INSTALLED WITHIN THE ROADWAY PRISM.
- THE USE OF A CASING.
- CONTACT THE ENGINEER IF ANY OF THE FOLLOWING SOIL CONDITIONS ARE ENCOUNTERED DURING DRILLING:

ROADWAY TRAFFIC SIGNAL PLANS SHALL SHOW:

1. Span wire sizes and locations (intersection, X & Y coordinates).
2. Lengths of span wire between each set of strain poles.
3. Traffic signal and signal size and locations along each span wire.
4. Span wire and tether cable sizes.
5. Lane line locations under span wires.
6. Pole height at each corner.
7. Span wire loading is based on the sign and signal locations shown on sheet 2.
8. Contact the engineer if any of the following soil conditions are encountered during drilling:

   a) Strain poles will not be installed within the roadway prism.
   b) The soil has a high organic content or consists of saturated silt and clay.
   c) The site won't support the weight of the drilling rig.
   d) The foundation soils are not homogenous.
   e) Firm bedrock is encountered.

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13. Double span strain wire diameter selection charts (2 of 2)
SPAN WIRE ORIENTATION
(eyebolts and washers not shown for clarity)

TETHER WIRE CONNECTION TO STRAIN POLE

STRUCTURAL WELDED SPLICE

SPAN WIRE ORIENTATION
(eyebolts and washers not shown for clarity)

TETHER WIRE CONNECTION TO STRAIN POLE

SPAN WIRE CONNECTION TO STRAIN POLE

HANDHOLE DETAILS

NOTES:
1. OPTIONAL FIELD WELD: REPAIR DAMAGED HOT-DIP GALVANIZING WITH ZINC-BASED ALLOY
   SOLDER AS PER ASTM A760 ANNEX A1 OR SPRAYED ZINC METALLIZING AS PER ANNEX A3 TO
   PROVIDE A MINIMUM COATING THICKNESS OF 3.0 MILLS IN ACCORDANCE WITH TABLE 2 FOR
   COATING GRADE 75.

SPAN WIRE DETAILS (2 OF 3)

TEMPORARY SPAN WIRE SIGNALS

STANDARD PLAN NO.
S-614-41

Traffic & Safety Engineering

Issued By: Traffic & Safety Engineering Branch July 31, 2019
Project Sheet Number:
PIPE 2" STD. X 10' WITH 8° PROJECTION

TIP DIAMETER OF TAPERED SECTION = 2.796" •
TYPICAL FOR BOTH LUMINAIRE ARM LENGTHS

TYPICAL
NOMINAL (SEE LUMINAIRE ARM NOTES BELOW)

LUMINAIRE ARM NOTES

1. 10'-0" LUMINAIRE ARM SHAFT: WALL THICKNESS = 0.1793;
   LINEAR TAPER = 0.14 IN./FT.; DIAMETER AT ARM SIMPLEX PLATE = 4.066".

2. 15'-0" LUMINAIRE ARM SHAFT: WALL THICKNESS = 0.1793;
   LINEAR TAPER = 0.14 IN./FT.; DIAMETER AT ARM SIMPLEX PLATE = 4.679".

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

LUMINAIRE ARM

POLE SIMPLEX PLATE

GUSSET PLATE

BOTTOM PLATE

SECTION A

BOTTOM PLATE SHOWN; TOP PLATE SIMILAR

STOP ALL WELDS 1/4" SHOOT OF PLATE EDGES AND BOLT HOLES.

DETAILED...
EXAMPLE 1:

SELECT THE STRAIN POLE SIZE, SPAN-WIRE DIAMETER, AND CAISSON DEPTH FOR A SINGLE SPAN INSTALLATION FOUNDED IN COHESIVE SOIL AS SHOWN ABOVE.

SOLUTION:

1. DETERMINE THE LOAD KEY AS SHOWN HEREIN ON SHEETS 7 TO 13.  
   4 SIGNALS AND 3 SIGNS = ±0 OADs FOR 4 SIGNALS AND 4 SIGNS MAX.
2. DETERMINE THE SPAN POLE SIZE BY USING SIMPLE SPAN STRAIN POLE SELECTION CHART ON SHEET 7.  
   FIND THE 143'-0" SPAN LENGTH ON THE HORIZONTAL AXIS OF THE CHART, THEN GO VERTICALLY TO MEET WITH LINE B. THE REQUIRED SPAN POLE SIZE IS 18"0 XS PIPE.
3. DETERMINE THE SPAN WIRE DIAMETER BY USING THE SIMPLE SPAN SPAN-WIRE SELECTION CHART ON SHEET 7.  
   FIND THE 143'-0" SPAN LENGTH ON THE HORIZONTAL AXIS OF THE CHART, THEN GO VERTICALLY TO MEET WITH LINE B. THE REQUIRED SPAN POLE SIZE IS 18"0 XS PIPE.
4. DETERMINE THE CASSON DEPTH BY USING THE TABLE ON SHEET 5.

EXAMPLE 2:

SELECT THE STRAIN POLE SIZE, SPAN-WIRE DIAMETER, AND CAISSON DEPTHS FOR A DOUBLE SPAN, 5-PLAN BOX FOUND IN COHESIVE SOIL AS SHOWN ABOVE.

SOLUTION:

1. DETERMINE THE LOAD KEYS AS SHOWN HEREIN ON SHEETS 7 TO 13.  
   4 SIGNALS AND 3 SIGNS = ±0 OADs FOR 4 SIGNALS AND 4 SIGNS MAX.
   3 SIGNALS AND 2 SIGNS = ±0 OADs FOR 3 SIGNALS AND 3 SIGNS MAX.
   2 SIGNALS AND 2 SIGNS = ±0 OADs FOR 2 SIGNALS AND 2 SIGNS MAX.
   1 SIGNAL AND 1 SIGN MAX.
2. DETERMINE THE SIZE OF POLES@ AND ©.  
   FOR POLES@ (USED IN THE DOUBLE SPAN STRAIN POLE SELECTION CHART FOR 20° 5 < 80° ON SHEET 9) EITHER THE HORIZONTAL CHART OR THE VERTICAL CHART CAN BE USED TO DETERMINE THE SPAN POLE SIZE FOR SPAN AB. LOCATE THE 153' SPAN LENGTH ON THE HORIZONTAL LINE, THEN GO VERTICALLY TO MEET WITH LINE B. THE REQUIRED PIPE DIAMETER FOR POLE@ IS 24"0 XS PIPE.  
   FOR POLES@ AND ©, USE THE SINGLE SPAN SPAN POLE SELECTION CHART ON SHEET 7 AND FOLLOW THE SAME LOGIC AS SHOWN ON EXAMPLE 1 TO DETERMINE THE POLE SIZE.  
   FOR POLES@ AND ©, USE THE SINGLE SPAN SPAN POLE SELECTION CHART ON SHEET 7 AND FOLLOW THE SAME LOGIC AS SHOWN ON EXAMPLE 1 TO DETERMINE THE POLE SIZE.  
3. DETERMINE THE SPAN WIRE DIAMETER BY USING THE SIMPLE SPAN SPAN-WIRE SELECTION CHART ON SHEET 7.  
   SPAN AC: LOCATE THE 172' SPAN LENGTH ON THE HORIZONTAL AXIS, THEN GO VERTICALLY TO MEET WITH LINE B. THE REQUIRED PIPE DIAMETER FOR POLE© IS 20"0 XS PIPE.  
   SPAN AD: LOCATE THE 153' SPAN LENGTH ON THE HORIZONTAL LINE, THEN GO VERTICALLY TO MEET WITH LINE B. THE REQUIRED PIPE DIAMETER FOR POLE© IS 20"0 XS PIPE.  
4. DETERMINE THE CAISSON DEPTHS BY USING THE TABLE ON SHEET 5.

EXAMPLE 3:

SELECT THE SPAN POLE SIZES, SPAN-WIRE DIAMETERS, AND CAISSON DEPTHS FOR CAISSONS FOR A DOUBLE SPAN RECTANGULAR PLAN BOX FOUND IN COHESIONLESS SOIL AS SHOWN ABOVE.

SOLUTION:

1. DETERMINE THE LOAD KEYS AS SHOWN HEREIN ON SHEETS 7 TO 13.  
   SPAN AB: 4 SIGNALS AND 3 SIGNS = ±0 OADs FOR 4 SIGNALS AND 4 SIGNS MAX.
   SPAN BC: 3 SIGNALS AND 3 SIGNS = ±0 OADs FOR 3 SIGNALS AND 3 SIGNS MAX.
   SPAN CD: 3 SIGNALS AND 3 SIGNS = ±0 OADs FOR 3 SIGNALS AND 3 SIGNS MAX.
   SPAN AD: 3 SIGNALS AND 2 SIGNS = ±0 OADs FOR 3 SIGNALS AND 3 SIGNS MAX.
2. DETERMINE THE SIZE OF POLES@ AND ©.  
   FOR POLE@ (USED IN THE DOUBLE SPAN STRAIN POLE SELECTION CHART FOR 70° 5 < 80° ON SHEET 10) EITHER THE HORIZONTAL CHART OR THE VERTICAL CHART CAN BE USED TO DETERMINE THE POLE SIZE.  
   FOR POLE© (USED IN THE SIMPLE SPAN STRAIN POLE SELECTION CHART FOR 20° 5 < 80° ON SHEET 9) EITHER THE HORIZONTAL CHART OR THE VERTICAL CHART CAN BE USED TO DETERMINE THE POLE SIZE.
3. DETERMINE THE SPAN WIRE DIAMETER BY USING THE SIMPLE SPAN SPAN-WIRE SELECTION CHART ON SHEET 7.  
   FOR POLES@ AND ©, USE THE SINGLE SPAN SPAN POLE SELECTION CHART ON SHEET 7 AND FOLLOW THE SAME LOGIC AS SHOWN ON EXAMPLE 1 TO DETERMINE THE POLE SIZE.
4. DETERMINE THE CAISSON DEPTHS BY USING THE TABLE ON SHEET 5.

COMPUTER FILE INFORMATION

Computer File Information

- EXAMPLES -

STANDARD PLAN NO. S-614-41

TEMPORARY SPAN WIRE SIGNALS

TEMPORARY SPAN WIRE SIGNALS

STANDARD PLAN NO. S-614-41

TEMPORARY SPAN WIRE SIGNALS

STANDARD PLAN NO. S-614-41

TEMPORARY SPAN WIRE SIGNALS

STANDARD PLAN NO. S-614-41

TEMPORARY SPAN WIRE SIGNALS
DOUBLE SPAN STRAIN POLE SELECTION CHARTS (1 OF 4)

DOUBLE SPAN STRAIN POLE SELECTION CHART FOR 60° ≤ θ < 70°

DOUBLE SPAN STRAIN POLE SELECTION CHART FOR 70° ≤ θ < 80°

LOAD KEY

- 12" XS PIPE
- 14" XS PIPE
- 16" XS PIPE
- 18" XS PIPE
- 20" XS PIPE
- 24" XS PIPE

EXAMPLE 3, STEP 2 FOR STRAIN POLE
DOUBLE SPAN STRAIN POLE SELECTION CHARTS (2 OF 4)

DOUBLE SPAN STRAIN POLE SELECTION CHART FOR 80° ≤ θ < 90°

Example 2, Step 2
For Span Pole φ

LOAD KEY

- 12" XS PIPE
- 14" XS PIPE
- 16" XS PIPE
- 18" XS PIPE
- 20" XS PIPE
- 24" XS PIPE

SPAN LENGTH (L) IN FT

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Traffic & Safety Engineering

STANDARD PLAN NO.
S-614-41
Temporary Span Wire Signals

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