OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

8/10/2017

STD DWG
4202
SHT 1 OF 7
OVERHEAD SIGNAL
ATTACHMENTS - SPAN WIRE

EXTERIOR: OVERLAP AT LEAST 3" AND FASTEN WITH AT LEAST 2 BOLTS AT 2 IN. SPACING (SEE NOTE 6)

SINGLE-HOLE EXTENDER CONNECTOR HANGER, 3/4" (SEE NOTE 1)

ADJUSTABLE-DROP TRI-STUD WIRE ENTRANCE (SEE NOTE 4)

6 IN DRIP LOOP (TYP.)

BACKPLATE (SEE NOTE 18)

TRI-STUD BREAKAWAY CLAMP (DETAIL A)

CLAMP ASSEMBLY, 3/4" SLOT

MESSENGER WIRE

MESSER WIRE

DIRECTION OF VEHICLE TRAVEL UNDER SIGNAL

6 IN DRIP LOOP (TYP.)

STRAIN-RELIEF SPRING (SEE DETAIL B2)

BEND AWAY CLAMP, FULL WIDTH, FIXED SIDE FULLY FLAT

BEND AWAY CLAMP, FULL WIDTH, FIXED SIDE FULLY FLAT

TETHER WIRE: 1/4" 7-STRAND

TETHER WIRE: 1/4" 7-STRAND

DIRECTION OF VEHICLE TRAVEL UNDER SIGNAL

1-5/8" MIN.

BREAKAWAY CLAMP, FULL WIDTH, FIXED SIDE FULLY FLAT

BREAKAWAY CLAMP, FULL WIDTH, FIXED SIDE FULLY FLAT

WIRE ROPE CLAMP

WIRE ROPE CLAMP

3-SECTION SIGNAL HEAD SUSPENSION

DETAIL A: BREAKAWAY TETHER ANCHOR (TYPICAL, SEE NOTE 6)
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4202

8/10/2017

SHT 3 OF 7

OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

CITY ENGINEER
DIRECTION OF VEHICLE TRAVEL UNDER SIGNAL

SPREADER BARS

STRAIN-RELIEF SPRING (SEE NOTE 9)

TETHER WIRE

DETAIL B2:
DOUBLE SPREADER BARS AND CROSS-BRACING ON SKEWED SPANS (BOTTOM VIEW)

OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE
DETAIL C
(TOP VIEW)

LOCK WIRE
(SEE NOTE 11)

TURNBUCKLE
(MIN. 5/8" BOLT SIZE)

S-HOOK:
TURNBUCKLE END
MUST BE CLOSED

SAFETY TIE

THIMBLE

THIMBLE

2" MIN.
(SEE NOTE 11)

ANCHOR SHACKLE

SPAN WIRE
CLAMP ASSEMBLY

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8/10/2017

CITY ENGINEER

SHT 5 OF 7
NOTES:

1. ADJUST HANGER AND SPAN WIRE CLAMP TO ELIMINATE ALL PLAY BETWEEN HANGER AND CLAMP BY USING SHIM WASHERS AS NECESSARY. CAST 3/4” ALUMINUM MATCHING CLAMPS AND HANGERS WITH A TIGHT INITIAL FIT SHALL BE USED.

2. ALL SIGNAL HEAD ASSEMBLIES SHALL BE INSTALLED IN A PLUMB POSITION AND PERPENDICULAR TO THE APPROACH LANE.

3. ALL SIGNAL HEADS SHALL BE INSTALLED WITH THEIR LOWEST PART (INCLUDING TETHER ATTACHMENT HARDWARE AND BACKPLATES) WITH A CLEARANCE ABOVE THE ROADWAY PAVEMENT AT ALL POINTS OF 16.5’ MINIMUM, 19’ MAXIMUM. HOWEVER 17’ IS PREFERED HEIGHT. TO OBTAIN 17’ IT IS INTENDED THAT THIS CLEARANCE BE OBTAINED WITHOUT THE USE OF BOTTOM EXTENDERS, BUT RATHER BY THE CAREFUL SELECTION OF FOUNDATION HEIGHTS, ATTACHMENT HEIGHTS, SPAN WIRE SAG, AND OTHER FACTORS DURING THE INSTALLATION. IF THE INSTALLATION CANNOT BE ADJUSTED TO THE PROPER CLEARANCE THE CONTRACTOR SHALL ADVISE THE CITY OF ALL SIGNALS WHICH EXCEED THE MAXIMUM.

4. SIGNAL HEAD ROTATION SHALL BE PREVENTED BY THE USE OF SERRATED RINGS AND TRI-STUDS OR OTHER POSITIVE LOCKING DEVICES INCORPORATED IN THE SIGNAL HOUSING AND AT CRITICAL LOCATIONS IN THE SUPPORTING HARDWARE. ONLY SINGLE-PIECE TRI-STUD ENTRANCE PORTS SHALL BE USED, NOT INSERTS. NYLON LOCKING OR DEFORMED-THREADED NUTS SHALL BE USED.

5. ALL CONDUCTORS SHALL HAVE ADEQUATE CLEARANCE BETWEEN HANGERS, THIMBLES, BULLRINGS, ETC. IN ORDER TO AVOID DAMAGE FROM RUBBING.

6. FOR ALL TETHERED INSTALLATIONS, BREAKAWAY TETHER ANCHOR(S) SHALL BE INSTALLED IN BOTTOM BRACKET. SIGNAL HEIGHT ADJUSTMENT SHALL BE MADE BY TOP-MOUNTED EXTENDERS ONLY. BREAKAWAY CLAMP SHALL BE FULL WIDTH WITH ROUNDED EDGES. CLAMP SHOULD COMPRESS TETHER WIRE ONLY AGAINST A FLAT SURFACE (DETAIL A).

7. BACKUP TIE SHALL BE 1/4", 7-STRAND WIRE IDENTICAL TO TETHER WIRE. THREE CAST WIRE ROPE CLIPS ON EACH SIDE SHALL BE USED WITH 18" OVERLAP AND SPACING AS SHOWN. TIE SHALL HANG NO LOWER THAN 17" ABOVE PAVEMENT, AND MUST NOT RUB AGAINST THE BREAKAWAY CLAMP. TIES UNDER 3-SECTION HEADS ARE RECOMMENDED IN WINDY AREAS; SHALL BE INSTALLED IF SPECIFIED IN PLANS, OR IF DIRECTED BY THE CITY. SPACING OF CLIPS MAY BE ADJUSTED TO ACCOMODATE ADJACENT HEADS. CLOSELY SPACED ADJACENT HEADS MAY SHARE A SINGLE BACKUP TIE AND WIRE ROPE CLIPS; THERE SHALL BE A MINIMUM OF THREE WIRE ROPE CLIPS BETWEEN HEADS.

8. MULTI-WAY HEADS WITH BACKPLATES SHALL NOT BE USED ON TETHERED SPANS. EXISTING MULTI-WAY HEADS SHALL BE SEPARATED AS DIRECTED BY THE CITY. REWIRE AS NECESSARY TO SEPARATE THE HEADS PER THE PROPER ALIGNMENT.

9. COMPRESSION SPRING, 0.375” OD, 0.054” WIRE DIAMETER, 10-12 COILS PER INCH, STAINLESS STEEL 6” MINIMUM LENGTH.
10. S-HOOK IS MATCHED TO THE STRAIN POLE DESIGN NUMBER (SEE TABLE 1). S-HOOK AND TURNBUCKLE ARE REQUIRED ONLY AT ONE END OF SIMPLE SPANS, ALL ENDS OF COMPLEX SPANS. S-HOOK SHALL BE CLOSED AT POLE END. IF S-HOOK BEGINS TO YIELD DURING INSTALLATION, IT SHALL BE REMOVED AND REPLACED. THE WIRE TENSION SHALL BE ADJUSTED TO MINIMIZE MOVEMENT OF SIGNAL HEADS IN HIGH WINDS. TYPICAL TENSION IS 600 TO 800 LBS.

**TABLE 1 - S-HOOK PROPERTIES**

<table>
<thead>
<tr>
<th>Strain Pole Design No.</th>
<th>Galvanized Mild Steel S-Hook Wire Diameter (Inches)</th>
<th>S-hook yield point (+10%/-20%) (Pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - 14</td>
<td>1/2</td>
<td>3300</td>
</tr>
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</table>

11. LOCK WIRE SHALL BE STAINLESS STEEL, 1/8" SOFT TEMPER, WOUND TO PREVENT TURNING OF THE TURNBUCKLE BODY. FINISHED SPAN SHALL HAVE AT LEAST 2" OF SPACE FOR TURNBUCKLE ADJUSTMENT. TURNBUCKLE SHALL NOT BE OVERTIGHTENED. USE 8-INCH HAND TOOLS, MAXIMUM.

12. IF SIGNAL ORIENTATION IS NOT PERPENDICULAR TO SPAN AND TETHER WIRE, THEN USE AN ANCHOR EXTENSION. CLAMP ASSEMBLY MUST BE ATTACHED TO THE FLAT SIDE OF THE EXTENDER BAR.

13. INSTALL SAFETY TIE AT EACH TURNBUCKLE. THIS WIRE SHALL BE 1"X19", 1/8" STAINLESS STEEL. TIE SHOULD BE SLACK, BUT NOT SO SLACK AS TO CONTACT POLE. USE 3 CLIPS PER END AT 3-1/4" SPACING.

14. TETHER WIRE SHALL BE 7-STRAND ASTM A475 HS OR EHS GRADE 1/4" ON ALL SPANS, INSTALL TETHER HORIZONTALLY. MAINTAIN PREFERRED CLEARANCE OF 17' OVER ROADWAY.

15. SPAN WIRE CLAMP AS PER CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4170 REQUIRED FOR TETHER WIRE ATTACHMENT OR APPROVED EQUAL RATED AT 3650 LBS. OR HIGHER. ALTERNATE ATTACHMENT METHOD SHALL NOT BE PERMITTED.

16. SAFETY TIE ANCHOR HEIGHT ABOVE TETHER IS ADJUSTED IN THE FIELD BEFORE S-HOOK IS INSTALLED. DIMENSION X (SAFETY TIE HEIGHT) SHALL BE ADJUSTED SO THAT THE MINIMUM VERTICAL CLEARANCE OF THE SAGGING TETHER WIRE ABOVE THE PAVEMENT WITHOUT THE S-HOOK INSTALLED IS AT LEAST 14'. MINIMUM DISTANCE BETWEEN THE SAFETY TIE CLAMP AND TETHER CLAMP SHALL BE 1.5" AND CONTAIN ENOUGH SLACK FOR HEAD TO SWAY IN HIGH WINDS. SAFETY TIE ANCHOR MAY BE ANY GALVANIZED OR STAINLESS STEEL POLE CLAMP ASSEMBLY RATED AT 3650 POUNDS OR HIGHER.

17. ON SPANS WITH BULLRINGS, A TIE SHALL BE PROVIDED BETWEEN MESSENGER AND TETHER BULLRINGS IF A 14" CLEARANCE CANNOT BE MAINTAINED AFTER S-HOOK OPENING. THIS VERTICAL TIE SHALL BE 1"X19", 1/16" STAINLESS STEEL. TIE SHALL BE SLIGHTLY SLACK, TIED BACK USING CAST WIRE ROPE CLIPS AS SHOWN. WIRE ROPE CLIPS SHALL NOT BE OVER-TIGHTENED.

18. FOR BACKPLATES SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4205.

19. ALL SPREADER BAR HARDWARE SHALL BE STAINLESS STEEL, WITH NYLON LOCKING OR DEFORMED-THREAD NUTS.

20. DO NOT TETHER SIGNS ON SIGNAL SPANS.