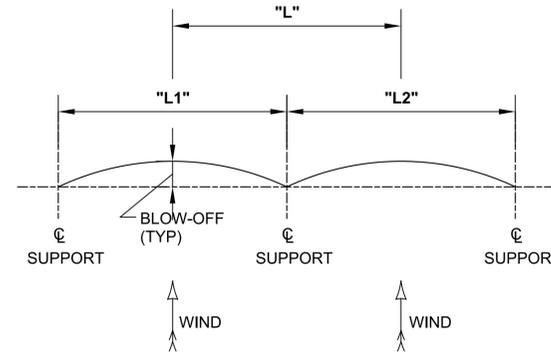


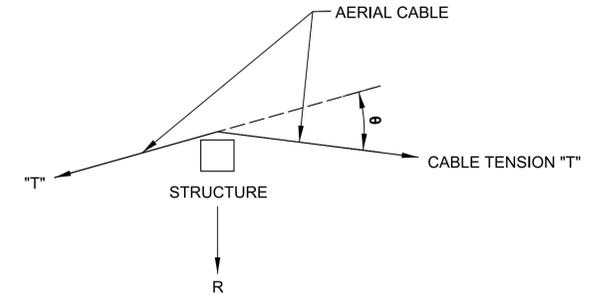
ELEVATION
VERTICAL LOAD

"L" = THE DISTANCE BETWEEN THE LOW POINTS OF THE MESSENGER ON BOTH SIDES OF SUPPORT IN FEET.



PLAN
WIND LOAD

$$"L" = \frac{L1 + L2}{2}$$



PLAN
RADIAL LOAD
 $R = T \cdot \sin(\theta)$

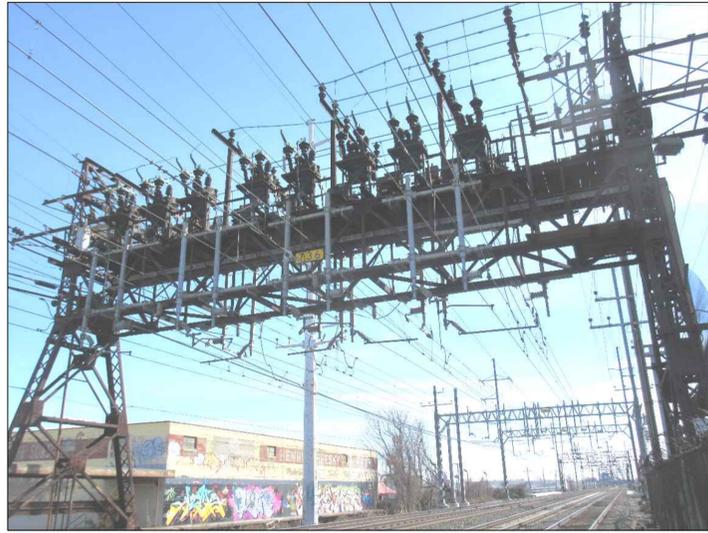
SPAN "L" (FT)	VERTICAL LOAD (LB)	
	NO ICE	WITH ICE (NOTE 1)
100	68	234
110	75	257
120	82	280
130	89	304
140	95	327
150	102	350
160	109	374
170	116	397
180	123	420
190	129	444
200	136	467
210	143	491
220	150	514
230	157	537
240	163	561
250	170	584
260	177	607
270	184	631
280	191	654
290	197	677
300	204	701
310	211	724
320	218	748

SPAN "L" (FT)	WIND LOAD (LB)		
	55 MPH WIND, W/ ICE	55 MPH WIND, NO ICE	90 MPH WIND, NO ICE
100	204	139	373
110	224	153	411
120	245	167	448
130	265	181	485
140	286	195	523
150	306	209	560
160	326	223	597
170	347	237	635
180	367	251	672
190	388	265	709
200	408	279	747
210	428	293	784
220	449	307	822
230	469	321	859
240	490	335	896
250	510	349	934
260	530	363	971
270	551	377	1008
280	571	390	1046
290	592	404	1083
300	612	418	1120
310	632	432	1158
320	653	446	1195

ANGLE "theta" (°)	RADIAL LOAD (LB)		
	NO WIND @ 60°F	55 MPH WIND, 1/2" ICE @ 0°F	90 MPH WIND @ 60°F
1	45	97	100
2	89	193	200
3	133	289	299
4	178	386	399
5	222	482	499
6	267	578	598
7	311	674	697
8	355	770	796
9	399	865	895
10	443	960	993
11	487	1055	1091
12	530	1150	1189
13	574	1244	1287
14	617	1338	1384
15	660	1432	1480

- NOTES:
- ICE CONDITION IS WITH 1/2" THICK RADIAL ICE ON AERIAL DUCT.
 - LOADING VALUES AS SHOWN IN THE TABLES ARE BASED ON AN EQUIVALENT AERIAL DUCT DIAMETER OF 2.161" WITHOUT ICE, AND 3.161" WITH ICE.

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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 4/1/2016			



STRUCTURE TYPE AB
ANCHOR BRIDGE



STRUCTURE TYPE AF
A-FRAME



STRUCTURE TYPE BC
BUILT-UP CHANNEL



REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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DEPARTMENT OF TRANSPORTATION

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185 Plains Road
Suite 208E
Milford, CT 06461

PROJECT TITLE:
**NETWORK INFRASTRUCTURE
UPGRADE FOR SECURITY
NEW HAVEN LINE
PHASE 2**

TOWN: **WESTPORT
TO STRATFORD**
DRAWING TITLE:
**STRUCTURE TYPES
SHEET 1 OF 4**

PROJECT NO.: **300-0178**
DRAWING NO.: **FCI-405**
SHEET NO.: **04.05**



STRUCTURE TYPE LA
PORTAL LATTICE ANGLE



STRUCTURE TYPE HT
HIGH TOWER



REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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Filename: ...FCI-406_FA_Sheet_0300-0178.dgn

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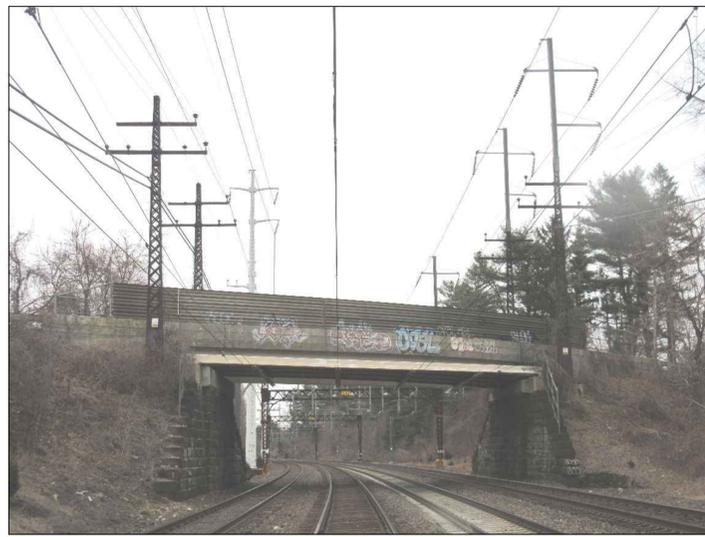
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UPGRADE FOR SECURITY
NEW HAVEN LINE
PHASE 2**

TOWN: **WESTPORT
TO STRATFORD**
DRAWING TITLE:
**STRUCTURE TYPES
SHEET 2 OF 4**

PROJECT NO.: **300-0178**
DRAWING NO.: **FCI-406**
SHEET NO.: **04.06**



STRUCTURE TYPE LC
PORTAL LATTICE CHANNEL



STRUCTURE TYPE TP
TRANSMISSION POLE



STRUCTURE TYPE WALL
WALL / BRIDGE ABUTMENT



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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 4/1/2016	Filename: ...FCI-407_FA_Sheet_0300-0178.dgn		



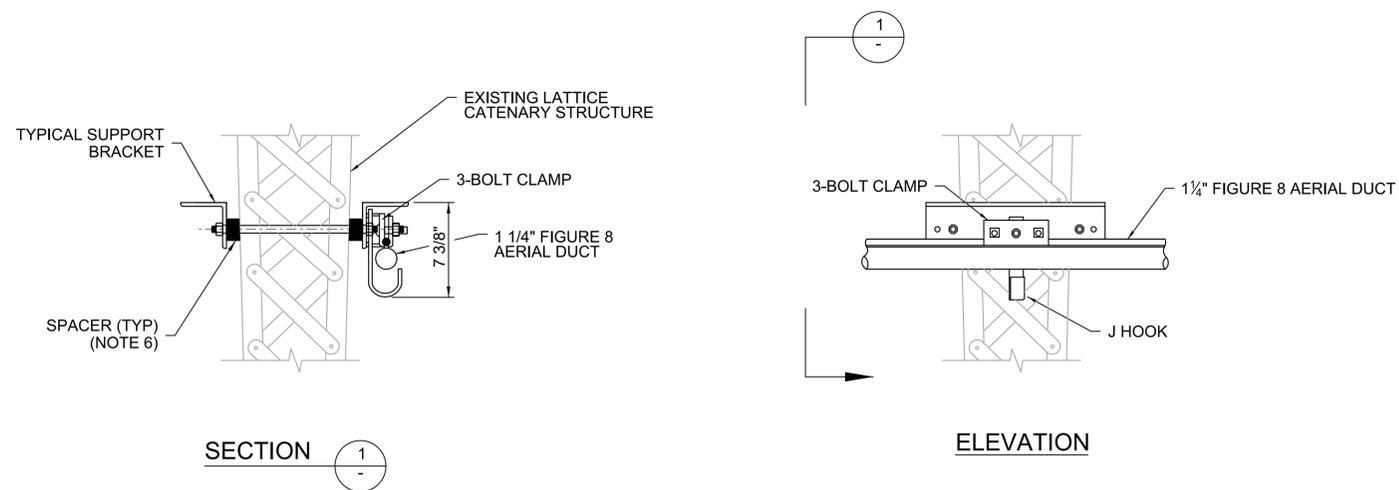
STRUCTURE TYPE WF
WIDE FLANGE (I-BEAM)



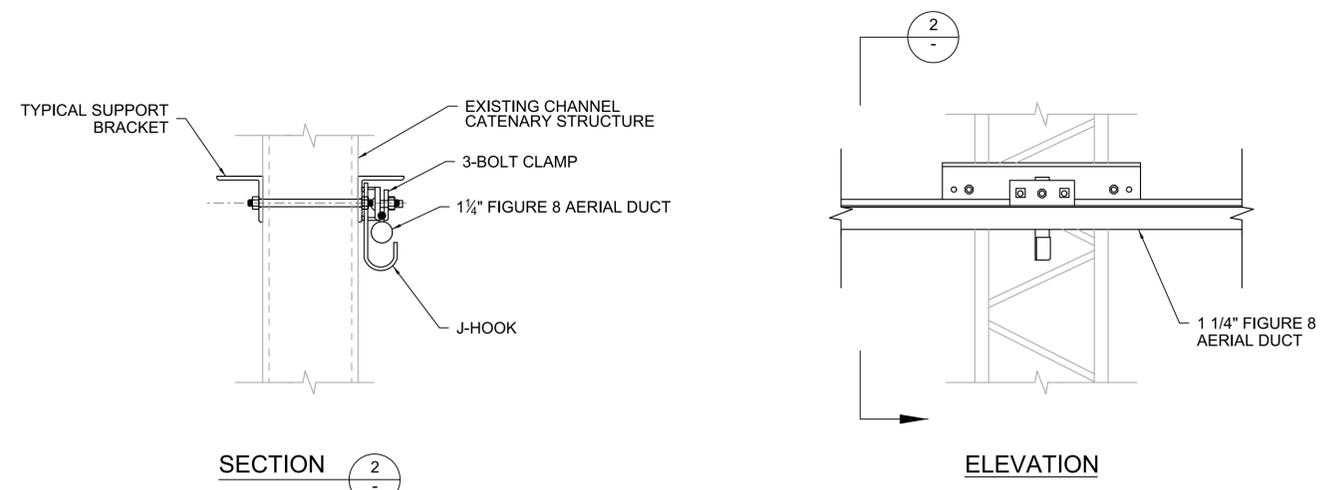
STRUCTURE TYPE WP
WOOD POLE



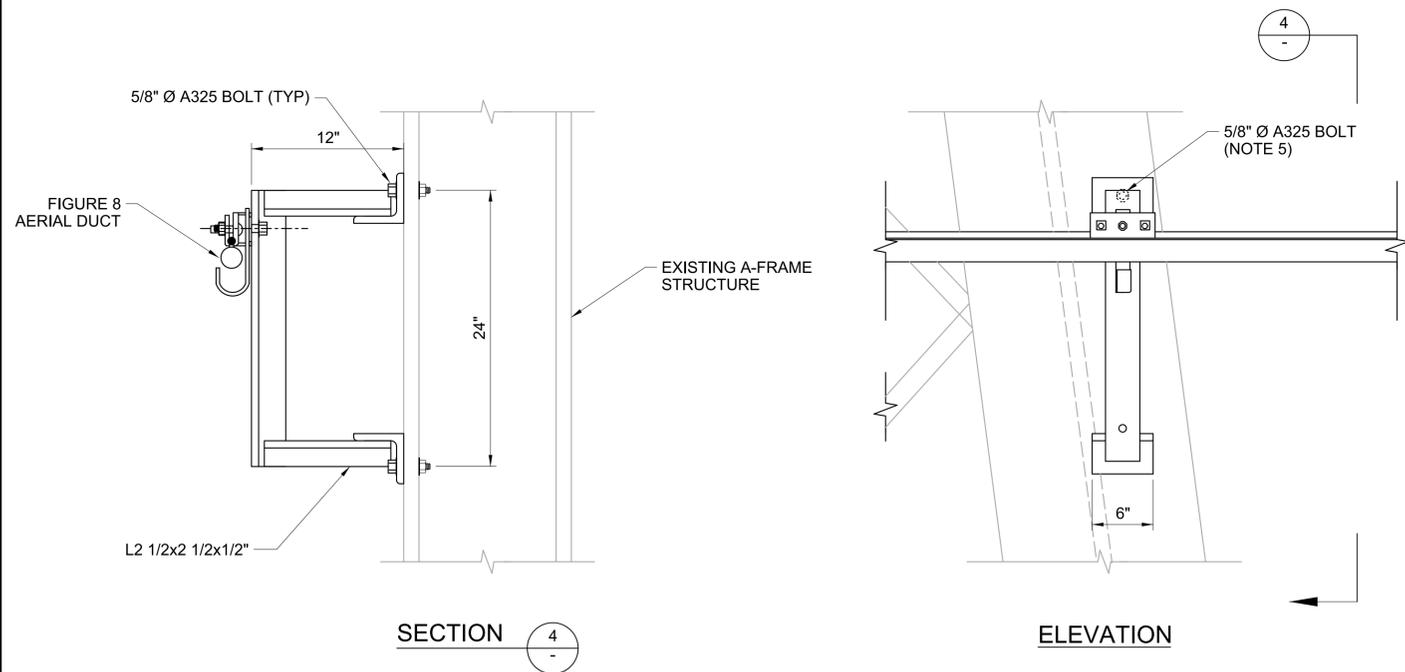
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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 4/1/2016			



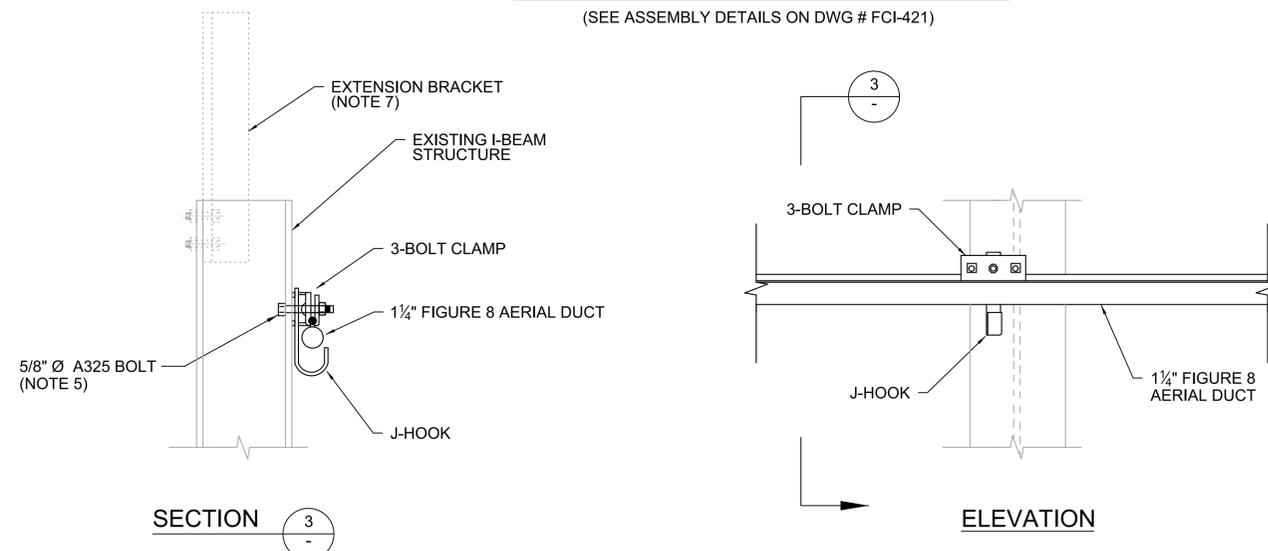
TYPE B-1
TYPICAL LATTICE STRUCTURE
 (SEE ASSEMBLY DETAILS ON DWG # FCI-421)



TYPE B-2
TYPICAL PORTAL LATTICE WITH CHANNEL
 (SEE ASSEMBLY DETAILS ON DWG # FCI-421)



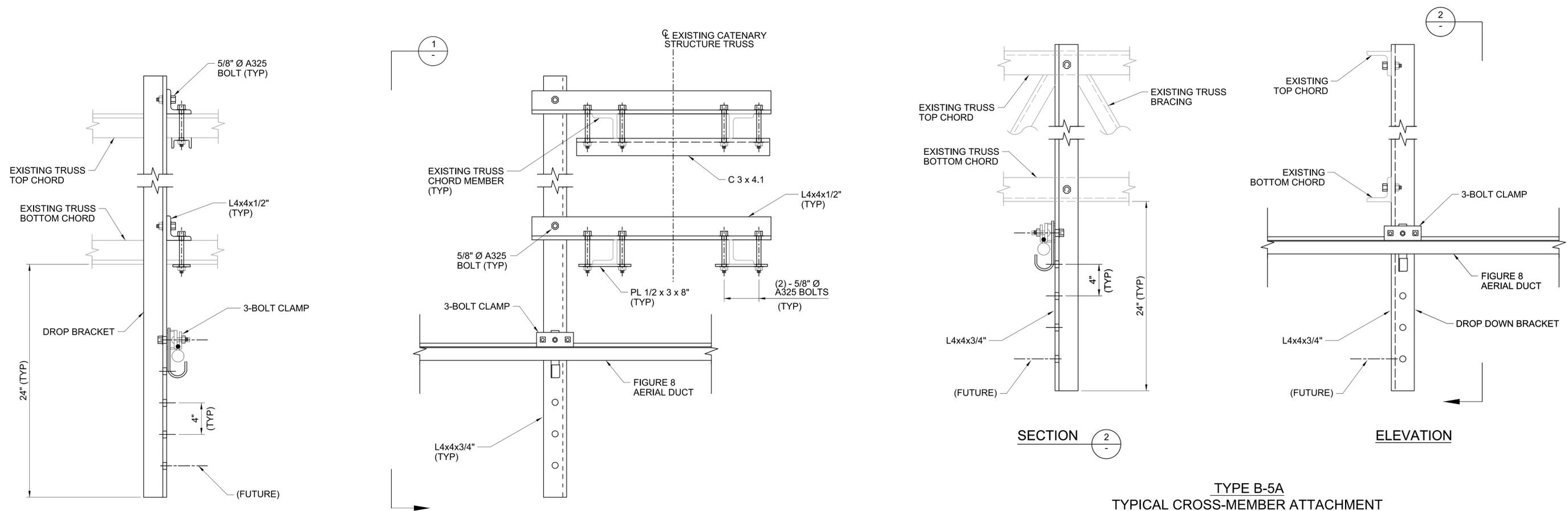
TYPE B-4
A-FRAME ATTACHMENT
 (SEE ASSEMBLY DETAILS ON DWG # FCI-423)



TYPE B-3
TYPICAL I-BEAM STRUCTURE
 (SEE ASSEMBLY DETAILS ON DWG # FCI-421)

- NOTES:**
- FOR GENERAL NOTES SEE DWG. G-002.
 - FOR ABBREVIATIONS AND LEGEND SEE DWG. G-003.
 - THE FIGURE 8 AERIAL DUCT SHALL HAVE A MINIMUM 12" CLEARANCE FROM ANY EXISTING COMMUNICATION CABLES.
 - ALL FIELD DRILLED HOLES SHALL RECEIVE COLD GALVANIZING TOUCH-UP PAINT IN ACCORDANCE WITH FORM 816.
 - LOCATE CENTERLINE OF HOLE A MINIMUM OF 1 1/8" FROM EDGE OF COLUMN FLANGE.
 - SPACERS SHALL BE WELDED TO SUPPORT BRACKETS AS REQUIRED TO ALLOW FOR PROPER FIT ON RIVETED LATTICE STRUCTURES. SEE SPACER DETAIL ON DWG # FCI-421. IN ADDITION, ALL WELDED AREAS SHALL BE TREATED WITH TOUCH-UP COLD GALVANIZING COMPOUND.
 - IF APPLICABLE, ATTACHMENT TO EXISTING EXTENSION BRACKET ON I-BEAM STRUCTURE IS ALSO PERMITTED, PROVIDED MINIMUM CLEARANCES FROM EXISTING CABLES AND OTHER OBSTRUCTIONS ARE MET.

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Plotted Date: 4/1/2016		CHECKED BY: SCC					
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SECTION 1

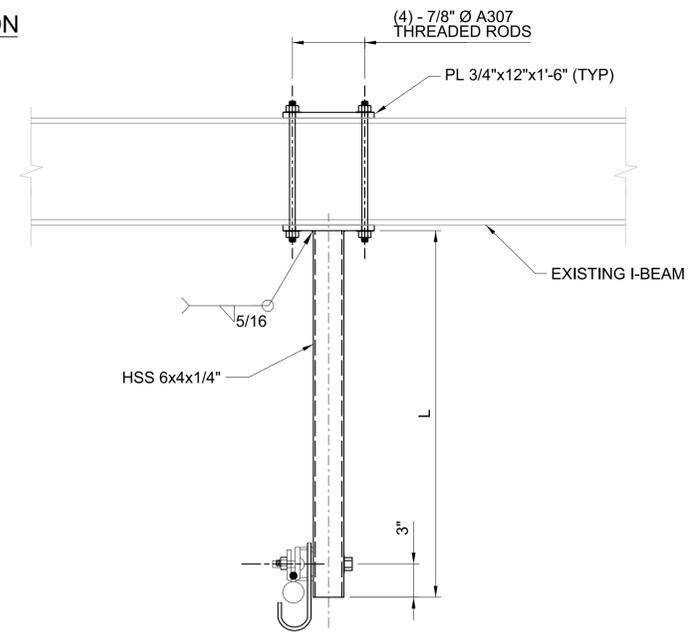
ELEVATION

TYPE B-5
TYPICAL CROSS-MEMBER ATTACHMENT
(SEE ASSEMBLY DETAILS ON DWG # FCI-422)

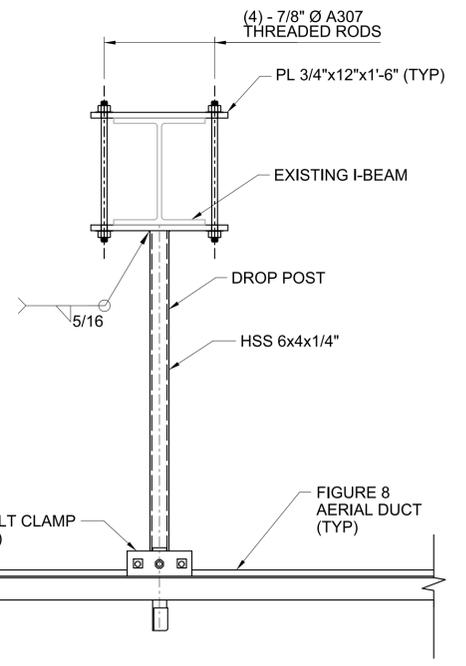
SECTION 2

ELEVATION

TYPE B-5A
TYPICAL CROSS-MEMBER ATTACHMENT
(SEE ASSEMBLY DETAILS ON DWG # FCI-422)



SECTION 3

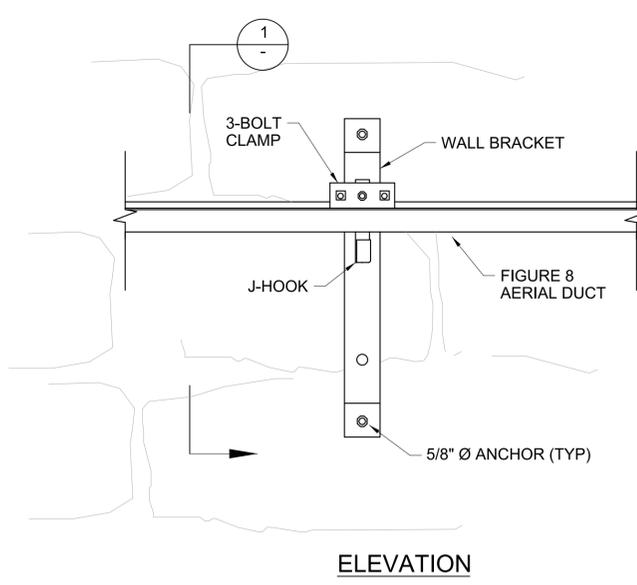


ELEVATION

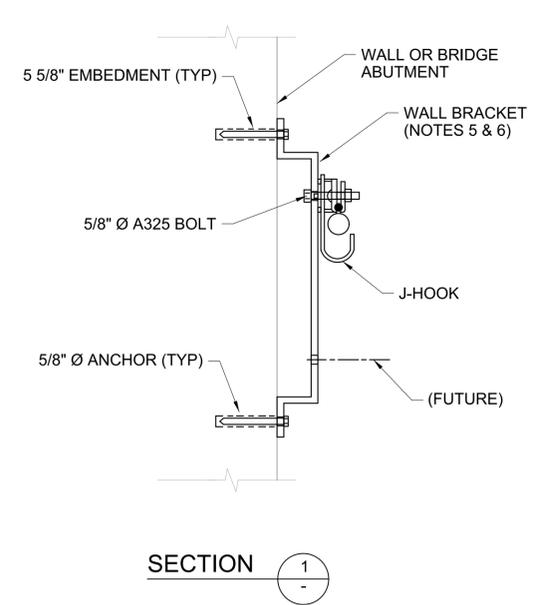
TYPE B-5B
TYPICAL CROSS-MEMBER ATTACHMENT
(SEE ASSEMBLY DETAILS ON DWG # FCI-424)

- NOTES:
- FOR GENERAL NOTES SEE DWG. G-002.
 - FOR ABBREVIATIONS AND LEGEND SEE DWG. G-003.
 - OFFSET DISTANCE FROM CATENARY POLE SHALL BE AS SHOWN ON DWG # FCI-300 AND CABLE ROUTING PLAN DRAWINGS.

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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 4/1/2016			

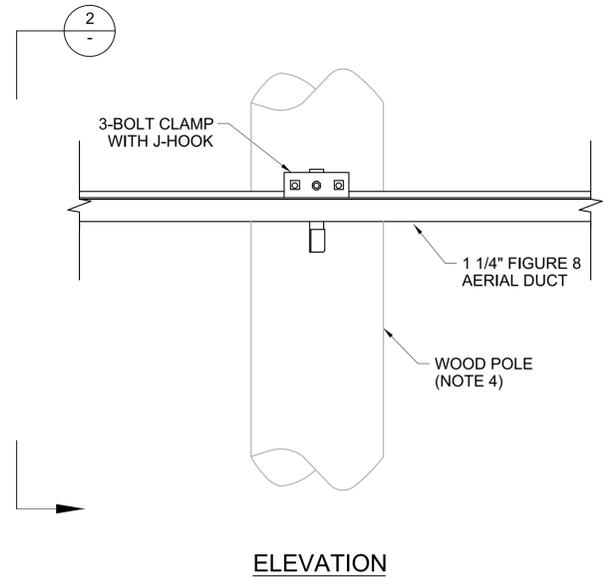


ELEVATION

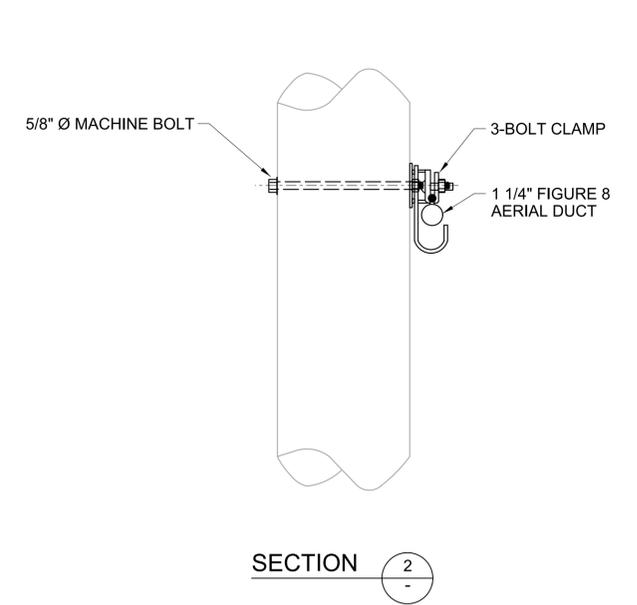


SECTION 1

TYPE B-6
TYPICAL WALL/ ABUTMENT ATTACHMENT
(SEE ASSEMBLY DETAILS ON DWG # FCI-423)

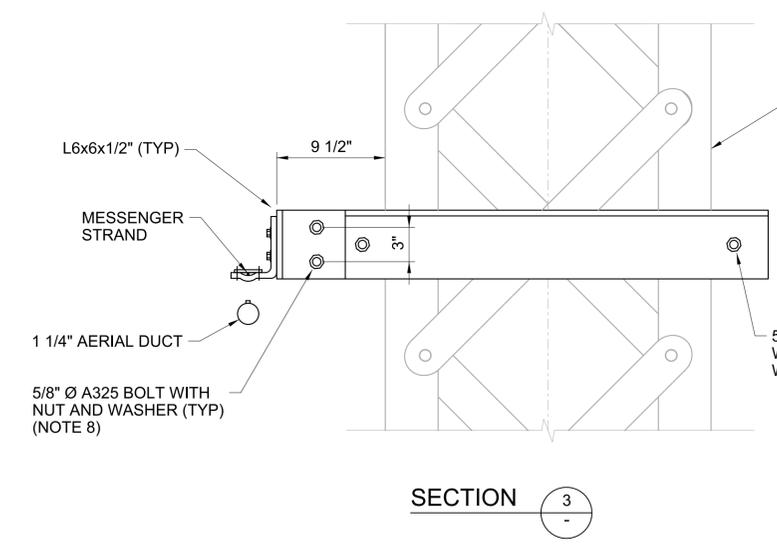


ELEVATION

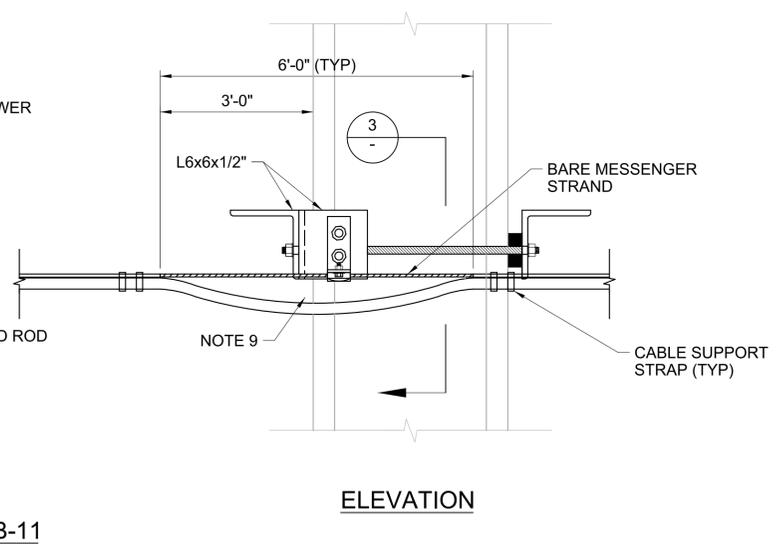


SECTION 2

TYPE B-7
TYPICAL WOOD POLE ATTACHMENT
(SEE ASSEMBLY DETAILS ON DWG # FCI-423)

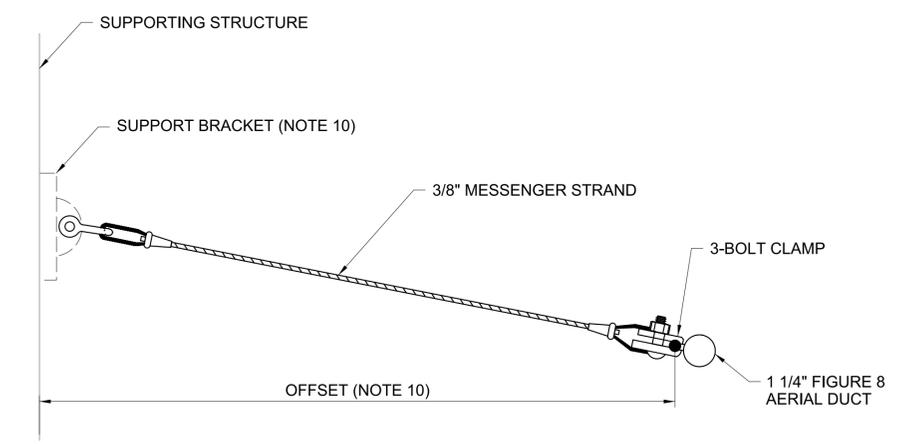


SECTION 3



ELEVATION

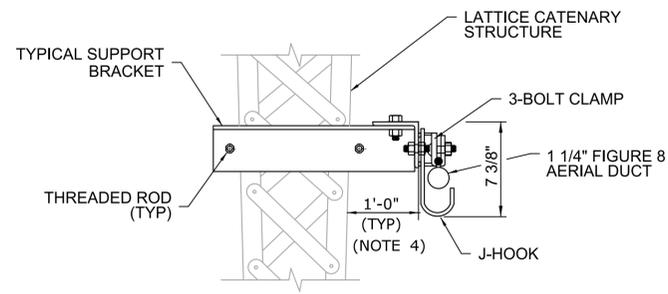
TYPE B-11
ANGLE BRACKET
(SEE ASSEMBLY DETAILS ON DWG # FCI-424)



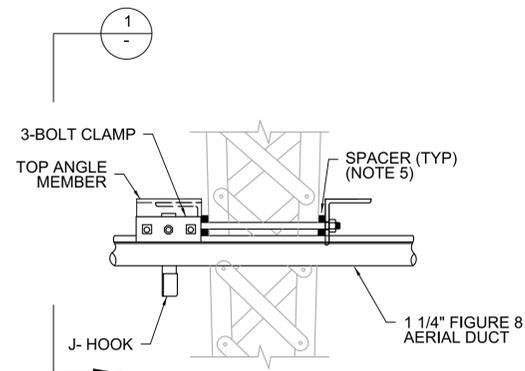
TYPE B-12
STRANDWISE PULLOFF ATTACHMENT
(SEE ASSEMBLY DETAILS ON DWG # FCI-423)

- NOTES:**
- FOR GENERAL NOTES SEE DWG. G-002.
 - FOR ABBREVIATIONS AND LEGEND SEE DWG. G-003.
 - THE FIGURE 8 AERIAL DUCT SHALL HAVE A MINIMUM 12" CLEARANCE FROM ANY EXISTING CABLES.
 - CABLE ROUTING PLAN DRAWINGS SPECIFY WHETHER WOOD POLE IS EXISTING OR NEW IN THIS CONTRACT.
 - WALL MOUNT BRACKETS SHALL BE SPACED A MAXIMUM OF 50 FEET ON CENTER.
 - WALL MOUNT BRACKETS SHALL HAVE A MINIMUM EDGE DISTANCE OF 6" IN CONCRETE, AND 12" OTHERWISE.
 - ALL FIELD DRILLED HOLES SHALL RECEIVE TOUCHED UP PAINT IN ACCORDANCE WITH FORM 816.
 - FOR DRILLING LOCATIONS OF STRUCTURAL ANGLES, SEE DETAIL ON DWG # FCI-422.
 - A MINIMUM CLEARANCE OF 2" SHALL BE MAINTAINED BETWEEN MESSENGER HANGER BRACKET AND DUCT.
 - SEE CABLE ROUTING PLAN DRAWINGS FOR OFFSET VALUES AND SUPPORT BRACKET TYPE.

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NOT TO SCALE	FILENAME: ...FCI-413_FA_Sheet_0300-0178.dgn	DRAWING NO. FCI-413					
REV. DATE REVISION DESCRIPTION SHEET NO. Plotted Date: 4/1/2016					DRAWING TITLE: ATTACHMENT DETAILS SHEET 3 OF 4		SHEET NO. 04.011

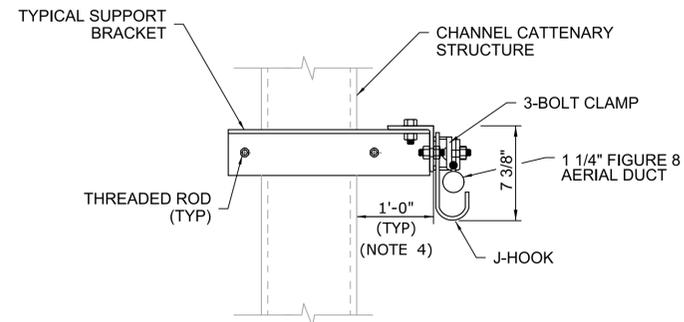


SECTION 1



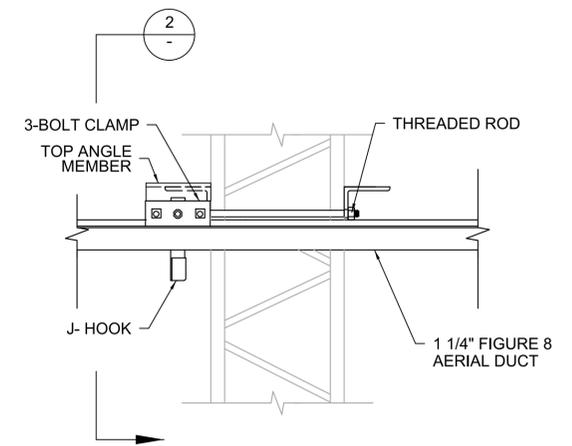
ELEVATION

TYPE B-1M
TYPICAL OFFSET BRACKET ON LATTICE STRUCTURE
 (SEE ASSEMBLY DETAILS ON DWG # FCI-424)



SECTION 2

TYPE B-2M
TYPICAL OFFSET BRACKET ON PORTAL LATTICE WITH CHANNEL
 (SEE ASSEMBLY DETAILS ON DWG # FCI-424)



ELEVATION

NOTES:

1. FOR GENERAL NOTES SEE DWG. G-002.
2. FOR ABBREVIATIONS AND LEGEND SEE DWG. G-003.
3. THE FIGURE 8 AERIAL DUCT SHALL HAVE A MINIMUM 12" CLEARANCE FROM ANY EXISTING CABLES.
4. FOR OFFSET VALUES AT SPECIFIC STRUCTURE LOCATIONS, SEE CABLE ROUTING PLAN DRAWINGS.
5. SPACERS SHALL BE WELDED TO SUPPORT BRACKETS AS REQUIRED TO ALLOW FOR PROPER FIT ON RIVETED LATTICE STRUCTURES. SEE SPACER DETAIL ON DWG # FCI-421. IN ADDITION, ALL WELDED AREAS SHALL BE TREATED WITH TOUCH-UP COLD GALVANIZING COMPOUND.

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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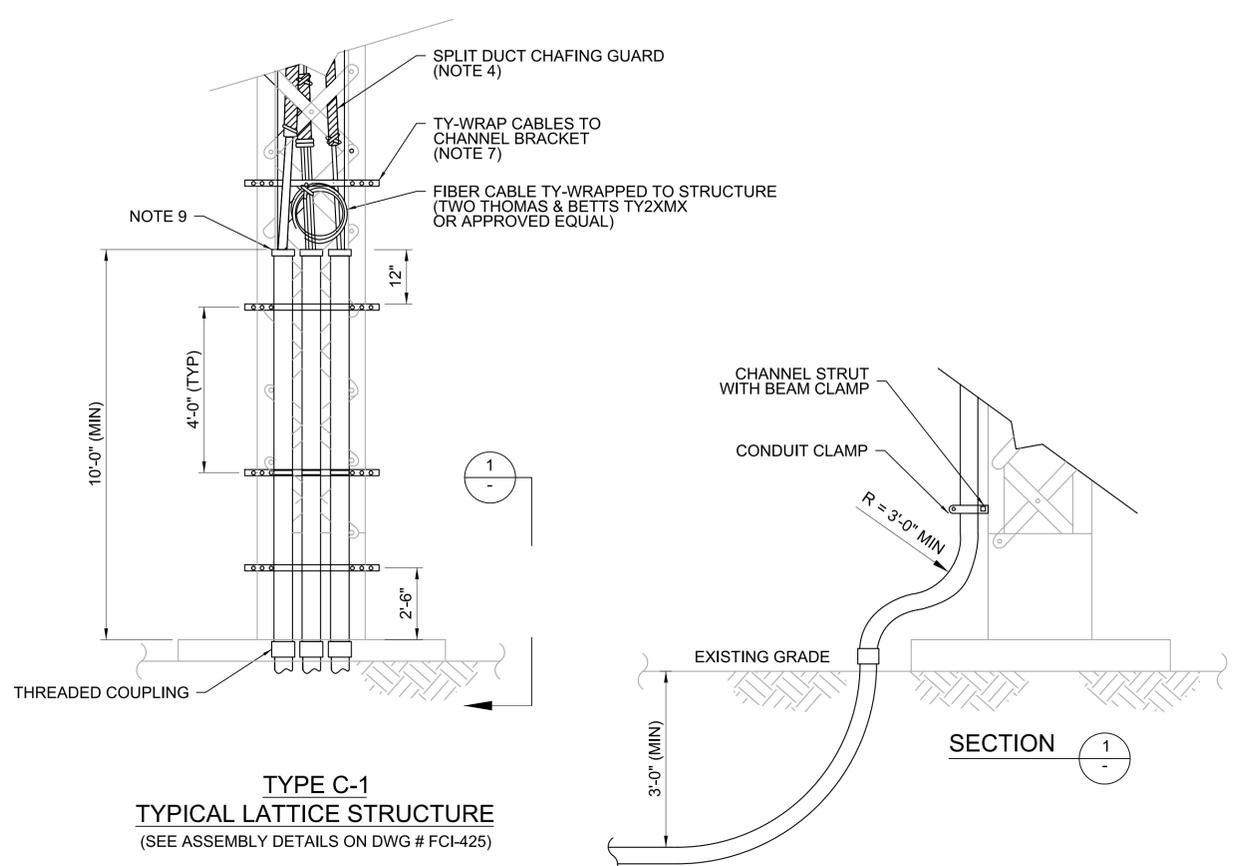
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 Milford, CT 06461

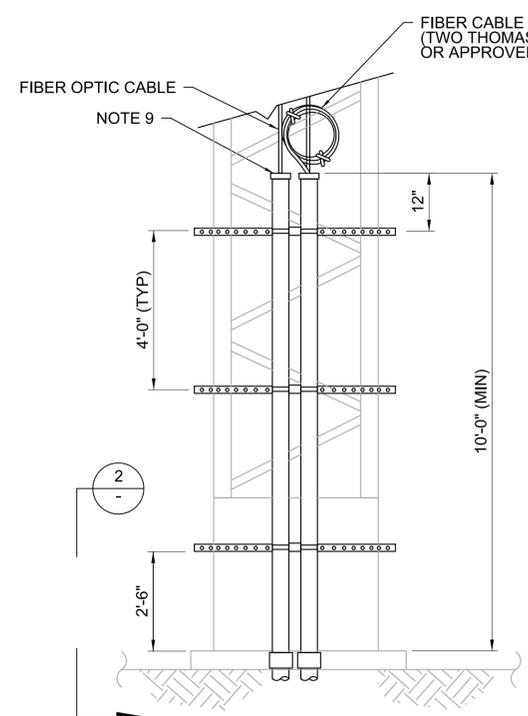
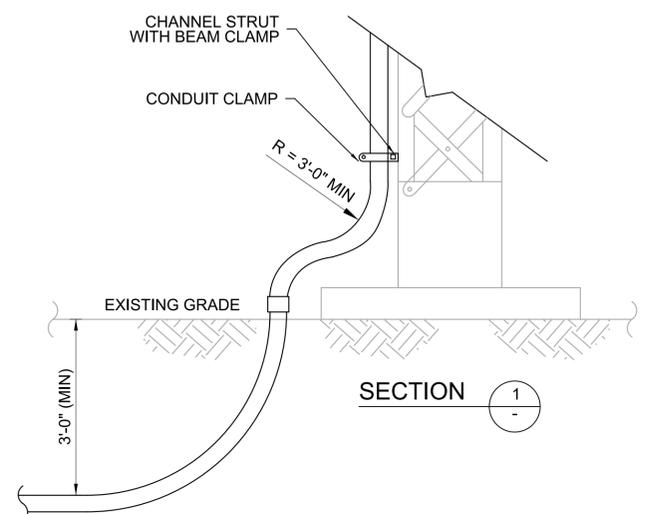
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**NETWORK INFRASTRUCTURE
 UPGRADE FOR SECURITY
 NEW HAVEN LINE
 PHASE 2**

TOWN: **WESTPORT
 TO STRATFORD**
 DRAWING TITLE:
**ATTACHMENT DETAILS
 SHEET 4 OF 4**

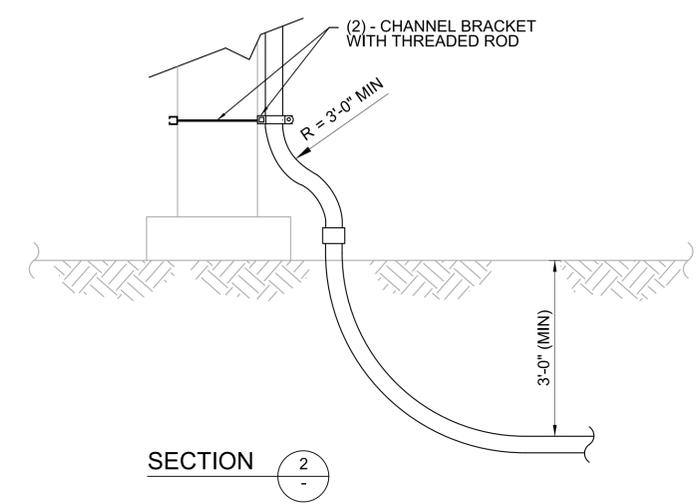
PROJECT NO. **300-0178**
 DRAWING NO. **FCI-414**
 SHEET NO. **04.012**



TYPE C-1
TYPICAL LATTICE STRUCTURE
 (SEE ASSEMBLY DETAILS ON DWG # FCI-425)

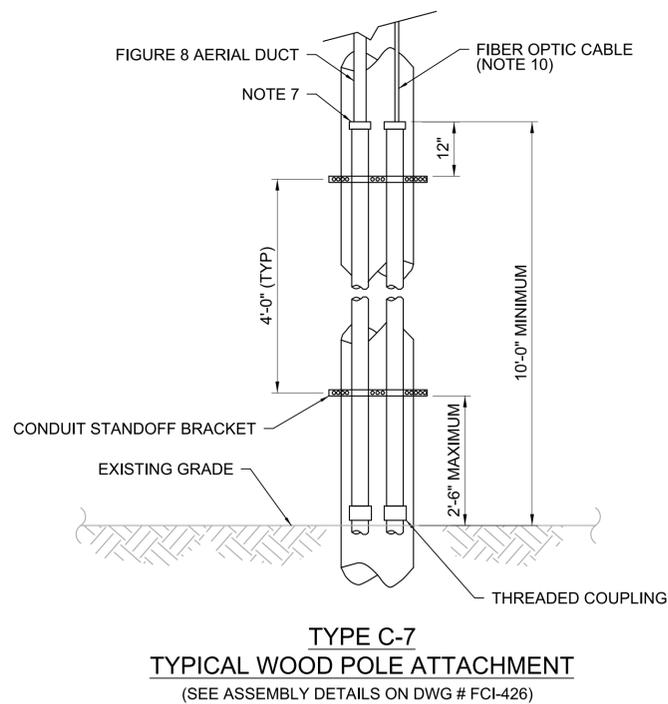
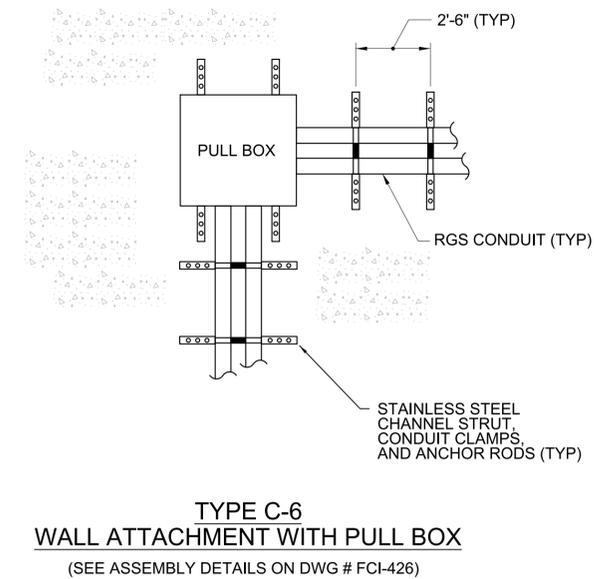
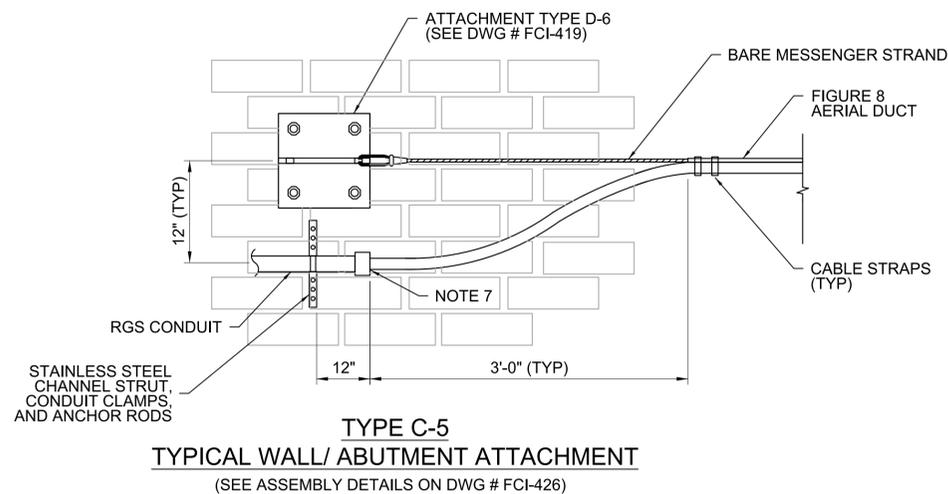


TYPE C-2
TYPICAL PORTAL LATTICE WITH CHANNEL
 (SEE ASSEMBLY DETAILS ON DWG # FCI-425)



- NOTES:**
- FOR GENERAL NOTES SEE DWG. G-002.
 - FOR ABBREVIATIONS AND LEGEND SEE DWG. G-003.
 - NUMBER OF CONDUITS, THEIR SIZE, AND MATERIAL ARE SPECIFIED IN CABLE ROUTING PLANS.
 - CONTRACTOR SHALL FURNISH AND INSTALL SPLIT DUCT CHAFING GUARDS AROUND ALL CABLES THAT COME IN CONTACT WITH STRUCTURE AND SECURE WITH TY-WRAP AT EACH END AND IN THE CENTER IF THE DISTANCE BETWEEN TY WRAPS EXCEEDS 12".
 - ATTACHMENT OF BEAM CLAMPS TO LEG, FLANGE, OR DIAGONAL BRACING OF EXISTING CATENARY STRUCTURES IS PERMITTED.
 - CONTRACTOR SHALL FIELD VERIFY/CUT LENGTHS OF STRUT CHANNEL TO SITE SPECIFIC REQUIREMENTS AND PROTECT AS SPECIFIED.
 - STRUT CHANNEL USED FOR SUPPORT OF CABLES SHALL BE INSTALLED 12" ABOVE TOP OF CONDUIT AND 24" THERE AFTER AS REQUIRED.
 - SEE CABLE SPECIFICATIONS FOR MINIMUM BENDING RADIUS.
 - ALL CONDUITS SHALL BE SEALED WITH A PLUG AT OPENINGS.
 - WIDTH OF CONDUIT SUPPORT BRACKET SHALL NOT EXTEND 4" PAST EDGE OF STRUCTURE. STACK CONDUITS AS REQUIRED.
 - ALL MOUNTING HARDWARE FOR PVC COATED CONDUIT SHALL BE STAINLESS STEEL.

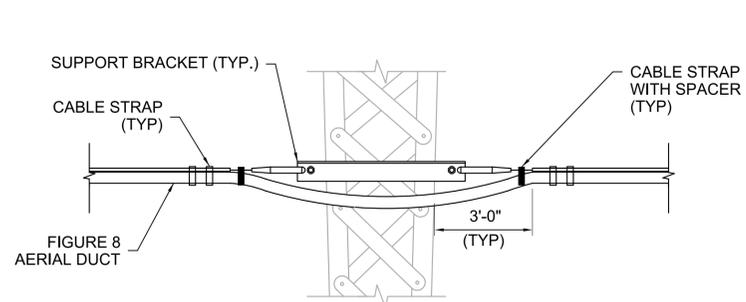
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NOTES:

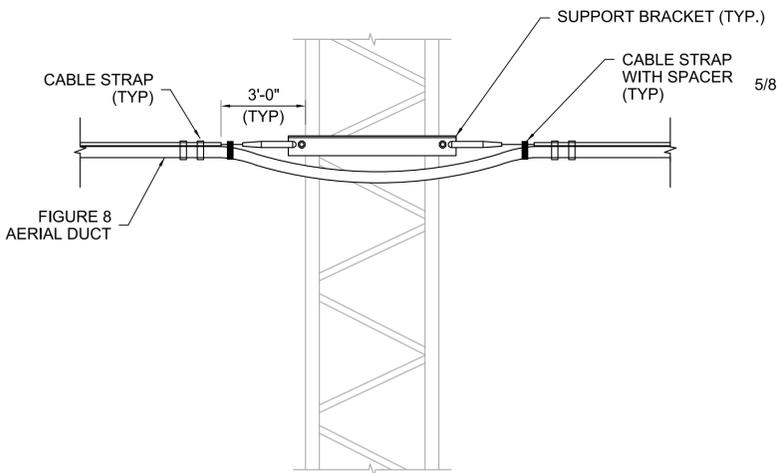
1. FOR GENERAL NOTES SEE DWG. G-002.
2. FOR ABBREVIATIONS AND LEGEND SEE DWG. G-003.
3. NUMBER OF CONDUITS, THEIR SIZE, AND MATERIAL ARE SPECIFIED IN CABLE ROUTING PLANS.
4. CONTRACTOR SHALL FIELD VERIFY/CUT LENGTHS OF STRUT CHANNEL TO SITE SPECIFIC REQUIREMENTS AND PROTECT AS SPECIFIED.
5. STRUT CHANNEL USED FOR SUPPORT OF CABLES SHALL BE INSTALLED 12" ABOVE TOP OF CONDUIT AND 24" THERE AFTER AS REQUIRED.
6. SEE CABLE SPECIFICATIONS FOR MINIMUM BENDING RADIUS.
7. ALL CONDUITS SHALL BE SEALED WITH A PLUG AT OPENINGS.
8. WIDTH OF CONDUIT SUPPORT BRACKET SHALL NOT EXTEND 4" PAST EDGE OF STRUCTURE. STACK CONDUITS AS REQUIRED.
9. BRACKET AND PULLBOX SHALL BE INSTALLED A MINIMUM OF 6" FROM EDGE OF WALL.
10. CONTRACTOR SHALL INSTALL CHAFING GUARDS AROUND ALL CABLES NOT ENCLOSED IN AERIAL DUCT OR CONDUIT THAT COME IN CONTACT WITH THE STRUCTURE.
11. ALL MOUNTING HARDWARE FOR PVC COATED CONDUIT SHALL BE STAINLESS STEEL.

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: PM CHECKED BY: SCC NOT TO SCALE	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Filename: ...FCI-416_FA_Sheet_0300-0178.dgn	SIGNATURE/ BLOCK: STV Incorporated 185 Plains Road Suite 208E Milford, CT 06461	PROJECT TITLE: NETWORK INFRASTRUCTURE UPGRADE FOR SECURITY NEW HAVEN LINE PHASE 2	TOWN: WESTPORT TO STRATFORD DRAWING TITLE: CONDUIT ATTACHMENTS SHEET 2 OF 2	PROJECT NO. 300-0178 DRAWING NO. FCI-416 SHEET NO. 04.014
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 4/1/2016			



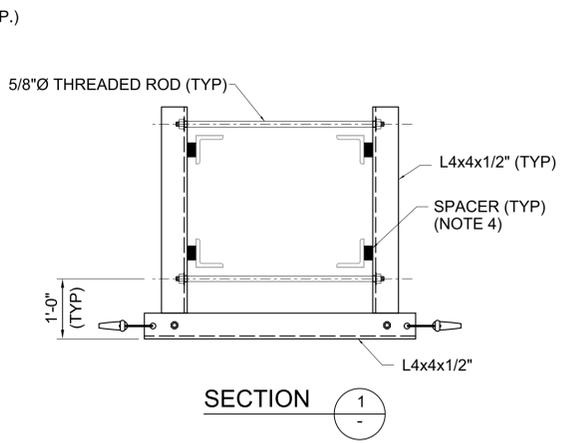
ELEVATION

**TYPE D-1
TYPICAL LATTICE STRUCTURE DEAD END**
(SEE ASSEMBLY DETAILS ON DWG # FCI-427)

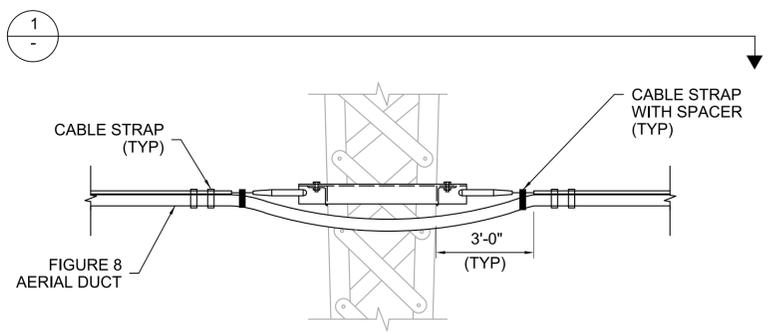


ELEVATION

**TYPE D-2
TYPICAL CHANNEL STRUCTURE DEAD END**
(SEE ASSEMBLY DETAILS ON DWG # FCI-427)

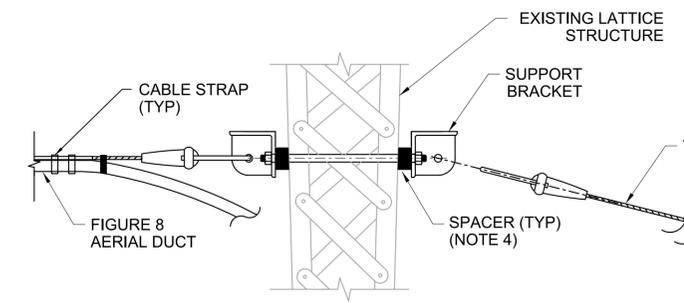


SECTION 1



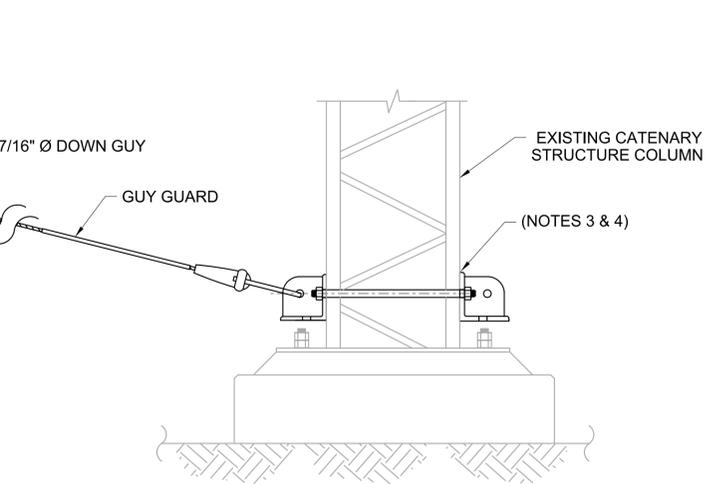
ELEVATION

**TYPE D-1M
TYPICAL OFFSET DEAD END BRACKET ON
LATTICE STRUCTURE**
(SEE ASSEMBLY DETAILS ON DWG # FCI-428)



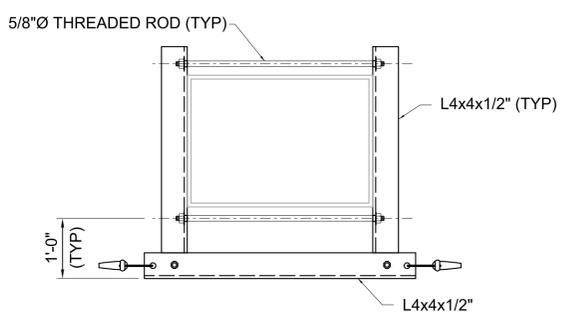
ELEVATION

**TYPE D-3
DEAD END BRACKET**
(SEE ASSEMBLY DETAILS ON DWG # FCI-428)

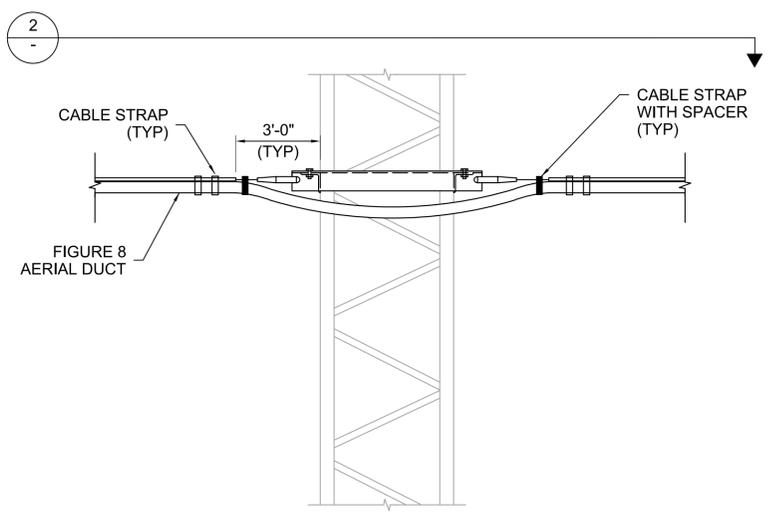


ELEVATION

**TYPE D-3A
DOWN GUY BRACKET**
(SEE ASSEMBLY DETAILS ON DWG # FCI-428)



SECTION 2



ELEVATION

**TYPE D-2M
TYPICAL OFFSET DEAD END BRACKET ON
LATTICE CHANNEL STRUCTURE**
(SEE ASSEMBLY DETAILS ON DWG # FCI-428)

- NOTES:
1. FOR GENERAL NOTES SEE DWG. G-002.
 2. FOR ABBREVIATIONS AND LEGEND SEE DWG. G-003.
 3. DOWN GUY BRACKET SHALL BE INSTALLED AS CLOSE TO THE BASE OF THE STRUCTURE AS POSSIBLE.
 4. SPACERS SHALL BE WELDED TO SUPPORT BRACKETS AS REQUIRED TO ALLOW FOR PROPER FIT ON RIVETED LATTICE STRUCTURES. SEE SPACER DETAIL ON DWG # FCI-421. IN ADDITION, ALL WELDED AREAS SHALL BE TREATED WITH TOUCH-UP COLD GALVANIZING COMPOUND.
 5. SEE DRAWING # FCI-440 FOR GROUNDING DETAILS.

REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 4/1/2016

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File name: ...FCI-417_FA_Sheet_0300-0178.dgn

SIGNATURE/BLOCK:

STV Incorporated
185 Plains Road
Suite 208E
Milford, CT 06461

PROJECT TITLE:

**NETWORK INFRASTRUCTURE
UPGRADE FOR SECURITY
NEW HAVEN LINE
PHASE 2**

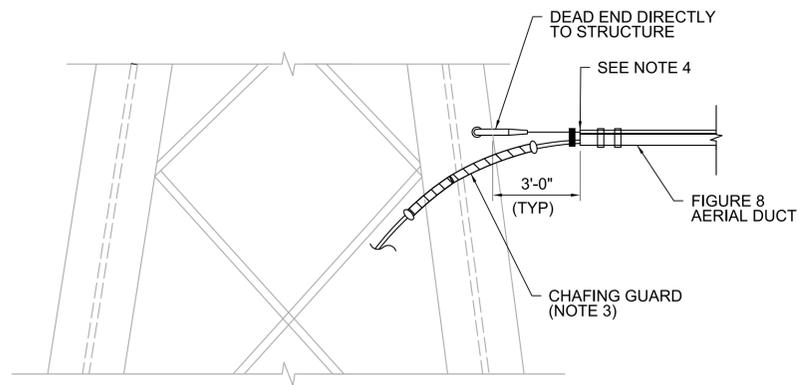
TOWN:

**WESTPORT
TO STRATFORD**

DRAWING TITLE:

**DEADEND ATTACHMENTS
SHEET 1 OF 3**

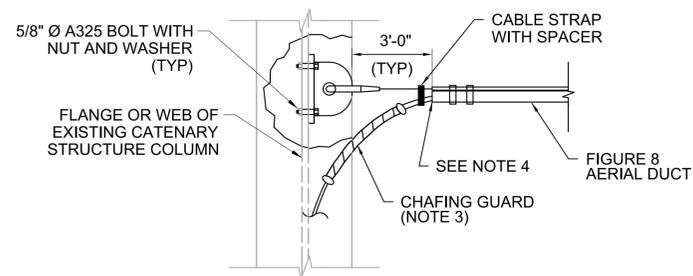
PROJECT NO. **300-0178**
DRAWING NO. **FCI-417**
SHEET NO. **04.015**



ELEVATION

**TYPE D-4
TYPICAL A-FRAME STRUCTURE DEAD END**

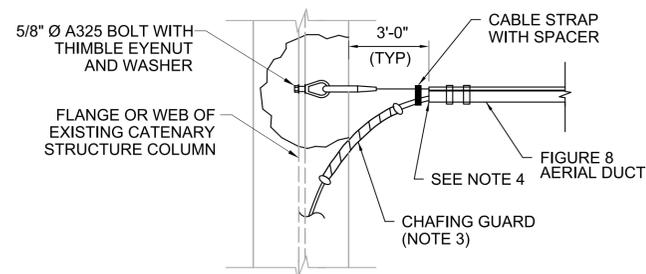
(SEE ASSEMBLY DETAILS ON DWG # FCI-427)
(NOTE 6)



ELEVATION

**TYPE D-4A
STRUCTURE DEAD END BRACKET**

(SEE ASSEMBLY DETAILS ON DWG # FCI-427)
(NOTE 6)



ELEVATION

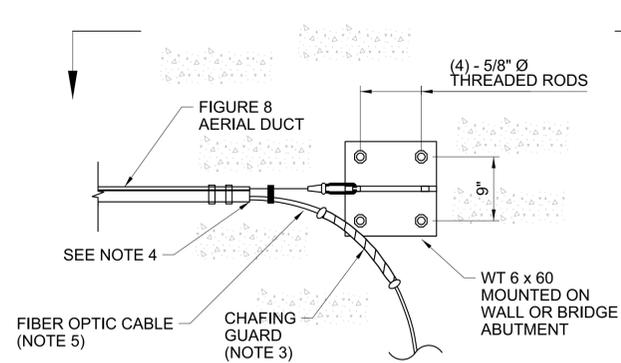
**TYPE D-4B
STRUCTURE DEAD END**

(SEE ASSEMBLY DETAILS ON DWG # FCI-427)
(NOTE 6)

NOTES:

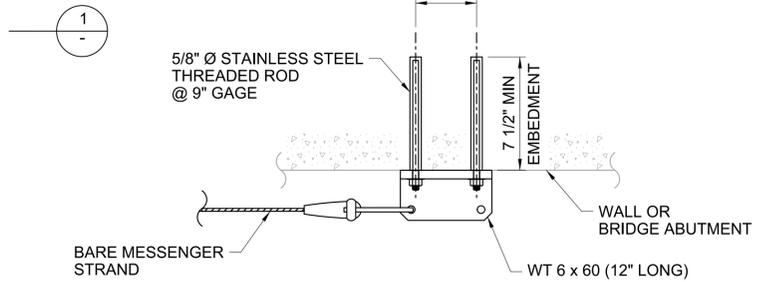
1. FOR GENERAL NOTES SEE DWG. G-002.
2. FOR ABBREVIATIONS AND LEGEND SEE DWG. G-003.
3. CONTRACTOR SHALL INSTALL SPLIT DUCT CHAFING GUARDS AROUND ALL CABLES THAT COME IN CONTACT WITH THE STRUCTURE, AND SECURE WITH TY-WRAPS AT EACH END AND IN THE CENTER IF THE DISTANCE BETWEEN WRAPS EXCEED 12".
4. FIGURE 8 AERIAL DUCT TERMINATIONS SHALL BE PLUGGED WITH 1 1/4" DUCT PLUG AS MANUFACTURED BY ETCO SPECIALTY PRODUCTS OR APPROVED EQUAL.
5. REFER TO DWG # FCI-440 FOR GROUNDING DETAILS.
6. ATTACHMENT TERMINATION SHALL BE INSTALLED AT A REDUCED TENSION, OR SLACK SPAN.

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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 4/1/2016			

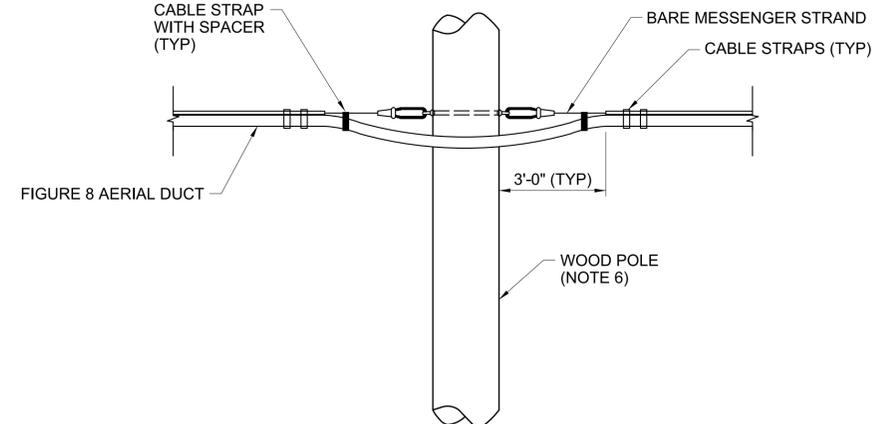


ELEVATION

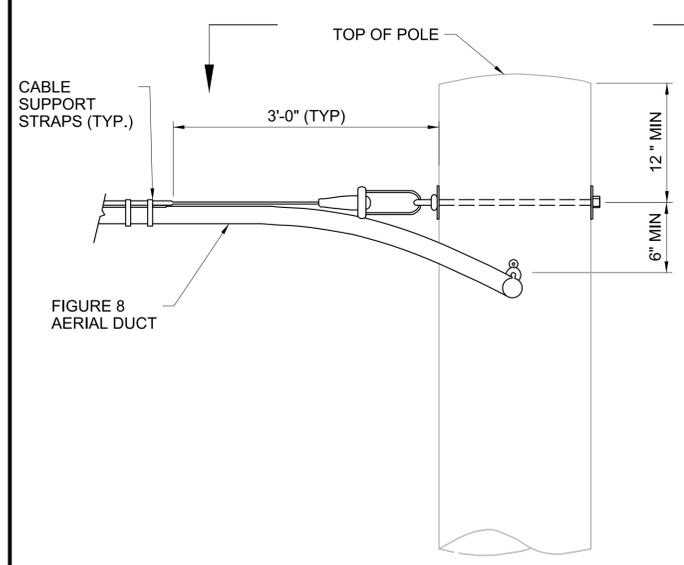
TYPE D-6
WALL / ABUTMENT MOUNTED DEAD END
(SEE ASSEMBLY DETAILS ON DWG # FCI-427)



SECTION 1

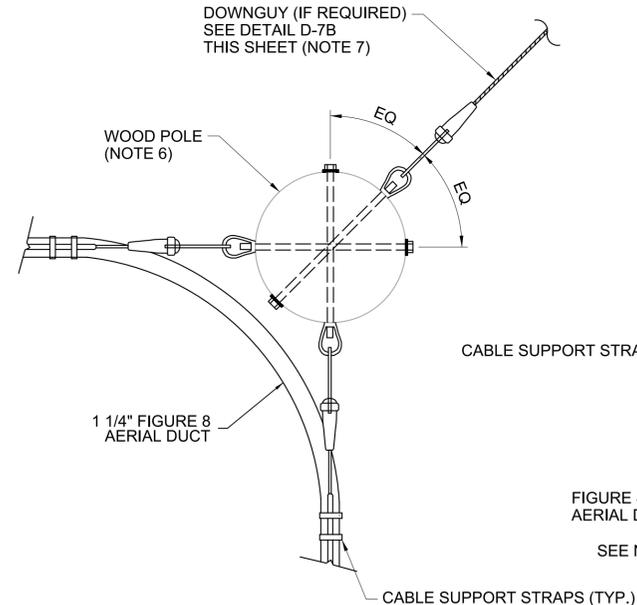


TYPE D-7
TYPICAL MESSENGER DEAD END ON WOOD POLE
(SEE ASSEMBLY DETAILS ON DWG # FCI-429)

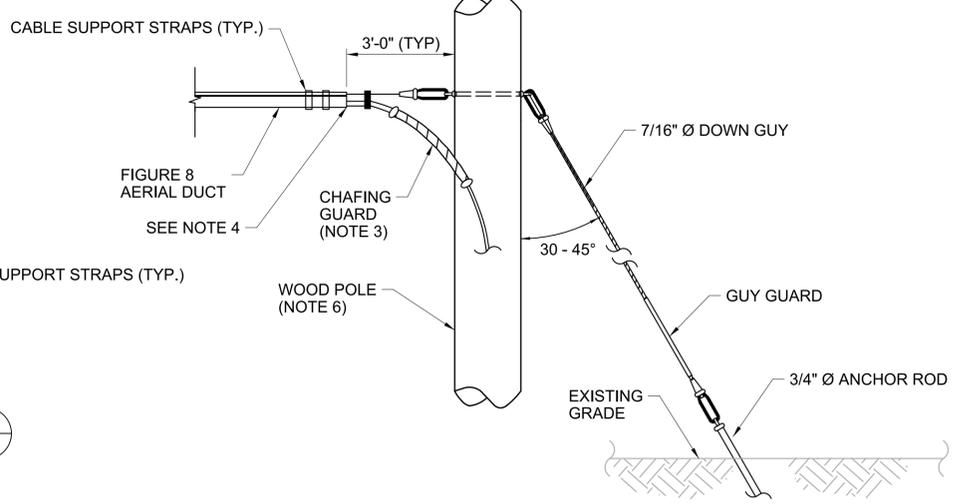


ELEVATION

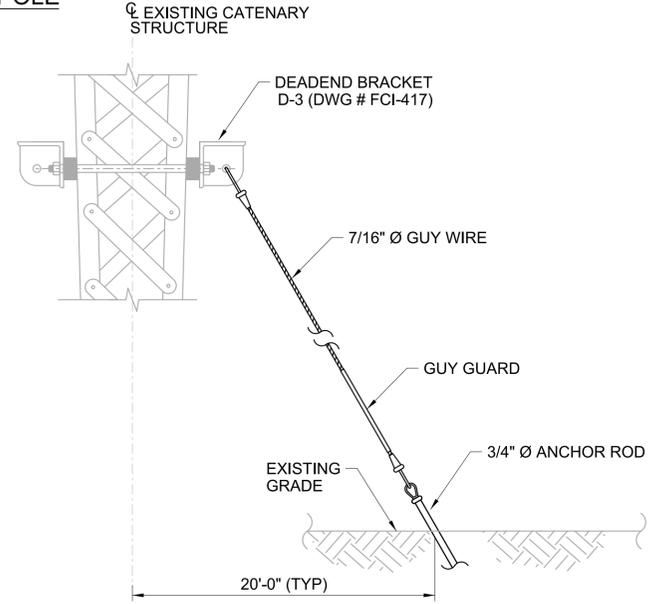
TYPE D-7A
MESSENGER DEAD END ON WOOD POLE (90° TURN)
(SEE ASSEMBLY DETAILS ON DWG # FCI-429)



SECTION 2



TYPE D-7B
MESSENGER DEAD END ON ONE SIDE
(SEE ASSEMBLY DETAILS ON DWG # FCI-429)



TYPE D-8
GUY DEAD END
(SEE ASSEMBLY DETAILS ON FCI-428)

- NOTES:
- FOR GENERAL NOTES SEE DWG. G-002.
 - FOR ABBREVIATIONS AND LEGEND SEE DWG. G-003.
 - CONTRACTOR SHALL INSTALL SPLIT DUCT CHAFING GUARDS AROUND ALL CABLES THAT COME IN CONTACT WITH THE STRUCTURE, AND SECURE WITH TY-WRAPPS AT EACH END AND IN THE CENTER IF THE DISTANCE BETWEEN WRAPS EXCEED 12".
 - FIGURE 8 AERIAL DUCT TERMINATIONS SHALL BE PLUGGED WITH 1 1/4" DUCT PLUG AS MANUFACTURED BY ETCO SPECIALTY PRODUCTS (PART # CL-127S-620, CONTRACTOR SHALL VERIFY) OR APPROVED EQUAL.
 - CABLE ARRANGEMENT MAY VARY DEPENDING ON CONDUIT DROP OR CABLE CROSSOVER AT SUPPORT LOCATIONS.
 - CABLE ROUTING PLAN DRAWINGS SPECIFY WHETHER WOOD POLE IS EXISTING OR NEW IN THIS CONTRACT.
 - INSTALL THE DOWNGUY ATTACHMENT A MINIMUM OF 6" BELOW THE FIGURE 8 AERIAL DUCT.

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 DEPARTMENT OF TRANSPORTATION

File name: ...FCI-419_FA_Sheet_0300-0178.dgn

SIGNATURE/BLOCK:

STV Incorporated
 185 Plains Road
 Suite 208E
 Milford, CT 06461

PROJECT TITLE:

**NETWORK INFRASTRUCTURE
 UPGRADE FOR SECURITY
 NEW HAVEN LINE
 PHASE 2**

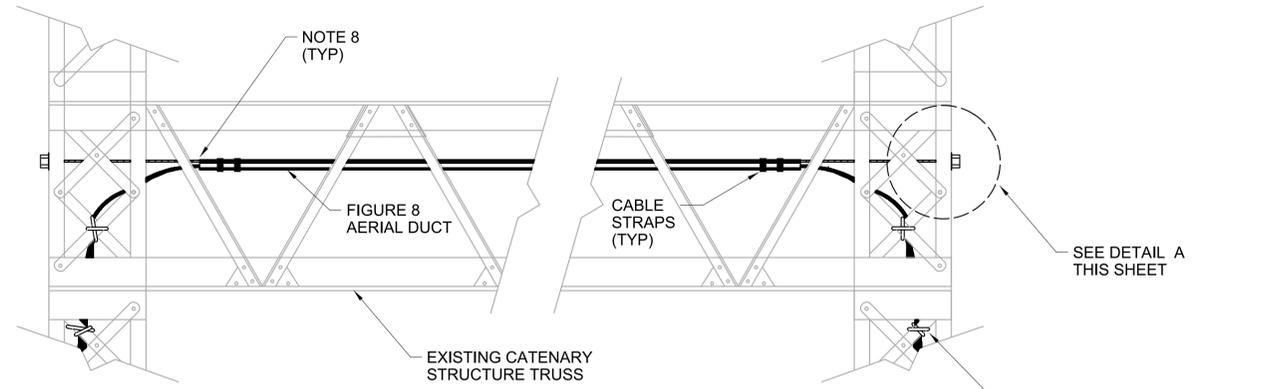
TOWN:

**WESTPORT
 TO STRATFORD**

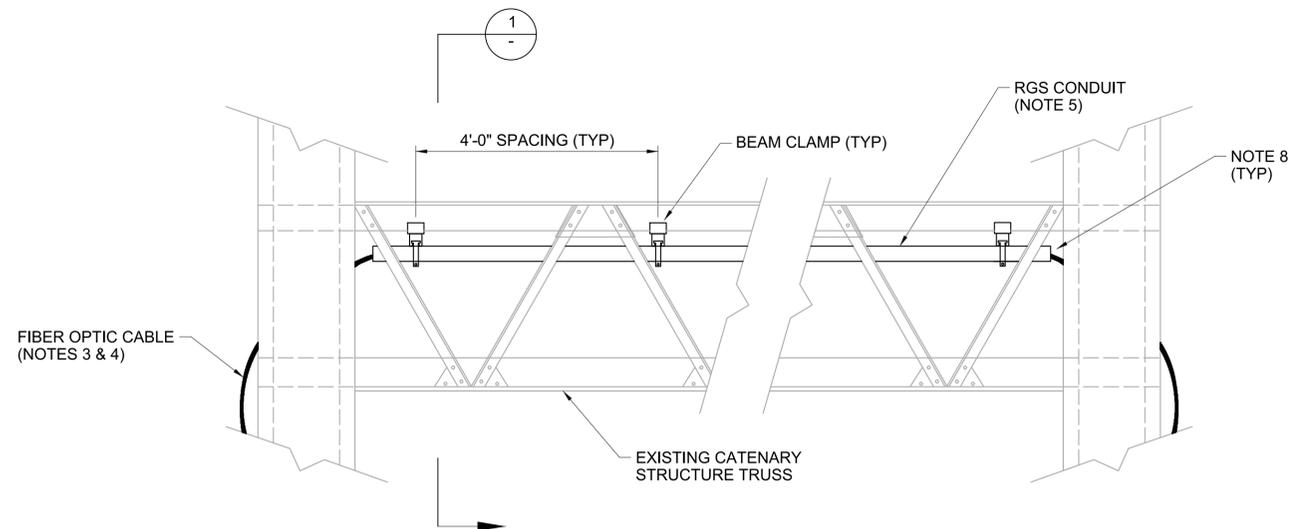
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**DEADEND ATTACHMENTS
 SHEET 3 OF 3**

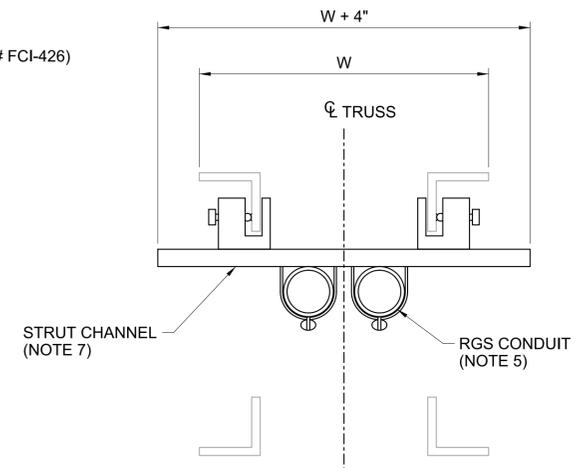
PROJECT NO. **300-0178**
 DRAWING NO. **FCI-419**
 SHEET NO. **04.017**



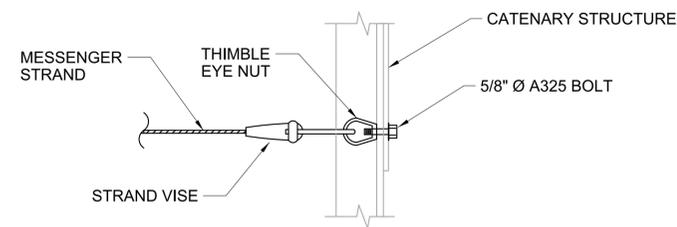
**ELEVATION VIEW
TYPE X-1
TYPICAL CABLE CROSSING**
(SEE ASSEMBLY DETAILS ON DWG # FCI-428)



**ELEVATION VIEW
TYPE X-2
CABLE CROSSING**
(SEE ASSEMBLY DETAILS ON DWG # FCI-426)



SECTION 1

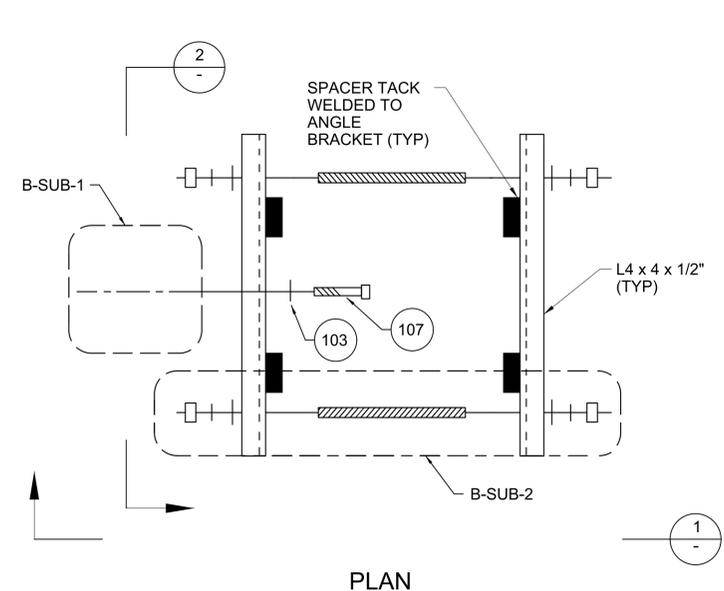


DETAIL A

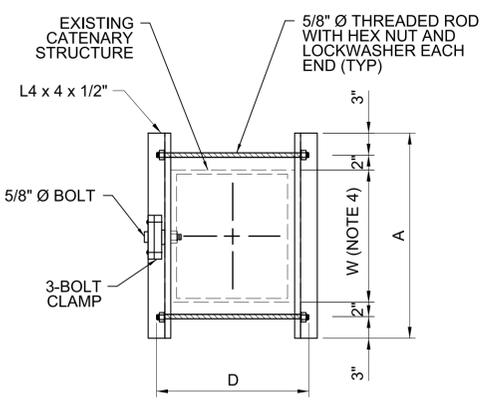
NOTES:

1. FOR GENERAL NOTES SEE DWG. G-002.
2. FOR ABBREVIATIONS AND LEGEND SEE DWG. G-003.
3. CONTRACTOR SHALL INSTALL CHAFING GUARDS AROUND ALL CABLES THAT COME IN CONTACT WITH THE STRUCTURE, AND SECURE WITH TY-WRAPPS AT EACH END AND IN THE CENTER IF THE DISTANCE BETWEEN WRAPS EXCEED 12".
4. SEE CABLE SPECIFICATIONS FOR MINIMUM BENDING RADIUS.
5. NUMBER OF CONDUITS AND THEIR SIZE ARE SPECIFIED IN CABLE ROUTING PLANS.
6. ATTACHMENT OF BEAM CLAMPS TO LEG, FLANGE, OR DIAGONAL BRACING OF EXISTING CATENARY STRUCTURES IS PERMITTED.
7. CONTRACTOR SHALL FIELD VERIFY/CUT LENGTHS OF STRUT CHANNEL TO SITE SPECIFIC REQUIREMENTS AND PROTECT AS SPECIFIED.
8. CONTRACTOR SHALL INSTALL SPLIT DUCT PLUGS AT EVERY OPENING OF FIGURE 8 AERIAL DUCT OR RGS CONDUIT.
9. ATTACHMENT OF TYPE X-2 ASSEMBLY TO THE BOTTOM TRUSS CORD OF THE SUPPORTING STRUCTURE IS ALSO PERMITTED.

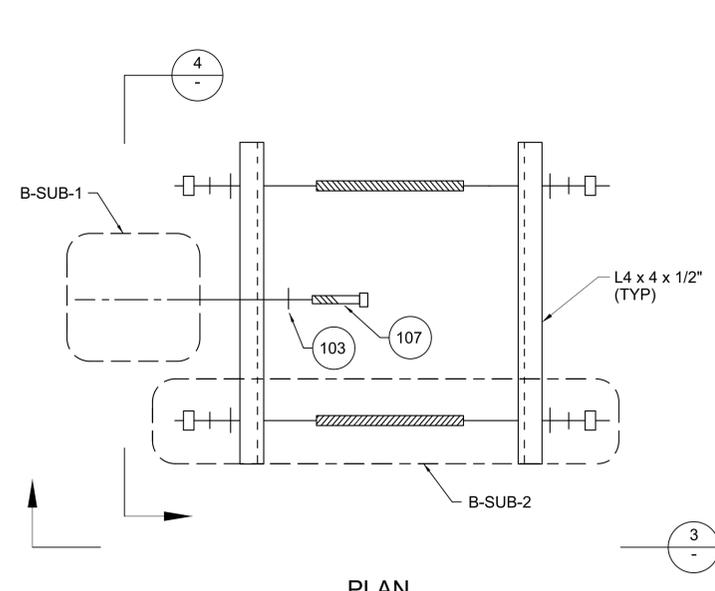
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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 4/1/2016			



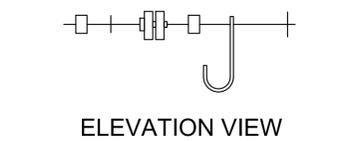
PLAN



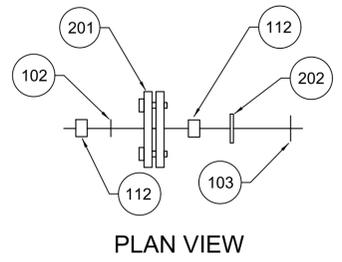
SUPPORT BRACKET			
TYPE	W	A	D
LA	24"	34"	31"
LC	36"	46"	40"
BC	24"	34"	26"



PLAN

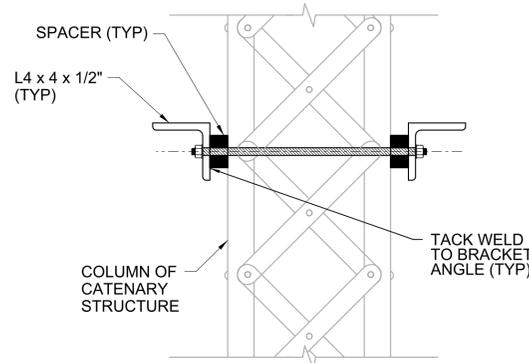


ELEVATION VIEW



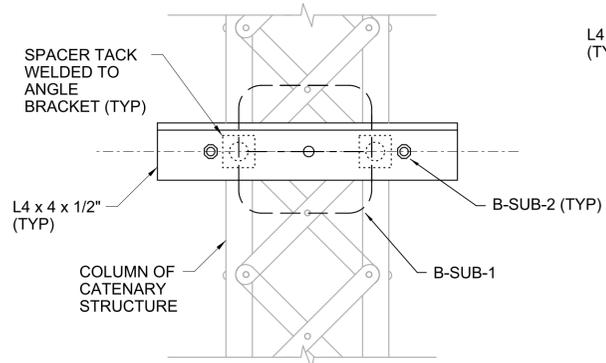
PLAN VIEW

ASSEMBLY B-SUB-1
TYPICAL 3-BOLT CLAMP

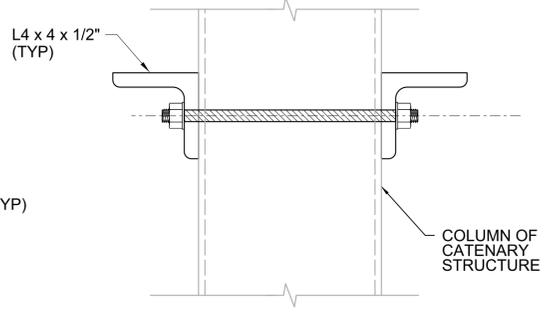


SECTION 1

ASSEMBLY TYPE B-1
TYPICAL SUPPORT BRACKET

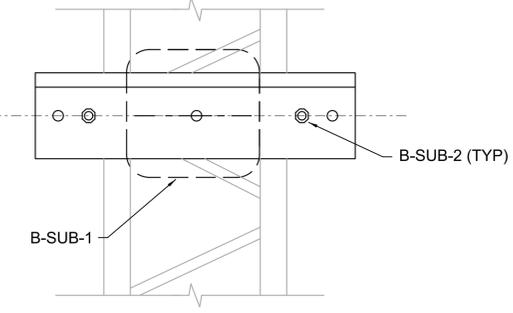


SECTION 2

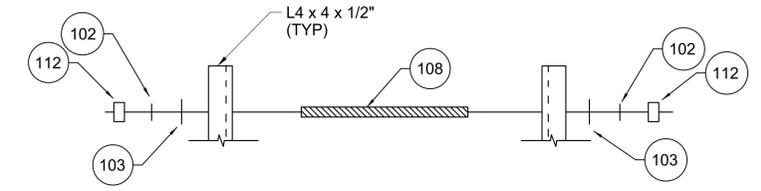


SECTION 3

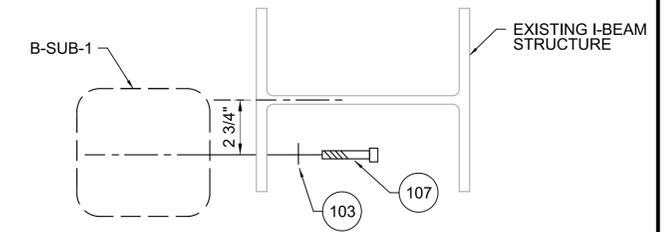
ASSEMBLY TYPE B-2
TYPICAL SUPPORT BRACKET



SECTION 4

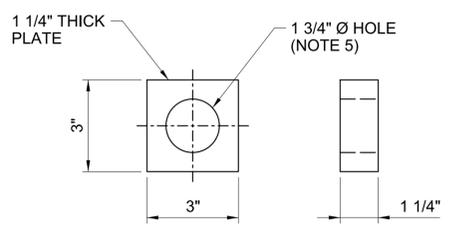


ASSEMBLY B-SUB-2
TYPICAL BRACKET BINDING ASSEMBLY



ASSEMBLY TYPE B-3
BOLT ATTACHMENT

BILL OF MATERIALS							
REF #	DESCRIPTION	QUANTITY PER ASSEMBLY					MANUFACTURER PART # / DETAIL (OR APPROVED EQUAL)
		B-SUB-1	B-SUB-2	B-1	B-2	B-3	
102	5/8" LOCK WASHER	1	2	-	-	-	HUBBELL / CHANCE 4036
103	5/8" WASHER	1	2	1	1	1	HUBBELL / CHANCE 6805
107	5/8" Ø A325 BOLT	-	-	1	1	1	PORTLAND BOLT (SEE NOTE 2)
108	5/8" Ø ASTM A307 THREADED ROD	-	1	-	-	-	FIELD CUT AS REQUIRED
112	5/8" HEAVY HEX NUT	2	2	-	-	-	PORTLAND BOLT
201	3 BOLT CLAMP	1	-	-	-	-	ELECTRIC MOTION EM0930
202	J HOOK	1	-	-	-	-	MACLEAN POWER SYSTEMS J2235C
B-SUB-1	3 BOLT CABLE CLAMP ASSEMBLY	-	-	1	1	1	
B-SUB-2	BRACKET BINDING ASSEMBLY	-	-	2	2	-	
-	SPACER	-	-	4	-	-	



SPACER DETAIL

NOTES:

- ALL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED. ALL FIELD CUTS SHALL RECEIVE TOUCHED UP PAINT.
- PORTLAND BOLTS FABRICATED TO CONTRACT SPECIFICATIONS.
- TORQUE ALL FASTENERS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- LENGTH OF STEEL BRACKET AND RODS VARIES DEPENDING ON STRUCTURE TYPE. CONTRACTOR SHALL VERIFY ALL MEASUREMENTS PRIOR TO FABRICATION AND INSTALLATION.
- HOLE IN SPACER TO ALLOW FOR PROPER FIT ON RIVETED CATENARY STRUCTURES. CONTRACTOR TO VERIFY RIVET HEAD SIZE FOR DIAMETER OF HOLE IN SPACER.
- FOR DRILLING LOCATIONS OF STRUCTURAL ANGLES, SEE DWG # FCI-422.

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

DESIGNER/DRAFTER: **PM/MN**
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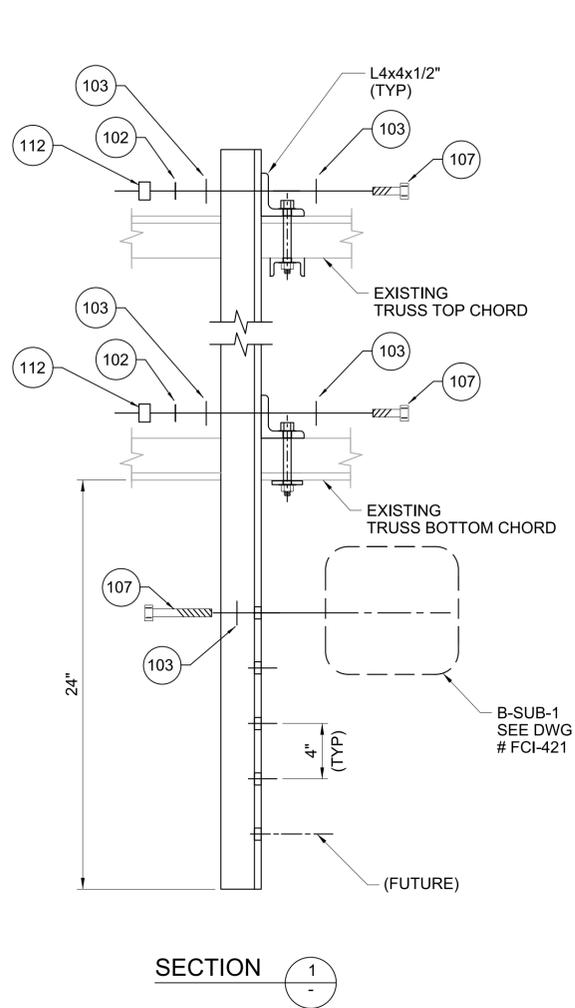
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185 Plains Road
Suite 208E
Milford, CT 06461

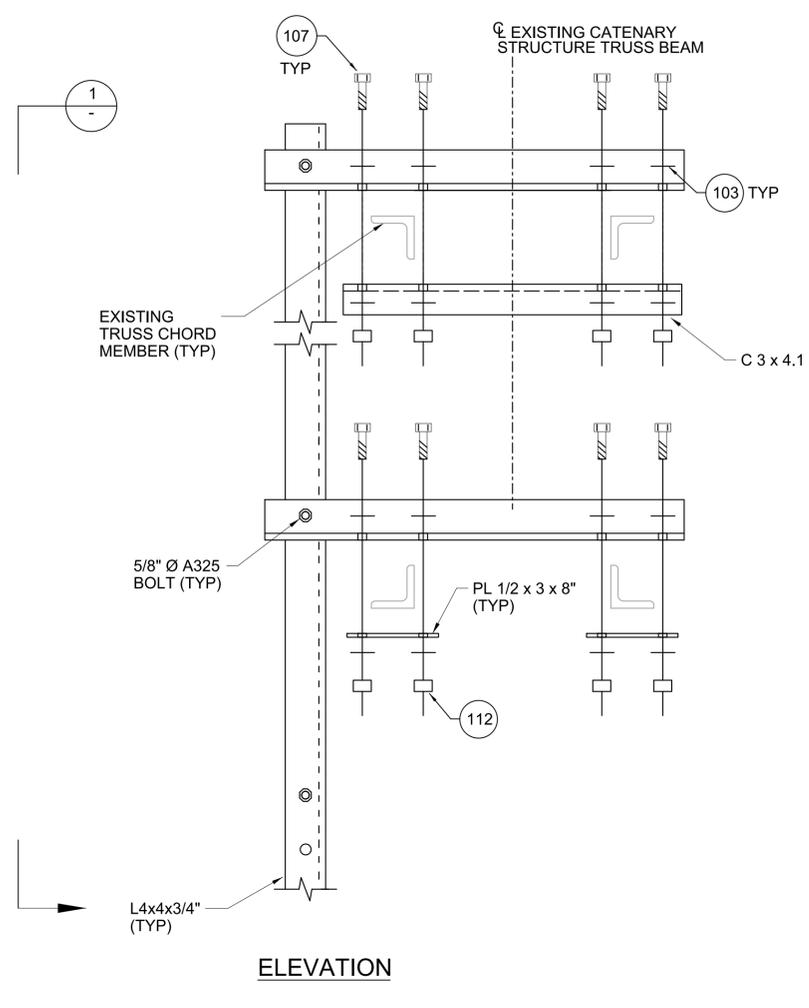
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NETWORK INFRASTRUCTURE UPGRADE FOR SECURITY NEW HAVEN LINE PHASE 2

TOWN: **WESTPORT TO STARTFORD**
DRAWING TITLE:
ASSEMBLY DETAILS SHEET 1 OF 4

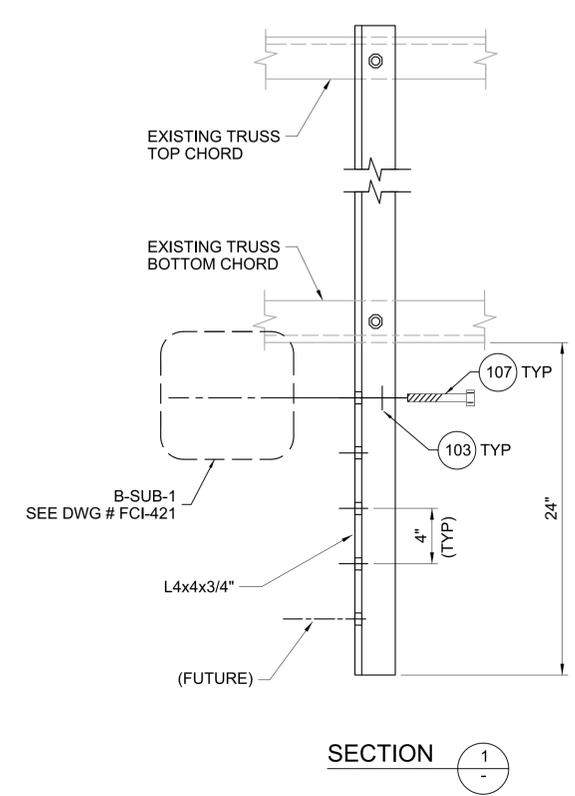
PROJECT NO. **300-0178**
DRAWING NO. **FCI-421**
SHEET NO. **04.019**



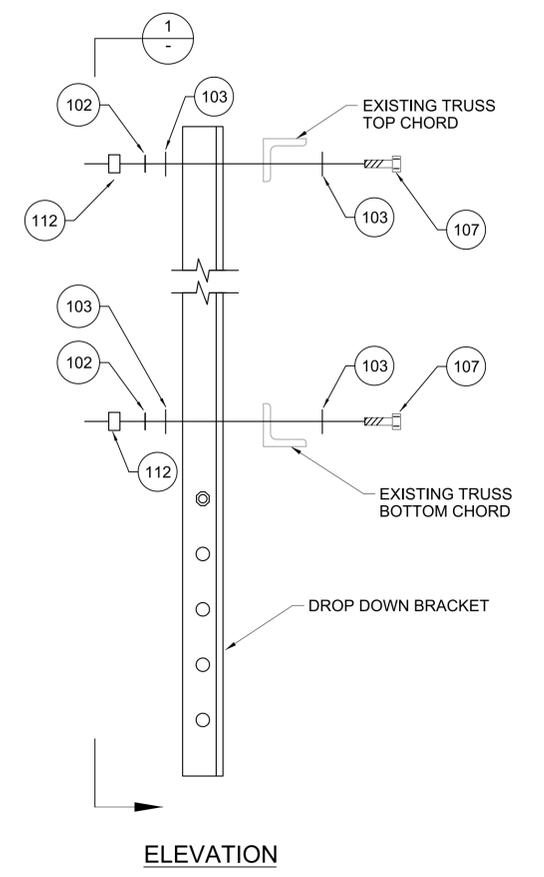
**TYPE B-5
CROSS-MEMBER ASSEMBLY**



ELEVATION

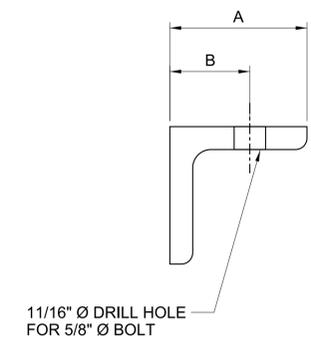


**TYPE B-5A
CROSS-MEMBER ASSEMBLY**



ELEVATION

BILL OF MATERIALS				
REF #	DESCRIPTION	QUANTITY PER ASSEMBLY		MANUFACTURER PART # / DETAIL (OR APPROVED EQUAL)
		B-5	B-5A	
102	5/8" LOCK WASHER	2	2	HUBBELL / CHANCE 4036
103	5/8" WASHER	21	5	HUBBELL / CHANCE PS 6805
107	5/8" Ø A325 BOLT	11	3	PORTLAND BOLT (SEE NOTE 2)
112	5/8" HEAVY HEX NUT	10	2	PORTLAND BOLT
B-SUB-1	3-BOLT CABLE CLAMP ASSEMBLY (SEE DWG # FCI-421)	1	1	

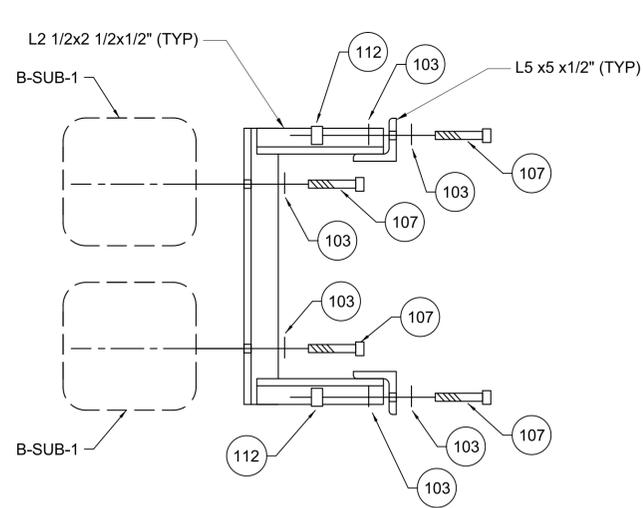


ANGLE SIZE	BOLT GAUGE
A (IN)	B (IN)
3	1 3/4
3 1/2	2
4	2 1/2
5	3
6	3 1/2

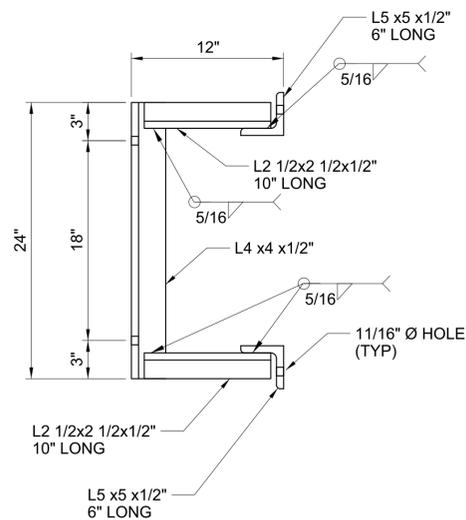
DRILLING REQUIREMENTS FOR STRUCTURAL ANGLES

- NOTES:**
- ALL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED. ALL FIELD CUTS SHALL RECEIVE TOUCHED UP PAINT.
 - PORTLAND BOLTS FABRICATED TO CONTRACT SPECIFICATIONS.
 - TORQUE ALL FASTENERS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

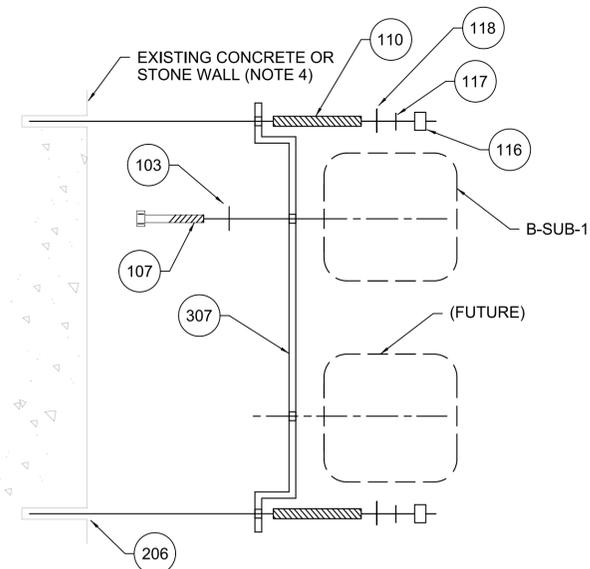
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.	DESIGNER/DRAFTER: PM/MN	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	SIGNATURE/ BLOCK: 	PROJECT TITLE: NETWORK INFRASTRUCTURE UPGRADE FOR SECURITY NEW HAVEN LINE PHASE 2	TOWN: WESTPORT TO STRATFORD	PROJECT NO. 300-0178
	CHECKED BY: SCC					SCALE AS NOTED
REV. DATE REVISION DESCRIPTION SHEET NO. Plotted Date: 4/1/2016	Filename: ...FCI-422_FA_Sheet_0300-0178.dgn		STV Incorporated 185 Plains Road Suite 208E Milford, CT 06461	SHEET NO. 04.020	DRAWING TITLE: ASSEMBLY DETAILS SHEET 2 OF 4	



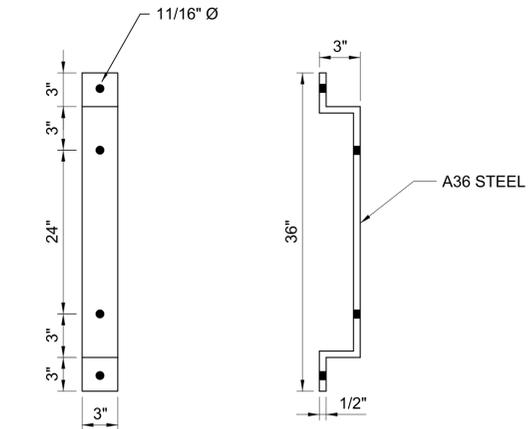
**ASSEMBLY TYPE B-4
BRACKET ASSEMBLY**



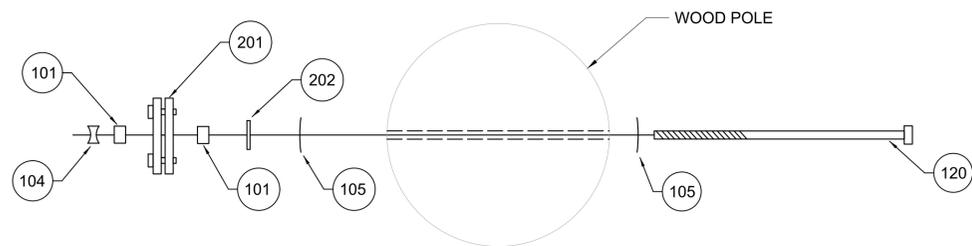
**ASSEMBLY TYPE B-6
WALL BRACKET ASSEMBLY**



**ASSEMBLY TYPE B-12
STRANDWISE PULLOFF ATTACHMENT**



TYPICAL WALL BRACKET



**PLAN VIEW
ASSEMBLY TYPE B-7
3-BOLT CLAMP WOOD POLE ASSEMBLY**

BILL OF MATERIALS

REF #	DESCRIPTION	QUANTITY PER ASSEMBLY				MANUFACTURER PART # / DETAIL (OR APPROVED EQUAL)
		B-4	B-6	B-7	B-12	
101	5/8" SQUARE NUT	-	-	2	-	HUBBELL / CHANCE 55084P
103	5/8" WASHER	6	1	-	-	HUBBELL / CHANCE PS6805
104	5/8" M-F CURVED LOCKNUT	-	-	1	-	HUBBELL / CHANCE 3512
105	2 1/2 x 2 1/2 x 3/16" SQUARE CURVED WASHER	-	-	2	-	HUBBELL / CHANCE PS6822
107	5/8" Ø A325 BOLT	4	1	-	-	PORTLAND BOLT (SEE NOTE 2)
110	5/8" Ø X S.S. THREADED ROD, GRADE 316L	-	2	-	-	FIELD CUT
112	5/8" HEAVY HEX NUT	2	-	-	-	PORTLAND BOLT
116	5/8" STAINLESS STEEL HEX NUT	-	2	-	-	PORTLAND BOLT
117	5/8" STAINLESS STEEL LOCK WASHER	-	2	-	-	PORTLAND BOLT
118	5/8" STAINLESS STEEL WASHER	-	2	-	-	PORTLAND BOLT
120	5/8" Ø MACHINE BOLT	-	-	1	-	HUBBELL / CHANCE 8814
201	3 BOLT CLAMP	-	-	1	1	ELECTRIC MOTION EM0930
202	J HOOK	-	-	1	-	MACLEAN POWER SYSTEMS J2235C
205	3/8" STRANDWISE	-	AS REQ'D	-	2	HUBBELL GDE-5202
206	EPOXY ADHESIVE	-	AS REQ'D	-	-	HILTI HIT-RE 500-SD
210	ANCHOR SHACKLE	-	-	-	1	HUBBELL / CHANCE 5801
307	WALL BRACKET, GRADE A36 STEEL	-	1	-	-	CONTRACTOR TO FABRICATE
801	3/8" MESSENGER WIRE, 7-STRAND EHS STEEL, GALV.	-	-	-	AS REQ'D	
B-SUB-1	3-BOLT CABLE CLAMP ASSEMBLY (SEE DWG #FCI-421)	2	1	-	-	

NOTES:

- ALL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED. FIELD CUT SHALL RECEIVE TOUCHED UP PAINT.
- PORTLAND BOLTS FABRICATED TO CONTRACT SPECIFICATIONS.
- TORQUE ALL FASTENERS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- DRILLING LOCATIONS SHALL HAVE A MINIMUM DISTANCE OF 6" FROM EDGE OF CONCRETE AND 12" FROM EDGE OF STONE.

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

DESIGNER/DRAFTER:
PM/MN
CHECKED BY:
SCC
SCALE AS NOTED



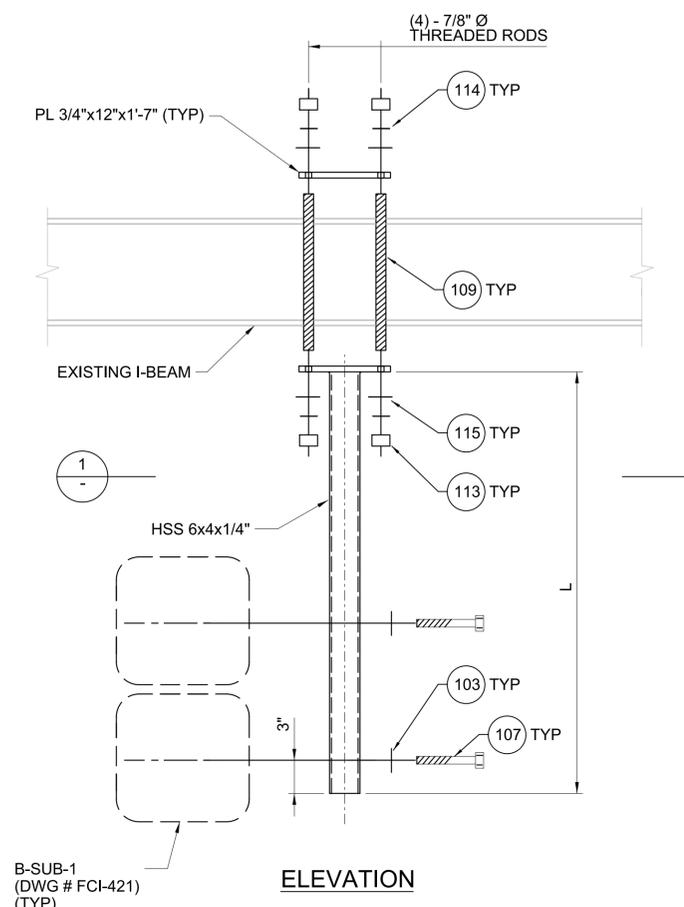
SIGNATURE/BLOCK:

STV Incorporated
185 Plains Road
Suite 208E
Milford, CT 06461

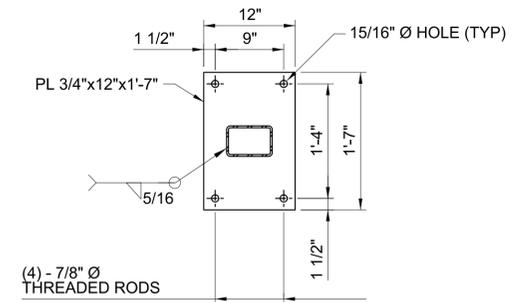
PROJECT TITLE:
**NETWORK INFRASTRUCTURE
UPGRADE FOR SECURITY
NEW HAVEN LINE
PHASE 2**

TOWN:
**WESTPORT
TO STRATFORD**
DRAWING TITLE:
**ASSEMBLY DETAILS
SHEET 3 OF 4**

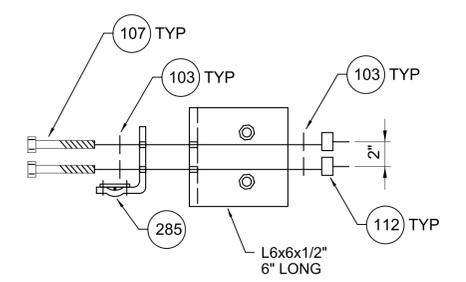
PROJECT NO.
300-0178
DRAWING NO.
FCI-423
SHEET NO.
04.021



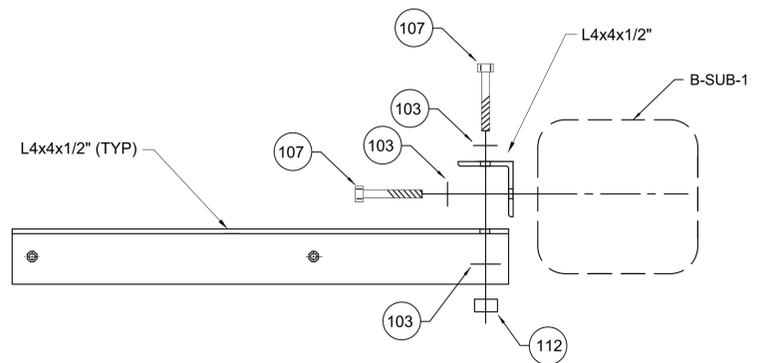
**ASSEMBLY TYPE B-5B
CROSS-MEMBER ASSEMBLY**



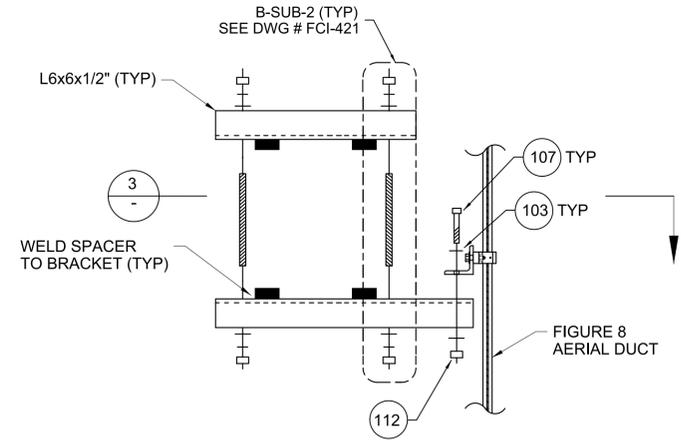
SECTION 1



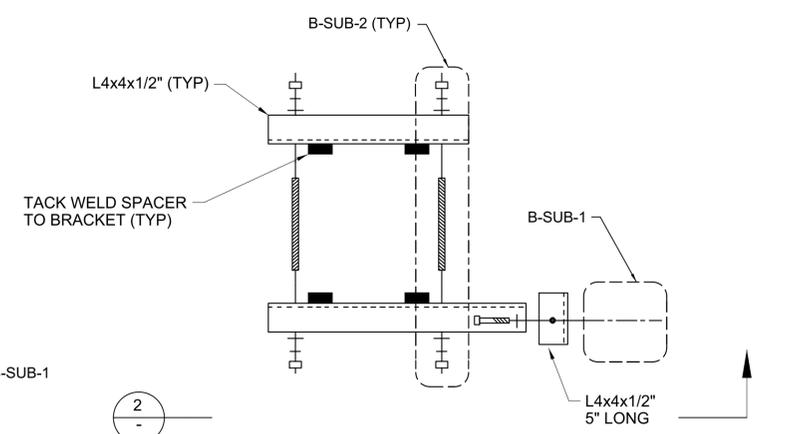
SECTION 3



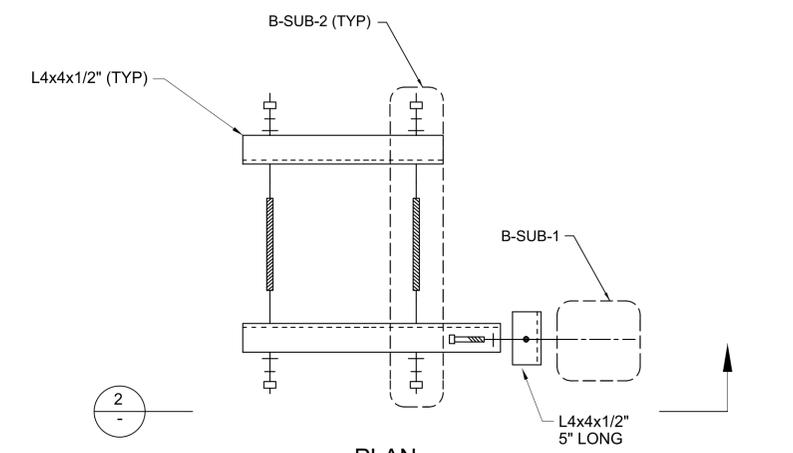
SECTION 2



**ASSEMBLY TYPE B-11
TYPICAL ANGLE BRACKET ON
LATTICE TOWER STRUCTURE**



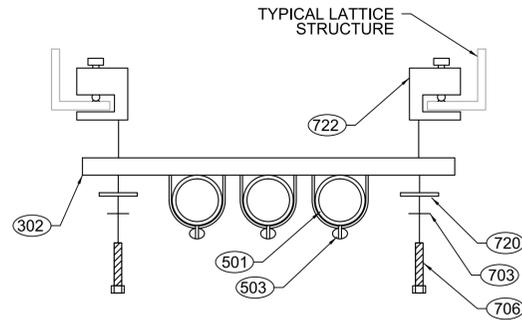
**ASSEMBLY TYPE B-1M
TYPICAL OFFSET BRACKET ON LATTICE STRUCTURE**



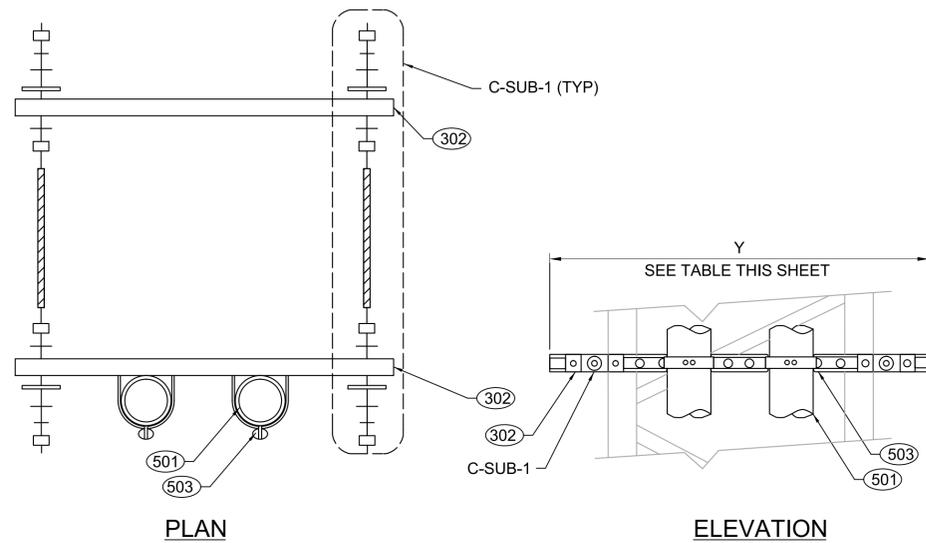
**ASSEMBLY TYPE B-2M
TYPICAL OFFSET BRACKET ON PORTAL LATTICE WITH CHANNEL**

- NOTES:**
1. ALL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED. ALL FIELD CUTS SHALL RECEIVE TOUCHED UP PAINT.
 2. PORTLAND BOLTS FABRICATED TO CONTRACT SPECIFICATIONS.
 3. TORQUE ALL FASTENERS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 4. OFFSET DISTANCE FROM VERTICAL SUPPORT SHALL BE AS SHOWN ON CABLE ROUTING PLAN DRAWINGS.
 5. FOR DRILLING LOCATIONS OF STRUCTURAL ANGLES, SEE DWG # FCI-422.

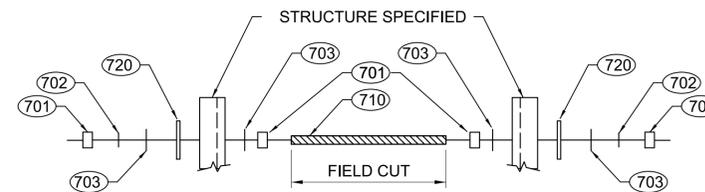
BILL OF MATERIALS						
REF #	DESCRIPTION	QUANTITY PER ASSEMBLY				MANUFACTURER PART # / DETAIL (OR APPROVED EQUAL)
		B-5B	B-1M	B-2M	B-11	
103	5/8" WASHER	2	3	3	8	HUBBELL / CHANCE 6805
107	5/8" Ø A325 BOLT	2	2	2	4	PORTLAND BOLT (SEE NOTE 2)
109	7/8" Ø A307 THREADED ROD	4	-	-	-	FIELD CUT
112	5/8" HEAVY HEX NUT	-	1	1	4	PORTLAND BOLT
113	7/8" HEAVY HEX NUT	8	-	-	-	PORTLAND BOLT
114	7/8" LOCK WASHER	8	-	-	-	HUBBELL / CHANCE PSC2050496
115	7/8" WASHER	8	-	-	-	HUBBELL / CHANCE PS6807
285	MESSENGER SUPPORT BRACKET	-	-	-	1	
B-SUB-1	3-BOLT CABLE CLAMP ASSEMBLY (SEE DWG # FCI-421)	2	1	1	-	
B-SUB-2	BRACKET BINDING ASSEMBLY (SEE DWG # FCI-421)	-	2	2	2	
-	SPACER (DWG # FCI-421)	-	4	-	4	



ASSEMBLY TYPE C-1



ASSEMBLY TYPE C-2



ASSEMBLY C-SUB-1
TYPICAL BRACKET BINDING ASSEMBLY

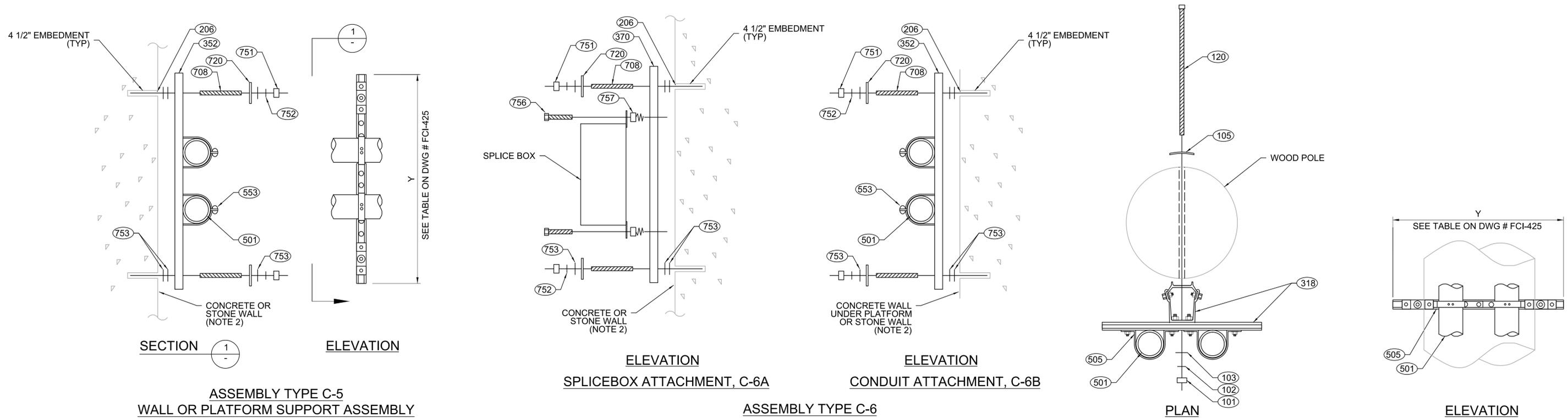
CHANNEL STRUT LENGTHS	
"Y" (NOTE 5)	STRUCTURE TYPE
26"	PORTAL LATTICE WITH ANGLE LEGS (LA)
40"	PORTAL LATTICE WITH CHANNEL LEGS (LC)
30"	BUILT UP CHANNEL WITH PLATES (BC)
18"	WIDE FLANGE I-BEAM (WF)
40"	A-FRAME PORTAL (AF)
20"	WALL
20"	PLATFORM
12"	WOOD POLE (WP)

BILL OF MATERIALS					
REF #	DESCRIPTION	QUANTITY PER ASSEMBLY			MANUFACTURER PART # / DETAIL (NOTE 3 & 6) (OR APPROVED EQUAL)
		C-SUB-1	C-1	C-2	
302	1 5/8" CHANNEL, 12 GAUGE	-	1	2	UNISTRUT P1000HS
501	CONDUIT (NOTE 4)	-	AS REQ'D	AS REQ'D	ALLIED RIGID
503	CONDUIT CLAMP (NOTE 4)	-	AS REQ'D	AS REQ'D	UNISTRUT P1117
701	1/2" HEX NUT	4	-	-	PORTLAND BOLT
702	1/2" LOCK WASHER	2	-	-	HUBBELL / CHANCE 4035
703	1/2" WASHER	4	2	-	HUBBELL / CHANCE PS6803
706	1/2" Ø HEX HEAD BOLT	-	2	-	PORTLAND BOLT
710	1/2" Ø THREADED ROD	1	-	-	UNISTRUT HTHR050
720	FLAT PLATE FITTING	2	2	-	UNISTRUT P1064
722	BEAM CLAMP	-	2	-	UNISTRUT PFL050T
C-SUB-1	BRACKET BINDING ASSEMBLY	-	-	2	

NOTES:

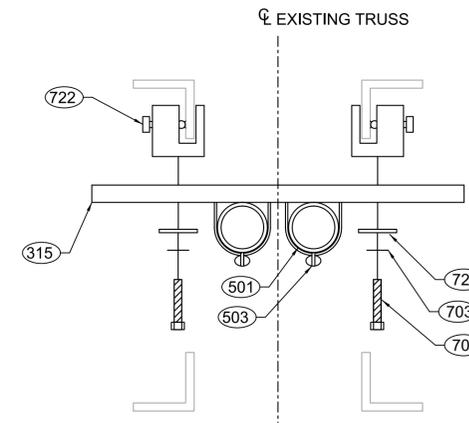
- TORQUE ALL FASTENERS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- NUMBER OF CONDUITS, THEIR SIZE, AND MATERIAL ARE SPECIFIED IN CABLE ROUTING PLAN DRAWINGS.
- ALL MOUNTING HARDWARE FOR PVC COATED CONDUIT ON CATENARY STRUCTURES SHALL BE STAINLESS STEEL. HOT-DIP GALVANIZED HARDWARE SHALL BE USED OTHERWISE.
- MANUFACTURER PART NUMBER VARIES DEPENDING ON SIZE OF CONDUIT. SEE CABLE ROUTING PLANS FOR MORE INFORMATION.
- LENGTH OF STRUT CHANNEL VARIES DEPENDING ON CATENARY STRUCTURE TYPE. CONTRACTOR SHALL VERIFY ALL MEASUREMENTS PRIOR TO FABRICATION AND CONSTRUCTION.
- THE PART NUMBERS SHOWN ARE FOR REFERENCE ONLY. ALL ITEMS SHALL BE COMPATIBLE TO FORM A COMPLETE CONDUIT SUPPORT SYSTEM IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS.

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: PM/MN CHECKED BY: SCC SCALE AS NOTED	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Filename: ...FCI-425_FA_Sheet_0300-0178.dgn	SIGNATURE/ BLOCK: STV Incorporated 185 Plains Road Suite 208E Milford, CT 06461	PROJECT TITLE: NETWORK INFRASTRUCTURE UPGRADE FOR SECURITY NEW HAVEN LINE PHASE 2	TOWN: WESTPORT TO STRATFORD DRAWING TITLE: CONDUIT ASSEMBLY DETAILS SHEET 1 OF 2	PROJECT NO. 300-0178 DRAWING NO. FCI-425 SHEET NO. 04.023
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 4/1/2016			



BILL OF MATERIALS

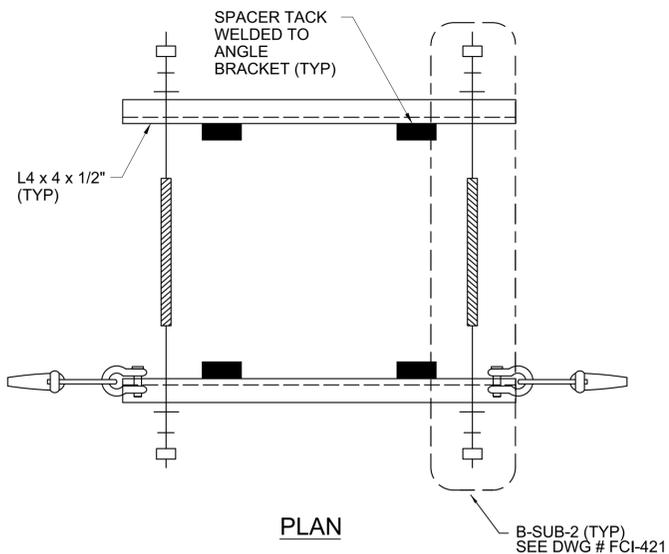
REF #	DESCRIPTION	QUANTITY PER ASSEMBLY					MANUFACTURER PART # / DETAIL (NOTES 3 & 7) (OR APPROVED EQUAL)
		C-5	C-6A	C-6B	C-7	X-2	
101	5/8" SQUARE NUT	-	-	-	1	-	HUBBELL / CHANCE 55084P
102	5/8" LOCK WASHER	-	-	-	1	-	HUBBELL / CHANCE 4036
103	5/8" WASHER	-	-	-	1	-	HUBBELL / CHANCE 6805
105	2 1/2 x 2 1/2 x 3/16" SQUARE CURVED WASHER	-	-	-	1	-	HUBBELL / CHANCE PS6822
120	5/8" Ø MACHINE BOLT	-	-	-	1	-	HUBBELL / CHANCE 8814
206	EPOXY ADHESIVE	AS REQ'D	AS REQ'D	AS REQ'D	-	-	HITLI HIT-RE 500-SD
315	1 5/8 x 3 1/4" CHANNEL, 12 GAUGE	-	-	-	-	1	UNISTRUT P5000HS
318	CONDUIT STANDOFF BRACKET (NOTE 4)	-	-	-	1	-	HUBBELL / CHANCE C6CSO12
352	1 5/8" STAINLESS STEEL CHANNEL, 12 GAUGE	1	-	1	-	-	UNISTRUT P1000HS (SS)
370	1 5/8 x 7/8" S.S. CHANNEL, 12 GAUGE, SLOTTED HOLES	-	2	-	-	-	UNISTRUT P3300T (SS)
501	CONDUIT (NOTE 4)	AS REQ'D	-	AS REQ'D	AS REQ'D	AS REQ'D	ALLIED RIGID
503	CONDUIT CLAMP (NOTE 4)	-	-	-	-	AS REQ'D	UNISTRUT P1117
505	CONDUIT STRAP KIT (NOTE 4)	-	-	-	AS REQ'D	-	HUBBELL / CHANCE CSTK2
553	STAINLESS STEEL CONDUIT CLAMP (NOTE 4)	AS REQ'D	-	AS REQ'D	-	-	UNISTRUT P1117 (SS)
703	1/2" WASHER	-	-	-	-	2	HUBBELL / CHANCE PS6803
706	1/2" Ø HEX HEAD BOLT	-	-	-	-	2	PORTLAND BOLT
708	1/2" Ø STAINLESS STEEL THREADED ROD	2	4	2	-	-	UNISTRUT HTHR050
720	FLAT PLATE FITTING	2	4	2	-	2	UNISTRUT P1064
722	BEAM CLAMP	-	-	-	-	2	UNISTRUT PFL050T
751	1/2" STAINLESS STEEL HEX NUT	2	4	2	-	-	ALLIED BOLT 54513
752	1/2" STAINLESS STEEL LOCK WASHER	2	4	2	-	-	ALLIED BOLT 53060
753	1/2" STAINLESS STEEL WASHER	6	12	6	-	-	ALLIED BOLT 17215
756	1/2" Ø STAINLESS STEEL HEX HEAD BOLT	-	4	-	-	-	PORTLAND BOLT
757	1/2" STAINLESS STEEL CHANNEL NUT	-	4	-	-	-	UNISTRUT P4010 (SS)



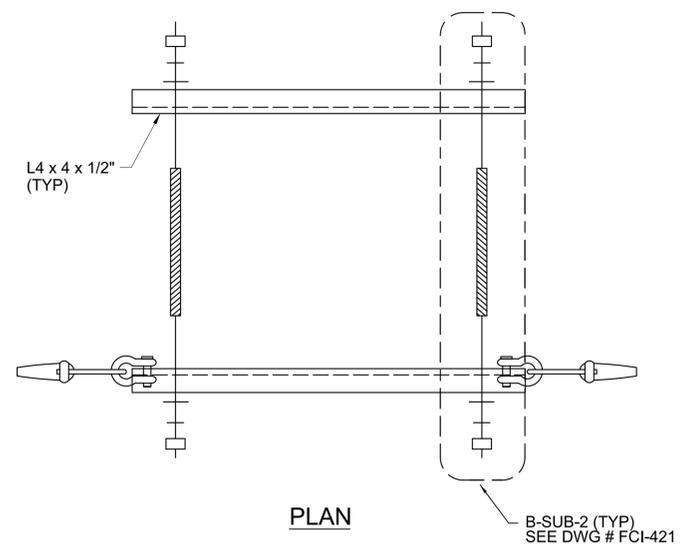
NOTES:

- TORQUE ALL FASTENERS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- THE MINIMUM EDGE DISTANCE SHALL BE 6" FOR CONCRETE, AND 12" FOR STONE.
- ALL MOUNTING HARDWARE FOR PVC COATED CONDUIT SHALL BE STAINLESS STEEL.
- MANUFACTURER PART NUMBER VARIES DEPENDING ON SIZE AND MATERIAL OF CONDUIT. SEE CABLE ROUTING PLANS FOR MORE INFORMATION.
- LENGTH OF STRUT CHANNEL VARIES DEPENDING ON CATENARY STRUCTURE TYPE. CONTRACTOR SHALL VERIFY ALL MEASUREMENTS PRIOR TO FABRICATION AND CONSTRUCTION.
- NUMBER OF CONDUITS, THEIR SIZE, AND MATERIAL ARE SPECIFIED IN CABLE ROUTING PLAN DRAWINGS.
- THE PART NUMBERS SHOWN ARE FOR REFERENCE ONLY. ALL ITEMS SHALL BE COMPATIBLE TO FORM A COMPLETE CONDUIT SUPPORT SYSTEM IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS.

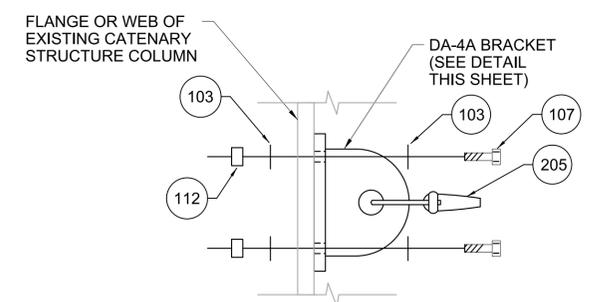
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<p>THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.</p> <p>Plotted Date: 4/1/2016</p>	<p>File name: ...FCI-426_FA_Sheet_0300-0178.dgn</p>			



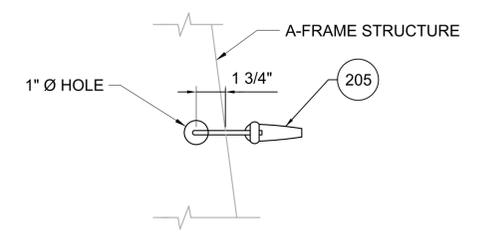
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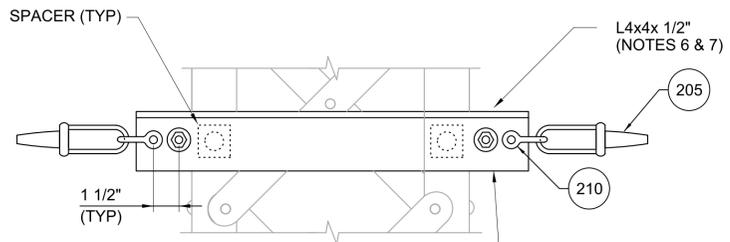
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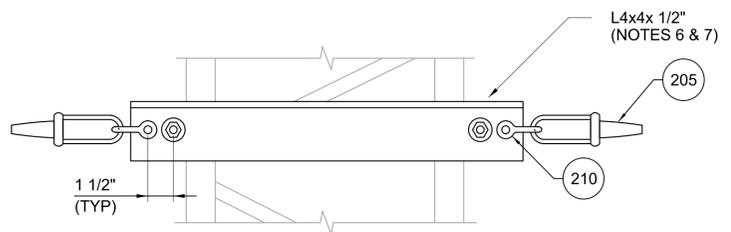
TYPE D-4A
DEAD END BRACKET ASSEMBLY



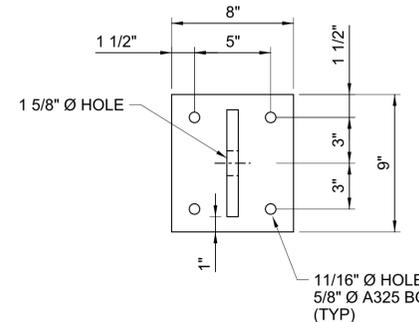
TYPE D-4
A-FRAME DEADEND ASSEMBLY



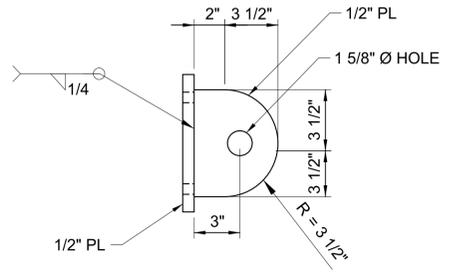
ELEVATION



ELEVATION



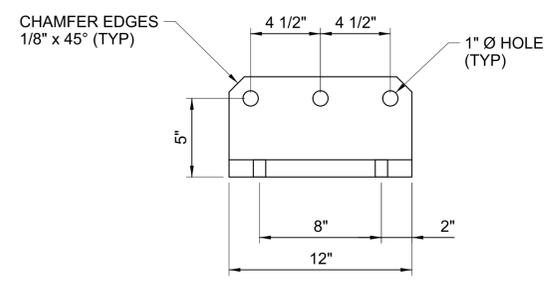
D-4A BRACKET DETAIL



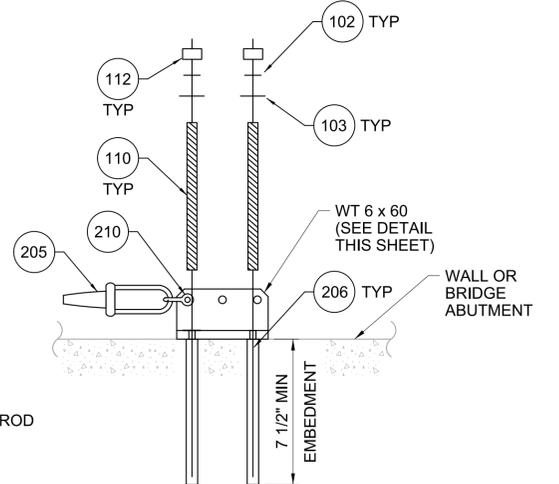
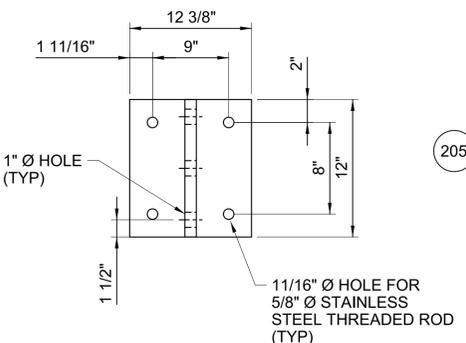
BRACKET SHALL BE SHIMMED WITH SPACERS AS REQUIRED BASED ON LOCATION OF LACING.

TYPE D-1
DEADEND BRACKET ASSEMBLY

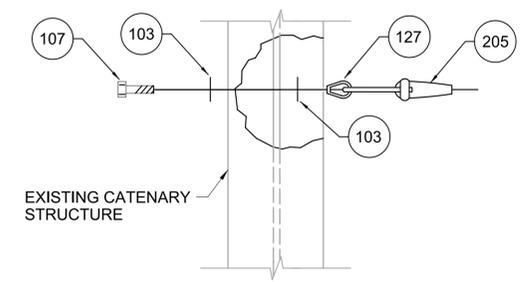
TYPE D-2
DEADEND BRACKET ASSEMBLY



WT6 x 60 BRACKET DETAIL



TYPE D-6
WALL MOUNTED DEAD END ASSEMBLY



TYPE D-4B
STRUCTURE DEAD END ASSEMBLY

- NOTES:
1. ALL MATERIALS TO BE GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED.
 2. TORQUE ALL FASTENERS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 3. PORTLAND BOLTS FABRICATED TO CONTRACT SPECIFICATIONS.
 4. BOLT MAY HAVE TO BE CUT IN THE FIELD FOR PROPER FIT-UP.
 5. SEE DWG # FCI-440 FOR GROUNDING DETAILS.
 6. FOR DRILLING LOCATIONS OF STRUCTURAL ANGLES, SEE DWG # FCI-422.
 7. FOR BRACKET ANGLE LENGTHS, SEE TABLE ON DWG # FCI-421.

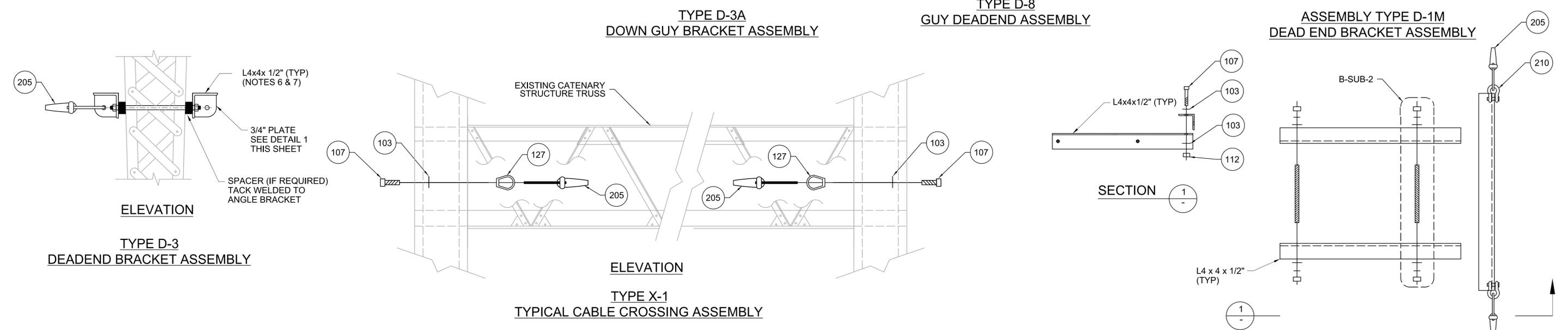
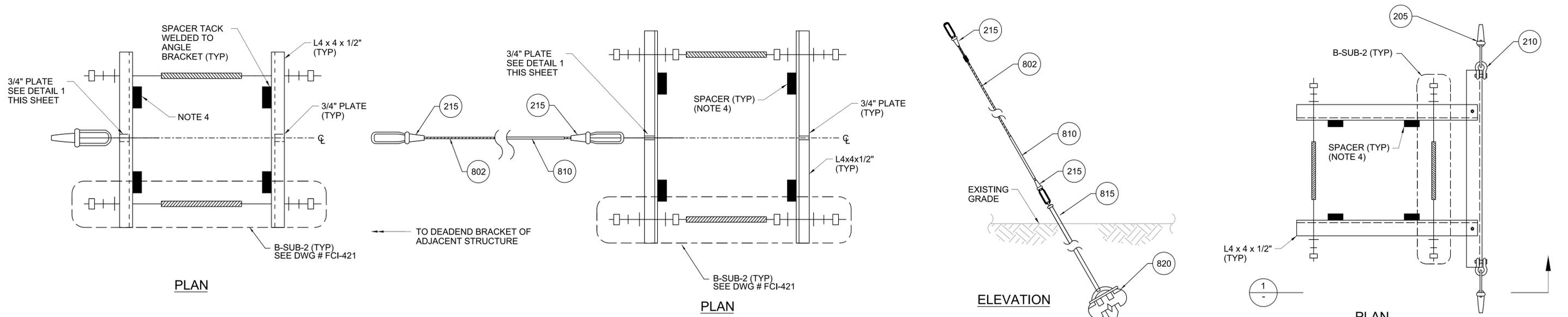
BILL OF MATERIALS

REF #	DESCRIPTION	QUANTITY PER ASSEMBLY						MANUFACTURER PART # / DETAIL (OR APROVED EQUAL)
		D-1	D-2	D-4	D-4A	D-4B	D-6	
102	5/8" LOCK WASHER	-	-	-	-	-	4	HUBBELL / CHANCE 4036
103	5/8" WASHER	-	-	-	8	2	4	HUBBELL / CHANCE 6805
107	5/8" Ø A325 BOLT	-	-	-	4	1	-	PORTLAND BOLT
110	5/8" Ø S.S. THREADED ROD, GRADE 316L	-	-	-	-	-	4	PORTLAND BOLT (NOTE 4)
112	5/8" HEAVY HEX NUT	-	-	-	4	-	4	PORTLAND BOLT
127	5/8" THIMBLE EYE NUT	-	-	-	-	1	-	HUBBELL / CHANCE 6510
205	3/8" STRANDVISE	2	2	1	1	1	1	HUBBELL GDE-5202
206	EPOXY ADHESIVE	-	-	-	-	-	-	AS REQ'D
210	ANCHOR SHACKLE	2	2	-	-	-	1	HUBBELL / CHANCE 5801
B-SUB-2	BRACKET BINDING ASSEMBLY	2	2	-	-	-	-	
-	SPACER (DWG # FCI-421)	4	-	-	-	-	-	

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED. Plotted Date: 4/1/2016	DESIGNER/DRAFTER: PM/MN	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	SIGNATURE/ BLOCK:	PROJECT TITLE: NETWORK INFRASTRUCTURE UPGRADE FOR SECURITY NEW HAVEN LINE PHASE 2	TOWN: WESTPORT TO STRATFORD	PROJECT NO. 300-0178
	CHECKED BY: SCC		SCALE AS NOTED			DRAWING NO. FCI-427

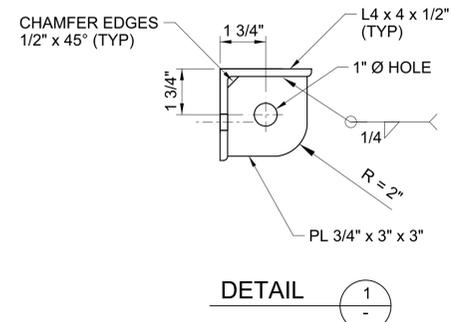
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Filename: ...FCI-427_FA_Sheet_0300-0178.dgn



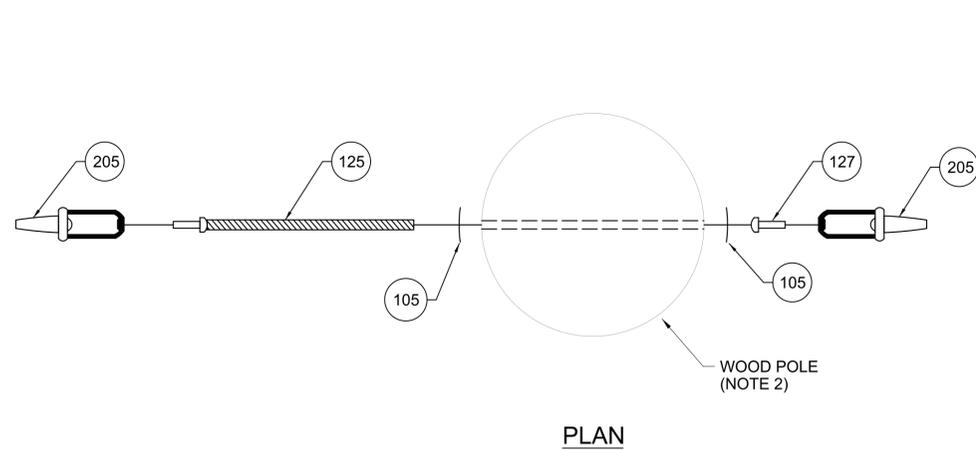
BILL OF MATERIALS

REF #	DESCRIPTION	QUANTITY PER ASSEMBLY						MANUFACTURER PART # / DETAIL (OR APROVED EQUAL)
		D-3	D-3A	D-8	D-1M	D-2M	X-1	
103	5/8" WASHER	-	-	-	4	4	2	HUBBELL / CHANCE 6805
107	5/8" Ø A325 BOLT	-	-	-	2	2	2	PORTLAND BOLT
112	5/8" Ø HEAVY HEX NUT	-	-	-	2	2	-	-
127	5/8" THIMBLE EYE NUT	-	-	-	-	-	2	HUBBELL / CHANCE 6510
205	3/8" STRANDVISE	1	-	-	2	2	2	HUBBELL GDE-5202
210	ANCHOR SCHACKLE	-	-	-	2	2	-	-
215	7/16" STRANDVISE	-	2	2	-	-	-	HUBBELL GDE-5203
802	7/16" Ø GUY WIRE, 7-STRAND EHS STEEL, GALV.	-	1	1	-	-	-	-
810	YELLOW GUY MARKER, 1 1/8" x 8 FOOT LONG	-	1	1	-	-	-	HUBBELL / CHANCE 96FRPE
815	3/4" x 10 FT LONG EXPANDING ANCHOR ROD	-	-	1	-	-	-	HUBBELL 5360
820	EXPANSION ANCHOR FOR 3/4" Ø ROD	-	-	1	-	-	-	HUBBELL 108234
B-SUB-2	BRACKET BINDING ASSEMBLY (SEE DWG # FCI-421)	2	2	-	2	2	-	-
-	SPACER (IF REQUIRED) (SEE DWG # FCI-421)	4	4	-	4	-	-	-

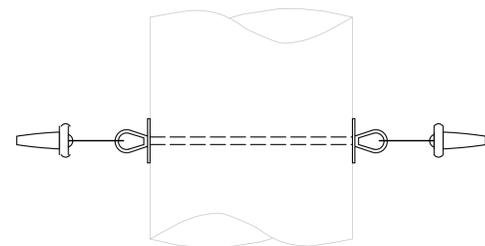


- NOTES:**
- ALL MATERIALS TO BE GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED.
 - TORQUE ALL FASTENERS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 - PORTLAND BOLTS FABRICATED TO CONTRACT SPECIFICATIONS.
 - SPACERS SHALL BE TACK WELDED TO SUPPORT BRACKETS AS REQUIRED TO ALLOW FOR PROPER FIT ON RIVETED LATTICE STRUCTURES. SEE SPACER DETAIL ON DWG # FCI-421.
 - SEE DWG # FCI-440 FOR GROUNDING DETAILS.
 - FOR DRILLING LOCATIONS OF STRUCTURAL ANGLES, SEE DWG # FCI-422.
 - FOR BRACKET ANGLE LENGTHS, SEE TABLE ON DWG # FCI-421.

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: PM/MN CHECKED BY: SCC SCALE AS NOTED	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Filename: ...FCI-428_FA_Sheet_0300-0178.dgn	SIGNATURE/BLOCK: STV Incorporated 185 Plains Road Suite 208E Milford, CT 06461	PROJECT TITLE: NETWORK INFRASTRUCTURE UPGRADE FOR SECURITY NEW HAVEN LINE PHASE 2	TOWN: WESTPORT TO STRATFORD	PROJECT NO. 300-0178 DRAWING NO. FCI-428 SHEET NO. 04.026
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 4/1/2016			

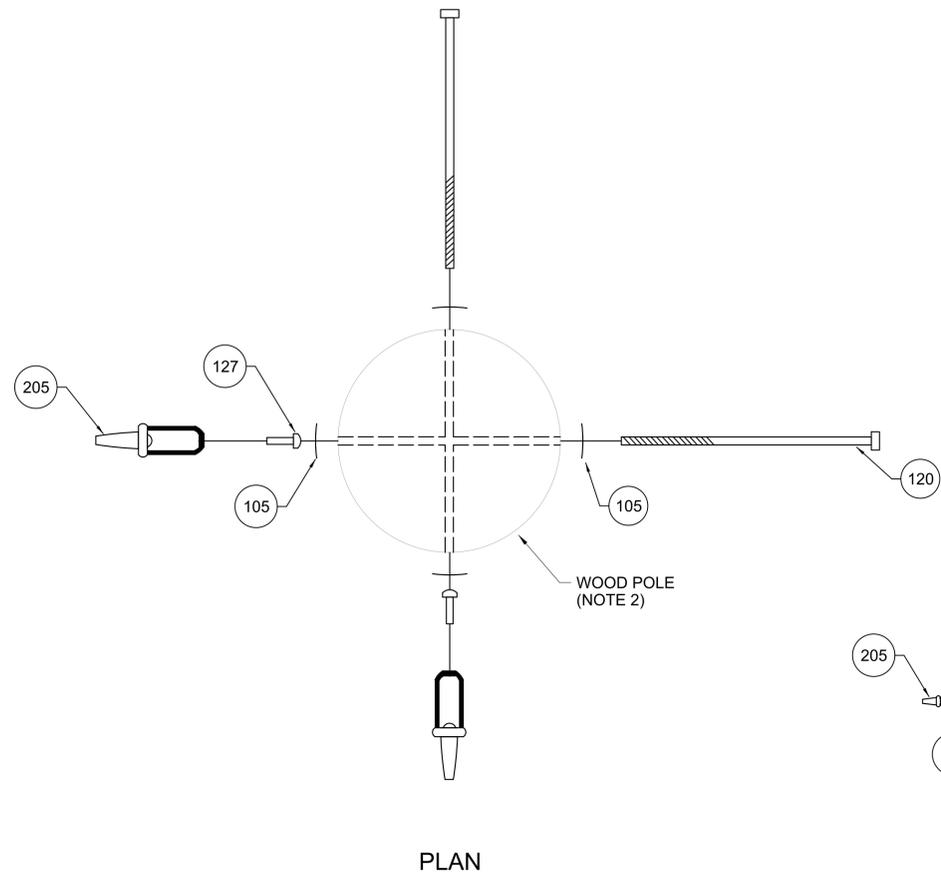


PLAN

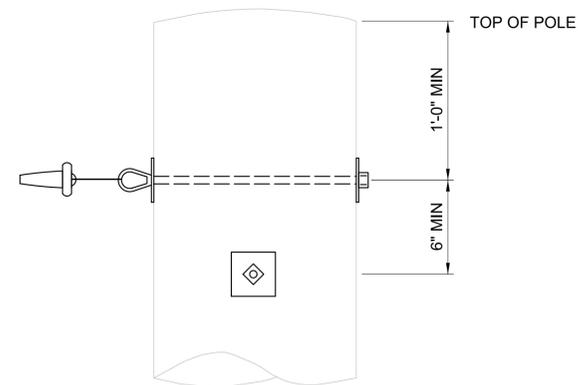


ELEVATION

TYPE D-7
TYPICAL WOOD POLE ASSEMBLY

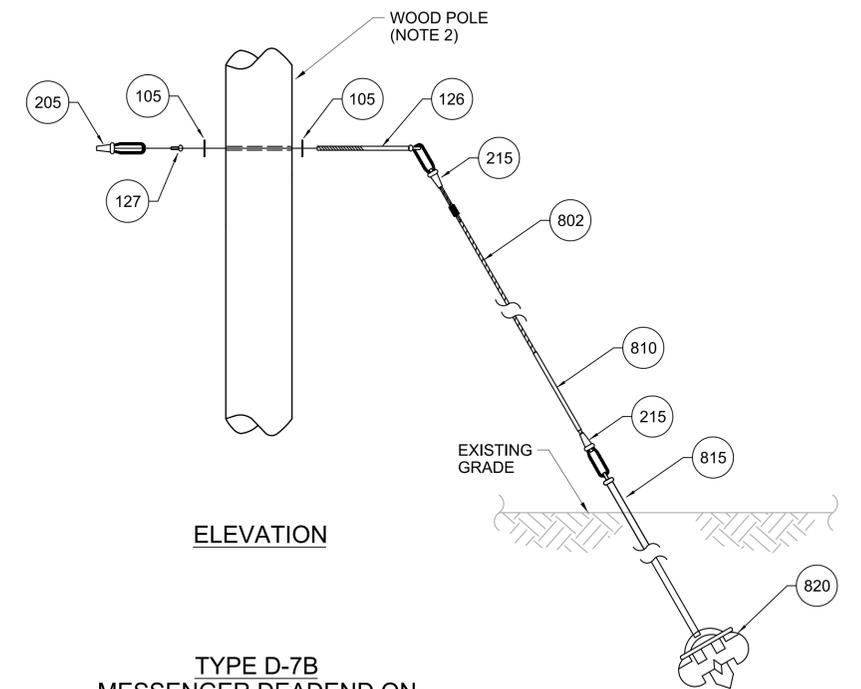


PLAN



ELEVATION

TYPE D-7A
TYPICAL 90° WOOD POLE ASSEMBLY



ELEVATION

TYPE D-7B
MESSENGER DEADEND ON
WOOD POLE WITH DOWN GUY

BILL OF MATERIALS

REF #	DESCRIPTION	QUANTITY PER ASSEMBLY			MANUFACTURER PART # / DETAIL (OR APPROVED EQUAL)
		D-7	D-7A	D-7B	
105	2 1/2 x 2 1/2 x 3/16" SQUARE CURVED WASHER	2	4	2	HUBBELL / CHANCE PS6822
120	5/8" Ø MACHINE BOLT	-	2	-	HUBBELL / CHANCE 8814
125	5/8" Ø THIMBLEYE BOLT	1	-	-	HUBBELL / CHANCE 5514
126	5/8" Ø THIMBLEYE ANGLE BOLT	-	-	1	HUBBELL / CHANCE 5014
127	5/8" THIMBLE EYENUT	1	2	1	CHANCE 6510
205	3/8" STRANDVISE	2	2	1	HUBBELL GDE-5202
215	7/16" STRANDVISE	-	-	2	HUBBELL GDE-5203
802	7/16" Ø GUY WIRE, 7-STRAND EHS STEEL, GALV.	-	-	1	
810	YELLOW GUY MARKER, 1 1/8" x 8 FOOT LONG	-	-	1	HUBBELL / CHANCE 96FRPE
815	3/4" x 10 FT LONG EXPANDING ANCHOR ROD	-	-	1	HUBBELL 5360
820	EXPANSION ANCHOR FOR 3/4" Ø ROD	-	-	1	HUBBELL 108234

NOTES:

1. ALL MATERIALS TO BE GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED.
2. CABLE ROUTING PLAN DRAWINGS SPECIFY WHETHER WOOD POLE IS EXISTING OR NEW TO BE INSTALLED THIS CONTRACT.
3. FOR GROUNDING DETAILS, SEE DWG. # FCI-441.

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

DESIGNER/DRAFTER:
PM/MN
CHECKED BY:
SCC
SCALE AS NOTED

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...FCI-429_FA_Sheet_0300-0178.dgn

SIGNATURE/
BLOCK:

STV Incorporated
185 Plains Road
Suite 208E
Milford, CT 06461

PROJECT TITLE:
**NETWORK INFRASTRUCTURE
UPGRADE FOR SECURITY
NEW HAVEN LINE
PHASE 2**

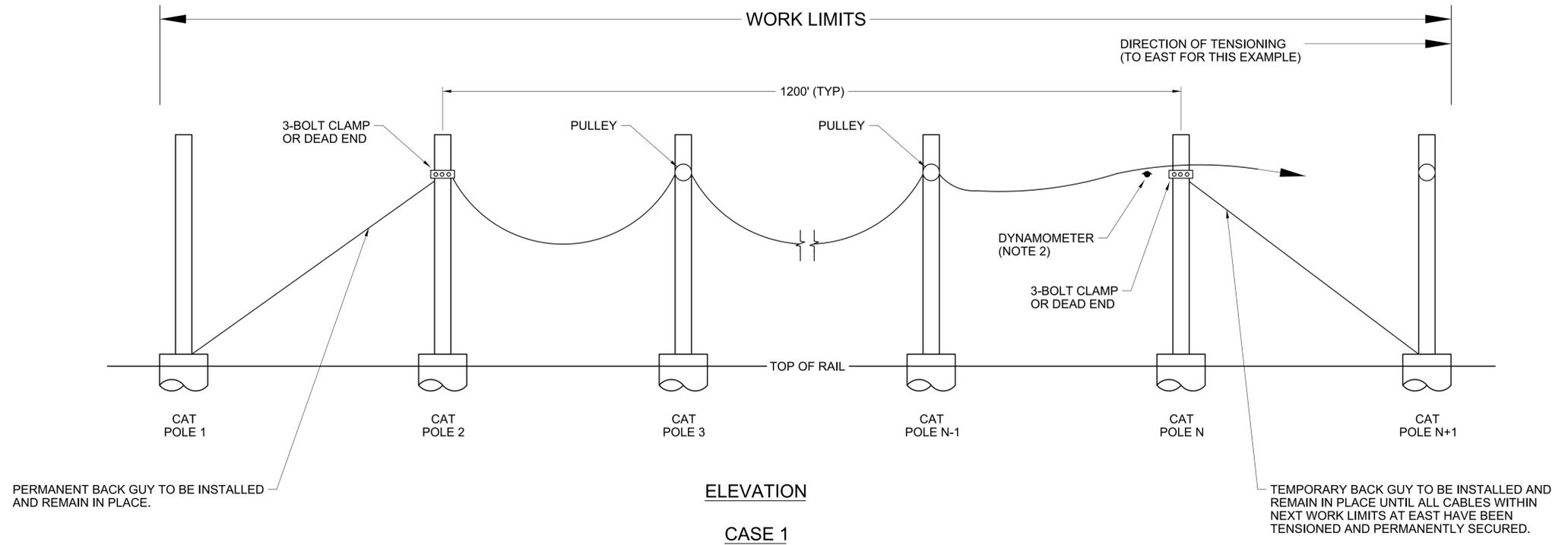
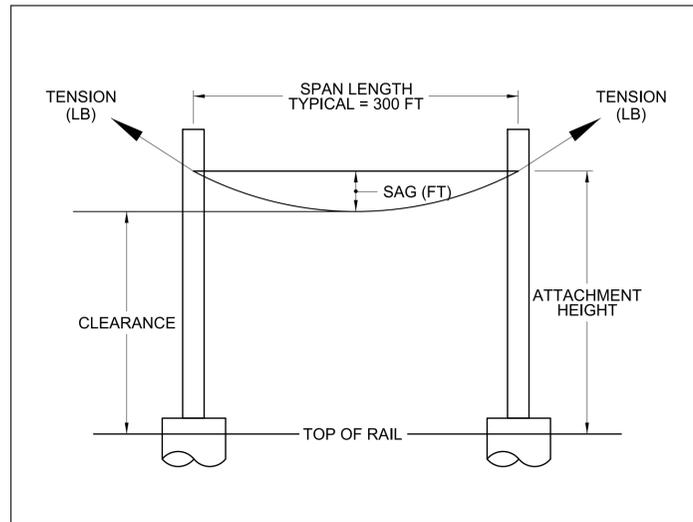
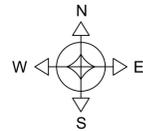
TOWN:
**WESTPORT
TO STRATFORD**

DRAWING TITLE:
**DEADEND ASSEMBLY
DETAILS SHEET 3 OF 3**

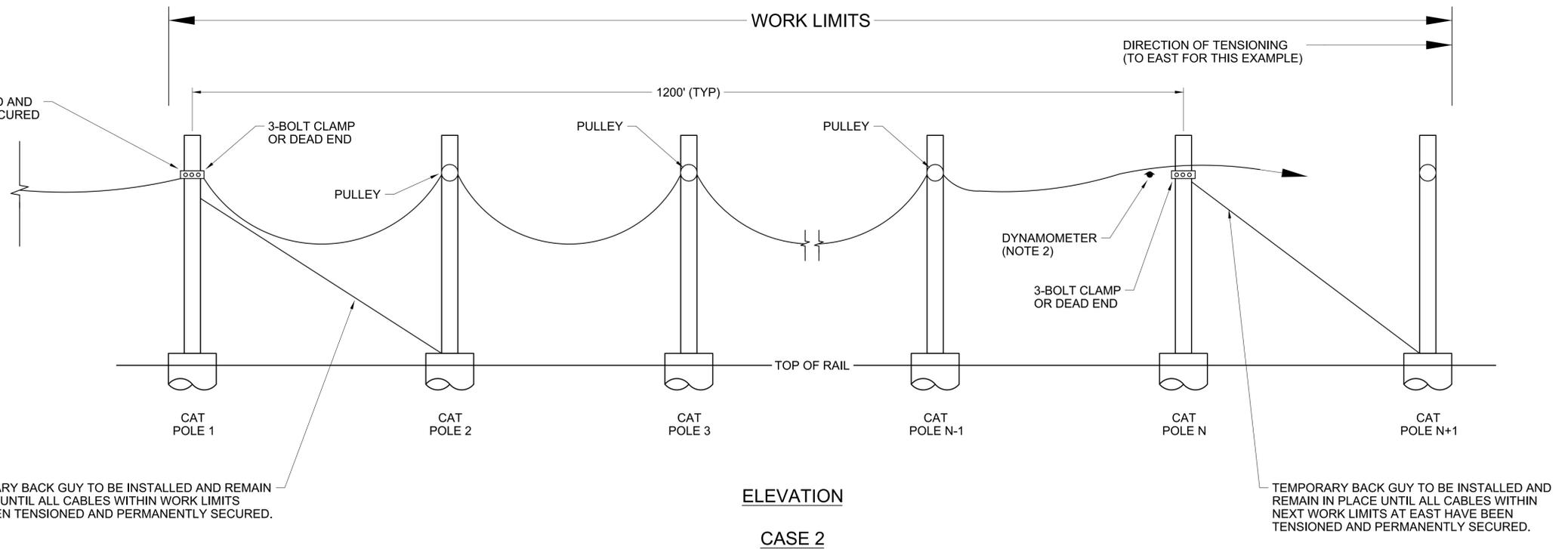
PROJECT NO.
300-0178

DRAWING NO.
FCI-429

SHEET NO.
04.027



TENSIONING TO WEST COMPLETED AND MESSENGER IS PERMANENTLY SECURED TO 3-BOLT CLAMP OR DEAD END.



NOTES:

1. THIS DRAWING IS SUPPLIED TO INFORM THE CONTRACTOR OF THE REQUIRED CALCULATIONS AND GENERAL APPROACH TO BE SUBMITTED FOR APPROVAL AND TO BE UTILIZED IN ESTABLISHING THE SAG AND TENSION OF THE INSTALLED CABLES IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATION. ALTERNATIVE METHODS MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.
2. MESSENGER TENSIONING SHALL BE MONITORED WITH A DYNAMOMETER, EITHER AERIAL, OR AT GROUND LEVEL ON TENSIONING REEL OR MECHANISM. THE MAXIMUM CALCULATED TENSION SHALL NOT BE EXCEEDED DURING TENSIONING.
3. CALCULATED SAG AND TENSION ARE BASED ON SPECIFIC PRODUCTS AND PARAMETERS LISTED. CONTRACTOR SHALL PERFORM CALCULATIONS, FOR ENGINEER APPROVAL, USING ENGINEER APPROVED PRODUCTS.
4. THE MESSENGER STRAND SHALL BE GROUNDED EVERY 1200' MAXIMUM. REF. TO DWGS. FCI-440 AND FCI-441.

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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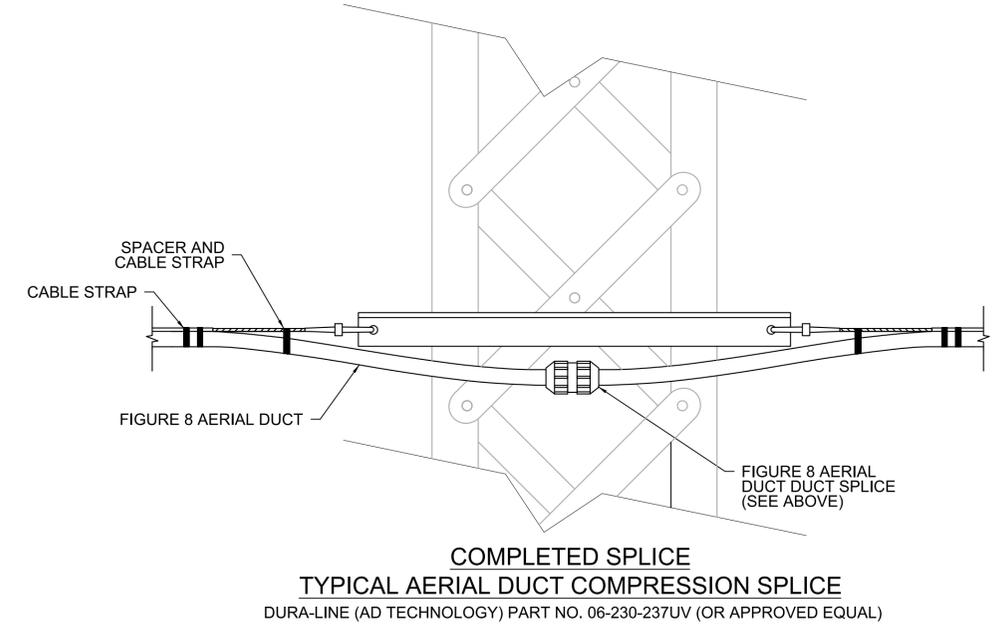
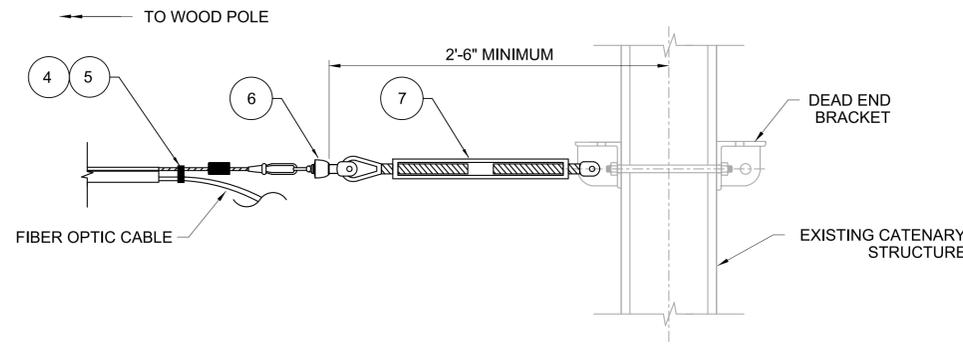
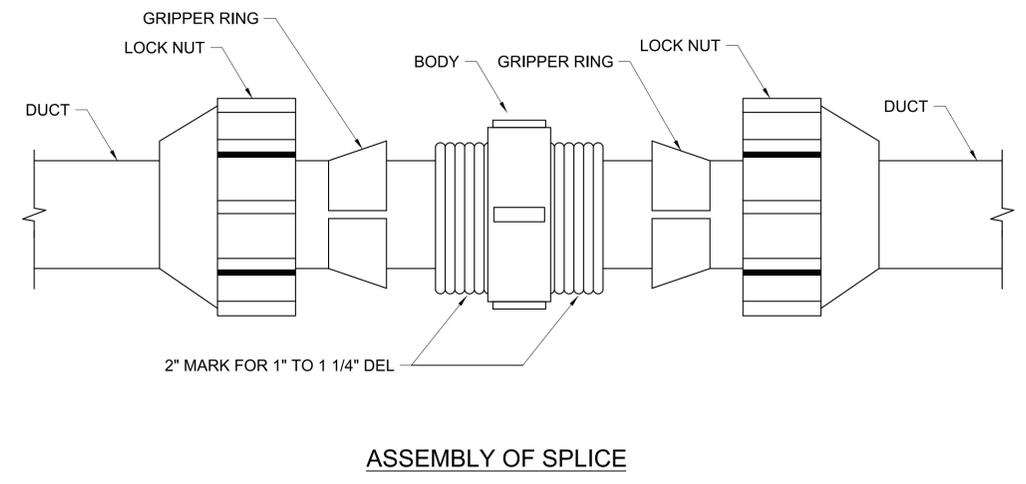
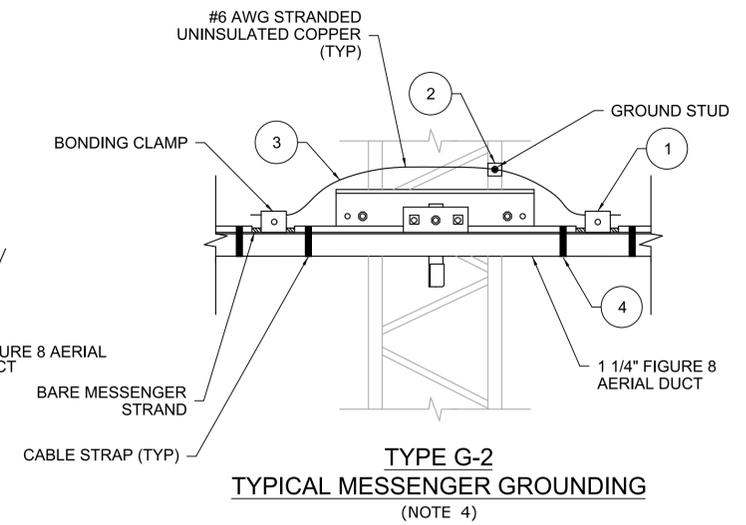
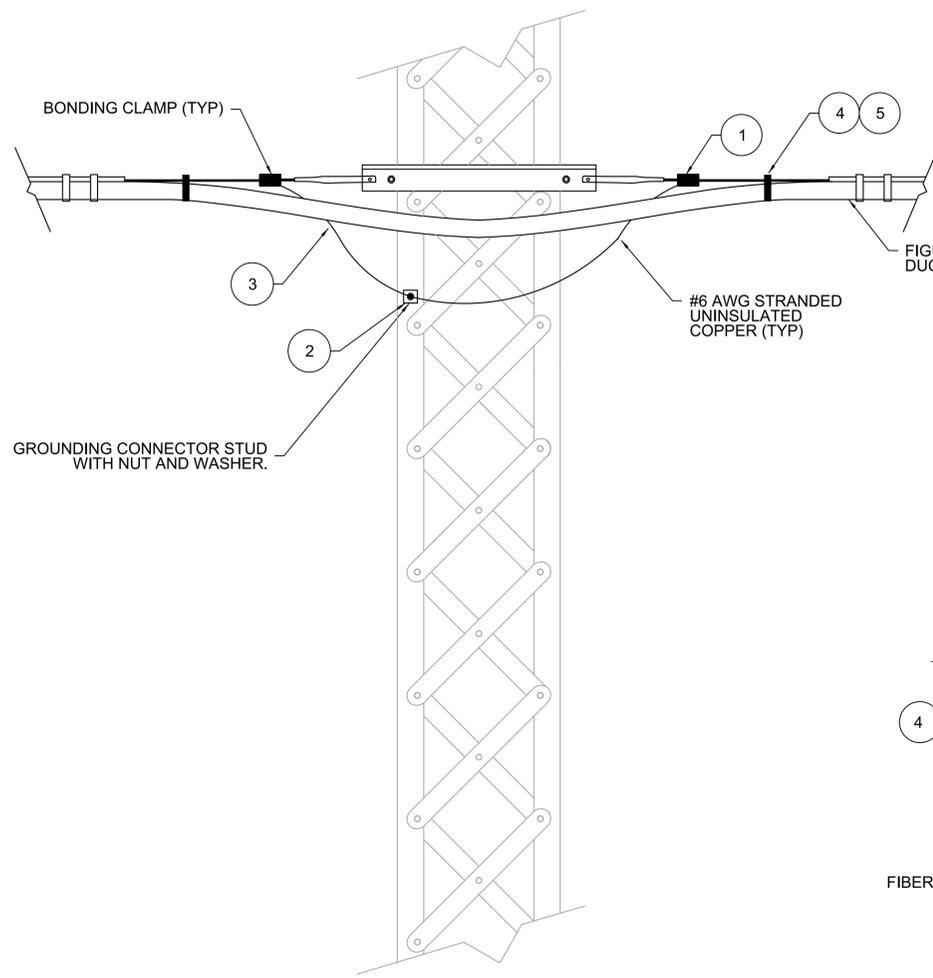


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Milford, CT 06461

PROJECT TITLE:
**NETWORK INFRASTRUCTURE
UPGRADE FOR SECURITY
NEW HAVEN LINE
PHASE 2**

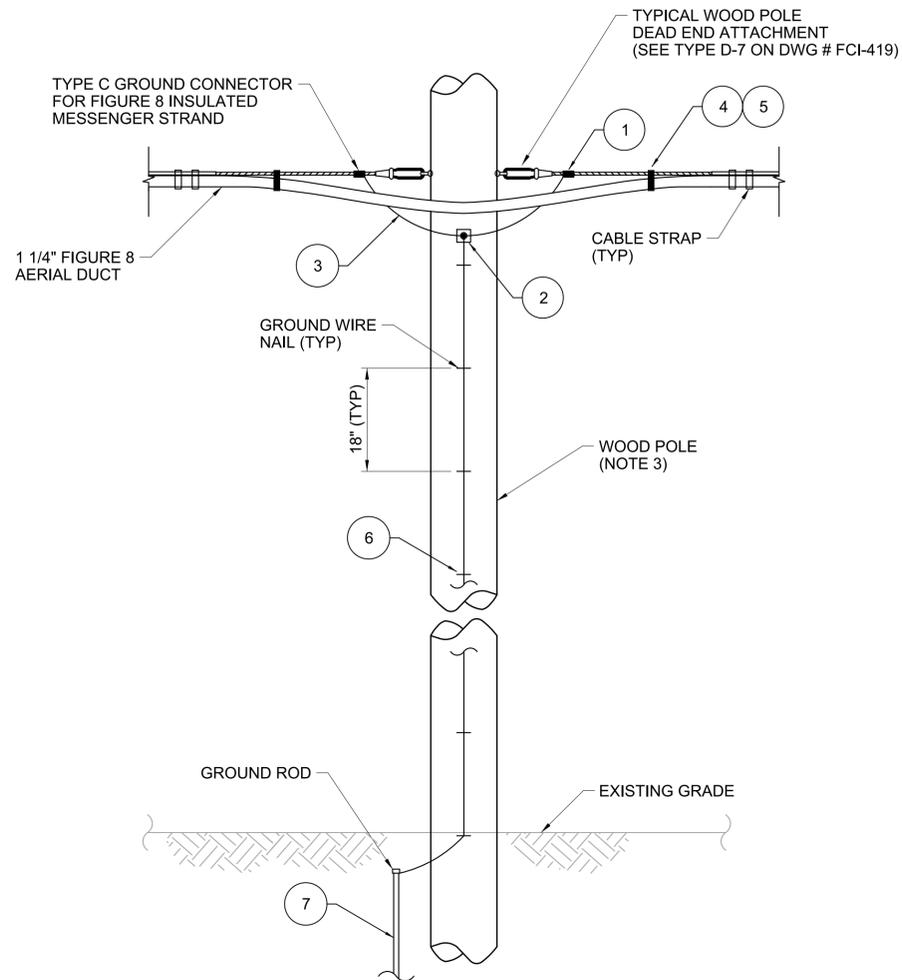
TOWN: **WESTPORT
TO STRATFORD**
DRAWING TITLE:
**DEADEND/DOWNGUY
INSTALLATION DETAILS**

PROJECT NO.: **300-0178**
DRAWING NO.: **FCI-435**
SHEET NO.: **04.028**

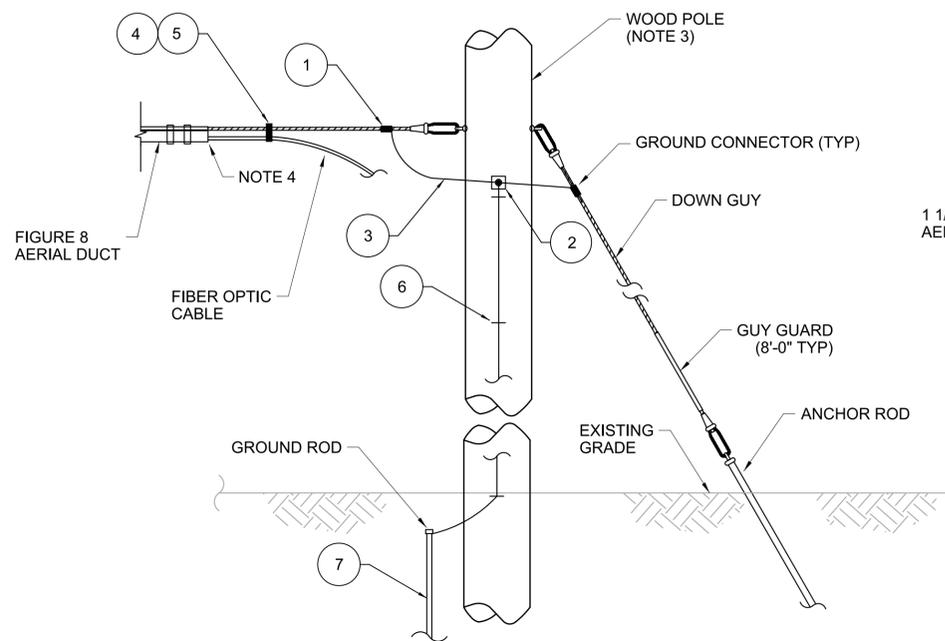


- NOTES:
- GROUNDING SHALL OCCUR AT EVERY 1200 FEET MAXIMUM. MESSENGER STRANDS SHALL BE GROUNDED AT ALL DEAD END LOCATIONS
 - HOLE SHALL BE DRILLED NO LESS THEN ONE INCH FROM EDGE OF STEEL STRUCTURE FOR SERVICE POST GROUNDING STUD AND USING MAGNETIC DRILL BITS. STEEL STRUCTURE SHALL BE PREPARED AND STUD SHALL BE SECURED WITH FLANGED LOCK WASHERS AND NUTS TO ENSURE MECHANICAL AND ELECTRICAL CONNECTION TO STRUCTURAL STEEL AND SHALL BE TREATED WITH APPROVED ANTI-OXIDANT GREASE AFTER INSTALLATION.
 - FOR DETAILS OF MESSENGER GROUNDING SEE SPECIFICATIONS.
 - TYPICAL BONDING SHOWN, APPLIES TO ALL METALLIC STRUCTURE TYPES.

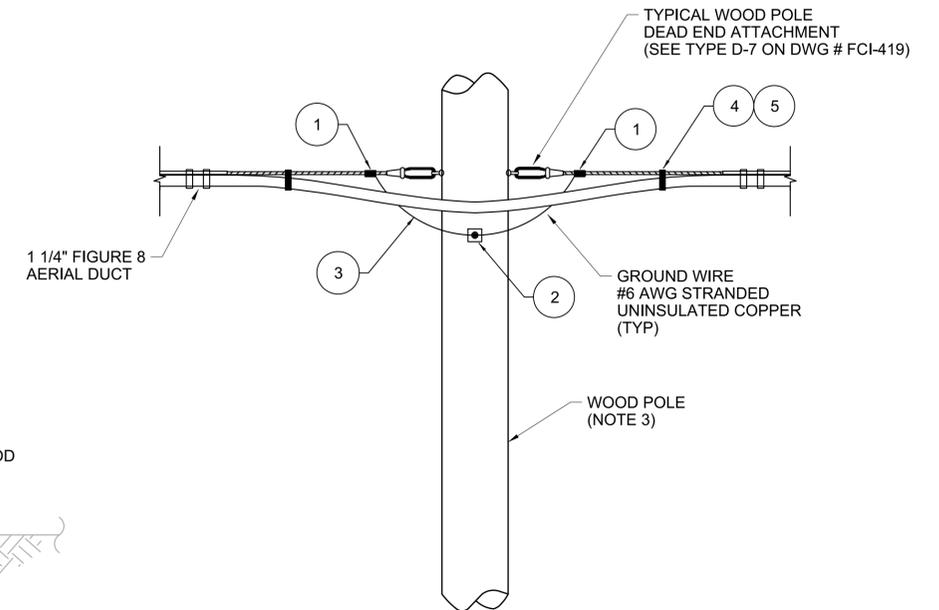
BILL OF MATERIALS					
REF #	DESCRIPTION	QUANTITY PER ASSEMBLY			MANUFACTURER PART # / DETAIL (OR APPROVED EQUAL)
		TYPE G-1	TYPE G-2	TYPE IS-1	
1	BONDING CLAMP	2	2	-	ELECTRIC MOTION EM4811
2	GROUND CONNECTOR STUD	1	1	-	THOMAS & BETTS #SP2SL
3	#6 AWG STRANDED COPPER WIRE, UNINSULATED	AS REQUIRED	AS REQUIRED	-	
4	CABLE SUPPORT STRAP, LENGTH AS REQ'D S.S.	AS REQUIRED	AS REQUIRED	1	POWER & TEL #34-08912/22/32
5	CABLE SPACER	2	-	1	POWER & TEL #34-08850/75
6	CLEVIS / EYE SPOOL STRAIN INSULATOR	-	-	1	IMPULSE NC #022478-2000
7	JAW-EYE FORGED STEEL TURNBUCKLE	-	-	1	HUBBELL #TB34JE12BNK



TYPE G-3
TYPICAL MESSENGER GROUNDING
ON WOOD POLE



TYPE G-4
MESSENGER GROUNDING ON
WOOD POLE WITH DOWN GUY



TYPE G-5
MESSENGER GROUNDING
ON WOOD POLE

BILL OF MATERIALS

REF #	DESCRIPTION	QUANTITY PER ASSEMBLY			MANUFACTURER PART # / DETAIL (OR APPROVED EQUAL)
		TYPE G-3	TYPE G-4	TYPE G-5	
1	BONDING CLAMP	2	2	2	ELECTRIC MOTION EM4811
2	STRAND BOND CLAMP	1	1	1	ELECTRIC MOTION EM4811
3	#6 AWG STRANDED COPPER WIRE, UNINSULATED	AS REQUIRED	AS REQUIRED	AS REQUIRED	
4	CABLE SUPPORT STRAP, LENGTH AS REQUIRED S.S.	2	1	2	POWER & TEL #34-08912/22/32
5	SPACER	2	1	2	POWER & TEL #34-08850/75
6	GROUND WIRE STAPLE	AS REQUIRED	AS REQUIRED	-	HUBBELL / CHANCE C2050216
7	3/4" x 10' GALVANIZED GROUND ROD	1	1	-	HUBBELL / CHANCE 8620

NOTES:

- MESSENGER STRAND SHALL BE GROUNDED AT ALL MESSENGER DEAD END LOCATIONS.
- MESSENGER STRAND SHALL BE GROUNDED EVERY 1200 FEET MAXIMUM.
- CABLE ROUTING PLAN DRAWINGS SPECIFY WHETHER WOOD POLE IS EXISTING OR NEW IN THIS CONTRACT.
- CONTRACTOR SHALL INSTALL SPLIT DUCT PLUGS AT EVERY OPENING OF FIGURE 8 AERIAL DUCT OR RGS CONDUIT.

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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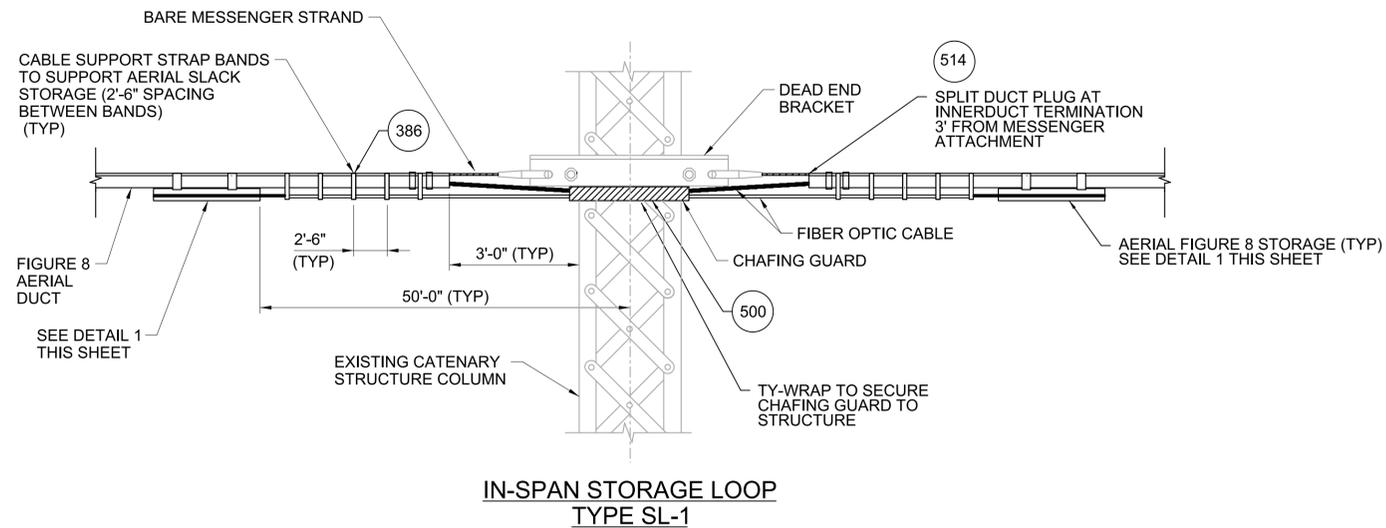


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PROJECT TITLE:
**NETWORK INFRASTRUCTURE
UPGRADE FOR SECURITY
NEW HAVEN LINE
PHASE 2**

TOWN: **WESTPORT
TO STRATFORD**
DRAWING TITLE:
**GROUNDING DETAILS
SHEET 2 OF 2**

PROJECT NO.: **300-0178**
DRAWING NO.: **FCI-441**
SHEET NO.: **04.030**



BILL OF MATERIALS			
REF #	DESCRIPTION	QUANTITY PER ASSEMBLY	MANUFACTURER PART # / DETAIL (OR APPROVED EQUAL)
386	STAINLESS STEEL CABLE SUPPORT STRAP, LENGTH AS REQ'D	AS REQUIRED	THOMAS & BETTS #34-08922
500	SPLIT DUCT CHAFING GUARD	1	PREFORMED LINE PRODUCTS #PTG-0203
512	TAP BRACKET, TYP ATB	4	OPT1-LOOP
513	IN-SPAN STORAGE SYSTEM TYP FOS	2	OPT1-LOOP
514	SPLIT DUCT PLUG	2	ETCO CL-127S-620

