

**NOTES:**

- FOR ADDITIONAL DESIGN PARAMETERS SEE SPECIFICATIONS.
- ALL GROUND CONNECTIONS SHALL BE IRREVERSIBLE COMPRESSION CONNECTION UNLESS OTHERWISE NOTED.
- LINK BOX WILL CONTAIN FOUR DISCONNECTING LINKS, AS PROVIDED BY VENDOR.
- POLYWATER FST SHALL BE USED TO SEAL CONDUIT.
- BONDING CABLE CONNECTION BETWEEN HIGH VOLTAGE DC CABLE SPLICE AND LINK BOX SHALL BE NO LONGER THAN 30 FEET. FIELD FIT EXACT LOCATION.
- RESISTANCE OF GROUND GRID MEASURED RELATIVE TO DEEP EARTH SHALL BE 10 OHMS OR LESS. LENGTH AND NUMBER OF GROUND RODS TO BE DETERMINED BASED ON MEASURED GROUND ROD RESISTANCE.
- KIEWIT HAS PROVIDED GROUNDING AS PER NKT REQUIREMENTS. NO OTHER ELECTRICAL SYSTEM DESIGN HAS BEEN INCLUDED BY KIEWIT.

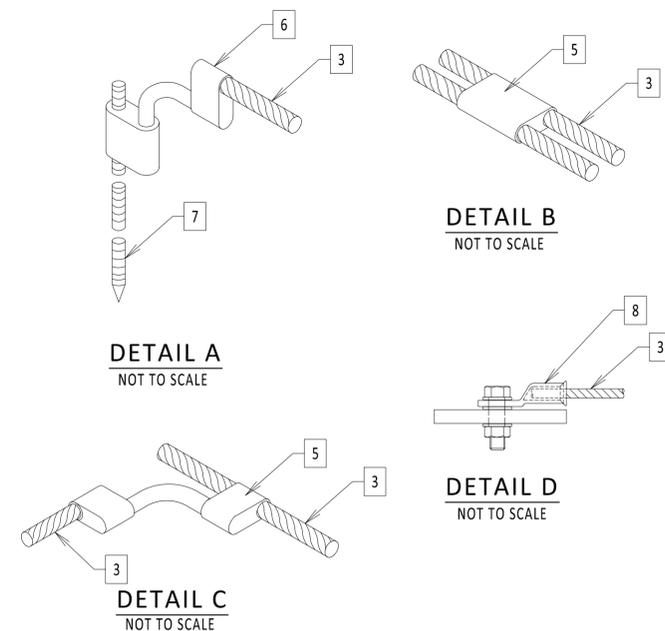
**BILL OF MATERIALS**

ITEM NO.	ITEM DESCRIPTION	MANUFACTURER & CATALOG NO.	PROVIDER	INSTALLER
1	LINK BOX	AS REQUIRED	NKT	KIEWIT
2	INSULATED GROUND CABLE	AS REQUIRED	NKT	NKT
3	BARE 4/0 GROUND CABLE	AS REQUIRED	KIEWIT	KIEWIT
4	COMPRESSION CROSS GRID CONNECTOR	BURNDY YGL29C29	KIEWIT	KIEWIT
5	COMPRESSION C CONNECTOR	BURNDY YGH29C29	KIEWIT	KIEWIT
6	COMPRESSION CONNECTION TO GROUND ROD	BURNDY YGL34C29	KIEWIT	KIEWIT
7	3/4" X 10'-0" GROUND ROD	NVENT ERICO 613400	KIEWIT	KIEWIT
8	3/4" STUD RING TERMINAL	BURNDY YAD28M20E34	KIEWIT	KIEWIT

APPROVED EQUAL MATERIAL MAYBE SUBMITTED FOR REVIEW AND APPROVAL. QUANTITIES ARE MINIMUM - PROVIDER IS RESPONSIBLE FOR ALL MATERIAL ITEMS AND QUANTITIES.

**REFERENCE DRAWINGS**

LIST NO.	DRAWING NAME	DRAWING NO.
1	STRUCTURAL VAULT DRAWINGS	S-700
2	TYPICAL OPEN PIT SPLICE CASING DETAILS	C-808
3	GROUNDING SPECIFICATIONS	260526.01



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for EMCP approval only



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No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP
0	09/16/2022	EM&CP REGULATORY RE-SUBMISSION	SD	ASM

**CHAMPLAIN HUDSON POWER EXPRESS**

**OPEN PIT SPLICE GROUNDING DETAILS**

DRAWN BY: DLM DESIGNED BY: SD APPROVED BY: ASM SCALE: NOT TO SCALE

KIEWIT PROJECT NO.	21162
CHA PROJECT NO.	066076
DRAWING NO.	<b>C-809</b>
DATE	09/16/2022
SH.NO.	OF XXX

A

B

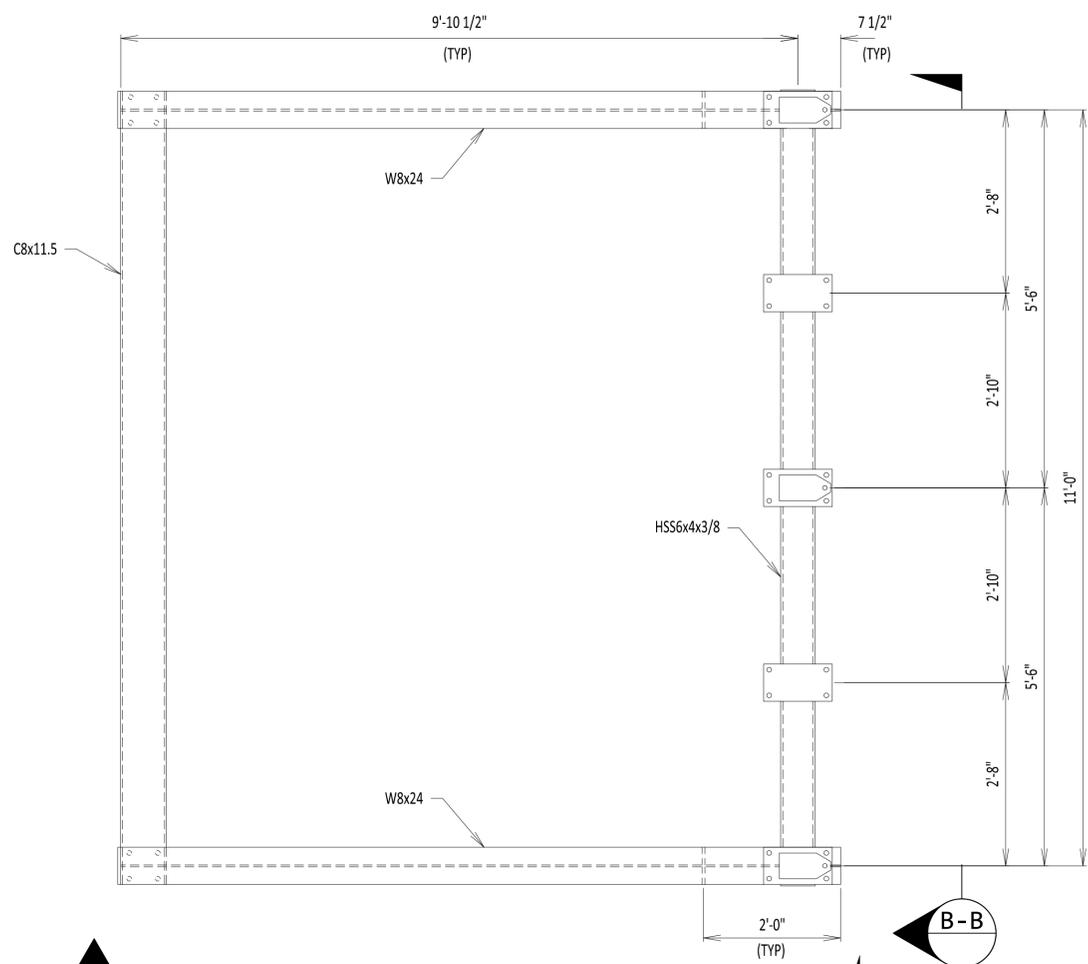
File: R:\INFO\IPD\USG\STANDARDS\UNDERGROUND\_SHAREPOINT\PROJECTS\CHPE\_400KV\_DC\_WORKING\_FOLDER\DWG\C-809\_OPEN\_PIT\_SPLICE\_GROUNDING.DWG Saved: 9/14/2022 7:19:42 AM Plotted: 9/15/2022 7:50:46 AM Current User: Douglas.Mason LastSavedBy: Douglas.Mason

1

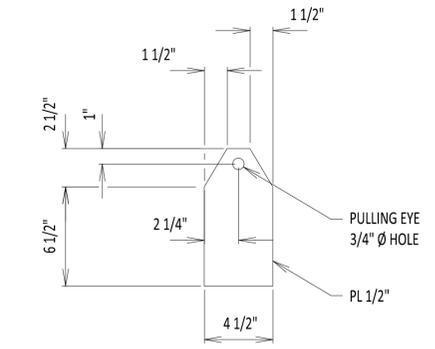
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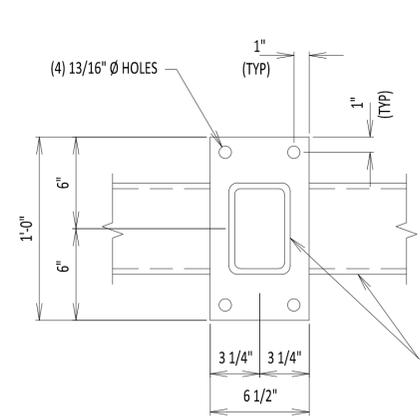
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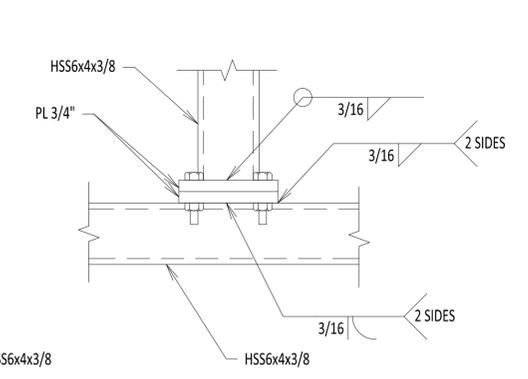
**PLAN**  
SCALE: 3/4" = 1'-0"



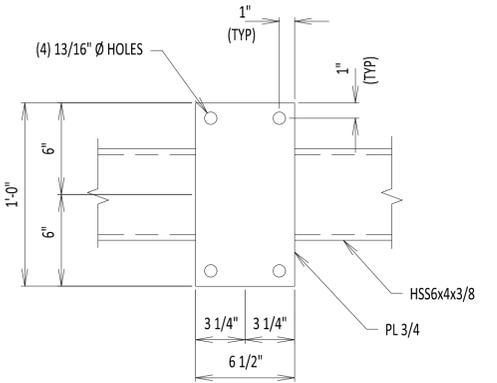
**PULLING EYE DETAIL 1**  
SCALE: 2" = 1'-0"



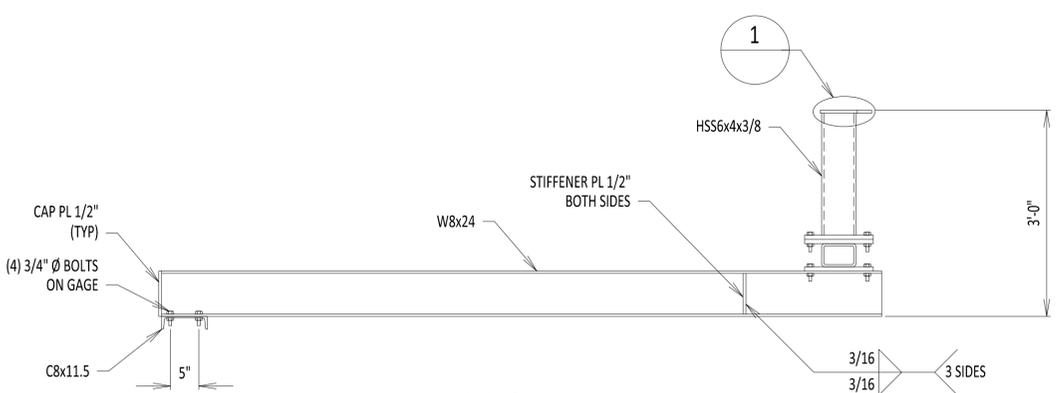
**DETAIL 2**  
SCALE: 2" = 1'-0"



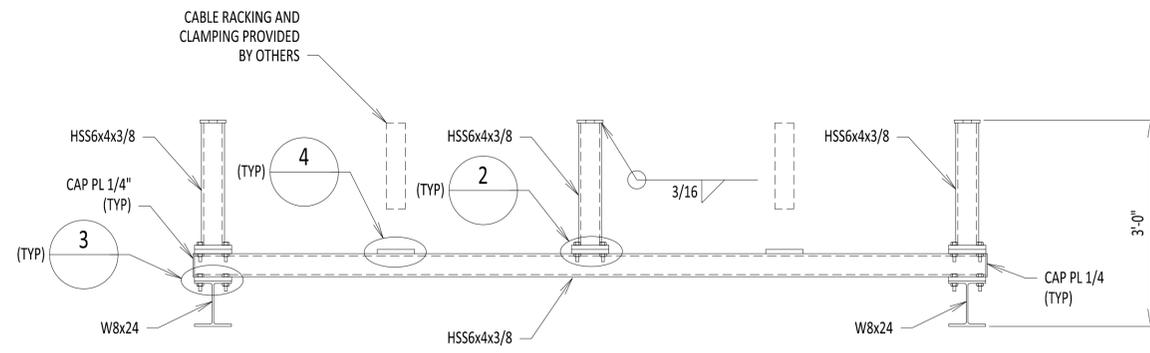
**DETAIL 3**  
SCALE: 2" = 1'-0"



**DETAIL 4**  
SCALE: 2" = 1'-0"



**SECTION A-A**  
SCALE: 3/4" = 1'-0"



**SECTION B-B**  
SCALE: 3/4" = 1'-0"

**NOTES:**

1. W-SHAPES SHALL BE ASTM A992. CHANNELS SHALL BE ASTM A36. HSS RECTANGULAR TUBES SHALL BE ASTM A1085. PLATES SHALL BE ASTM A572 GR 50. ALL STRUCTURAL MEMBERS SHALL BE HOT DIP GALVANIZED.
2. CONNECTION BOLTS TO BE 3/4" DIAMETER U.N.O. ALL STRUCTURAL BOLTS SHALL BE ASTM F3125 GR A325. ALL NUTS SHALL BE ASTM A563. ALL WASHERS SHALL BE ASTM F436. ALL FASTENERS SHALL BE HOT DIP GALVANIZED.
4. ALL MATERIAL ON THIS SHEET SHALL BE HOT DIP GALVANIZED AFTER FABRICATION PER ASTM A123 AND ASTM A153. FABRICATOR TO PROVIDE GALV VENTS AS REQ'D.
5. WELDING ELECTRODES SHALL BE E70. WELDING SHALL BE PERFORMED IN ACCORDANCE WITH AWS D1.1.
6. LOADING ON THE PULLING EYES SHALL NOT EXCEED 2,200LBS. TWO PULLING EYES CAN BE LOADED AT A TIME.
7. CABLE CLAMPING LOAD SHALL NOT EXCEED 3,400LBS AT EACH OF THE TWO CABLE LOCATIONS. CLAMPS AND CLAMP SUPPORTS SHALL BE EVALUATED AND PROVIDED BY OTHERS.
8. THE MAXIMUM DESIGN LIFE OF THE STRUCTURE IS 30 YEARS.

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No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP
0	09/16/2022	EM&CP REGULATORY RE-SUBMISSION	AJH	MRF

**CHAMPLAIN HUDSON POWER EXPRESS**  
**STEEL SUPPORT DETAILS**

DRAWN BY: DLM DESIGNED BY: AJH APPROVED BY: MRF SCALE: REV. NO.

KIEWIT PROJECT NO.	21162
CHA PROJECT NO.	066076
DRAWING NO.	<b>C-811</b>
DATE	08/25/2022
SH.NO.	1 OF 1

1

2

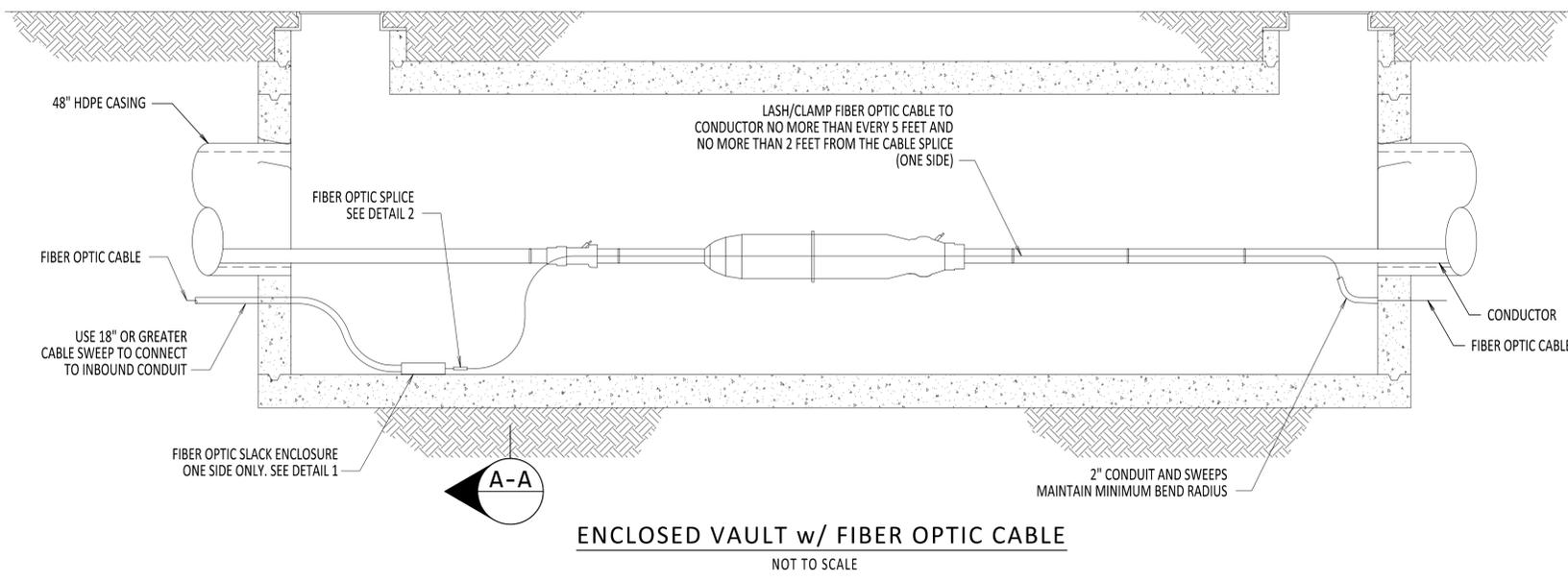
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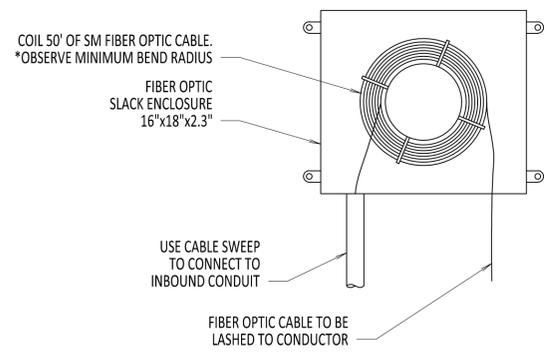
**NOTES:**

- NKT TO LASH/CLAMP FIBER OPTIC CABLE AND ATTACH SPLICE CLOSURES AS NEEDED.
- SPLICE CLOSURE ONLY AT SPECIFIED LOCATIONS. SEE PLAN AND PROFILE.

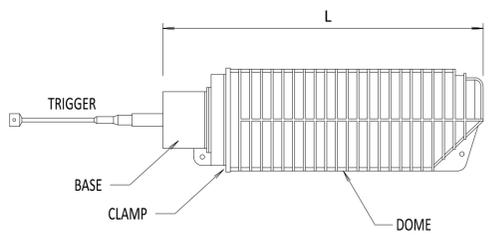
REFERENCE DOCUMENTS		
LIST NO.	DOCUMENT NAME	DOCUMENT NO.
1	SPLICE VAULT PLAN AND ELEVATION	S-700
2	SPLICE VAULT SECTION AND DETAILS	S-701
3	SLACK ENCLOSURE DIAGRAM	C-856



**ENCLOSED VAULT w/ FIBER OPTIC CABLE**  
NOT TO SCALE

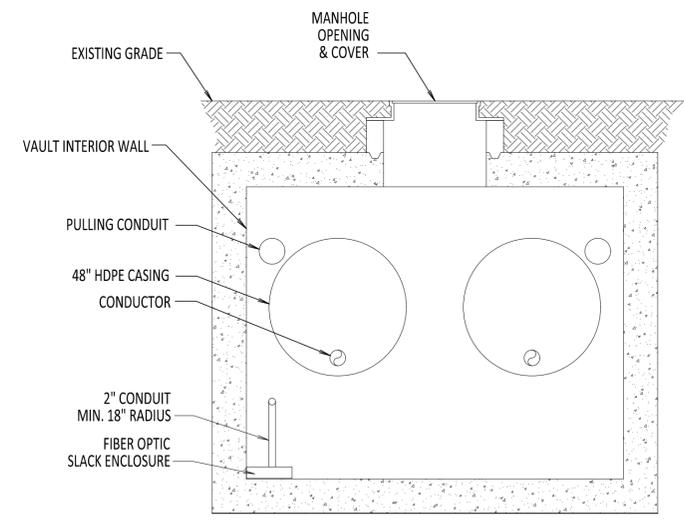


**DETAIL 1**  
**FIBER OPTIC SLACK ENCLOSURE**  
NOT TO SCALE



**DETAIL 2**  
**FIBER OPTIC SPLICE CLOSURE**  
NOT TO SCALE

NOTE:  
TO BE INSTALLED AS REQUIRED.  
SEE DRAWING (LATER) FOR LOCATIONS



**SECTION A-A**  
NOT TO SCALE

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No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP
0	09/16/2022	EM&CP REGULATORY RE-SUBMISSION	DM	MK

**CHAMPLAIN HUDSON POWER EXPRESS**  
**ENCLOSED VAULT w/ FIBER OPTICS**

KIEWIT PROJECT NO.	21162
CHA PROJECT NO.	066076
DRAWING NO.	<b>C-852</b>
DATE	09/16/2022
SH.NO.	OF XXX

DRAWN BY: TJM DESIGNED BY: MK APPROVED BY: XX SCALE: REV. NO. DATE: 09/16/2022 SH.NO. OF: XXX

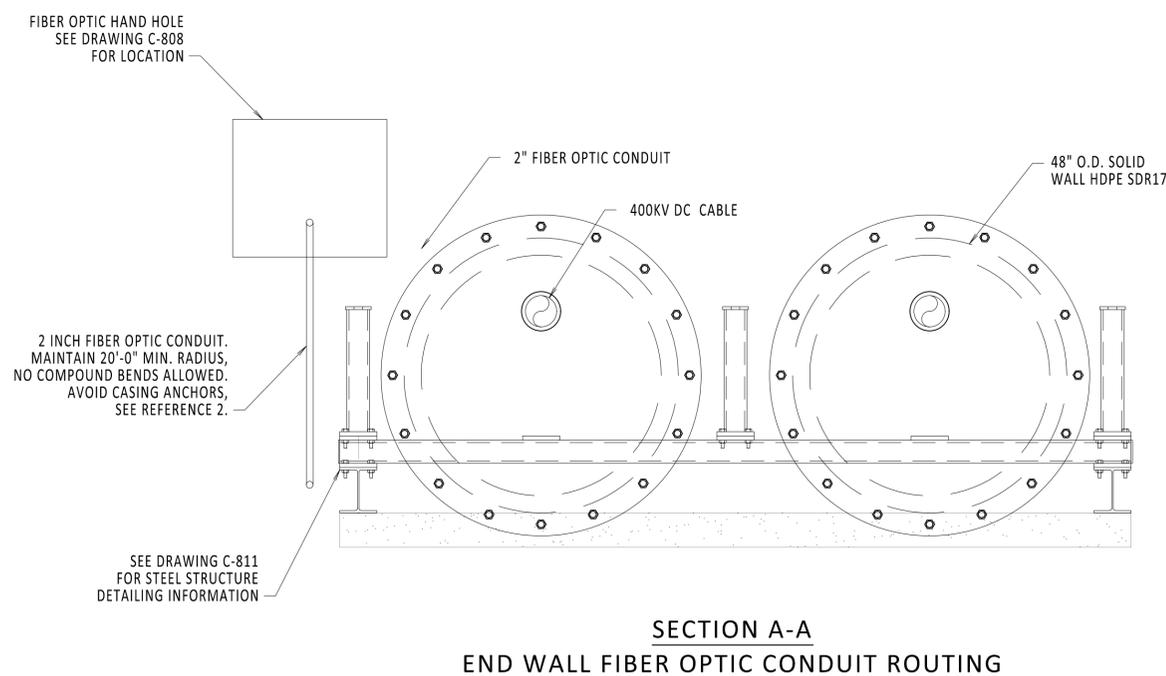
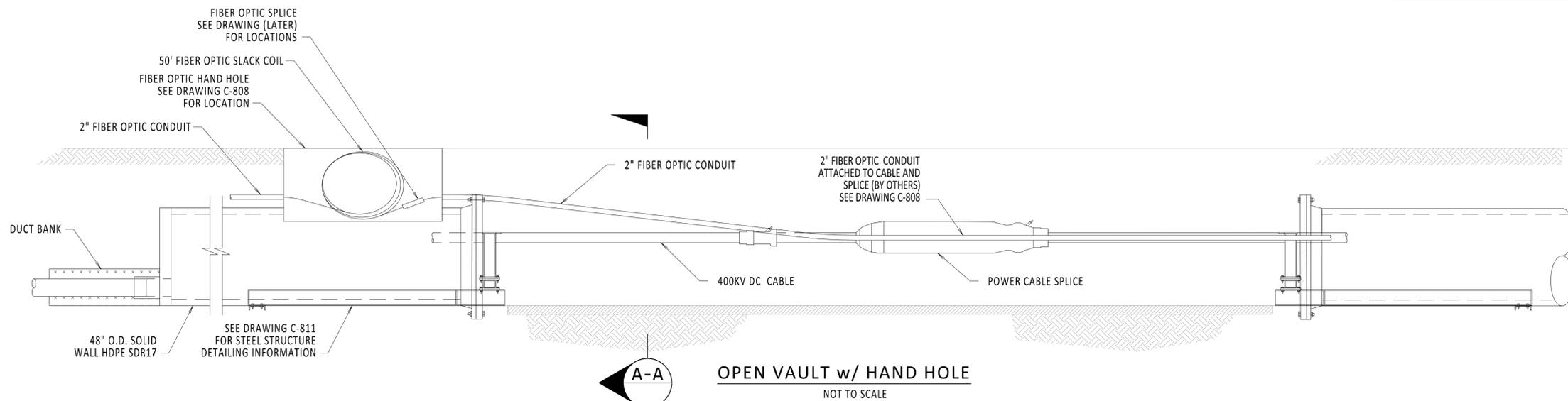
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NOTES:

- 1. ADD HAND HOLE TO ALL OPEN VAULT LOCATIONS.
- 2. FIBER OPTIC SPLICE CLOSURE ONLY AT SPECIFIC LOCATIONS.

REFERENCE DOCUMENTS

LIST NO.	DOCUMENT NAME	DOCUMENT NO.
1	FRP FIBER COMMUNICATION HAND HOLE	S-771
2	TYPICAL OPEN PIT SPLICE CASING DETAILS	C-808
3	STEEL SUPPORT DETAILS	C-811



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No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP
0	09/16/2022	EM&CP REGULATORY RE-SUBMISSION	DM	MK

**CHAMPLAIN HUDSON POWER EXPRESS**  
**OPEN VAULT w/ FIBER OPTICS  
HAND HOLE**

KIEWIT PROJECT NO.	21162
CHA PROJECT NO.	066076
DRAWING NO.	<b>C-853</b>
DATE	09/16/2022
SH.NO.	OF XXX

DRAWN BY: TJM DESIGNED BY: MK APPROVED BY: XX SCALE: REV. NO. DATE: 09/16/2022 SH.NO.: OF XXX

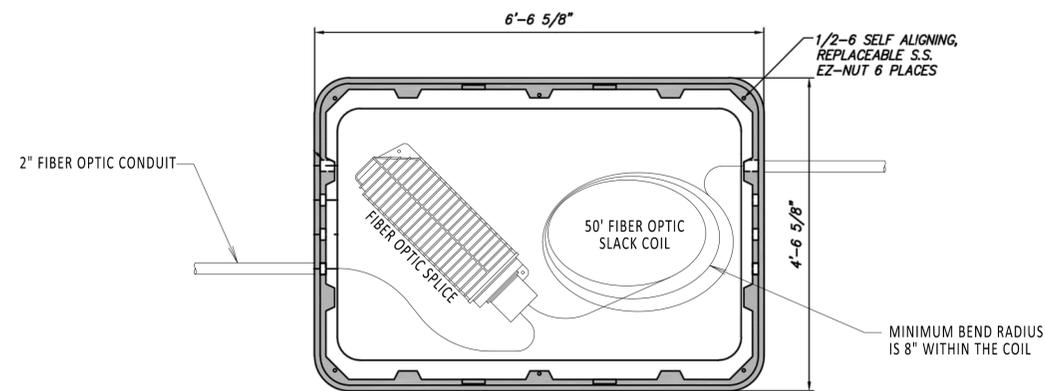
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NOTES:

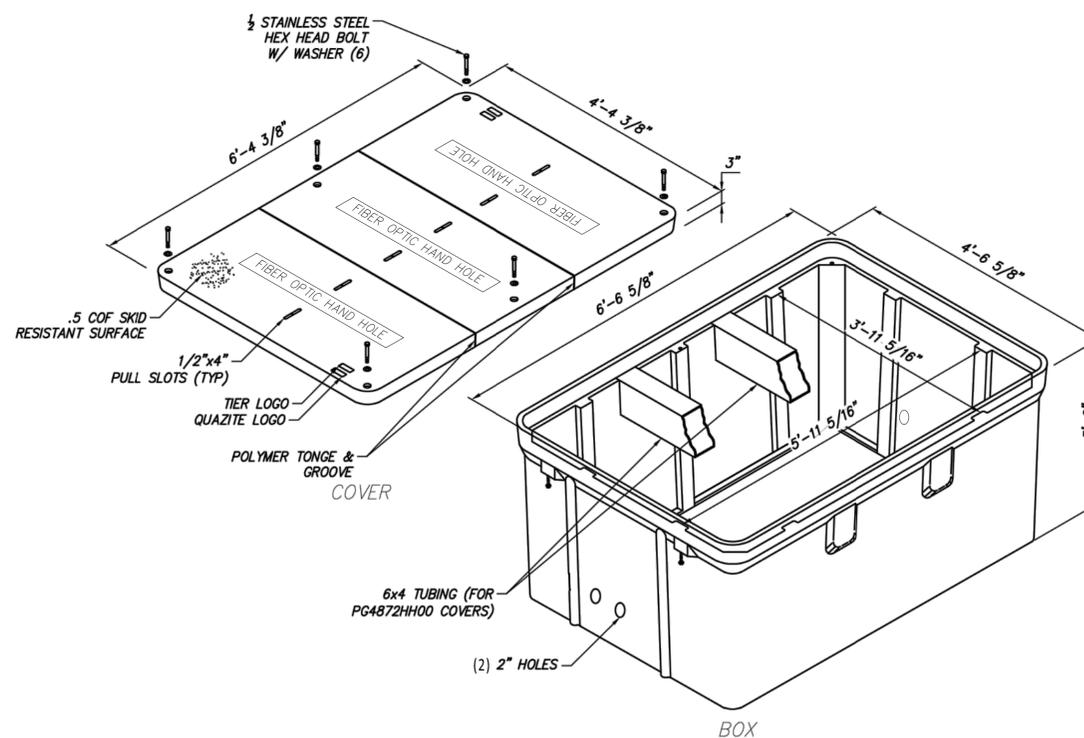
- 1. FIBER OPTIC COIL TO BE PLACED IN BOTTOM OF HAND HOLE. OBSERVE MINIMUM BEND RADIUS.
- 2. SPLICE ALL FIBERS STRAIGHT THROUGH.
- 3. FIBER OPTIC SPLICE CLOSURE ONLY AT SPECIFIC LOCATIONS.
- 4. GROUNDING REQUIREMENTS TO BE DETERMINED.
- 5. HAND HOLE AT ALL OPEN SPLICE LOCATIONS.

REFERENCE DOCUMENTS

LIST NO.	DOCUMENT NAME	DOCUMENT NO.
1	TYPICAL OPEN PIT SPLICE CASING DETAILS	C-808
2	FIBER OPTIC SPLICE DETAILS	C-855



HAND HOLE  
TOP VIEW  
NOT TO SCALE



ISOMETRIC VIEW  
NOT TO SCALE

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No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP
0	09/16/2022	EM&CP REGULATORY RE-SUBMISSION	DM	MK

CHAMPLAIN HUDSON POWER EXPRESS

FIBER OPTIC HAND HOLE DETAILS

KIEWIT PROJECT NO.  
21162  
CHA PROJECT NO.  
066076  
DRAWING NO.

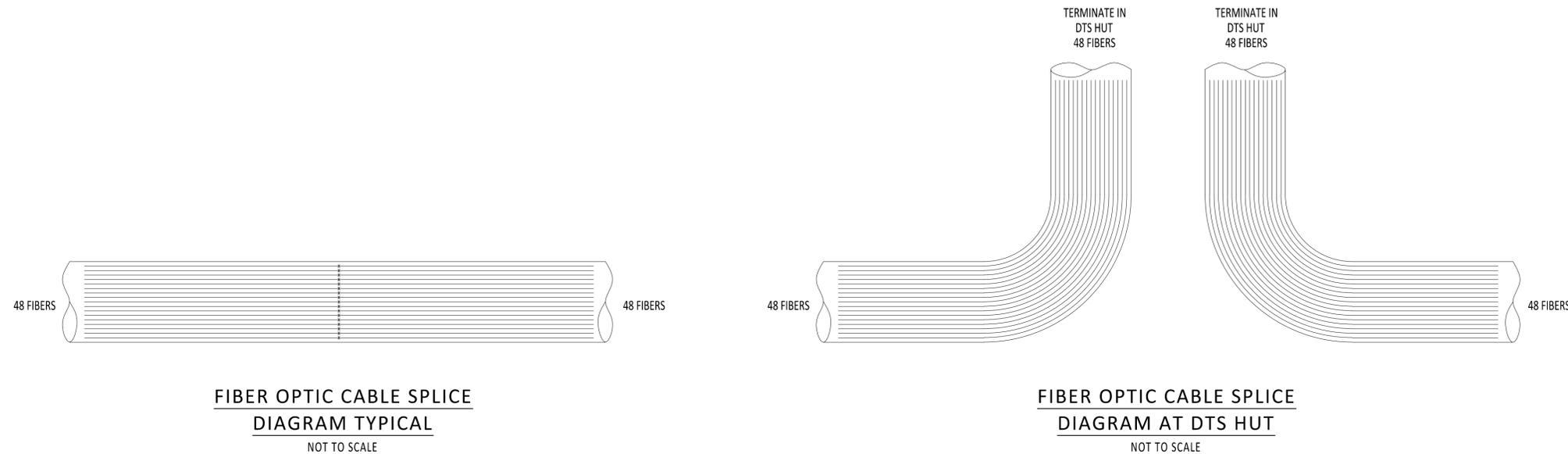
**C-854**

DRAWN BY: TJMQ DESIGNED BY: MK APPROVED BY: XX SCALE REV. NO. DATE 09/16/2022 SH.NO. OF XXX

A

B

- NOTES:**
1. GROUNDING DETAILS. TBD.
  2. MAINTAIN 18" SWEEPS ON ALL CONDUITS.
  3. DTS HUT FIBERS WILL SPLICE TO BLUE TUBE FIBER COLORS BLUE, ORANGE, GREEN AND BROWN.



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0	09/16/2022	EM&CP REGULATORY RE-SUBMISSION	DM	MK

**CHAMPLAIN HUDSON POWER EXPRESS**  
FIBER OPTIC SPLICE DIAGRAM

KIEWIT PROJECT NO.	21162
CHA PROJECT NO.	066076
DRAWING NO.	<b>C-855</b>
DATE	09/16/2022
SH.NO.	OF XXX

DRAWN BY: TJMG DESIGNED BY: MK APPROVED BY: XX SCALE: REV. NO.

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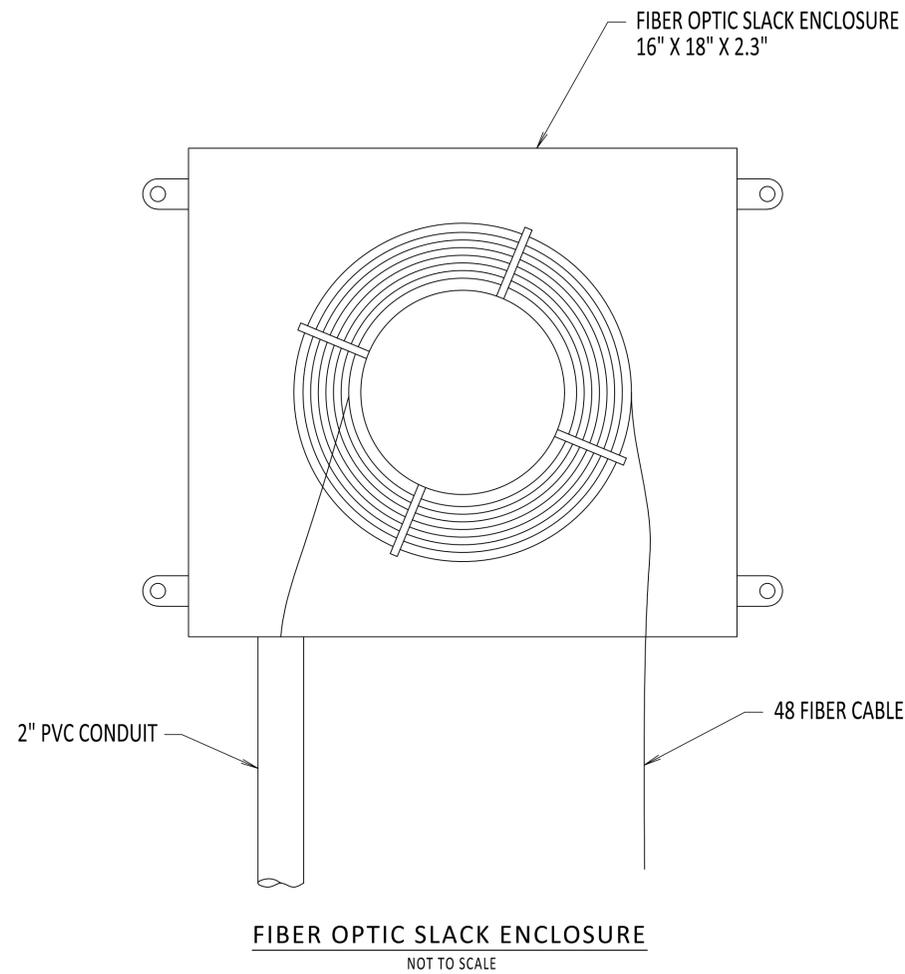
B

NOTES:

- 1. DO NOT KINK OR TWIST FIBER OPTIC CABLE.
- 2. IN VAULT PULL FROM DISTANT MANHOLE THEN COIL AND PLACE IN THE FIBER OPTIC SLACK ENCLOSURE.

REFERENCE DOCUMENTS

LIST NO.	DOCUMENT NAME	DOCUMENT NO.
1	TRANSITION VAULT WITH FIBER OPTIC DETAILS	C-850
2	ENCLOSED VAULT WITH FIBER OPTIC DETAILS	C-852



FIBER OPTIC SLACK ENCLOSURE  
NOT TO SCALE

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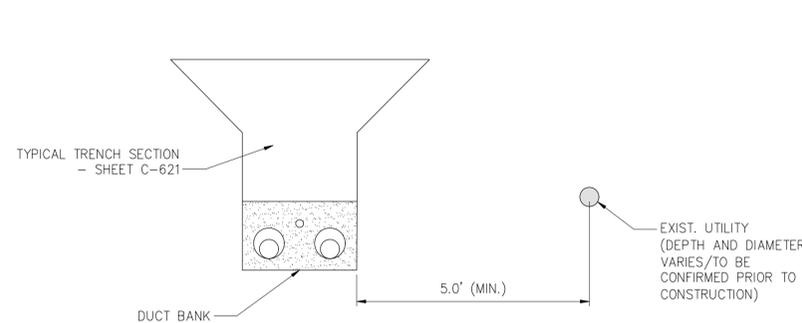
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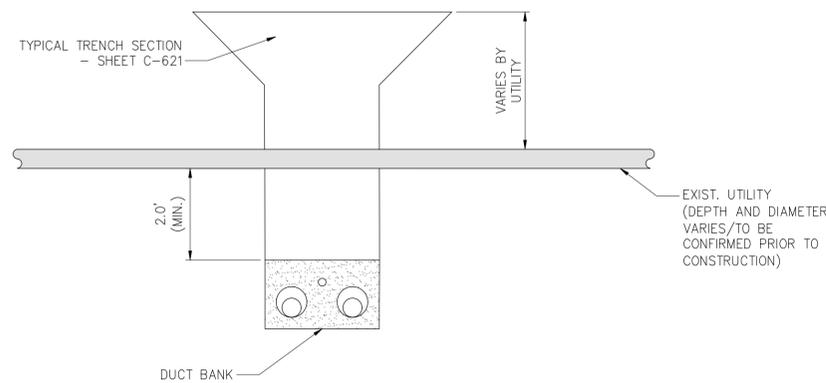
CHAMPLAIN HUDSON POWER EXPRESS  
FIBER OPTIC SLACK ENCLOSURE DETAIL

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CHA PROJECT NO.	066076
DRAWING NO.	<b>C-856</b>
DATE	09/16/2022
SH.NO.	OF XXX

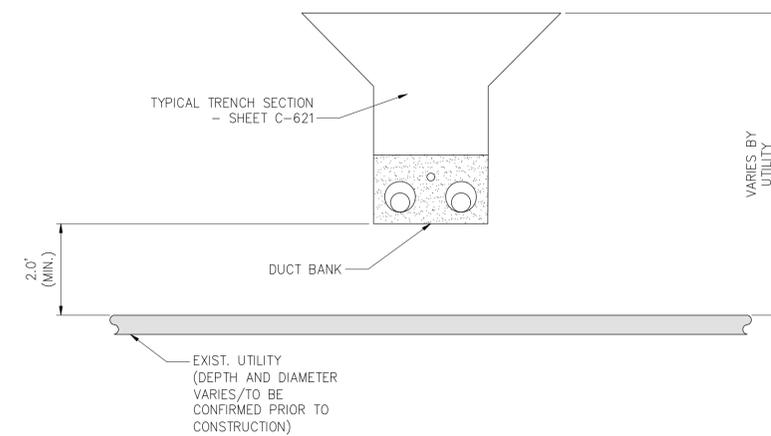
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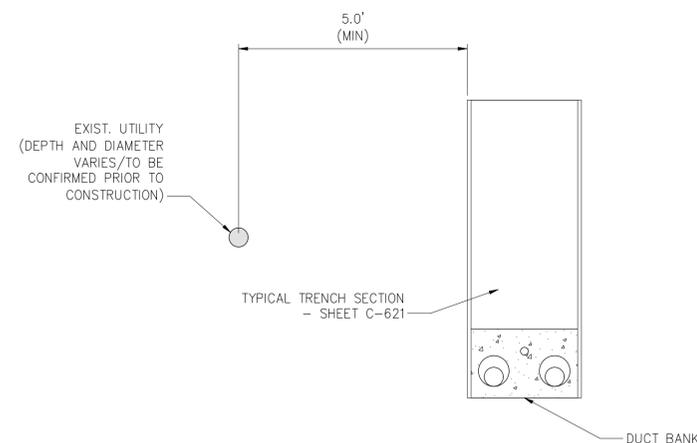
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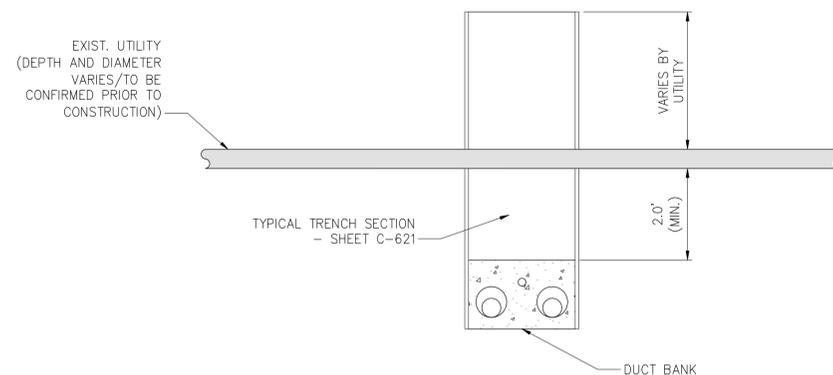
3 OPEN TRENCH - VERTICAL SEPARATION (UNDER)  
NOT TO SCALE



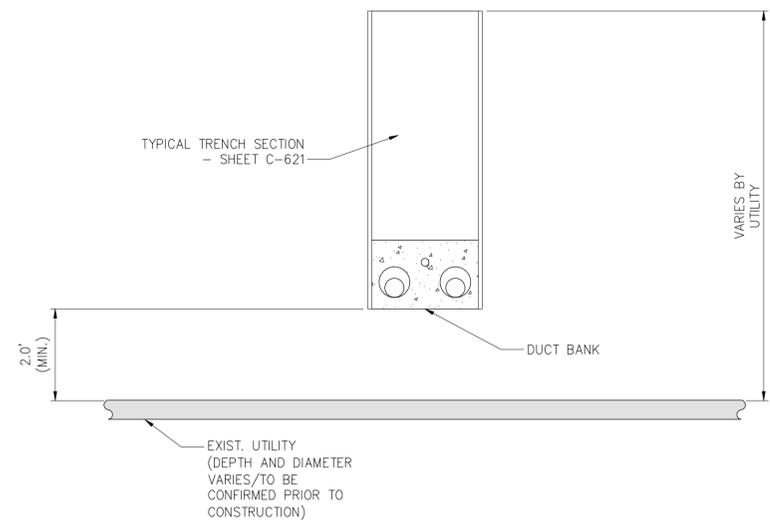
5 OPEN TRENCH - VERTICAL SEPARATION (OVER)  
NOT TO SCALE



2 TYPICAL DUCTBANK IN ROADWAY - HORIZONTAL SEPARATION  
NOT TO SCALE



4 TYPICAL DUCTBANK IN ROADWAY - VERTICAL SEPARATION (UNDER)  
NOT TO SCALE



6 TYPICAL DUCTBANK IN ROADWAY - VERTICAL SEPARATION (OVER)  
NOT TO SCALE

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No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP
0	09/21/22	FINAL EM&CP SUBMISSION	WSO	

**CHAMPLAIN HUDSON POWER EXPRESS  
PACKAGE 1 A - PUTNAM TO DRESDEN  
UTILITY TYPICAL  
SEPARATION DETAILS**

KIEWIT PROJECT NO.	21162
CHA PROJECT NO.	066076
DRAWING NO.	<b>C-901</b>
SCALE	AS NOTED
DATE	11/02/2021
REV. NO.	0
SH.NO.	XXX OF XXX

DRAWN BY: wso DESIGNED BY: wso APPROVED BY: SCALE AS NOTED DATE 11/02/2021

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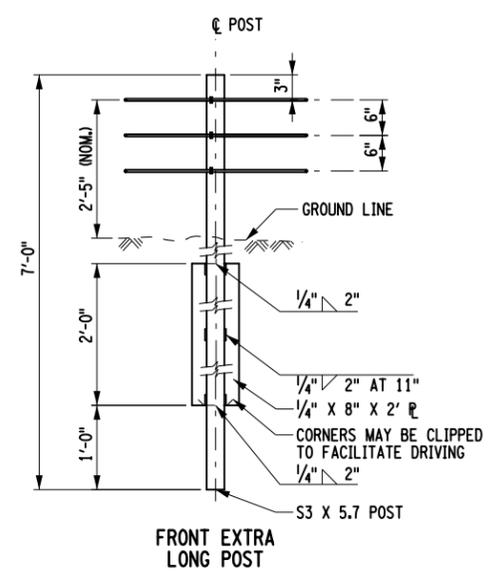
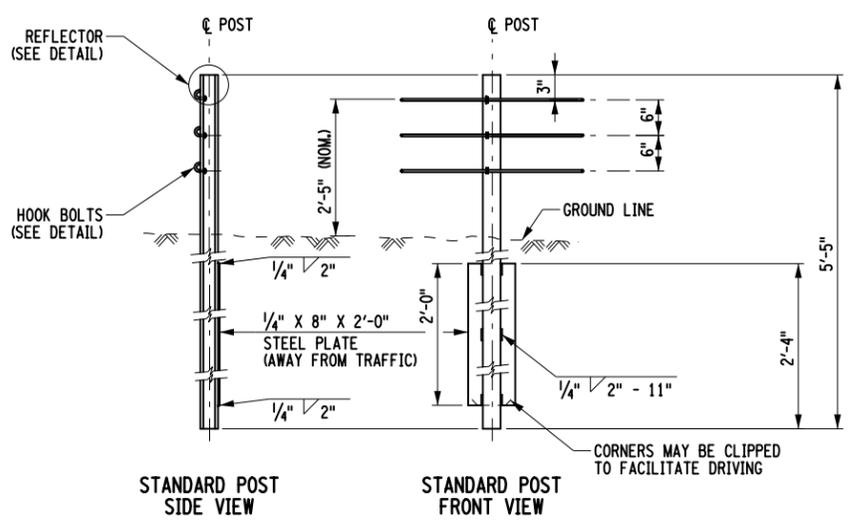
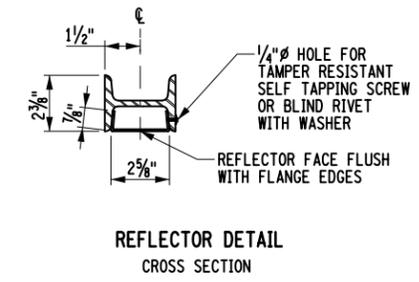
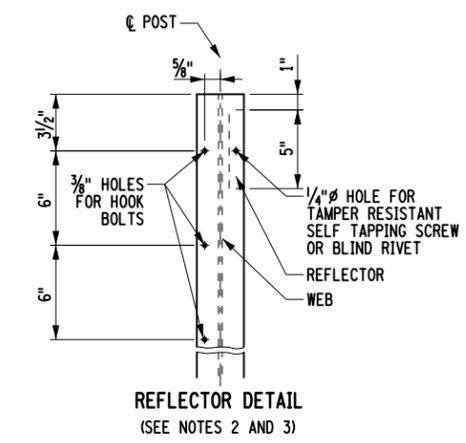
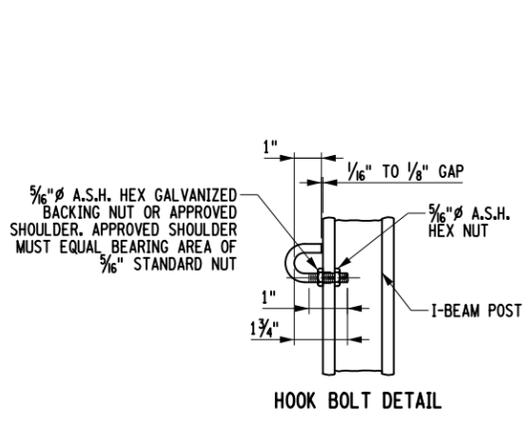
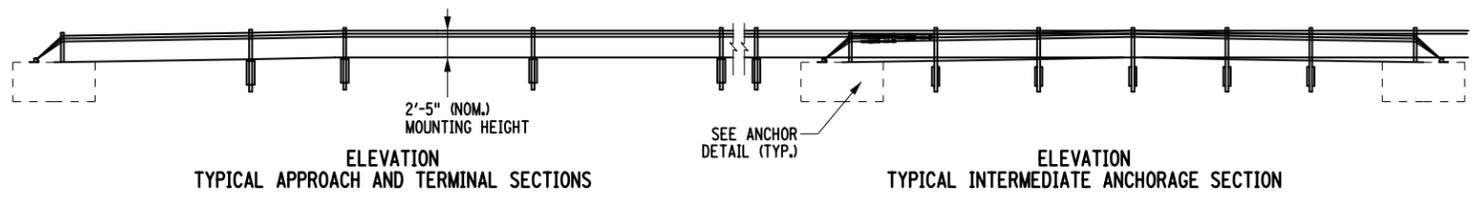
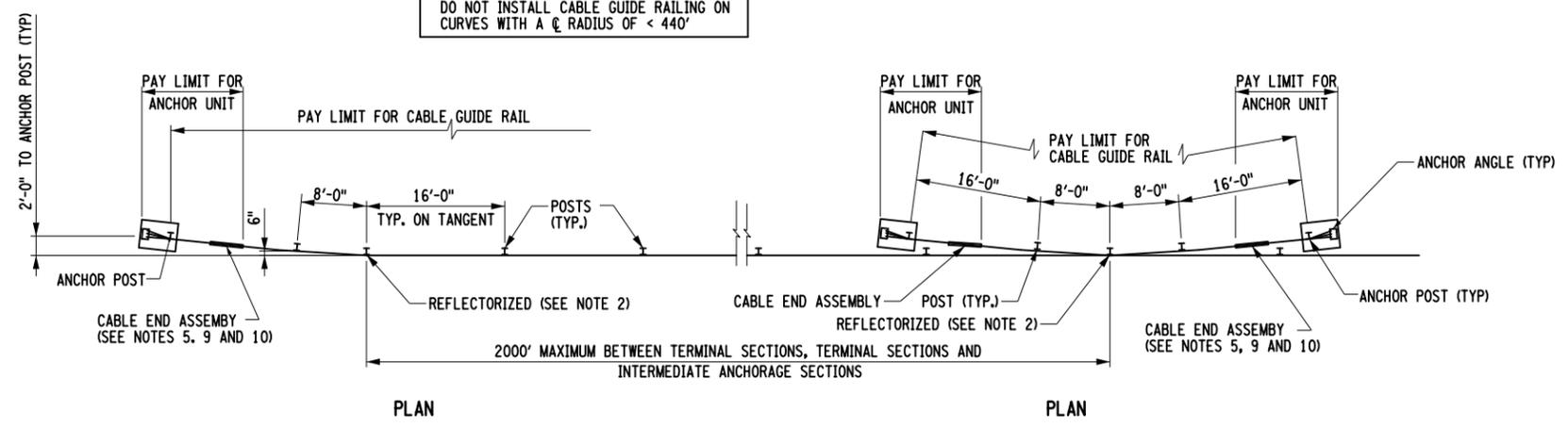
APPENDIX A

NYSDOT STANDARD SHEETS

NOT FOR CONSTRUCTION  
FOR EM&CP PERMIT ONLY

TABLE "A"	
RADIUS OF $\phi$ CURVATURE	MAX. POST SPACING
$\geq 715'$	16'
$\geq 440'$ AND $\leq 715'$	12'

DO NOT INSTALL CABLE GUIDE RAILING ON CURVES WITH A  $\phi$  RADIUS OF  $< 440'$



TYPICAL POST DETAILS NOTE: FOR OPTIONAL UNIVERSAL POST DETAILS SEE BOX BEAM GUIDE RAIL STANDARD SHEETS.

GENERAL NOTES:

- ALL POSTS SHALL BE S3 X 5.7 ROLLED STEEL SECTION. THE ANCHOR POST STUB SHALL BE S3 X 7.5.
- WHERE THE RAIL IS PARALLEL TO THE EDGE OF THE PAVEMENT, EVERY SIXTH (6TH) POST STARTING WITH THE FIRST SHALL BE REFLECTORIZED. DO NOT REFLECTORIZE POSTS IN THE INTERMEDIATE ANCHORAGE SECTION, TYPICAL APPROACH AND TERMINAL SECTION, OR WHEN USED AS A MEDIAN BARRIER.
- REFLECTORS SHALL BE ALUMINUM ALLOY 1/16" THICK WITH REFLECTIVE SHEETING. THE REFLECTIVE SHEETING SHALL BE WHITE WHEN INSTALLED ON THE RIGHT SIDE OF TRAFFIC AND FLUORESCENT YELLOW WHEN ON THE LEFT.
- STAGGER CABLE SPLICES. PROVIDE A MINIMUM OF 20' BETWEEN ANY PAIR. PROVIDE A MINIMUM OF 100' BETWEEN CABLE SPLICES ON THE SAME CABLE.
- FOR ARRANGEMENT OF SPRING CABLE END ASSEMBLIES (COMPENSATING DEVICE) AND TURNBUCKLE CABLE END ASSEMBLIES, THE FOLLOWING CRITERIA SHALL APPLY:  
 LENGTH OF CABLE RUN  
 -LENGTH OF CABLE RUNS UP TO 1000' - USE COMPENSATING DEVICE (DETAIL B) ON ONE END, AND TURNBUCKLE (DETAIL A) ON THE OTHER END OF EACH INDIVIDUAL CABLE.  
 -LENGTH OF CABLE RUNS 1000' TO 2000' - USE COMPENSATING DEVICE (DETAIL B) ON THE ENDS OF EACH INDIVIDUAL CABLE.  
 -LENGTH OF CABLE RUNS OVER 2000' - START A NEW STRETCH BY INTERLACING AT LAST PARALLEL POST (SEE TYPICAL INTERMEDIATE ANCHORAGE DETAILS).  
 PRIOR TO FINAL ACCEPTANCE BY THE STATE, THE FOLLOWING VALUES SHALL BE USED TO TIGHTEN THE TURNBUCKLES, DEPENDING ON THE TEMPERATURE AT THE TIME OF ADJUSTMENT.

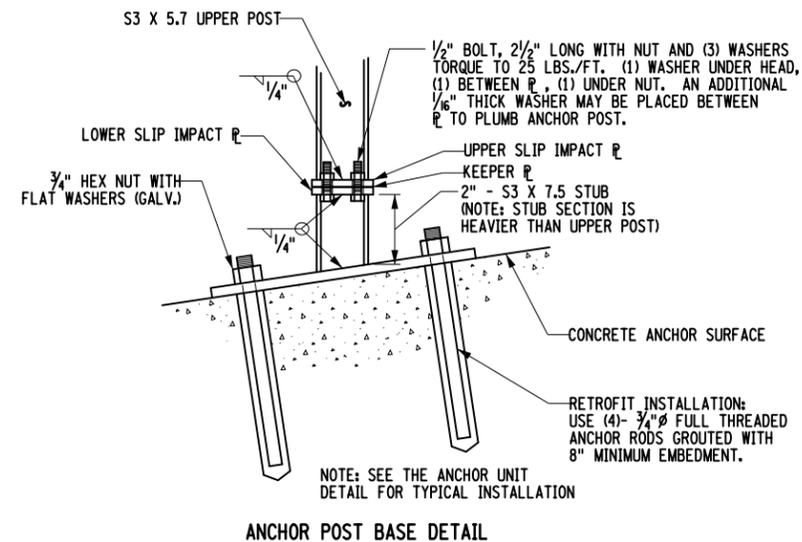
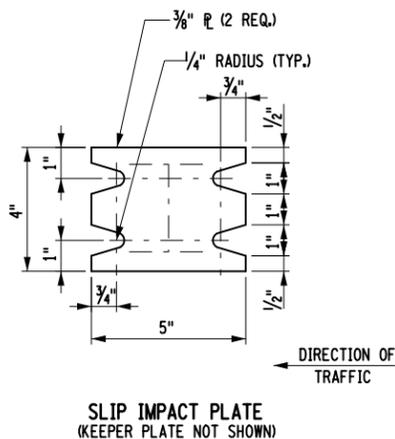
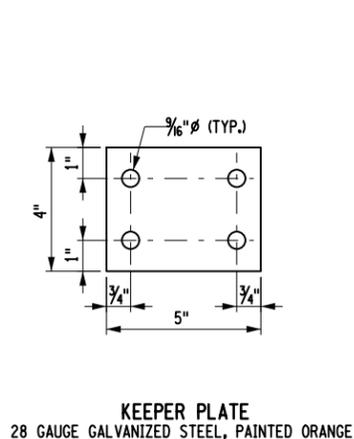
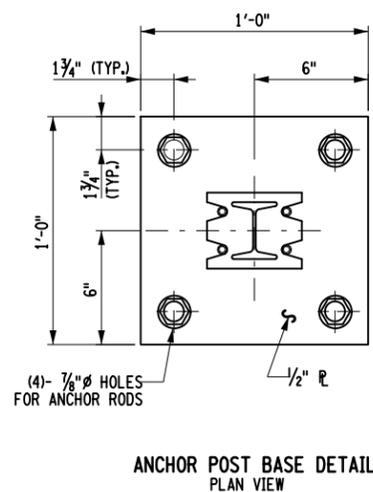
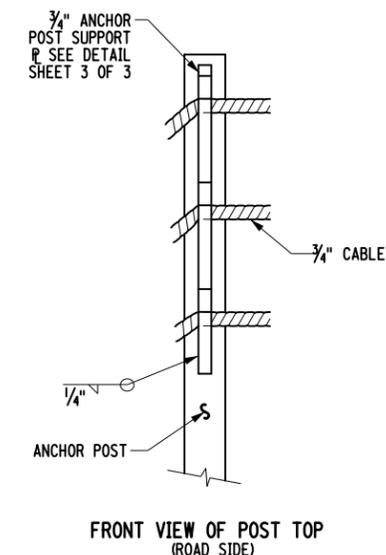
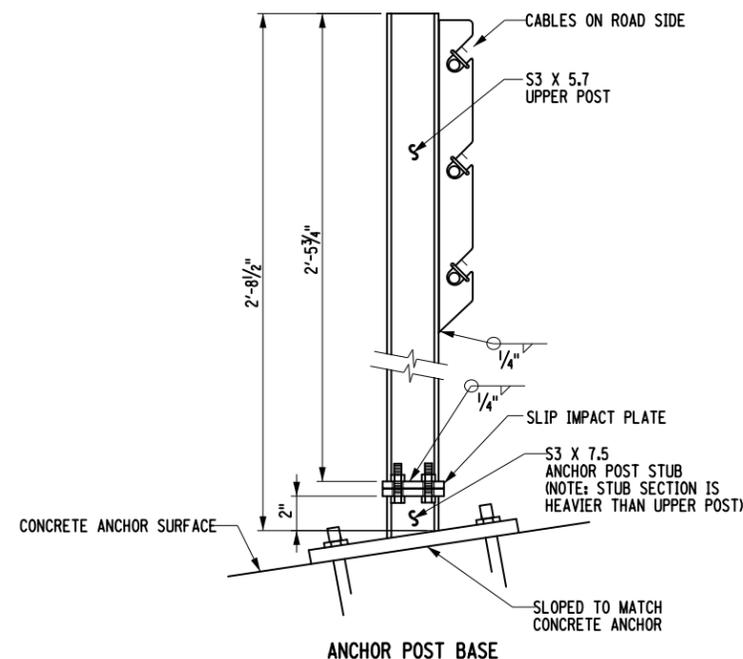
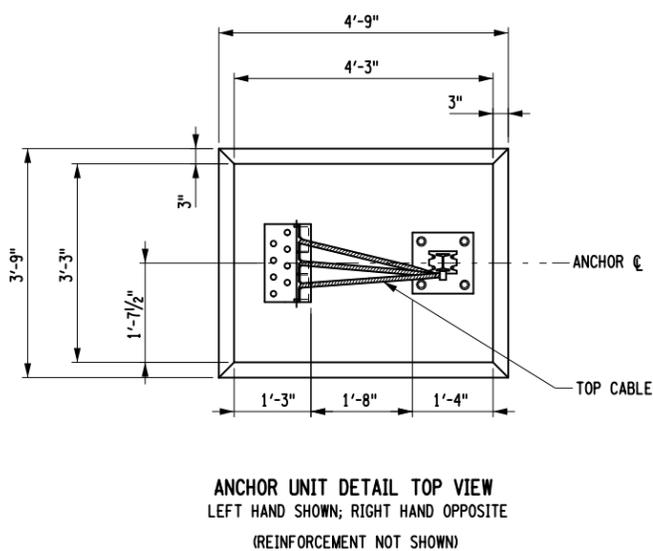
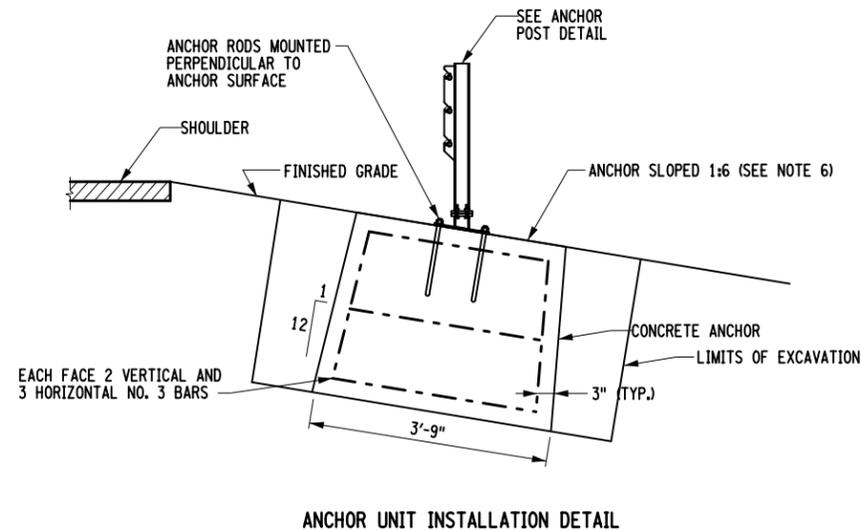
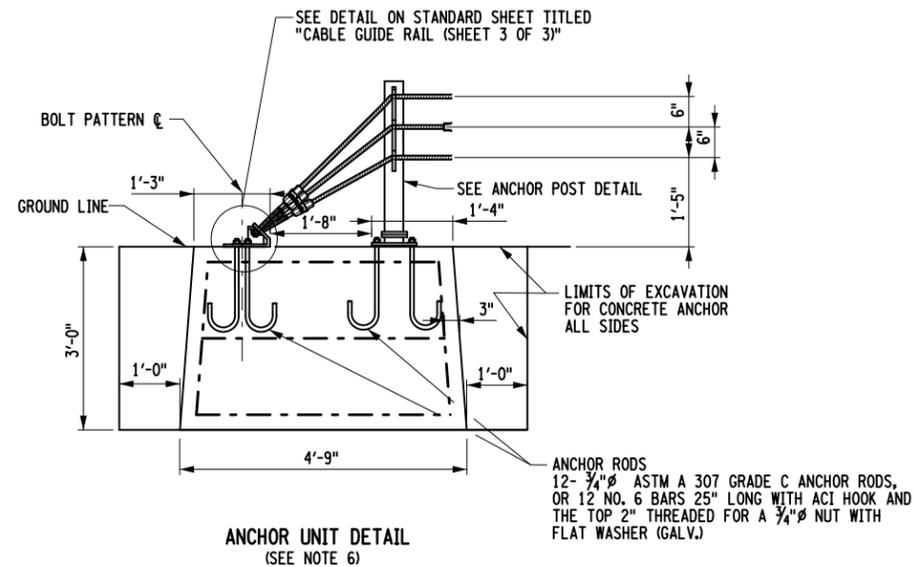
TEMPERATURE (DEGREES FARENHEIT)													
120	109	99	89	79	69	59	49	39	29	19	9	-1	-11
TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
110	100	90	80	70	60	50	40	30	20	10	0	-10	-20
SPRING COMPRESSION FROM UNLOADED POSITION IN EACH SPRING - MEASURED IN INCHES													
1	1/4	1/2	3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/2

- THE CONCRETE ANCHOR SHALL BE SET INTO THE EXCAVATION AS DETAILED. THE BOTTOM OF THE ANCHOR SHALL HAVE A FULL AND EVEN BEARING ON THE SURFACE UNDER IT. BACK FILL IN ACCORDANCE WITH THE REQUIREMENTS OF §203-3.15 "FILL AND BACK FILL AT STRUCTURES, CULVERTS, PIPES, CONDUITS, AND DIRECT BURIAL CABLES".
- RAIL MOUNTING HEIGHT IS TO BE MEASURED FROM PAVEMENT IF OFFSET BETWEEN PAVEMENT AND CURB IS  $\leq 12"$  AND FROM GROUND BENEATH RAIL IF OFFSET  $> 12"$ .
- LIFTING DEVICES, IF EMBEDDED IN CONCRETE, SHALL BE RATED BY THEIR MANUFACTURER AS HAVING A "SAFE WORKING LOAD" OF FOUR TONS (4 TONS).
- AT ALL LOCATIONS WHERE THE CABLE IS CONNECTED TO A CABLE SOCKET WITH A WEDGE TYPE CONNECTION, ONE WIRE OF THE WIRE ROPE SHALL BE CRIMPED OVER THE BASE OF THE WEDGE TO HOLD IT FIRMLY IN PLACE.
- CABLE ENDS SHALL BE FABRICATED FROM MALLEABLE IRON (§715-09) OR CAST STEEL (§715-02). THE CABLE SPLICE AND WEDGE SHALL BE FABRICATED FROM MALLEABLE IRON OR ASTM A536 DUCTILE IRON GRADE 65-45-12.

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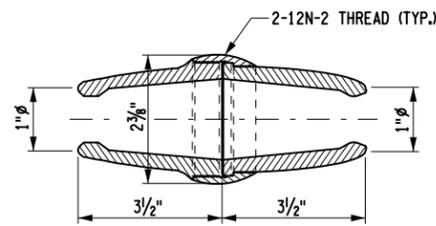
STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION	
U.S. CUSTOMARY STANDARD SHEET	
CABLE GUIDE RAILING (SHEET 1 OF 3)	
APPROVED FEBRUARY 14, 2012	ISSUED UNDER EB 12-003
/S/ RICHARD W. LEE, P.E. DEPUTY CHIEF ENGINEER DESIGN (ACTING)	606-01

ERRATA 1: EFF. 05/01/18  
 ISSUED WITH EB 18-003

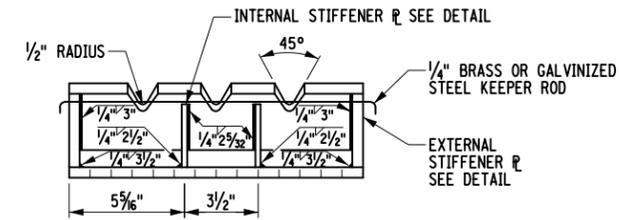
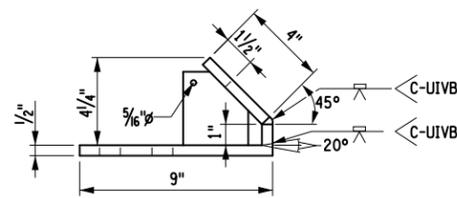
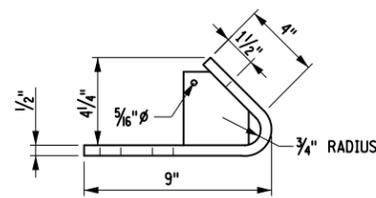


	STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION
	U.S. CUSTOMARY STANDARD SHEET
CABLE GUIDE RAILING (SHEET 2 OF 3)	
APPROVED FEBRUARY 14, 2012	ISSUED UNDER EB 12-003
/S/ RICHARD W. LEE, P.E. FOR THE DEPUTY CHIEF ENGINEER (DESIGN)	606-01

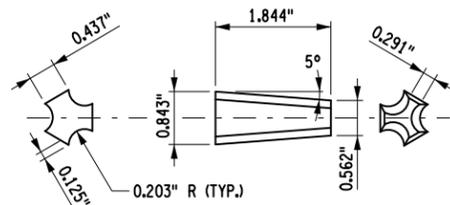
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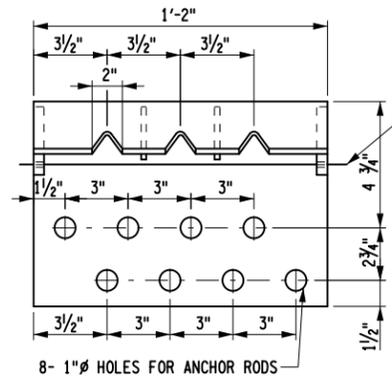
**CABLE SPLICE DETAIL**  
(SEE NOTE 4)



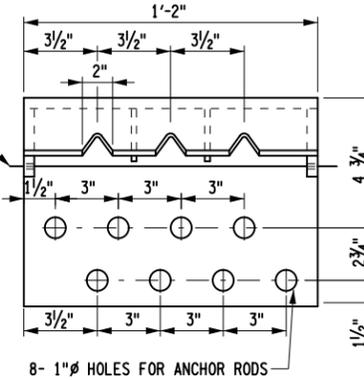
**ANCHOR ANGLE DETAILS**



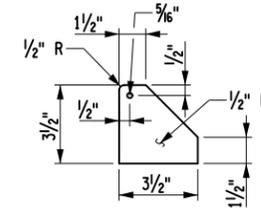
**DETAIL "X"**  
TYPICAL WEDGE FOR ALL  
CABLE SPLICES AND CABLE ENDS  
(DO NOT GALVANIZE)



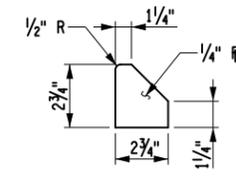
**BENT PLATE  
ANCHOR ANGLE DETAILS**



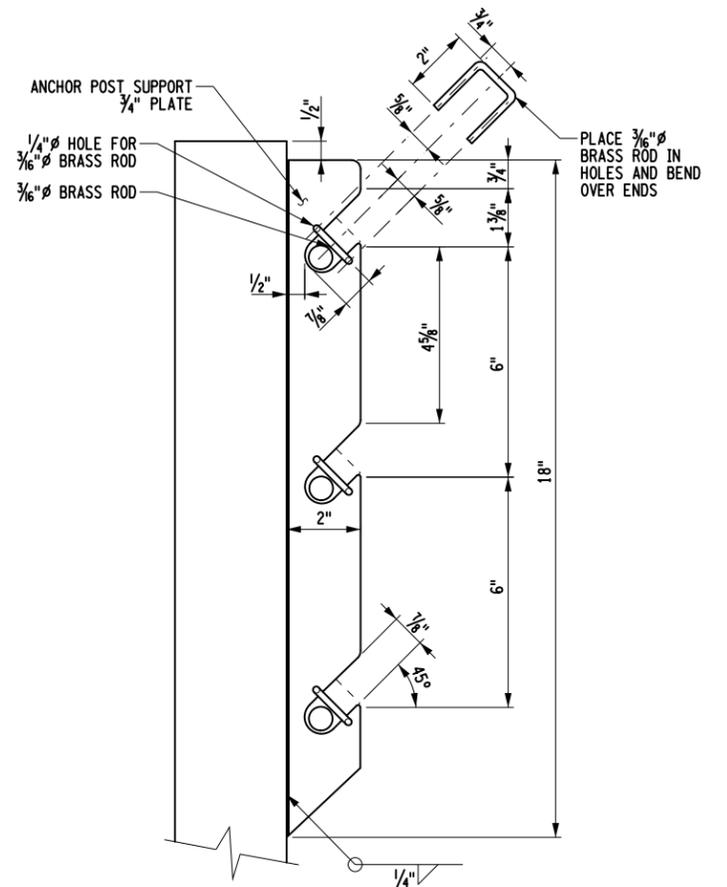
**WELDED PLATE  
ANCHOR ANGLE DETAILS**



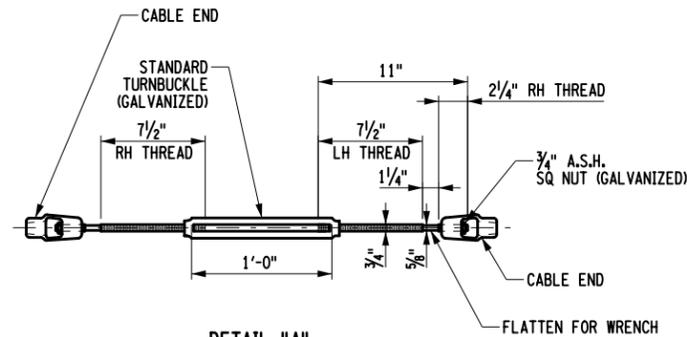
**EXTERNAL STIFFENER R  
ANCHOR ANGLE DETAILS**



**INTERNAL STIFFENER R  
ANCHOR ANGLE DETAILS**



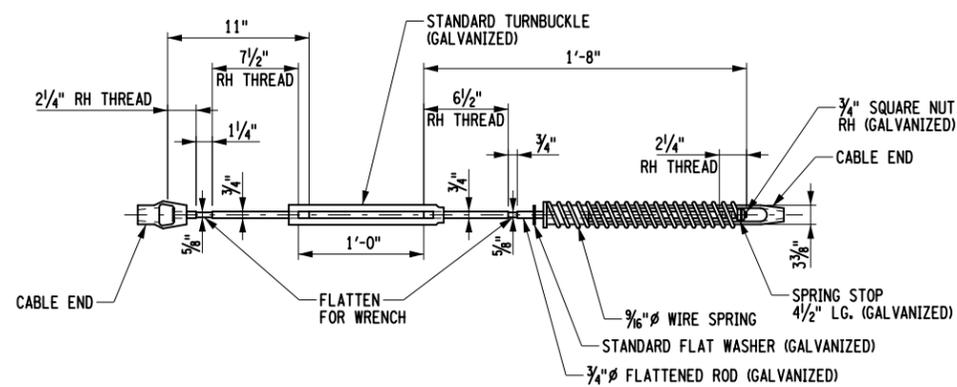
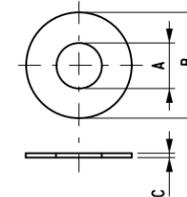
**SIDE VIEW OF ANCHOR POST TOP**



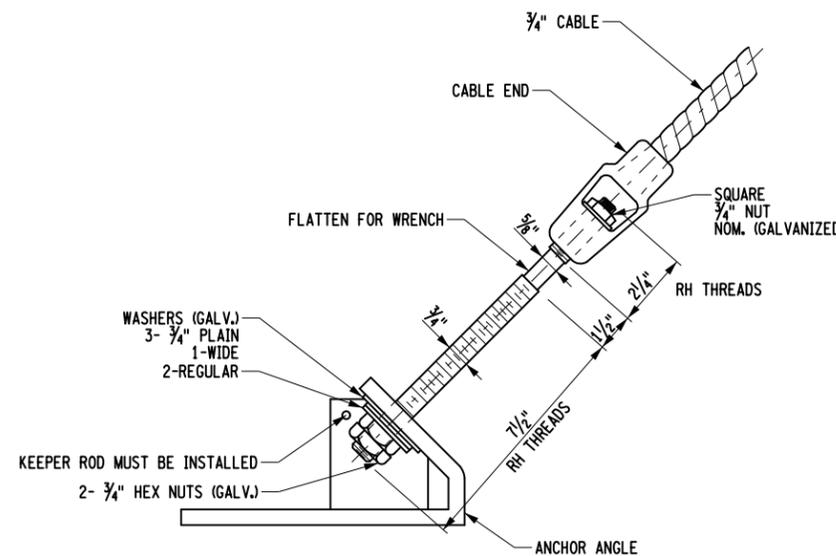
**DETAIL "A"**  
STEEL TURNBUCKLE CABLE END ASSEMBLY  
(SEE NOTE 5)

WASHER	WASHER SERIES	INSIDE DIAMETER "A"			OUTSIDE DIAMETER "B"			THICKNESS "C"		
		BASIC	TOLERANCE PLUS	TOLERANCE MINUS	BASIC	TOLERANCE PLUS	TOLERANCE MINUS	BASIC	MAX.	MIN.
3/4"	REGULAR	0.812	0.030	0.007	1.469	0.030	0.007	0.134	0.160	0.108
	WIDE	0.812	0.030	0.007	2.000	0.030	0.007	0.165	0.192	0.136
1/2"	NARROW	0.531	0.015	0.005	1.062	0.030	0.007	0.095	0.121	0.074

**WASHER TABLE AND WASHER DETAIL**



**DETAIL "B"**  
SPRING CABLE END ASSEMBLY  
(COMPENSATING DEVICE)  
(SEE NOTE 5)



**CABLE END ASSEMBLY TO  
ANCHOR ANGLE DETAILS**

GENERAL NOTES ON SHEET 1 OF 3

FILE NAME = 606-0103\_090612.dgn  
DATE/TIME = 22-FEB-2012 11:20  
USER = jturley

 <b>STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION</b>	
U.S. CUSTOMARY STANDARD SHEET	
<b>CABLE GUIDE RAILING (SHEET 3 OF 3)</b>	
APPROVED FEBRUARY 14, 2012	ISSUED UNDER EB 12-003
/S/ RICHARD W. LEE, P.E. DEPUTY CHIEF ENGINEER DESIGN (ACTING)	
606-01	

EFFECTIVE DATE: 09/06/12