

File: R:\INFO\IPD\USG STANDARDS\UNDERGROUND SHAREPOINT\PROJECTS\CHPE 400KV DC WORKING FOLDER\DWG\C-809_OPEN PIT SPLICE GROUNDING.DWG Saved: 6/9/2023 3:25:25 PM Plotted: 6/9/2023 6:45:00 AM Current User: Douglas.Mason LastSavedBy: Douglas.Mason

1

2

3

4

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5

6

DETAIL A

NOT TO SCALE

4

3

DETAIL B

NOT TO SCALE

NOTES:

1. FOR ADDITIONAL DESIGN PARAMETERS SEE SPECIFICATIONS.

2. ALL GROUND CONNECTIONS SHALL BE IRREVERSIBLE COMPRESSION CONNECTION UNLESS OTHERWISE NOTED.

3. LINK BOX WILL CONTAIN FOUR DISCONNECTING LINKS, AS PROVIDED BY VENDOR.

4. BONDING CABLE CONNECTION BETWEEN HIGH VOLTAGE DC CABLE SPLICE AND LINK BOX SHALL BE NO LONGER THAN 30 FEET. FIELD FIT EXACT LOCATION.

5. 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.

6. KIEWIT HAS PROVIDED GROUNDING AS PER NKT REQUIREMENTS. NO OTHER ELECTRICAL SYSTEM DESIGN HAS BEEN INCLUDED BY KIEWIT.

7. WHERE THERE IS DIFFICULTY INSERTING GROUND RODS DUE TO SOIL CONDITIONS. REFER TO GROUNDING COMPONENTS AND INSTALLATION SPECIFICATION FOR ALTERNATIVE GROUND ROD INSTALLATION METHODS.

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 C CONNECTOR	BURNDY YGHC29C29	KIEWIT	KIEWIT
5	COMPRESSION CONNECTION TO GROUND ROD	BURNDY YGHR29C34	KIEWIT	KIEWIT
6	3/4" X 10'-0" GROUND ROD	NVENT ERICO 613400	KIEWIT	KIEWIT
7	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 DETAILS	C-808
3	GROUNDING SPECIFICATIONS	260526.01

CHPE

Champlain Hudson Power Express

PKS

Kiewit

STATE OF NEW YORK

MICHAEL REIHS WHEELER

103646

LICENSED PROFESSIONAL ENGINEER

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

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0	06/08/2023	ISSUED FOR CONSTRUCTION SUBMISSION	DLM	ASM

CHAMPLAIN HUDSON POWER EXPRESS

OPEN PIT SPLICE GROUNDING DETAILS

DRAWN BY: DESIGNED BY: SD APPROVED BY: ASM

SCALE: NOT TO SCALE REV. NO. 0

KIEWIT PROJECT NO. 21162

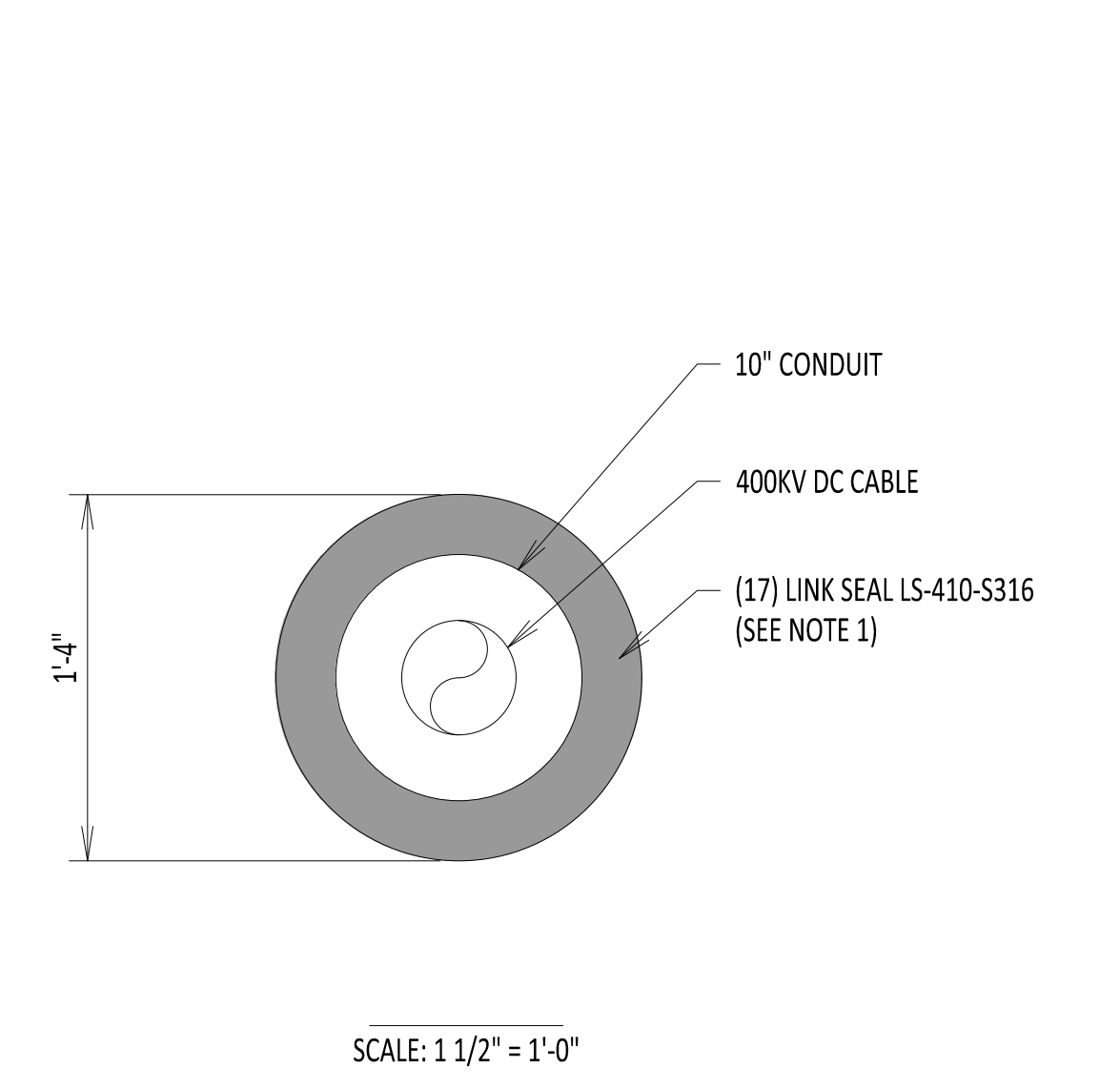
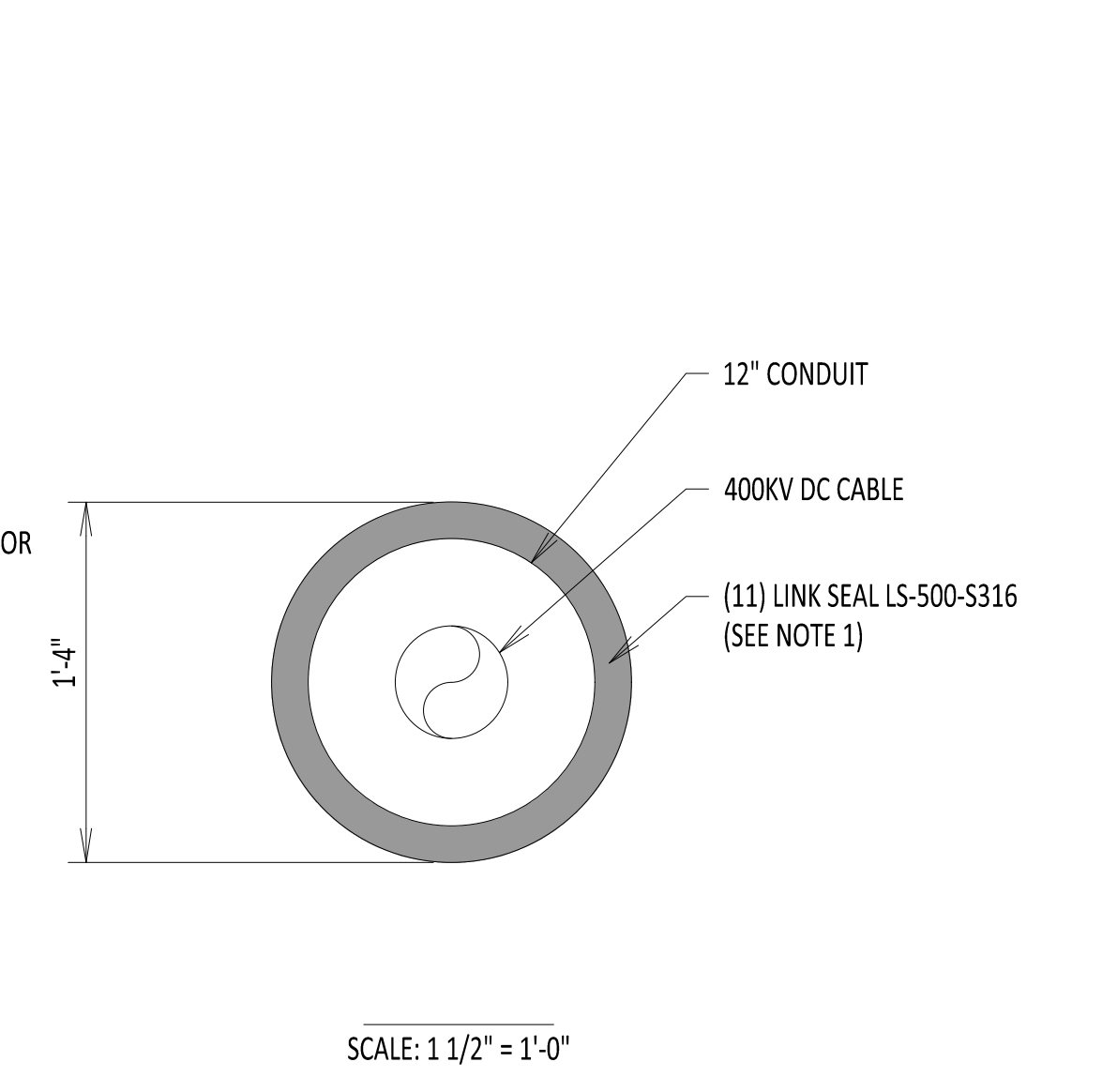
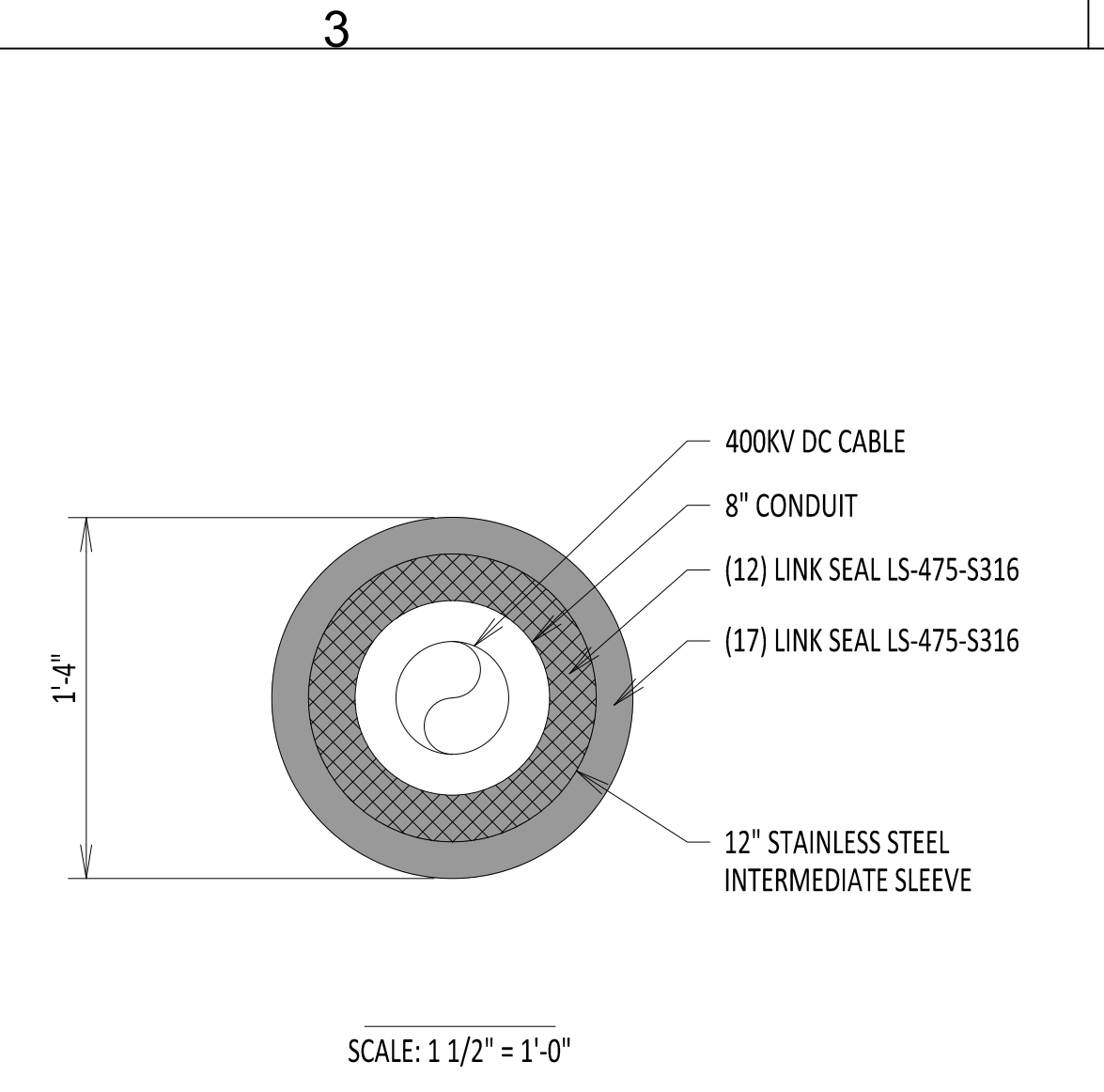
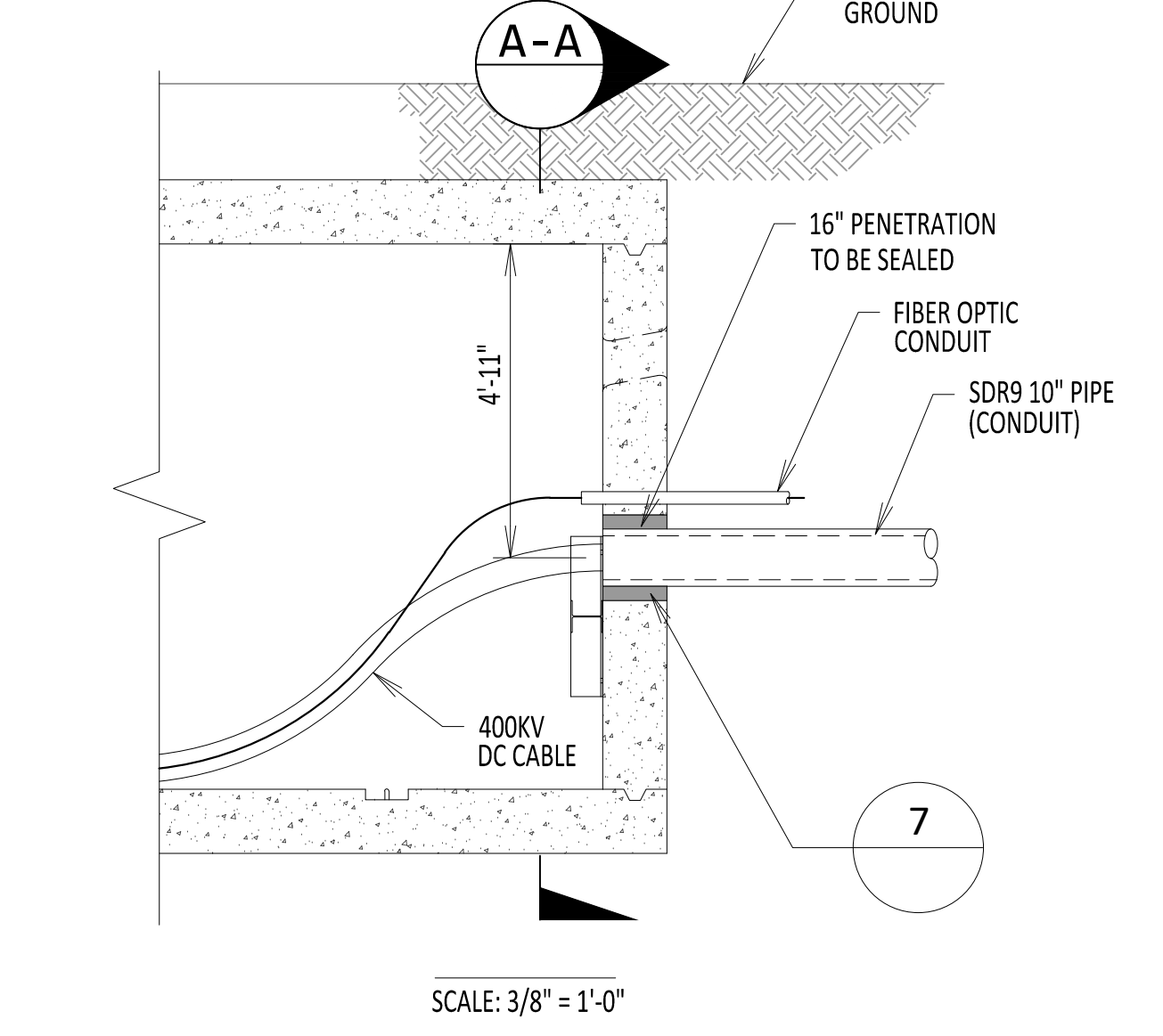
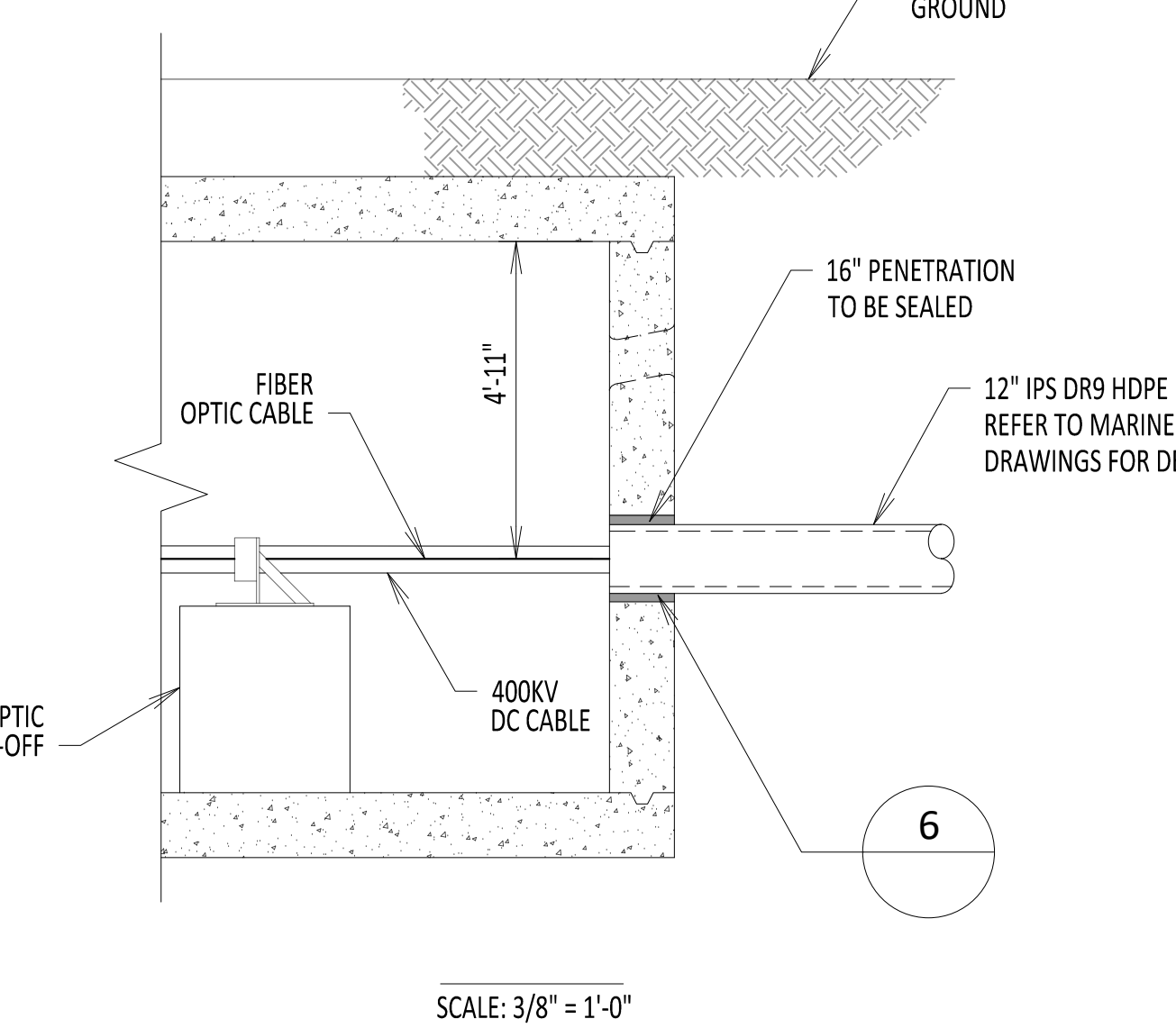
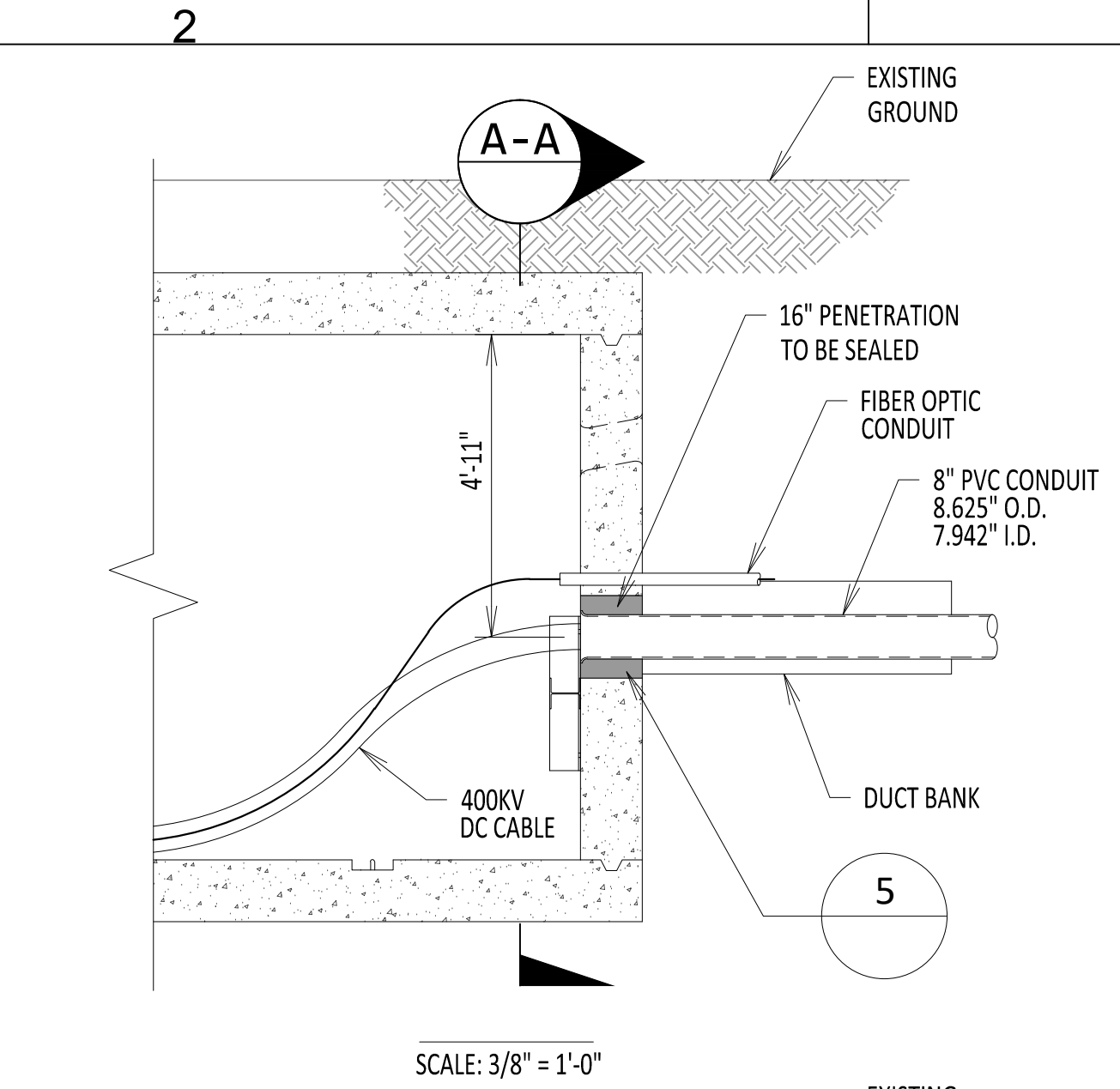
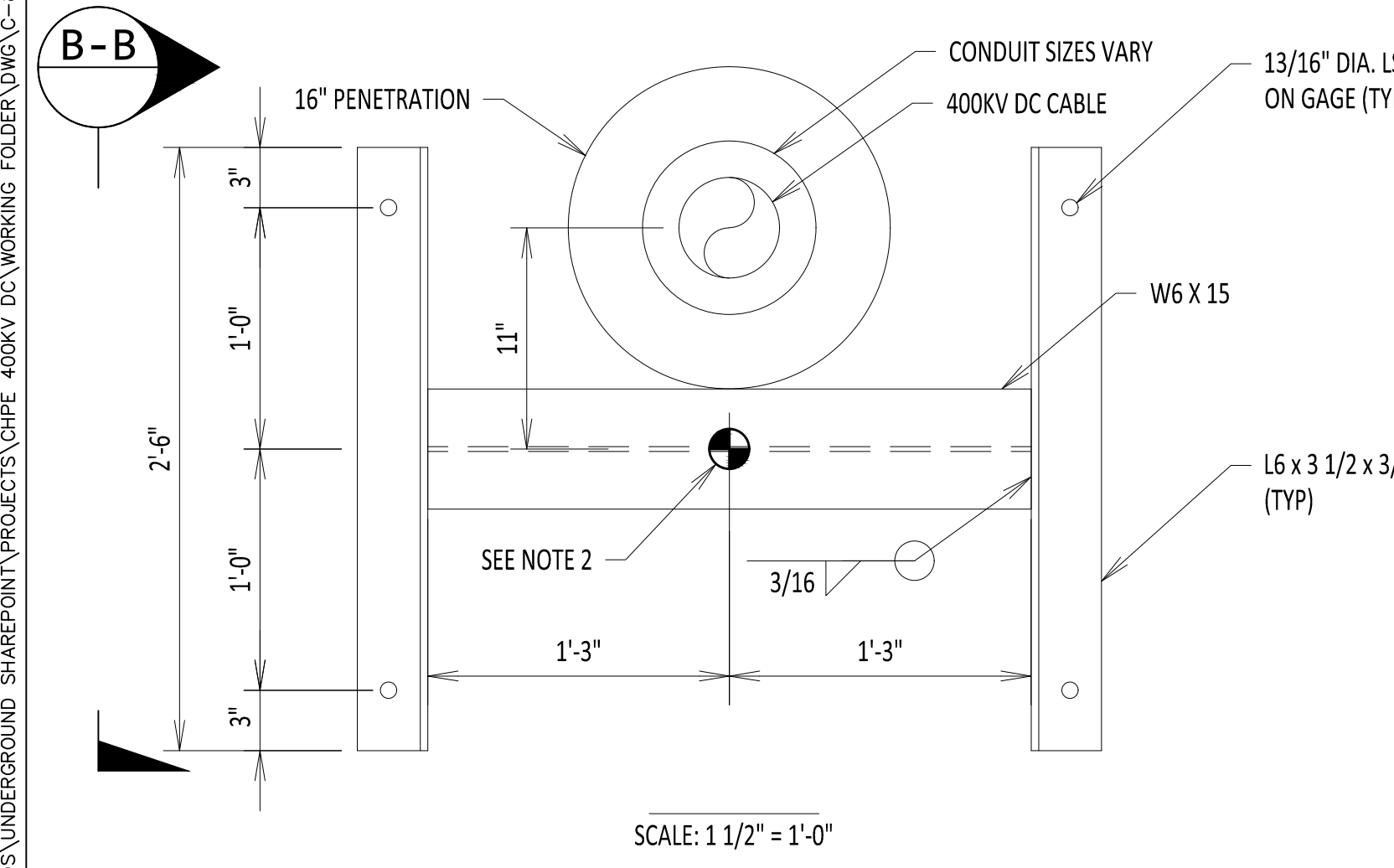
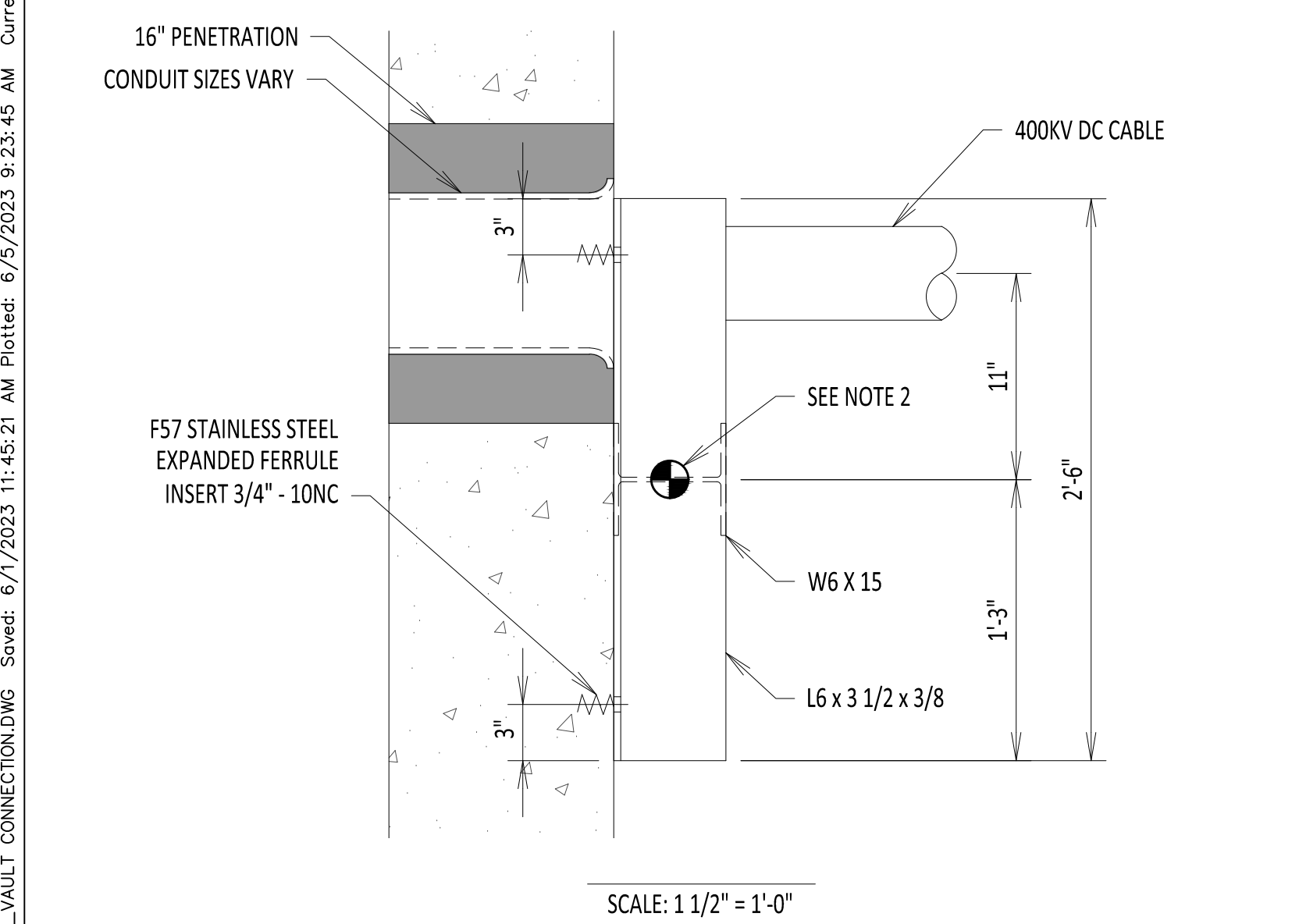
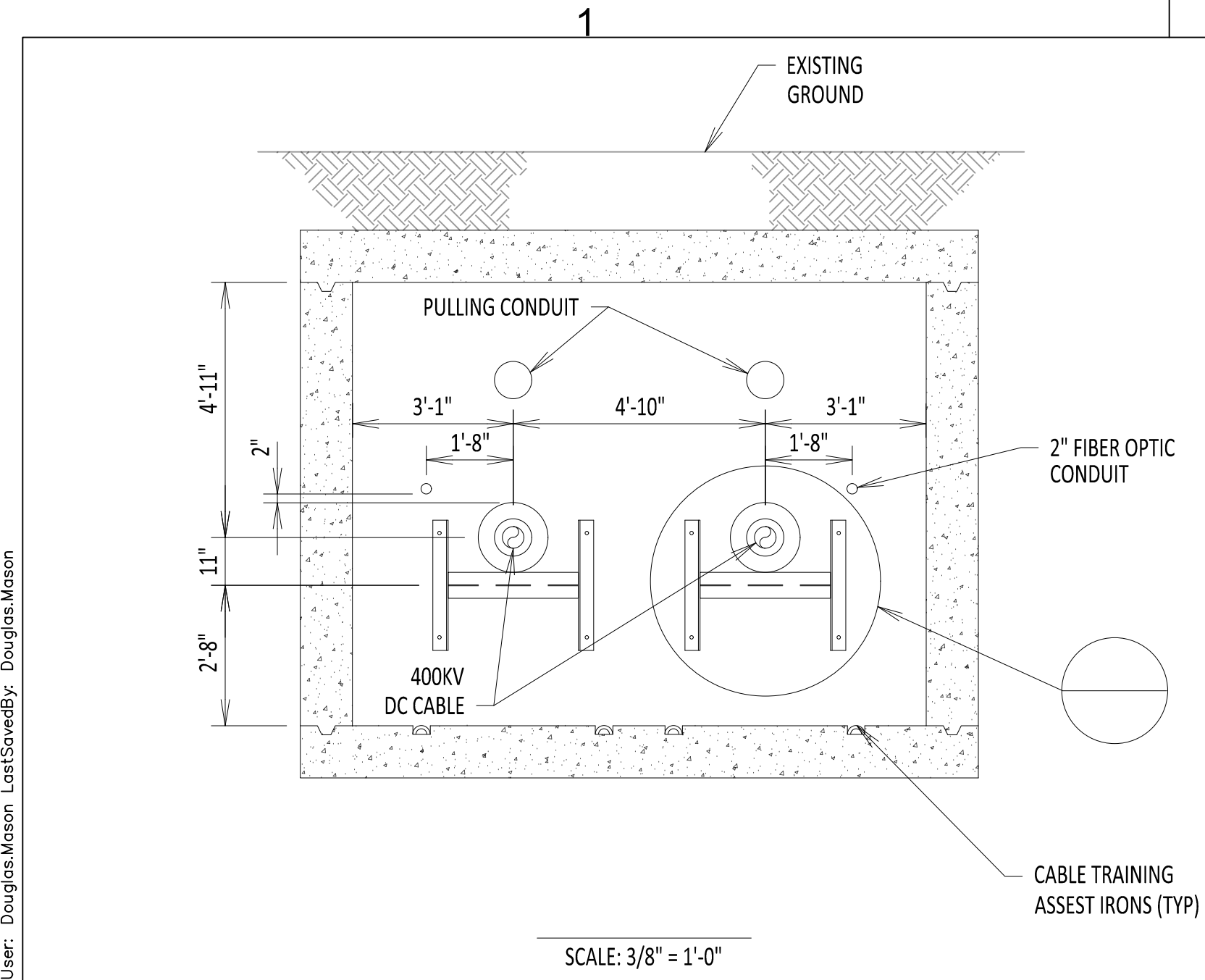
CHA PROJECT NO. 066076

DRAWING NO. C-809

DATE 06/08/2023 SH.NO.

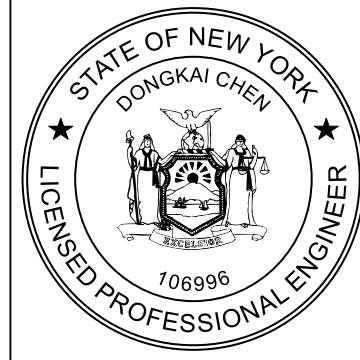
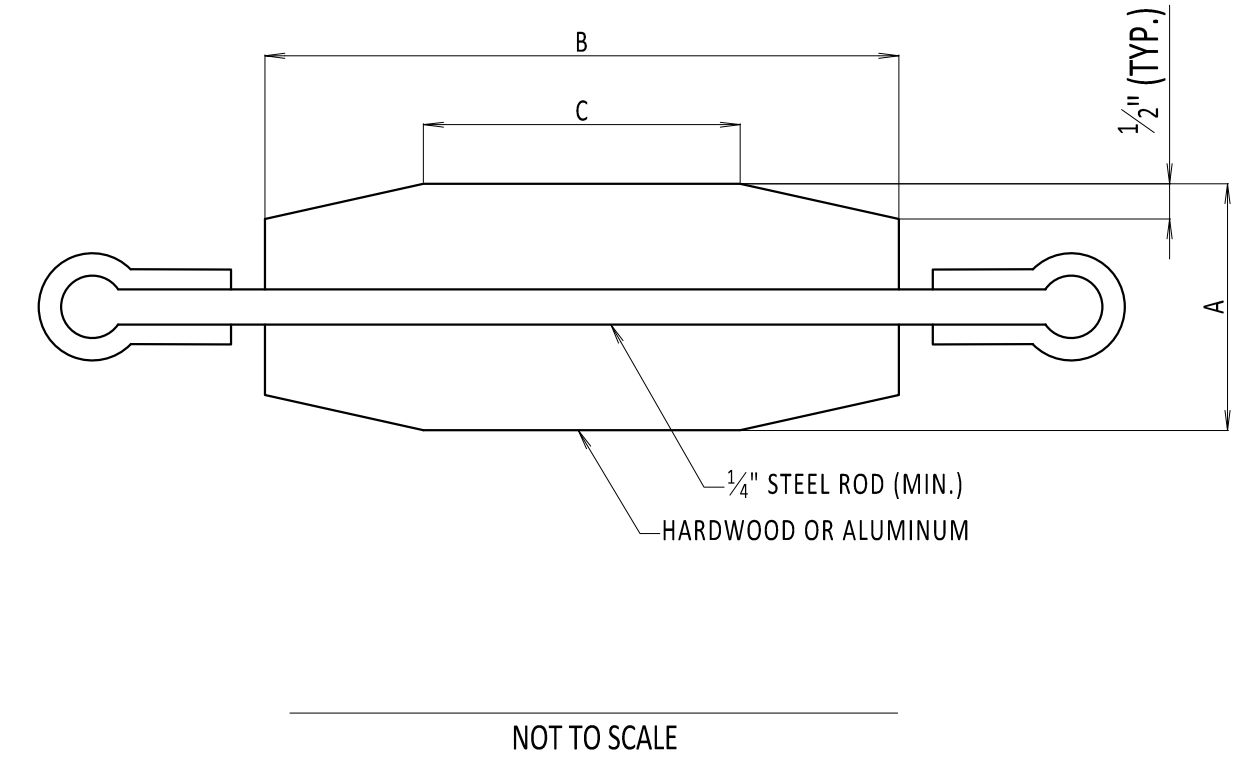
Profile to location on GROUNDING ELEVATION

File: R:\INFO\IPD\USG STANDARDS\UNDERGROUND SHAREPOINT\PROJECTS\CHPE 400KV DC WORKING FOLDER\DWG\0-812_VAULT_CONNECTION.DWG Saved: 6/7/2023 11:45:21 AM Plotted: 6/5/2023 9:23:45 AM Current User: Douglas.Mason Last Saved By: Douglas.Mason



1. NUMBER OF LINK SEAL WILL VARY WHEN APPLYING TO 10" CONDUIT AND 12" CONDUIT.
2. INDICATES LOCATION OF ATTACHMENT. END WALL CABLE CLAMP (BY OTHERS) TO BE ATTACHED CENTERED ON W6 WEB. CABLE AXIAL LOAD SHALL NOT EXCEED 9KIPS (ULTIMATE).

MANDREL SIZE DATA TABLE									
CONDUIT INFORMATION					MANDREL DIM.				
CONDUIT TYPE	SCH.	NOMINAL CONDUIT SIZE	MINIMUM CONDUIT RADIUS	CONDUIT O.D.	CONDUIT I.D.	A	B	C	
PVC	40	8"	8'-0"	8.625"	7.942"	7.481"	18.5"	10"	
PVC	40	8"	10'-0"	8.625"	7.942"	7.481"	20.5"	11"	
PVC	40	8"	12'-0"	8.625"	7.942"	7.481"	22.5"	12"	
HDPE	DR7	10"	8'-0"	10.75"	7.49"	7.481"	18.5"	10"	
HDPE	DR7	10"	10'-0"	10.75"	7.49"	7.481"	20.5"	11"	
HDPE	DR7	10"	12'-0"	10.75"	7.49"	7.481"	22.5"	12"	
HDPE	DR9	10"	8'-0"	10.75"	8.22"	7.481"	18.5"	10"	
HDPE	DR9	10"	10'-0"	10.75"	8.22"	7.481"	20.5"	11"	
HDPE	DR9	10"	12'-0"	10.75"	8.22"	7.481"	22.5"	12"	
FRE	-	8"	8'-0"	8.9"	8.4"	7.481"	18.5"	10"	
FRE	-	8"	10'-0"	8.9"	8.4"	7.481"	20.5"	11"	
FRE	-	8"	12'-0"	8.9"	8.4"	7.481"	22.5"	12"	



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CHAMPLAIN HUDSON POWER EXPRESS

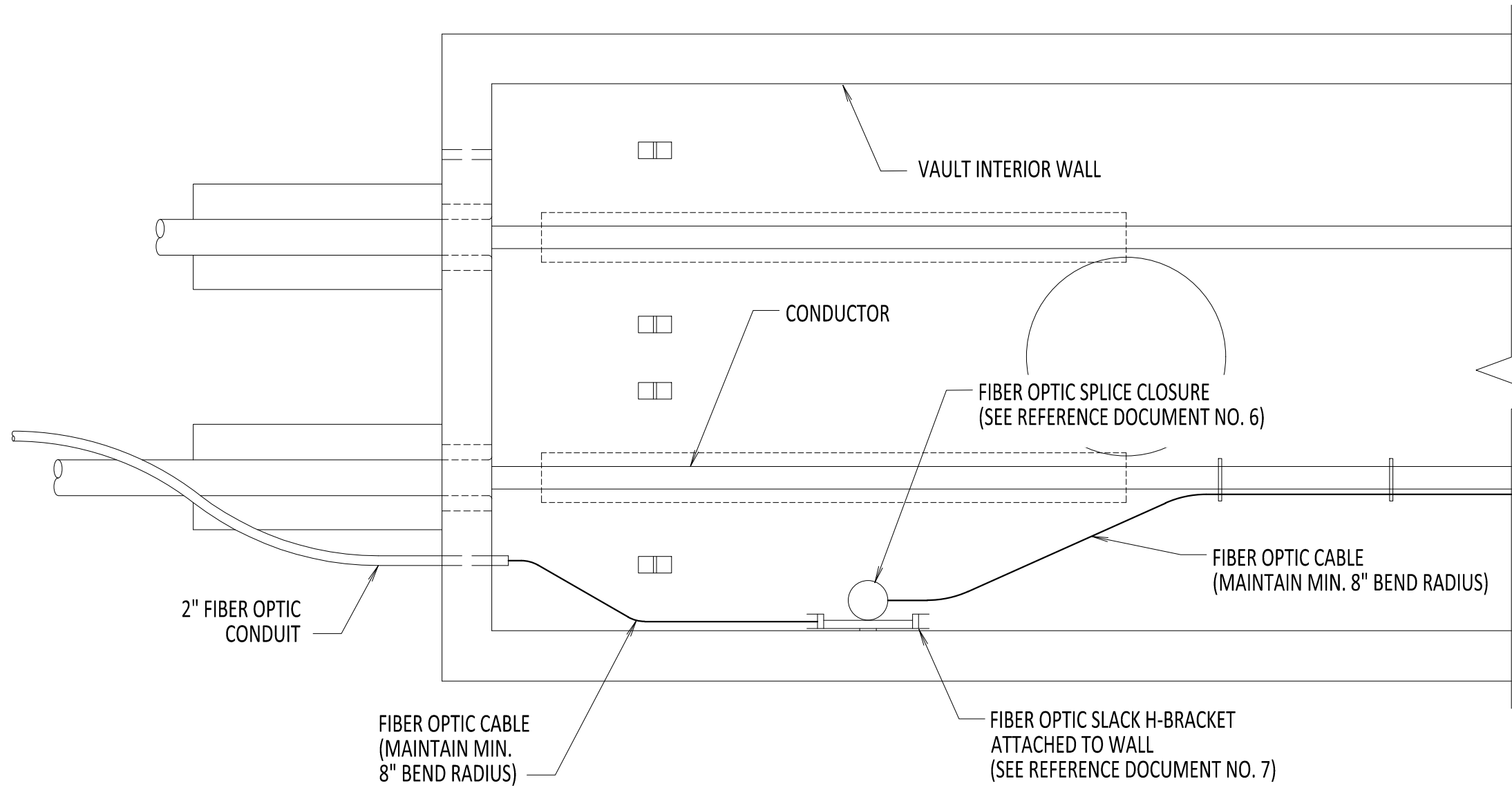
VAULT CONNECTION DETAILS

DRAWN BY: DLM DESIGNED BY: SS APPROVED BY: ASM SCALE: NOT TO SCALE REV. NO. 0

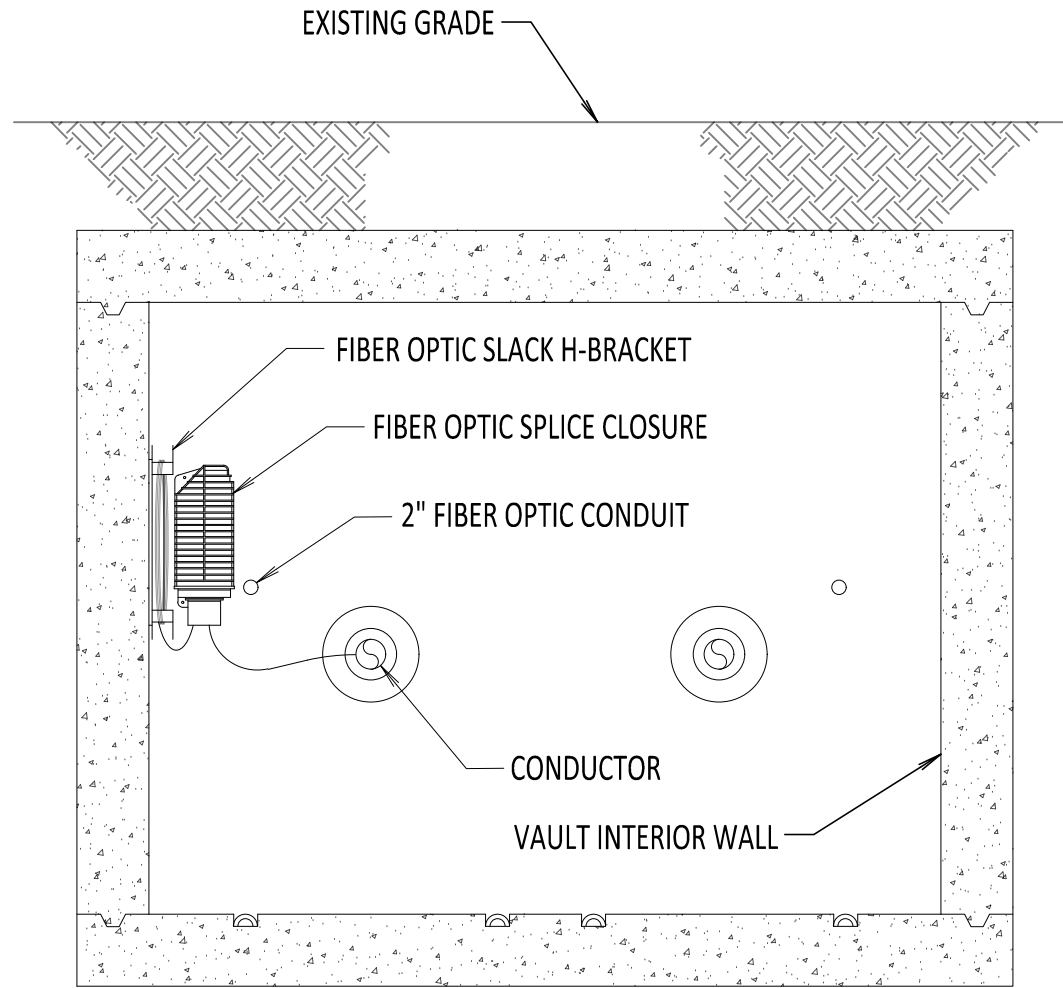
KIEWIT PROJECT NO.	21162
CHA PROJECT NO.	066076
DRAWING NO.	C-812
DATE	06/08/2023
SH.NO.	

PROJECT MANAGER DETAIL

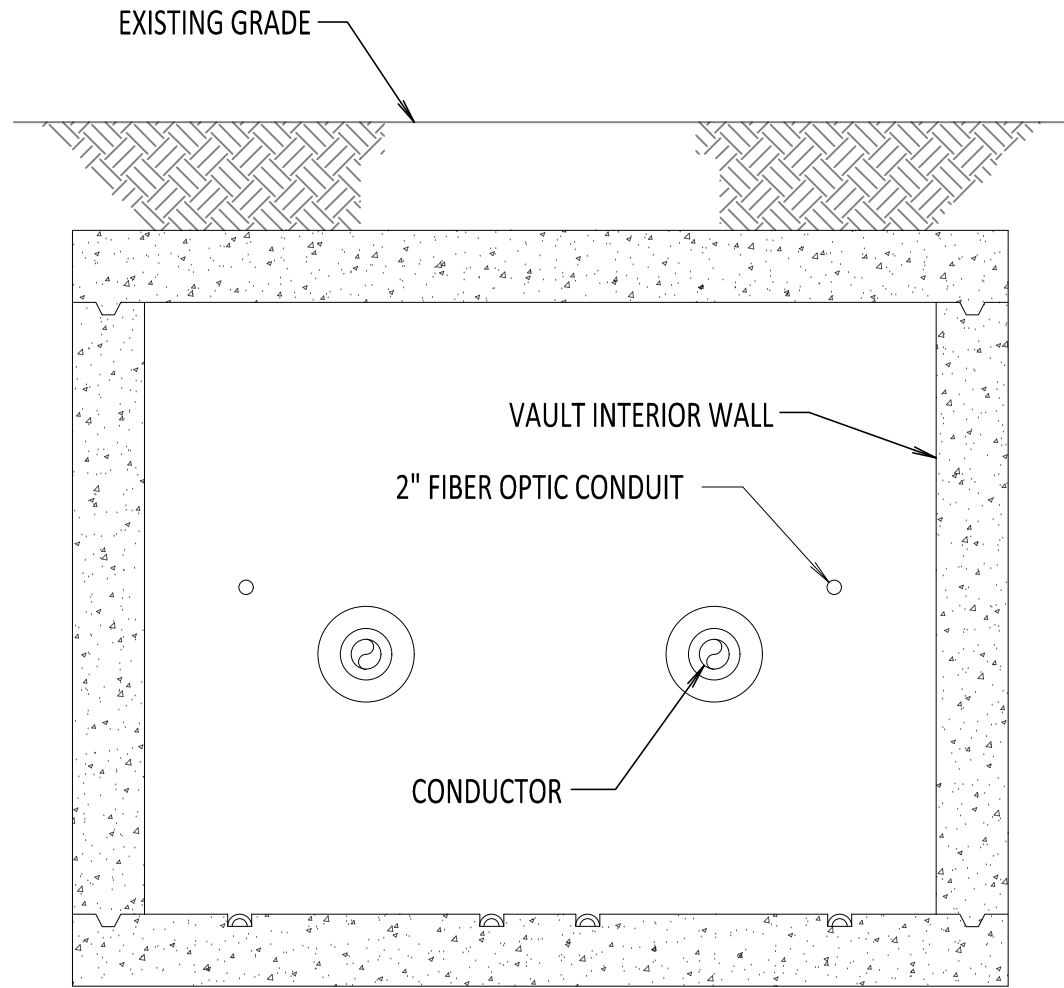
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ENCLOSED VAULT w/ FIBER OPTIC CABLE PLAN VIEW
SCALE: 3/8" = 1'-0"



SECTION A-A
SCALE: 3/8" = 1'-0"

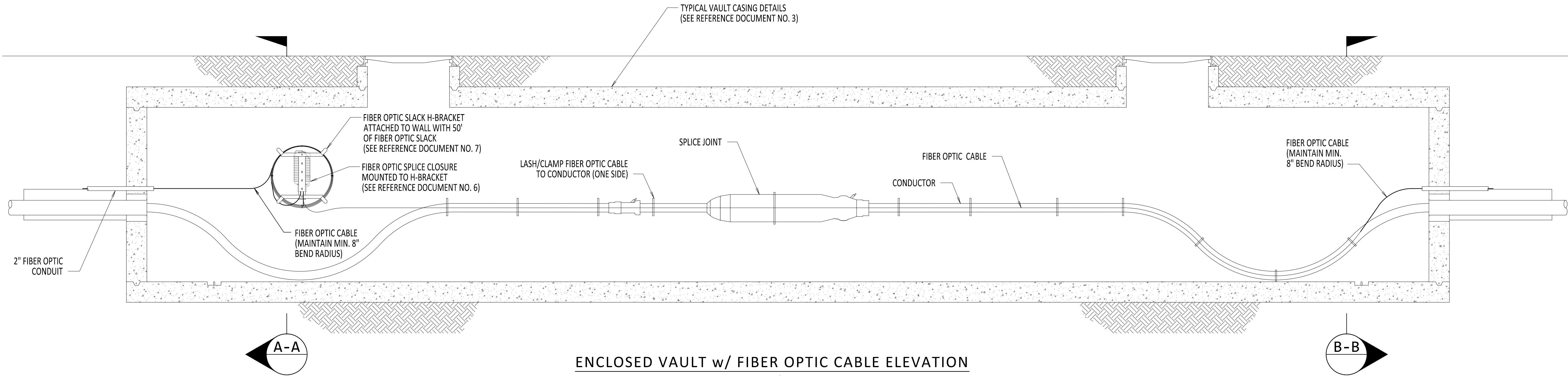


SECTION B-B
SCALE: 3/8" = 1'-0"

1. NKT TO LASH/CLAMP FIBER OPTIC CABLE AND ATTACH SPLICE CLOSURES AS NEEDED.
2. FIBER OPTIC CABLE SHALL FOLLOW THE NEGATIVE POLE HVDC CABLE NOTED ON THE PLAN AND PROFILE DRAWINGS, UNLESS OTHERWISE STATED. IN THE CASE THAT THE FIBER OPTIC CABLE ENTRY IS NOT ALIGNED WITH THE NEGATIVE POLE, THE FIBER OPTIC CONFIGURATION HEREIN SHALL BE MIRRORED ON THE OPPOSITE SIDE.
3. SPLICE CLOSURE ONLY AT SPECIFIED LOCATIONS. SEE PLAN AND PROFILE.
4. SEE REFERENCE DOCUMENT 5 FOR DETAILS ON ROUTING FIBER TO DTS HUT.

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	TYPICAL VAULT DETAILS	C-802
4	TYPICAL VAULT GROUNDING DETAILS	C-803
5	DST HUT CONNECTION FIBER OPTIC SPLICE AND HANDHOLE	C-851
6	FIBER OPTIC SPLICE DETAILS	C-855
7	FIBER OPTIC H-FRAME BRACKET DETAILS	C-856



ENCLOSED VAULT w/ FIBER OPTIC CABLE ELEVATION
SCALE: 3/8" = 1'-0"



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CHAMPLAIN HUDSON POWER EXPRESS

ENCLOSED VAULT
w/ FIBER OPTICS

DRAWN BY: DLM DESIGNED BY: NM APPROVED BY: MK SCALE: 3/8" = 1'-0" REV. NO. 0

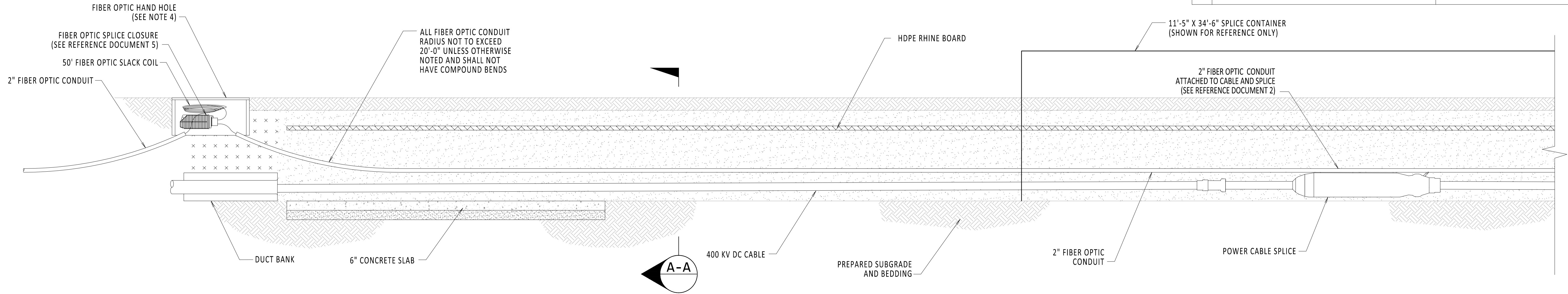
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CHA PROJECT NO.	066076
DRAWING NO.	C-852
DATE	06/08/2023
SH.NO.	

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1. ADD HAND HOLE TO ALL OPEN SPLICE LOCATIONS.
2. FIBER OPTIC SPLICE CLOSURE ONLY AT SPECIFIC LOCATIONS. SEE PLAN AND PROFILE FOR DETAILS.
3. SEE REFERENCE DOCUMENTS 2 FOR HAND HOLE LOCATION DETAILS.
4. SEE REFERENCE DOCUMENT 4 FOR FIBER OPTIC HAND HOLE DETAILS.
5. MAINTAIN A MINIMUM FIBER OPTIC CABLE BEND RADIUS OF 8" UNLESS OTHERWISE STATED (WHEN BENDING THE CABLE).

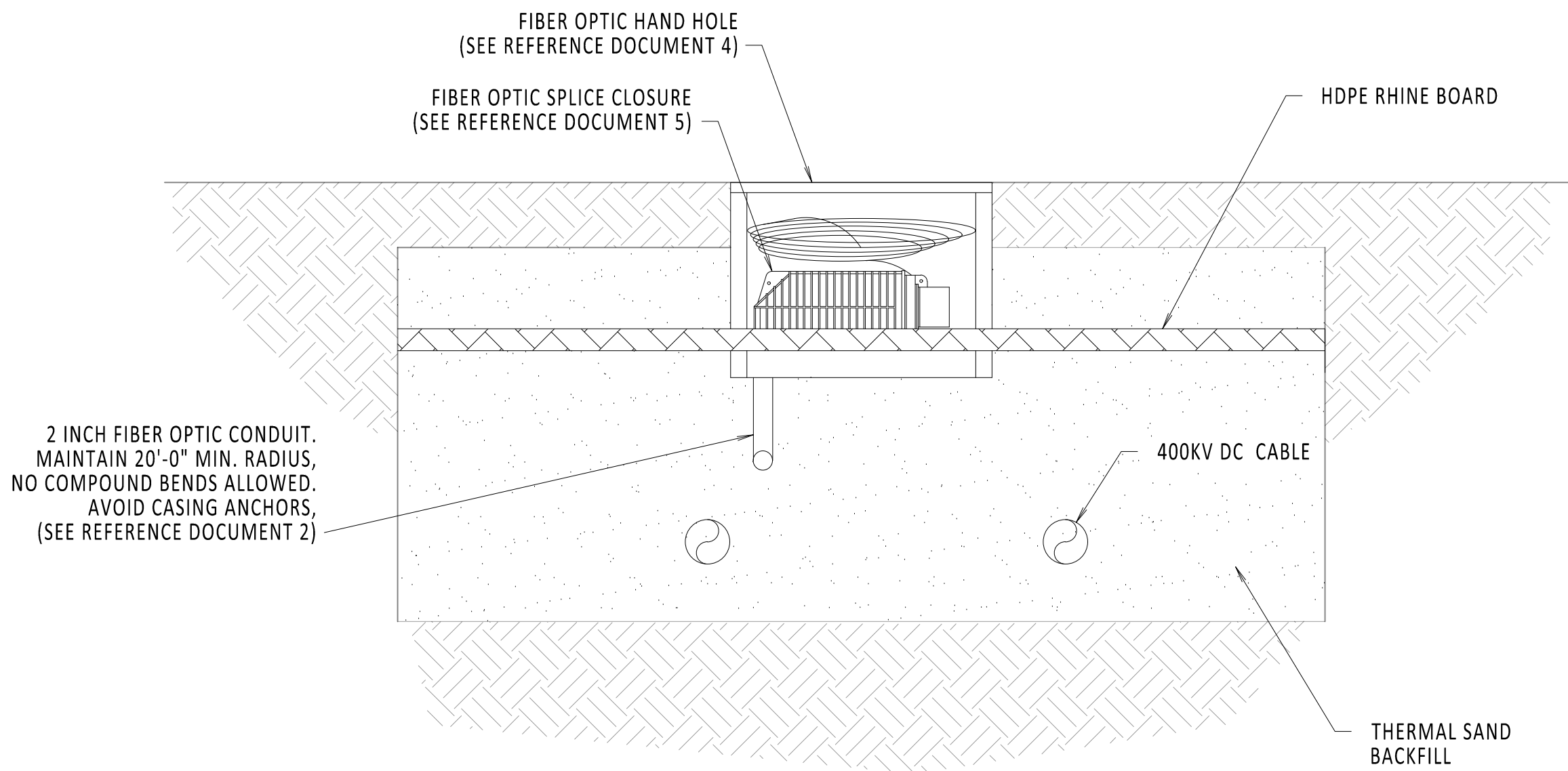
REFERENCE DOCUMENTS

LIST NO.	DOCUMENT NAME	DOCUMENT NO.
1	FRP FIBER COMMUNICATION HAND HOLE	S-771
2	TYPICAL OPEN PIT SPLICE DETAILS	C-808
3	DTS HUT CONNECTION FIBER OPTIC SPLICE AND HAND HOLE	C-851
4	FIBER OPTIC HAND HOLE DETAILS	C-854
5	FIBER OPTIC SPLICE DETAILS	C-855



OPEN SPLICE w/ HAND HOLE PROFILE VIEW

SCALE: 3/8" = 1'-0"



SECTION A-A

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



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OPEN SPLICE w/ FIBER OPTICS
HAND HOLE

DRAWN BY: TJMG DESIGNED BY: MK APPROVED BY: XX SCALE REV. NO. 0

KIEWIT PROJECT NO.	21162
CHA PROJECT NO.	066076
DRAWING NO.	C-853
DATE	06/08/2023
SH.NO.	

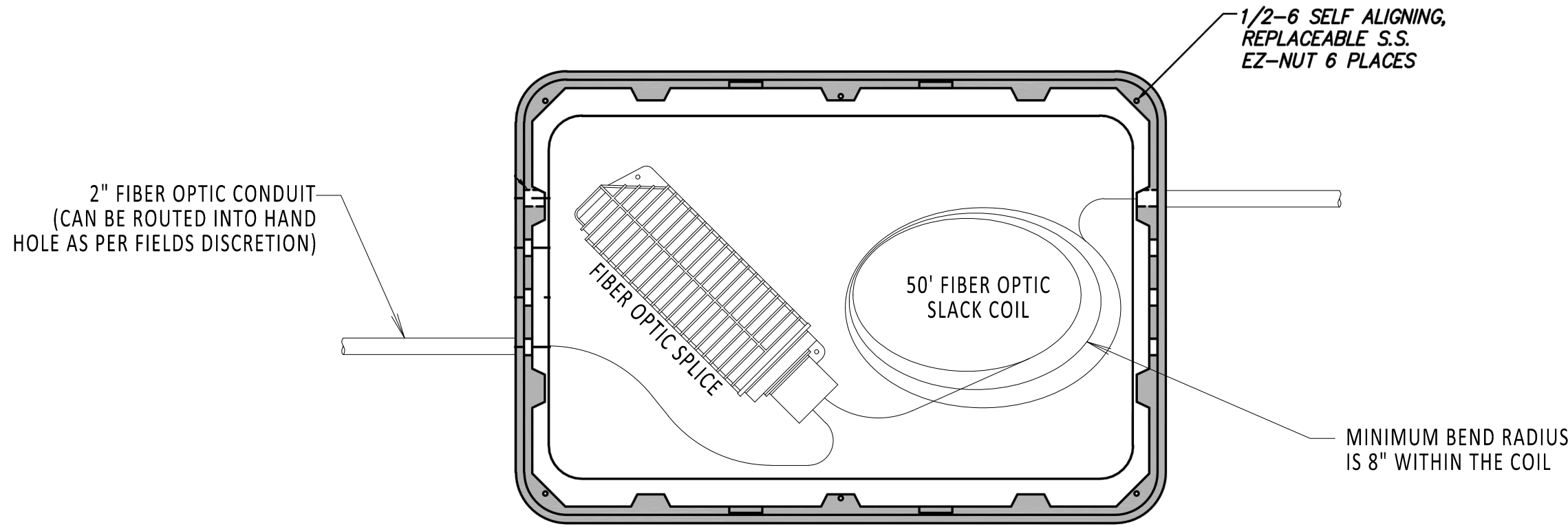
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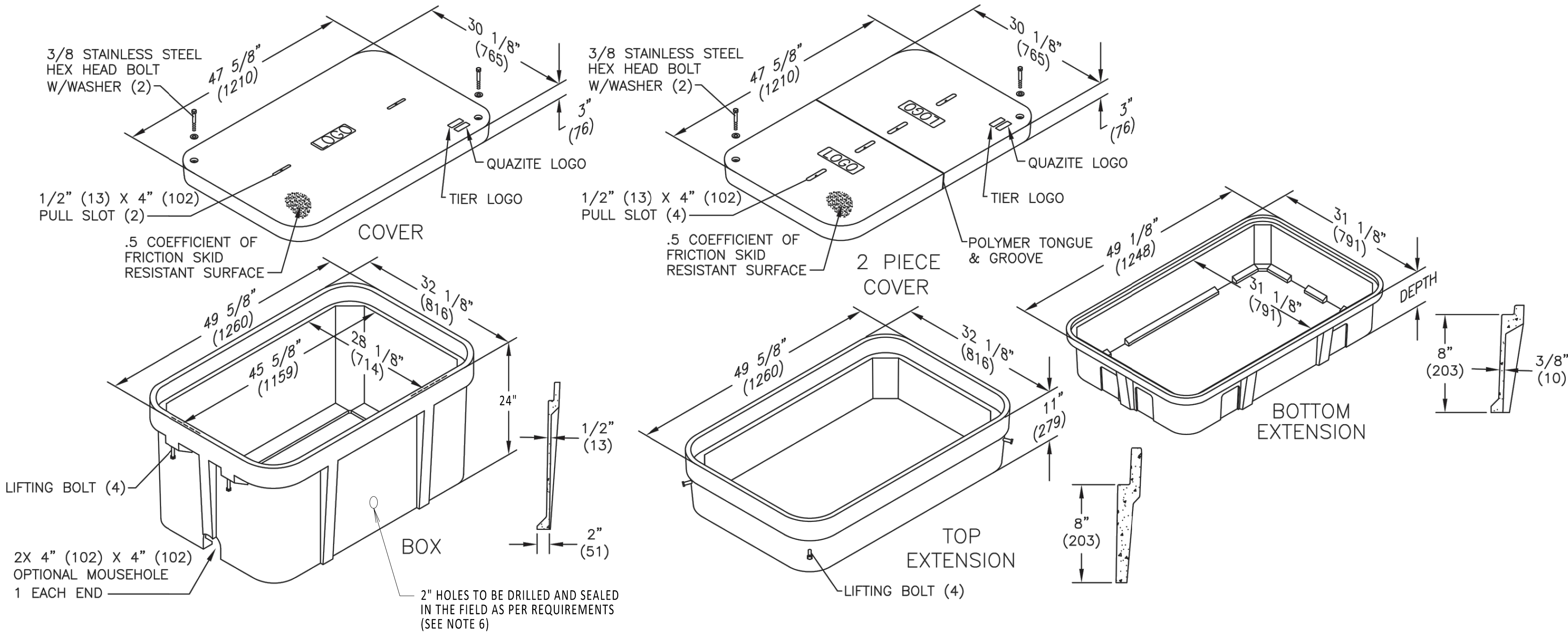
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3

4



HAND HOLE
TOP VIEW
NOT TO SCALE



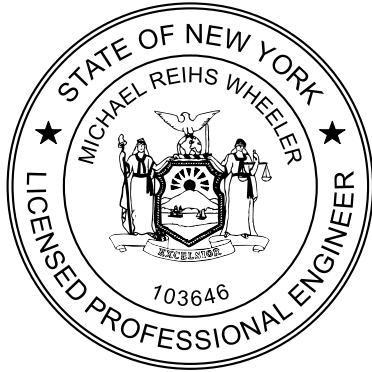
ISOMETRIC VIEW
NOT TO SCALE

- 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. SEE PLAN AND PROFILE FOR DETAILS.
- 4. GROUNDING REQUIREMENTS TO BE DETERMINED.
- 5. HAND HOLE AT ALL OPEN SPLICE LOCATIONS. SEE REFERENCE DOCUMENTS 1 AND 2 FOR DETAILS ON HAND HOLE PLACEMENT IN OPEN PIT.
- 6. DRILLED HOLES ARE INTENDED TO ROUTE FIBER OPTIC CONDUIT AND CAN BE DRILLED AND SEALED ON ANY SIDE OF HAND HOLE AS REQUIRED BY THE FIELD.

REFERENCE DOCUMENTS

LIST NO.	DOCUMENT NAME	DOCUMENT NO.
1	TYPICAL OPEN PIT SPLICE DETAILS	C-808
2	OPEN VAULT w/FIBER OPTIC HAND HOLE	C-853
3	FIBER OPTIC SPLICE DETAILS	C-855
4	HUBBELL QUAZITE (HAND HOLE)	MODEL NO. PG3048BA24

A



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CHAMPLAIN HUDSON POWER EXPRESS
FIBER OPTIC HAND HOLE DETAILS

DRAWN BY:	DLM	DESIGNED BY:	NM	APPROVED BY:	MK	SCALE		DATE	06/08/2023
						REV. NO.	0	SH.NO.	

KIEWIT PROJECT NO.	21162
CHA PROJECT NO.	066076
DRAWING NO.	C-854
DATE	06/08/2023
SH.NO.	

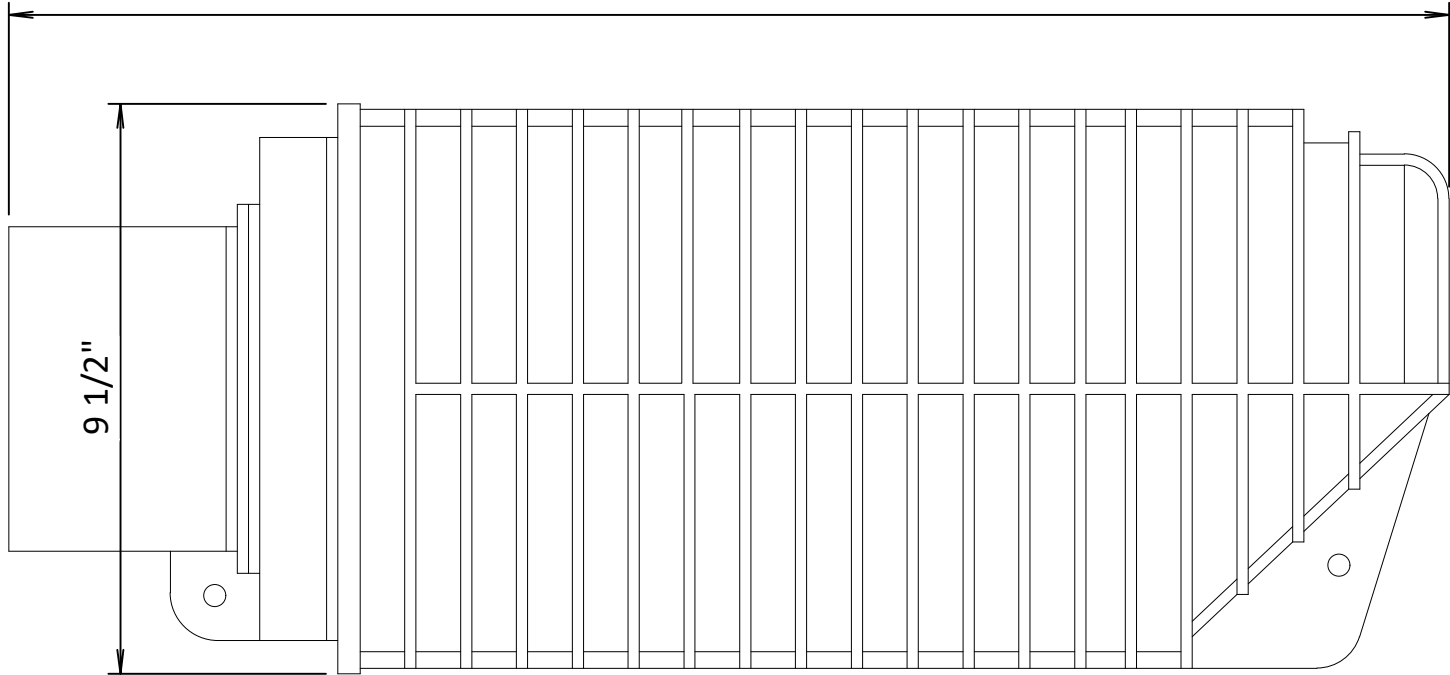
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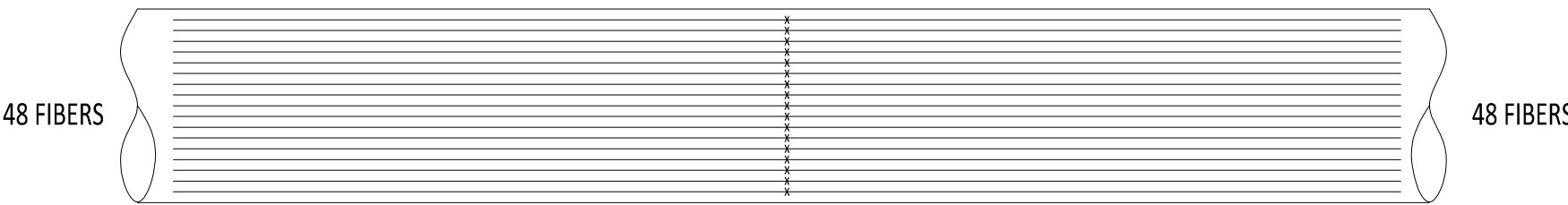
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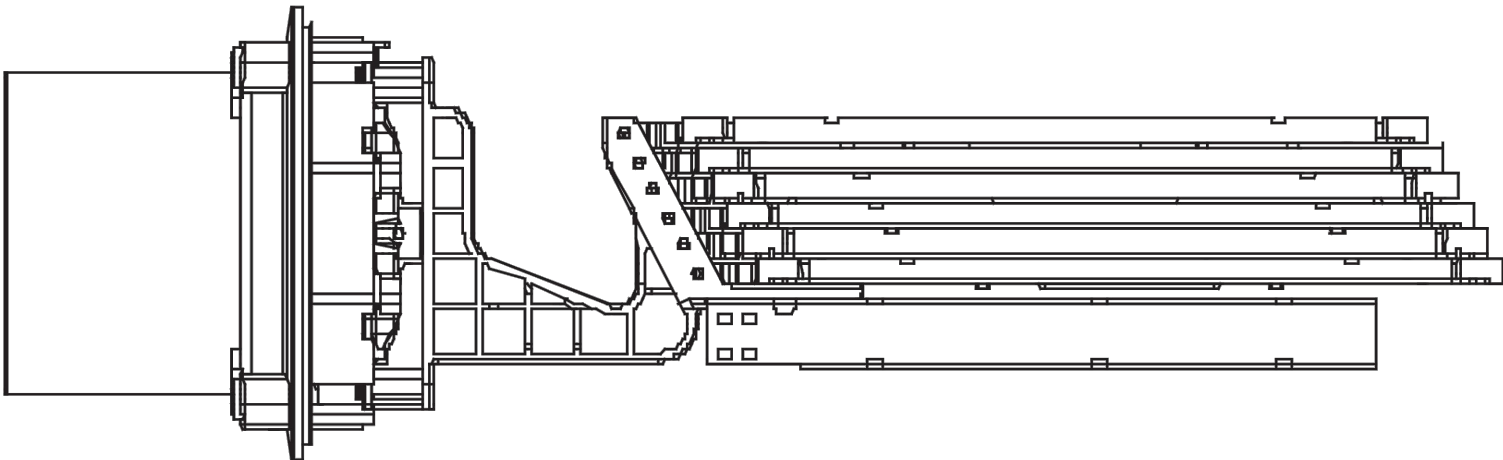
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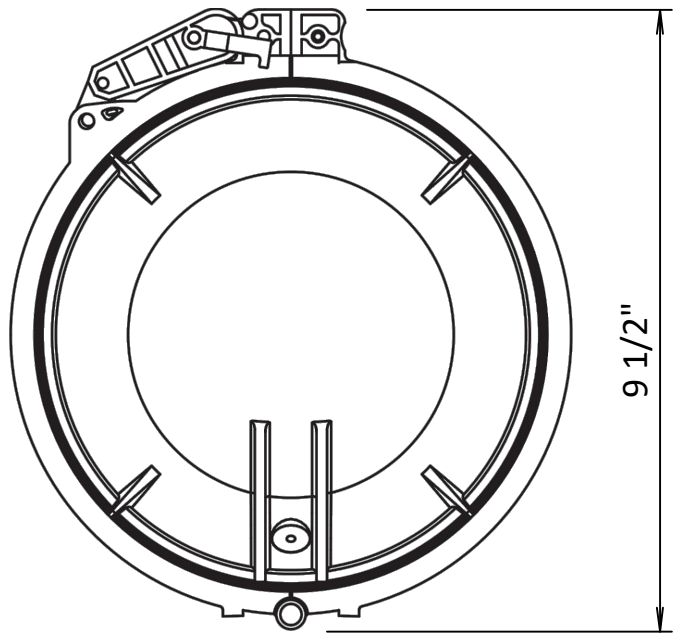
FIBER OPTIC SPLICE CLOSURE
NOT TO SCALE



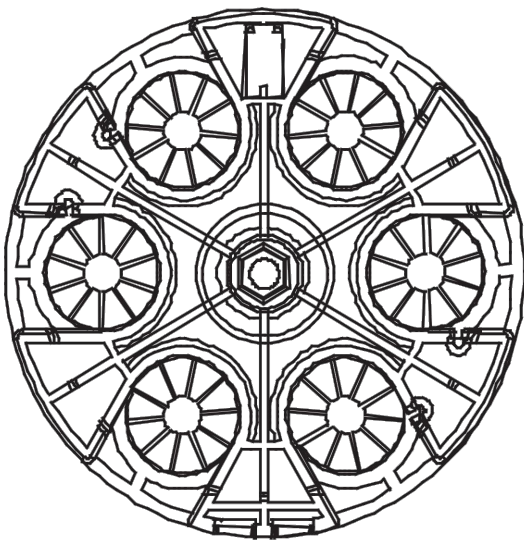
FIBER OPTIC CABLE SPLICE
DIAGRAM TYPICAL
NOT TO SCALE



FIBER OPTIC SPLICE CLOSURE
INSIDE DIAGRAM
NOT TO SCALE



FIBER OPTIC SPLICE CLOSURE
NOT TO SCALE



FIBER OPTIC SPLICE CLOSURE
GEL-BLOCK PROFILE
NOT TO SCALE

- 1. MAINTAIN 18" SWEEPS ON ALL CONDUITS.
- 2. DTS HUT FIBERS WILL SPLICE TO BLUE TUBE FIBER COLORS BLUE, ORANGE, GREEN AND BROWN.
- 3. SEE REFERENCE DOCUMENTS 2, 3, 4 AND 5 FOR PLACEMENT DETAILS.
- 4. FIBER OPTIC SPLICE CLOSURE ONLY IN SPECIFIC LOCATIONS. SEE PLAN AND PROFILES FOR DETAILS.

REFERENCE DOCUMENTS

LIST NO.	DOCUMENT NAME	DOCUMENT NO.
1	FIBER OPTIC SPLICE CLOSURE	COMMSCOPE: MODEL NO. FOSC450-B6-6-24-1-83V
2	TRANSITION VAULT FIBER OPTIC DETAIL	C-850
3	DTS HUT CONNECTION FIBER OPTIC SPLICE AND HANDHOLE	C-851
4	ENCLOSED VAULT w/FIBER OPTICS	C-852
5	OPEN VAULT w/FIBER OPTICS HAND HOLE	C-853



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CHAMPLAIN HUDSON POWER EXPRESS
FIBER OPTIC SPLICE DETAILS

DRAWN BY: DLM DESIGNED BY: NM APPROVED BY: MK SCALE: 0

KIEWIT PROJECT NO.	21162
CHA PROJECT NO.	066076
DRAWING NO.	C-855
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CHPE

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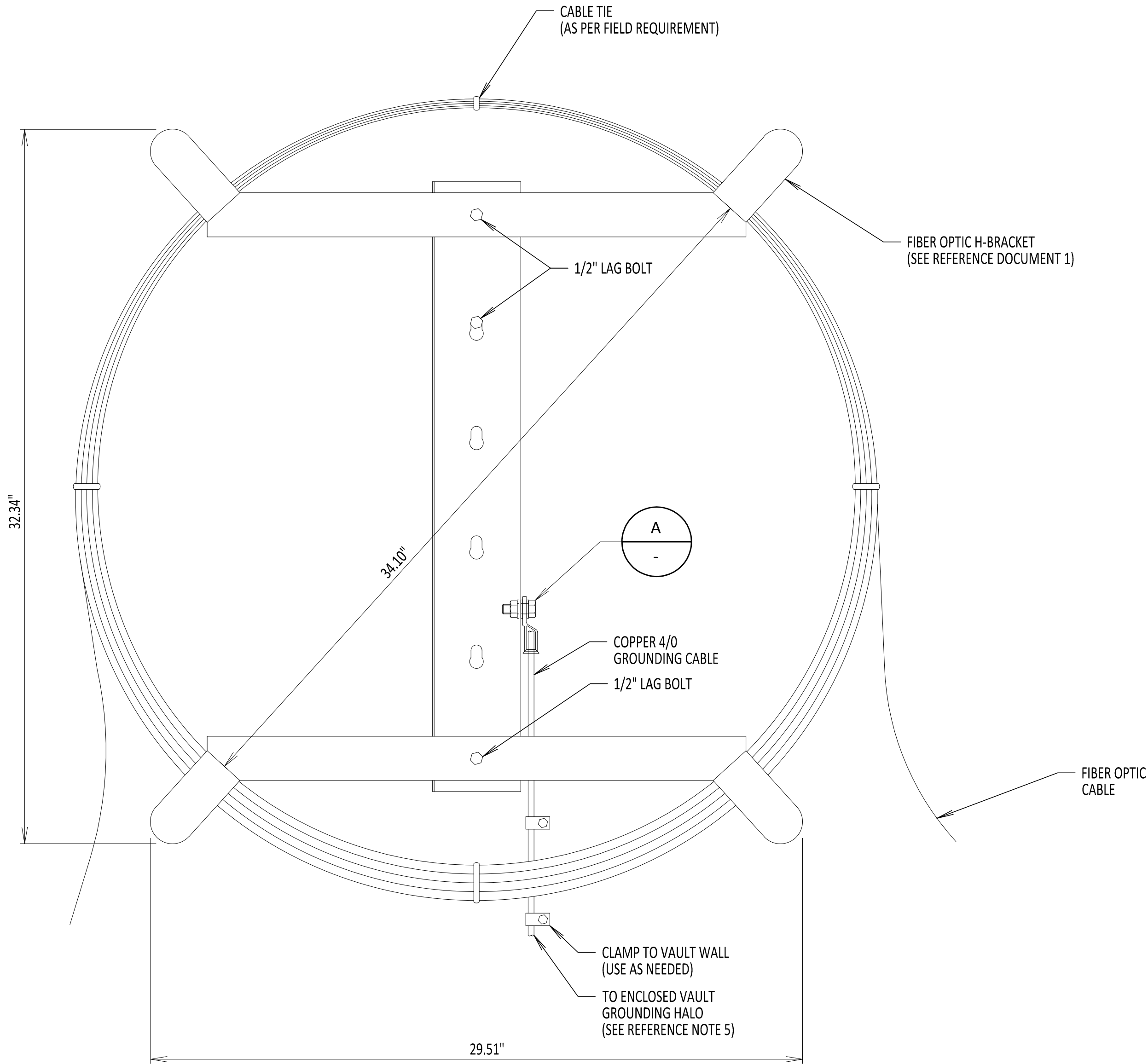
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No.	DATE	SUBMITTAL / REVISION DESCRIPTION		DB	APP

CHAMPLAIN HUDSON POWER EXPRESS

FIBER OPTIC H-FRAME BRACKET DETAIL

KIEWIT PROJECT NO.	
21162	
CHA PROJECT NO.	
066076	
DRAWING NO.	
C-856	
DATE	06/08/2023
SH.NO.	

DRAWN BY:	DLM	DESIGNED BY:	NM	APPROVED BY:	MK	SCALE	
						REV. NO.	0

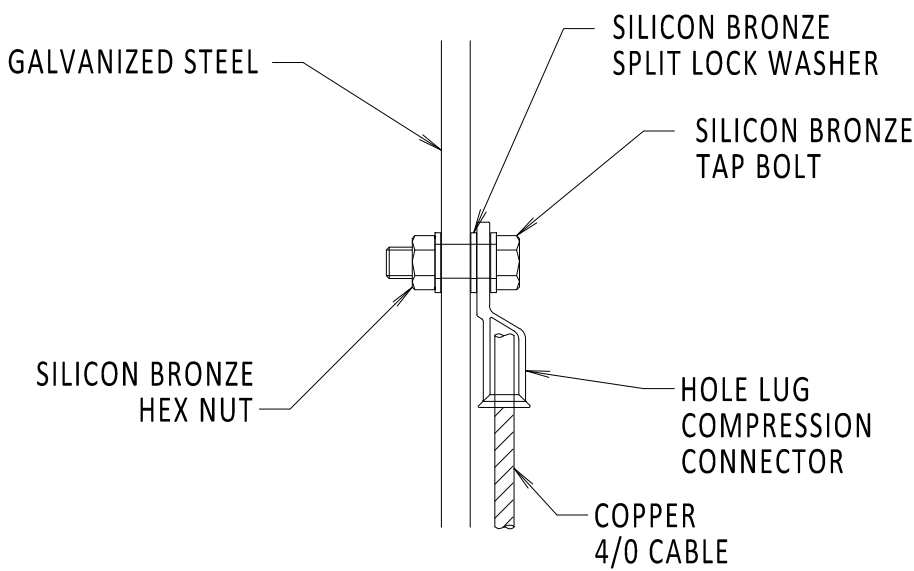


FIBER OPTIC H-FRAME BRACKET
NOT TO SCALE

- DO NOT KINK OR TWIST FIBER OPTIC CABLE.
- IN VAULT PULL FROM DISTANT MANHOLE THEN COIL AND PLACE ON H-FRAME BRACKET.
- H-FRAME IS ONLY USED IN ENCLOSED VAULTS. SEE REFERENCE DOCUMENTS 2 AND 3 FOR PLACEMENT DETAILS.
- H-FRAME BRACKET DEPTH IS 4.50".
- H-FRAME BRACKET TO BE GROUNDED TO THE GROUNDING HALO WITHIN AN ENCLOSED VAULT. SEE DRAWING C-803 FOR ENCLOSED VAULT GROUNDING DETAILS.
- H-FRAME BRACKET IS MADE OF 12GA GALVANIZED STEEL.
- 1/2" LAG BOLT DOES NOT COME WITH H-BRACKET ASSEMBLY AND NEEDS TO BE PROCURED AS NEEDED. BOLT TO BE INSTALLED INTO VAULT WALL BY FIELD PERSONNEL.

REFERENCE DOCUMENTS

LIST NO.	DOCUMENT NAME	DOCUMENT NO.
1	AMERICAN PRODUCT	H-FRAME POLE BRACKET MODEL NO: AM-3432-FSF-G-B x2
2	TYPICAL VAULT GROUNDING DETAILS	C-803
3	TRANSITION VAULT FIBER OPTIC DETAILS	C-850
4	ENCLOSED VAULT w/FIBER OPTICS	C-852

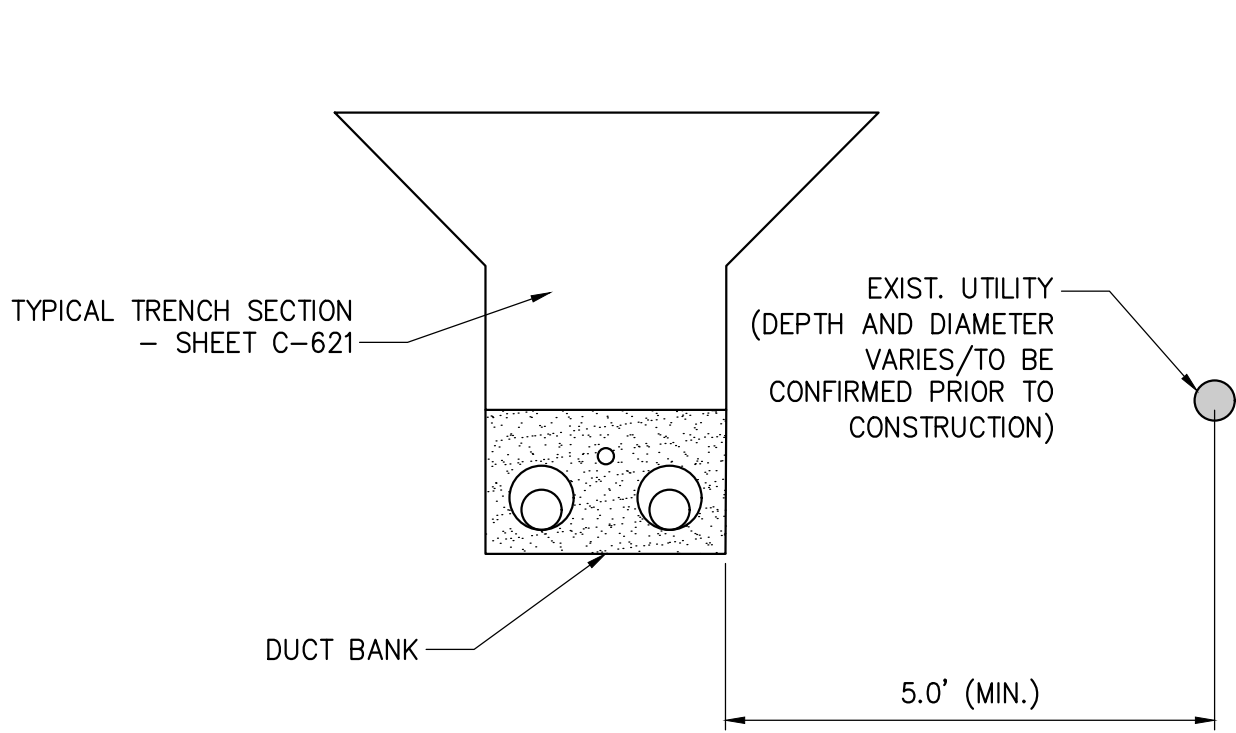


DETAIL A
NOT TO SCALE

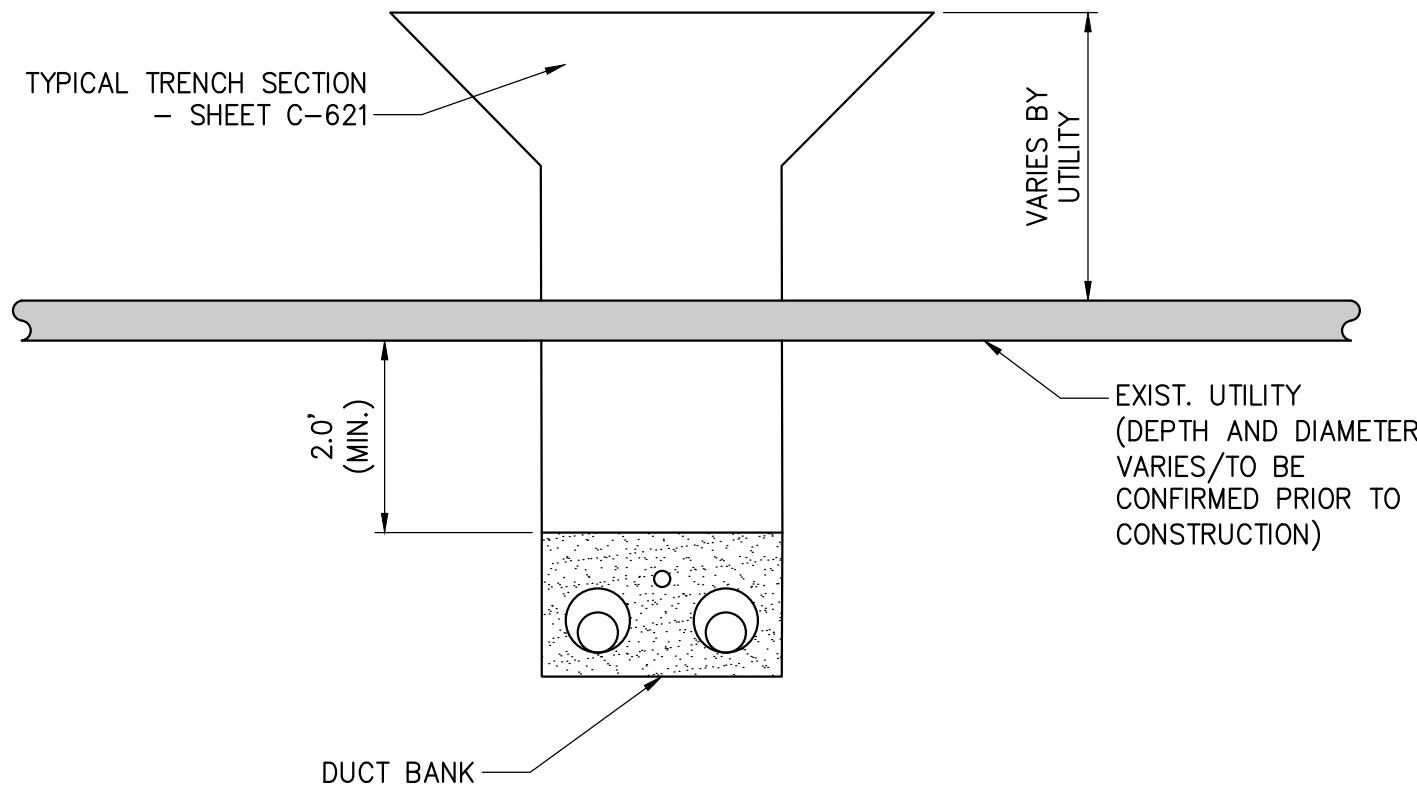
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NATIONAL GRID NOTES

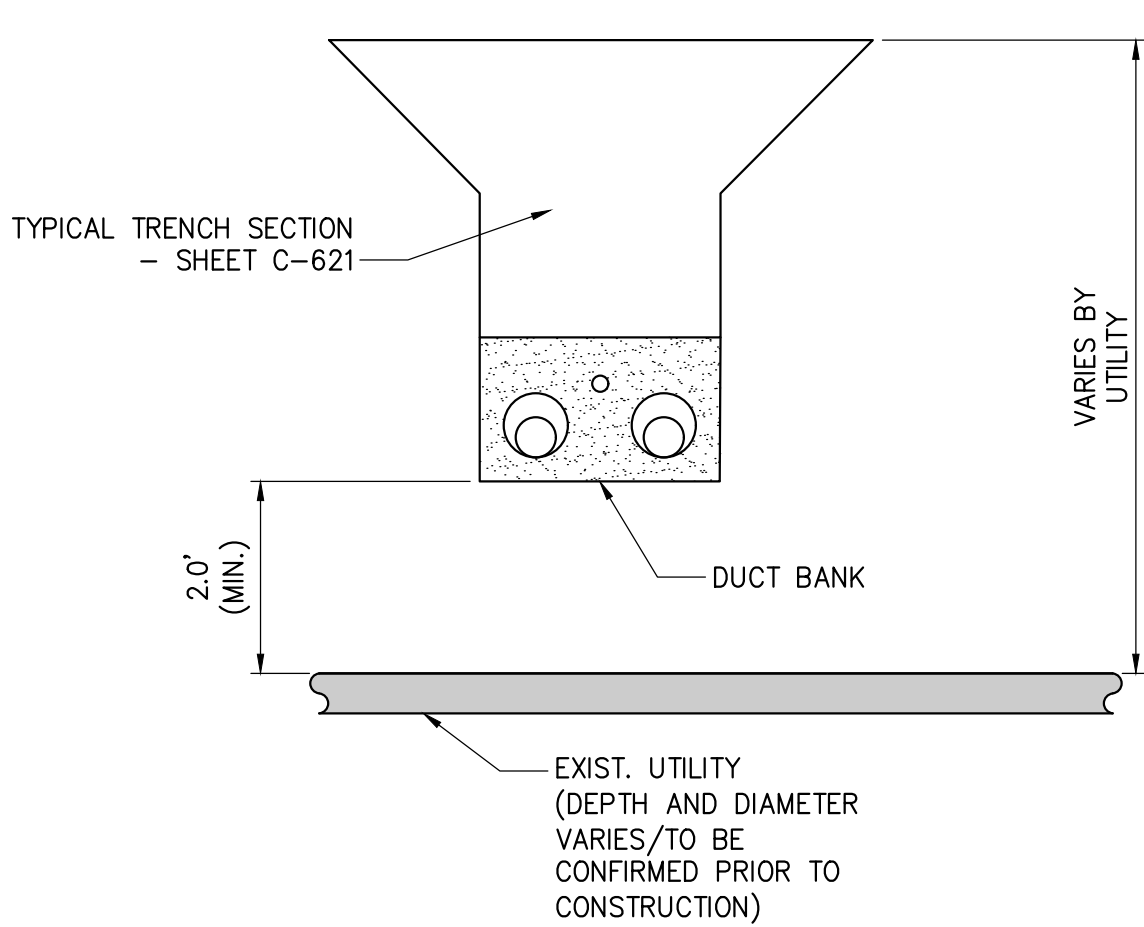
1. THE CONTRACTOR SHALL OBSERVE AND ABIDE BY THE APPLICABLE POWER LINE SAFETY REGULATIONS 29 C.F.R. § 1926.1406 – 1926.1411.
2. THE CONTRACTOR SHALL TRAIN EMPLOYEES WORKING AS DEDICATED SPOTTERS IN ACCORDANCE WITH 29 C.F.R. § 1926.1408(G)(2).
3. CONSTRUCTION UNDER TRANSMISSION LINES REQUIRES A DEDICATED SPOTTER, AS APPLICABLE.
4. THE CONTRACTOR SHALL SUBMIT QUALIFIED INDIVIDUALS' RESUMES TO NATIONAL GRID.



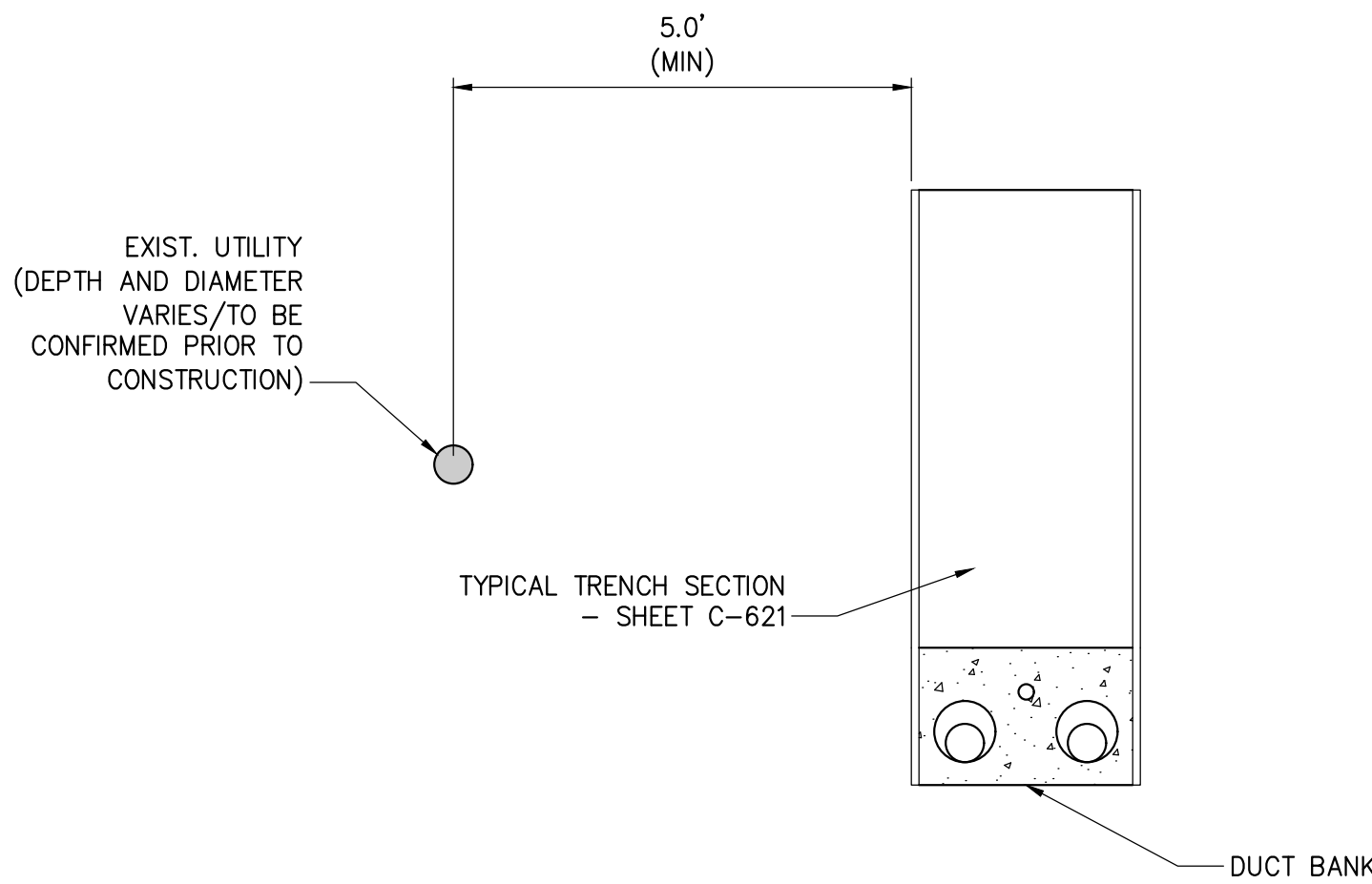
1 OPEN TRENCH - HORIZONTAL SEPARATION
NOT TO SCALE



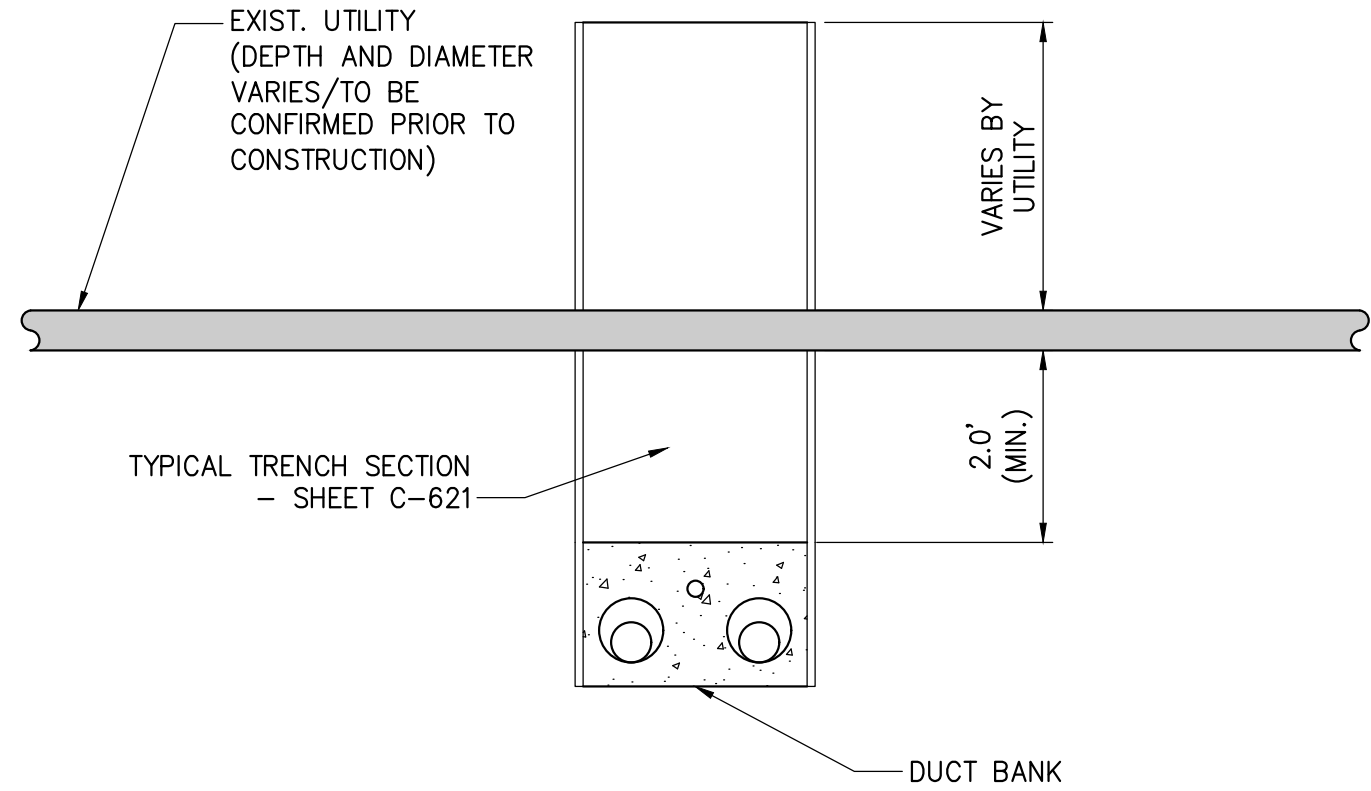
2 OPEN TRENCH - VERTICAL SEPARATION (UNDER)
NOT TO SCALE



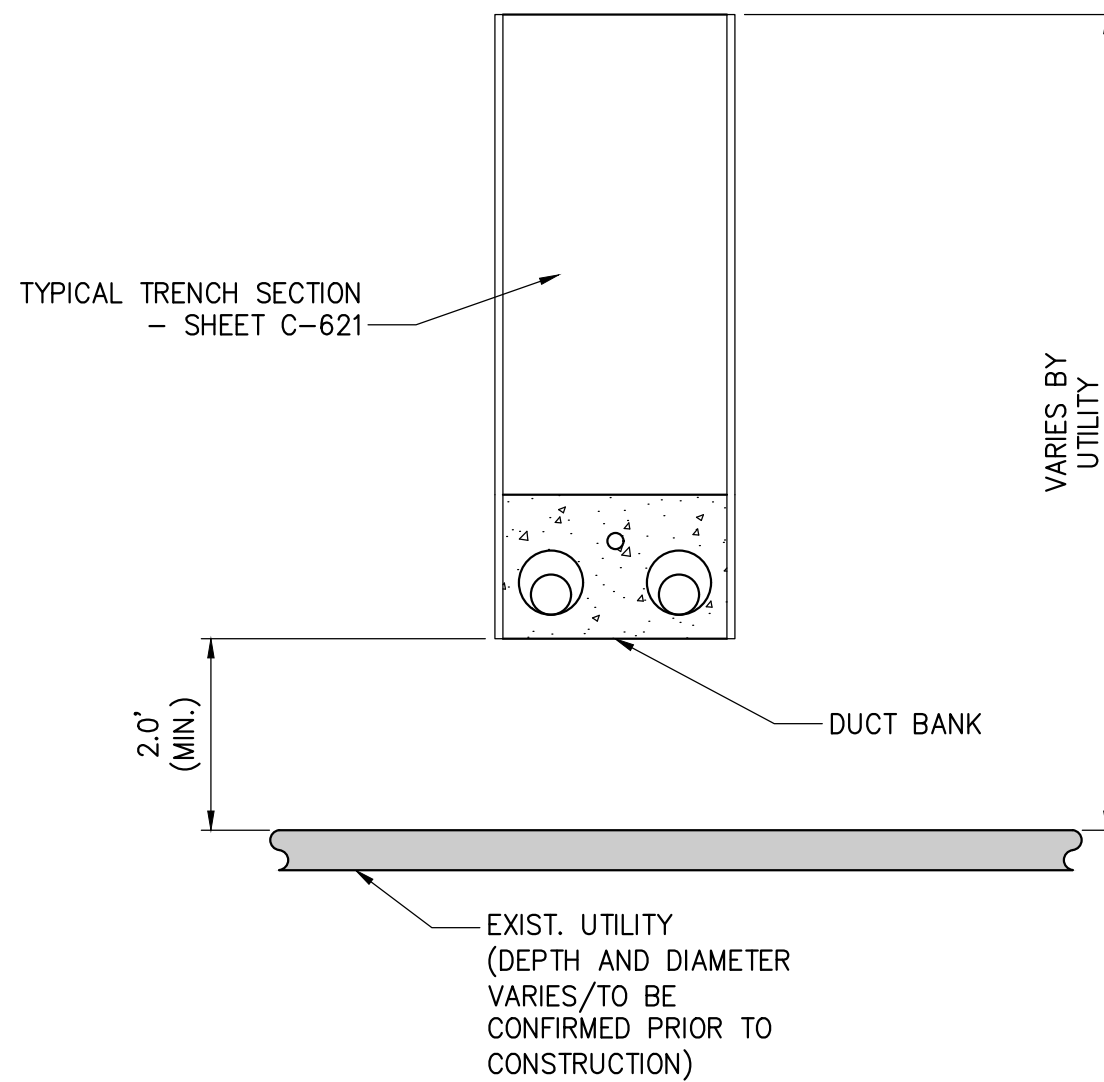
3 OPEN TRENCH - VERTICAL SEPARATION (OVER)
NOT TO SCALE



4 TYPICAL DUCTBANK IN ROADWAY - HORIZONTAL SEPARATION
NOT TO SCALE



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



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



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

0	06/09/2023	ISSUED FOR CONSTRUCTION SUBMISSION	BV	TK	
No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP	

CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 9 (PACKAGE 5B) - CSX: SELKIRK RAIL YARD BYPASS
UTILITY TYPICAL SEPARATION DETAILS

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE REV. NO.	AS SHOWN 0	DATE SH.NO.	06/09/2023
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KIEWIT PROJECT NO. 21162
DRAWING NO. C-901