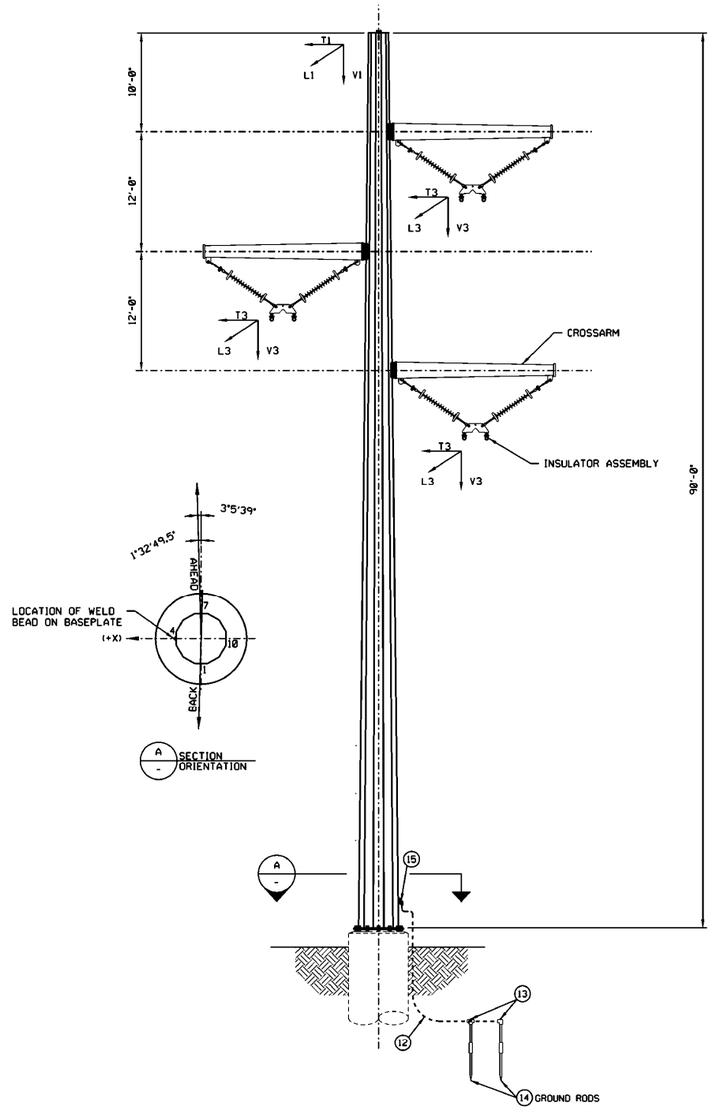
DOCKETED	
Docket Number:	21-AFC-02
Project Title:	Willow Rock Energy Storage Center
TN #:	265082
Document Title:	Willow Rock Data Adequacy Response, Attachment TSD-1
Description:	Resubmission of files previously submitted through Kiteworks
Filer:	Kathryn Stevens
Organization:	WSP USA Inc.
Submitter Role:	Applicant Consultant
Submission Date:	7/29/2025 2:37:54 PM
Docketed Date:	7/29/2025

LOADING TABLE (KIPS)																				
DESCRIPTION	LOAD	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9	CASE 10	CASE 11	CASE 12	CASE 13	CASE 14	CASE 15	CASE 16	CASE 17	CASE 18
OPGW	T1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1272 ACSS "BITTERN"	T3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WIND ON STRUCTURE (PSF)	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



MECHANICAL LOADING CRITERIA

1 - NESC RULE 250B - LIGHT LOADING (INTACT): 9 PSF WIND, 0° ICE, 30 DEG F, INITIAL LOAD FACTOR: TRANSVERSE=2.5, LONGITUDINAL=1.65, VERTICAL=1.5
2 - NESC RULE 250B - LIGHT LOADING (UPLIFT): 9 PSF WIND, 0" ICE, 30 DEG F, INITIAL LOAD FACTOR: TRANSVERSE=2.5, LONGITUDINAL=1.65, VERTICAL=1
3 - NESC RULE 250B - LIGHT LOADING (DEADEND): 9 PSF WIND, 0" ICE, 30 DEG F, INITIAL LOAD FACTOR: TRANSVERSE=2.5, LONGITUDINAL=1.65, VERTICAL=1.5
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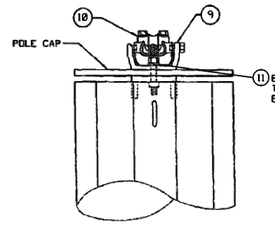
5 - NESC RULE 250C - EXTREME WIND (DEADEND): 18.5 PSF WIND, 0" ICE, 60 DEG F, INITIAL LOAD FACTOR: 1.0
6 - NESC RULE 261A - EXTREME WIND (WITHOUT CONDUCTORS): 18.5 PSF WIND, 0" ICE, 60 DEG F LOAD FACTOR: 1.0
7 - ASCE 74/RUS 1724E-200 RESIDUAL STATIC LOAD (RSL): 0 PSF WIND, 0" ICE, 60 DEG F, INITIAL LOAD FACTOR: TRANSVERSE=2.5, LONGITUDINAL=1.65, VERTICAL=1.5
8 - ASCE 7-10 EXTREME WIND: 31 PSF WIND, 0" ICE, 60 DEG F, INITIAL LOAD FACTOR: 1.0
9 - GO-95 LIGHT LOADING (INTACT): 8 PSF WIND, 0" ICE, 25 DEG F, INITIAL SAFETY FACTOR: 1.5
10 -GO-95 LIGHT LOADING (DEADEND): 8 PSF WIND, 0" ICE, 25 DEG F, INITIAL SAFETY FACTOR: 1.5
11 - EVERYDAY/PRE-CAMBER: 0 PSF WIND, 0" ICE, 60 DEG F, INITIAL LOAD FACTOR: 1.0
12 -SDG&E CASE 1 GO-95 LIGHT LOADING (INTACT): 9 PSF WIND, 0" ICE, 25 DEG F, INITIAL SAFETY FACTOR: 1.5
13 -SDG&E CASE 1A FTZ VERY HIGH: 20 PSF WIND, 0" ICE, 60 DEG F, FINAL SAFETY FACTOR: 1.5
14 -SDG&E CASE 2A TERMINAL DEADEND: 9 PSF WIND, 0" ICE, 25 DEG F, INITIAL SAFETY FACTOR: 1.5
15 -SDG&E CASE 2B BROKEN PHASE: 9 PSF WIND, 0" ICE, 25 DEG F, FINAL SAFETY FACTOR: 1.25
16 -SDG&E CASE 3 CAMBER: 0 PSF WIND, 0" ICE, 60 DEG F, FINAL SAFETY FACTOR: 1.0
17 -SDG&E CASE 5 STRINGING WIRE: 13 PSF WIND, 0" ICE, 25 DEG F, INITIAL SAFETY FACTOR: 1.25
CONDUCTORS STRUNG AT 30 DEGREES HORIZONTAL
VERTICAL LOAD OF 1500 LBS
18 -SDG&E ARM DESIGN: 9 PSF WIND, 0" ICE, 25 DEG F, INITIAL SAFETY FACTOR: 1.25
CONDUCTORS STRUNG AT 30 DEGREES HORIZONTAL
VERTICAL LOAD OF 1500 LBS

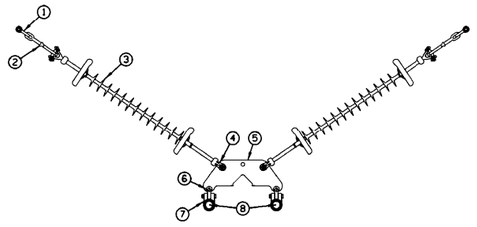
BILL OF MATERIALS

ITEM NO	ITEM DESCRIPTION	MANUFACTURER	CATALOG NO.	PROVIDED BY	MIN QTY	UNITS
1	ANCHOR SHACKLE, 30K	-	-	-	6	EA
2	LINK, CHAIN, 1/2" x 2-1/4", 30K	-	-	-	6	EA
3	INSULATOR, POLYMER, Y-CLEVIS BALL WITH CORONA RING, 30K	-	-	-	6	EA
4	Y-CLEVIS, SOCKET, 30K	-	-	-	6	EA
5	PLATE, Y-STRING YOKE, 40K	-	-	-	3	EA
6	EYE, Y-CLEVIS, 30K	-	-	-	6	EA
7	CLAMP, SUSPENSION, AL. ALLOY	-	-	-	6	EA
8	ARMOR RODS, ALUMINUM	-	-	-	6	EA
9	BRACKET, TRUNNION	-	-	-	1	EA
10	OPGW TRUNNION CLAMP	-	-	-	1	EA
11	OPGW BONDING WIRE ASSEMBLY	-	-	-	1	EA
12	GROUNDING WIRE, #2 COPPERWELD	-	-	-	20	FT
13	GROUND ROD CLAMP	-	-	-	2	EA
14	GROUNDING ROD, COPPERWELD, 5/8" X 8'	-	-	-	2	EA
15	COMP. TERM. FOR #2 CU TO 2 HOLE NEMA	-	-	-	1	EA

- ALTERNATE MATERIALS MAY BE SUBMITTED FOR REVIEW AND APPROVAL
- QUANTITIES ARE FOR INFORMATION ONLY



OPGW SUSPENSION CLAMP ASSEMBLY
230kV STEEL POLE
(NOT TO SCALE)



INSULATOR ASSEMBLY
POLYMER V-STRING INSULATOR
230kV STEEL STRUCTURE
(NOT TO SCALE)

DESIGN NOTES

1. ALL LOADS ARE ULTIMATE LOADS AND INCLUDE OVERLOAD FACTORS AND WEIGHT OF INSULATORS, AND HARDWARE.
2. UNITS OF ENTRIES ON THE STRUCTURE LOADING TABLE ARE AS FOLLOWS: TRANSVERSE (T), VERTICAL (V), AND LONGITUDINAL (L) LOADS - KIPS; WIND PRESSURE (W) - LBS PER SQ FT.
3. THE TRANSVERSE LOADS (T) INCLUDE WIND REACTIONS ON THE WIRES AND THE TRANSVERSE LOAD DUE TO THE LINE ANGLE.
4. ALL STEEL POLES SHALL BE GALVANIZED STEEL.
5. THE POLE SHALL BE PRECAMBERED IF DEFLECTION EXCEEDS 1.5% OF THE STRUCTURE HEIGHT ABOVE GROUND UNDER LOAD CASE 11 & 16.
6. POLE CAP FOR TRUNNION CLAMP PER SDG&E DWG 17180.
7. CLIMBING AND WORKING STEPS PER SDG&E DWG 17105.
8. POLE GROUNDING PER SDG&E DWG 17135.
9. LOAD CASE 15 BREAKS TWO WIRES:
   (1) OPGW
   (1) TOP 230kV TRANSMISSION PHASE A
10. LOAD FOR CASE 15 SHALL BE APPLIED AT TIP OF CROSSARM.
11. THIS DRAWING SHOWS DESIGN LOADING, DIMENSIONS AND CONFIGURATIONS FOR INFORMATION. REFERENCE FABRICATOR'S CALCULATIONS, AND DRAWINGS FOR FINAL STRUCTURE DESIGN AND DETAILS.

230KV TRANSMISSION LINE
SINGLE CIRCUIT STRUCTURE 1

Kiewit

DRAWING NUMBER
SGL CKT STR1

8/25/2023 12:08:55 PM Christopher.Heck J:\PD\BD\STD\Design Resources\Typical Details\OHX\Single Circuit Structure 1.dgn

PATH: G:\Hydrostor\Ansel\99_PROJECTS\31406639.003_Hydrostor\Ansel_Section3_and_5\31406639.003_Section3\02_PRODUCTION\MXD\FIGURES\Rev1\31406639-003_00_Section-3_Figures.aprx PRINTED: 5/20/2024 at 1:38 PM BY: MKristen

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

1 in

CONSULTANT	wsp
YYYY-MM-DD	2024-05-20
DESIGNED	-
PREPARED	MK
REVIEWED	JP
APPROVED	VG/LL

CLIENT
GEM A-CAES LLC

REFERENCE(S)
1. 230KV TRANSMISSIO N LINESINGLE CIRCUIT S TRUCTURE 1 (GL CKT STR1) - KIEWIT 2023

PROJECT
WILLOW ROCK ENERGY STORAGE CENTER
SUPPLEMENTAL AFC

TITLE
REPRESENTATIVE TRANSMISSION POLE, STRUCTURE 1

PROJECT NO.	PHASE	REV.	FIGURE
31406639.003	01	1	3-1a

LOADING TABLE (KIPS)																				
DESCRIPTION	LOAD	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9	CASE 10	CASE 11	CASE 12	CASE 13	CASE 14	CASE 15	CASE 16	CASE 17	CASE 18
OPGW	T1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1272 ACSS "BITTERN"	T3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WIND ON STRUCTURE (PSF)	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MECHANICAL LOADING CRITERIA

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LOAD FACTOR: 1.0
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LOAD FACTOR: 1.0
7 - ASCE 74/RUS 1724E-200 RESIDUAL STATIC LOAD (RSL): 0 PSF WIND, 0" ICE, 60 DEG F, INITIAL
LOAD FACTOR: TRANSVERSE=2.5, LONGITUDINAL=1.65, VERTICAL=1.5
8 - ASCE 7-10 EXTREME WIND: 31 PSF WIND, 0" ICE, 60 DEG F, INITIAL
LOAD FACTOR: 1.0
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SAFETY FACTOR: 1.5
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LOAD FACTOR: 1.0
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SAFETY FACTOR: 1.5
14 -SDG&E CASE 2A TERMINAL DEADEND: 9 PSF WIND, 0" ICE, 25 DEG F, INITIAL
SAFETY FACTOR: 1.5
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16 -SDG&E CASE 3 CAMBER: 0 PSF WIND, 0" ICE, 60 DEG F, FINAL
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CONDUCTORS STRUNG AT 30 DEGREES HORIZONTAL
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BILL OF MATERIALS

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1	ANCHOR SHACKLE, 30K	-	-	-	6	EA
2	LINK, CHAIN, 1/2" x 2-1/4", 30K	-	-	-	6	EA
3	Y-CLEVIS, BALL, 50K, ANSI CLASS 52-8/11	-	-	-	6	EA
4	INSULATOR, POLYMER, Y-CLEVIS BALL WITH CORONA RING, 30K	-	-	-	6	EA
5	Y-CLEVIS, SOCKET, 30K	-	-	-	6	EA
6	PLATE, V-STRING, YOKE, 40K	-	-	-	3	EA
7	EYE, Y-CLEVIS, 30K	-	-	-	6	EA
8	CLAMP, SUSPENSION, AL. ALLOY	-	-	-	6	EA
9	ARMOR RODS, ALUMINUM	-	-	-	6	EA
10	BRACKET, TRUNNION	-	-	-	1	EA
11	OPGW TRUNNION CLAMP	-	-	-	1	EA
12	OPGW BONDING WIRE ASSEMBLY	-	-	-	1	EA
13	GROUNDING WIRE, #2 COPPERWELD	-	-	-	20	FT
14	GROUND ROD CLAMP	-	-	-	2	EA
15	GROUNDING ROD, COPPERWELD, 5/8" X 8'	-	-	-	2	EA
16	COMP. TERM. FOR #2 CU TO 2 HOLE NEMA	-	-	-	1	EA

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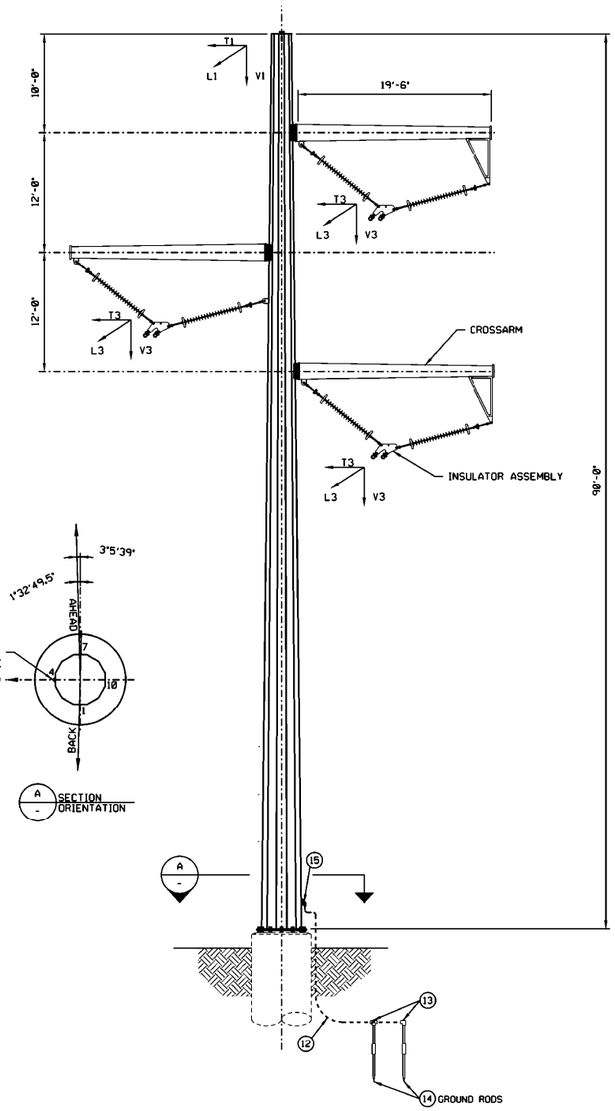
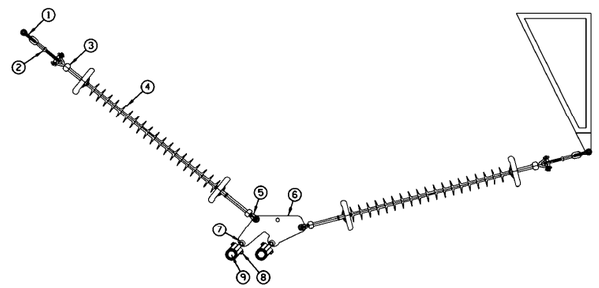
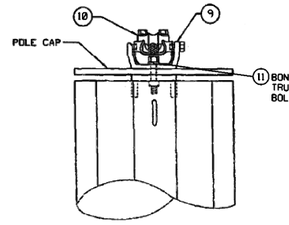




INSULATOR ASSEMBLY
POLYMER V-STRING INSULATOR
230kV STEEL STRUCTURE
(NOT TO SCALE)



OPGW SUSPENSION CLAMP ASSEMBLY
230kV STEEL POLE
(NOT TO SCALE)

DESIGN NOTES

1. ALL LOADS ARE ULTIMATE LOADS AND INCLUDE OVERLOAD FACTORS AND WEIGHT OF INSULATORS, AND HARDWARE.
2. UNITS OF ENTRIES ON THE STRUCTURE LOADING TABLE ARE AS FOLLOWS: TRANSVERSE (T), VERTICAL (V), AND LONGITUDINAL (L) LOADS - KIPS; WIND PRESSURE (W) - LBS PER SQ FT.
3. THE TRANSVERSE LOADS (T) INCLUDE WIND REACTIONS ON THE WIRES AND THE TRANSVERSE LOAD DUE TO THE LINE ANGLE.
4. ALL STEEL POLES SHALL BE GALVANIZED STEEL.
5. THE POLE SHALL BE PRECAMBERED IF DEFLECTION EXCEEDS 1.5% OF THE STRUCTURE HEIGHT ABOVE GROUND UNDER LOAD CASE 11 & 16.
6. POLE CAP FOR TRUNNION CLAMP PER SDG&E DWG 17180.
7. CLIMBING AND WORKING STEPS PER SDG&E DWG 17105.
8. POLE GROUNDING PER SDG&E DWG 17135.
9. LOAD CASE 15 BREAKS TWO WIRES:
   (1) OPGW
   (1) TOP 230kV TRANSMISSION PHASE A
10. LOAD FOR CASE 15 SHALL BE APPLIED AT TIP OF CROSSARM.
11. THIS DRAWING SHOWS DESIGN LOADING, DIMENSIONS AND CONFIGURATIONS FOR INFORMATION. REFERENCE FABRICATOR'S CALCULATIONS, AND DRAWINGS FOR FINAL STRUCTURE DESIGN AND DETAILS.

230KV TRANSMISSION LINE
SINGLE CIRCUIT STRUCTURE 2

Kiewit

DRAWING NUMBER
SGL CKT STR2

8/25/2023 12:09:04 PM Christopher.Heck J:\!PD\!BD\!STD\Design Resources\Typical Details\OHX\Single Circuit Structure 2.dgn

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

1 in

CONSULTANT
wsp

YYYY-MM-DD	2024-05-20
DESIGNED	-
PREPARED	MK
REVIEWED	JP
APPROVED	VG/LL

CLIENT
GEM A-CAES LLC

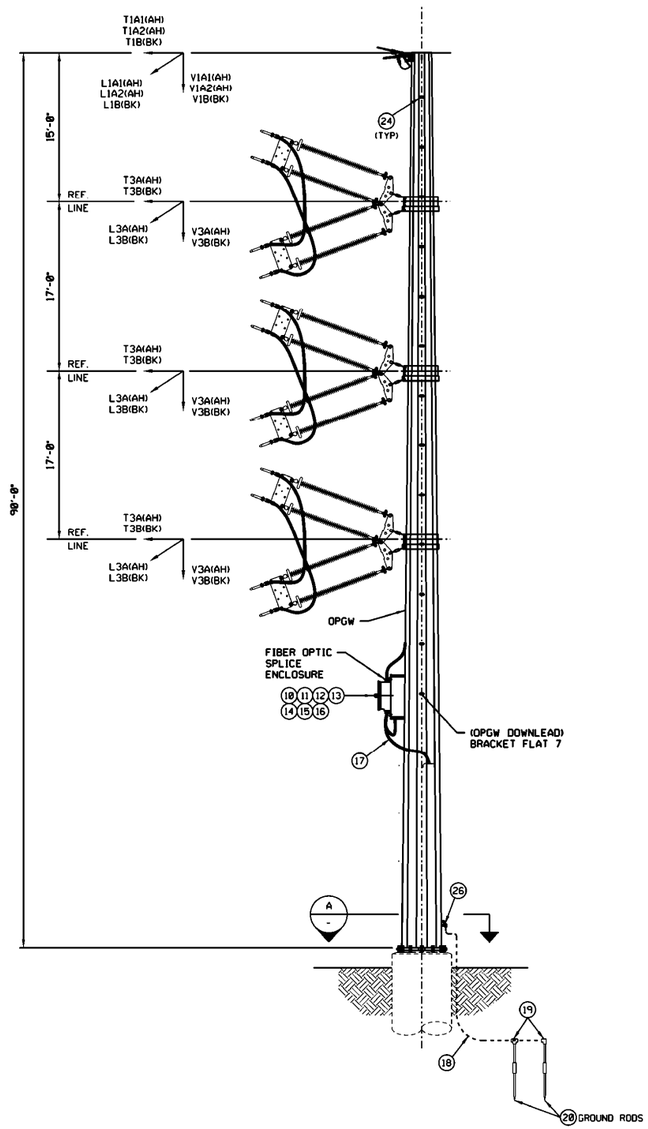
REFERENCE(S)
1. 230KV TRANSMISSIO N LINESINGLE CIRCUIT S TRUCTURE 2 (GL CKT STR2) - KIEWIT 2023

PROJECT
WILLOW ROCK ENERGY STORAGE CENTER
SUPPLEMENTAL AFC

TITLE
REPRESENTATIVE TRANSMISSION POLE, STRUCTURE 2

PROJECT NO.	PHASE	REV.	FIGURE
31406639.003	01	1	3-1b

LOADING TABLE (KIPS)																				
DESCRIPTION	LOAD	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9	CASE 10	CASE 11	CASE 12	CASE 13	CASE 14	CASE 15	CASE 16	CASE 17	CASE 18
OPGW BACK	T1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2" EHS SHIELD WIRE AHEAD (LOADS SHOWN APPLY TO EACH SHIELD WIRE)	T1AL2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V1AL2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L1AL2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1272 ACSS "BITTERN" BACK	T3B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V3B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L3B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1272 ACSS "BITTERN" AHEAD	T3A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V3A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L3A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WIND ON STRUCTURE (PSF)	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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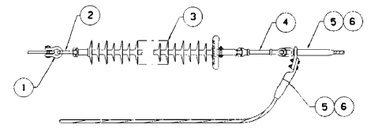
16 - SDG&E CASE 3 CAMBER: 0 PSF WIND, 0° ICE, 60 DEG F, FINAL SAFETY FACTOR: 1.0
17 - SDG&E CASE 5 STRINGING WIRE: 13 PSF WIND, 0° ICE, 25 DEG F, INITIAL SAFETY FACTOR: 1.25 CONDUCTORS STRUNG AT 30 DEGREES HORIZONTAL VERTICAL LOAD OF 1500 LBS
18 - SDG&E ARM DESIGN: 9 PSF WIND, 0° ICE, 25 DEG F, INITIAL SAFETY FACTOR: 1.25 CONDUCTORS STRUNG AT 30 DEGREES HORIZONTAL VERTICAL LOAD OF 1500 LBS

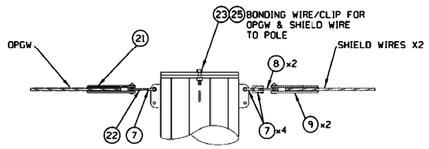
BILL OF MATERIALS

ITEM NO	ITEM DESCRIPTION	MANUFACTURER	CATALOG NO.	PROVIDED BY	MIN QTY	UNITS
1	ANCHOR SHACKLE, 50K	-	-	-	12	EA
2	BALL, OVAL-EYE, 30K	-	-	-	12	EA
3	INSULATOR, SUSPENSION, POLYMER, 102.5-104" LONG, BALL (HOT END) AND SOCKET, WITH CORONA RING, 30K	-	-	-	12	EA
4	Y-CLEVIS, SOCKET, HOTLINE, 30K	-	-	-	12	EA
5	DEADEND, COMPRESSION	-	-	-	12	EA
6	JOINT COMPOUND, 16 OZ. TUBE	-	-	-	4	EA
7	SHACKLE, ANCHOR, 30K	-	-	-	5	EA
8	EXTENSION STRAP, 2-1/2" x 5/8" x 4" LG., GALV. STEEL, 40K	-	-	-	2	EA
9	CLAMP, QUADRANT STRAIN, DUCTILE IRON	-	-	-	2	EA
10	OPGW SPLICE ENCLOSURE	-	-	-	1	EA
11	OPGW COIL BRACKET	-	-	-	1	EA
12	OPGW CONNECTOR KIT	-	-	-	1	EA
13	ADSS CONNECTOR	-	-	-	1	EA
14	POLE BAND MOUNTING BRACKET	-	-	-	2	EA
15	POLE BAND FOR COIL BRACKET	-	-	-	2	EA
16	SPLICE PROTECTOR SLEEVE	-	-	-	5	EA
17	ADSS	-	-	-	-	
18	GROUNDING WIRE, #2 COPPERWELD	-	-	-	20	FT
19	GROUND ROD CLAMP	-	-	-	2	EA
20	GROUNDING ROD, COPPERWELD, 5/8" X 8'	-	-	-	2	EA
21	OPGW BOLTED DEAD-END	-	-	-	1	EA
22	DEAD END LINK PLATE	-	-	-	1	EA
23	OPGW BONDING WIRE ASSEMBLY	-	-	-	1	EA
24	DOWNLEAD CLAMP, OPGW	-	-	-	15	EA
25	BONDING CLIP FOR SHIELD WIRE FOR 1/2" BOLT	-	-	-	1	EA
26	COMP. TERM. FOR #2 CU TO 2 HOLE NEMA	-	-	-	1	EA

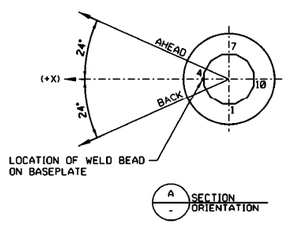
- ALTERNATE MATERIALS MAY BE SUBMITTED FOR REVIEW AND APPROVAL
- QUANTITIES ARE FOR INFORMATION ONLY



INSULATOR ASSEMBLY
POLYMER DEADEND INSULATOR SINGLE CONDUCTOR-ACSR 230KV STEEL STRUCTURE
(NOT TO SCALE)



SHIELD WIRE/OPGW ASSEMBLY
OHGW DEADEND ASSEMBLY
OPGW DEADEND ASSEMBLY
(NOT TO SCALE)



DESIGN NOTES

1. ALL LOADS ARE ULTIMATE LOADS AND INCLUDE OVERLOAD FACTORS AND WEIGHT OF INSULATORS, AND HARDWARE.
2. UNITS OF ENTRIES ON THE STRUCTURE LOADING TABLE ARE AS FOLLOWS: TRANSVERSE (T), VERTICAL (V), AND LONGITUDINAL (L) LOADS - KIPS; WIND PRESSURE (W) - LBS PER SQ FT.
3. THE TRANSVERSE LOADS (T) INCLUDE WIND REACTIONS ON THE WIRES AND THE TRANSVERSE LOAD DUE TO THE LINE ANGLE.
4. ALL STEEL POLES SHALL BE GALVANIZED STEEL.
5. THE POLE SHALL BE PRECAMBERED IF DEFLECTION EXCEEDS 1.5% OF THE STRUCTURE HEIGHT ABOVE GROUND UNDER LOAD CASE 11 & 16.
6. POLE CAP FOR TRUNNION CLAMP PER SDG&E DWG 17180.
7. CLIMBING AND WORKING STEPS PER SDG&E DWG 17105.
8. POLE GROUNDING PER SDG&E DWG 17135.
9. LOAD CASE 15 BREAKS TWO WIRES:
   (1) OPGW
   (1) TOP 230kv TRANSMISSION PHASE A
10. LOAD FOR CASE 15 SHALL BE APPLIED AT TIP OF CROSSARM.
11. THIS DRAWING SHOWS DESIGN LOADING, DIMENSIONS AND CONFIGURATIONS FOR INFORMATION. REFERENCE FABRICATOR'S CALCULATIONS, AND DRAWINGS FOR FINAL STRUCTURE DESIGN AND DETAILS.

230KV TRANSMISSION LINE
SINGLE CIRCUIT STRUCTURE 3

Kiewit

DRAWING NUMBER
SGL CKT STR3

CONSULTANT
wsp

YYYY-MM-DD	2024-05-20
DESIGNED	-
PREPARED	MK
REVIEWED	JP
APPROVED	VG/LL

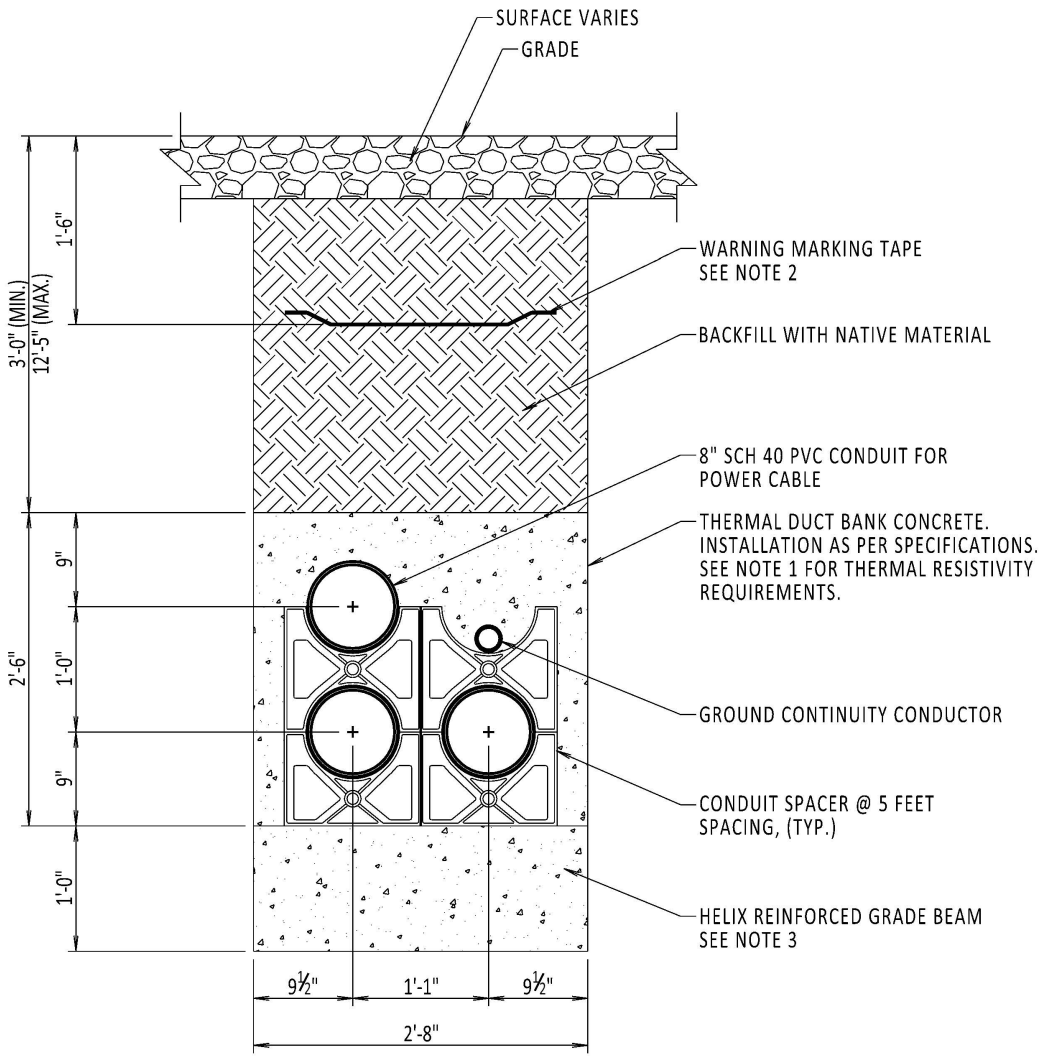
CLIENT
GEM A-CAES LLC

REFERENCE(S)
1. 230KV TRANSMISSIO N LINESINGLE CIRCUIT S TRUCTURE 3 (GL CKT STR3) - KIEWIT 2023

PROJECT
WILLOW ROCK ENERGY STORAGE CENTER
SUPPLEMENTAL AFC

TITLE
REPRESENTATIVE TRANSMISSION POLE, STRUCTURE 3

PROJECT NO.	PHASE	REV.	FIGURE
31406639.003	01	1	3-1c



8" PVC CONDUIT
2 X 2 HELIX DUCT BANK

SCALE: ½" = 1'-0"

NOTES:

1. THE THERMAL RESISTIVITY OF THE DUCT BANK CONCRETE SHALL BE NO MORE THAN 55° C-cm/W.
2. CONTRACTOR TO INSTALL WARNING MARKING TAPE ABOVE THE DUCT BANK AS SHOWN. CABLE MARKING TAPE SHALL BE PROVIDED BY THE CONTRACTOR TO COVER THE ENTIRE UNDERGROUND LENGTH OF THE CONCRETE DUCT BANK. CABLE MARKING TAPE WILL BE PER THE SPECIFICATION. THE TAPE SHALL BE INSTALLED FLAT AND DIRECTLY ABOVE THE DUCT BANK WITH THE PRINTED SIDE UP. TAPE SHALL BE INSTALLED AS INDICATED ON THE DRAWINGS.
3. CONTRACTOR SHALL USE APPROVED HELIX REINFORCED CONCRETE MIX DESIGN FOR SUPPORT OF THE DUCT BANK (5,000 P.S.I.).
4. CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS FOR HELIX REINFORCED CONCRETE (ACI-318) AND CAST-IN-PLACE CONCRETE SPECIFICATION, CLASS II.
5. 3 INCH MINIMUM EDGE TO EDGE SPACING SHALL BE MAINTAINED BETWEEN CONDUITS AT ALL LOCATIONS.

REFERENCE(S)
1. 8" PVC CONDUIT 2X2 HELIX DUCT BANK (DS1132) - KIEWIT 2023

- PRELIMINARY -
NOT FOR CONSTRUCTION

A	revision description		
	1st Int.Last Name	1st Int.Last Name	date
REV	DESIGN BY	CHECKED BY	DATE

KIEWIT DETAIL DRAWING STANDARDS
UNDERGROUND TRANSMISSION LINES

8" PVC CONDUIT
2X2 HELIX DUCT BANK

ENGINEER/DESIGN ORIGINATOR	1st Int.Last Name
LEAD ENG	1st Int.Last Name
ENG MGR	1st Int.Last Name
PROJ MGR	1st Int.Last Name

DRAWING NUMBER: DS1132

CLIENT: GEM A-CAES LLC

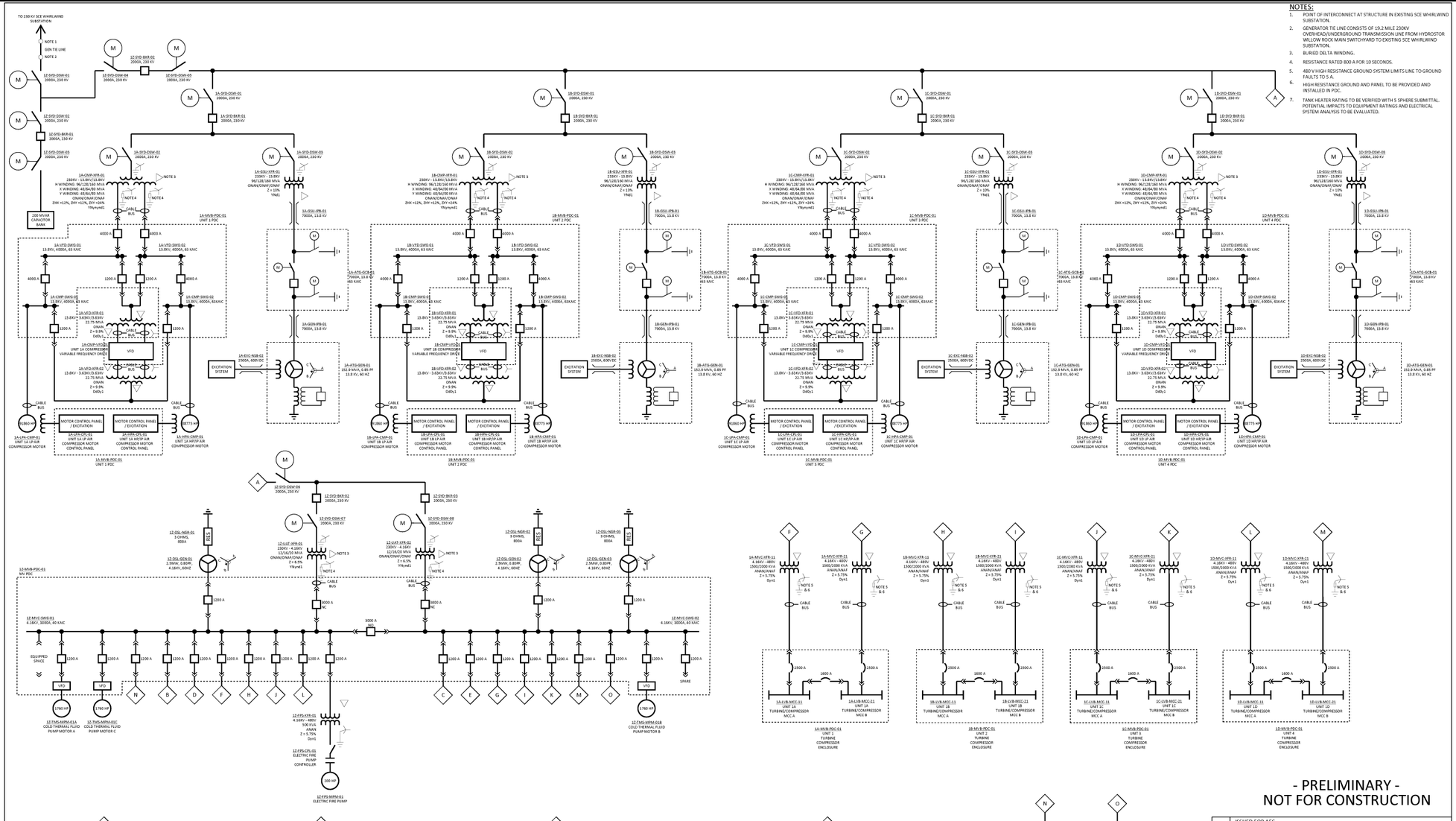
PROJECT: WILLOW ROCK ENERGY STORAGE CENTER
SUPPLEMENTAL AFC

CONSULTANT: wsp

YYYY-MM-DD	2024-05-20
DESIGNED	-
PREPARED	MK
REVIEWED	JP
APPROVED	VG/LL

TITLE: **230-KILOVOLT UNDERGROUND CABLE INSTALLATION EXAMPLE**

PROJECT NO.	PHASE	REV.	FIGURE
31406639.003	01	1	3-2



NOTES:

1. POINT OF INTERCONNECT AT STRUCTURE IN EXISTING SCE WHIRLWIND SUBSTATION.
2. GENERATOR TIE LINE CONSISTS OF 19.2 MILE 230KV OVERHEAD/UNDERGROUND TRANSMISSION LINE FROM HYDROSTOR WILLOW ROCK MAIN SWITCHYARD TO EXISTING SCE WHIRLWIND SUBSTATION.
3. BURIED DELTA WINDING.
4. RESISTANCE RATED 800 A FOR 10 SECONDS.
5. 480 V HIGH RESISTANCE GROUND SYSTEM LIMITS LINE TO GROUND FAULTS TO 5 A.
6. HIGH RESISTANCE GROUND AND PANEL TO BE PROVIDED AND INSTALLED IN PDC.
7. TANK HEATER RATING TO BE VERIFIED WITH 5 SPHERE SUBMITTAL. POTENTIAL IMPACTS TO EQUIPMENT RATINGS AND ELECTRICAL SYSTEM ANALYSIS TO BE EVALUATED.

- PRELIMINARY -
NOT FOR CONSTRUCTION

REV	DESIGN BY	CHECKED BY	DATE
0	ISSUED FOR AFC		
	R. LOOS	A. TILLEMA	01-12-24

HYDROSTOR

WILLOW ROCK ENERGY STORAGE CENTER

Kiewit

ELECTRICAL ONE LINE DIAGRAM
OVERALL ONE LINE

ENGINEER/DESIGN ORIGINATOR	R. LOOS
LEAD ENG	R. LOOS
ENG MGR	J. LUNDQUIST
PROJ MGR	J. LUNDQUIST

DRAWING NUMBER: 20045352-EO-001

PATH: G:\Hydrostor\Ansel\09_PROJECTS\31406639.003_Hydrostor\Ansel_Section3_and_5\31406639.003_Section3\02_PRODUCTION\MXD\FIGURES\Rev1\31406639-003_00_Section-3_Figures.aprx PRINTED: 5/20/2024 at 2:03 PM BY: MKrielen

CONSULTANT

wsp

YYYY-MM-DD	2024-05-20
DESIGNED	-
PREPARED	MK
REVIEWED	JP
APPROVED	VG/LL

CLIENT
GEM A-CAES LLC

REFERENCE(S)
1. ELECTRICAL ONE LINE DIAGRAM OVERALL ONE LINE (20045352-EO001) - KIEWIT 2024

PROJECT
WILLOW ROCK ENERGY STORAGE CENTER
SUPPLEMENTAL AFC

TITLE
ELECTRICAL ONE-LINE DIAGRAM

PROJECT NO.	PHASE	REV.	FIGURE
31406639.003	01	1	3-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 1 in