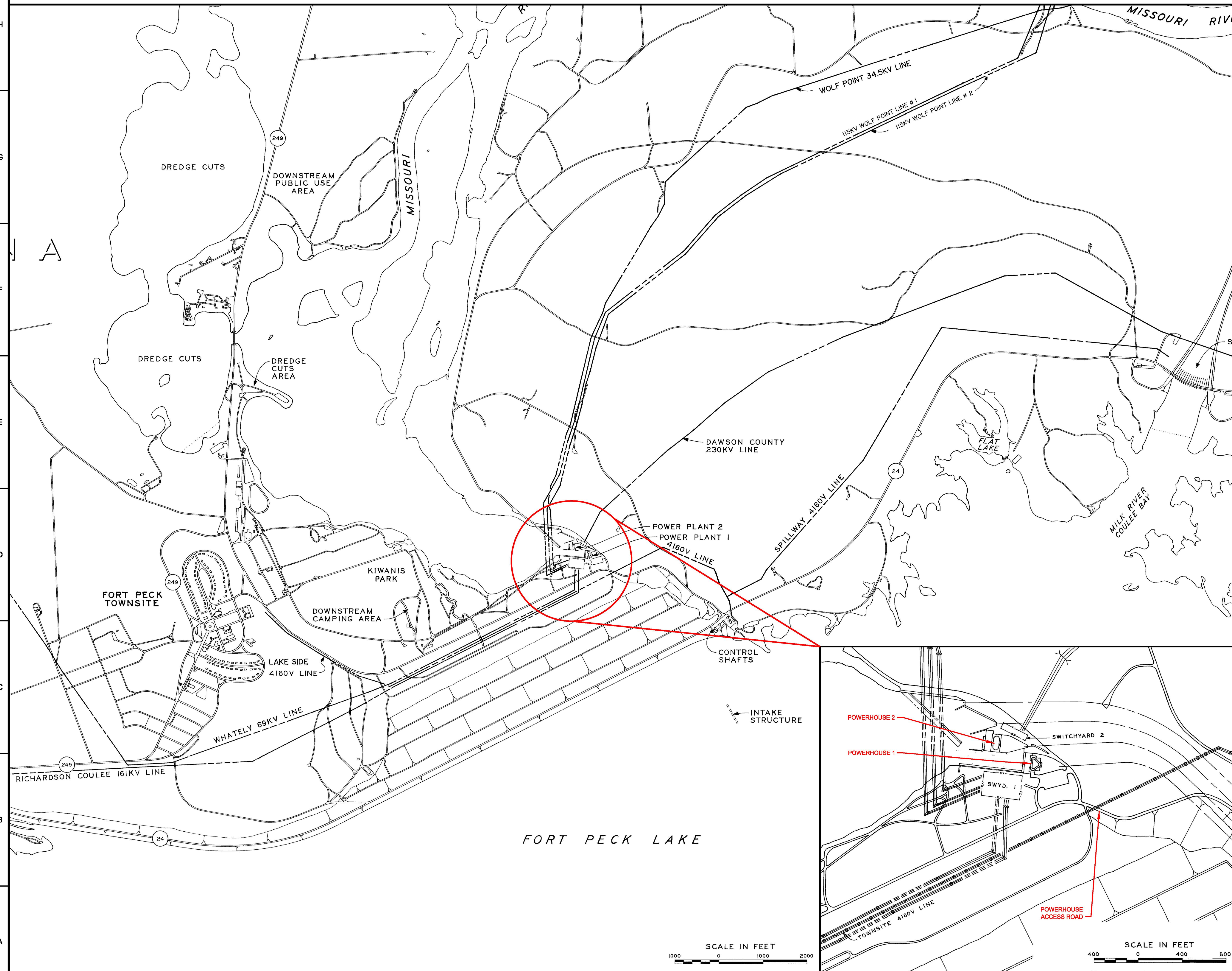


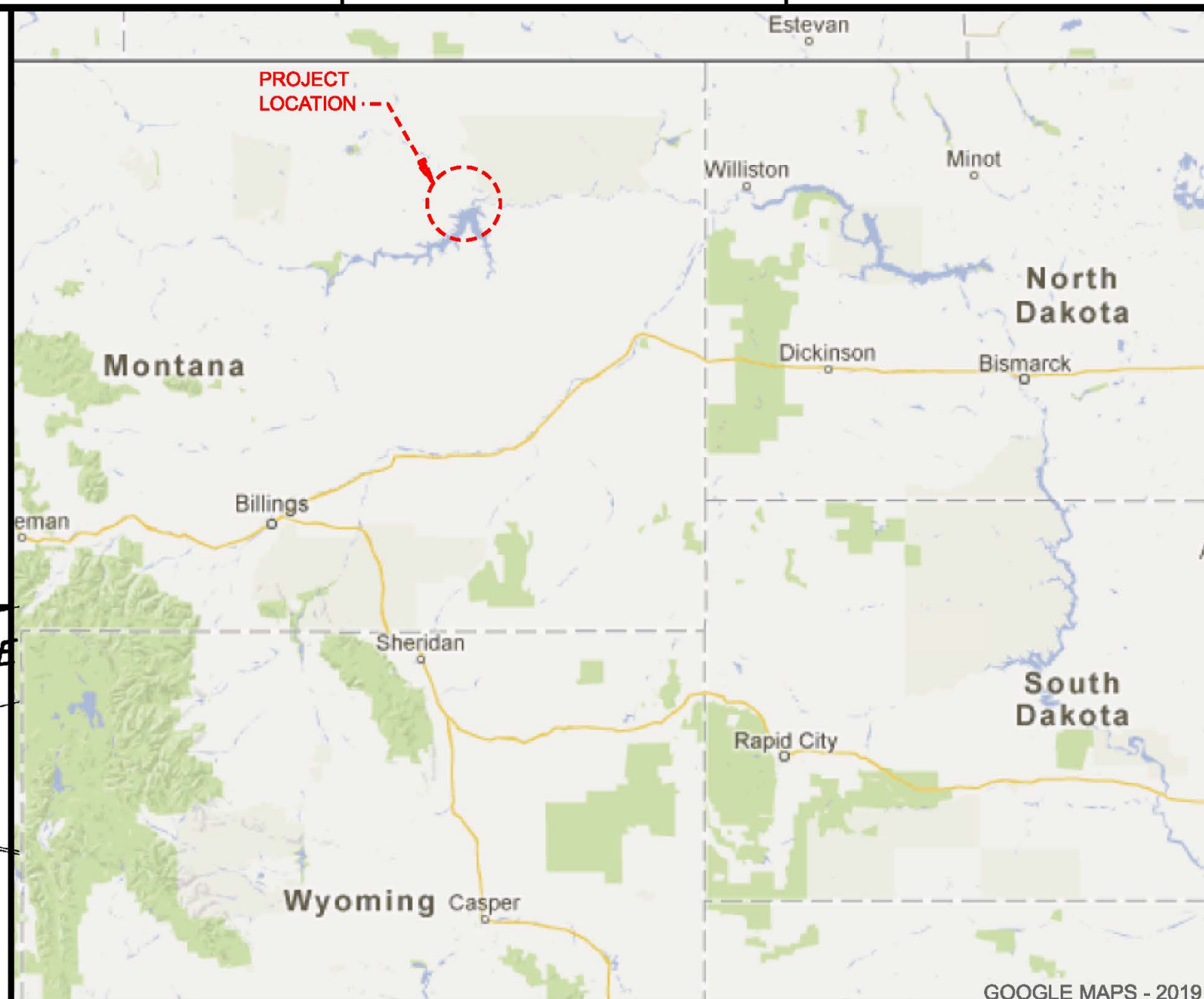


SOLICITATION NUMBER: W9128F-23-R-0009

CONTRACT NUMBER:  
DATE: JANUARY 2023



## PROJECT VICINITY MAP



## PROJECT LOCATION MAP



PROJECT PHOTO

This project was designed by the Hydroelectric Design Center of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152.

SUBMITTED BY:	APPROVED BY:
JAMES D. CALNON, P.E. CHIEF, MECH/STRUCTURAL BRANCH	DATE
SUBMITTED BY:	
JOHN Z. YEN, P.E. CHIEF, ELECTRICAL BRANCH	DATE
JORDAN S. FINK, P.E. DIRECTOR HDC	DATE



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U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA NEBRASKA	DESIGNED BY: D. LUNDY P.E.	ISSUE DATE: JANUARY 2023
	DRAWN BY: M. GUNDROM	SOLICITATION NO.: W972F-23-R-0089
	CHECKED BY: P. E.	CONTRACT NO.:
	SUBMITTED BY: JORDAN S. FINK P.E.	DRAWING NO.:
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	SIZE: A	PP78 FPD-1.008 G-001

**FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB**

SHEET ID  
G-001



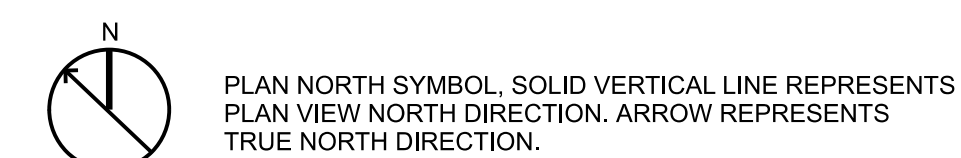
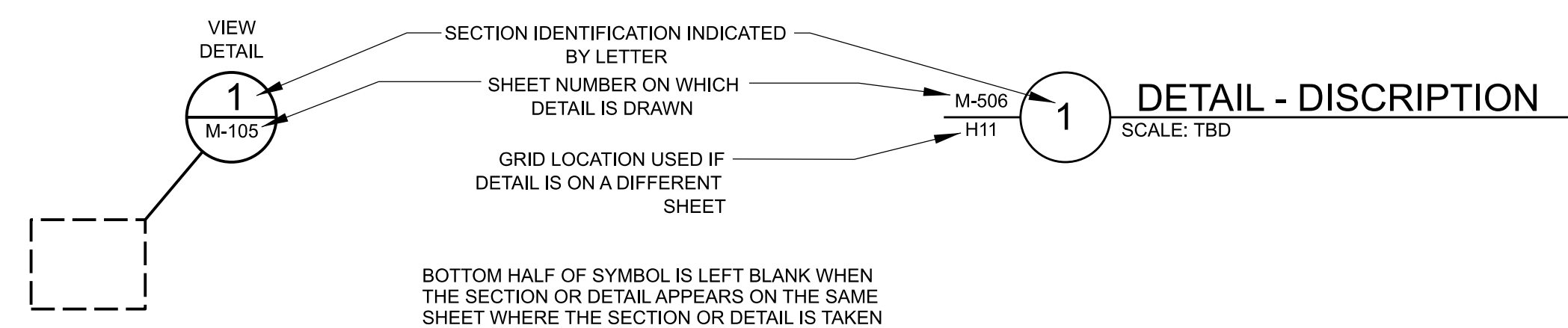
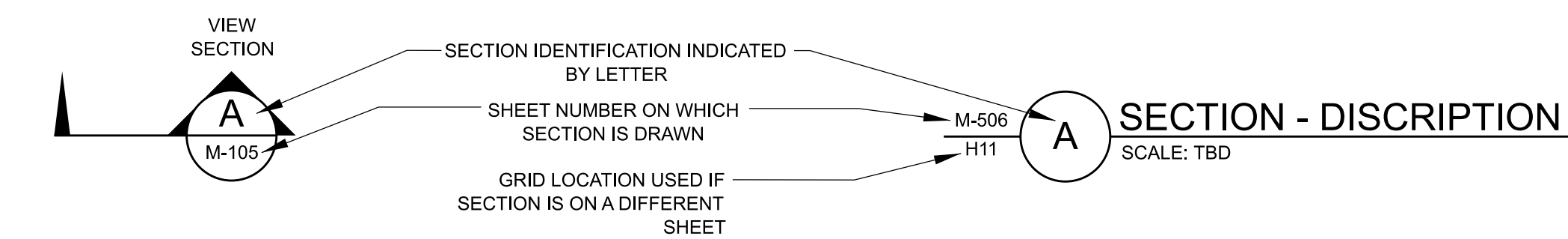




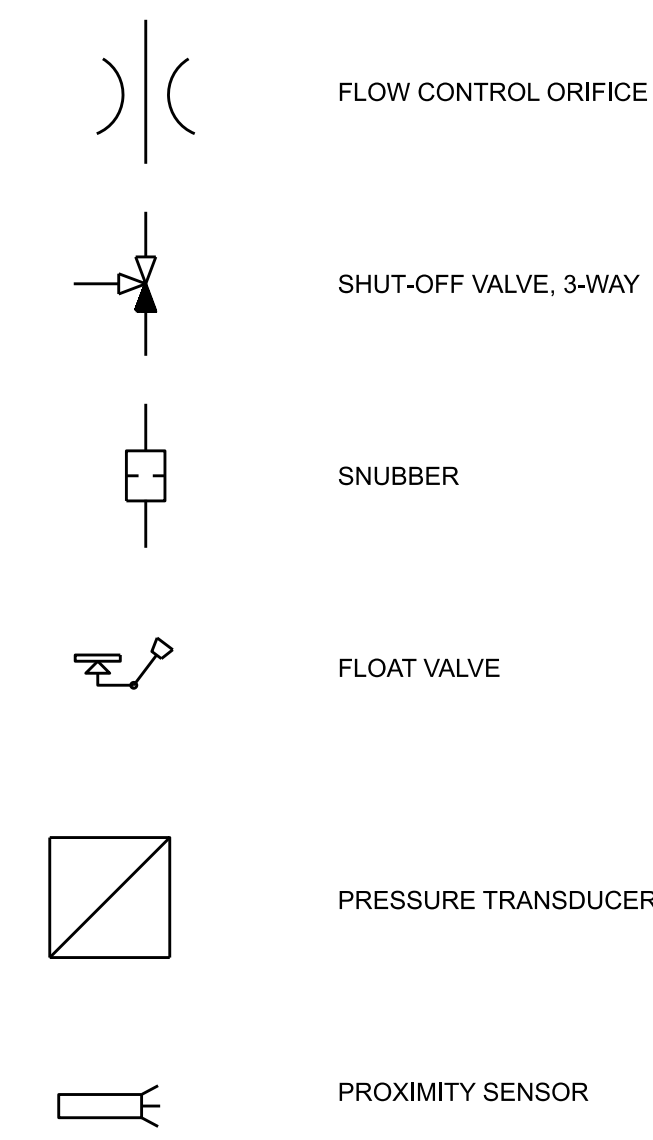
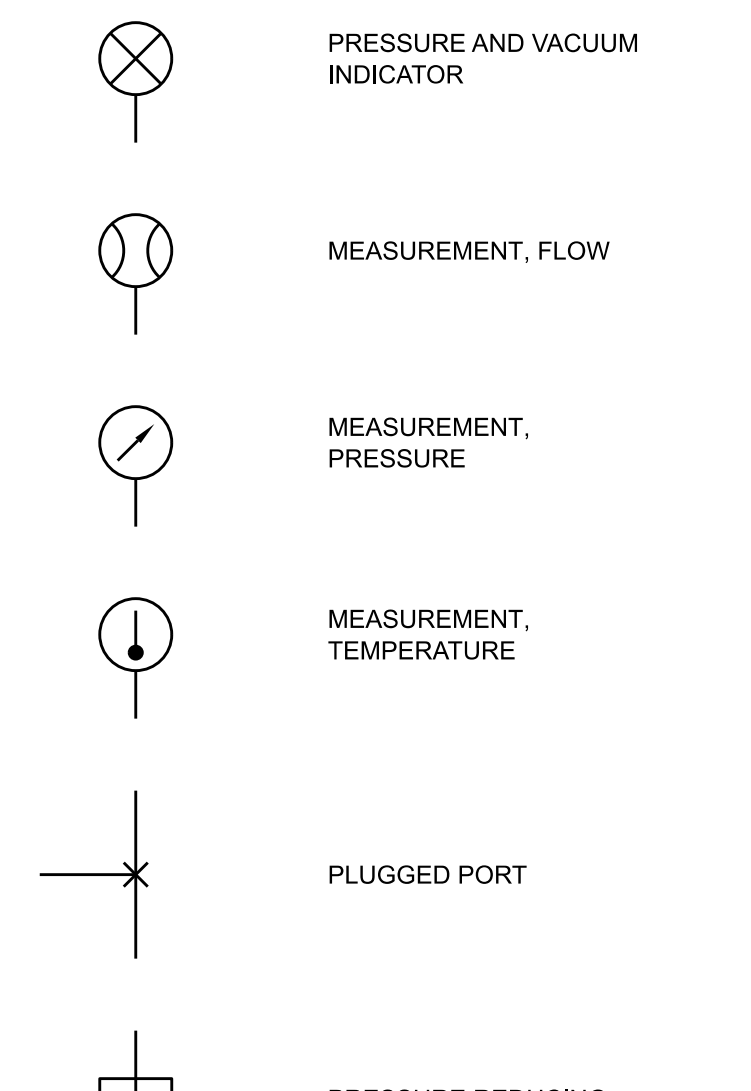
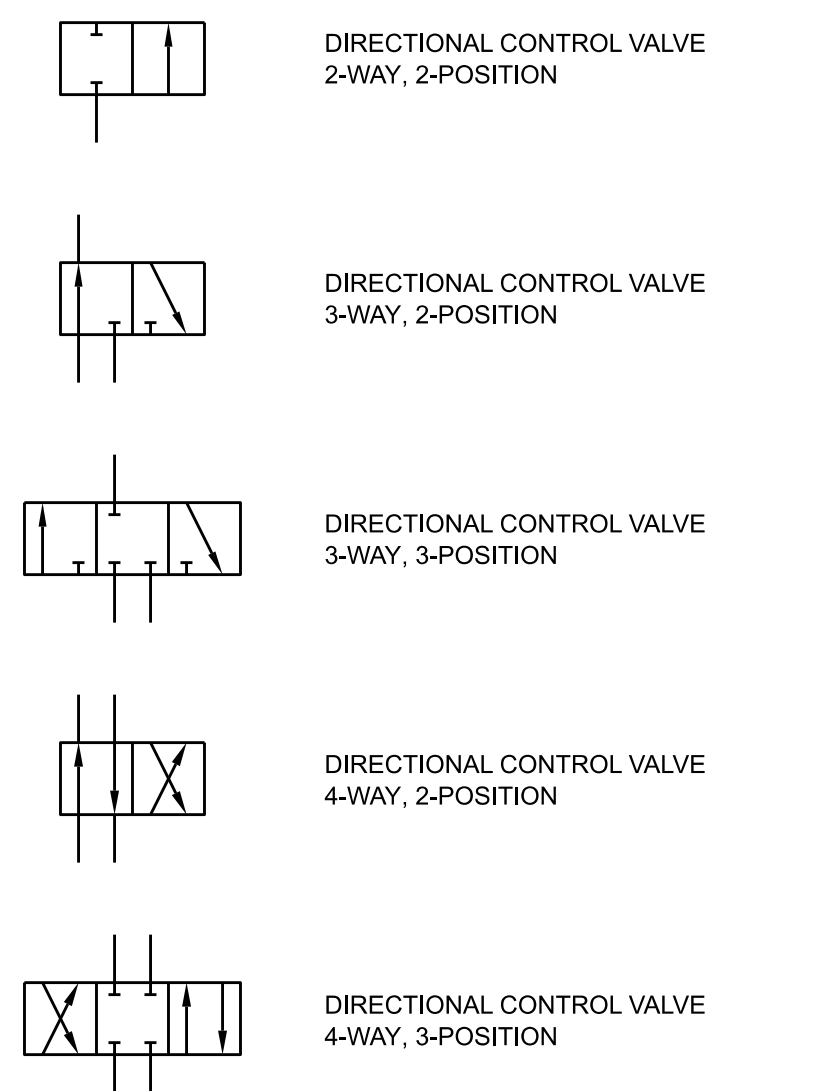
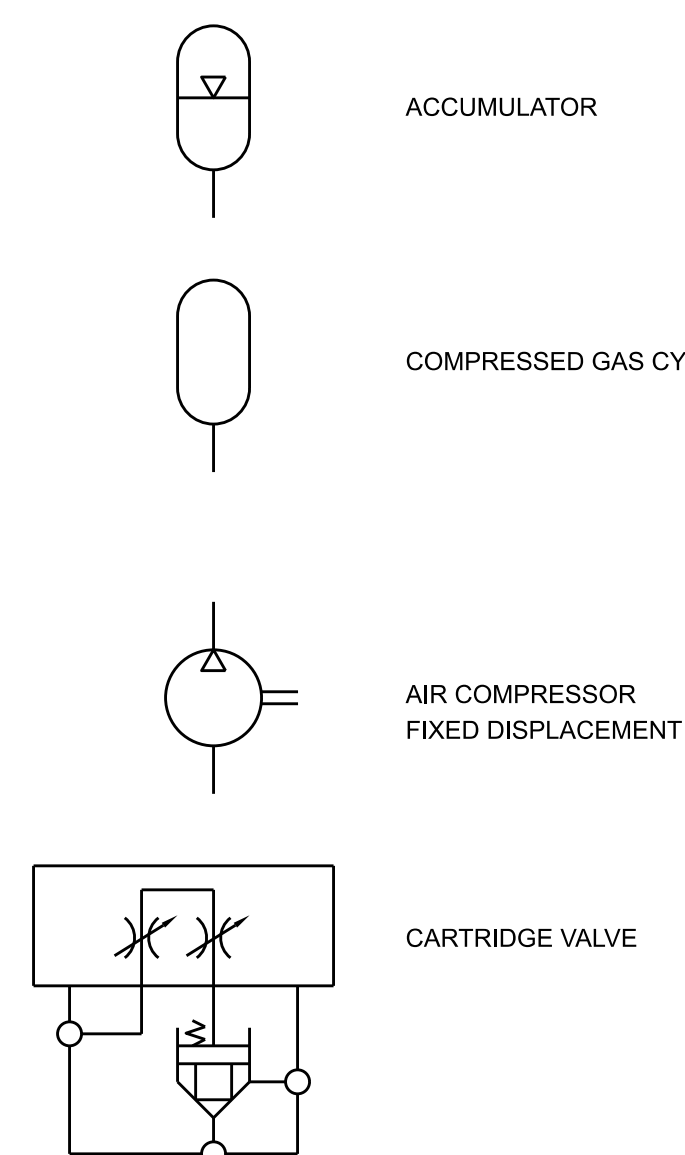




## SECTION AND DETAIL SYMBOLS



## GRAPHIC SYMBOLS LEGEND



## ABBREVIATIONS

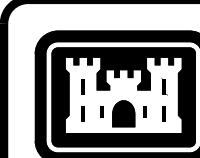
APPROX	APPROXIMATELY
BFV	BUTTERFLY VALVE
BTWN	BETWEEN
CL	CENTERLINE
D/S	DOWNSTREAM
EL	ELEVATION
GEN	GENERATOR
GFE	GOVERNMENT-FURNISHED EQUIPMENT
HPU	HYDRAULIC POWER UNIT
MAINT	MAINTENANCE
MH	MAN HOLE
PLCS	PLACES
PP1	POWER PLANT 1
PP2	POWER PLANT 2
Typ	TYPICAL
U/S	UPSTREAM
WISCO	WILLAMETTE IRON AND STEEL COMPANY

## MATERIAL INDICATIONS



NOTES:

1. CONTRACTOR MUST FIELD VERIFY EXISTING CONDITIONS.
2. ON REMOVAL SHEETS, EXISTING EQUIPMENT TO BE REMOVED / MODIFIED, OR ITEMS FOR AWARENESS, ARE INDICATED BY GREEN TEXT, HEAVIER LINE WEIGHTS, CROSS - HATCHED, CLOUDING, AND / OR AS NOTED.
3. ON INSTALL SHEETS, NEW EQUIPMENT TO BE INSTALLED OR PROVIDED, REFURBISHED, MODIFIED, AND ITEMS FOR AWARENESS, ARE INDICATED BY RED TEXT, HEAVIER LINE WEIGHTS, AND/OR AS NOTED.
4. SOME COMPONENTS AND FEATURES ON THE FOLLOWING DRAWINGS ARE OMITTED FOR CLARITY AND/OR MAY NOT BE TO SCALE.
5. ALL EXISTING EQUIPMENT WHICH IS NOT TO BE REUSED FOR THE NEW CONTROL SYSTEM MUST BE REMOVED AND ANY VOIDS CAUSED BY THE REMOVAL MUST BE COVERED, PLUGGED OR PATCHED AND PAINTED AS APPROPRIATE TO PROVIDE A CLEAN APPEARANCE.
6. TOUCH UP PAINT ALL DISTURBED SURFACES AND OTHER AREAS AS SPECIFIED.
7. ITEMS SHOWN ON THIS DRAWING ARE NOT ALL NECESSARILY REFERENCED ON THE FOLLOWING INDIVIDUAL MECHANICAL DRAWINGS.
8. HYDRAULIC SCHEMATIC SYMBOLS, DEVICE NUMBERS AND LEGEND SHOWN ON THIS DRAWING ARE APPLICABLE FOR ALL DRAWINGS. HOWEVER, IF SYMBOLS, DEVICE NUMBERS AND LEGEND APPEAR ON AN INDIVIDUAL DRAWING AND DIFFERS FROM THIS DRAWING, THE INFORMATION ON THE INDIVIDUAL DRAWING MUST GOVERN.
9. NEW PRESSURE PIPE ROUTING SHOWN ON THE DRAWINGS MAY NOT ABSOLUTELY BE THE MOST PRACTICABLE ROUTING; THEREFORE, SLIGHT MODIFICATION MAY BE ALLOWED TO FACILITATE A BETTER INSTALLATION AFTER PERMISSION FROM THE CONTRACTING OFFICER'S REPRESENTATIVE HAS BEEN GRANTED.
10. SPIRAL CASE AND SCROLL CASE ARE INTERCHANGEABLE TERMS.



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[illegible]

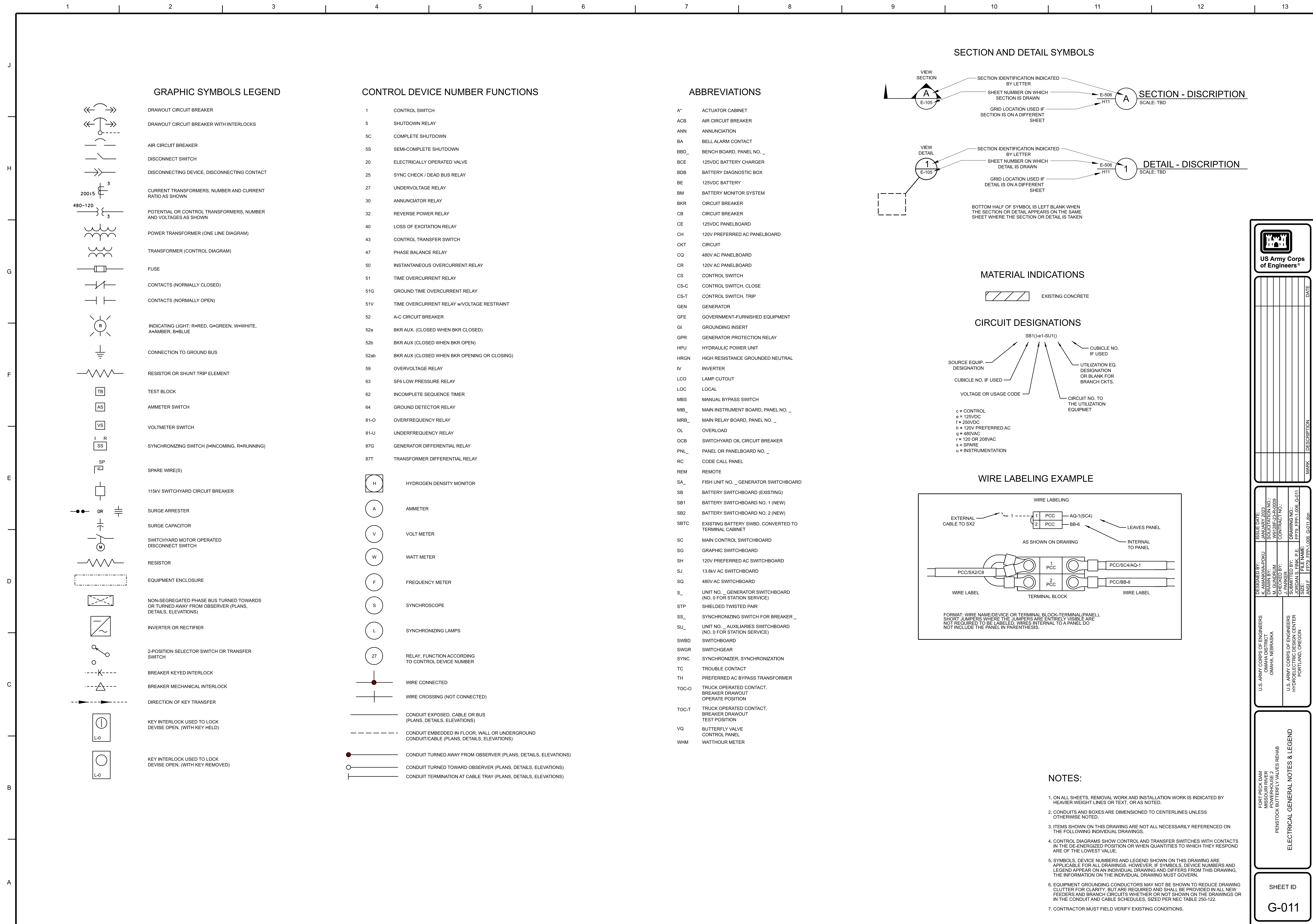
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	DESIGNED BY: D. LUNDY P.E.	ISSUE DATE: JANUARY 2023
OMAHA, NEBRASKA	DRAWN BY: M. GUNDRUM	SOLICITATION NO.: W9129F-23-R-0009
	CHECKED BY: D. COURSON P.E.	CONTRACT NO.:
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	SUBMITTED BY: D. COURSON P.E.	DRAWING NO.: P775-P7-1.036 C-010
	SIZE: 11" X 17"	DATE: 1/10/23

## MECHANICAL GENERAL NOTES &amp; LEGEND

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVE

SHEET ID  
G-010

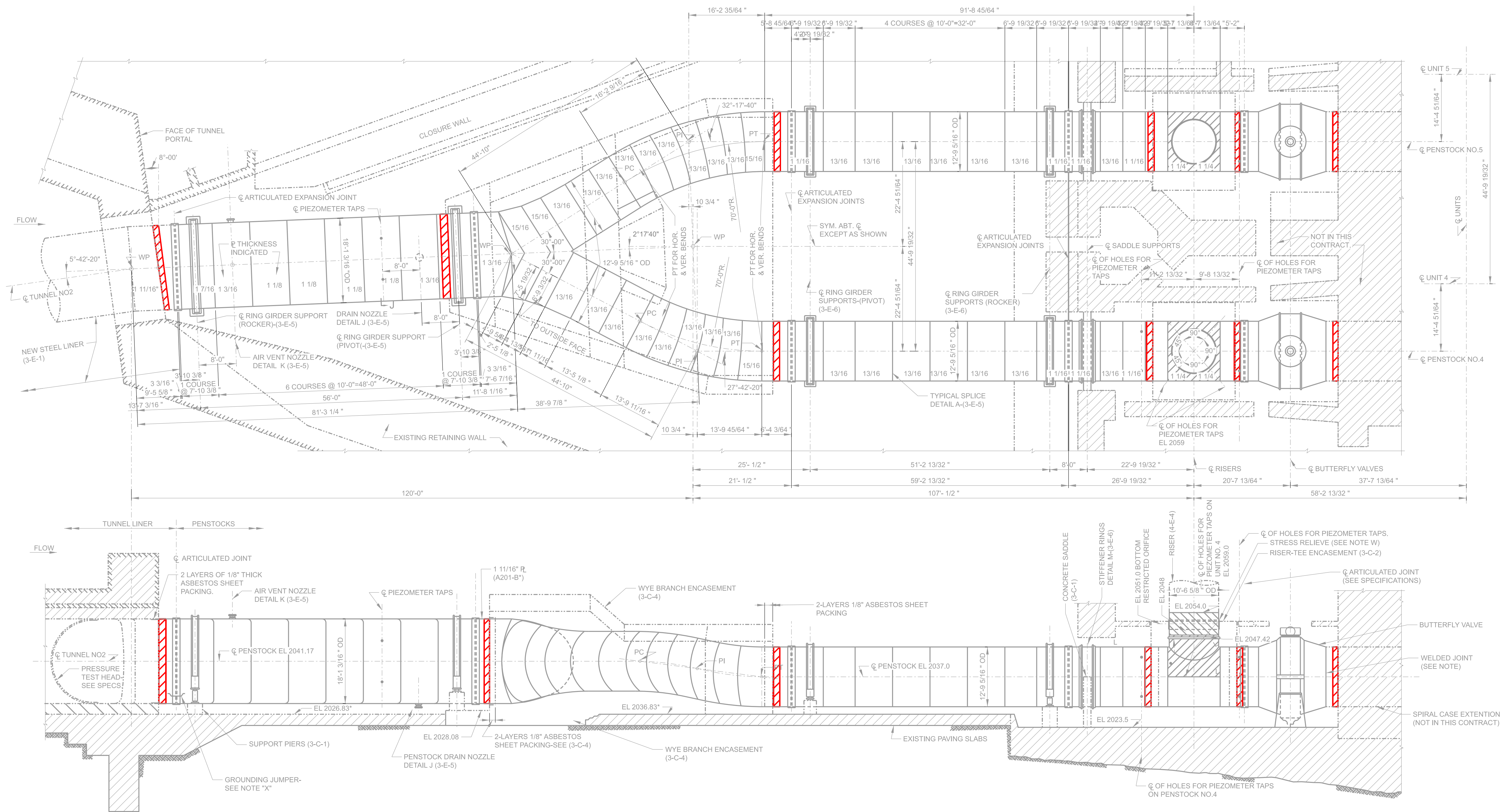




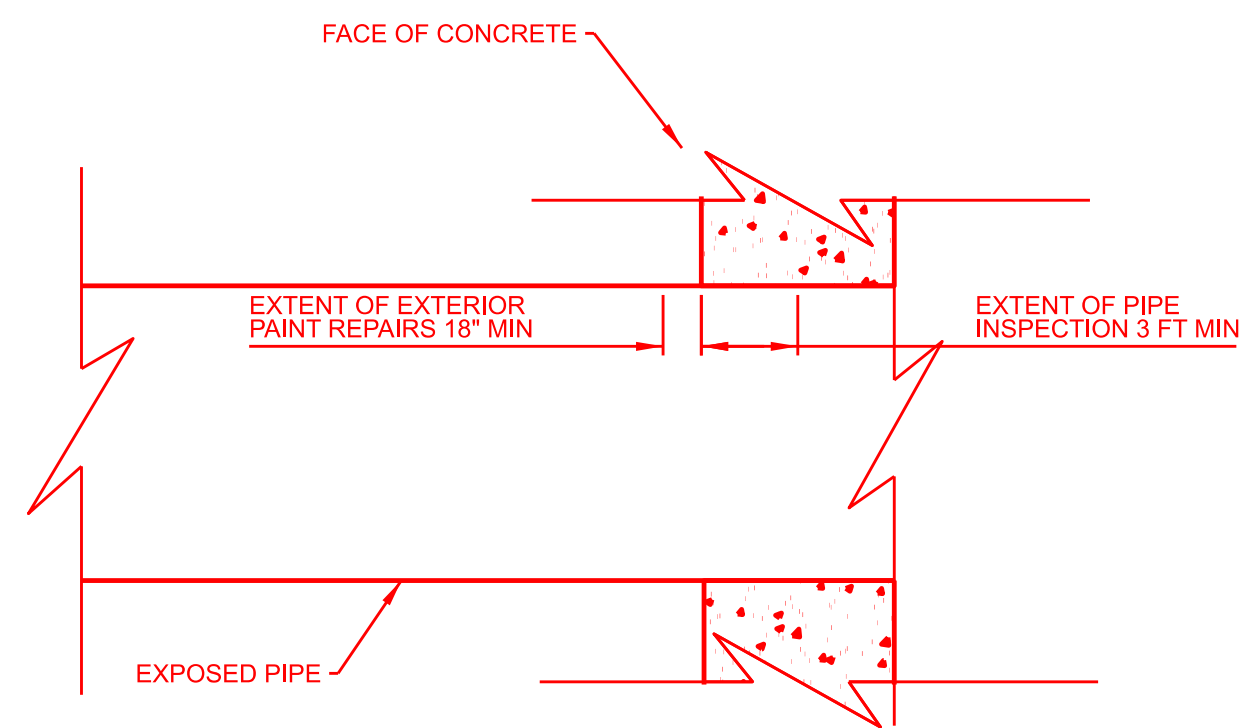








PENSTOCK PAINT REPAIRS AND INSPECTION PLAN  
SCALE: 3/32" = 1' - 0"



TYPICAL SECTION  
SCALE: N.T.S.

LEGEND:

PAINT REPAIR AND INSPECTION LOCATION

- REFERENCE DRAWINGS:
- 5577.3 - C - 2 SECOND POWER PLANT PENSTOCKS AND TUNNEL LINER CONCRETE RISER - TEE ENCASEMENT
  - 5577.3 - C - 5 SECOND POWER PLANT PENSTOCKS AND TUNNEL LINER CONCRETE WYE - BRANCH EMBEDMENT SHEET 2
  - 5577.3 - E - 4 SECOND POWER PLANT PENSTOCKS AND TUNNEL LINER PENSTOCKS SHEET 1

- NOTES:
- REPAIR EXTERIOR PAINT ON TUNNEL 2 AND PENSTOCKS #4 AND #6 AT THE LOCATIONS WHERE PIPE ENTERS AND EXITS CONCRETE (10 TOTAL).
  - REMOVE ALL PAINT AND PRIMER WITHIN 18" FROM FACE OF CONCRETE, OR UNTIL ALL DAMAGED PAINT IS REMOVED, AROUND THE FULL CIRCUMFERENCE OF PIPE.
  - ASSUME EXISTING PAINT CONTAINS LEAD.
  - PORTIONS OF THE PIPE ENCASED IN CONCRETE ARE WRAPPED IN ASBESTOS. SEE REFERENCE DRAWINGS. ABATE AS REQUIRED TO ACCOMPLISH PAINT REPAIRS.
  - PERFORM WORK IN ACCORDANCE WITH SECTION 09 97 02.00 26 OF THE SPECIFICATIONS.
  - MEASURE PIPE WALL THICKNESS AT THE LOCATIONS SHOWN IN ACCORDANCE WITH SECTION 05 05 23.13 26 OF THE SPECIFICATIONS. TAKE MEASUREMENTS FROM WITHIN PIPE, AROUND THE FULL PERIMETER, AND MINIMUM OF 3 FEET INTO CONCRETE ENCASEMENT. SEE SECTION ON THIS SHEET.

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DATE	DESCRIPTION	MARK

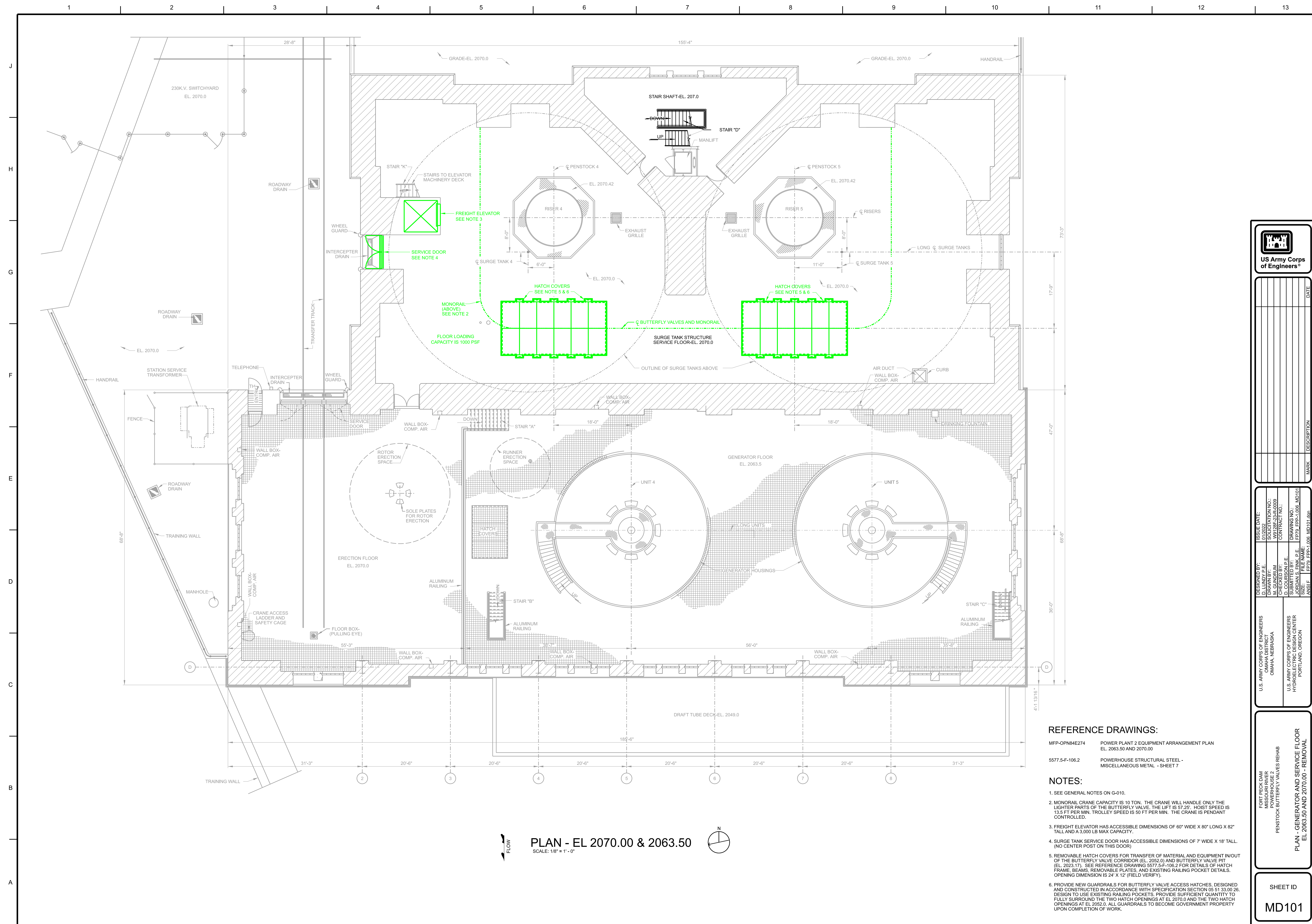
DESIGNED BY: S. KIM P.E.	ISSUE DATE: 01/2022
DRAWN BY: B. STOLT P.E.	SOLICITATION NO.: FP79-FPP-1.008-S-101
CHECKED BY: B. STOLT P.E.	CONTRACT NO.: FP79-FPP-1.008-S-101
SUBMITTED BY: B. STOLT P.E.	DRAWING NO.: FP79-FPP-1.008-S-101
FILE NAME: FP79-FPP-1.008-S-101.dgn	FILE NAME: FP79-FPP-1.008-S-101.dgn

U.S. ARMY CORPS OF ENGINEERS NORTH PLATTE DISTRICT OMAHA, NEBRASKA	U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON
--	---

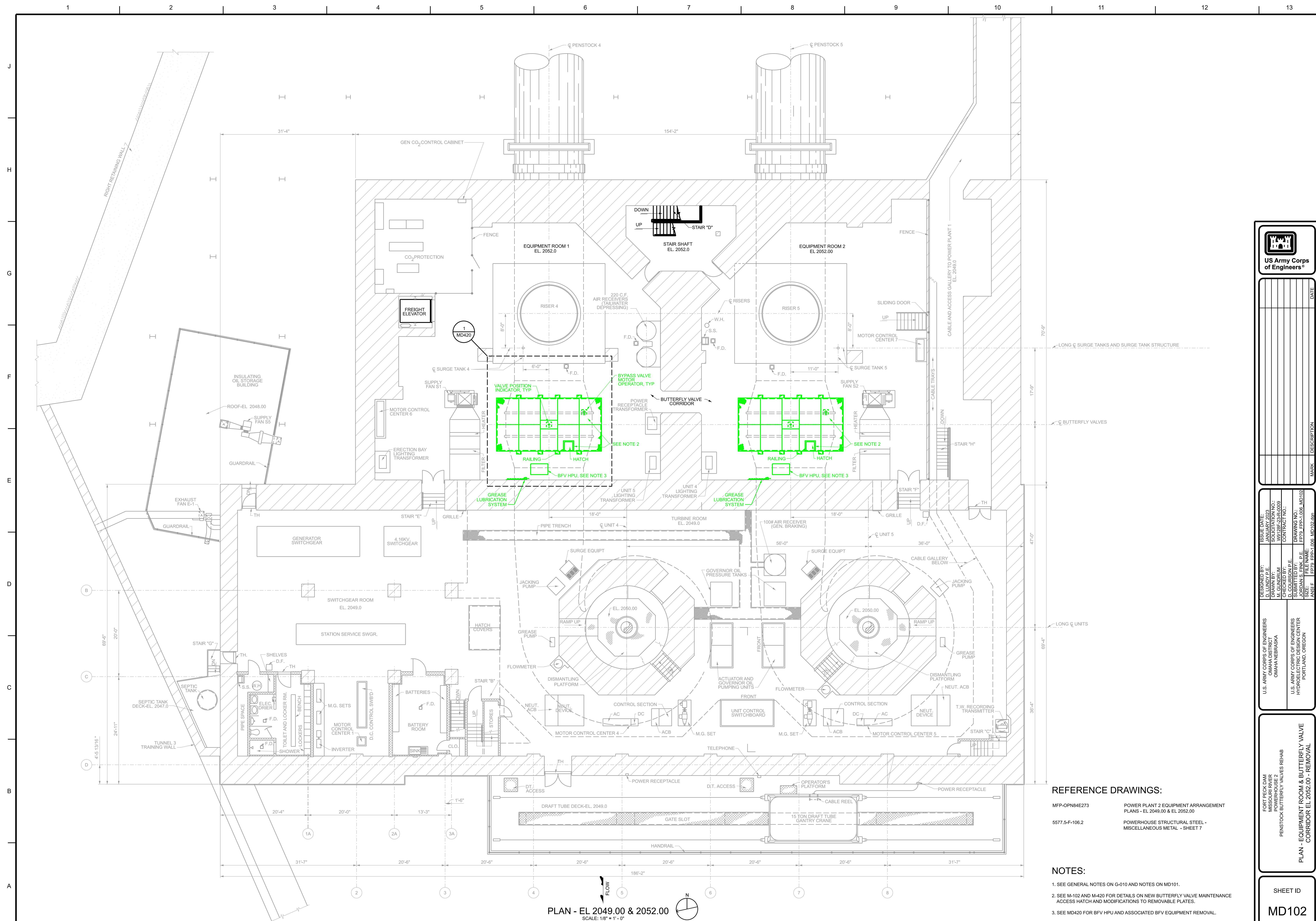
FOR RECORD POWERHOUSE 2 PENSTOCK BUTTERFLY VALVES REPAIR	PENSTOCK INSPECTIONS INSTALL
--	---------------------------------

SHEET ID S-101
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[illegible]

U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA NEBRASKA	DESIGNED BY: D. LUNDY P.E.	ISSUE DATE: JANUARY 2023
	CHECKED BY: M. GUNDIRM	DRAWING NO.: 17P-1-008 MD 102
	SUBMITTED BY: D. COURSON P.E.	FILE NAME: 17P-1-008 MD 102.dgn
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	CONTRACT NO.:	ANSI:

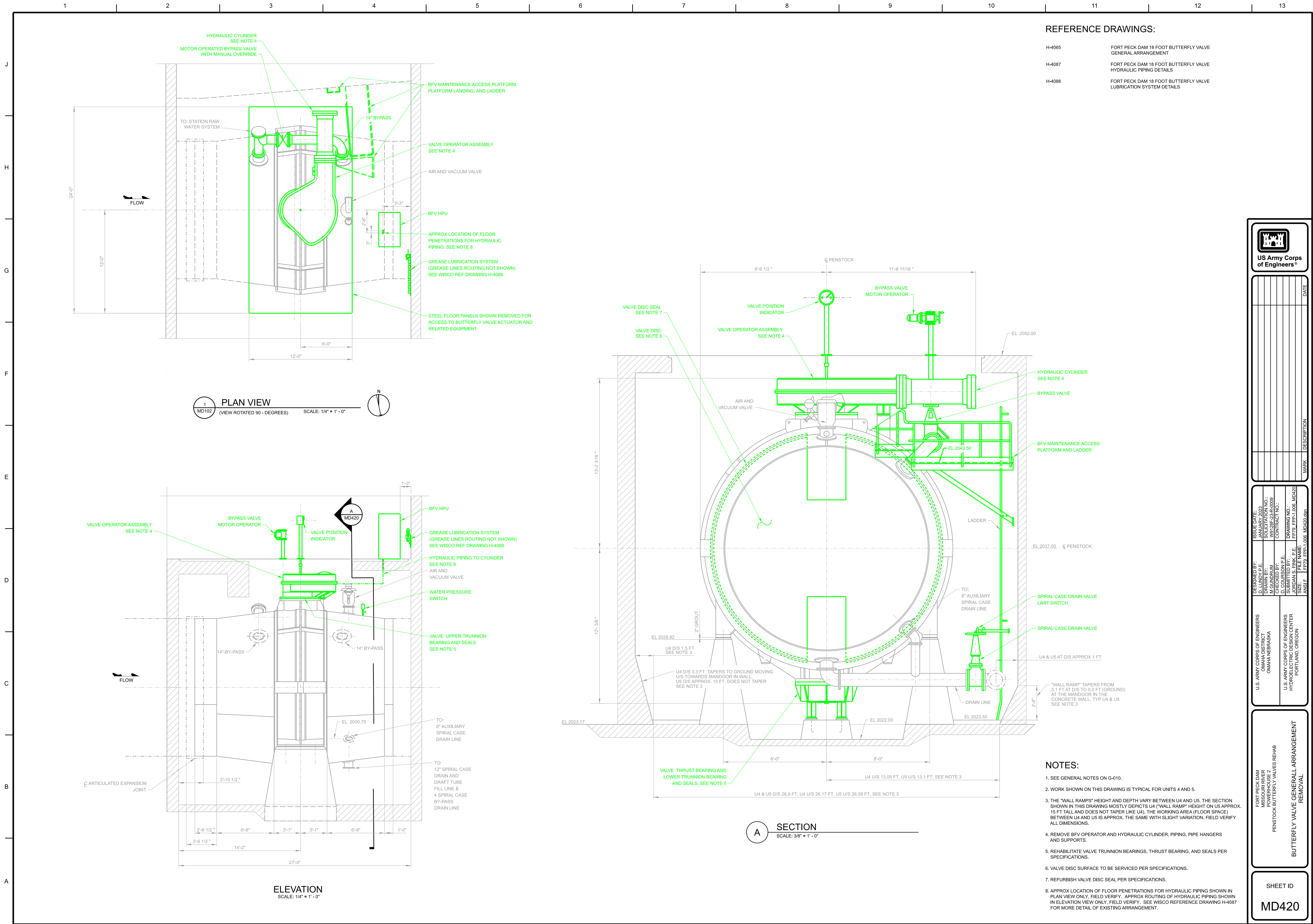
PLAN - EQUIPMENT ROOM & BUTTERFLY VALVE  
CONSTRUCTION 2023.00 - REMOVAL

SHEET ID  
MD102

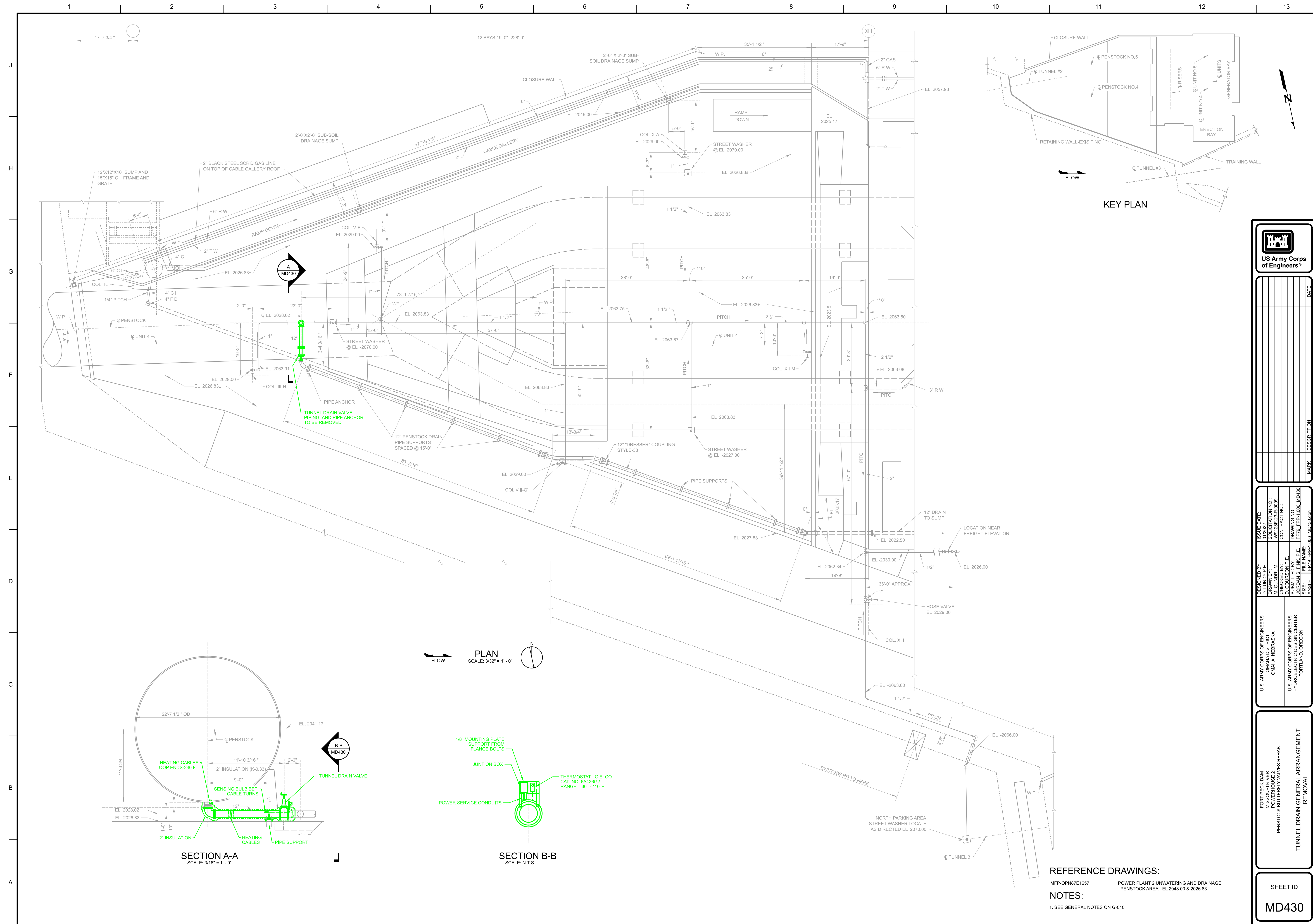
















REFERENCE DRAWINGS:

1454 - 1      ARRANGEMENT - FORT PECK BUTTERFLY VALVE  
HYDRAULIC CONTROL

1. SEE GENERAL NOTES ON G-010.
2. WORK SHOWN ON THIS DRAWING IS TYPICAL FOR UNITS 4 AND 5

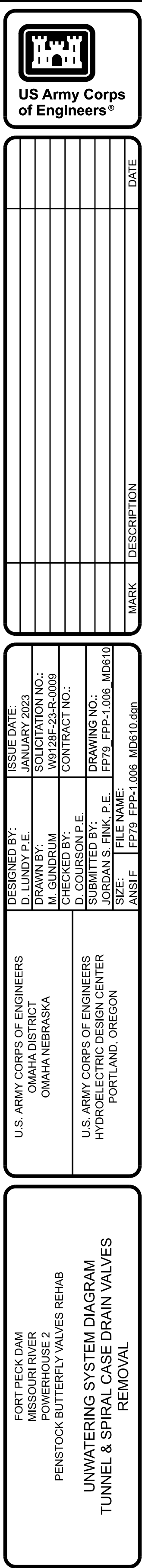
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U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA NEBRASKA	DESIGNED BY: D. LUNDY P.E.	ISSUE DATE: JANUARY 2023
	DRAWN BY: M. GUNDROM	SOLICITATION NO.: W9728F-23-R0089
	CHECKED BY: J. P.E.	CONTRACT NO.:
	SUBMITTED BY: J. P.E.	DRAWING NO.:
U.S. ARMY CORPS OF ENGINEERS HYDROLOGIC DESIGN CENTER PORTLAND, OREGON	JORDAN S. FINK P.E.	PP79. PPD-1.006. MD601
	SIZE:	

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
HYDRAULIC SCHEMATIC FOR  
BUTTERFLY VALVE ACTUATOR  
REMOVAL

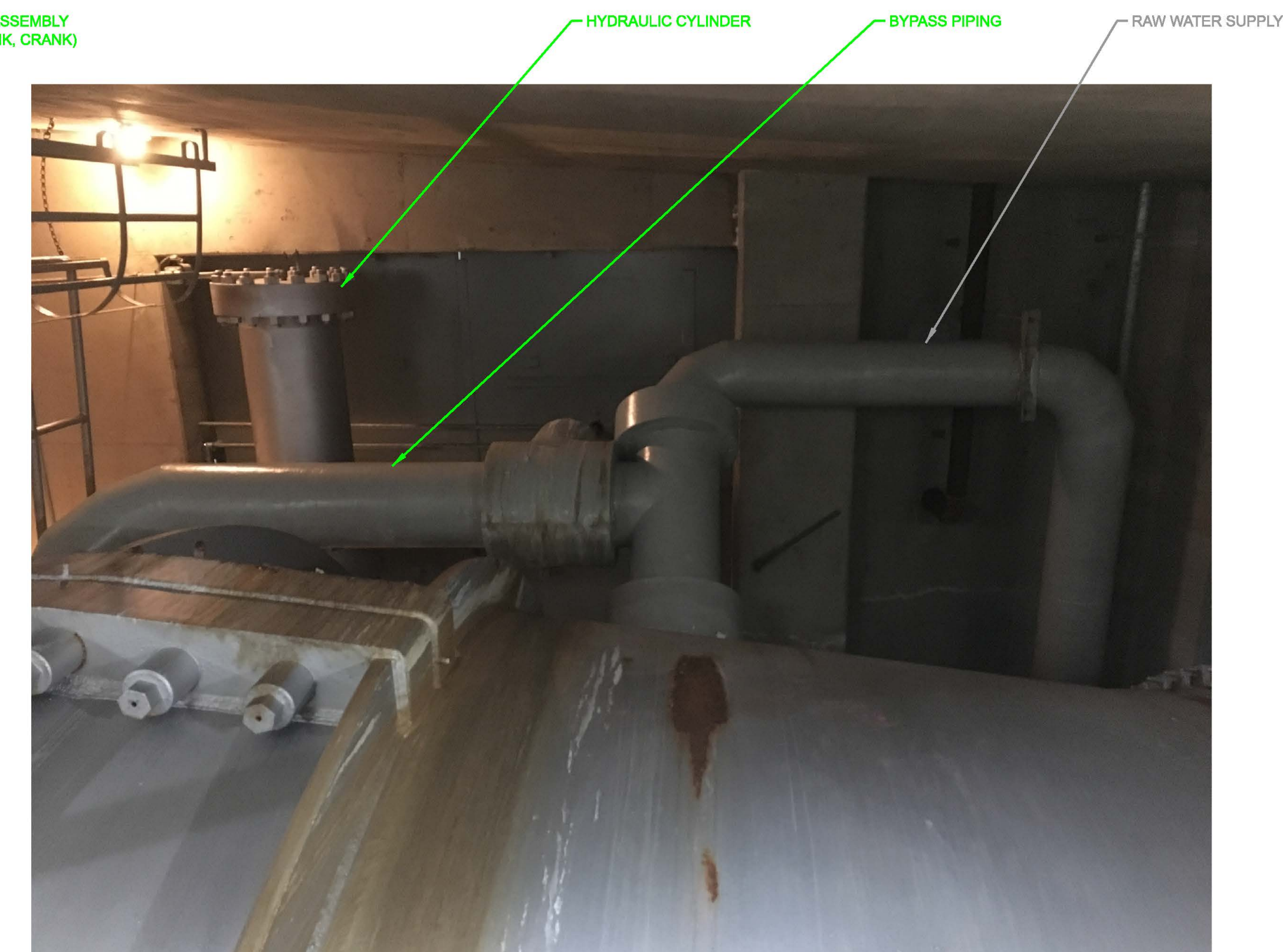
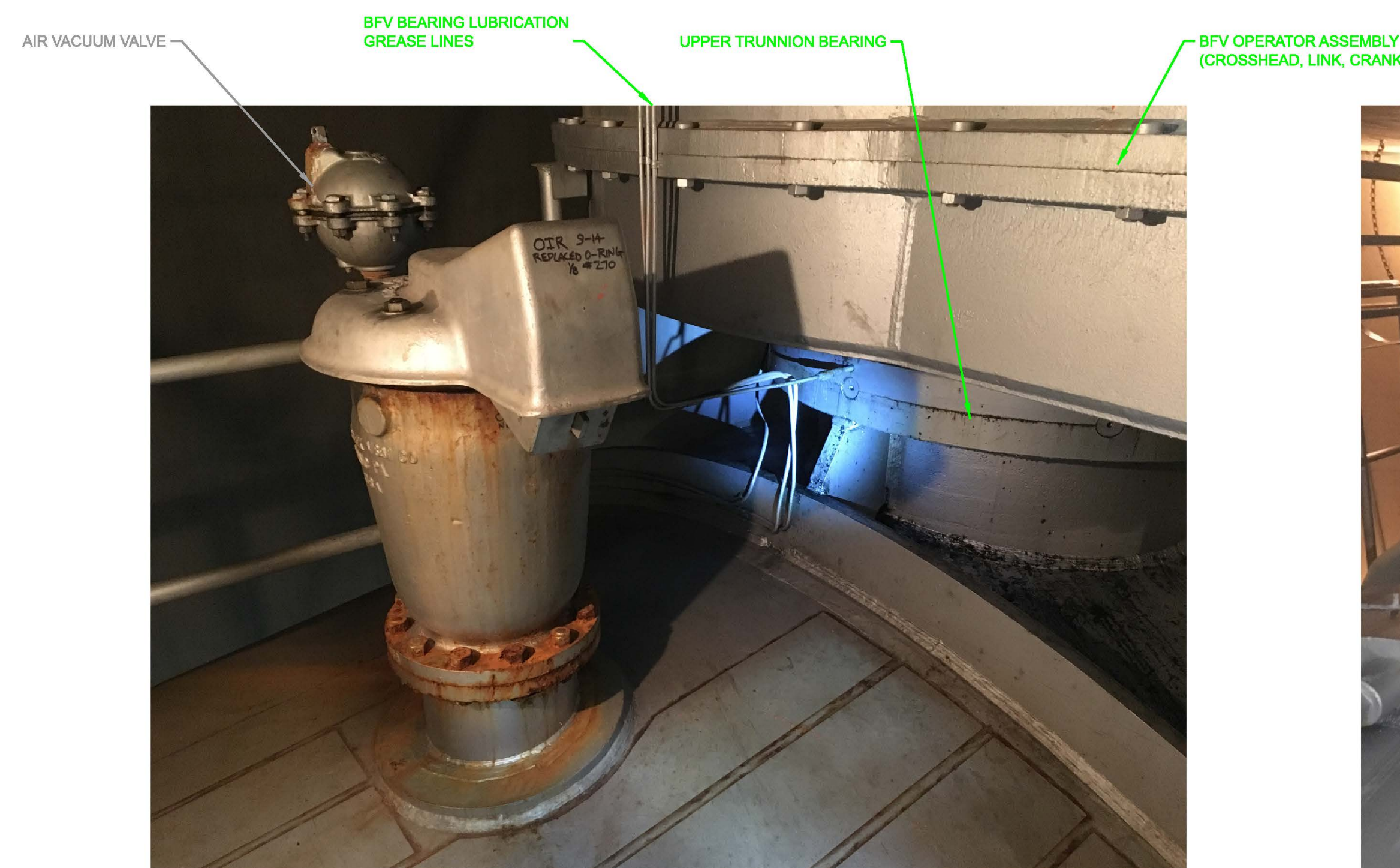
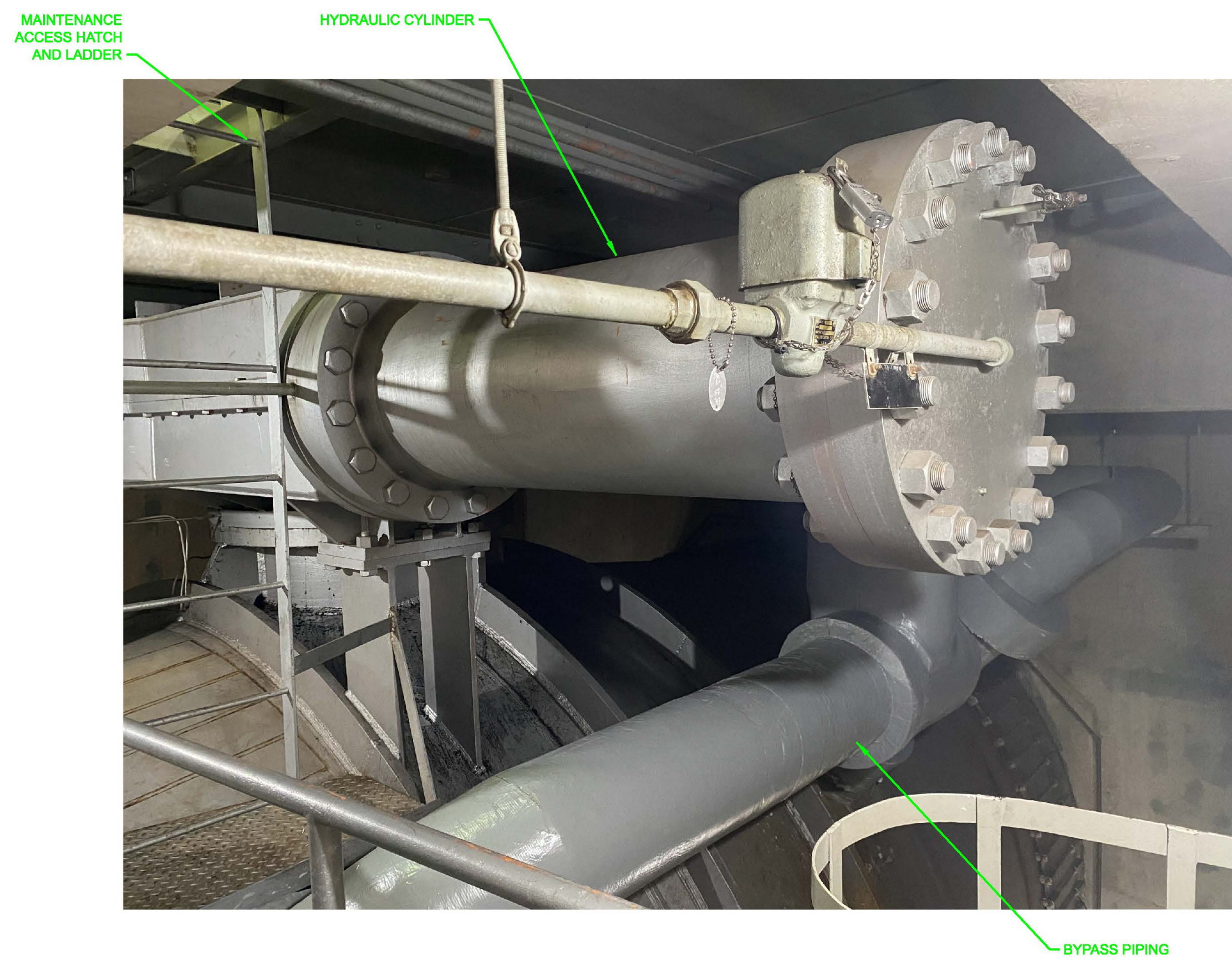
SHEET ID  
MD601





MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
UNWATERING SYSTEM DIAGRAM  
TUNNEL & SPIRAL CASE DRAIN VALVES





NOTES:

1. SEE GENERAL NOTES ON G-010.
2. UNIT 4 SHOWN, UNIT 5 SIMILAR.
3. PHOTOS OF ITEMS INDICATES EXISTING CONDITIONS.
4. REHABILITATION SCOPE OF WORK AS REQUIRED PER THE CONTRACT SPECIFICATIONS.



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[illegible]

U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA, NEBRASKA	DESIGNED BY: D. LUNDY P.E.	ISSUE DATE: JANUARY 2023
	DRAWN BY: M. GUNDRUM	SOLICITATION NO.: W912BF-23-R-0009
	CHECKED BY: E.	CONTRACT NO.:
	SUBMITTED BY: JORDAN S. FRANK, P.E.	DRAWING NO.: P770-1-006 MD901
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON		

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
PENSTOCK BUTTERFLY VALVE  
EQUIPMENT PHOTOS SHEET 1  
REMOVAL

SHEET ID  
MD901

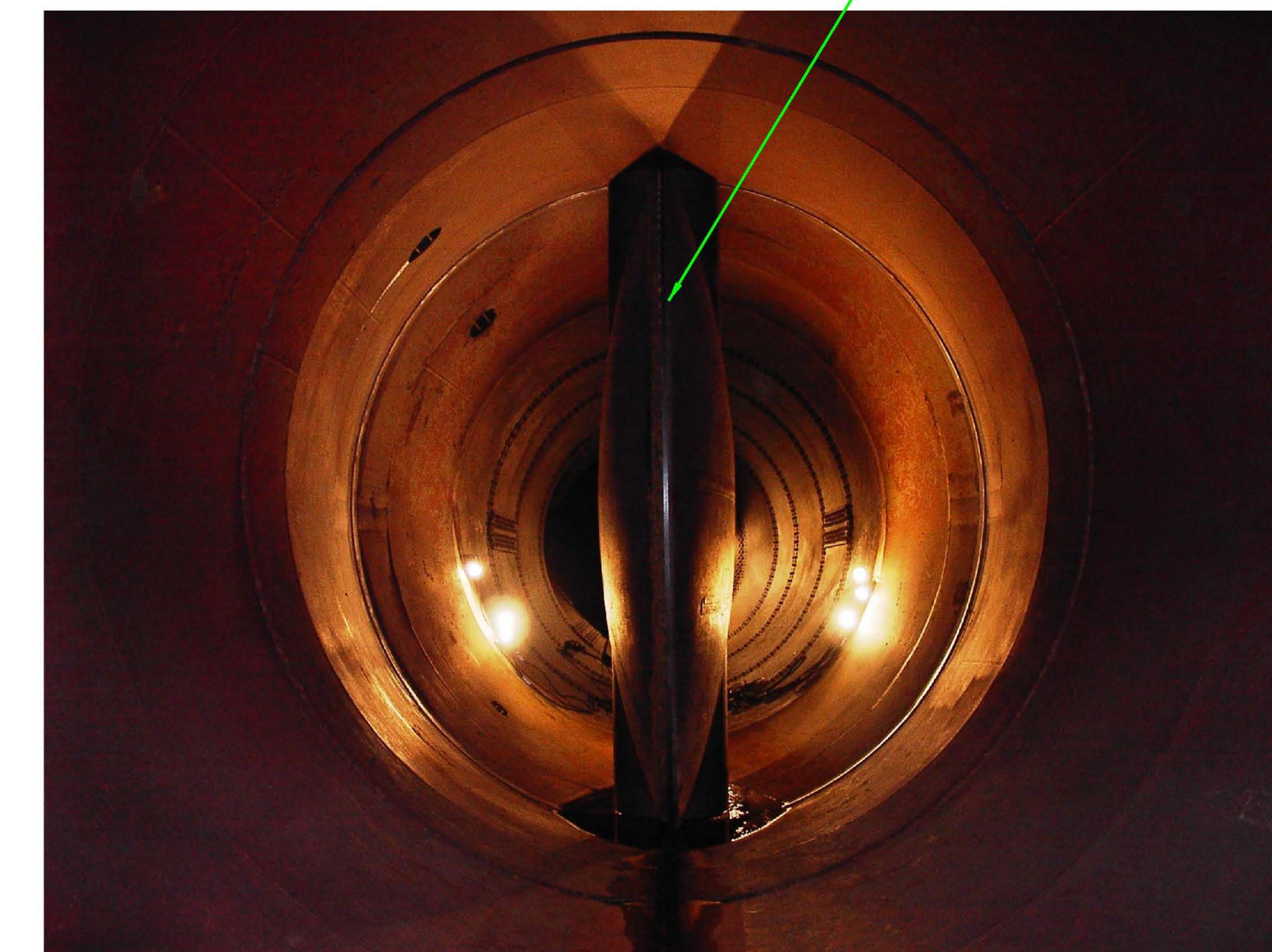




" PICTURE 1 - UNIT 4 BUTTERFLY VALVE LOWER TRUNNION BEARING HOUSING "  
UPSTREAM VIEW



" PICTURE 2 - UNIT 4 BUTTERFLY VALVE LOWER TRUNNION BEARING HOUSING  
DOWNSTREAM VIEW



" PICTURE 3 - UNIT 4 BUTTERFLY VALVE INTERIOR VIEW "



" PICTURE 4 - UNIT 4 BUTTERFLY VALVE DISC BRONZE SEALS "



" PICTURE 5 - UNIT 4 BUTTERFLY VALVE DISC "



" PICTURE 6 - UNIT 4 BUTTERFLY VALVE  
CLOSED POSITION  
EXISTING VALVE LEAKAGE "

NOTES:

1. SEE GENERAL NOTES ON G-010.
2. UNIT 4 SHOWN, UNIT 5 SIMILAR.
3. PHOTOS OF ITEMS INDICATES EXISTING CONDITIONS.
4. REHABILITATION SCOPE OF WORK AS REQUIRED PER THE CONTRACT SPECIFICATIONS.

[illegible]

U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA, NEBRASKA	ISSUE DATE: DESIGNED BY: DRAWN BY: M. GUNDERM CHECKED BY: D. COURSON P.E. JORDAN S. ENK, P.E.	PROJECT NO.: SOLICITATION NO.: W9128F-23-R-0009 CONTRACT NO.: DRAWING NO.: F779, FPP-1.006, MD902
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	FILE NAME: ANSI F	F779, FPP-1.006, MD902

**FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
PENSTOCK BUTTERFLY VALVE  
EQUIPMENT PHOTOS SHEET 2  
REMOVAL**

SHEET ID

MD902

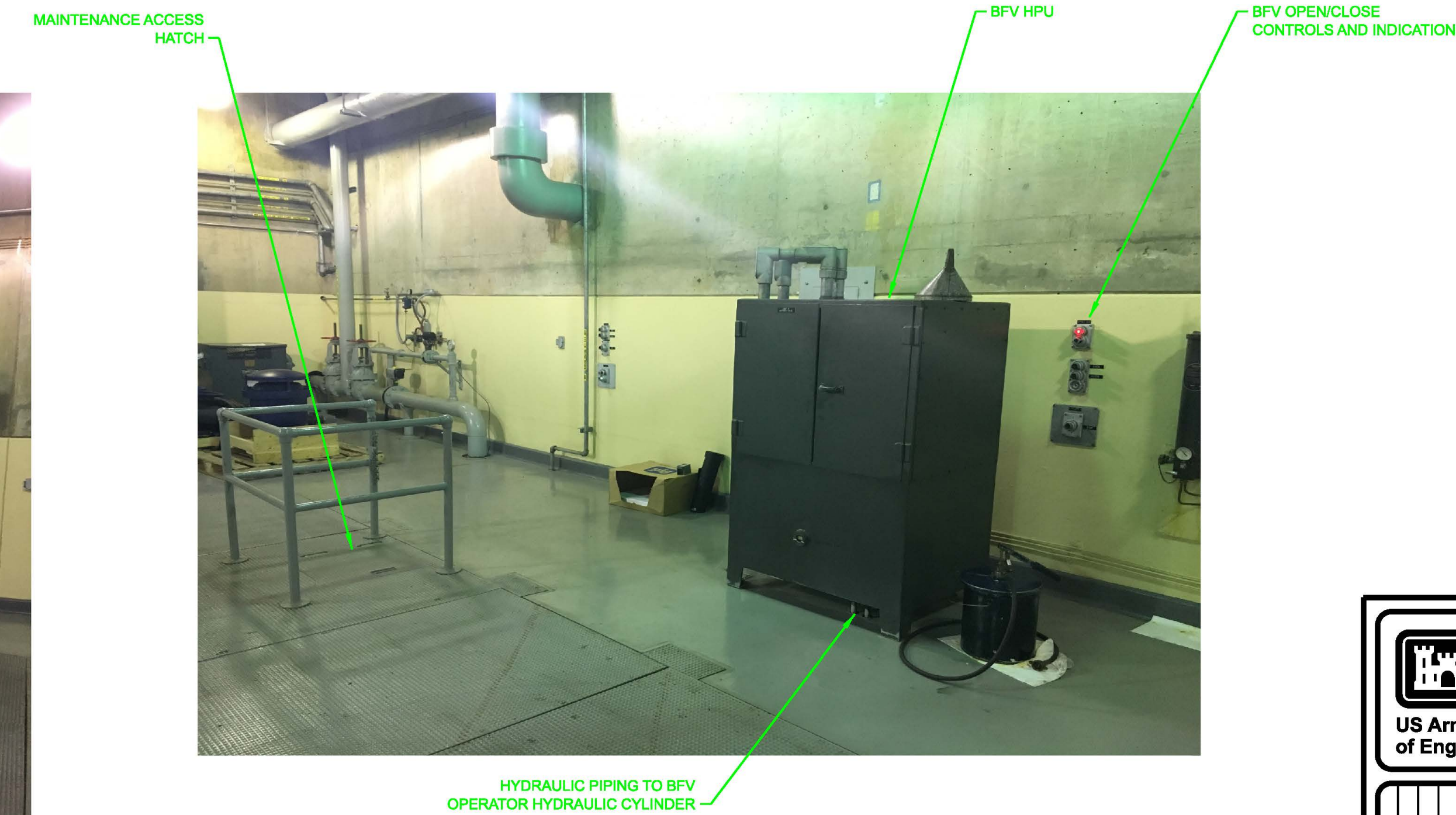




" PICTURE 1 - UNIT 4 BUTTERFLY VALVE CORRIDOR (EL 2052.00) "



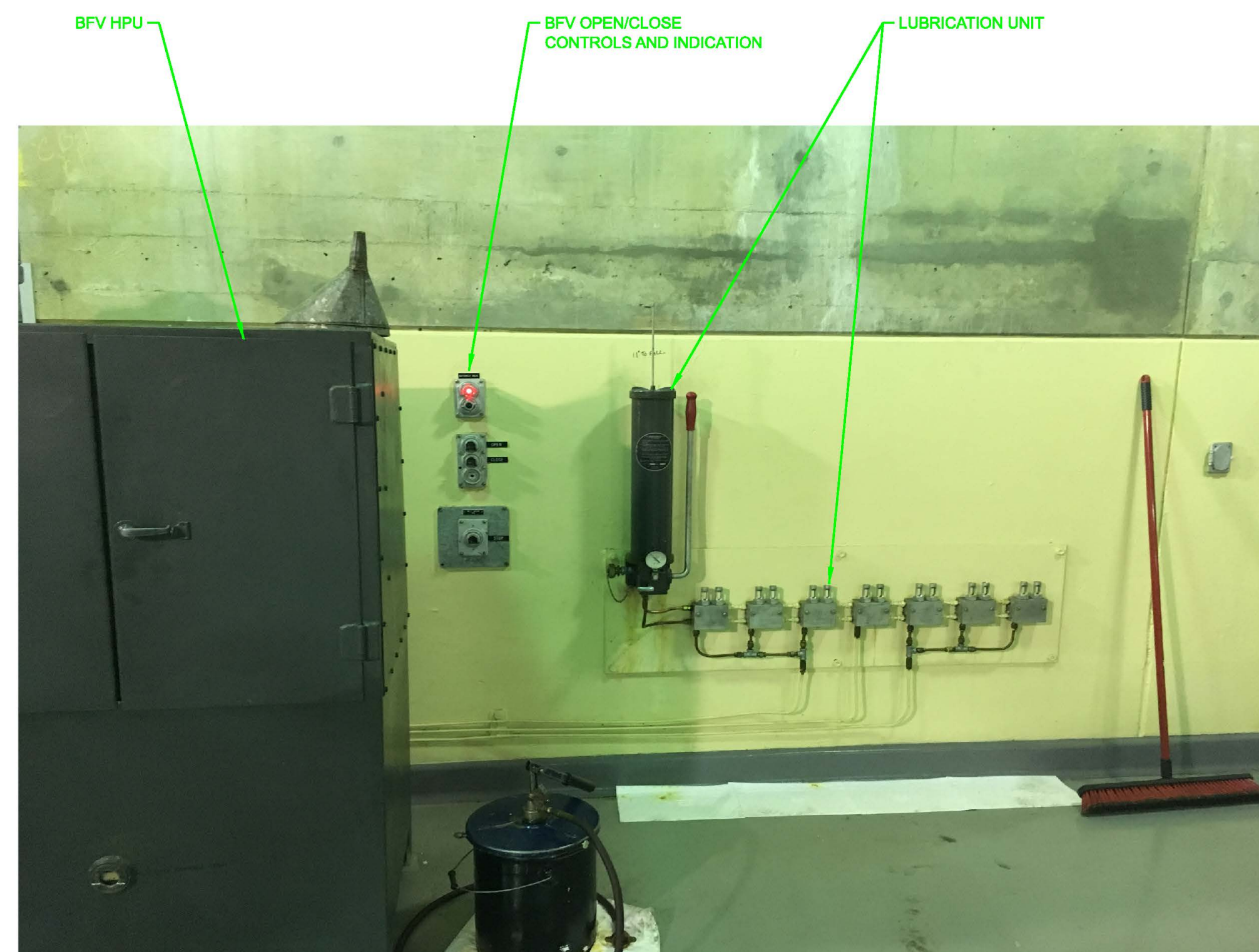
" PICTURE 2 - UNIT 4 BUTTERFLY VALVE CORRIDOR (EL 2052.00) "



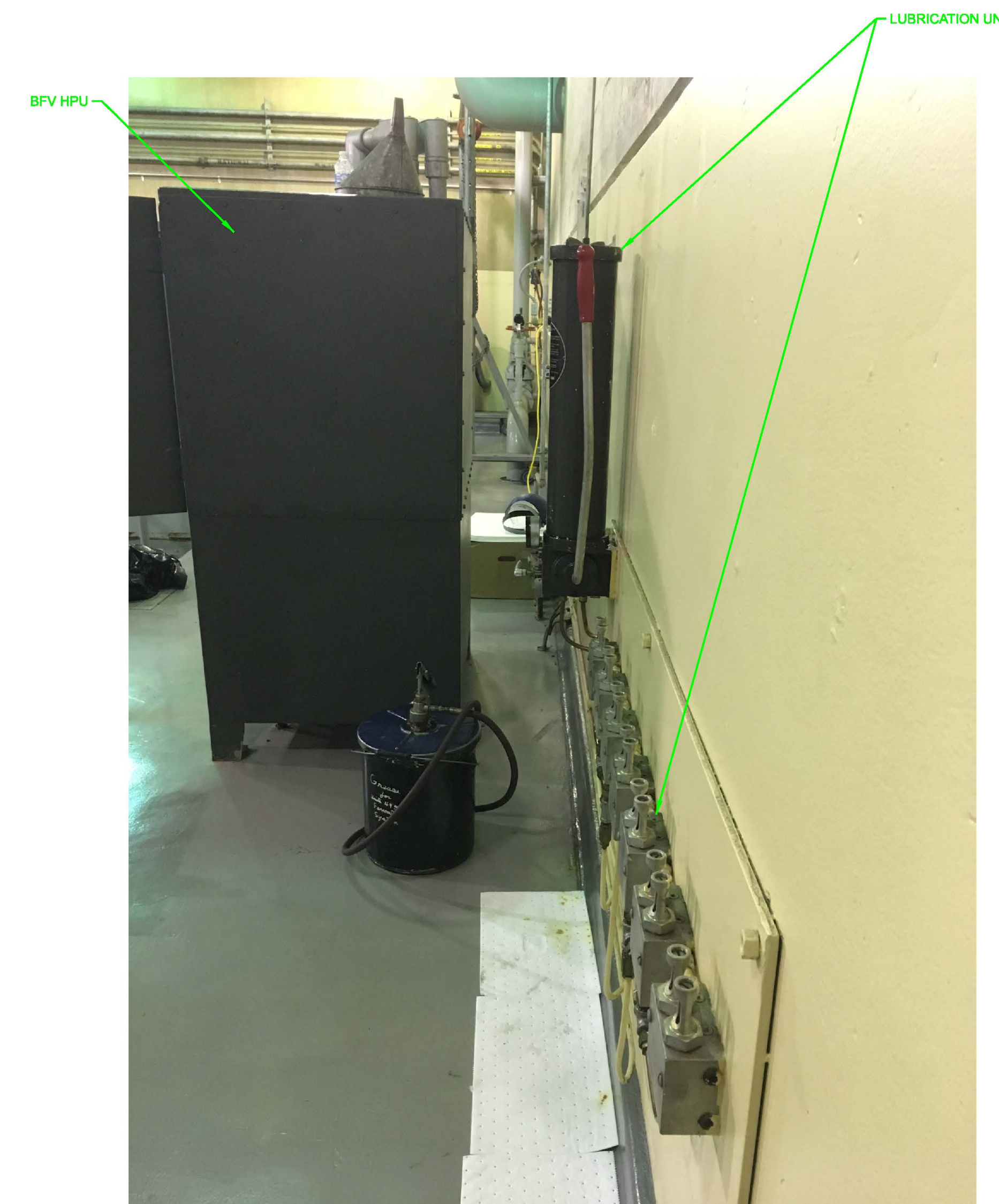
" PICTURE 3 - UNIT 4 HPU & MAINTENANCE ACCESS HATCH "



" PICTURE 4 - UNIT 4 BFV MAINTENANCE ACCESS HATCH "



" PICTURE 5 - UNIT 4 BFV HPU & LUBRICATION UNIT "



" PICTURE 6 - UNIT 4 BFV HPU & LUBRICATION UNIT "

NOTES:

1. SEE GENERAL NOTES ON G-010.
2. PHOTOS OF ITEMS INDICATES EXISTING CONDITIONS.
3. REHABILITATION SCOPE OF WORK AS REQUIRED PER THE CONTRACT SPECIFICATIONS.



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[illegible]

U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA NEBRASKA	DESIGNED BY: D. LUNDY P.E.	ISSUE DATE: JANUARY 2023
	DRAWN BY: M. GUNDRUM	SOLICITATION NO.: W9128F-23-R-0009
	CHECKED BY: P.E.	CONTRACT NO.:
	SUBMITTED BY: JORDAN S. FINK P.E.	DRAWING NO.: FP719 PPT-1.006 MD631
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	SIZE:	FILE NAME:

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
UNIT 4 BUTTERFLY VALVE CORRIDOR  
EQUIPMENT PHOTOS  
REMOVAL

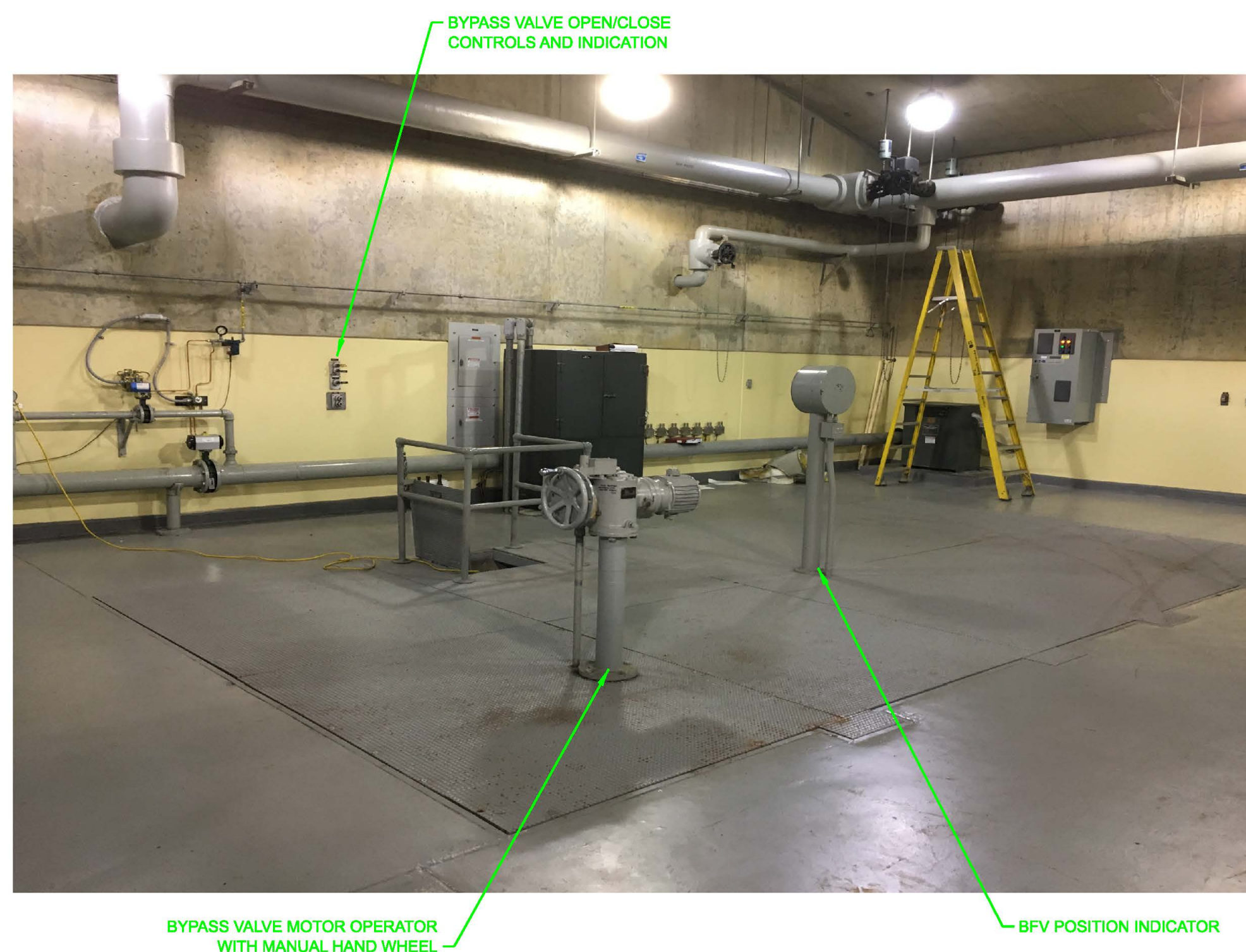
SHEET ID

MD931





" PICTURE 1 - UNIT 5 PENSTOCK BUTTERFLY VALVE CORRIDOR (EL 2052.00) "



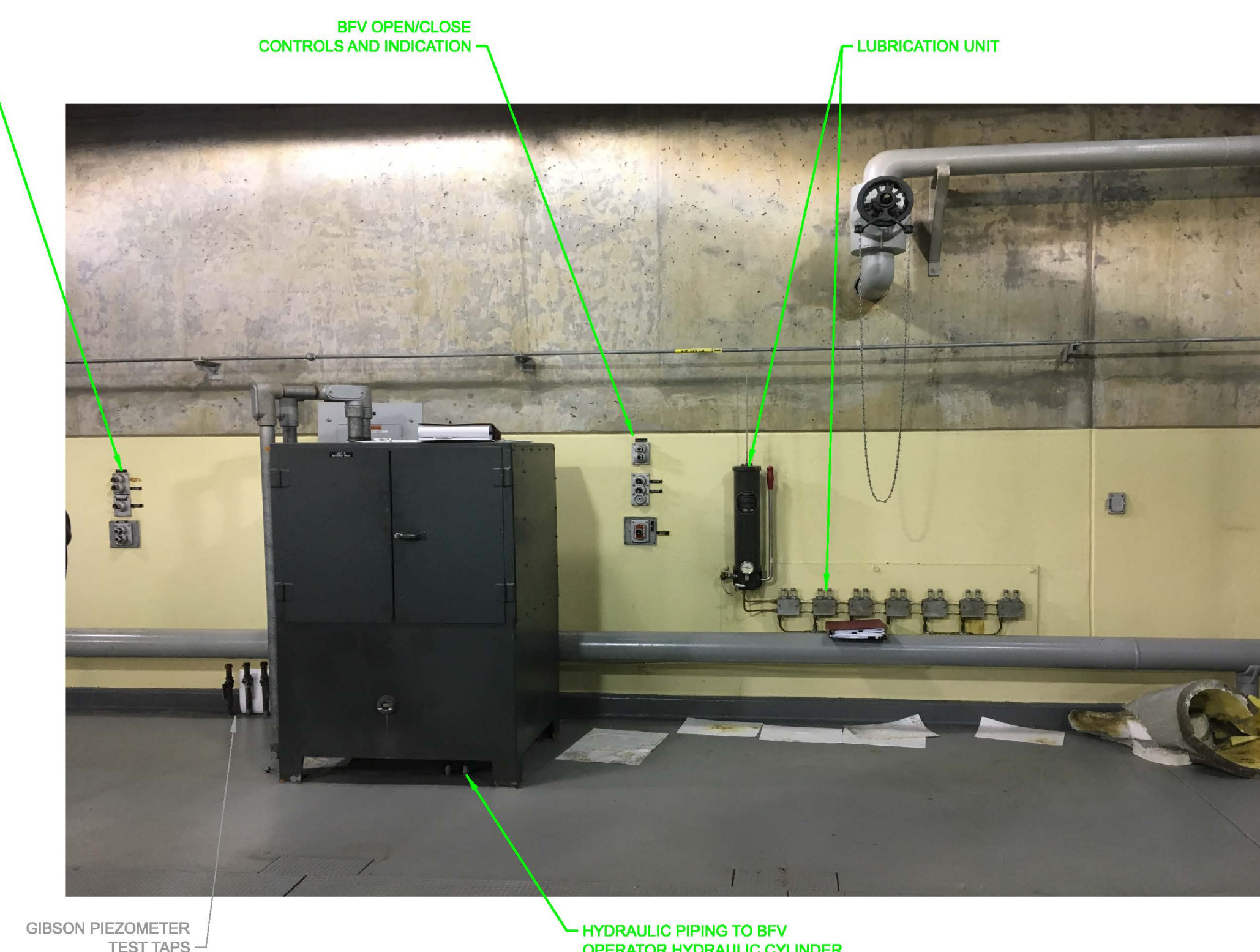
" PICTURE 2 - UNIT 5 PENSTOCK BUTTERFLY VALVE CORRIDOR (EL 2052.00) "



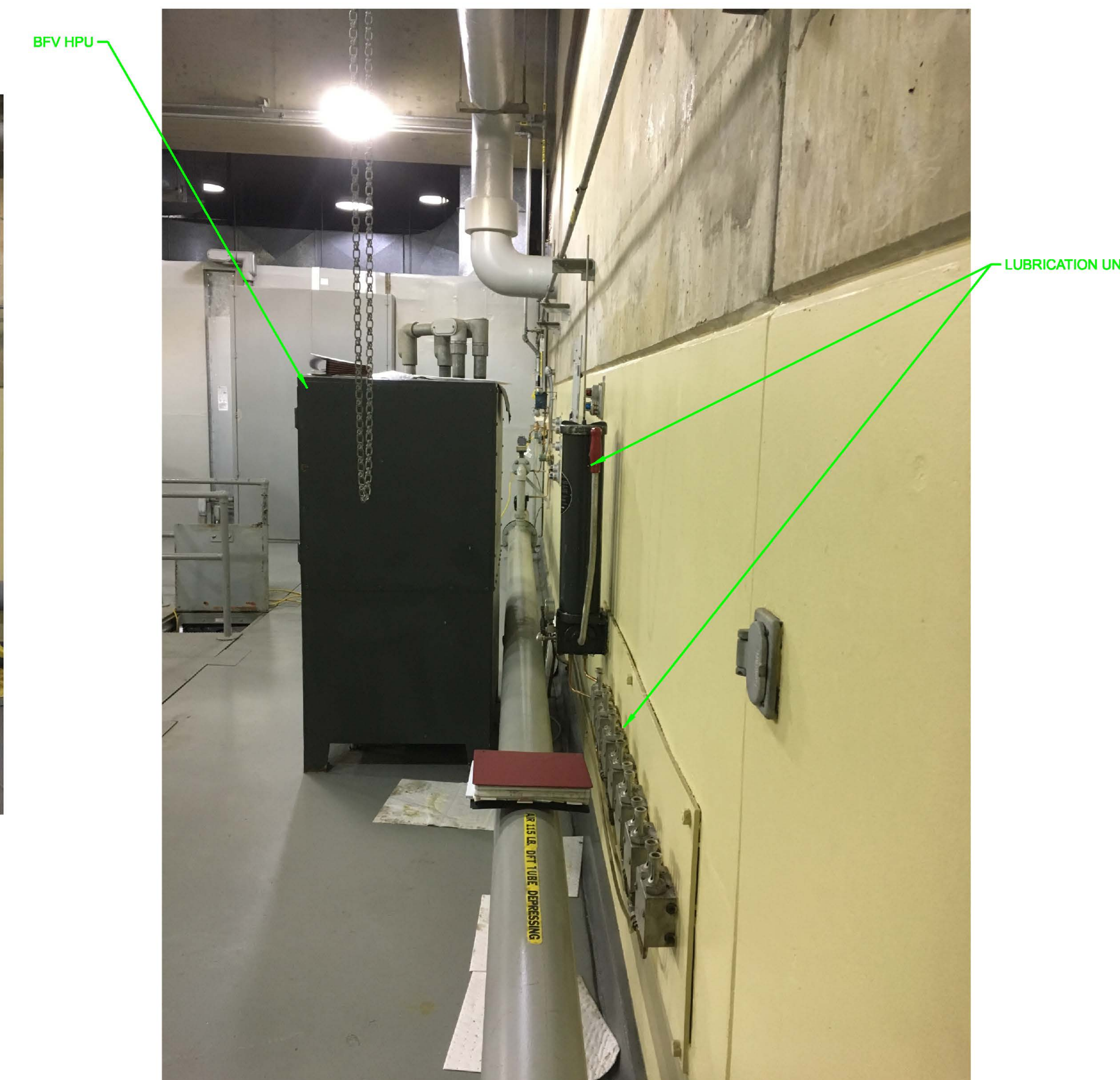
" PICTURE 3 - UNIT 5 BFV POSITION INDICATOR "



" PICTURE 4 - UNIT 5 BFV MAINTENANCE ACCESS HATCH "



" PICTURE 5 - UNIT 5 BFV HPU & LUBRICATION UNIT "



" PICTURE 6 - UNIT 5 BFV HPU & LUBRICATION UNIT "

NOTES:

1. SEE GENERAL NOTES ON G-010.
2. PHOTOS OF ITEMS INDICATES EXISTING CONDITIONS.
3. REHABILITATION SCOPE OF WORK AS REQUIRED PER THE CONTRACT SPECIFICATIONS.

[illegible]

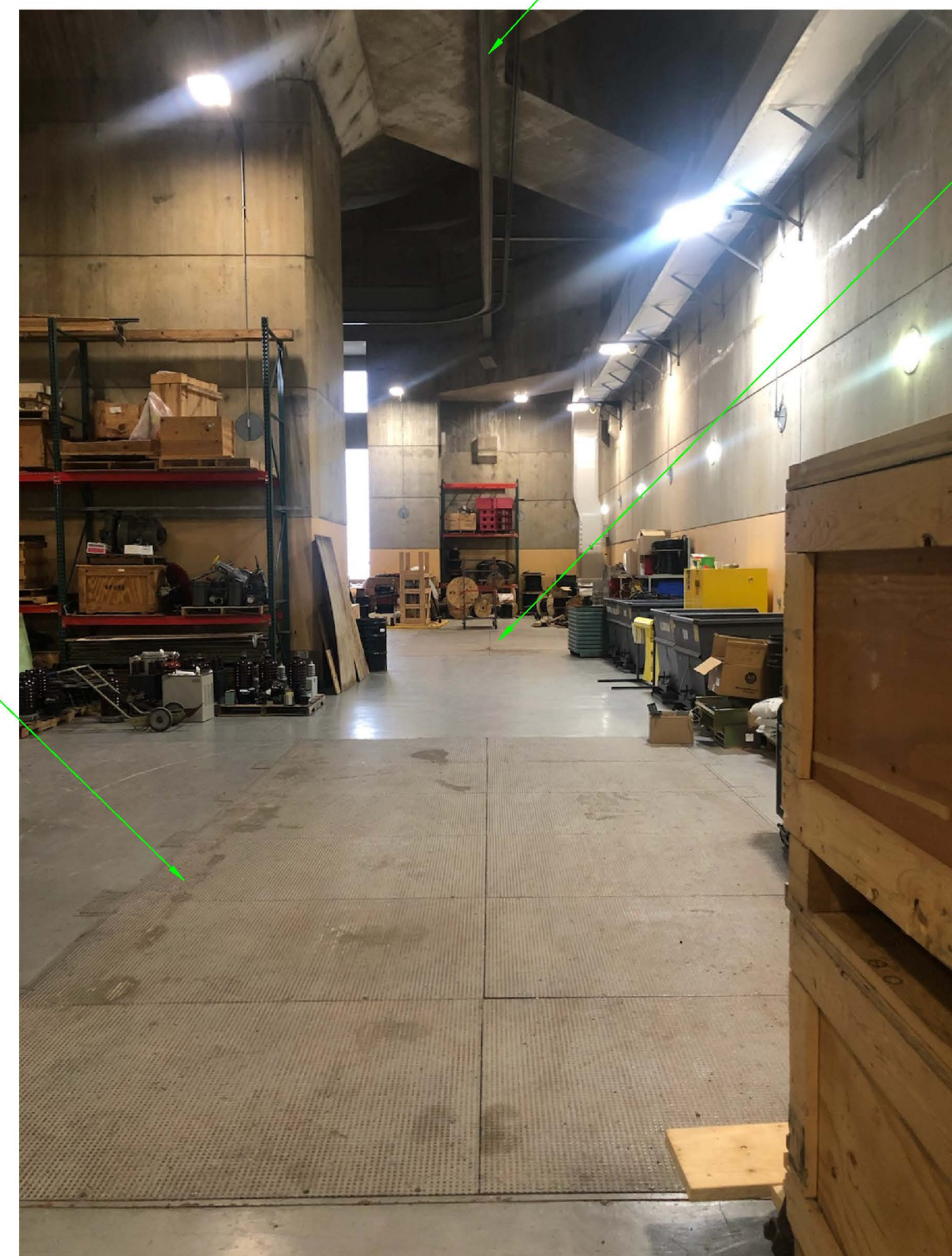
U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA NEBRASKA	DESIGNED BY: D. LUNDY P.E. DRAWN BY: W. J. ZACK CHECKED BY: C. STOKMAN P.E. SUBMITTED BY: JORDAN S. FINKE, P.E. SIZE: 1/4" = 1'	ISSUE DATE: JANUARY 2023 SOLICITATION NO.: W7232-2-008 CONTRACT NO.:  DRAWING NO.: FP79 FPP-1-008 M03932 FILE NAME: FP79 FPP-1-008 M03932.dgn
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON		

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
UNIT 5 BUTTERFLY VALVE CORRIDOR  
EQUIPMENT PHOTOS  
REMOVAL

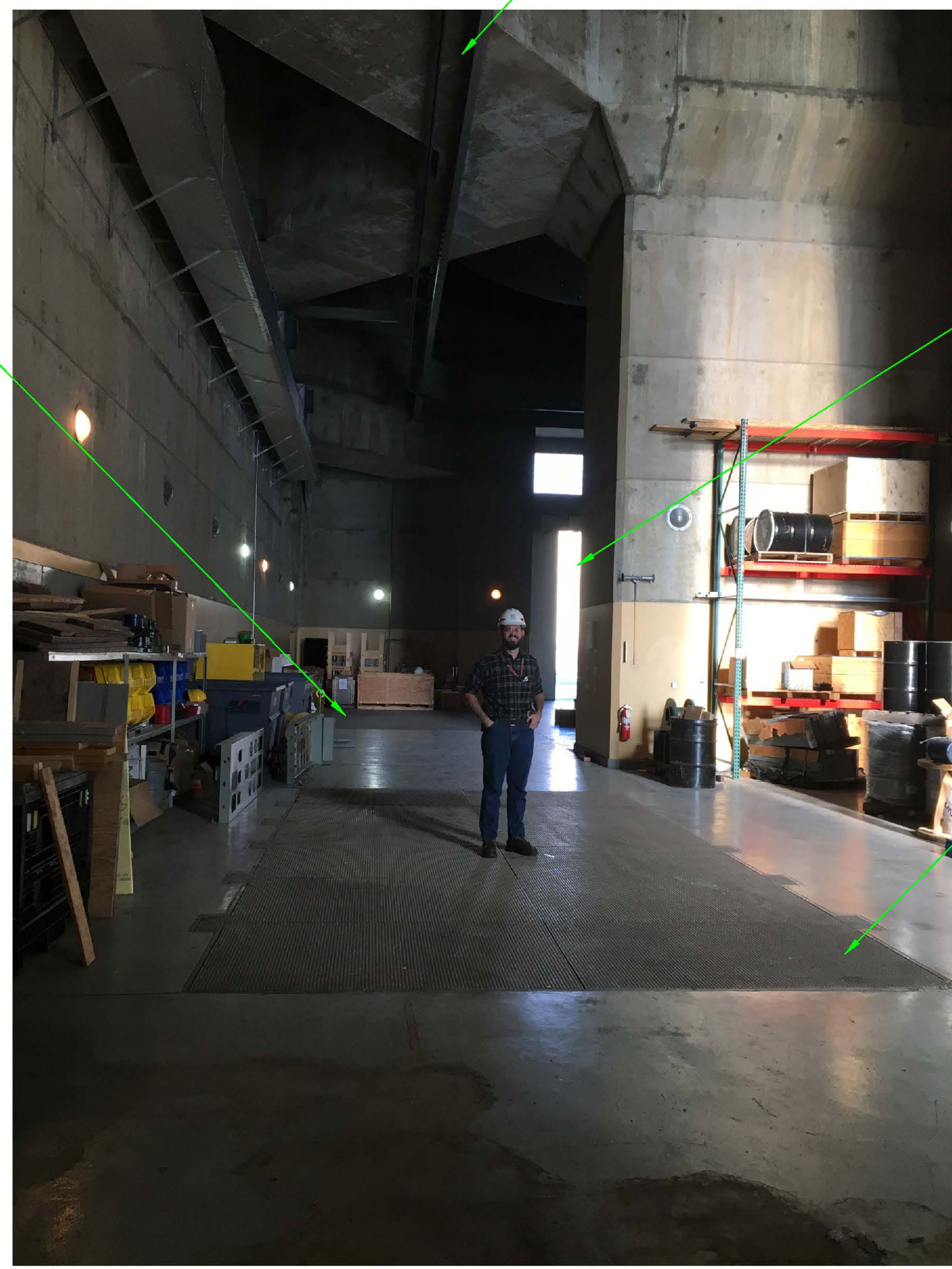
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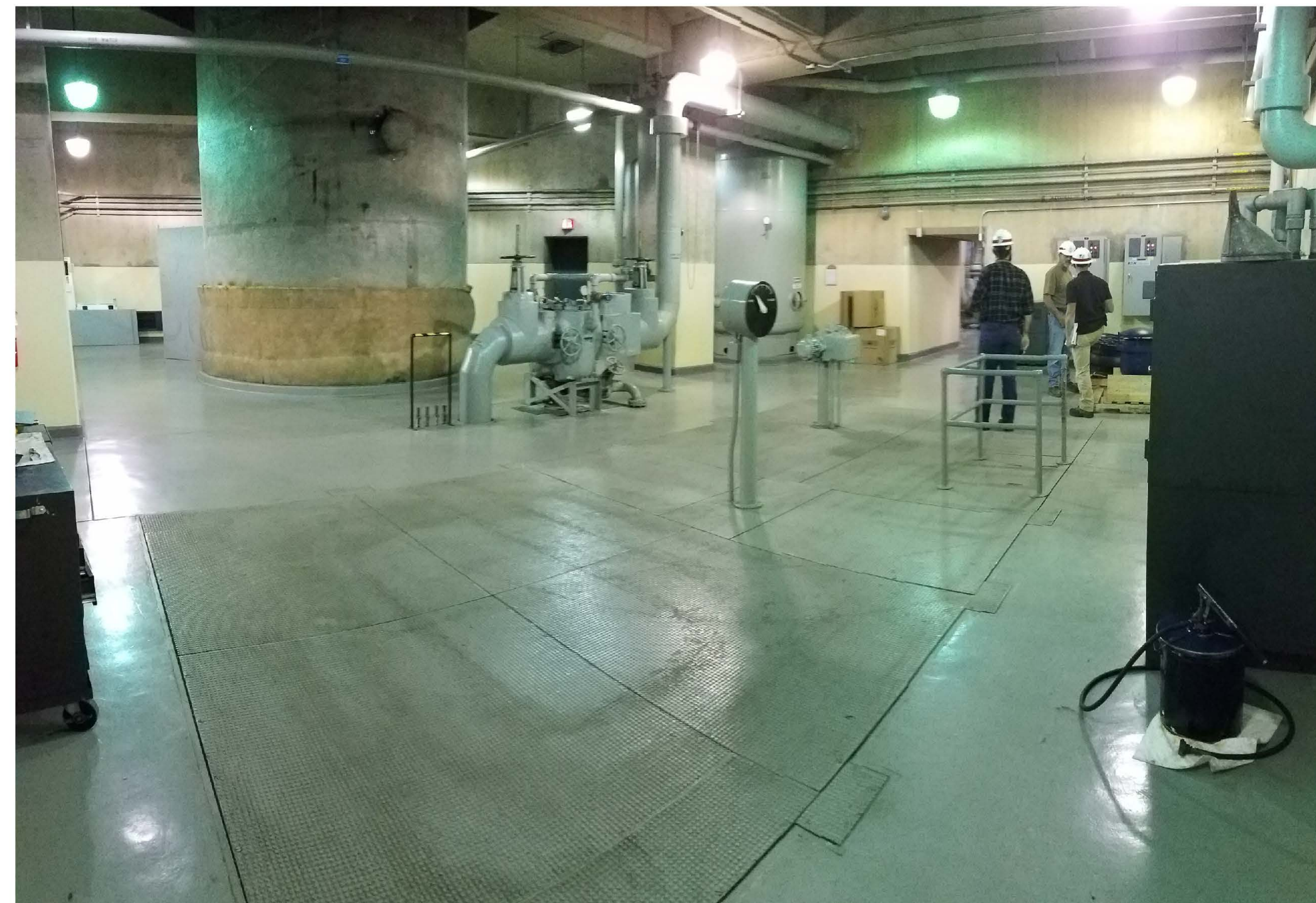
" PICTURE 1 - BFV HATCHES AT EL 2070 "



" PICTURE 2 - BFV HATCHES AT EL 2070 "



" PICTURE 3 - 10T MONORAIL CRANE "



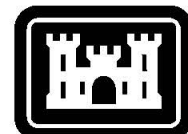
" PICTURE 5 - UNIT 4 BFV HATCHES AT EL 2052 AND 2070 "



" PICTURE 6 - SPIRAL CASE ACCESS "

NOTES:

1. SEE GENERAL NOTES ON G-010.
2. PHOTOS OF ITEMS INDICATES EXISTING CONDITIONS.
3. REHABILITATION SCOPE OF WORK AS REQUIRED PER THE CONTRACT SPECIFICATIONS.

[illegible]

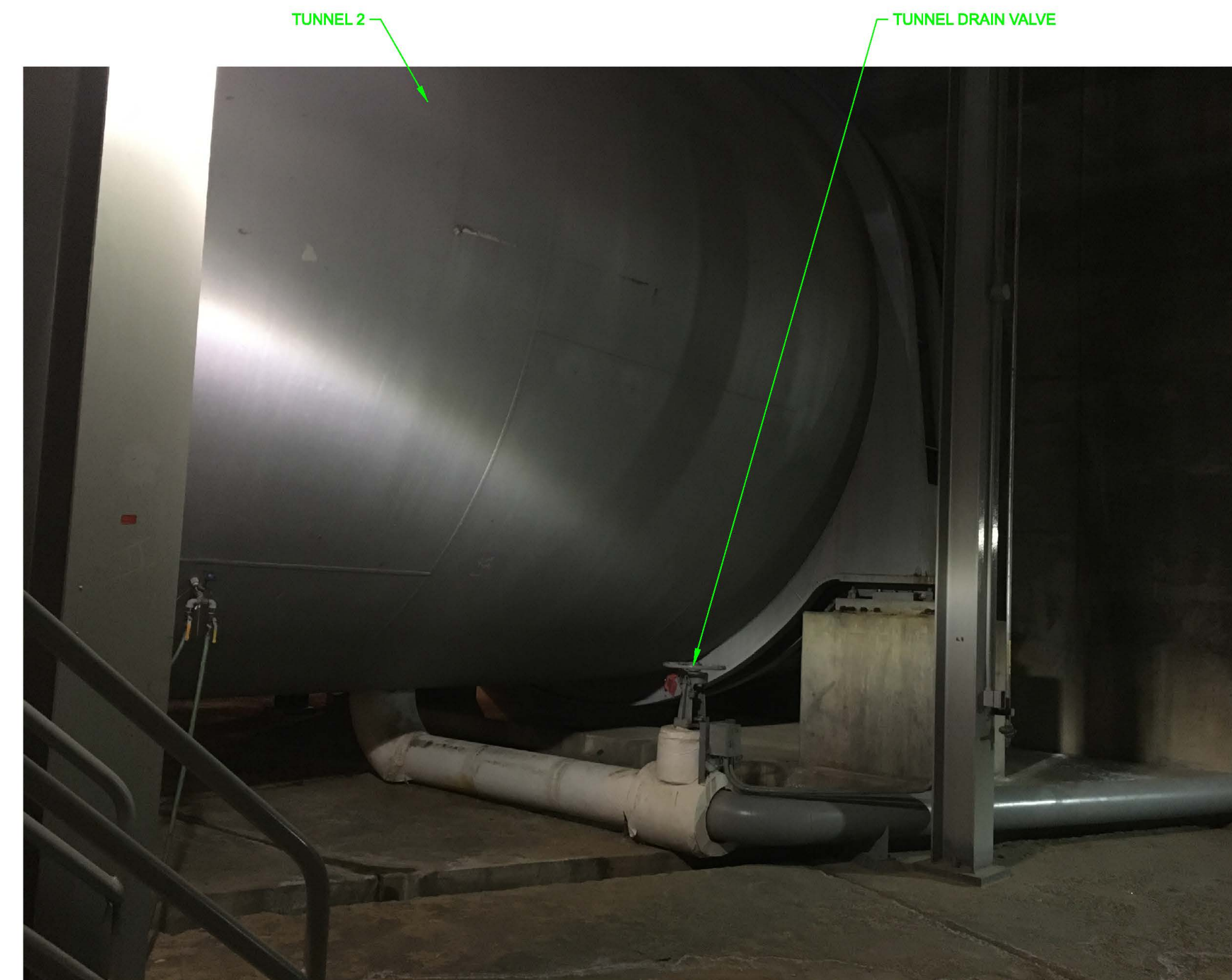
U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA, NEBRASKA	DESIGNED BY: D. LUNDY P.E.	ISSUE DATE: 01/20/2022
	CHECKED BY: M. GUNLUND	PROJECT NO.: 300124E-234-0009
	CONTRACT NO.:	
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	SUBMITTED BY: P.E. D. COURSON P.E.	DRAWING NO.: 17279-TP21-050-MD941
	SIZE: 11" X 17"	FILE NAME:
	ANSI/F	FP779-FP21-008-MD941.dgn

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
BUTTERFLY VALVE HATCHES  
10T MONORAIL AND SPIRAL CASE ACCESS - PHOTOS  
REMOVAL

SHEET ID

MD941





NOTES:

1. SEE GENERAL NOTES ON G-010.
2. PHOTOS OF ITEMS INDICATES EXISTING CONDITIONS.
3. REHABILITATION SCOPE OF WORK AS REQUIRED PER THE CONTRACT SPECIFICATIONS.



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[illegible]

U.S. ARMY CORPS OF ENGINEERS HYDROLOGICAL DESIGN CENTER PORTLAND, OREGON	DRAWN BY: E. M. GUNDERM CHECKED BY: D. COURSON P.E. SUBMITTED BY: JORDAN S. FINK, P.E. SIZE: FILE NAME: ANSI F PP79-PPP-1.006 MD951.dgn
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MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
TUNNEL DRAIN AND SPIRAL CASE DRAIN  
EQUIPMENT PHOTOS  
REMOVAL

SHEET ID

MD951

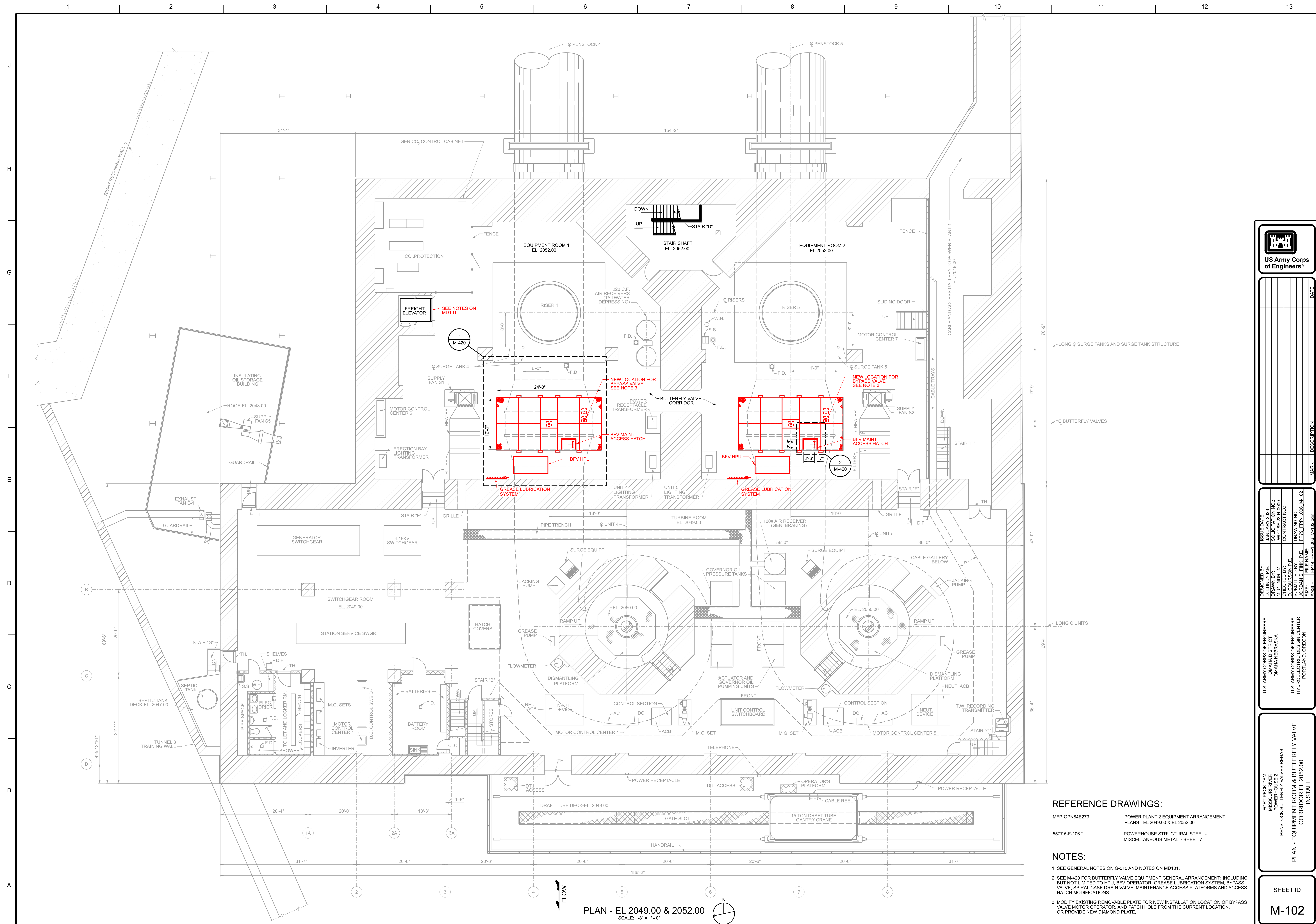




SCALE: 1/8" = 1' - 0"

1. SEE GENERAL NOTES ON G-010 AND NOTES ON MD101





US Army Corps  
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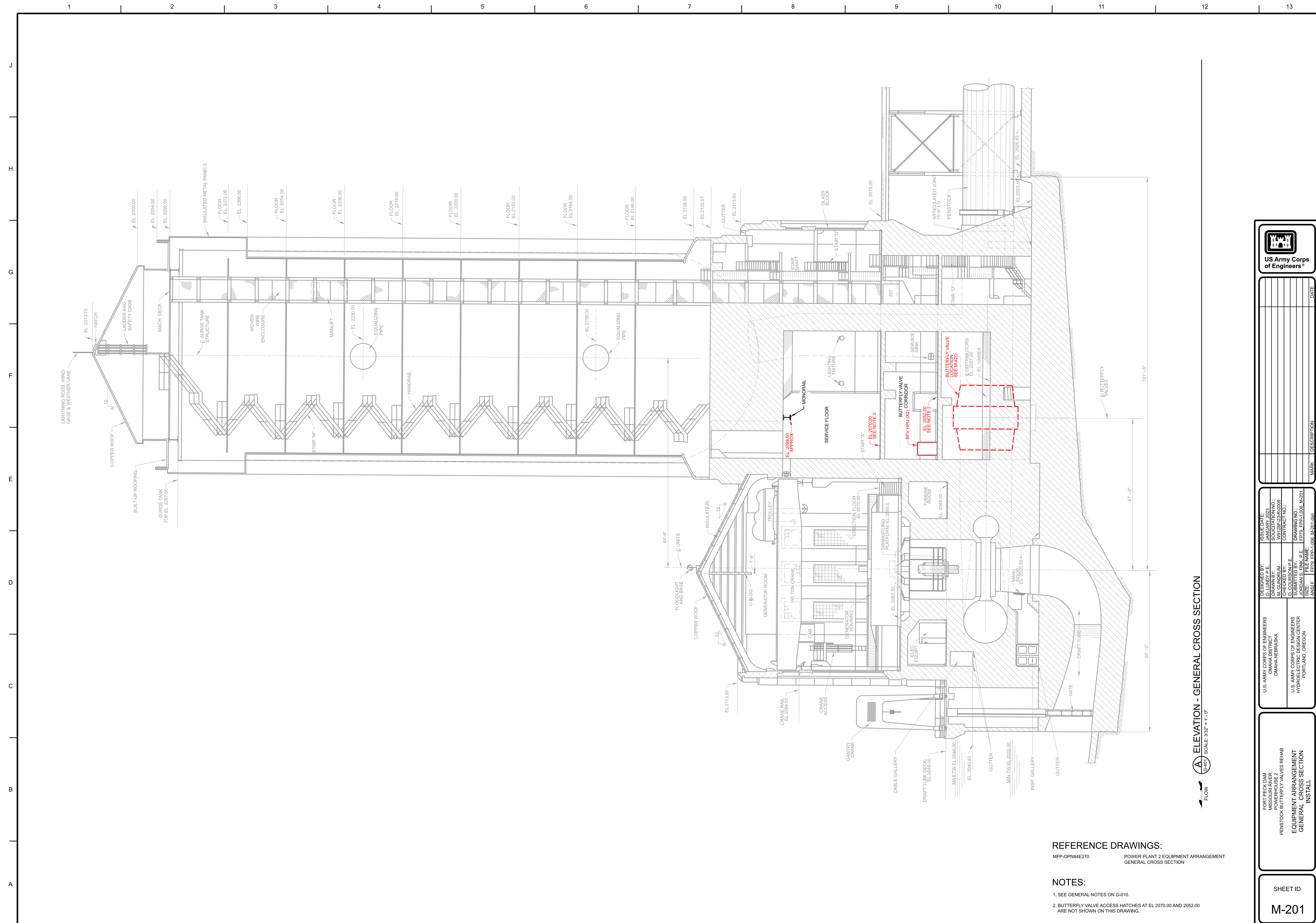
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U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA NEBRASKA	DESIGNED BY: D. LUNDY P.E.	ISSUE DATE: JANUARY 2023
	DRAWN BY: M. GUNDROM	SOLICITATION NUMBER: W9728F-23-R0089
	CHECKED BY: P. E.	CONTRACT NO.:
	SUBMITTED BY: JORDAN S. FINK P.E.	DRAWING NO.:
U.S. ARMY CORPS OF ENGINEERS HYDROLOGIC DESIGN CENTER PORTLAND, OREGON	SIZE: A	PP79 FPD-1.016 M-102
	FILE NAME:	

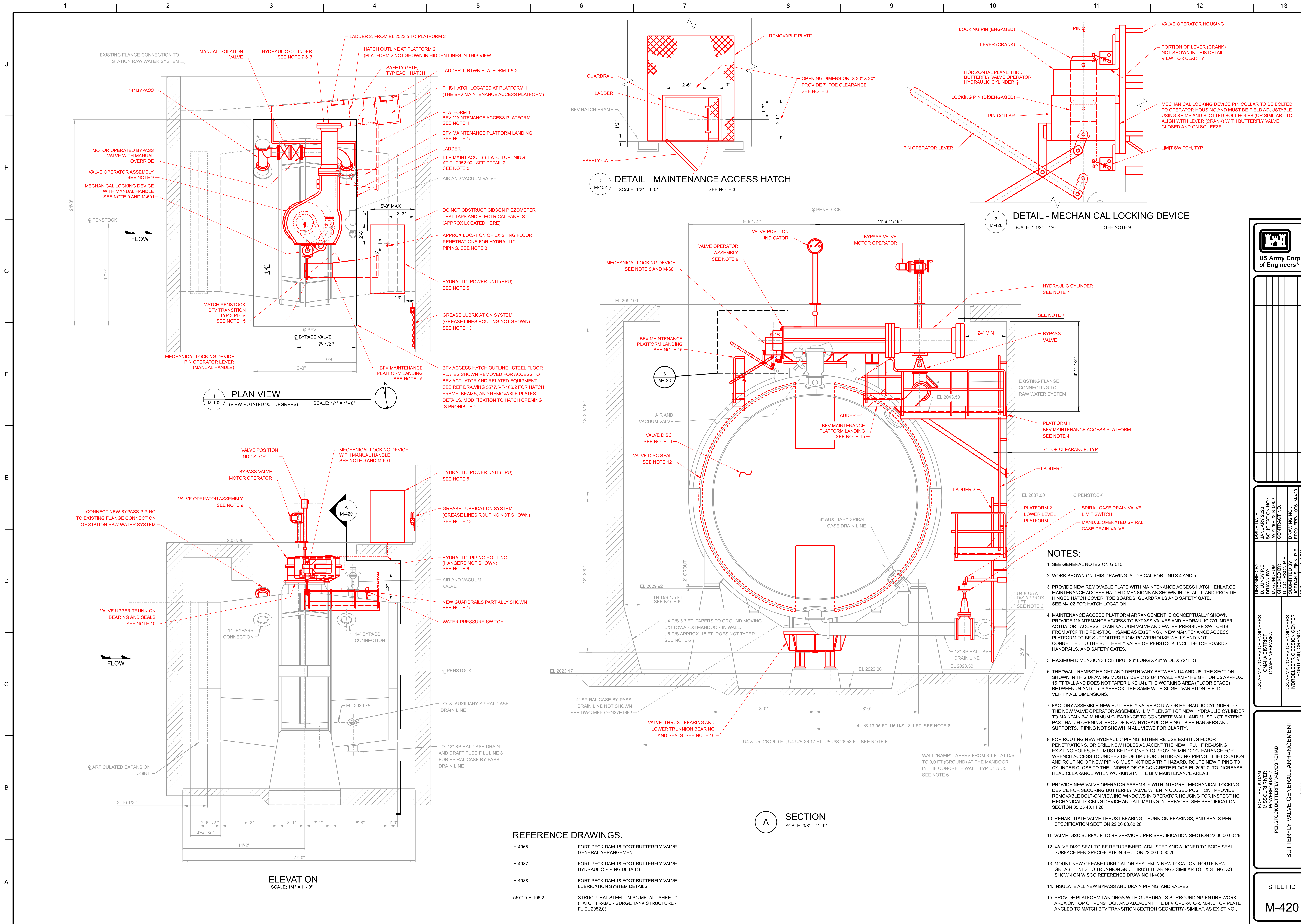
FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB

SHEET ID  
M-102









REFERENCE DRAWINGS:

H-4065	FORT PECK DAM 18 FOOT BUTTERFLY VALVE GENERAL ARRANGEMENT
H-4087	FORT PECK DAM 18 FOOT BUTTERFLY VALVE HYDRAULIC PIPING DETAILS
H-4088	FORT PECK DAM 18 FOOT BUTTERFLY VALVE LUBRICATION SYSTEM DETAILS
557.5-F-106.2	STRUCTURAL STEEL - MISC METAL - SHEET 7 (HATCH FRAME - SURGE TANK STRUCTURE - FL EL 2052.0)

US Army Corps of Engineers

DATE	DESCRIPTION	MARK

DESIGNED BY: D. LUNDY P.E.  
DRAWN BY: D. LUNDY P.E.  
CHECKED BY: D. LUNDY P.E.  
SUBMITTED BY: D. LUNDY P.E.  
SIZE: 11x17  
FILE NAME: PF79-FPP-1.005-M-420-000

U.S. ARMY CORPS OF ENGINEERS  
PORT PECK DAM  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB

U.S. ARMY CORPS OF ENGINEERS  
HYDROELECTRIC DESIGN CENTER  
PORTLAND, OREGON

INSTALL

BUTTERFLY VALVE GENERAL ARRANGEMENT

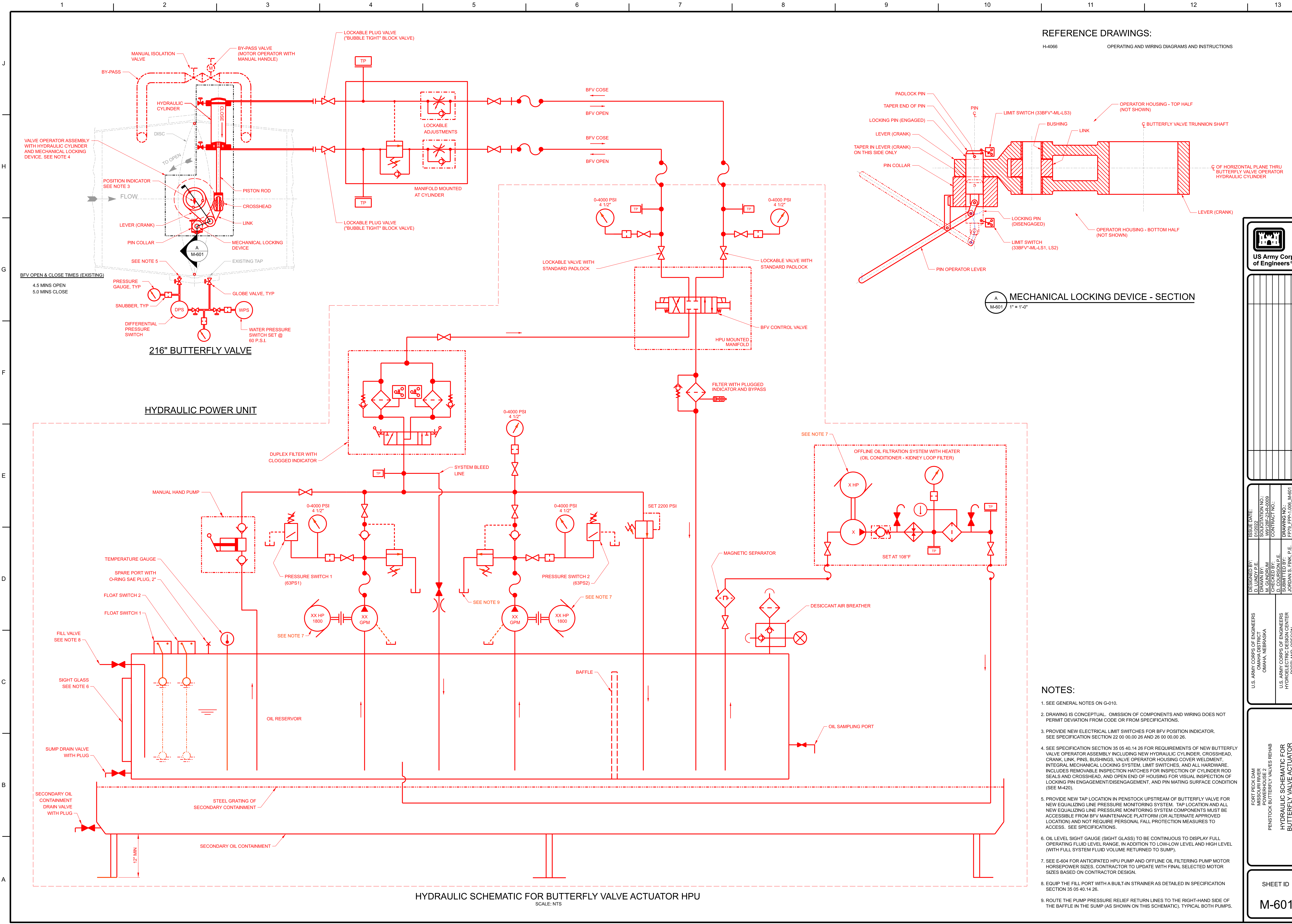
SHEET ID

M-420

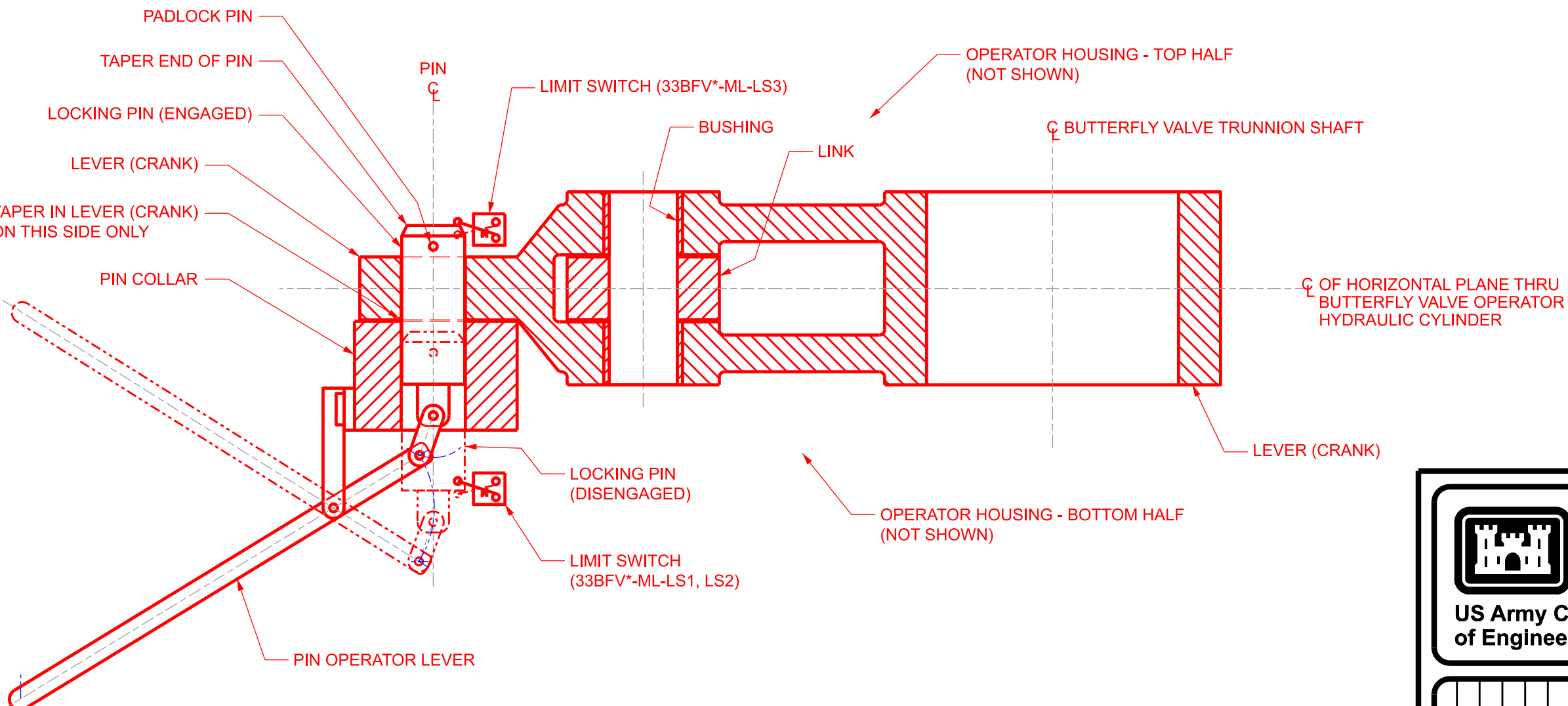








REFERENCE DRAWINGS:  
H-4066 OPERATING AND WIRING DIAGRAMS AND INSTRUCTIONS



**MECHANICAL LOCKING DEVICE - SECTION**  
1" = 1'-0"

- NOTES:**
- SEE GENERAL NOTES ON G-010.
  - DRAWING IS CONCEPTUAL. OMISSION OF COMPONENTS AND WIRING DOES NOT PERMIT DEVIATION FROM CODE OR FROM SPECIFICATIONS.
  - PROVIDE NEW ELECTRICAL LIMIT SWITCHES FOR BFV POSITION INDICATOR. SEE SPECIFICATION SECTION 22 00 00.00 26 AND 26 00 00.00 26.
  - SEE SPECIFICATION SECTION 35 05 40.14 26 FOR REQUIREMENTS OF NEW BUTTERFLY VALVE OPERATOR ASSEMBLY INCLUDING NEW HYDRAULIC CYLINDER, CROSSHEAD, CRANK, LINK, PINS, BUSHINGS, VALVE OPERATOR HOUSING COVER WELDMENT, INTEGRAL MECHANICAL LOCKING SYSTEM, LIMIT SWITCHES, AND ALL HARDWARE. INCLUDES REMOVABLE INSPECTION HATCHES FOR INSPECTION OF CYLINDER ROD SEALS AND CROSSHEAD, AND OPEN END OF HOUSING FOR VISUAL INSPECTION OF LOCKING PIN ENGAGEMENT/DISENGAGEMENT, AND PIN MATING SURFACE CONDITION (SEE M-420).
  - PROVIDE NEW TAP LOCATION IN PENSTOCK UPSTREAM OF BUTTERFLY VALVE FOR NEW EQUALIZING LINE PRESSURE MONITORING SYSTEM. TAP LOCATION AND ALL NEW EQUALIZING LINE PRESSURE MONITORING SYSTEM COMPONENTS MUST BE ACCESSIBLE FROM BFV MAINTENANCE PLATFORM (OR ALTERNATE APPROVED LOCATION) AND NOT REQUIRE PERSONAL FALL PROTECTION MEASURES TO ACCESS. SEE SPECIFICATIONS.
  - OIL LEVEL SIGHT GAUGE (SIGHT GLASS) TO BE CONTINUOUS TO DISPLAY FULL OPERATING FLUID LEVEL RANGE, IN ADDITION TO LOW-LOW LEVEL AND HIGH LEVEL (WITH FULL SYSTEM FLUID VOLUME RETURNED TO SUMP).
  - SEE E-604 FOR ANTICIPATED HPU PUMP AND OFFLINE OIL FILTERING PUMP MOTOR HORSEPOWER SIZES. CONTRACTOR TO UPDATE WITH FINAL SELECTED MOTOR SIZES BASED ON CONTRACTOR DESIGN.
  - EQUIP THE FILL PORT WITH A BUILT-IN STRAINER AS DETAILED IN SPECIFICATION SECTION 35 05 40.14 26.
  - ROUTE THE PUMP PRESSURE RELIEF RETURN LINES TO THE RIGHT-HAND SIDE OF THE BAFFLE IN THE SUMP (AS SHOWN ON THIS SCHEMATIC), TYPICAL BOTH PUMPS.

US Army Corps of Engineers	
DESIGNED BY: D. LUNDY P.E.	ISSUE DATE: 01/2022
DRAWN BY: D. LUNDY P.E.	SOLICITATION NO.: W91279-00-0000
CHECKED BY: D. COURSON P.E.	CONTRACT NO.:
SUBMITTED BY: D. LUNDY P.E.	DRAWING NO.: M-601
SIZE: ANSI	FILE NAME: FP79-FP2-1.003-M-601.dgn
U.S. ARMY CORPS OF ENGINEERS PORTLAND, OREGON	U.S. ARMY CORPS OF ENGINEERS PORTLAND, OREGON
HYDRAULIC SCHEMATIC FOR BUTTERFLY VALVE ACTUATOR HPU	
SHEET ID M-601	









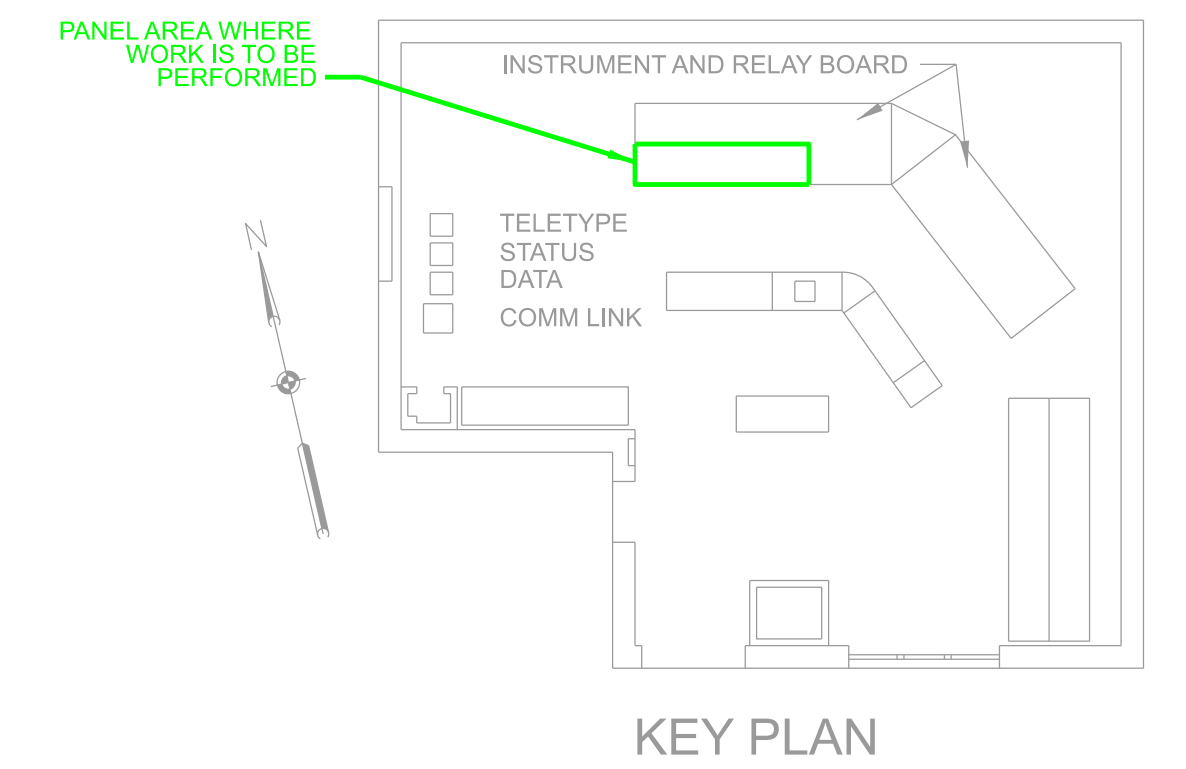










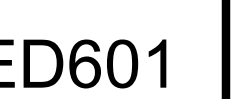


SHEET ID  
ED202





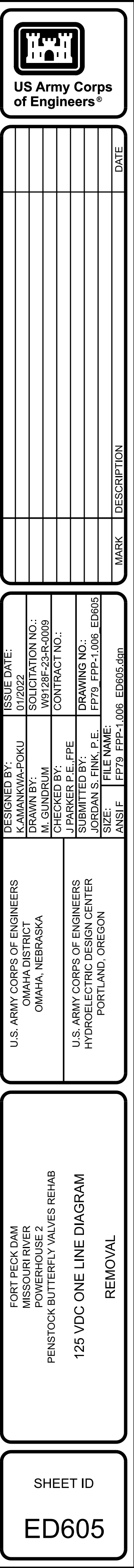
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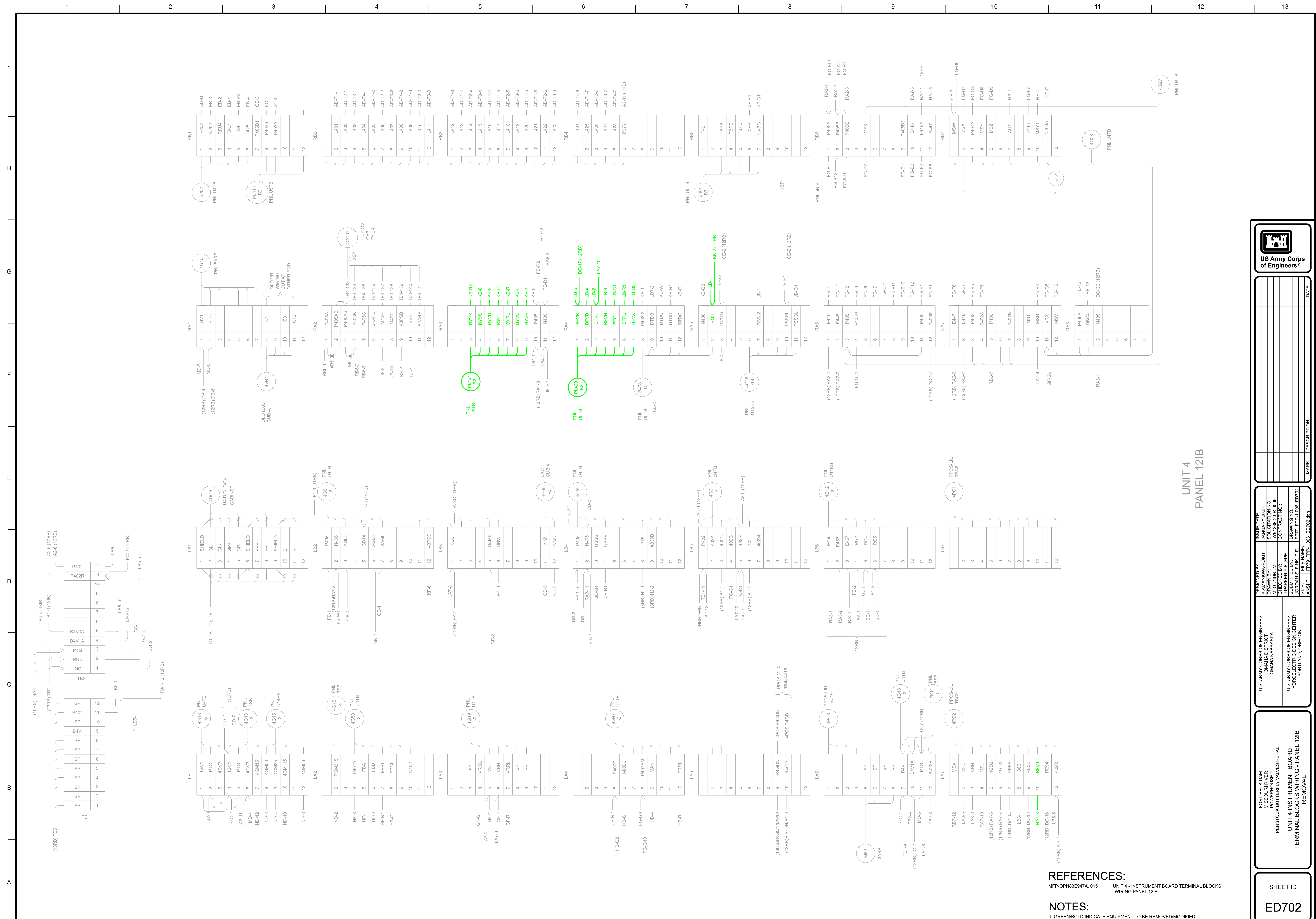












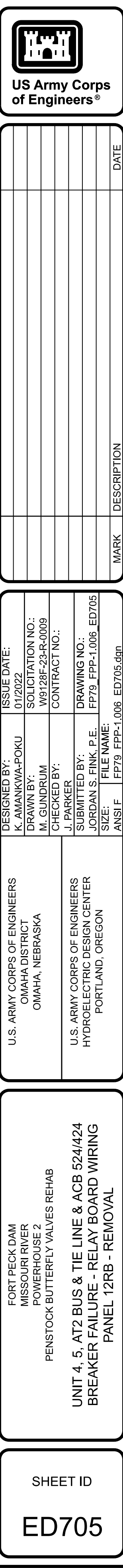












NOTES:

1. BOLD/GREEN INDICATE EQUIPMENT TO BE REMOVED/MODIFIED.











UNITS 1, 2 & 3 BUTTERFLY VALVE TRANSFER CONTROL SWITCHES

CONTACTS		BLK. OVAL HANDLE POS.	
HANDLE END	NO.	CONTR. RM.	LOCAL
1	2	1	2
2	1	X	X
3	4	3	4
4	3	X	X
5	6	5	6
6	5	X	X

TYPE SB1, CAT NO. 16SB1CB217  
PANEL: 11B, 51B, 71B



UNITS 4 & 5 AUXILIARY CONTROL SWITCHES

CONTACTS		BLK. PISTOL GRIP HDL. POS.	
HANDLE END	NO	ON	OFF
2	1	X	X
3	4		X
4	3		X
5	6		X
6	5		X
7	8		X
8	7		X
9	10	X	
10	9		X

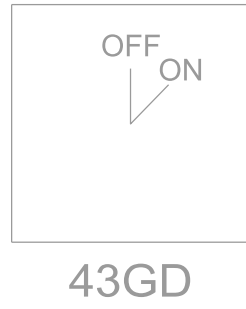
TYPE W, STYLE NO. 3801A81G01  
PANEL: 121B, 141B



UNIT 3, 4 & 5 EAST GEN DROPPING CONTROL SWITCH

CONTACTS		BLK. MOD. KNURLED HDL. POS.	
HANDLE END	NO.		
1	2		X
2	1		X
3	4		X
4	3		X
5	6		X
6	5		X
7	8		X
8	7		X
9	10		X
10	9		X

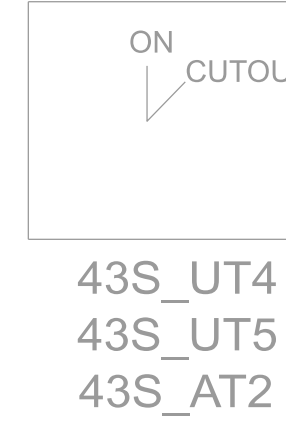
TYPE  
PANEL: 101B



UNITS 4 & 5 XFMRs & AT2 SUDDEN PRESSURE CUTOUT CONTROL SWITCH

CONTACTS		BLK. MODERN OVAL HDL. POS.	
HANDLE END	NO	ON	CUTOUT
1	2		
2	1	X	
3	4		X
4	3		X
5	6	X	
6	5		X
7	8		X
8	7		X
9	10		X
10	9		X

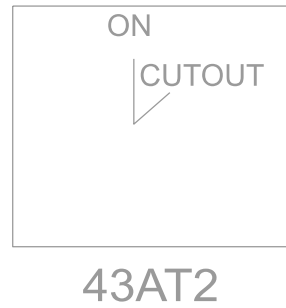
TYPE W, STYLE NO. 3623A47G01  
PANEL: 101B, 111B



AUTO TRANSFORMER SUDDEN PRESSURE SW.

CONTACTS		BLACK OVAL HDL POS.	
HANDLE END	NO.	ON	CUTOUT
1	2		
2	1		
3	4		
4	3		
5	6		
6	5		
7	8		
8	7		
9	10		
10	9		

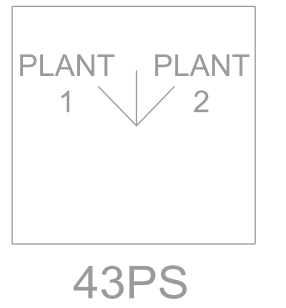
MODEL 16SB1BB206  
PANEL: 101B



PLANT 1 & PLANT 2 TRANSFER CONTROL SWITCH

CONTACTS		BLK. PISTOL GRIP HDL. POS.	
HANDLE END	NO	PLANT	PLANT 2
1	2		
2	1	X	
3	4		X
4	3		X
5	6		X
6	5		X
7	8		X
8	7		X
9	10	X	
10	9		X

TYPE W, STYLE NO. 3801A81G01  
PANEL: 121B, 141B



PP1 STA. SERV. AUDIBLE ALARM TEST & RESET CONTROL SWITCH

CONTACTS		BLK. PISTOL GRIP HDL. POS.	
HANDLE END	NO.	RESET	TEST
1	2		
2	1	X	X
3	4		X
4	3		X
5	6	X	
6	5		X
7	8		X
8	7	X	
9	10		X
10	9		X

TYPE SB10, CAT. NO. 0269A3801  
PANEL: 21B

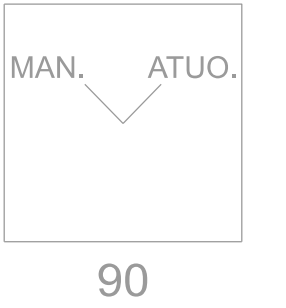
○ LATERAL CONTACTS: PULL OUT POSITION OPENS CONTACTS  
1 & 2, CLOSSES CONTACTS 3 & 4 IN NORMAL POSITION ONLY



GEN'S 1, 2 & 3 VOLTAGE REGULATOR TRANSFER CONTROL SWITCHES

CONTACTS		BLK. OVAL HANDLE POS.	
HANDLE END	NO.	AUTO.	MAN.
1	2	1	2
2	1	X	X
3	4	3	4
4	3	X	X
5	6	5	6
6	5	X	X

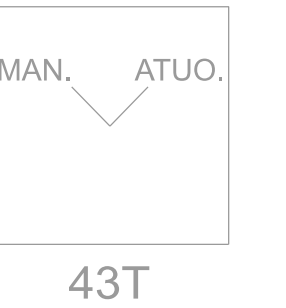
TYPE SB1, CAT NO. 16SB1CB2H70  
PANEL: 11B, 51B, 71B



GEN'S 4 & 5 VOLTAGE REGULATOR TRANSFER CONTROL SWITCHES

CONTACTS		BLK. PIST. GRIP HDL. POS.	
HANDLE END	NO	MANUAL	AUTO
2	1	1	2
1	2		X
3	4	3	4
4	3	X	X
5	6	5	6
6	5		X
7	8	7	8
8	7	X	X

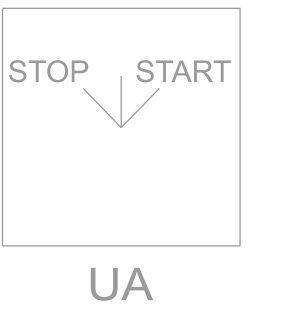
RETURN TO CENTER  
PANEL: 121B, 141B



UNITS 1, 2 & 3 START-STOP CONTROL SWITCHES

CONTACTS		BLK. PISTOL GRIP HDL. POS.	
HANDLE END	NO.	START	STOP
1	2	1	2
2	1	X	X
3	4	3	4
4	3	X	X
5	6	5	6
6	5		X
7	8	7	8
8	7		X
9	10	9	10
10	9		X

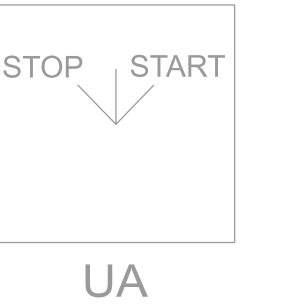
TYPE SB1, CAT. NO. 16SB1CD3H20  
PANEL: 11B, 51B, 71B



UNITS 4 & 5 START-STOP CONTROL SWITCHES

CONTACTS		BLACK PISTOL GRIP HANDLE POS.	
HANDLE END	NO.	STOP	START
2	1	2	1
1	2		X
3	4	3	4
4	3		X
5	6	5	6
6	5		X
7	8	7	8
8	7		X
9	10	9	10
10	9		X

TYPE W, STYLE NO. 3801A80G01  
PANEL: 121B, 141B

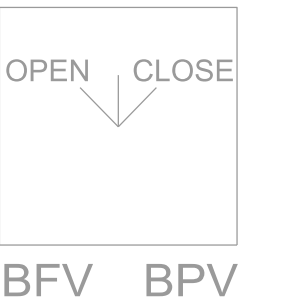


UNITS 1, 2 & 3 BUTTERFLY VALVE & BYPASS VALVE CONTROL SWITCHES

CONTACTS		BLK. PISTOL GRIP HDL. POS.	
HANDLE END	NO.	PULL OUT CLOSE	PULL OUT OPEN
1	2	1	2
2	1	X	X
3	4	3	4
4	3	X	X
5	6	5	6
6	5		X
7	8	7	8
8	7		X
9	10	9	10
10	9		X

TYPE SB10 CAT. NO. 448A132G2  
NO ROTATION WHEN IN  
PANEL: 11B, 51B, 71B

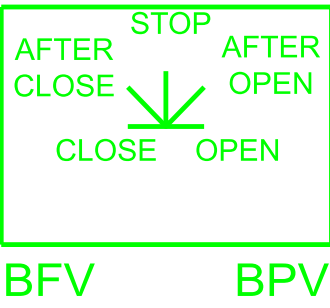
○ LATERAL CONTACTS: PULL OUT POSITION CLOSSES CONTACTS  
1 & 2 IN NEUTRAL POSITION ONLY, NO ROTATION WHEN IN



UNITS 4 & 5 BUTTERFLY VALVE & BYPASS VALVE CONTROL SWITCHES

CONTACTS		BLK. MODERN OVAL HDL. POS.	
HANDLE END	NO.	PULL OUT CLOSE	PULL OUT OPEN
1	2	1	2
2	1	X	X
3	4	3	4
4	3	X	X
5	6	5	6
6	5		X
7	8	7	8
8	7		X
9	10	9	10
10	9		X

TYPE W  
PANEL: 121B, 141B



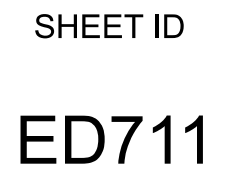
PLANT 2 4160V STA. SERV. LOCAL/PPCS CONTROL SWITCH

CONTACTS			BLACK NOB HANDLE	
HANDLE END		NO.	LOCAL	PPCS
6	5	1-2		
1-2		3-4	X	X
8	7	5-6	X	
3	4	7-8		X
6A	5A	1A-2A	X	
1A-2A		3A-4A		X
8A	7A	5A-6A	X	
3A	4A	7A-8A		X
6B	5B	1B-2B	X	
1B-2B		3B-4B		X
8B	7B	5B-6B	X	
3B	4B	7B-8B		
6C	5C	1C-2C	X	
1C-2C		3C-4C		X
8C	7C	5C-6C	X	
3C	4C	7C-8C		X

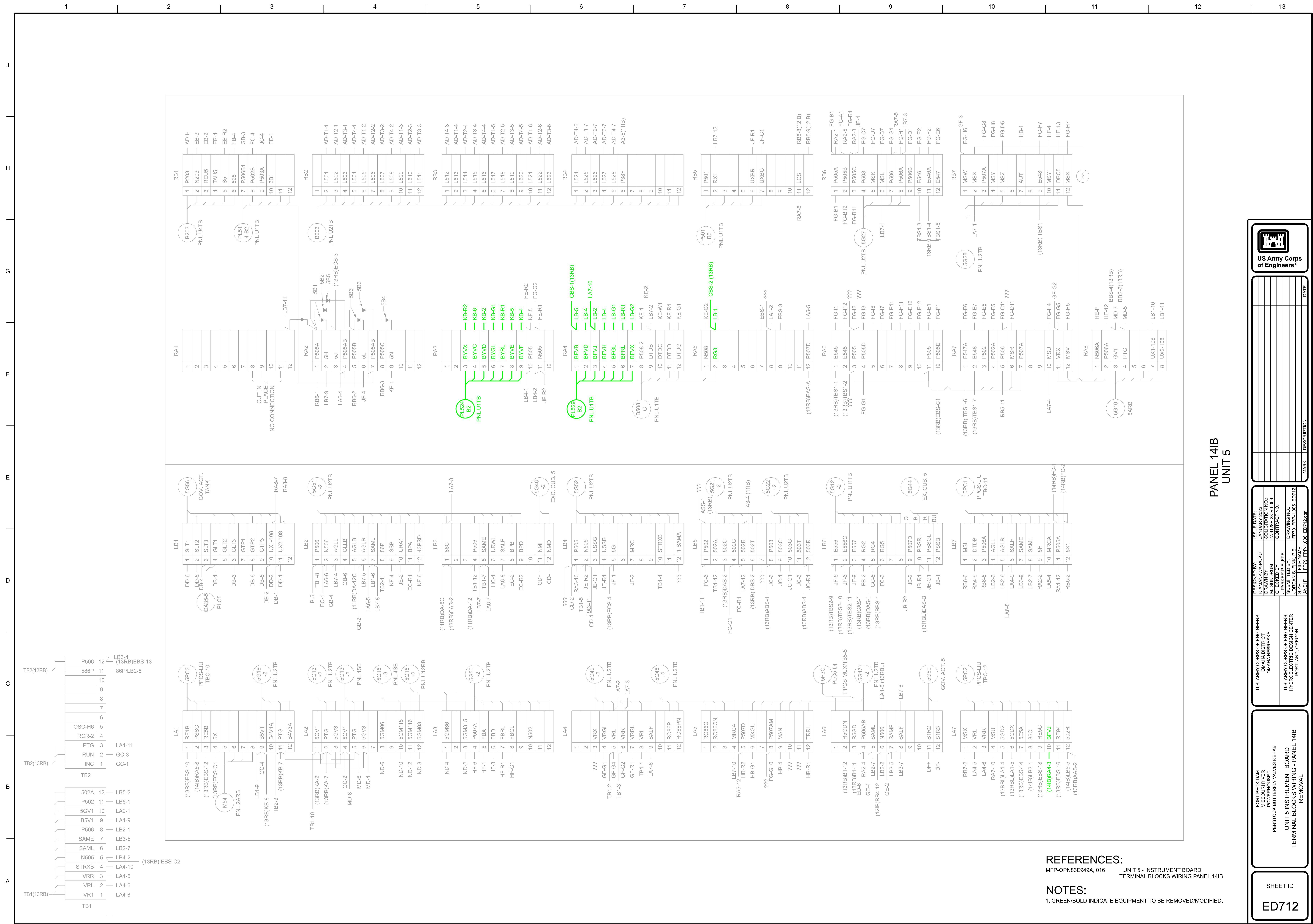












PANEL 14IB  
UNIT 5

## REFERENCES:

**NOTES:**  
1. GREEN/BOLD INDICATE EQUIPMENT TO BE REMOVED/MODIFIED.

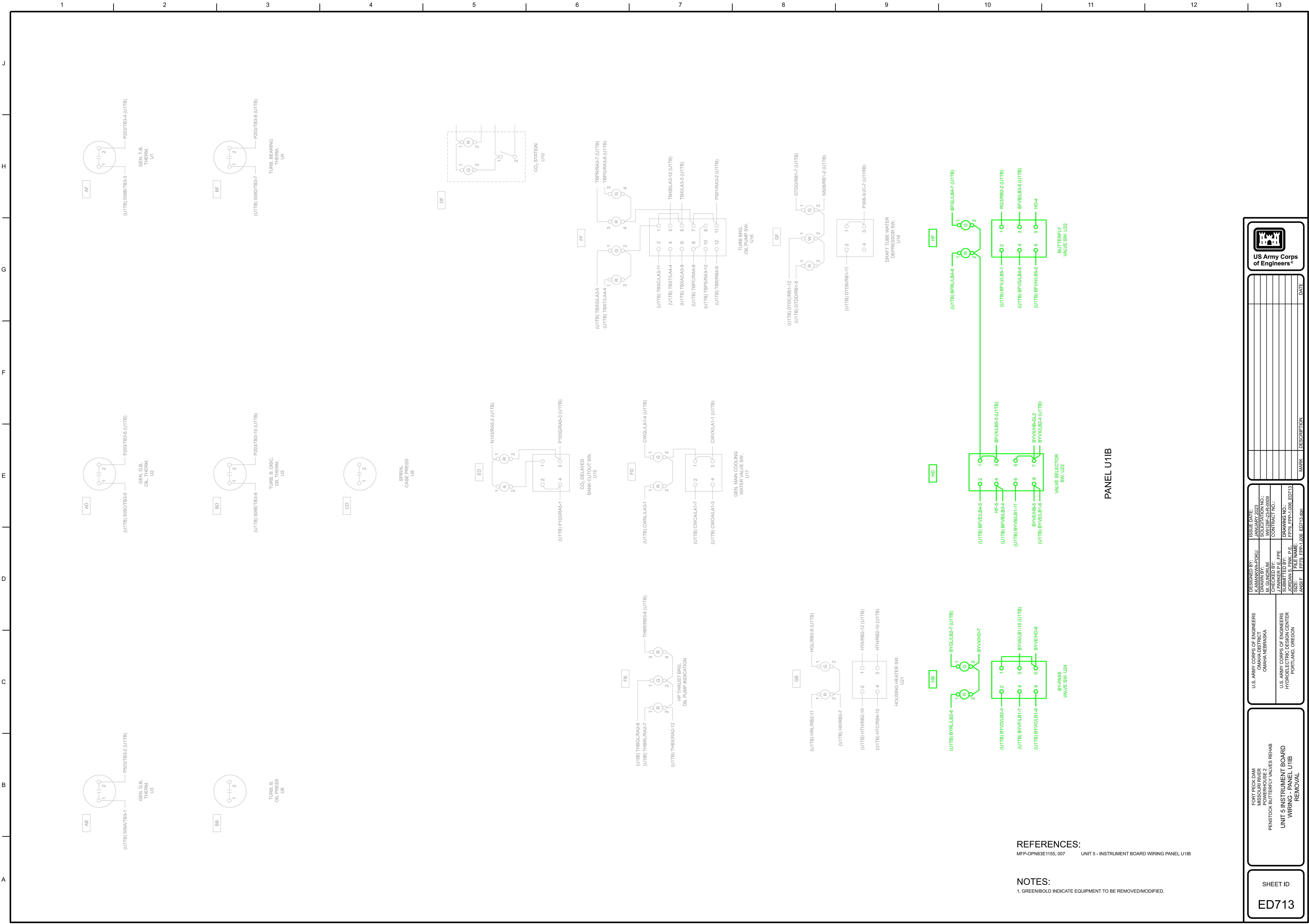
UNIT 5 INSTRUMENT BOARD  
TERMINAL BLOCKS WIRING - PANEL  
REMOVAL

SHEET ID  
ED712

U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA NEBRASKA	DESIGNED BY: KAWAKAWA-POKU S. S. S. S. W121BF-23-R-0009	ISSUE DATE: JANUARY 2023
	CHECKED BY: M. GUNDRUM	DRAWING NO.: HP79-FPP-1.006 ED12
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	SUBMITTED BY: J. PARKER P.E. FPE	FILE NAME: HP79-FPP-1.006 ED12.dgn
	APPROVED BY: S. S. S. S.	ANSI F

[illegible]





REFERENCES:  
MFP-OPN83E1155, 007 UNIT 5 - INSTRUMENT BOARD WIRING PANEL U1IB

NOTES:  
1. GREEN/BOLD INDICATE EQUIPMENT TO BE REMOVED/MODIFIED.

UNIT 5 INSTRUMENT BOARD  
WIRING - PANEL U1IB  
REMOVAL

ED713

U.S. ARMY CORPS OF ENGINEERS  
HYDROELECTRIC DESIGN CENTER  
PORTLAND, OREGON

DESIGNED BY:  
K. AMANKWA-POKU  
DRAWN BY:  
J. PARKER  
CHECKED BY:  
J. PARKER  
SUBMITTED BY:  
J. PARKER  
SIZE: 11x17  
ANSI F

ISSUE DATE:  
JANUARY 2023  
SOLICITATION NO.:  
H79-PP-1.006  
CONTRACT NO.:  
H79-PP-1.006  
DRAWING NO.:  
ED713  
FILE NAME:  
H79-PP-1.006-ED713.dgn

U.S. ARMY CORPS OF ENGINEERS  
OMAHA NEBRASKA

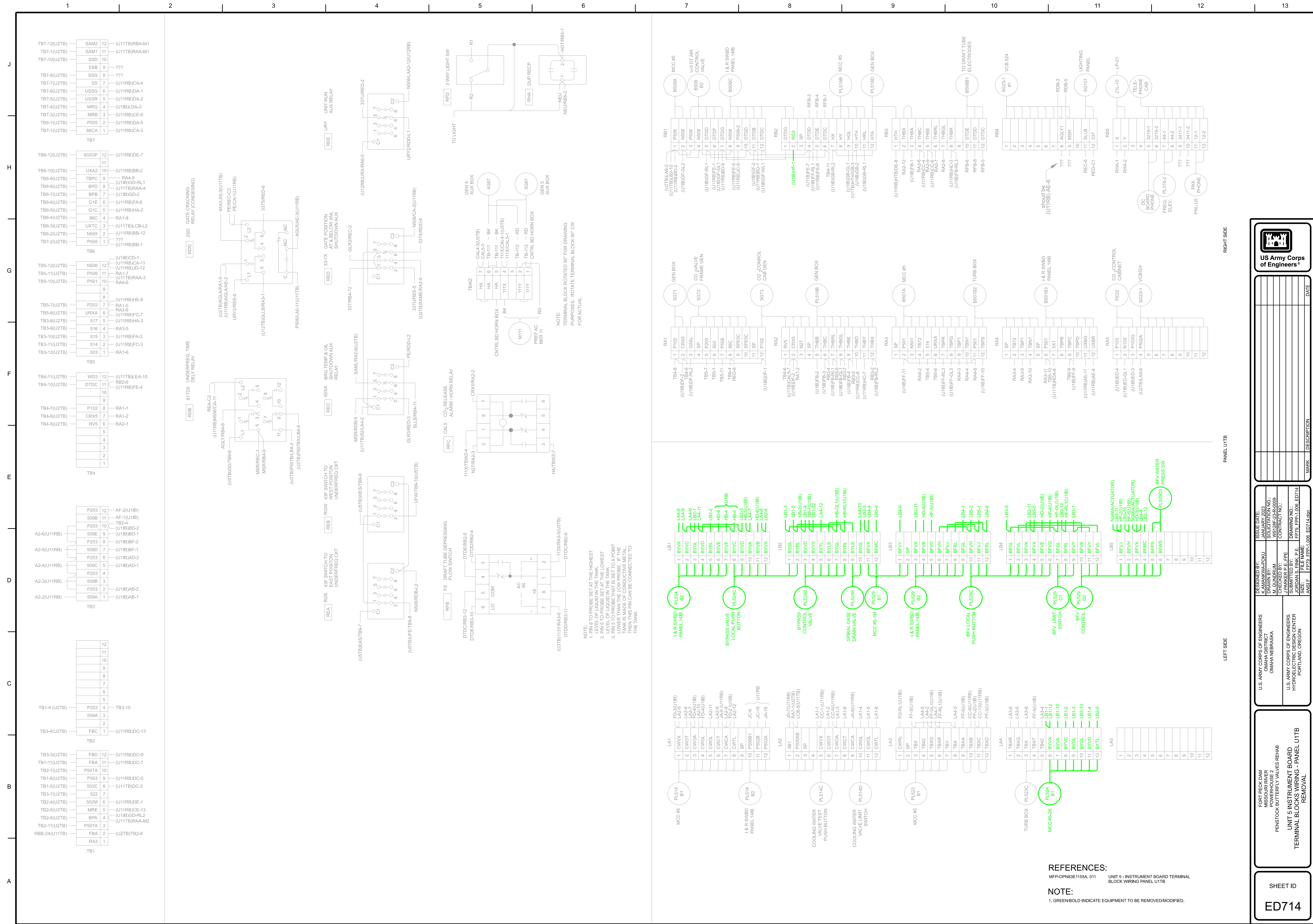
MARK

DATE

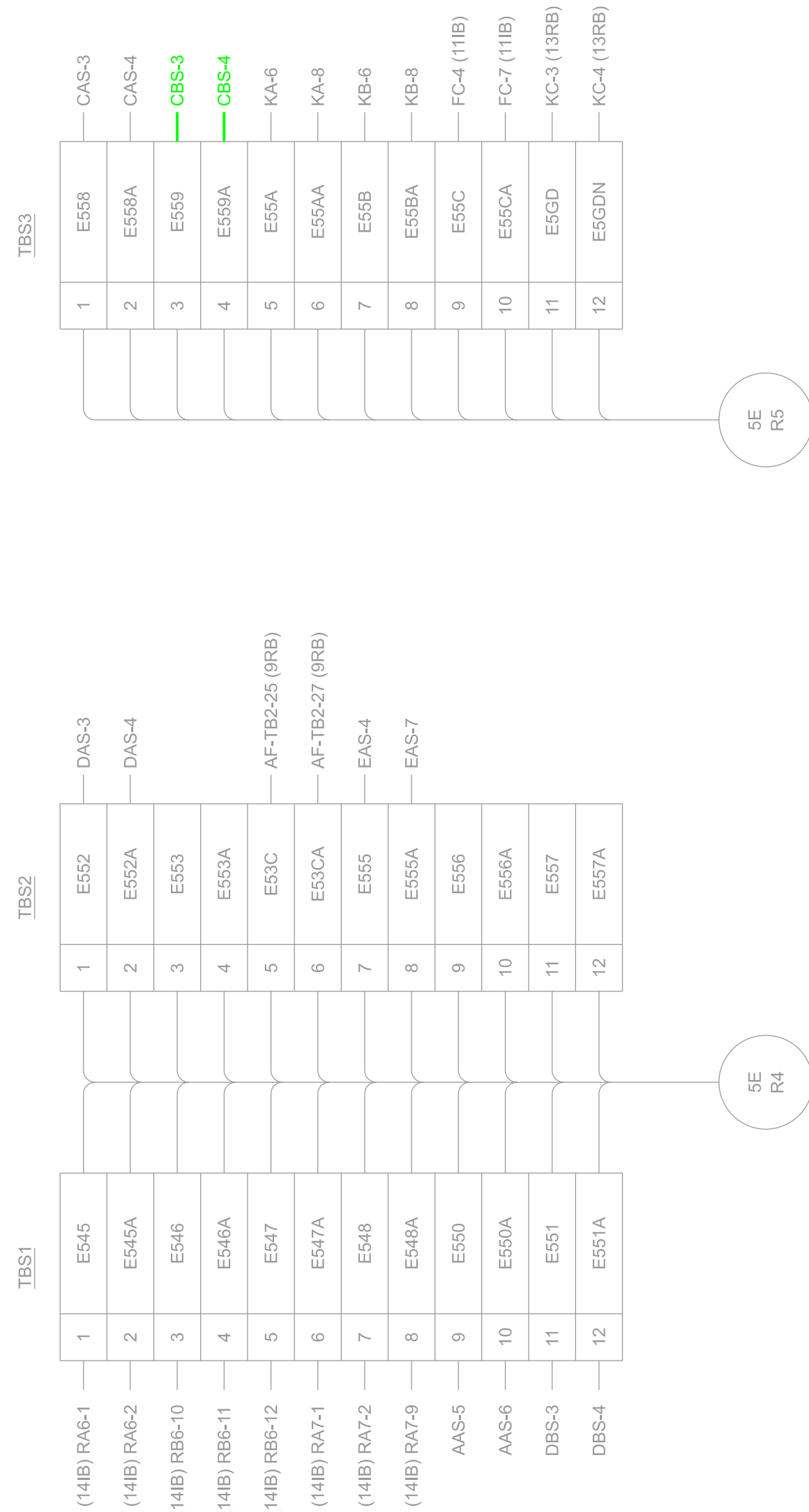
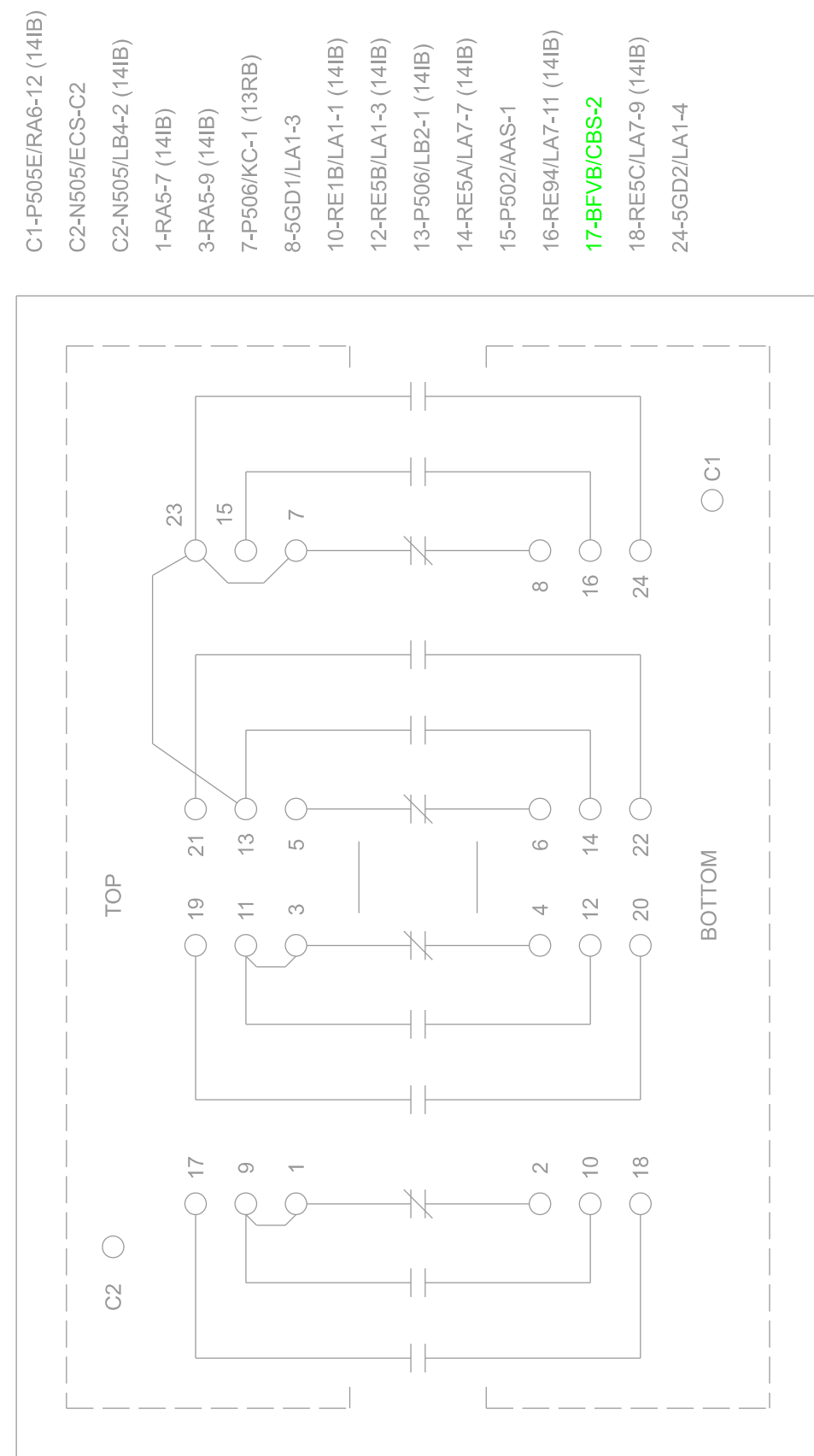
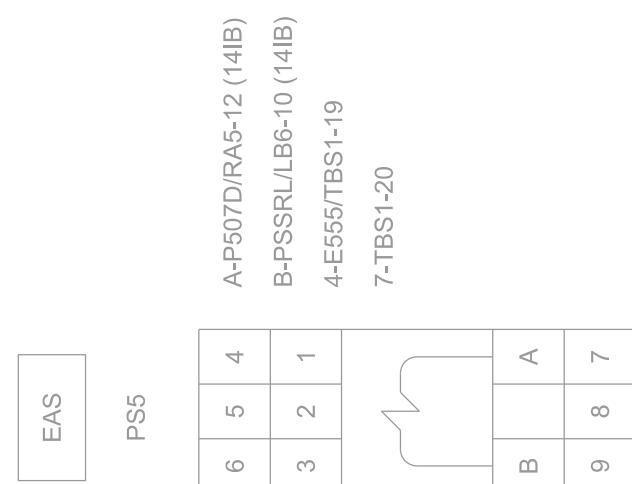
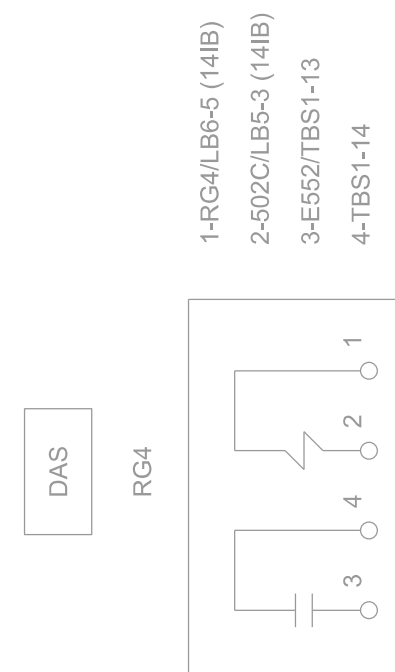
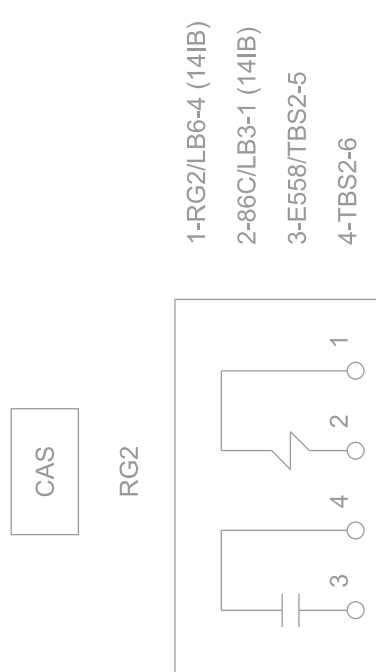
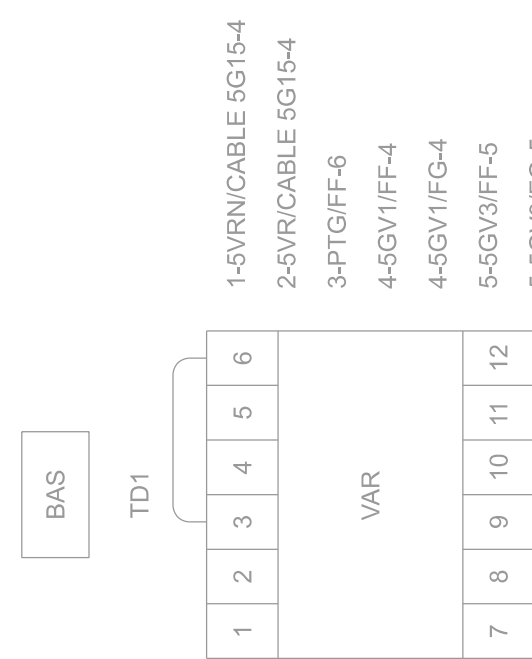
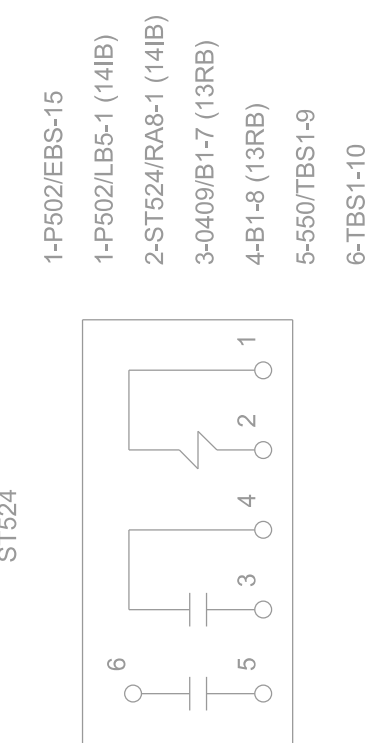
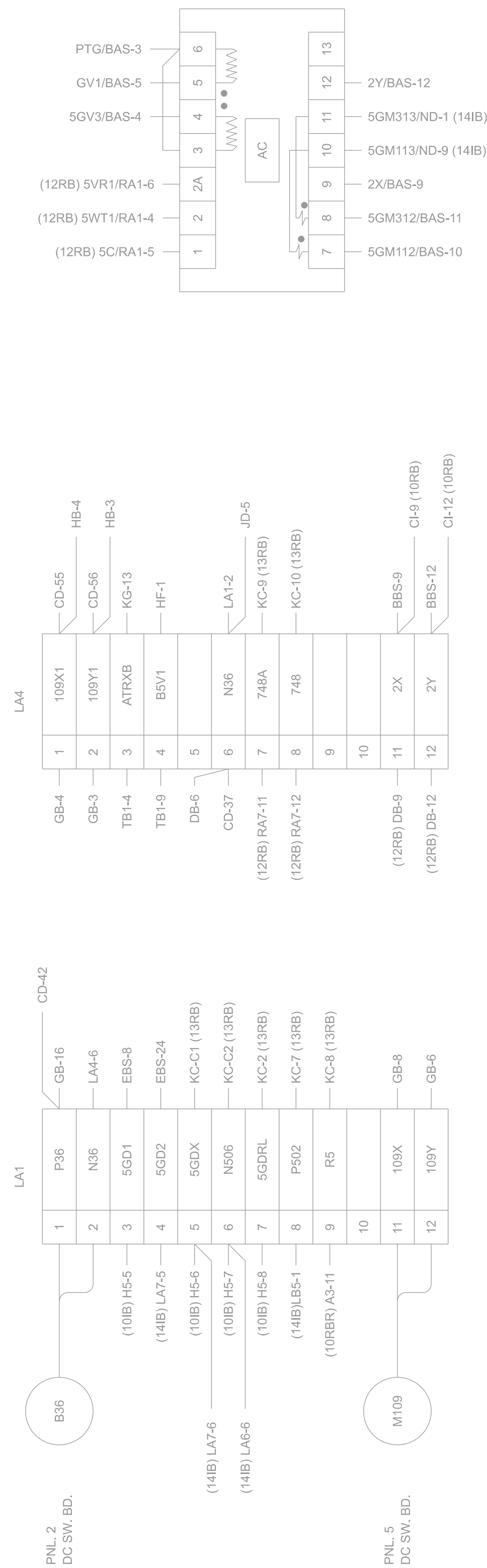
DESCRIPTION

US Army Corps of Engineers®









REFERENCE DRAWINGS:

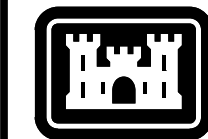
MFP - OPN83E948C, 008 RELAY BOARD WIRING PANEL 13RBL

NOTES:

1. BOLD/GREEN INDICATE EQUIPMENT TO BE REMOVED/MODIFIED.

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB

SHEET ID  
ED715

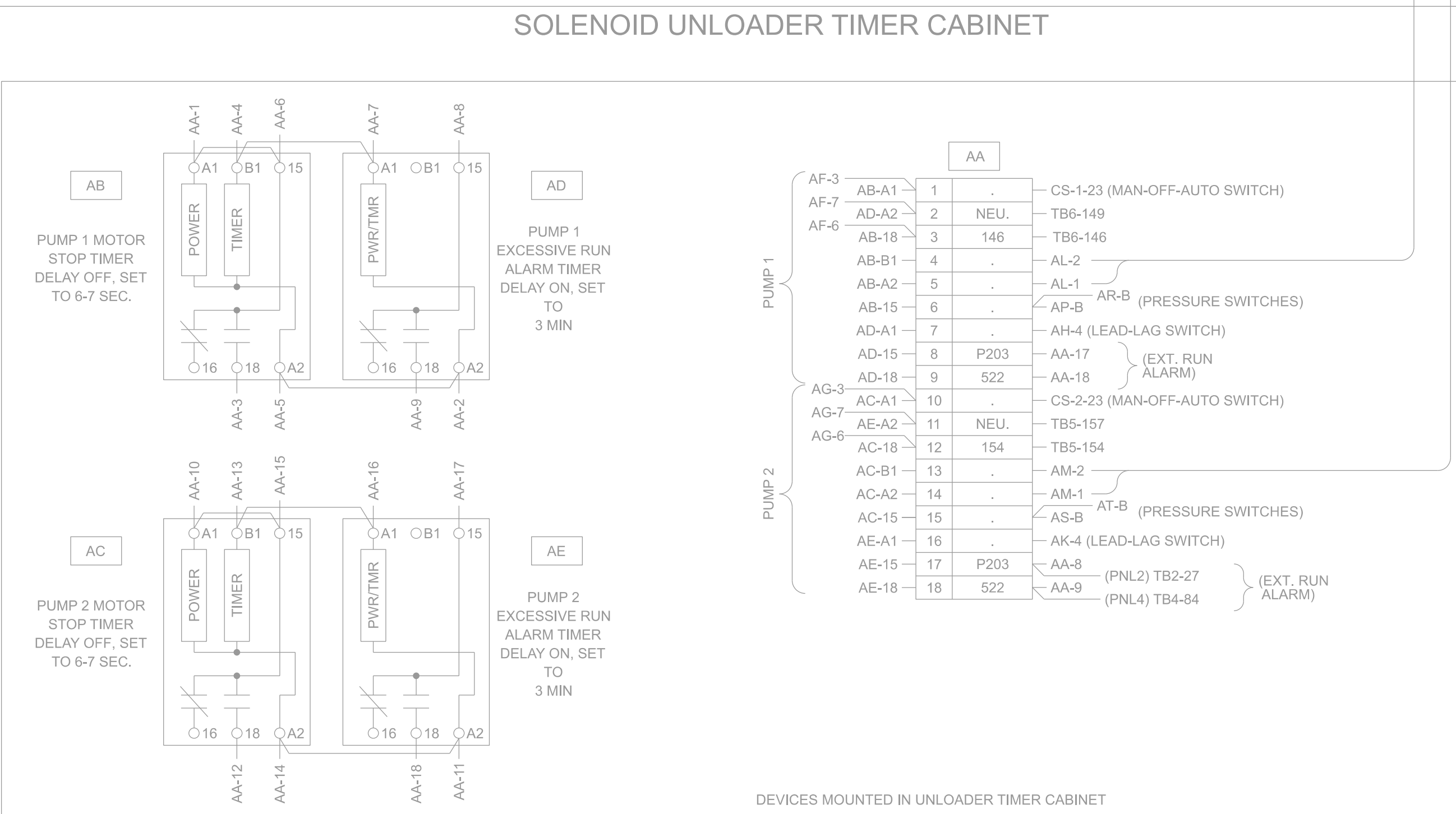
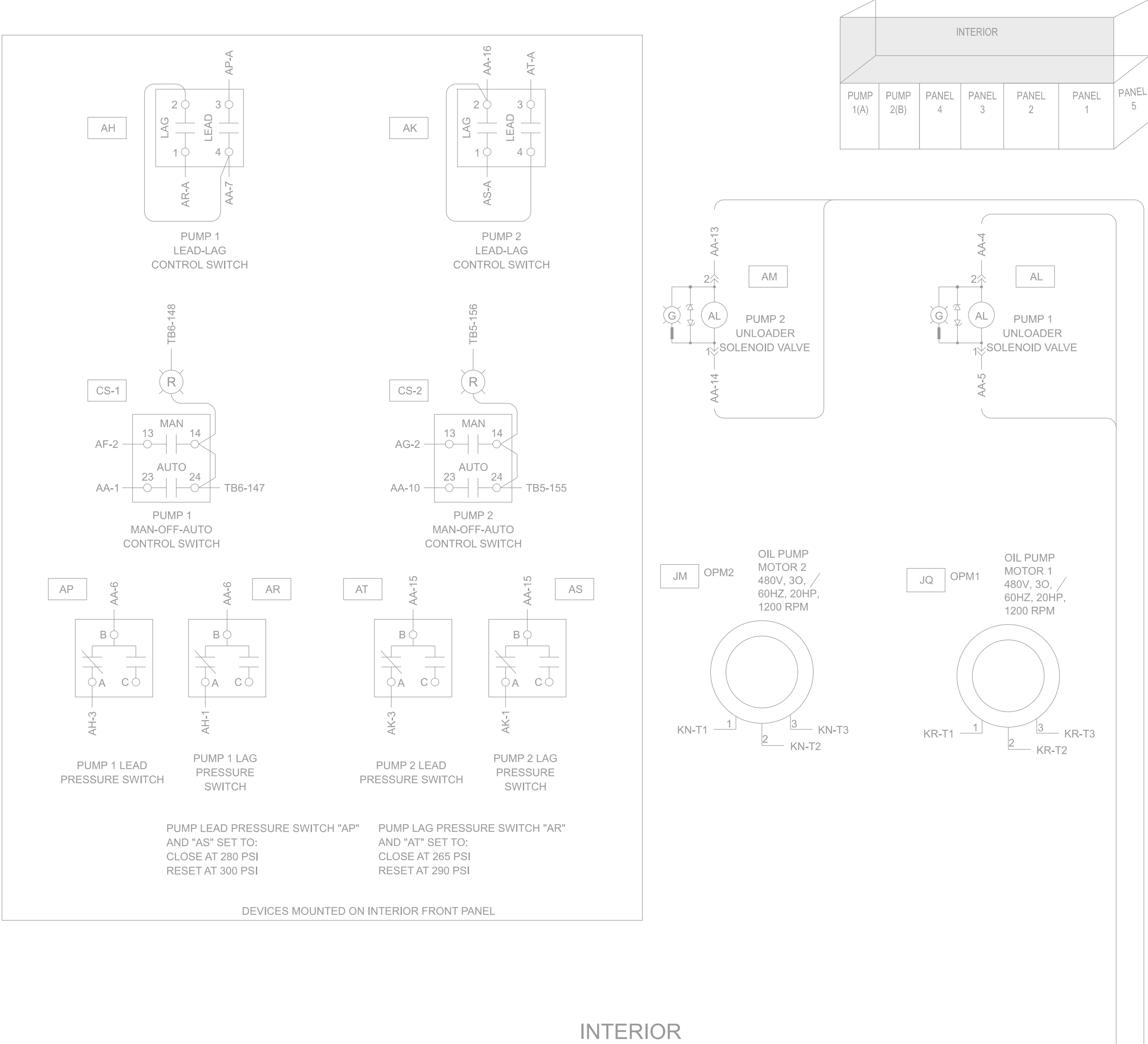


**US Army Corps  
of Engineers®**

[illegible]

U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA, NEBRASKA	DESIGNED BY: K. AMANKIWA-POKU	ISSUE DATE: 01/20/22
	DRAWN BY: W. J. DREW	SOLICITATION NO.: W9128-22-3-R0089
	CHECKED BY: J. PARKER	CONTRACT NO.:
U.S. ARMY CORPS OF ENGINEERS HYDROLOGICAL CENTER PORTLAND, OREGON	SUBMITTED BY: J. PARKER	DRAWING NO.: FP79-FPP-1-006-ED715
	SIZE: JORDAN S. FINKE P.E.	FILE NAME: FP79-FPP-1-006-ED715





NOTES:

1. GREEN/BOLD INDICATE EQUIPMENT TO BE REMOVED/MODIFIED.

**US Army Corps of Engineers**

**UNIT 5 GOVERNOR ACTUATOR CABINET  
PANELS 3, 4 & PUMP WIRING - SHEET 2**

**REMOVAL**

**SHEET ID**

ED717

**PORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2**

**PEMISTOCK BUTTERFLY VALVES REHAB**

**U.S. ARMY CORPS OF ENGINEERS  
OMAHA DISTRICT  
OMAHA, NEBRASKA**

**U.S. ARMY CORPS OF ENGINEERS  
HYDROELECTRIC DESIGN CENTER  
PORTLAND, OREGON**

**DESIGNED BY:**  
K. AMANUVA-POKU

**CHECKED BY:**  
J. PARKER

**ISSUE DATE:**  
01/2/2022

**CONTRACT NO.:**  
300126-23-R-0009

**DRAWING NO.:**  
ED717.FPP-1.00B.ED717

**FILE NAME:**  
F773.FPP-1.00B.ED717.dgn

**DATE:**



1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13

CONDUIT			CABLE					DESCRIPTION					REMARKS
NUMBER	SIZE	LENGTH	NUMBER	NO COND	SIZE	INS	RUN LENGTH	OPR VOLTAGE	FUNCTION	FROM	TO	ROUTING	
			4G66A	2/C	19/25		70		UNIT 4 GOV. TANK AND SUMP LOW LEVEL INTERLOCK	UC SWBD, PANEL U5	UNIT 4 CONTROL CAB., ACTUATOR PANEL		
P1205	1	50	P1205	2/C	12		110		BUTTERFLY VALVE 4 HEATER	DISTRIBUTION PANEL 2	BUTTERFLY VALVE HEATER		
PL424A	1	72	PL424A	3/C	12		246	480	BYPASS VALVE FEEDER	MCC4	BYPASS VALVE		
			PL424B1	7/C	19/25		64	120	BYPASS VALVE CONTROL BYPASS VALVE CONTROL	MCC4 MCC4	UC SWBD, PANEL U5 TRAY E	PL424B1, TRAY E	
			PL424B2	7/C	19/25		680	120	BYPASS VALVE CONTROL (PLANT 1)	UC SWBD, PANEL U5	RHD SWBD, PANEL R3	TRAY A, TRAY B	
PL424C	1-1/4"	72	PL424C	7/C	19/25		574	120	BYPASS VALVE LOCAL CONTROL	UC SWBD, PANEL U5	LOCAL PUSH BUTTON		
PL424D	1	80	PL424D	6/C	19/25		540	120	BYPASS VALVE LIMIT SWITCH & INTERLOCK	UC SWBD, PANEL U5	LIMIT SWITCH & INTERLOCK		
PL424E	1-1/4"	108	PL424E	2/C	19/25		120	120	DRAIN VALVE INTERLOCK & LIMIT SWITCH	UC SWBD, PANEL U5	SPIRAL CASE DRAIN VALVE & LIMIT SWITCH		
PL429A1	2	8	PL429A	3/C	8		165	480	BUTTERFLY VALVE FEEDER MCC4 BUTTERFLY VALVE FEEDER MCC4	MCC4 MCC4	BUTTERFLY VALVE MOTOR TRAY E	PL429A1, TRAY E, PL429A2	
PL429A2	2	51							BUTTERFLY VALVE FEEDER MCC4	TRAY E	BUTTERFLY VALVE MOTOR		
			PL429B1	4/C	19/25		66	120	BUTTERFLY CONTROL BUTTERFLY CONTROL	MCC4 MCC4	UC SWBD, PANEL U5 TRAY E	PL429B1, TRAY E	
			PL429B2	7/C	19/25		680	120	BUTTERFLY VALVE CONTROL (PLANT 1)	UC SWBD, PANEL U5	I&R SWDB, PANEL 12IB	TRAY A, TRAY B	
			PL429B3	2C	19/25			120	BUTTERFLY VALVE WATER PRESSURE SWITCH	UC SWBD, PANEL U5	SCROLL CASE WATER PRESSURE SWITCH		
			PL429C	9/C	19/25		186	120	BUTTERFLY VALVE LOCAL CONTROL PB BUTTERFLY VALVE LOCAL CONTROL PB	UC SWBD, PANEL U5 TRAY E	LOCAL PUSH BUTTON LOCAL PUSH BUTTON	TRAY E, PL429C	
			PL429D1	3/C	19/25		205	120	BUTTERFLY VALVE LIMIT SWITCH BUTTERFLY VALVE LIMIT SWITCH	UC SWBD, PANEL U5 TRAY E	LIMIT SWITCH LIMIT SWITCH	TRAY E, PL429D1	
			PL429D2	9/C	19/25		205	120	BUTTERFLY VALVE CONTROL RELAYS BUTTERFLY VALVE CONTROL RELAYS	UC SWBD, PANEL U5 TRAY E	CONTROL RELAYS CONTROL RELAYS	TRAY E, PL429D1	
			5G66A	2/C	19/25		120		UNIT 5 GOV. TANK AND SUMP LOW LEVEL INTERLOCK	UC SWBD, PANEL U1	UNIT 5 CONTROL CAB., ACTUATOR PANEL	PL521A	
P1309	1	60	P1309	2/C	12		140		BUTTERFLY VALVE 5 HEATER	DISTRIBUTION PANEL 3	BUTTERFLY VALVE HEATER		
PL524A	1	80	PL524A	3/C	12		270	480	BYPASS VALVE FEEDER	MCC5	BYPASS VALVE		
			PL524B1	7/C	19/25		63	120	BYPASS VALVE CONTROL BYPASS VALVE CONTROL	MCC5 MCC5	UC SWBD, PANEL U1 TRAY E	PL524B1, TRAY E	
			PL524B2	7/C	19/25		670	120	BYPASS VALVE CONTROL	UC SWBD, PANEL U1	I&R SWBD, PANEL 14IB	TRAY E	
PL524C	1-1/4"	64	PL524C	7/C	19/25		518	120	BYPASS VALVE LOCAL CONTROL PLANT 1	UC SWBD, PANEL U1	LOCAL PUSH BUTTON		
PL524D	1	72	PL524D	6/C	19/25		512	120	BYPASS VALVE LIMIT SWITCH & INTERLOCK	UC SWBD, PANEL U1	LIMIT SWITCH & INTERLOCK		
PL524E	1-1/4"	98	PL524E	2/C	19/25		110	120	SPIRAL CASE DRAIN VALVE INTERLOCK & LIMIT SWITCH	UC SWBD, PANEL U1	SPIRAL CASE DRAIN VALVE & LIMIT SWITCH		
			PL529A	3/C	8		180	480	BUTTERFLY VALVE FEEDER BUTTERFLY VALVE FEEDER	MCC5 MCC5	BUTTERFLY VALVE MOTOR TRAY E	PL529A1, TRAY E, PL529A2	
			PL529B1	5/C	19/25		63	120	BUTTERFLY VALVE CONTROL BUTTERFLY VALVE CONTROL	MCC5 MCC5	UC SWBD, PANEL U1 TRAY E	PL529B1, TRAY E	
			PL529B2	7/C	19/25		670	120	BUTTERFLY VALVE CONTROL	UC SWBD, PANEL U1	RHD SWBD, PANEL R1	TRAY E	
			PL529C	9/C	19/25		185	120	BUTTERFLY VALVE LOCAL PB BUTTERFLY VALVE LOCAL PB	UC SWBD, PANEL U1 TRAY E	LOCAL PUSH BUTTON LOCAL PUSH BUTTON	PL529C, TRAY E	
			PL529D1	3/C	19/25		195	120	BUTTERFLY VALVE LIMIT SWITCH BUTTERFLY VALVE LIMIT SWITCH	UC SWBD, PANEL U1 TRAY E	LIMIT SWITCH LIMIT SWITCH	PL529D1, TRAY E	
			PL529D2	9/C	19/25		195	120	BUTTERFLY VALVE CONTROL RELAYS BUTTERFLY VALVE CONTROL RELAYS	UC SWBD, PANEL U1 TRAY E	CONTROL RELAYS CONTROL RELAYS	PL529D2, TRAY E	
			PL529D3	2C	19/25			120	BUTTERFLY VALVE WATER PRESSURE SWITCH	UC SWBD, PANEL U1	SCROLL CASE WATER PRESSURE SWITCH		
			PL813A	4C	19/22		125	480	PENSTOCK DRAIN HEATER PENSTOCK DRAIN HEATER	PENSTOCK DRAIN HEATER DISC. SW PENSTOCK DRAIN HEATER DISC. SW	PENSTOCK DRAIN HEATER JUNCTION BOX PULL BOX 82	VIA PULL BOX 82 COL. IN.	
			PL813B	2C	19/25		250	120	PENSTOCK DRAIN HEATER THERMOSTAT PENSTOCK DRAIN HEATER THERMOSTAT	PP8 PP8	THERMOSTAT PULL BOX 82	VIA PULL BOX 82 COL. IN.	
									PENSTOCK DRAIN HEATER THERMOSTAT	PULL BOX 82	THERMOSTAT		

[illegible]

U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA NEBRASKA	DESIGNED BY: K. AMANKWA-POKU CHECKED BY: M. GUNDIRM	ISSUE DATE: JANUARY 2023 SHEET NO.: 300.126E-134-0000
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	CONTRACT NO.: J. PARKER P.E. PFE SUBMITTED BY: P.E.	DRAWING NO.: 1779.1PFL-1058 ED601
	FILE NAME: SIZE: ANSI/F	1779.1PFL-1058 ED601 P779.FPP-1.008 ANSI/F

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
CABLE AND CONDUIT SCHEDULE  
REMOVAL

SHEET ID  
ED801

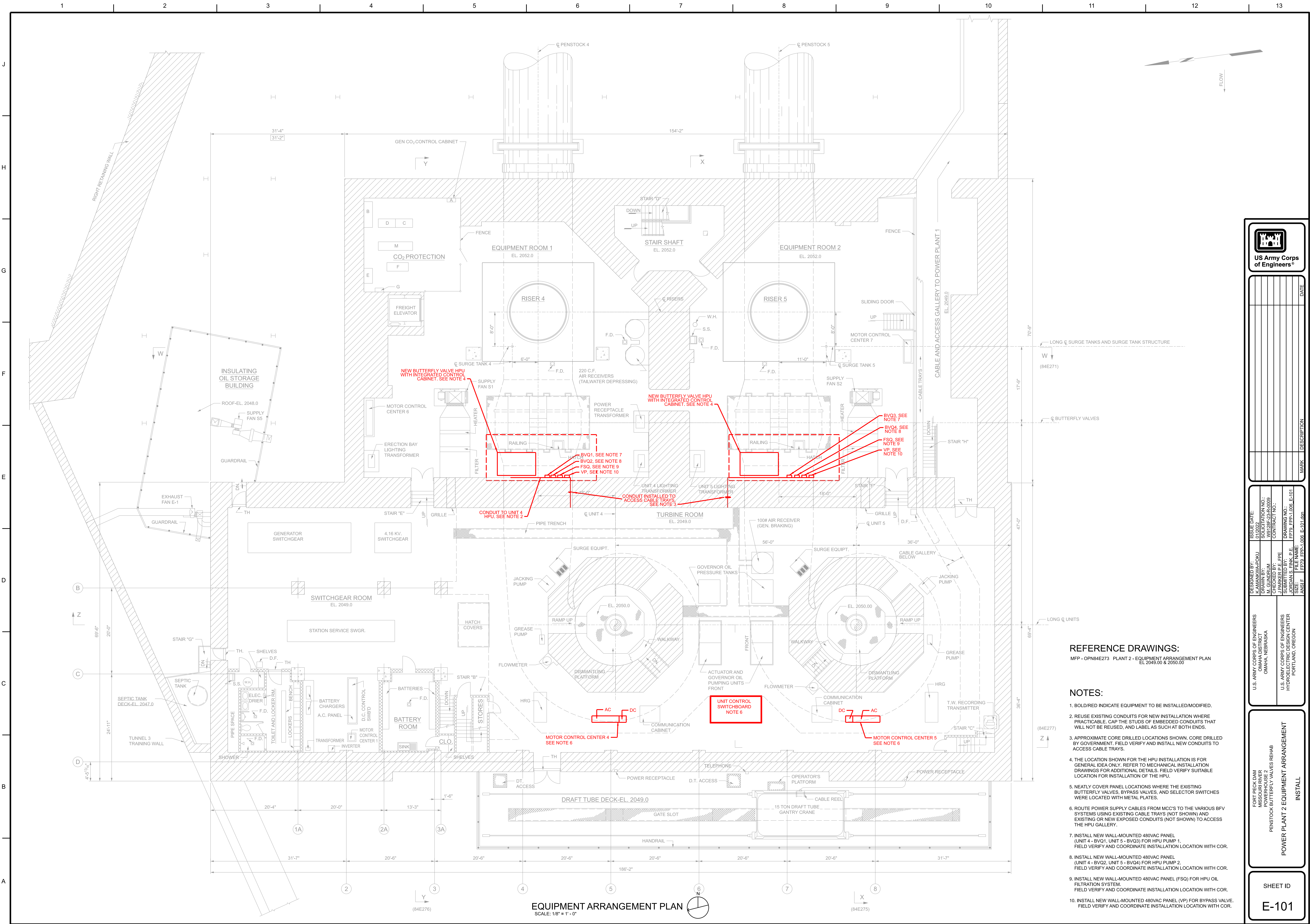
REFERENCE DRAWINGS:

5577.5-H-48	POWER AND CONTROL CABLE SCHEDULE SHEET 8
5577.5-H-49	POWER AND CONTROL CABLE SCHEDULE SHEET 9
5577.5-H-51	POWER AND CONTROL CABLE SCHEDULE SHEET 11
5577.5-H-53	POWER AND CONTROL CABLE SCHEDULE SHEET 13

NOTES:

1. BOLD/GREEN INDICATE EQUIPMENT TO BE REMOVED/MODIFIED.  
2. LENGTHS OF CABLES AND CONDUITS ARE LISTED FOR ESTIMATING PURPOSES ONLY. APPROXIMATE LENGTHS ARE PROVIDED AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

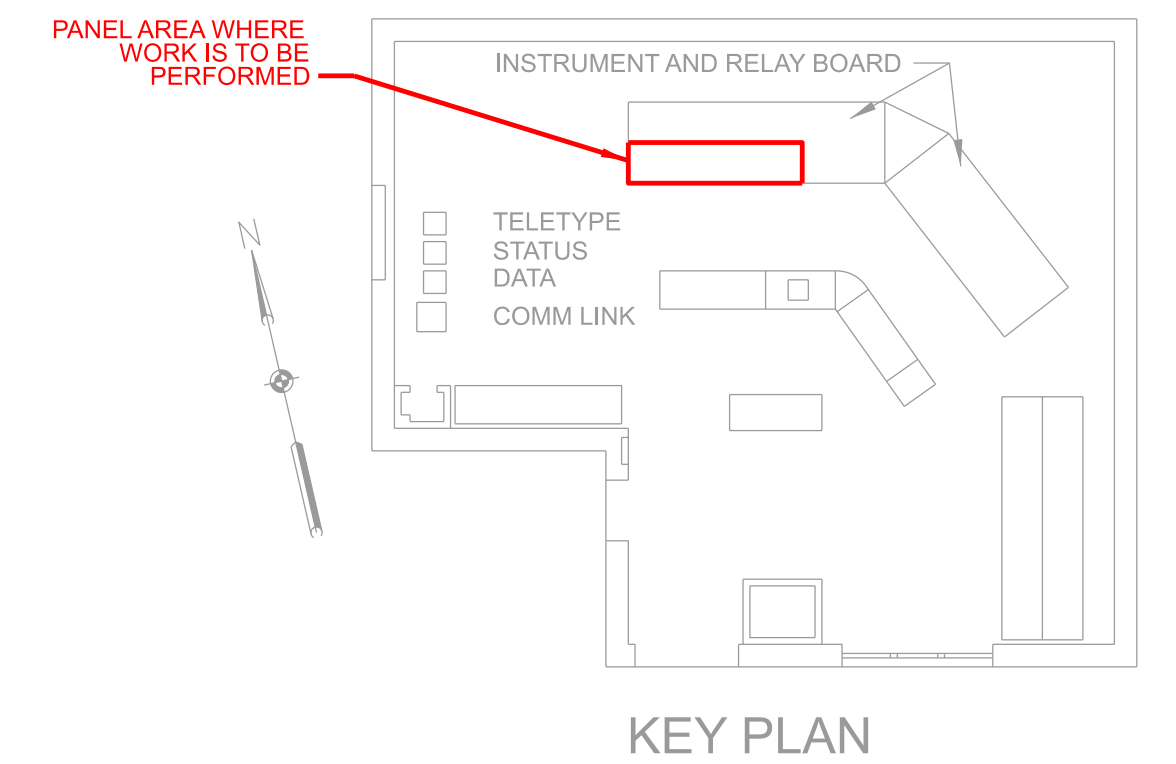









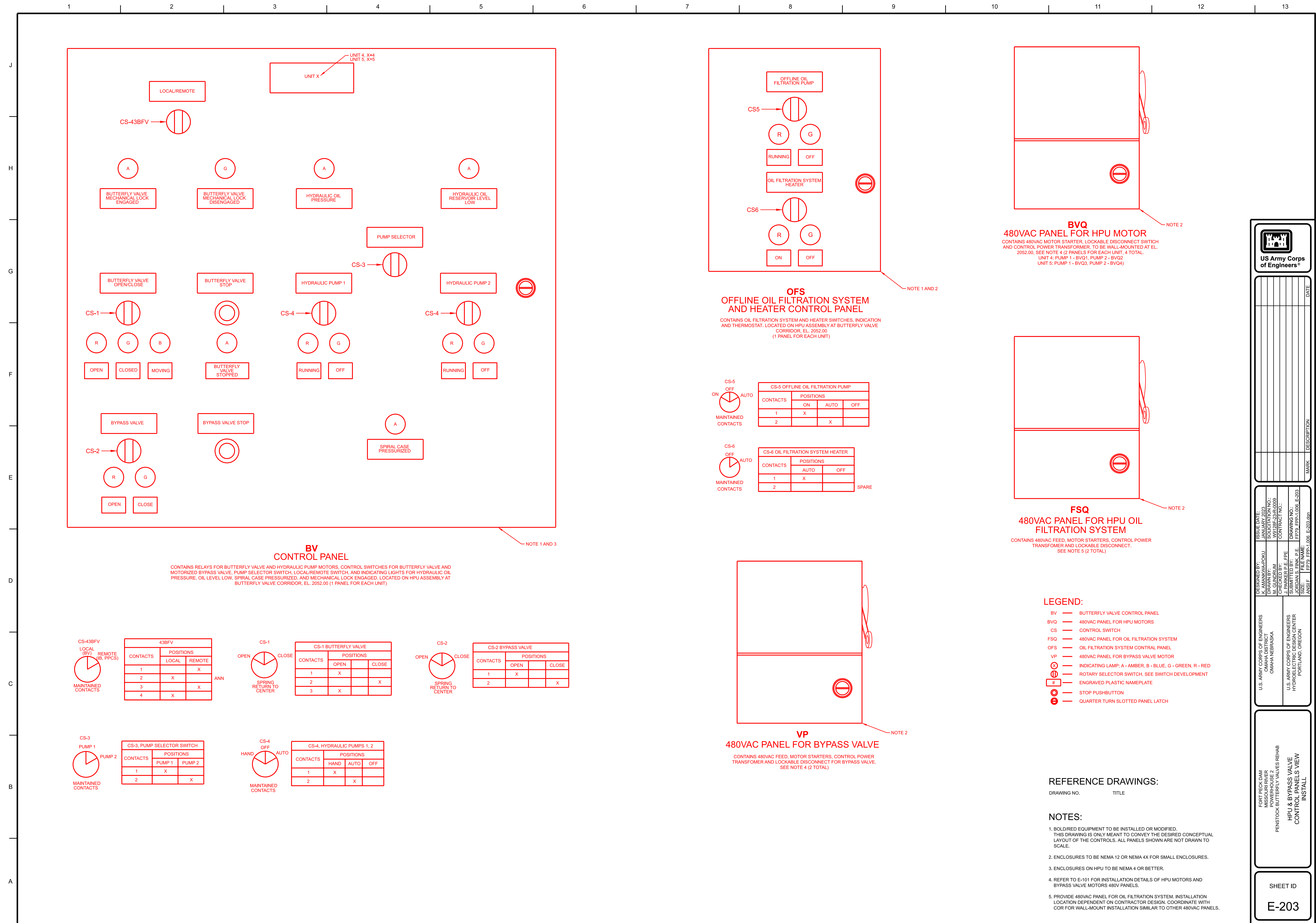




1. BOLD/RED INDICATE EQUIPMENT TO BE INSTALLED/MODIFIED.

SHEET ID <b>E-202</b>		PORT PECK DAM MISSOURI RIVER POWERHOUSE, 2 PENSTOCK BUTTERFLY VALVES REHAB		U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA, NEBRASKA		DESIGNED BY: K. KAWAKAWA/POKU JANUARY 2001 M. GUNDRUM W012BF-23-R-0009		ISSUE DATE: JANUARY 2001 CONTRACT NO.: W012BF-23-R-0009		 US Army Corps of Engineers®	
INSTRUMENT BOARD ELEVATION VIEW INSTALL		U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON		SUBMITTED BY: J. S. LEE CHECKED BY: E. EPE DRAWING NO.: 1P779 FPP-1.008 E-202		SIZE: 1/8" X 1/2" FILE NAME: 1P779 FPP-1.008 E-202.dgn		MARK DESCRIPTION DATE			













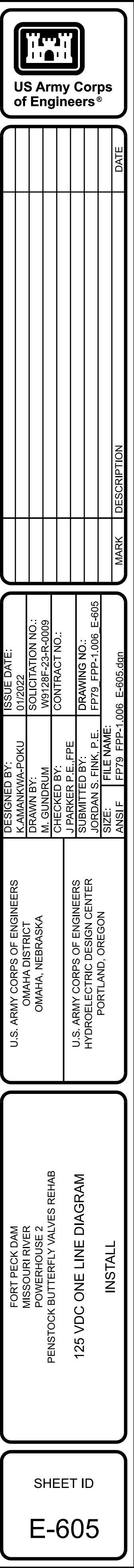












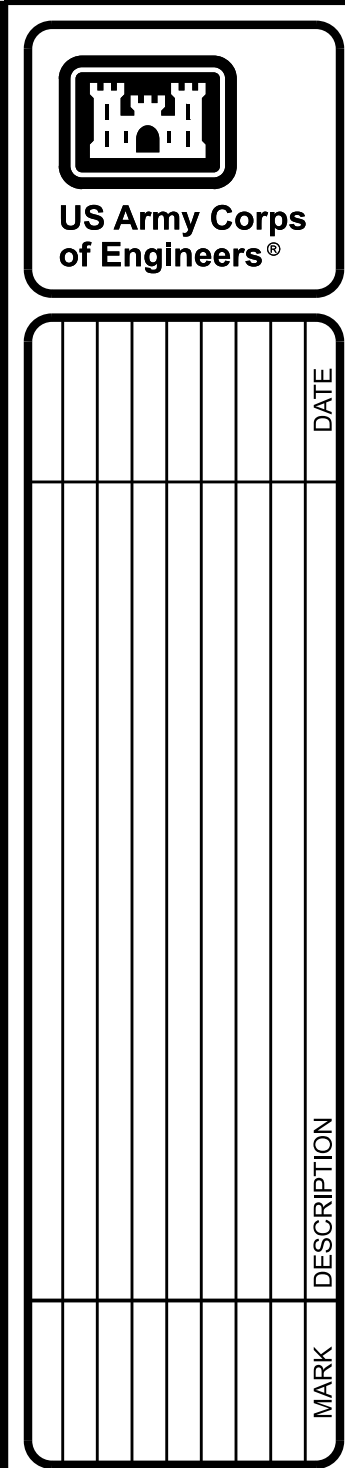










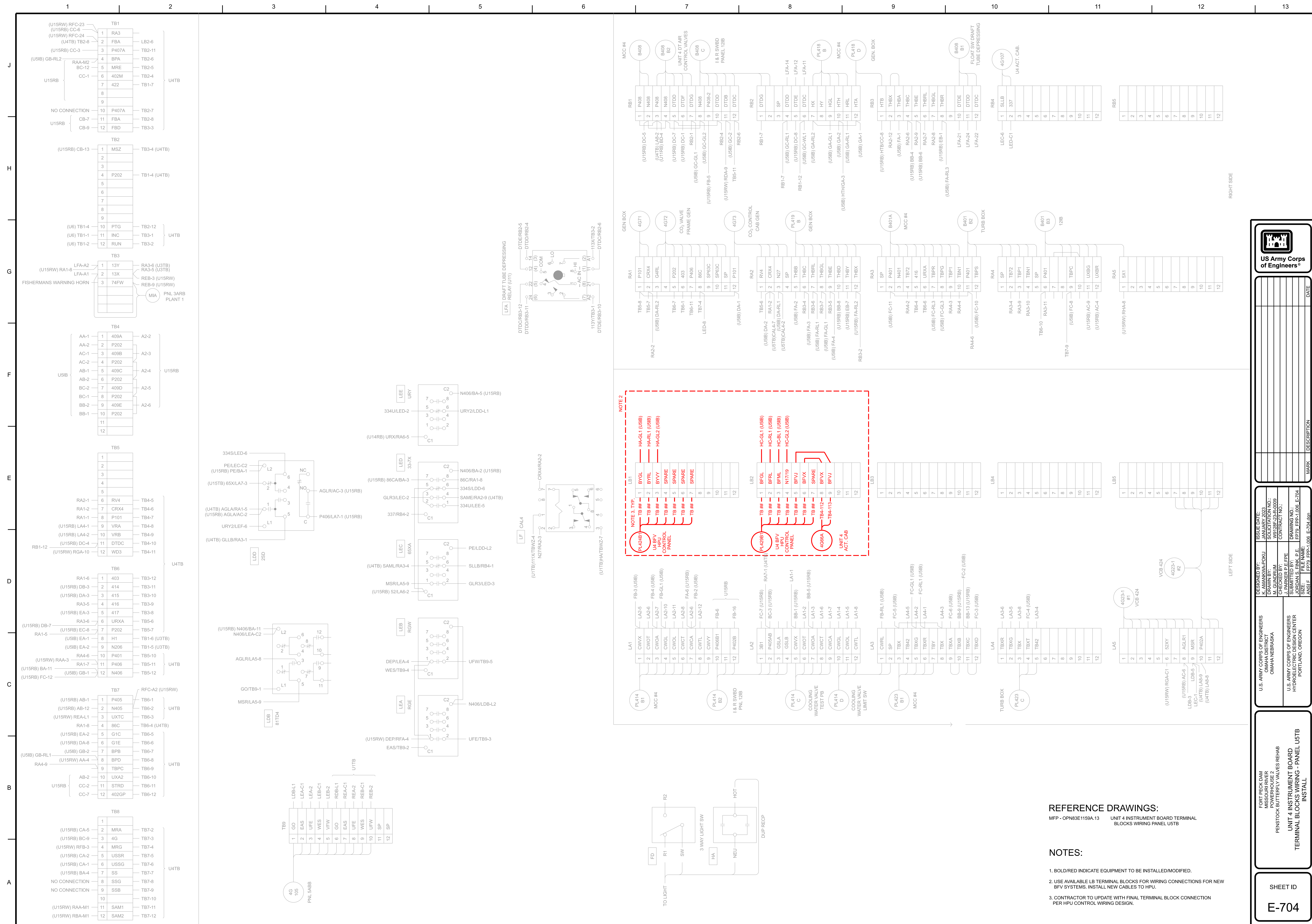


U.S. ARMY CORPS OF ENGINEERS ATTENTION: MR. JAMES W. HARRIS OMAHA TERRASSA	DESIGNED BY: K. AMANIKAVAPOKU DRAWN BY: M. GUNDIRUM CHECKED BY: M. GUNDIRUM CONTRACT NO.: DRAWING NO.: SHEET NO.: 1 OF 5 FILE NAME: E703 ANSIF: FPR-1-008 E703
U.S. ARMY CORPS OF ENGINEERS ATTENTION: MR. JAMES W. HARRIS OMAHA TERRASSA	DESIGNED BY: K. AMANIKAVAPOKU DRAWN BY: M. GUNDIRUM CHECKED BY: M. GUNDIRUM CONTRACT NO.: DRAWING NO.: SHEET NO.: 1 OF 5 FILE NAME: E703 ANSIF: FPR-1-008 E703

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
UNIT 4 INSTRUMENT BOARD  
WIRING PANEL U51B  
INSTALL

SHEET ID  
E-703

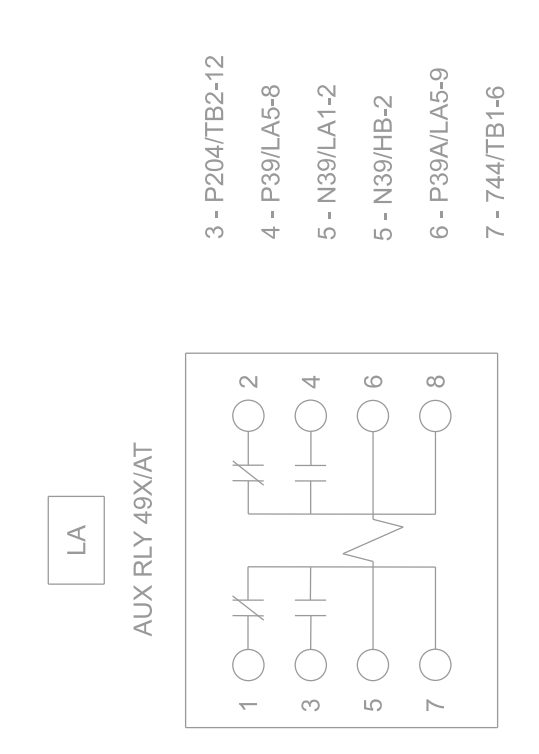












MFP - OPN83E647C, 009 RELAY BOARD TERMINAL BLOCK WIRING PANEL 12RB

1. BOLD/RED INDICATE EQUIPMENT TO BE INSTALLED/MODIFIED.



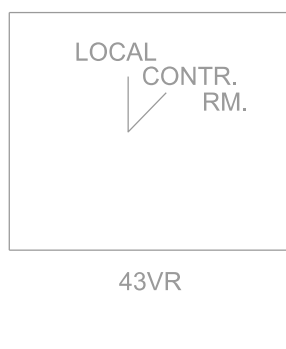




UNITS 1, 2 & 3 BUTTERFLY VALVE TRANSFER CONTROL SWITCHES

CONTACTS		BLK. OVAL HANDLE POS.		
HANDLE END	NO.	CONTR. RM.	LOCAL	
1 ○- ---○	2 ○- ---○	2 X		
3 ○- ---○	4 ○- ---○	3 X	X	
5 ○- ---○	6 ○- ---○	4 X	X	

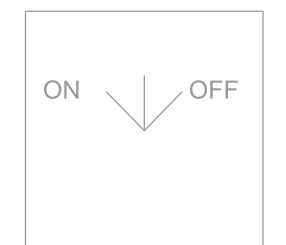
TYPE SB1, CAT NO. 16SB1CB217  
PANEL: 11B, 51B, 71B



UNITS 4 & 5 AUXILIARY CONTROL SWITCHES

CONTACTS		BLK. PISTOL GRIP HDL. POS.		
HANDLE END	NO.	ON	OFF	
2 ○- ---○	1 ○- ---○	1 X	X	
4 ○- ---○	3 ○- ---○		X	X
6 ○- ---○	5 ○- ---○		X	X
8 ○- ---○	7 ○- ---○			X
10 ○- ---○	9 ○- ---○	X		

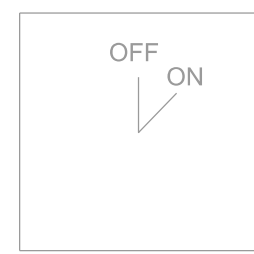
TYPE W, STYLE NO. 3801A81G01  
PANEL: 121B, 141B



UNIT 3, 4 & 5 EAST GEN DROPPING CONTROL SWITCH

CONTACTS		BLK. MOD. KNURLED HDL. POS.			
HANDLE END	NO.	X		X	
1 ○- ---○	2 ○- ---○			X	X
3 ○- ---○	4 ○- ---○			X	X

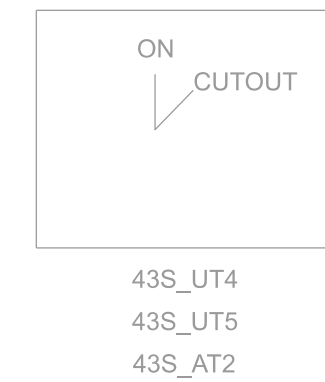
TYPE  
PANEL: 101B



UNITS 4 & 5 XFMRs & AT2 SUDDEN PRESSURE CUTOUT CONTROL SWITCH

CONTACTS		BLK. MODERN OVAL HDL. POS.		
HANDLE END	NO.	ON	CUTOUT	
2 ○- ---○	1 ○- ---○	1 X		
4 ○- ---○	3 ○- ---○		X	
6 ○- ---○	5 ○- ---○	X		
8 ○- ---○	7 ○- ---○		X	

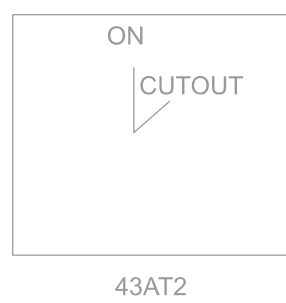
TYPE W, STYLE NO. 3623A47G01  
PANEL: 101B, 111B



AUTO TRANSFORMER SUDDEN PRESSURE SW.

CONTACTS		BLACK OVAL HNDL POS.		
HANDLE END	NO.	ON	CUTOUT	
1 ○- ---○	2 ○- ---○	1 2		
3 ○- ---○	4 ○- ---○	3 4		

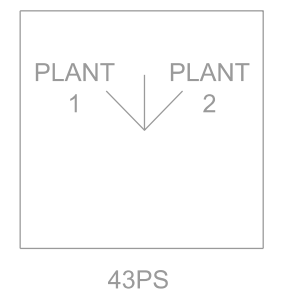
MODEL 16SB1BB206  
PANEL: 101B



PLANT 1 & PLANT 2 TRANSFER CONTROL SWITCH

CONTACTS		BLK. PISTOL GRIP HDL. POS.		
HANDLE END	NO.	PLANT 1	PLANT 2	
2 ○- ---○	1 ○- ---○	1 X	X	
4 ○- ---○	3 ○- ---○		X	X
6 ○- ---○	5 ○- ---○			X
8 ○- ---○	7 ○- ---○			X
10 ○- ---○	9 ○- ---○	X		X

TYPE W, STYLE NO. 3801A81G01  
PANEL: 121B, 141B

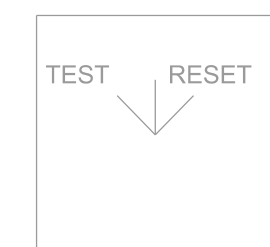


PP1 STA. SERV. AUDIBLE ALARM TEST & RESET CONTROL SWITCH

CONTACTS		BLK. PISTOL GRIP HDL. POS.			
HANDLE END	NO.	RESET	NORM.	TEST	
1 ○- ---○	2 ○- ---○	1 ○	○	○	○
3 ○- ---○	4 ○- ---○	2 ○	○	○	○
5 ○- ---○	6 ○- ---○	3 ○	○	○	○
7 ○- ---○	8 ○- ---○	4 ○	○	○	○
9 ○- ---○	10 ○- ---○	5 X			
11 ○- ---○	12 ○- ---○	6 X			X
13 ○- ---○	14 ○- ---○	7 X			X
15 ○- ---○	16 ○- ---○	8 X			X

TYPE SB10, CAT. NO. 0269A3801  
PANEL: 21B

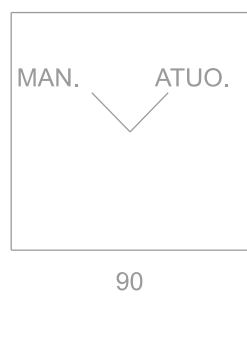
○ LATERAL CONTACTS; PULL OUT POSITION OPENS CONTACTS 1 & 2, CLOSSES CONTACTS 3 & 4 IN NORMAL POSITION ONLY



GEN'S 1, 2 & 3 VOLTAGE REGULATOR TRANSFER CONTROL SWITCHES

CONTACTS		BLK. OVAL HANDLE POS.		
HANDLE END	NO.	AUTO.	MAN.	
1 ○- ---○	2 ○- ---○	1 X		
3 ○- ---○	4 ○- ---○	2 X	X	
5 ○- ---○	6 ○- ---○	3 X	X	
7 ○- ---○	8 ○- ---○	4 X	X	

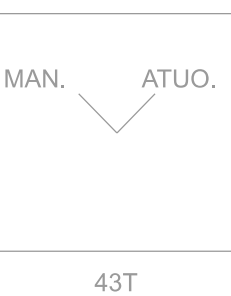
TYPE SB1, CAT NO. 16SB1CB2B70  
PANEL: 11B, 51B, 71B



GEN'S 4 & 5 VOLTAGE REGULATOR TRANSFER CONTROL SWITCHES

CONTACTS		BLK. PIST. GRIP HDL. POS.		
HANDLE END	NO.	MANUAL	AUTO	
2 ○- ---○	1 ○- ---○	1 2	X	
4 ○- ---○	3 ○- ---○	3 4	X	
6 ○- ---○	5 ○- ---○	5 6	X	
8 ○- ---○	7 ○- ---○	7 8	X	

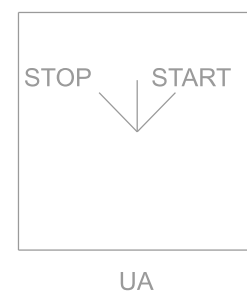
RETURN TO CENTER  
PANEL: 121B, 141B



UNITS 1, 2 & 3 START-STOP CONTROL SWITCHES

CONTACTS		BLK. PISTOL GRIP HDL. POS.				
HANDLE END	NO.	START	NORMAL AFTER START	AFTER STOP	STOP	
1 ○- ---○	2 ○- ---○	1 X				
3 ○- ---○	4 ○- ---○	2 X				
5 ○- ---○	6 ○- ---○	3 X	X			
7 ○- ---○	8 ○- ---○	4 X	X			
9 ○- ---○	10 ○- ---○	5 X			X	
11 ○- ---○	12 ○- ---○	6 X			X	

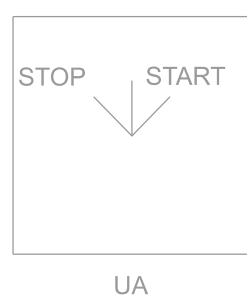
TYPE SB1, CAT. NO. 16SB1CD3H20  
PANEL: 11B, 51B, 71B



UNITS 4 & 5 START-STOP CONTROL SWITCHES

CONTACTS		BLACK PISTOL GRIP HANDLE POS.			
HANDLE END	NO.	STOP	NORMAL AFTER STOP	AFTER START	START
2 ○- ---○	1 ○- ---○	1 2			X
4 ○- ---○	3 ○- ---○	3 4		X	X
6 ○- ---○	5 ○- ---○	5 6		X	X
8 ○- ---○	7 ○- ---○	7 8		X	X
10 ○- ---○	9 ○- ---○	9 10	X		

TYPE W, STYLE NO. 3801A80G01  
PANEL: 121B, 141B

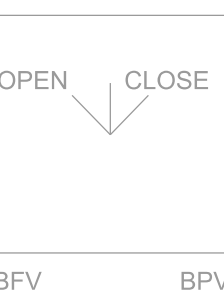


UNITS 1, 2 & 3 BUTTERFLY VALVE & BYPASS VALVE CONTROL SWITCHES

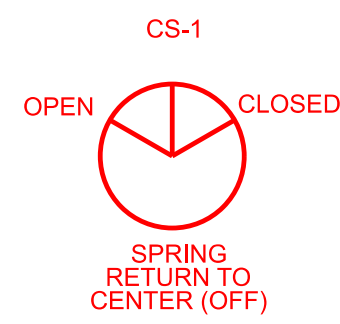
CONTACTS		BLK. PISTOL GRIP HDL. POS.			
HANDLE END	NO.	PULL OUT CLOSE	NEUT.	PULL OUT OPEN	
1 ○- ---○	2 ○- ---○	1 ○	○	○	
3 ○- ---○	4 ○- ---○	2 ○	○	○	
5 ○- ---○	6 ○- ---○	3 X		X	
7 ○- ---○	8 ○- ---○	4 X		X	
9 ○- ---○	10 ○- ---○	5 X		X	
11 ○- ---○	12 ○- ---○	6 X		X	

TYPE SB10 CAT. NO. 448A132G2  
NO ROTATION WHEN IN  
PANEL: 11B, 51B, 71B

○ LATERAL CONTACTS; PULL OUT POSITION CLOSSES CONTACTS 1 & 2 IN NEUTRAL POSITION ONLY; NO ROTATION WHEN IN

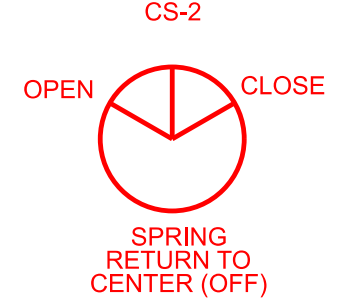


BUTTERFLY VALVES CONTROL SWITCH



CONTACTS		POSITIONS		
HANDLE END	NO.	OPEN	CLOSE	
1 ○- ---○	2 ○- ---○	1 X		
3 ○- ---○	4 ○- ---○	2 X	X	

BYPASS VALVE CONTROL SWITCH



CONTACTS		POSITIONS		
HANDLE END	NO.	OPEN	CLOSE	
1 ○- ---○	2 ○- ---○	1 X		
3 ○- ---○	4 ○- ---○	2 X	X	

PLANT 2 4160V STA. SERV. LOCAL/PPCS CONTROL SWITCH

CONTACTS			BLACK NOB HANDLE	
HANDLE END		NO.	LOCAL	PPCS
6 ○- ---○	5 ○- ---○	1-2 3-4	X	
8 ○- ---○	7 ○- ---○	5-6 7-8	X	X
10 ○- ---○	9 ○- ---○	7-8 9-10	X	X
6A ○- ---○	5A ○- ---○	1A 3A-4A	X	
8A ○- ---○	7A ○- ---○	5A-6A 7A-8A	X	X
6B ○- ---○	5B ○- ---○	1B-2B 3B-4B	X	X
8B ○- ---○	7B ○- ---○	5B-6B 7B-8B	X	X
6C ○- ---○	5C ○- ---○	1C-2C 3C-4C	X	X
8C ○- ---○	7C ○- ---○	5C-6C 7C-8C	X	X









MFP-OPN83E949A, 016      UNIT 5 - INSTRUMENT BOARD TERMINAL  
BLOCKS WIRING PANEL 14IB

1. RED/BOLD INDICATE EQUIPMENT TO BE INSTALLED/MODIFIED

2. USE AVAILABLE TERMINAL BLOCKS AT RA3 FOR BYPASS VALVE CONTROLS WIRING PER DESIGN. CONTRACTOR TO COMPLETE WIRING FOR CONTROL SWITCH SELECTED. INSTALL NEW CABLE TO HPU.
3. USE AVAILABLE TERMINAL BLOCKS AT RA4 FOR BUTTERFLY VALVE CONTROLS WIRING PER DESIGN. CONTRACTOR TO COMPLETE WIRING FOR CONTROL SWITCH SELECTED. INSTALL NEW CABLE TO HPU. INSTALL NEW CABLE TO HPU.
4. CONTRACTOR TO UPDATE WITH TERMINAL BLOCK CONNECTIONS PER HPU CONTROL WIRING DESIGN.

[illegible]

U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA NEBRASKA	DESIGNED BY: K. AMANKWA-POKU NO. 1000	ISSUE DATE: JANUARY 2023
	CHECKED BY: M. GUNDIRUM NO. 2318	DRAWING NO.: FP79-FPP-23-008 E-1/2
U.S. ARMY CORPS OF ENGINEERS HYDROLOGIC DESIGN CENTER PORTLAND, OREGON	SUBMITTED BY: J. PARKER P.E. NO. 1000	FILE NAME: FP79-FPP-23-008 E-1/2.dgn

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
UNIT 5 INSTRUMENT BOARD  
TERMINAL BLOCKS WIRING - PANEL 141B  
INSTALL

SHEET ID

E-712





PANEL U11B  
UNIT NO. 5

REFERENCES:

MFP-OPN83E1155, 007 UNIT 5 - INSTRUMENT BOARD WIRING PANEL U1IE

NOTES:

1. RED/BOLD INDICATE EQUIPMENT TO BE INSTALLED/MODIFIED.
2. INSTALL NEW BYPASS VALVE INDICATING LIGHTS AS FOLLOWS  
RED - VALVE OPEN  
GREEN - VALVE CLOSE

INSTALL METAL PLATE TO NEATLY COVER CUT OUT OF EXISTING CONTROL SWITCH. PROVIDE METAL PLATE OF SAME MATERIAL AND COLOR AS EXISTING INSTRUMENT BOARD PANEL.

3. INSTALL METAL PLATE TO NEATLY COVER CUT OUT OF EXISTING VALVE CONTROL MODE SELECTOR SWITCH AND INDICATING LIGHTS. PROVIDE METAL OF SAME MATERIAL AND COLOR AS EXISTING INSTRUMENT BOARD PANEL.

4. INSTALL NEW BUTTERFLY VALVE INDICATING LIGHTS AS FOLLOWS:
- RED - VALVE OPEN
  - GREEN - VALVE CLOSE
  - BLUE - VALVE IN TRANSITION/MOVING

INSTALL METAL PLATE TO NEATLY COVER CUT OUT OF EXISTING CONTROL SWITCH. PROVIDE METAL PLATE OF SAME MATERIAL AND COLOR AS EXISTING INSTRUMENT BOARD PANEL.

[illegible]

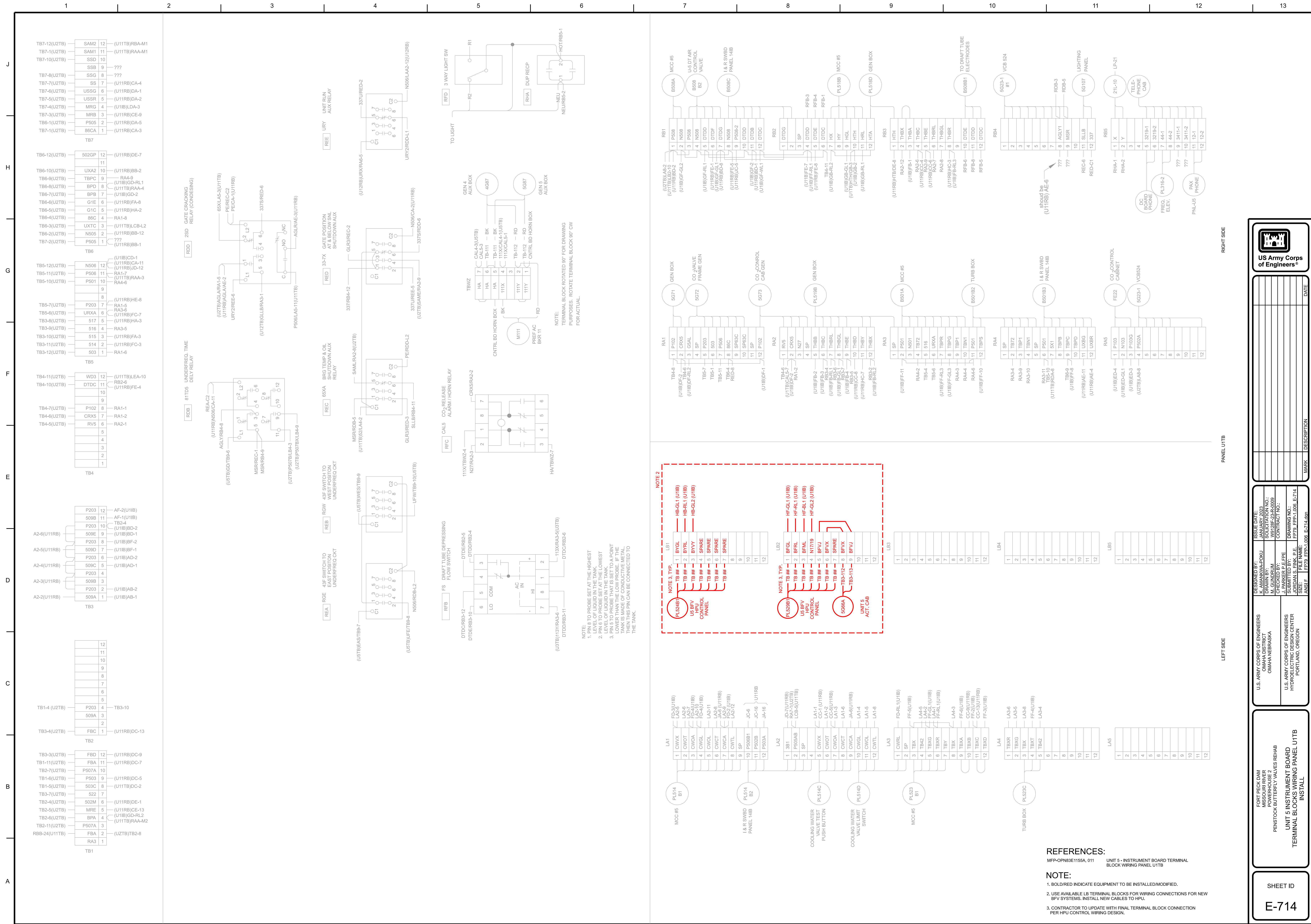
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	DESIGNED BY: K. AMANIKWA-POKU DRAWN BY: M. GUNDIRUM CHECKED BY: E. E. SPE SUBMITTED BY: JORDAN S. FRANK, P.E. SIZE: ANSI	ISSUE DATE: JANUARY 2023 SOLICITATION NO.: W9128F-23-R-0099 CONTRACT NO.: DRAWING NO.: FPP-1-008-E-713 FILE NAME: FPP9-FPP-1-008-E-713.dgn
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FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
UNIT 5 INSTRUMENT BOARD

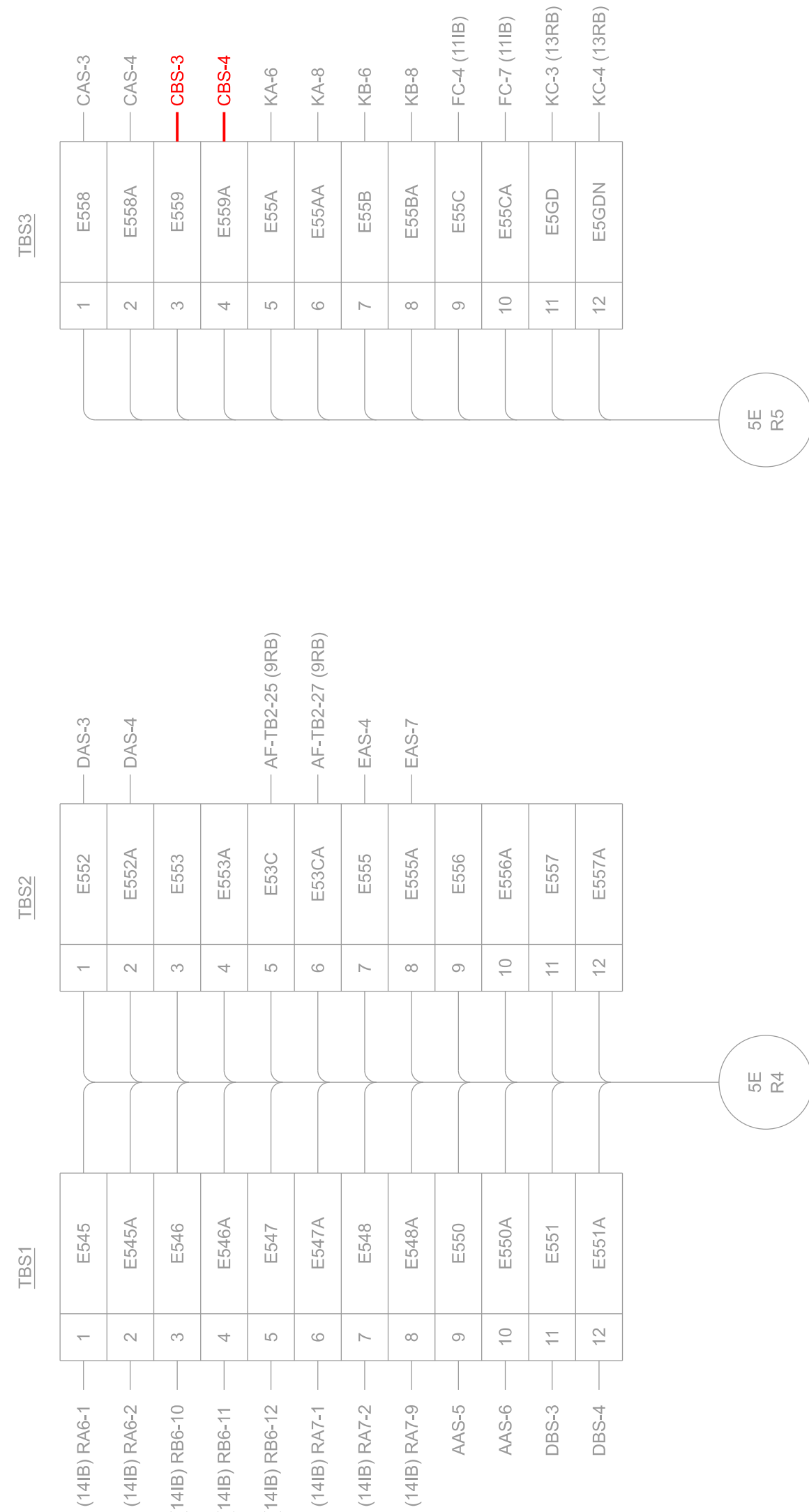
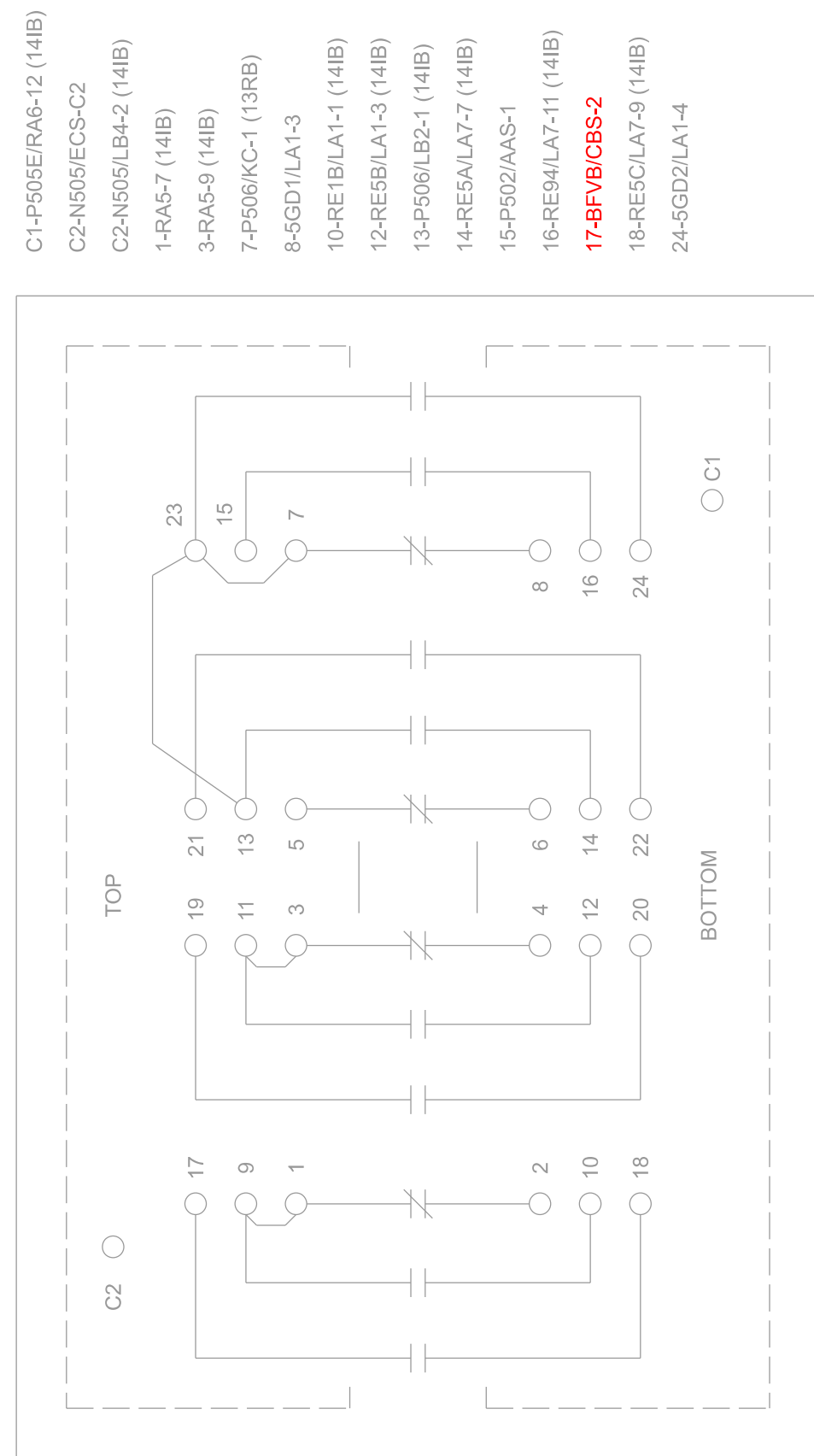
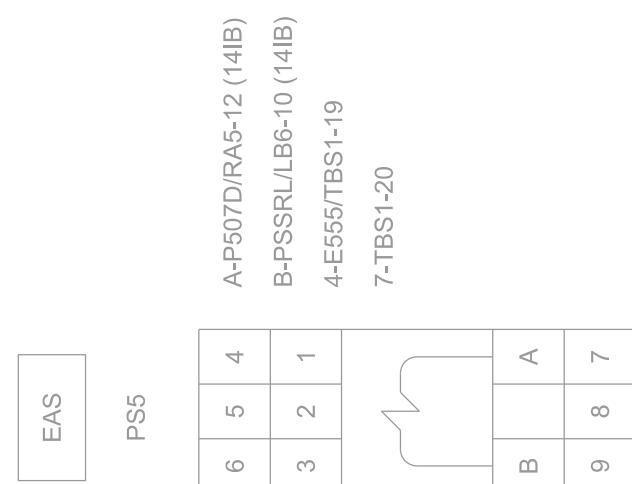
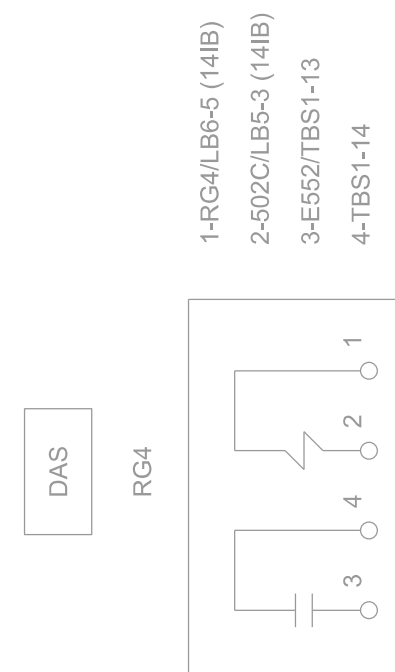
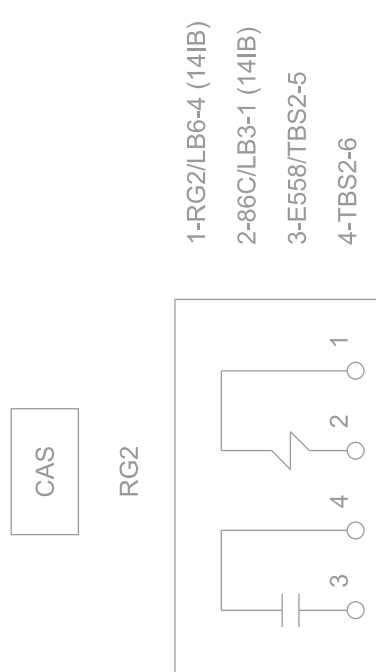
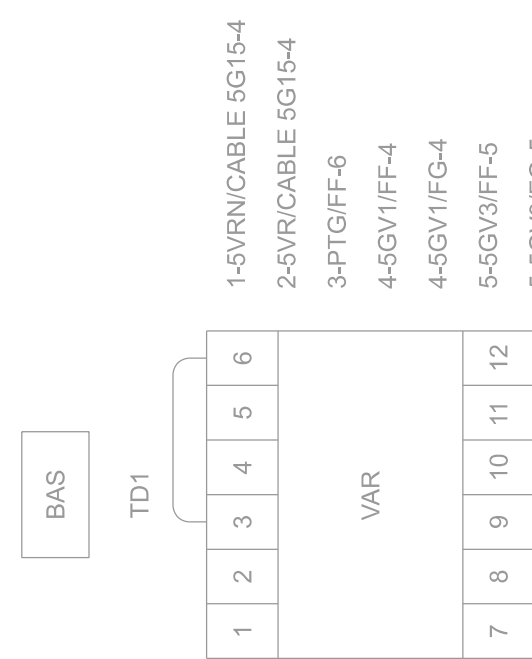
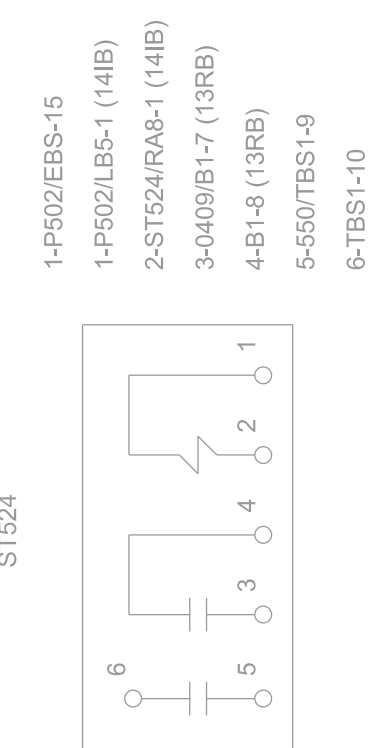
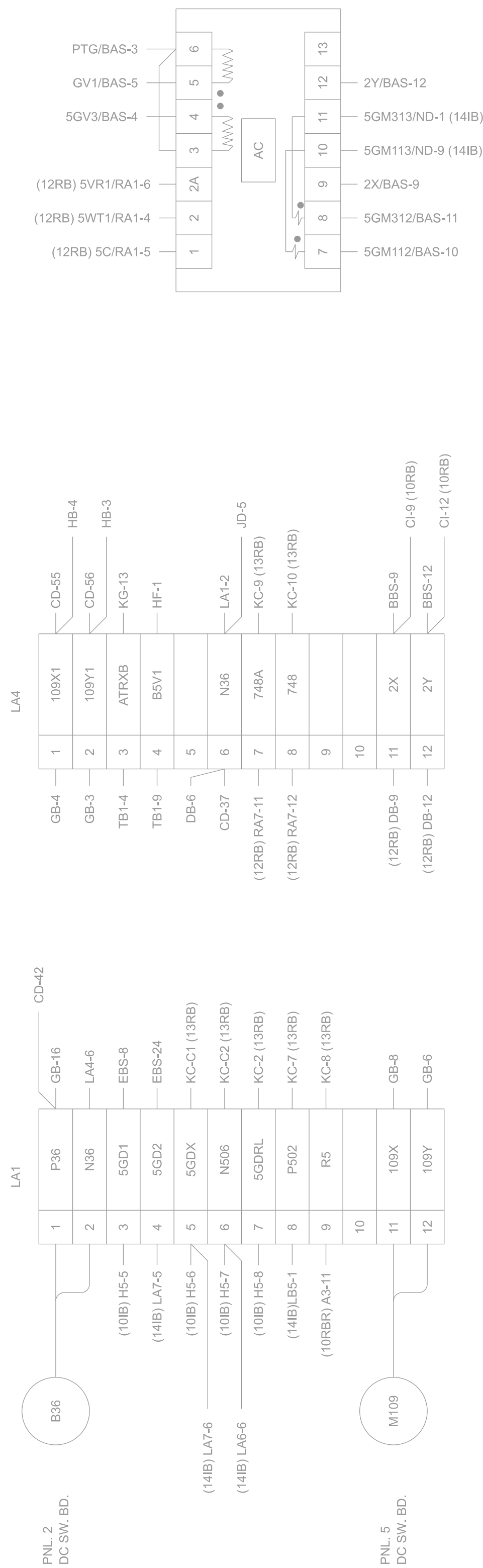
SHEET ID

E-713









REFERENCE DRAWINGS:

MFP - OPN83E948C, 008 RELAY BOARD WIRING PANEL 13RBL

NOTES:

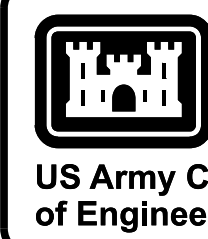
1. BOLD/RED INDICATE EQUIPMENT TO BE INSTALLED/MODIFIED.

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
STOCK BUTTERFLY VALVES REH  
RELAY BOARD WIRING  
PANEL 13RBL

SHEET ID

E-715

[illegible]

U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA, NEBRASKA	DESIGNED BY: K. AMANKWA-POKU	ISSUE DATE: 01/20/22
	CHECKED BY: M. GUNDIRUM	CONTRACT NO.: W12CE-23-R-0005
	CHECKED BY: J. PARKER	DRAWING NO.: E775-FTH-1.000, E-715
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	SUBMITTED BY: P.E. FILE NAME: SIZE: ANSI F: PP79-PP7-1.006 E-715	

DRY PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
UTTERLY VALVES REHAB

BOARD WIRING  
PANEL 13RBL  
INSTALL

PENSTOCK  
REL  
I

SHEET ID  
E-715







1 2 3 4 5 6 7 8 9 10 11 12 13

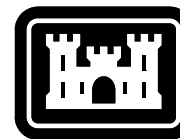
CONDUIT			CABLE					DESCRIPTION					REMARKS
NUMBER	SIZE	LENGTH	NUMBER	NO COND	SIZE	INS	RUN LENGTH	OPR VOLTAGE	FUNCTION	FROM	TO	ROUTING	
			4G66A	2/C	#12	600V	70	125VDC	UNIT 4 GOV. TANK AND SUMP LOW LEVEL INTERLOCK	PLANT 2 INST. CONTROL PANEL U5TB	UNIT 4 GOV. ACTUATOR PANEL	TBD BY CONTRACTOR	
			PL403	3/C	#12	600V	180	125VDC	UNIT 4 HPU 125VDC CONTROL POWER	MCC #4 125VDC PANEL	UNIT 4 HPU CONTROL PANEL	TRAY, CONDUIT	
			PL424A	3/C	#8	1000V	180	480VAC	UNIT 4 BYPASS VALVE FEEDER, MCC #4	MCC #4	DISCONNECT SWITCH AT BFV ROOM (VP)	TRAY, CONDUIT	
			PL424B	3C	#8	1000V	30	480VAC	UNIT 4 BYPASS VALVE FEEDER	DISCONNECT SWITCH AT BFV ROOM (VP)	BYPASS VALVE	TBD BY CONTRACTOR	
			PL424B1	7/C	#12	600V	150	120VAC	UNIT 4 BYPASS VALVE CONTROL (PLANT 2 INST. BOARD)	PLANT 2 INST. CONTROL PANEL U5TB	UNIT 4 HPU CONTROL PANEL	TBD BY CONTRACTOR	
			PL424B2	7/C	#12	600V	800	120VAC	UNIT 4 BYPASS VALVE CONTROL (PLANT 1)	UNIT 4 INST. CNTRL PANEL 121B	UNIT 4 HPU CONTROL PANEL	TRAY A, TRAY B	
			PL424C	3/C	#12	600V	40	120VAC	UNIT 4 BYPASS VALVE CONTROL POWER	DISCONNECT SWITCH AT BFV ROOM (VP)	UNIT 4 HPU CONTROL PANEL	TBD BY CONTRACTOR	
			PL424D	12/C	#12	600V	40	120VAC	U4 BYPASS VALVE CNTRL, LIMIT SWITCH & INTERLOCK	UNIT 4 HPU CONTROL PANEL	UNIT 4 BYPASS VALVE	TBD BY CONTRACTOR	
PL424E	1-1/4"	108	PL424E	4/C	#12	600V	60	120VAC	U4 SPIRAL CASE DRAIN VALVE LIMIT SWITCH INTERLOCK	UNIT 4 HPU CONTROL PANEL	SPIRAL CASE DRAIN VALVE LIMIT SWITCH	TBD BY CONTRACTOR	
			PL429A1	3/C	#8	1000V	180	480VAC	UNIT 4 BUTTERFLY VALVE HPU PUMP 1 FEEDER, MCC #4	MCC #4	DISCONNECT SWITCH AT BFV ROOM (BVQ1)	TRAY, CONDUIT	
			PL429A2	3/C	#8	1000V	30	480VAC	UNIT 4 BUTTERFLY VALVE HPU PUMP 1 FEEDER	DISCONNECT SWITCH AT BFV ROOM (BVQ1)	UNIT 4 HPU PUMP 1	TBD BY CONTRACTOR	
			PL429A3	3/C	#8	1000V	180	480VAC	UNIT 4 BUTTERFLY VALVE HPU PUMP 2 FEEDER, MCC #4	MCC #4	DISCONNECT SWITCH AT BFV ROOM (BVQ2)	TRAY, CONDUIT	
			PL429A4	3/C	#8	1000V	30	480VAC	UNIT 4 BUTTERFLY VALVE HPU PUMP 2 FEEDER	DISCONNECT SWITCH AT BFV ROOM (BVQ2)	UNIT 4 HPU PUMP 2	TBD BY CONTRACTOR	
			PL429A5	3/C	#8	1000V	10	480VAC	U4 BUTTERFLY VALVE HPU OIL FILTRATION SYS. FEEDER	DISCONNECT SWITCH AT BFV ROOM (BVQ1)	DISCONNECT SWITCH AT BFV ROOM (FSQ)	CONDUIT	
			PL429A6	3/C	#8	1000V	30	480VAC	U4 BUTTERFLY VALVE HPU OIL FILTRATION SYS. FEEDER	DISCONNECT SWITCH AT BFV ROOM (FSQ)	UNIT 4 OIL CONDITIONER PUMP & HEATER	TBD BY CONTRACTOR	
			PL429B1	7/C	#12	600V	150	125VDC	U4 BUTTERFLY VALVE CONTROL (PLANT 2 INST. BOARD)	PLANT 2 INST. CONTROL PANEL U5TB	UNIT 4 HPU CONTROL PANEL	TBD BY CONTRACTOR	
			PL429B2	7/C	#12	600V	800	125VDC	UNIT 4 BUTTERFLY VALVE CONTROL (PLANT 1)	UNIT 4 INST. CNTRL PANEL 141B	UNIT 4 HPU CONTROL PANEL	TRAY A, TRAY B	
			PL429B3	2C	#12	600V	100	125VDC	UNIT 4 BUTTERFLY VALVE WATER DIFF PRESSURE SWITCH	UNIT 4 HPU CONTROL PANEL	UNIT 4 SCROLL CASE WATER DIFF. PRESS. SWITCH	TBD BY CONTRACTOR	
			PL429C1	3/C	#12	600V	40	120VAC	UNIT 4 BUTTERFLY VALVE PUMP 1 CONTROL POWER	DISCONNECT SWITCH AT BFV ROOM (BVQ1)	UNIT 4 HPU CONTROL PANEL	TBD BY CONTRACTOR	
			PL429C2	3/C	#12	600V	40	120VAC	UNIT 4 BUTTERFLY VALVE PUMP 2 CONTROL POWER	DISCONNECT SWITCH AT BFV ROOM (BVQ2)	UNIT 4 HPU CONTROL PANEL	TBD BY CONTRACTOR	
			PL429C3	3/C	#12	600V	40	120VAC	U4 BUTTERFLY VALVE HPU OIL FILT. SYS. CONTROL PWR	DISCONNECT SWITCH AT BFV ROOM (FSQ)	UNIT 4 HPU CONTROL PANEL	TBD BY CONTRACTOR	
			PL429D1	7/C	#12	600V	50	125VDC	UNIT 4 BUTTERFLY VALVE OPEN/CLOSE LIMIT SWITCH	UNIT 4 HPU CONTROL PANEL	UNIT 4 BUTTERFLY VALVE POSITION INDICATOR	TBD BY CONTRACTOR	
			PL429D2	7/C	#12	600V	50	125VDC	U4 BUTTERFLY VALVE MECH. LOCK DEVICE LIMIT SWITCH	UNIT 4 HPU CONTROL PANEL	UNIT 4 BUTTERFLY VALVE MECHANICAL LOCK	TBD BY CONTRACTOR	
			5G66A	2/C	#12	600V	70	125VDC	UNIT 5 GOV. TANK AND SUMP LOW LEVEL INTERLOCK	PLANT 2 INST. CONTROL PANEL U1TB	UNIT 5 GOV. ACTUATOR PANEL	TRAY, CONDUIT	
			PL503	3/C	#12	600V	180	125VDC	UNIT 5 HPU 125VDC CONTROL POWER	MCC #5 125VDC PANEL	UNIT 5 HPU CONTROL PANEL	TRAY, CONDUIT	
			PL524A	3/C	#8	1000V	180	480VAC	UNIT 5 BYPASS VALVE FEEDER, MCC #5	MCC #5	DISCONNECT SWITCH AT BFV ROOM (VP)	TBD BY CONTRACTOR	
			PL524B	3C	#8	1000V	30	480VAC	UNIT 5 BYPASS VALVE FEEDER	DISCONNECT SWITCH AT BFV ROOM (VP)	BYPASS VALVE	TBD BY CONTRACTOR	
			PL524B1	7/C	#12	600V	150	120VAC	UNIT 5 BYPASS VALVE CONTROL (PLANT 2 INST. BOARD)	PLANT 2 INST. CONTROL PANEL U1TB	UNIT 5 HPU CONTROL PANEL	TRAY A, TRAY B	
			PL524B2	7/C	#12	600V	800	120VAC	UNIT 5 BYPASS VALVE CONTROL (PLANT 1)	UNIT 5 INST. CNTRL PANEL 121B	UNIT 5 HPU CONTROL PANEL	TBD BY CONTRACTOR	
			PL524C	3/C	#12	600V	40	120VAC	UNIT 5 BYPASS VALVE CONTROL POWER	DISCONNECT SWITCH AT BFV ROOM (VP)	UNIT 5 HPU CONTROL PANEL	TBD BY CONTRACTOR	
PL524E			PL524D	12/C	#12	600V	40	125VDC	U5 BYPASS V ALVE CNTRL, LIMIT SWITCH & INTERLOCK	UNIT 5 HPU CONTROL PANEL	UNIT 5 BYPASS VALVE	TBD BY CONTRACTOR	
	1-1/4"	108	PL524E	4/C	#12	600V	60	120VAC	U5 SPIRAL CASE DRAIN VALVE LIMIT SWITCH INTERLOCK	UNIT 5 HPU CONTROL PANEL	SPIRAL CASE DRAIN VALVE LIMIT SWITCH	TRAY, CONDUIT	
			PL529A1	3/C	#8	1000V	180	480VAC	UNIT 5 BUTTERFLY VALVE HPU PUMP 1 FEEDER, MCC #5	MCC #5	DISCONNECT SWITCH AT BFV ROOM (BVQ1)	TBD BY CONTRACTOR	
			PL529A2	3/C	#8	1000V	30	480VAC	UNIT 5 BUTTERFLY VALVE HPU PUMP 1 FEEDER	DISCONNECT SWITCH AT BFV ROOM (BVQ3)	UNIT 5 HPU PUMP 1	TRAY, CONDUIT	
			PL529A3	3/C	#8	1000V	180	480VAC	UNIT 5 BUTTERFLY VALVE HPU PUMP 2 FEEDER, MCC #5	MCC #5	DISCONNECT SWITCH AT BFV ROOM (BVQ2)	TBD BY CONTRACTOR	
			PL529A4	3/C	#8	1000V	30	480VAC	UNIT 5 BUTTERFLY VALVE HPU PUMP 2 FEEDER	DISCONNECT SWITCH AT BFV ROOM (BVQ4)	UNIT 5 HPU PUMP 2	CONDUIT	
			PL529A5	3/C	#8	1000V	10	480VAC	U5 BUTTERFLY VALVE HPU OIL FILTRATION SYS. FEEDER	DISCONNECT SWITCH AT BFV ROOM (BVQ3)	DISCONNECT SWITCH AT BFV ROOM (FSQ)	TBD BY CONTRACTOR	
			PL529A6	3/C	#8	1000V	30	480VAC	U5 BUTTERFLY VALVE HPU OIL FILTRATION SYS. FEEDER	DISCONNECT SWITCH AT BFV ROOM (FSQ)	OIL CONDITIONER PUMP & HEATER	TBD BY CONTRACTOR	
			PL529B1	7/C	#12	600V	150	125VDC	U5 BUTTERFLY VALVE CONTROL (PLANT 2 INST. BOARD)	PLANT 2 INST. CONTROL PANEL U1TB	UNIT 5 HPU CONTROL PANEL	TRAY A, TRAY B	
			PL529B2	7/C	#12	600V	800	125VDC	UNIT 5 BUTTERFLY VALVE CONTROL (PLANT 1)	UNIT 5 INST. CNTRL PANEL 141B	UNIT 5 HPU CONTROL PANEL	TBD BY CONTRACTOR	
			PL529B3	2C	#12	600V	100	125VDC	UNIT 5 BUTTERFLY VALVE WATER DIFF. PRESSURE SWITCH	UNIT 5 HPU CONTROL PANEL	UNIT 5 SCROLL CASE WATER DIFF. PRESS. SWITCH	TBD BY CONTRACTOR	
			PL529C1	3/C	#12	600V	40	120VAC	UNIT 5 BUTTERFLY VALVE PUMP 1 CONTROL POWER	DISCONNECT SWITCH AT BFV ROOM (BVQ3)	UNIT 5 HPU CONTROL PANEL	TBD BY CONTRACTOR	
			PL529C2	3/C	#12	600V	40	120VAC	UNIT 5 BUTTERFLY VALVE PUMP 2 CONTROL POWER	DISCONNECT SWITCH AT BFV ROOM (BVQ4)	UNIT 5 HPU CONTROL PANEL	TBD BY CONTRACTOR	
			PL529C3	3/C	#12	600V	40	120VAC	U5 BUTTERFLY VALVE HPU OIL FILT. SYS. CONTROL PWR	DISCONNECT SWITCH AT BFV ROOM (FSQ)	UNIT 5 HPU CONTROL PANEL	TBD BY CONTRACTOR	
			PL529D1	7/C	#12	600V	50	125VDC	UNIT 5 BUTTERFLY VALVE OPEN/CLOSE LIMIT SWITCH	UNIT 5 HPU CONTROL PANEL	UNIT 5 BUTTERFLY VALVE POSITION INDICATOR	TBD BY CONTRACTOR	
PL813A1			PL529D2	7C	#12	600V	50	125VDC	U5 BUTTERFLY VALVE MECH. LOCK DEVICE LIMIT SWITCH	UNIT 5 HPU CONTROL PANEL	UNIT 5 BUTTERFLY VALVE MECHANICAL LOCK	TBD BY CONTRACTOR	
PL813A1			PL813A	3C	#12	600V	125	120VAC	PENSTOCK DRAIN HEATER	PP8A	PENSTOCK DRAIN HEATER JUNCTION BOX	VIA PULL BOX 82	
PL813A2	1	5							PENSTOCK DRAIN HEATER	PP8A	PULL BOX 82		
	1	115							PENSTOCK DRAIN HEATER	PULL BOX 82	PENSTOCK DRAIN HEATER JUNCTION BOX		
PL813B1			PL813B	2C	#12	600V	250	120VAC	PENSTOCK DRAIN HEATER THERMOSTAT	PP8A	THERMOSTAT		
PL813B2	1	5							PENSTOCK DRAIN HEATER THERMOSTAT	PP8A	PULL BOX 82	VIA PULL BOX 82	
	1	115							PENSTOCK DRAIN HEATER THERMOSTAT	PULL BOX 82	THERMOSTAT		
									</				

REFERENCE DRAWINGS:

5577.5-H-48	POWER AND CONTROL CABLE SCHEDULE SHEET 8
5577.5-H-49	POWER AND CONTROL CABLE SCHEDULE SHEET 9
5577.5-H-51	POWER AND CONTROL CABLE SCHEDULE SHEET 11
5577.5-H-53	POWER AND CONTROL CABLE SCHEDULE SHEET 13

NOTES:

2. LENGTHS OF CABLES AND CABLE ROUTING ARE LISTED FOR ESTIMATING PURPOSES ONLY. APPROXIMATE LENGTHS ARE PROVIDED AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES. FIELD VERIFY.



**US Army Corps  
of Engineers®**

[illegible]

U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT OMAHA NEBRASKA	DESIGNED BY: K. AMAWA-POKU DATE: JANUARY, 2003 DRAWING NO.: W312BF-23-R-0009	ISSUE DATE: JANUARY, 2003 DRAWING NO.: W312BF-23-R-0009
U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC DESIGN CENTER PORTLAND, OREGON	CHECKED BY: M. GUNDRUM SUBMITTED BY: J. PARKER DATE: JANUARY, 2003	CONTRACT NO.: DRAWING NO.: W312BF-23-R-0009
	P.E. FILE NAME: P.P. FILE NAME: SIZE: FILE NAME: ANSI/FPP-PP-1-006 E-801	

FORT PECK DAM  
MISSOURI RIVER  
POWERHOUSE 2  
PENSTOCK BUTTERFLY VALVES REHAB  
CABLE AND CONDUIT SCHEDULE

SHEET ID

E-801