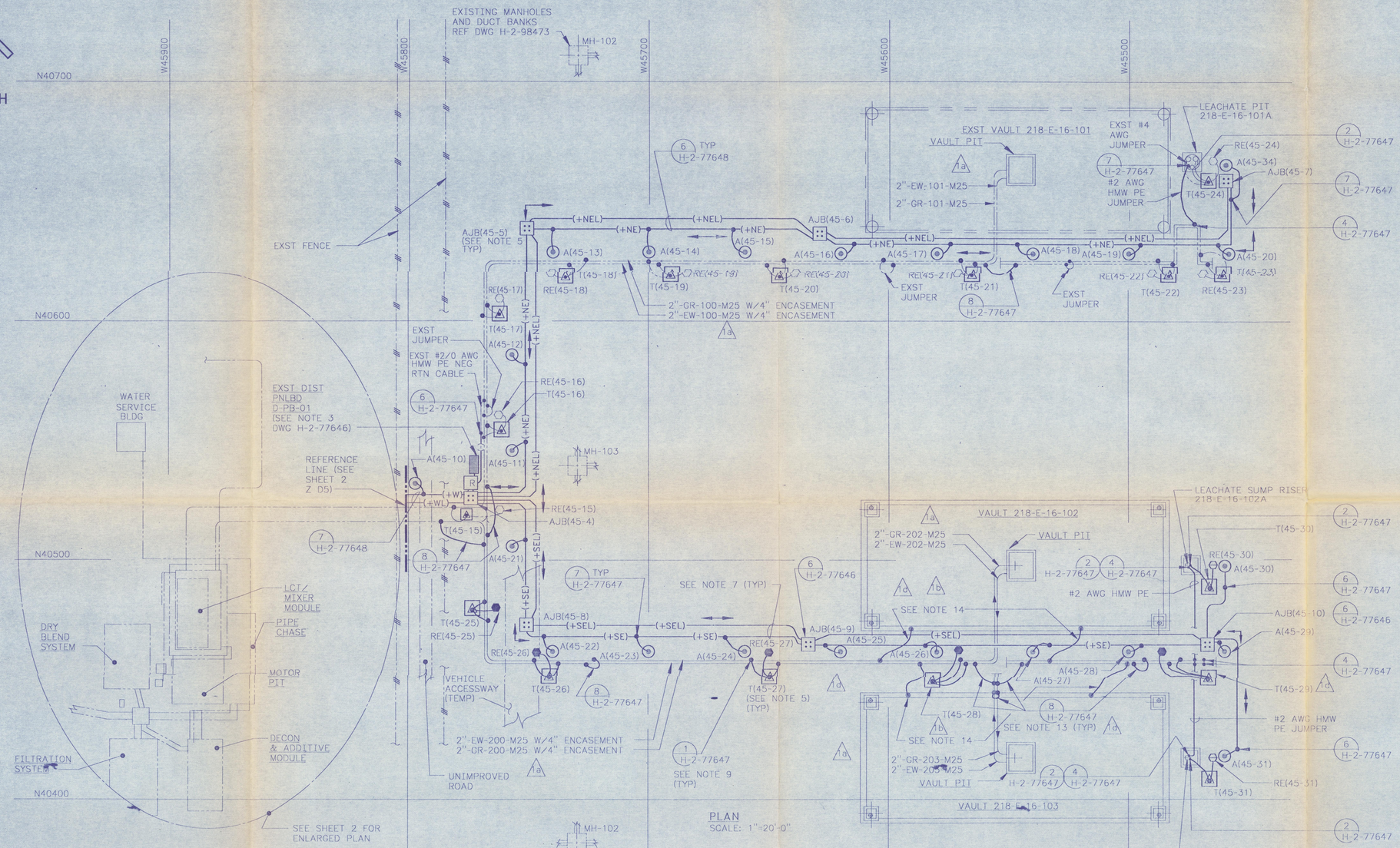
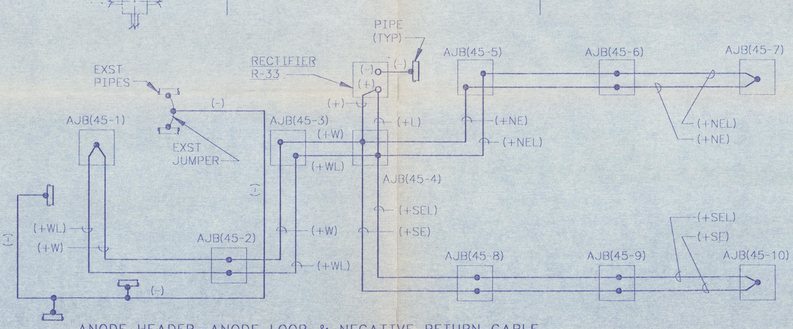


PLAN
SCALE: 1"=20'-0"



ANODE HEADER, ANODE LOOP & NEGATIVE RETURN CABLE CONNECTION DIAGRAM

SYMBOL LIST

SYMBOL	DESCRIPTION (SEE NOTE 1)
	VERTICAL PREPACKAGED ANODE SEE DETAIL 5, DWG H-2-77647
	HORIZONTAL REFERENCE ELECTRODE SEE DETAIL 1, DWG H-2-77648
	REF ELECTRODE, INSTALL VERT AT MID-POINT OF RISER PIPE AND 12 IN. FROM RISER PIPE
	ANODE JUNCTION BOX (AJB) SEE DETAILS 1,2 & 3, DWG H-2-77646 AND NOTE 4
R	RECTIFIER R-33 SEE DETAIL 4, DWG H-2-77646
OR	CABLE MARKER SEE DETAIL 5, DWG H-2-77648 AND NOTE 8
—(+•)—	ANODE HEADER CABLE, # 2 AWG WITH HMW PE INSULATION INSERT APPROPRIATE ABBREVIATION: W=WEST; NE=NORTHEAST; SE=SOUTHEAST
—(+•L)—	ANODE LOOP CABLE, # 2 AWG WITH HMW PE INSULATION INSERT APPROPRIATE ABBREVIATION: W=WEST; NE=NORTHEAST; SE=SOUTHEAST
—(-)—	NEGATIVE RETURN CABLE, # 2 AWG WITH HMW PE INSULATION
	EXISTING
TEST STA ENCLOSURE, TEST STA, PIPE TEST CONDUCTORS	NEW TEST STATION & NEW PIPE TEST CONDUCTORS SEE DETAIL 1, 2 & 3, DWG H-2-77648 AND NOTES 4 & 13
TEST STA ENCLOSURE, TEST STA, REF ELECTRODE, PIPE TEST CONDUCTORS	NEW TEST STATION, EXST PIPE TEST CONDUCTORS & EXST REF ELECTRODES SEE DETAIL 1, 2 & 3, DWG H-2-77648 AND NOTE 3

NOTES:

1. SEE CONSTRUCTION SPECIFICATION B-714-C2 FOR MATERIAL DESCRIPTION AND INSTALLATION INSTRUCTIONS UNLESS OTHERWISE NOTED.
2. ABBREVIATIONS ARE PER ANSI Y1.1 UNLESS OTHERWISE NOTED.
3. REMOVE EXISTING METAL POSTS USED FOR SUPPORT OF EXISTING COILED PIPE TEST CONDUCTORS AND INSTALL TEST STATION ENCLOSURES, APPROXIMATELY WHERE SHOWN DIRECTLY ABOVE POINT OF PIPE TEST CONDUCTOR EARTH EMERGENCE. SEE DWG H-2-98479 & SK-2-44557 FOR DESIGN OF EXISTING INSTALLATION OF PIPE TEST CONDUCTORS AND REFERENCE ELECTRODES.
4. TEST STATION ENCLOSURES T(45-25) THRU T(45-31) AND ANODE JUNCTION BOX ENCLOSURES AJB(45-8), (45-9) & (45-10) SHALL HAVE 25' OF CABLE COILED INSIDE TO PERMIT ENCLOSURES TO BE RAISED TO GRADE LEVEL AT FINAL BACKFILL.
5. ANODE JUNCTION BOX ENCLOSURES AND TEST STATION ENCL SHALL BE LOCATED AT COORDINATES SHOWN IN TABLE EXCEPT THEY MAY BE MOVED IN ANY DIRECTION SUBJECT TO APPROVAL BY THE KEH FIELD ENGINEER. FINAL LOCATION SHALL BE DETERMINED AT TIME OF INSTALLATION.
6. ANODES SHALL BE INSTALLED AT COORDINATES SHOWN IN TABLE EXCEPT THEY MAY BE MOVED IN ANY DIRECTION SUBJECT TO APPROVAL BY THE KEH FIELD ENGINEER.
7. ANODE HEADER AND LOOP CABLES SHALL BE ROUTED DIRECTLY OVER ANODE LOCATIONS WHERE PRACTICABLE.
8. CABLE MARKERS SHALL BE INSTALLED WHERE SHOWN DIRECTLY OVER THE CABLES.
9. EXOTHERMICALLY WELD TWO #6 AWG PIPE TEST CONDUCTORS TO THE PIPE AS SHOWN IN DET 1 & 2 ON H-2-77647. WRAP ONE OF THE PIPE TEST CONDUCTORS WITH WHITE TAPE AND THE OTHER WITH RED TAPE AT TERMINATION IN TEST STATION. EXOTHERMICALLY WELD TWO #6 AWG PIPE TEST CONDUCTORS TO ANY FOREIGN PIPE OR OTHER PIPES AS DIRECTED BY THE KEH FIELD ENGINEER. WRAP EACH OF THE TWO PIPE TEST CONDUCTORS WITH BLUE TAPE AT TERMINATION IN TEST STATION. MAINTAIN A 12 INCH SEPARATION BETWEEN CONDUCTOR CONNECTIONS ON THE PIPE. IDENTIFY EACH PIPE TEST CONDUCTOR PER THE REQUIREMENTS IN CONSTRUCTION SPECIFICATION B-714-C2. SEE DETAILS 1 & 2 ON DWG H-2-77648.
10. CHIP APPROX A 6" DIAMETER AREA OF CONCRETE, 1" DEEP AROUND THE TEST LEADS THAT EMERGE FROM THE CONCRETE SHOWN ON SHEET 2, ZONE C7. CUT THE CONDUCTORS AS CLOSE TO THE CONCRETE AS PRACTICAL, AND FILL CHIPPED AREA WITH GROUT. PAINT NEW GROUT WHITE TO MATCH EXISTING CONCRETE.
11. TAPE END AND COIL THE #2/0 AWG NEGATIVE RETURN CABLE FROM PIPE 2"-W-C1-P01 (2"-SN-621-M25) INSIDE TEST STATION ENCLOSURE T(45-10). SEE SHEET 2, ZONE D6
12. ~~INSTALL CONDUIT SEALING FITTING IN TEST STATION ENCLOSURES T(45-28) AND T(45-29) SIMILAR TO DETAIL 6 ON DWG H-2-77646.~~

(NOTES CONTINUED IN 2 B3)

13. DO NOT CONNECT PIPE TEST CONDUCTORS OR PIPE JUMPERS TO THE PIPE INSIDE ANY PIPE EXPANSION VOID.
14. EXOTHERMICALLY WELD #2 AWG JUMPER CABLE TO TWO (2) STEEL REINFORCING BARS INSIDE OF VAULT WALL.

ANODE LOCATION TABLE
(SEE NOTE 6)

NUMBER	COORDINATES	
A(45-1)	N40532	W45920
A(45-2)	N40532	W45884
A(45-3)	N40484	W45912
A(45-4)	N40444	W45908
A(45-5)	N40425	W40896
A(45-6)	N40427	W45876
A(45-7)	N40462	W45855
A(45-8)	N40502	W45855
A(45-9)	N40532	W45840
A(45-10)	N40532	W45800
A(45-11)	N40547	W45757
A(45-12)	N40585	W45757
A(45-13)	N40631	W45740
A(45-14)	N40631	W45700
A(45-15)	N40631	W45660
A(45-16)	N40631	W45620
A(45-17)	N40631	W45580
A(45-18)	N40631	W45540
A(45-19)	N40631	W45500
A(45-20)	N40631	W45460
A(45-21)	N40506	W45757
A(45-22)	N40458	W45740
A(45-23)	N40458	W45700
A(45-24)	N40458	W45660
A(45-25)	N40458	W45620
A(45-26)	N40458	W45580
A(45-27)	N40458	W45540
A(45-28)	N40458	W45500
A(45-29)	N40458	W45460
A(45-30)	N40494	W45460
A(45-31)	N40414	W45460
A(45-32)	N40550	W45882
A(45-33)	N40514	W45869
A(45-34)	N40666	W45460

ANODE JUNCTION BOX ENCL LOCATION TABLE
(SEE NOTE 5)

NUMBER	COORDINATES	
AJB(45-1)	N40527	W45917
AJB(45-2)	N40428	W45880
AJB(45-3)	N40527	W45852
AJB(45-4)	N40527	W45774
AJB(45-5)	N40632	W45760
AJB(45-6)	N40632	W45630
AJB(45-7)	N40660	W45470
AJB(45-8)	N40465	W45760
AJB(45-9)	N40465	W45640
AJB(45-10)	N40465	W45473

TEST STATION ENCLOSURE LOCATION TABLE
(SEE NOTE 5)

NUMBER	COORDINATES	
T(45-25)	N40480	W45773
T(45-26)	N40446	W45740
T(45-27)	N40446	W45650
T(45-28)	N40446	W45575
T(45-29)	N40446	W45473
T(45-30)	N40492	W45473
T(45-31)	N40424	W45473

DRAWING TRACEABILITY LIST

NUMBER	TITLE
SK-2-44557	ELEC CATH PROT TEST WIRE INSTALLATION
H-2-98479	ELEC CATH PROT TEST WIRE INSTALLATION

REFERENCES

NUMBER	TITLE
H-2-98880	SITE GRADING/PAVING PLAN
H-2-98807 SH 1 - SH 3	INTERCONNECTING PIPE CHASE PLANS, SECTIONS & DETAILS
H-2-98842	MODULE INTCON PIPING SECT & DET
H-2-58473	ELEC SITE & VAULT PLANS & DET
H-2-76455	CIVIL SITE PLAN
H-2-98837	MODULE INTCON PIPING LAYOUT
H-2-98610	ELEC DUCT BANK SITE PLAN LAYOUT
H-2-98806	CONCRETE ENCASEMENT FOR UGND PIPE
H-2-76525	ELEC CATH PROT PLANS & DETAILS
SK-2-44557	ELEC CATH PROT TEST WIRE INSTL
H-2-98479	ELEC CATH PROT TEST WIRE INSTL
H-2-77573	DRAWING LIST

NEXT USED ON H-2-77573

DOES NOT CONTAIN CLASSIFIED OR UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION

Designing Official/AOC
Kaiser Engineers Hanford Company
11-26-90
Date

CHARLES L. SUBLETT, STATE OF WASHINGTON, 14516, REGISTERED PROFESSIONAL ENGINEER
12-12-90
Rev 1

IMPACT LEVEL 3

EDT# 101089

REV	BY-DATE	BY-DATE	ECO	REV BY DATE	DESCRIPTION
M	JR 12/13/90	JR 12-13-90			a)B-714-42 b)B-714-30 b)B-714-17 a)B-714-14 THRU B-714-61 GEN. REV; INCORP ALL ECN'S
RS1		RH 12-14-90	6-18-90		

APPROVAL: WHC; KEH APPROVAL

REVISIONS

MICROFILMED

COMMENT REVIEW

		DATE
WHC APPROVAL		
BY	MD NORTHY	11-4 1988
PROJ ENGR	JD CLOUD	11-4 1988
QA	JE BREED	8-3 1988
APPROVED BY	RM TIEN	8-3 1988
SAFETY	D PARTHREE	8-1 1988
APPROVED BY ARS	C SUBLETT	8-1 1988
CHECKED BY	GP MCDONALD	7-28 1988
DRAWN BY	JL BRINKLEY	6-13 1988
DESIGNED BY	WC ATKINS	5-10 1988

CAD FILE: B077645A
CAD CODE: 2J:SUN:ACD2:10.0:NN

U.S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
KAISER ENGINEERS HANFORD COMPANY

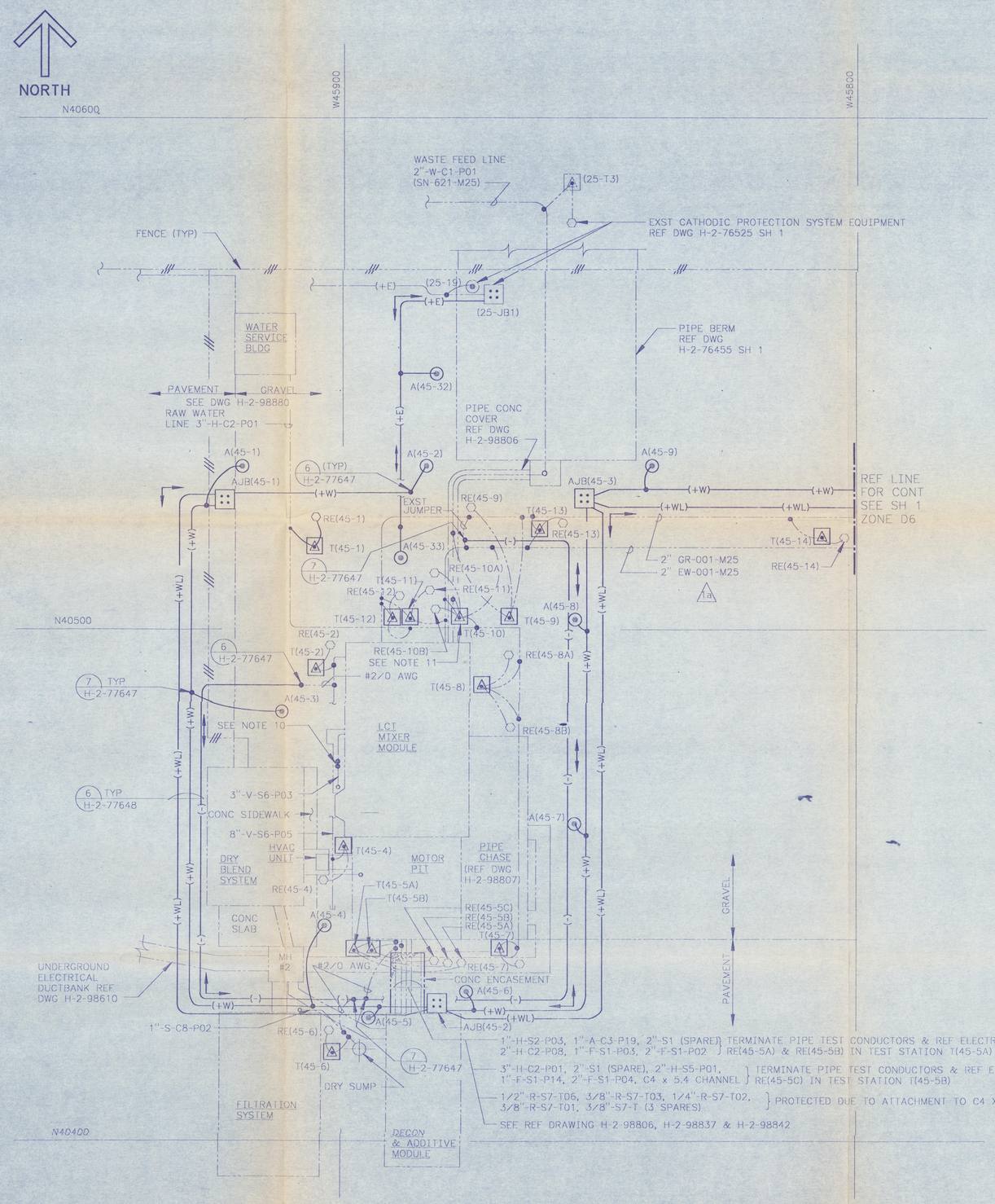
M ELECTRICAL CATHODIC PROTECTION PLAN

PROJECT TITLE: GROUT VAULT PAIR 218-E-16-102 & 103

PROJ: B-714 | WO: ER1060 | JOB:
SCALE: SHOWN | BLDG: 218-E-16 | INDEX: 7801
DRAWING NUMBER: H-2-77645 | SHEET 1 OF 2 | REV 1

KEHCAD

00112512 1of2



1"-H-S2-P03, 1"-A-C3-P19, 2"-S1 (SPARE), 2"-H-C2-P08, 1"-F-S1-P03, 2"-F-S1-P02 } TERMINATE PIPE TEST CONDUCTORS & REF ELECTRODES LEADS RE(45-5A) & RE(45-5B) IN TEST STATION T(45-5A)

3"-H-C2-P01, 2"-S1 (SPARE), 2"-H-S5-P01, 1"-F-S1-P14, 2"-F-S1-P04, C4 x 5.4 CHANNEL } TERMINATE PIPE TEST CONDUCTORS & REF ELECTRODE LEAD RE(45-5C) IN TEST STATION T(45-5B)

1/2"-R-S7-T06, 3/8"-R-S7-T03, 1/4"-R-S7-T02, 3/8"-R-S7-T01, 3/8"-S7-T (3 SPARES) } PROTECTED DUE TO ATTACHMENT TO C4 X 5.4 CHANNEL.

SEE REF DRAWING H-2-98806, H-2-98837 & H-2-98842

PLAN
SCALE: 1"=10'-0"

PIPES CATHODICALLY PROTECTED BY PROJECT B-714		
PIPE SIZE & IDENTIFICATION	USE	ASSOCIATED TEST STATON
3"-H-C2-P01	RAW WATER	T(45-1), T(45-12), T(45-10), T(45-8) T(45-7), T(45-5B)
2"-H-C2-P08	RAW WATER	T(45-5A)
1"-A-C3-P19	COMPRESSED AIR	T(45-5A)
2"-S1	SPARE	T(45-5B)
2"-S1	SPARE	T(45-5A)
1"-F-S1-P03	DECON SOLUTION	T(45-5A)
2"-F-S1-P02	DECON SOLUTION	T(45-5A)
1"-F-S1-P14	DECON SOLUTION	T(45-5B)
2"-F-S1-P04	DECON SOLUTION	T(45-5B)
1"-H-S2-P03	RAW WATER	T(45-5A)
2"-H-S5-P01	RAW WATER	T(45-5B)
3/8"-S7-T	3 SPARE	T(45-5B)
3/8"-R-S7-T01	ADDITIVES	T(45-5B)
1/4"-R-S7-T02	ADDITIVES	T(45-5B)
3/8"-R-S7-T03	ADDITIVES	T(45-5B)
1/2"-R-S7-T06	ADDITIVES	T(45-5B)
1"S-C8-P02	VENTILATION	T(45-6)
8"V-S6-P05	VENTILATION	T(45-2),T(45-4)
4"/2" GR-001-M25 & 4"/2" GR-100-M25	GROUT DISCHARGE (VAULT 101)	T(45-12), T(45-11), T(45-9), T(45-13), T(45-14), T(45-15), T(45-16), T(45-17), T(45-18), T(45-19), T(45-20), T(45-21), T(45-22), T(45-23)
4"/2" EW-001-M25 & 4"/2" EW-100-M25	EXCESS WATER (VAULT 101)	T(45-10), T(45-11), T(45-13), T(45-14), T(45-16), T(45-17), T(45-18), T(45-19), T(45-20), T(45-21), T(45-22), T(45-23)
4"/2" GR-200-M25	GROUT DISCHARGE (VAULT 102)	T(45-25), T(45-26), T(45-27), T(45-28), T(45-29)
4"/2" EW-200-M25	EXCESS WATER (VAULT 102)	T(45-25), T(45-26), T(45-27), T(45-28), T(45-29)
LEACHATE TK 101 18" RISER PIPES	LEACHATE COLLECTION	T(45-24)
LEACHATE TK 101 4" RISER PIPE	LEACHATE COLLECTION	T(45-24)
LEACHATE TK 102 26" RISER PIPE	LEACHATE COLLECTION	T(45-30)
LEACHATE TK 103 26" RISER PIPE	LEACHATE COLLECTION	T(45-31)

NOTE:

1. SEE SHEET 1 FOR NOTES, SYMBOL LIST AND REFERENCE DRAWINGS.

DOES NOT CONTAIN CLASSIFIED OR UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION

Reviewing Official/ADC
Kaiser Engineers Hanford Company
11-26-90
Date

CHARLES L. SUBLETT
STATE OF WASHINGTON
14598
REGISTERED
PROFESSIONAL ENGINEER
12-12-90 Rev 1

M	LR 11/13/90	KEH 11/13/90	JM 11/13/90	VA 11-26-90	
MICROFILMED	BY-DATE	BY-DATE			
	WHC APPROVAL	KEH APPROVAL	ECN NUMBER	REV BY DATE	DESCRIPTION
					REVISIONS
	COMMENT REVIEW				

NUMBER	TITLE
DRAWING TRACEABILITY LIST	

NUMBER	TITLE
DRAWING LIST	
REFERENCES	
NEXT USED ON	

bJB-714-42,2C3			
aJB-714-14,2D5,D3			
THRU B-714-61			
GENL REV; INCORP ALL ECN'S			RS 1

EDT# 101089			
WHC APPROVAL	DATE		
BY MD NORTHY	11-4 1988		
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CHECKED BY CP MCDONALD	7-29 1988		
DRAWN BY JL BRINKLEY	6-14 1988		
DESIGNED BY WC ATKINS	6-10 1988		
CAD FILE B077645B			
CAD CODE 2U:SUN:ACD2:10.0:NN			

IMPACT LEVEL 3

U.S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE

KAISER ENGINEERS HANFORD COMPANY

M ELECTRICAL CATHODIC PROTECTION PLAN

PROJECT TITLE: CROUT VAULT PAIR 218-E-16-102 & 103

PROJ	WO	JOB
B-714	ER1060	

SCALE	BLDG	INDEX
SHOWN	218-E-16	7801

DRAWING NUMBER	SHEET	OF	REV
H-2-77645	2	2	1

KEHCAD

01251R
2 of 2