START

0013679

ENGINEERING CHANGE NOTICE

Page 1 of 11

1. ECN 131382

Proj. ECN B-714-77

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.		4 Date
Supplemental ■	A.R. SNOWHITE, KEH, E6-32, 6-6033		2-11-91
Direct Revision ☐	5 Project Title/No./Work Order No.	6. Bldg./Sys./Fac. No.	7 Impact Level
Change ECN ☐	SEE BLOCK 12	218-E-16	3
Temporary ☐	8 Document Number Affected (include rev. and sheet no.)	9. Related ECN No(s).	10. Related PO No
Supersedure ☐	SEE BLOCK 12	NONE	N/A
Discovery ☐			
Cancel/Void ☐			

11a. Modification Work	11b. Work Package Doc. No.	11c. Complete Installation Work	11d. Complete Restoration (Temp. ECN only)
☐ Yes (fill out Blk. 11b)	UNKNOWN	Cog. Engineer Signature & Date	Cog. Engineer Signature & Date
☐ No (NA Blks. 11b, 11c, 11d) UNK			

12. Description of Change

Block 5: B-714, GROUT VAULT PAIR (218-E-16-102 & 103)(218-E-16-104 & 105)/ER8007
Block 8: SPECIFICATION B-714-C2, REV 1 (V-B714C2-003) sjc 2/27/91
See pages 5 thru 8 of this ECN for changes.

DRAWINGS:

H-2-77623, SH 1, REV 0	H-2-78494, SH 1, REV 0
H-2-77636, SH 2, REV 1	H-2-78510, SH 1, REV 1
H-2-77640, SH 1, REV 1	H-2-78511, SH 1, REV 1
H-2-77641, SH 1, REV 1	H-2-78515, SH 1, REV 0
H-2-77645, SH 1, REV 1	
H-2-77645, SH 2, REV 1	
H-2-77647, SH 1, REV 0	

MAY 1991 RECEIVED EDMC

****
SEE SUCCEEDING PAGES FOR DESCRIPTION OF CHANGES
****

BLOCK 13b. CONTINUED:
(DI): Functional test of each reference electrode requested by WHC as noted in comments to cathodic protection ATP (Item 12B3-6). Part was discontinued after original design completed (Item 1,2).
(DE): (Item 4, 6B, 7, 8, 11, 12B1, 12B2, 12B7, 12B8)

13a. Justification (mark one)	13b. Justification Details
Criteria Change ■	(CC): Circuit breaker size changed due to single phase loads in PIH/Vault Exhauster (Item 3,5,9,12A). (DI): Termination of cathodic protection cable connected to vault re-bar reconnected from pipe to terminals in test station to permit testing of soil to structure & permit future connection to cathodic protection system if necessary (Item 6A, 10). **ADDITIONAL JUSTIFICATION CONTINUED IN BLOCK 12.**
Design Improvement ■	
Environmental ☐	
As-Found ☐	
Facilitate Const. ☐	
Const. Error/Omission ☐	
Design Error/Omission ■	

14. Distribution (include name, MSIN, and no. of copies)

EDC

KEH DISTRIBUTION		J. K. Epperley	S0-05
Const Doc Cntl	E2-50	O. A. Halverson	R3-09
Engrg Doc Cntl	E6-52	J. S. Hill [2]	H4-57
		K. S. McCullough	N1-83
WHC DISTRIBUTION		D. B. Powell [4]	R4-03
Project Files	R1-28	J. E. Vanbeek	R3-27
S. R. Briggs(PE)	R3-27	CDWS #10	A3-27
T. K. Cordray	S1-54	DOE	
L. GARZA	A3-80	A. G. Lassila	A5-18

RELEASE STAMP

34

OFFICIAL RELEASE BY WHC
DATE MAR 0 1 1991
Sta # 2

A-7900-013 (11/88)

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): B-714-77

15. Design Verification Required	16. Cost Impact		17. Schedule Impact (days)
	ENGINEERING	CONSTRUCTION	
■ Yes	Additional ☒ $ 3080.60	Additional ☒ $ 6500	Improvement ☐ N/A
☐ No	Savings ☐ $	Savings ☐ $	Delay ☐

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	☐	Seismic/Stress Analysis	☐	Tank Calibration Manual	☐
Functional Design Criteria	☐	Stress/Design Report	☐	Health Physics Procedure	☐
Operating Specification	☐	Interface Control Drawing	☐	Spares Multiple Unit Listing	☐
Criticality Specification	☐	Calibration Procedure	☐	Test Procedures/Specification	☐
Conceptual Design Report	☐	Installation Procedure	☐	Component Index	☐
Equipment Spec.	☐	Maintenance Procedure	☐	ASME Coded Item	☐
Const. Spec.	☐	Engineering Procedure	☐	Human Factor Consideration	☐
Procurement Spec.	☐	Operating Instruction	☐	Computer Software	☐
Vendor Information	☐	Operating Procedure	☐	Electric Circuit Schedule	☐
OM Manual	☐	Operational Safety Requirement	☐	ICRS Procedure	☐
FSAR/SAR	☐	IEFD Drawing	☐	Process Control Manual/Plan	☐
Safety Equipment List	☐	Cell Arrangement Drawing	☐	Process Flow Chart	☐
Radiation Work Permit	☐	Essential Material Specification	☐	Purchase Requisition	☐
Environmental Impact Statement	☐	Fac. Proc. Samp. Schedule	☐		☐
Environmental Report	☐	Inspection Plan	☐		☐
Environmental Permit	☐	Inventory Adjustment Request	☐		☐

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision

20. Approvals

OPERATIONS AND ENGINEERING	Signature	Date
Cog./Project Engineer	J.E. Von Bach for SR Briggs	2/26/91
Cog./Project Engr. Mgr.	J.E. Von Bach	2/26/91
QA	J.K. Chenhay	2/26/91
Safety		
Security		
Proj.Prog./Dept. Mgr.		
Def. React. Div.		
Chem. Proc. Div.		
Def. Wst. Mgmt. Div.		
Adv. React. Dev. Div.		
Proj. Dept.		
Environ. Div.		
IRM Dept.		
Facility Rep. (Ops)		
Other		

ARCHITECT-ENGINEER	Signature	Date
PE	K.C. Burgard	2/25/91
QA	T.D. Lang / F.C. Gelle	2-23-91 / 2-21-91
Safety	D. Lundgren	2-21-91
Design INSTM:	H.J. Stoffano	2/13/91
Other ELEC:	C. Aubert for A.R. SNOWHITE	2-12-91
SPECS:	W.A. Lyellhay	2/15/91
ENVIR:	R. Hollenbeck	2-19-91
PLE:	[illegible]	2-25-91
DEPARTMENT OF ENERGY		
ADDITIONAL		

INSTRUMENTATION CHANGES TO DRAWINGS

1) H-2-77623, SH 1, REV 0
PARTS LIST (ZE1-2): Change PN 14 Description & Matl/Ref as follows
from 12"x10"x10" to 12"x12"x8"
from #WAB121010-99 to #WAB121208-99

2) H-2-78494, SH 1, REV 0
PARTS LIST (ZE1-2): Change PN 14 Description & Matl/Ref as follows
from 12"x10"x10" to 12"x12"x8"
from #WAB121010-99 to #WAB121208-99

ELECTRICAL CHANGES TO DRAWINGS

3) H-2-77636, SH 2, REV 1
ONE-LINE DIAGRAM (ZA7, D7): Change rating of feeder circuit breaker to PIH as follows (typ 2 places)

from 225AF/150AT to 225AF/175AT

4) H-2-77640, SH 1, REV 1
ELEMENTARY DIAGRAM (ZE8): Modify - see page 9 of this ECN.

5) H-2-77641, SH 1, REV 1
GWD 110 (ZC5): Change "TO" column from 225KVA TRANSFORMER to VAULT TRANSFORMER

6) H-2-77645, SH 1, REV 1
A) PLAN (ZC3-5): Modify - see page 10 of this ECN.

B) TEST STA ENCL LOCATION TABLE (ZA7): Add the following

T(45-1)	N40515	W45905

7) H-2-77645, SH 2, REV 1
PLAN (ZD7): Above Test Station (45-1) Change

⬡ RE(45-1) to ⬢ RE(45-1)

8) H-2-77647, SH 1, REV 0
TABLE I (ZE-F3): Change PIPE SIZE to PIPE OR REBAR SIZE and Add the following

#2	#10 REBAR	XJE-581V w/PACKING KIT PN B-144B	115

ELECTRICAL CHANGES TO DRAWINGS CONTINUED

9) H-2-78510, SH 1, REV 1
ONE-LINE DIAGRAM (ZD5): Change rating of feeder circuit breaker to PIH as follows

from 225AF/150AT to 225AF/175AT

10) H-2-78511, SH 1, REV 1
PLAN (ZC4-5): Modify - see page 11 of this ECN.

11) H-2-78515, SH 1, REV 0
TABLE I (ZE-F3): Change PIPE SIZE to PIPE OR REBAR SIZE and Add the following:

#2	#10 REBAR	XJE-581V w/PACKING KIT PN B-144B	115

12) SPECIFICATION B-714-C2, REV 1

A) SECTION 16300, para 2.2.2.2.c: Change "(1) 225AF, 150AT, 3P" to "(1) 225AF, 175AT, 3P"

B) SECTION 16640:

1. PARA 1.2.3: Change "pipe wall by" to "pipe wall or reinforcing steel by"

2. PARA 1.2.4: Change "vertical pipe." to "vertical pipe or reinforcing steel."

3. PARA 2.1.10: Change to read
Wiremakers: Imprinted tubular plastic or imprinted plastic tags securely fastened to conductor with plastic wire ties.

4. PARA 3.3.7.2: Change to read
Soak in water for minimum 3 hours, then install as shown on Drawings.

5. PARA 3.3.7.3: Change to read
Install package between 6 and 18 inches below outer surface of pipe. KEH will assist in positioning reference electrodes.

6. PARA 3.3.7.5: Change to read
Repair damaged lead wire insulation with 2 half-lapped layers of electrical splice insulating tape and 2 half-lapped layers of plastic insulating tape.

7. PARA 3.3.8.3: Change to read
Pipe or reinforcing steel test conductors

8. PARA 3.3.8.3.a: Change 3rd and 4th sentence as follows
.... each pipe or reinforcing steel and file .... test conductor to pipe or reinforcing steel in accordance with ...

9. ADD new para as follows:
3.4.1.5 See Apppendix A for functional test of reference electrodes.

10. ADD Appendix A as shown on page 6 thru 8 of this ECN.

APPENDIX A

FUNCTIONAL TEST OF REFERENCE ELECTRODES

1.0 PURPOSE: This procedure provides functional test for reference electrodes used for testing of cathodic protection system.

2.0 TOOLS, EQUIPMENT, AND MATERIALS

2.1 Digital multimeter.

2.2 Portable copper-copper sulfate reference electrode.

2.3 7/16 inch nutdriver.

2.4 Channelocks.

3.0 INSTRUCTIONS

NOTE: Perform test after installation of pipe test conductors, reference electrodes, and test stations preferably before backfill.

3.1 Method 1

NOTE: Use Method 1 when there is one reference electrode connected to single test station. Use Method 2, Step 3.2, for 2 reference electrodes connected to single test station.

3.1.1 Connect voltmeter (-) test lead to lead wire from reference electrode.

3.1.2 Connect voltmeter (+) test lead to associated pipe test conductor.

3.1.3 Read and record polarity and voltage on attached Data Sheet.

3.1.4 Place portable reference electrode approximately 12 inches from reference electrode noted in Step 3.1.1 or on ground directly above it.

3.1.5 Remove voltmeter (-) test lead from reference electrode and connect to portable reference electrode lead wire.

3.1.6 Read and record voltage and polarity on attached Data Sheet.

3.1.7 Compare values obtained in Steps 3.1.3 and 3.1.6. If difference between measurements is less than 50 mV, reference electrode is ok. If difference is equal to or greater than 50 mV, replace reference electrode and repeat steps for Method 1.

3.2 Method 2

3.2.1 Connect voltmeter (-) test lead to lead wire from Reference Electrode 1.

3.2.2 Connect voltmeter (+) test lead to associated pipe test conductor.

3.2.3 Read and record polarity and voltage on attached Data Sheet.

3.2.4 Remove voltmeter (-) test lead from Reference Electrode 1 and connect to lead wire from Reference Electrode 2.

3.2.5 Read and record polarity and voltage on attached Data Sheet.

3.2.6 Compare values obtained in Steps 3.2.3 and 3.2.5. If difference between measurements is less than 50 mV, reference electrodes are ok. If difference is equal to or greater than 50 mV, test each reference electrode using Method 1.

3.3 Repeat Step 3.1 or 3.2 for each reference electrode at test stations.

3.4 Disconnect and remove test equipment.

4.0 RESTORATION

4.1 Report deficiencies or probable cause of early failure to KEH for corrective action.

5.0 DISPOSITION

5.1 Return attached Data Sheet to KEH.

*DATA SHEET

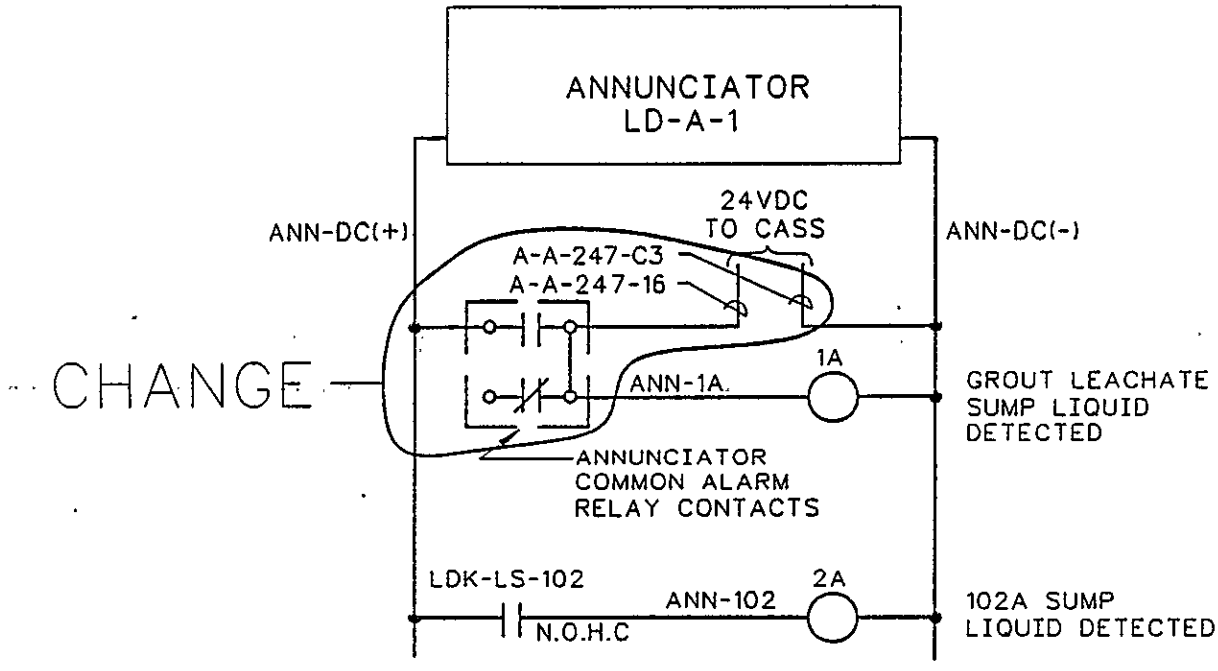
LOCATION: _____

TEST STATION	REFERENCE ELECTRODE	POTENTIAL (VOLTS)	DIFFERENCE (VOLTS)	LOCATION/ COMMENTS	QUALITY CONTROL
	REF ELEC 1				
	REF ELEC 2				
	PORTABLE REF ELEC				
	REF ELEC 1				
	REF ELEC 2				
	PORTABLE REF ELEC				
	REF ELEC 1				
	REF ELEC 2				
	PORTABLE REF ELEC				
	REF ELEC 1				
	REF ELEC 2				
	PORTABLE REF ELEC				
	REF ELEC 1				
	REF ELEC 2				
	PORTABLE REF ELEC				
	REF ELEC 1				
	REF ELEC 2				
	PORTABLE REF ELEC				

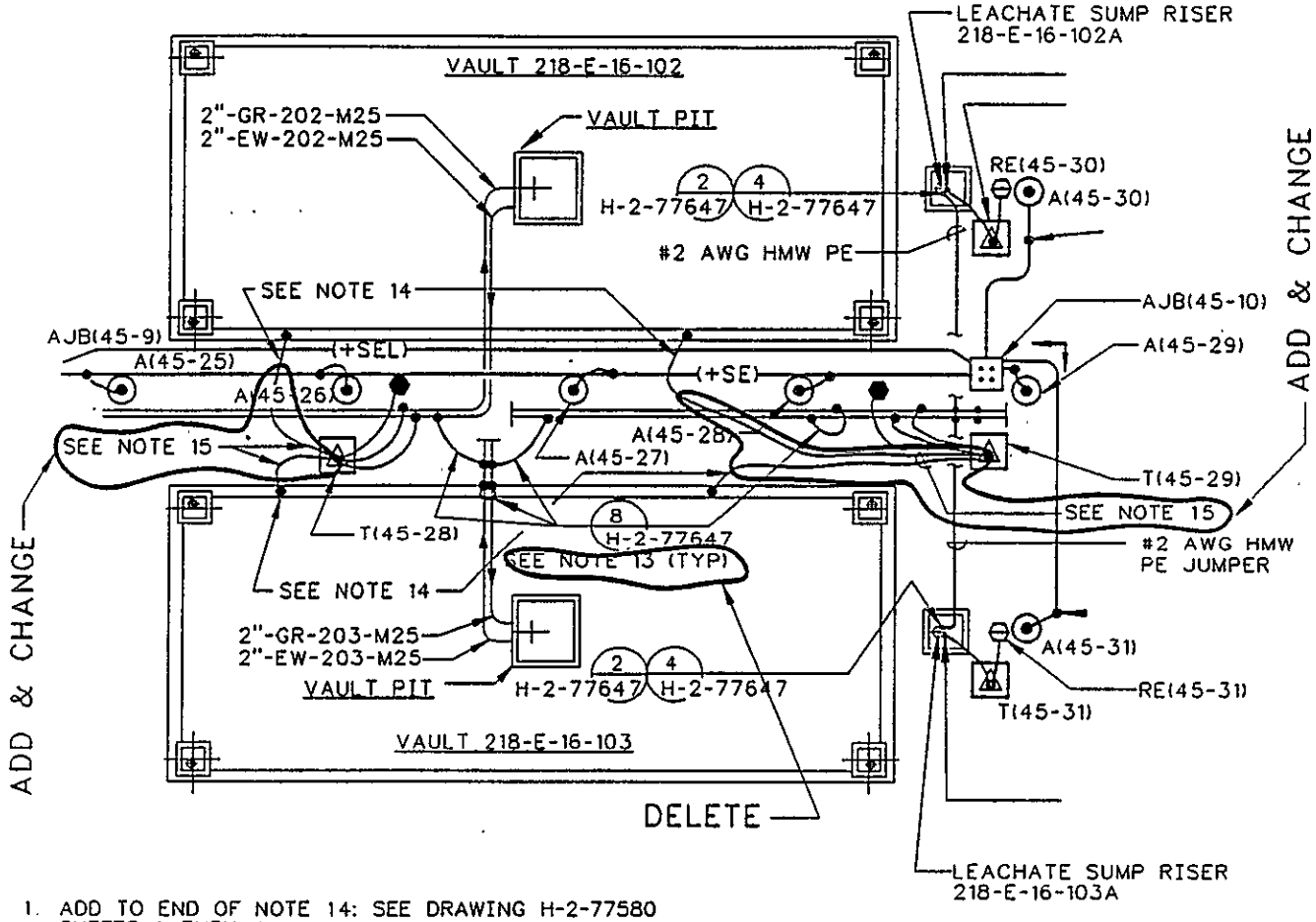
WORK PERFORMED BY: _____ DATE: _____

*NOTE: Obtain additional Sheets from KEH.

KAISER ENGINEERS HANFORD	ENGINEERING CHANGE NOTICE SKETCH					
Ref. Dwg. H-2-77640	Sh. 1	Rev. 1	Prepared By AR SNOWHITE	Checked By C Dubletz	ECN No. B-714-77	Page 9/11



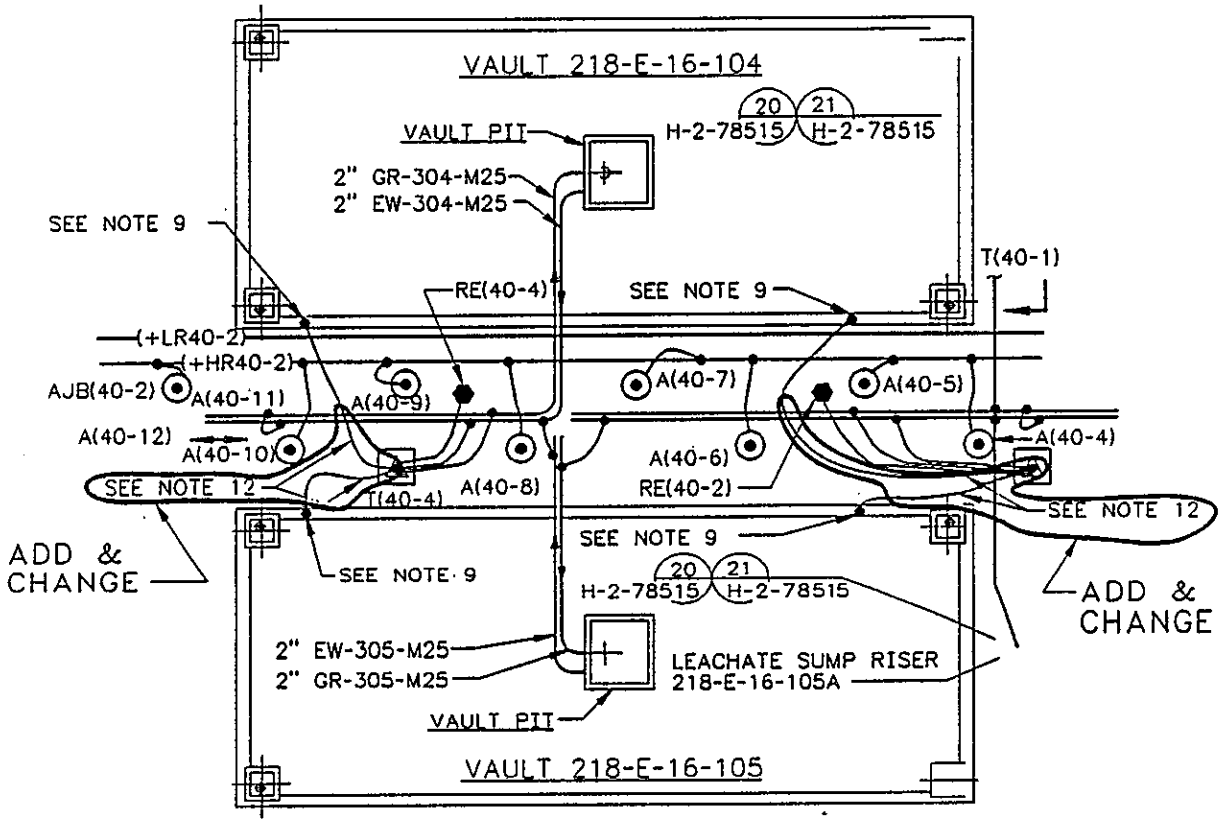
KAISER ENGINEERS HANFORD	ENGINEERING CHANGE NOTICE SKETCH					
Ref. Dwg. H-2-77645	Sh. 1	Rev. 1	Prepared By TE COYNE	Checked By A. R. Snowhite	ECN No. B-714-77	Page 10/11



1. ADD TO END OF NOTE 14: SEE DRAWING H-2-77580 SHEETS 1 THRU 4.

2. ADD NOTE 15 AS FOLLOWS: CONNECT END OF JUMPER CABLE FROM VAULT 102 TO TEST STATION TERMINAL #3, AND JUMPER CABLE FROM VAULT 103 TO TEST STATION TERMINAL #4.

KAISER ENGINEERS HANFORD	ENGINEERING CHANGE NOTICE SKETCH					
Ref. Dwg. H-2-78511	Sh. 1	Rev. 1	Prepared By TE COYNE	Checked By A. R. Snowhite	ECN No. B-714-77	Page 11/11



ADD NOTE 12 AS FOLLOWS: CONNECT END OF JUMPER CABLE FROM VAULT 104 TO TEST STATION TERMINAL #3, AND JUMPER CABLE FROM VAULT 105 TO TEST STATION TERMINAL #4.