

**ENGINEERING REPORT
FOR
SUBMISSION TO THE WASHINGTON STATE
DEPARTMENT OF HEALTH**

**TEMPORARY SANITARY WASTEWATER HOLDING
SYSTEM FOR CONSTRUCTION MANAGEMENT
SUPPORT TRAILERS FOR THE EFFLUENT
TREATMENT FACILITY**

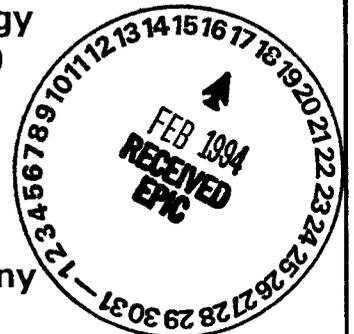
PROJECT C-018H

November 1993

**For the U.S. Department of Energy
Contract DE-AC06-87RL10900**

Prepared by

**Kaiser Engineers Hanford Company
Richland, Washington**



C018H-WSER

***KAISER ENGINEERS
HANFORD***

Date Received: 12/1/93 MB	INFORMATION RELEASE REQUEST ORIGINAL	Reference: WHC-CM-3-4	
Complete for all Types of Release			
Purpose <input type="checkbox"/> Speech or Presentation <input type="checkbox"/> Full Paper (Check only one suffix) <input type="checkbox"/> Summary <input type="checkbox"/> Abstract <input type="checkbox"/> Visual Aid <input type="checkbox"/> Speakers Bureau <input type="checkbox"/> Poster Session <input type="checkbox"/> Videotape		<input type="checkbox"/> Reference <input checked="" type="checkbox"/> Technical Report <input type="checkbox"/> Thesis or Dissertation <input type="checkbox"/> Manual <input type="checkbox"/> Brochure/Flier <input type="checkbox"/> Software/Database <input type="checkbox"/> Controlled Document <input type="checkbox"/> Other	
ID Number (include revision, volume, etc.) WHC-SD-C018H-ER-006 Rev. 0		List attachments.	
Date Release Required 8/31/93 12/1/93 12/10/93			
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Legal - General Counsel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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WHC Program/Project	<input checked="" type="checkbox"/>	<input type="checkbox"/>	J. J. Noble <i>J. J. Noble</i> 8/30/93
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Other Program/Project	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>Pat telecon</i> 12/13/93
Information conforms to all applicable requirements. The above information is certified to be correct.			
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Transmit to DOE-HQ/Office of Scientific and Technical Information	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Author/Requestor (Printed/Signature)		Date	
A. K. Vogt <i>A. K. Vogt</i>		8/27/93	
Intended Audience	<input type="checkbox"/> Internal <input type="checkbox"/> Sponsor <input checked="" type="checkbox"/> External		
Responsible Manager (Printed/Signature)		Date	
J. J. Noble <i>J. J. Noble</i>		8/27/93	Date Cancelled Date Disapproved

Sta 10
DEC 16 1993

23

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 150443

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Evaporator Condensate Treatment Project	4. Related EDT No.: NA
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(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Impact Level	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-C018H-ER-006		0	Engineering Report, Temporary Sanitary Wastewater Holding System for Construction Management Support Trailers for the Effluent Treatment Facility	4E	2	1	

16. KEY					
Impact Level (F)		Reason for Transmittal (G)		Disposition (H) & (I)	
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Reason	Disp.									Reason	Disp.
		Cog. Eng. A.K. Vogt <i>A.K. Vogt</i> 8/30/93 24-94									
		Cog. Mgr. J. J. Noble <i>J.J. Noble</i> 8/30/93 24-94									
		QA									
		Safety									
		Env. K. A. Giese <i>K.A. Giese</i> 11/24/93									

18. <i>A.K. Vogt</i> Signature of EDT Originator Date: 8/30/93	19. _____ Authorized Representative Date for Receiving Organization	20. <i>J.J. Noble</i> Cognizant/Project Engineer's Manager Date: 8/30/93	21. DOE APPROVAL (if required) Ltr. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
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SUPPORTING DOCUMENT

1. Total Pages **34**

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Engineering Report, Temporary Sanitary Wastewater Holding System for Construction Management Support Trailer for the Effluent Treatment Facility

3. Number

WHC-SD-C018H-ER-006

4. Rev No.

0

5. Key Words

Sanitary Wastewater, Holding Tanks, Project C-018H, Effluent Treatment Facility, Engineering Report

6. Author

Name: A. K. Vogt

Signature *[Handwritten Signature]*

8/27/93

24350/

Organization/Charge Code APM18

7. Abstract

This document in the Engineering Report for submittal to the Washington State Department of Health as required by the Washington Administrative Code 246-272.

~~8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed.~~

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10. RELEASE STAMP

OFFICIAL RELEASE

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BY WHC

DATE

DEC 16 1993

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9. Impact Level 4E

**APPROVED FOR
PUBLIC RELEASE**

M. Boston 12/13/93

Information Release Administration

C018H-WSER

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FOR
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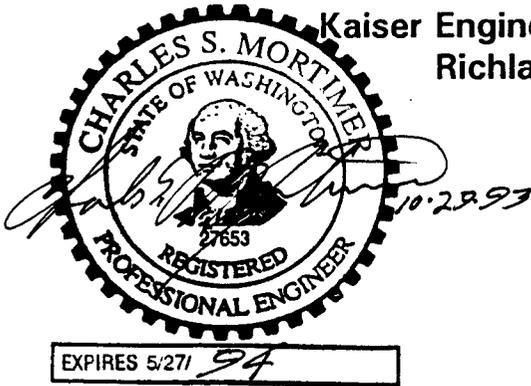
FOR

**TEMPORARY SANITARY WASTEWATER HOLDING
SYSTEM FOR CONSTRUCTION MANAGEMENT SUPPORT
TRAILERS FOR THE EFFLUENT TREATMENT FACILITY**

PROJECT C-018H

Prepared by

Kaiser Engineers Hanford Company
Richland, Washington



<u><i>Charles S. Mortimer</i></u>	<u>10-29-93</u>	<u><i>Judith L. Buchanan</i></u>	<u>10-20-93</u>
Principal Lead Engineer	Date	Technical Documents	Date
<u><i>S. Schulz</i></u>	<u>10-29-93</u>	<u><i>John D. Goff</i></u>	<u>10-29-93</u>
Safety Engineering	Date	Environmental Engineering	Date
<u><i>T.D. Day</i></u>	<u>11-1-93</u>	<u><i>J.P. [Signature]</i></u>	<u>10/29/93</u>
Quality Engineering	Date	Project Manager	Date

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- Appendix B. Site Plan
- Appendix C. Holding Tank and Details
- Appendix D. Alarm Panel and Details
- Appendix E. Telephone Conference Memo 81173-92-084

**ENGINEERING REPORT
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**TEMPORARY SANITARY WASTEWATER HOLDING
SYSTEM FOR CONSTRUCTION MANAGEMENT
SUPPORT TRAILERS FOR THE EFFLUENT
TREATMENT FACILITY**

PROJECT C-018H

I. GENERAL PLAN

The proposed sanitary wastewater holding system serves two double-wide construction support trailers through the completion of project C-018H construction in late 1994. These trailers provide office space for the construction management personnel supporting the project C-018H, "Effluent Treatment Facility." The trailers will be removed from the site when construction is completed. The holding tank system will then be decontaminated and decommissioned.

A. WATER SOURCE

The potable water supply is connected to the 200-East Area treatment facility. The public water supply system is operated by the operating contractor. Raw water is piped from the Columbia River to the treatment plant for disinfection and treatment. There are no water production wells within 5 miles of the holding tank sites.

B. WASTEWATER HOLDING SYSTEM

Wastewater is collected from each trailer and the piping routed appropriately to individual 1,500-gal wastewater holding tanks. Calculations verify the adequacy of the holding tank size serving each trailer (see Appendix A). A notification signal and an alarm signal are

installed in each holding tank to preclude any possible overflowing of the tanks.

The holding tank contents is disposed of by the operating contractor on a regular and on-call basis (see Appendix C).

II. DESIGN CRITERIA

A. SCOPE

Occupancy of each trailer has been established at 14 persons. There are no shower facilities in either trailer. There are no special wastes discharged from either trailer. Criteria for establishing the size of the holding tanks is from Washington State Department of Health, "Guidelines for Holding Tank Systems," December 1991.

B. HOLDING TANKS

Each holding tank is a standard single compartment 1,500-gal liquid capacity fiberglass reinforced plastic septic tank manufactured by Quadel Industries. The outlets have been plugged to prevent sewerage from entering the environment. The tanks are approved for use by Washington State Department of Health (see Appendix F).

Section (V) (A) (3) (c) (1) of the Washington State Department of Health guidelines requires buried holding tanks to be protected from buoyant forces if high ground water is anticipated. The water table in the 200 Area plateau varies from 200 to 300 ft below the surface. The annual precipitation is less than 7 in. The probability that the tanks, when empty, would float is negligible; therefore, no provision was made for buoyant forces on the tanks.

A normal-level and a high-level signal are installed in each tank. The signal is transmitted to both an audible and visual alarm in each trailer. As

detailed in the calculations, the normal-level alarm responds when the liquid level in the holding tank reaches the normal pump out volume. The high-level alarm responds when the liquid level reaches three times the normal daily flow. There is an additional volume available after the high-level alarm sounds to permit adequate time for the pumper truck to respond.

As required in the guidelines, a concrete splash pad has been installed around each pump out port. Washdown water is available through a hose bib with an approved backflow preventer. Post barricades are installed around the tanks to prevent vehicular traffic from operating over the tanks and still provide adequate access for tank contents removal.

III. REFERENCES

1. Manual, "Operations and Maintenance Manual for Temporary Sanitary Wastewater Holding System for Construction Management Support Trailers for the Effluent Treatment Facility," prepared by Kaiser Engineers Hanford Company, Document No. OMM-500, August 1993.

IV. OWNERSHIP

Owner: U.S. Department of Energy,
Richland Operations Office (RL)
P. O. Box 550
Richland, Washington 99352

Operating Contractor: Westinghouse Hanford Company
P. O. Box 1970
Richland, Washington 99352
Attn: Edward Yusis
Telephone: (509) 373-5786

Design Engineer: Kaiser Engineers Hanford Company
P. O. Box 888
Richland, Washington 99352
Attn: Charles S. Mortimer, P.E.
Telephone: (509) 376-7228

APPENDIX A

Design Calculations

KAISER ENGINEERS HANFORD	CALCULATION IDENTIFICATION AND INDEX	WO/Job No. C-018H Date 4/13/93
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This sheet shows the status and description of the attached Design Analysis sheets.

Discipline _____
 Project No. & Name C-018H Holding Tanks
 Calculation Item Daily Design Flow, Normal operating Vol., Reserve Storage Vol.

These calculations apply to:

Dwg. No. _____ Rev. No. _____
 Dwg. No. _____ Rev. No. _____
 Other (Study, CDR) _____ Rev. No. _____

The status of these calculations is:

- Preliminary Calculations
- Final Calculations
- Check Calculations (On Calculation Dated _____)
- Void Calculation (Reason Voided _____)

Incorporated in Final Drawings? Yes No
 This calculation verified by independent "check" calculations? Yes No

Original and Revised Calculation Approvals:

	Rev. 0 Signature/Date	Rev. 1 Signature/Date	Rev. 2 Signature/Date
Originator	<i>E. D. ... 3/31/93</i>		
Checked by	<i>... 4/20/93</i>		
Approved by			
Checked Against Approved Vendor Data			

INDEX

Design Analysis Page No.	Description
<u>1</u>	<u>Objective, Design Inputs + References</u>
<u>2</u>	<u>Horizontal Separations, Sizing + Daily Design Flow</u>
<u>3</u>	<u>Normal Operating Vol., Reserve Storage + Tank Sizing</u>
<u>4</u>	<u>Tank Vol.</u>
<u>5</u>	<u>Reserve Storage Vol. + Reserve Storage</u>
<u>6</u>	<u>Alarms + Piping</u>

DESIGN ANALYSIS

Client	WHC	WO/Job No.	C-018H		
Subject	OBJECTIVE + DESIGN INPUTS	Date	3/3/93	By	Edmund J. ...
		Checked	f-20-93	By	...
Location	600 Area	Revised		By	

OBJECTIVE

Determine design for holding Tank Sewage System.

DESIGN INPUTS:

Criteria:

1. Criteria, guidelines for holding Tank Sewage Systems, Washington State Department of Health Environmental Health Programs, Technical Review Committee, Dec. 1991.

REFERENCES:

1. Guidelines for Holding Tank Sewage Systems, Washington State Department of Health Environmental Health Programs Dec. 1991
2. See Drawing of site and location of Tanks
3. Onsite Wastewater Treatment & Disposal Systems
4. Alarm System and Panel Rack drawing

DESIGN ANALYSIS

Revision _____

Client	WHC	WO/Job No.	C-018H		
Subject	SEPARATIONS, SIZING + FLOW	Date	3/31/93	By	Edward A. ...
		Checked	4/20/93	By	Paul S. ...
Location	600 AREA ETF SITE	Revised		By	

For Minimum Horizontal Separations

REF 1, p.3, Table I

Based on Table I for setback requirements the referenced drawing indicates that setback requirements are met.

REF 2, Drawing P.

Sizing

Daily design Flow was taken from REF 3
EPA-625/1-80-012 (Purple Book) "Onsite Wastewater Treatment +
Disposal Systems" → Unit Gal./Day = 15/occupant

Daily Design Flow

Based on 14 employees in each facility
which is what each facility is designed for.

$$(\text{Design Flow Rate})(\text{Number of occupants}) = \text{Daily design Flow}$$

$$(15 \text{ gal/occupant daily})(14 \text{ occupants}) = 210 \text{ gal/day}$$

DESIGN ANALYSIS

Revision _____

Client	WHC	WO/Job No.	C018H
Subject	OPERATING VOL., RESERVE STORAGE	Date	3/31/93
	+ TANK SIZING	Checked	4/20/93
Location	600 AREA	Revised	
		By	Edward Deen
			Robert [Signature]

Normal operating Vol.

REF 1, p. 5 para. 2.

(daily design flow)(number of days between pumping) = Normal operating Vol.

$$(210 \text{ gal/day})(4 \text{ days}) = 840 \text{ gal}$$

Based on agreement with WHC pumping of Tanks will be every 4 days.

Reserve Storage

REF 1, p. 5 para. 2 b.

(daily design flow)(3 days) = Reserve Storage
REF

$$(210 \text{ gal/day})(3 \text{ days}) = 630 \text{ gal.}$$

Tank Sizing

$$\begin{aligned} \text{Normal operating Vol.} &= 840 \text{ gal} \\ + \text{Reserve storage} &= 630 \text{ gal} \\ \hline \text{Tank Capacity Required} &= 1470 \text{ gal} \end{aligned}$$

Tank Capacity of designed Tanks is 1500 gal.
which is greater than Tank Capacity Required.

DESIGN ANALYSIS

Revision _____

Client UIC

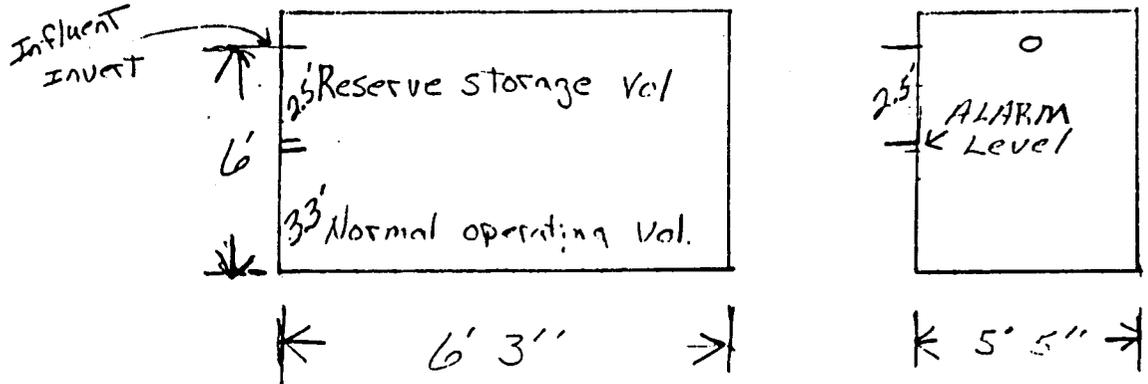
WO/Job No. C-018H

Subject TANK VOL., + NORMAL OPERATING VOL. Date 3/31/93 By Edward D. ...

VOL. Checked 4/20/93 By ...

Location 600 AREA Revised By

Tank Vol. The following calculations are approximate due to the shape of the tank.



ICF = 7.4805 GAL.

Normal operating Vol

$$\frac{840 \text{ gal.}}{7.4805 \text{ gal}} = 112.29 \text{ CF REF.}$$

using $(H)(w)(L) = \text{CF}$

Height of water level for normal storage is

$$H = \frac{\text{CF}}{(w)(L)}$$

$$H = \frac{112.29 \text{ CF}}{(5' 5") (6' 3")}$$

$$H = \frac{112.29 \text{ CF}}{33.875 \text{ sq FT}}$$

$$H = 3.3 \text{ FT}$$

DESIGN ANALYSIS

Revision _____

Client WHC

WO/Job No. C-018H

Subject RESERVE STORAGE

Date 3/31/93

By Edward D. Deen

Checked 4/20/93

By Robert S. [Signature]

Location 600 AREA

Revised _____

By _____

Reserve storage Vol.

$1CF = 7.4805 \text{ gal}$

$$\frac{630 \text{ gal}}{7.4805 \text{ gal}} = 84.22 \text{ CF}$$

RF 9.

using $(H)(W)(L) = CF$

Height of water level for Reserve storage is

$$H = \frac{CF}{(W)(L)}$$

$$H = \frac{84.22 \text{ CF}}{(5'5")(6'3")}$$

$$H = \frac{84.22 \text{ CF}}{33.875 \text{ sq. ft.}}$$

$$H = 2.5 \text{ ft.}$$

Reserve Storage

Ref 1, p. 5 para. 2b

The location of the Time-to-Pump alarm shall be located 2.7 ft. below invert of the influent pipe. The lower setting approximates the true reserve volume due to the tank shape (not a box).

DESIGN ANALYSIS

Client	WHC	WO/Job No.	C-018H		
Subject	ALARMS + PIPING	Date	3/31/93	By	Edward D. ...
		Checked	4/20/93	By	Charles ...
Location	600 AREA	Revised		By	

Alarms

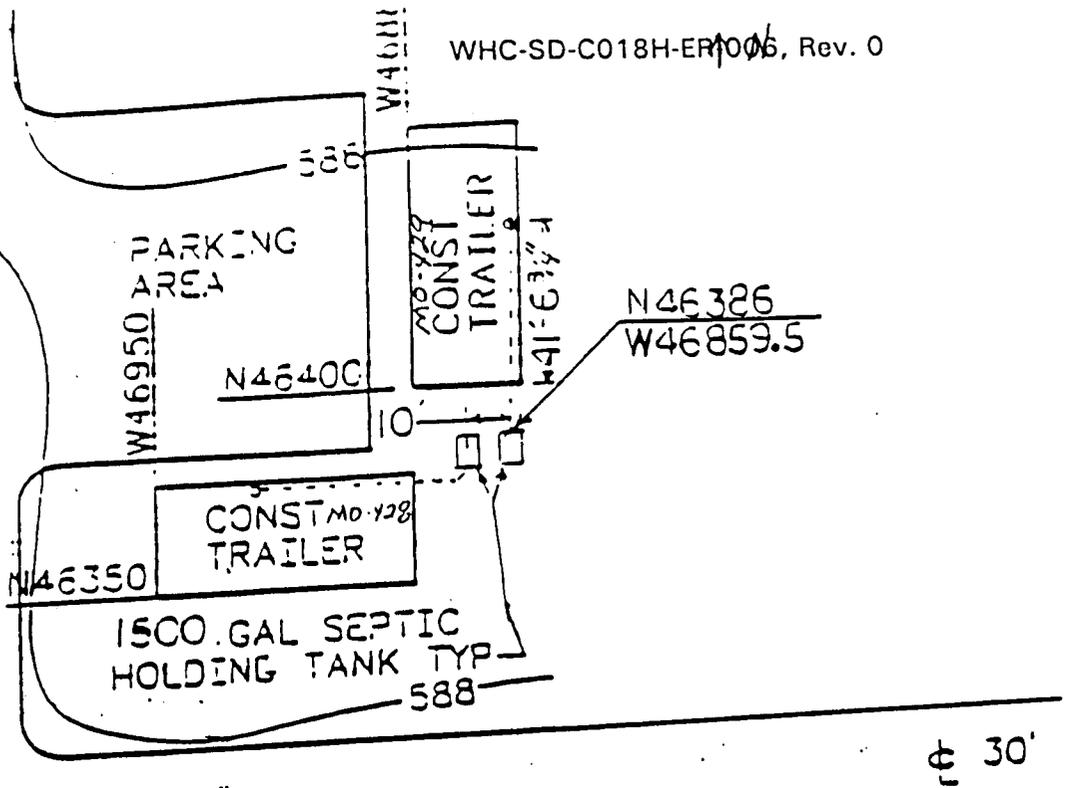
REF. 1, p.8, sec.D, para. 1,2,+3
See attachment REF. 4, For location and Type
of Control switch To be used. The Alarm System
is equiped with Audible and Visual Capabilities.

Piping

Piping To be installed in accordance with
Uniform Plumbing Code, 1988 edition. Leak/Pressure
Test preformed on sewer lines, Test 10ft. head pressure,
for leakage will be performed.

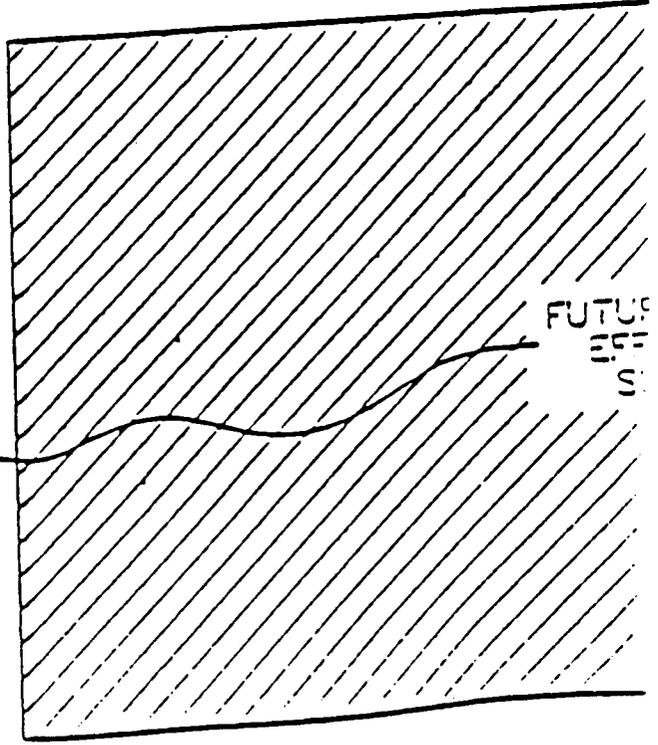
APPENDIX B

Site Plan



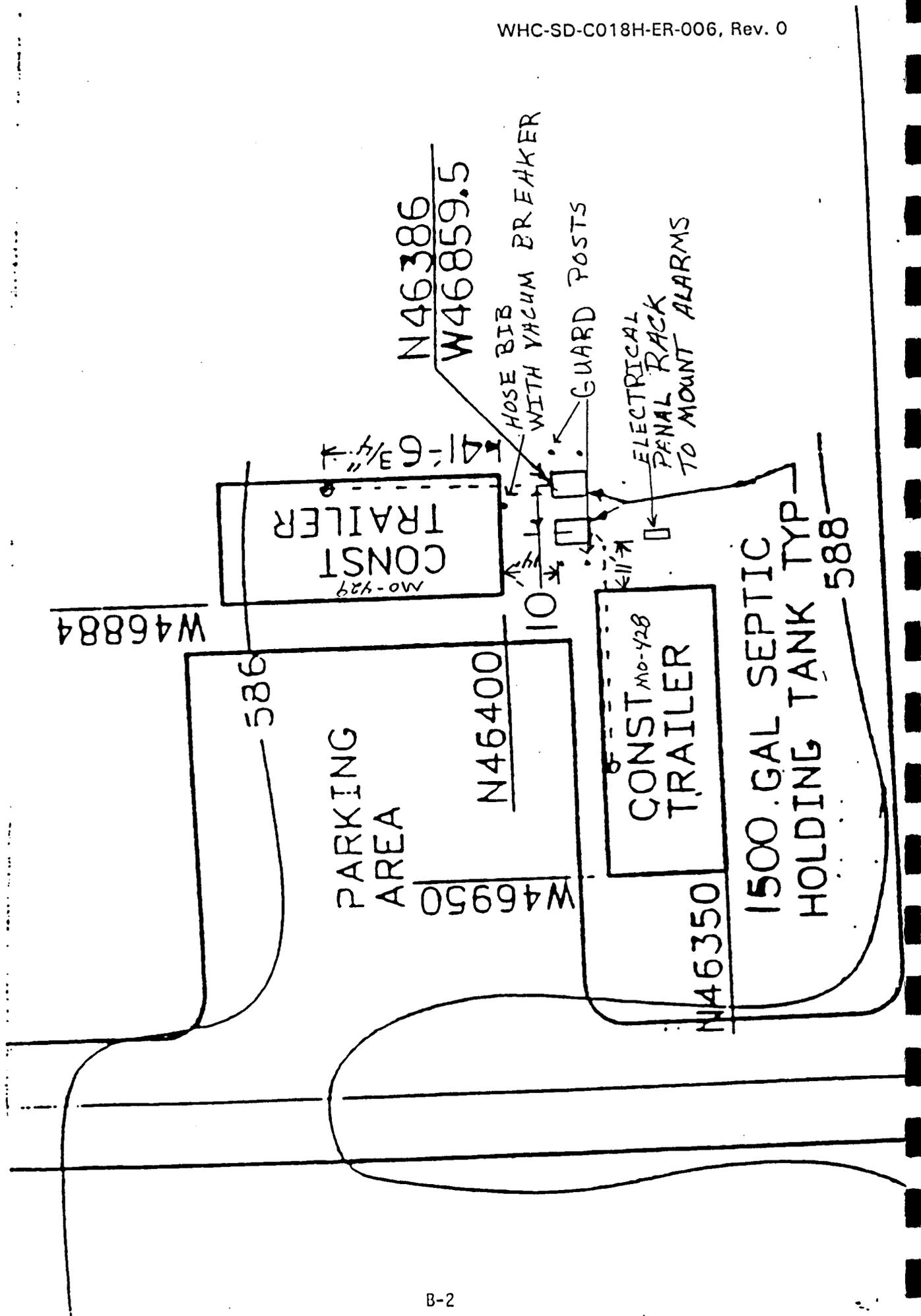
DRAWING 3.

EXISTING 42" CMP
W4/080



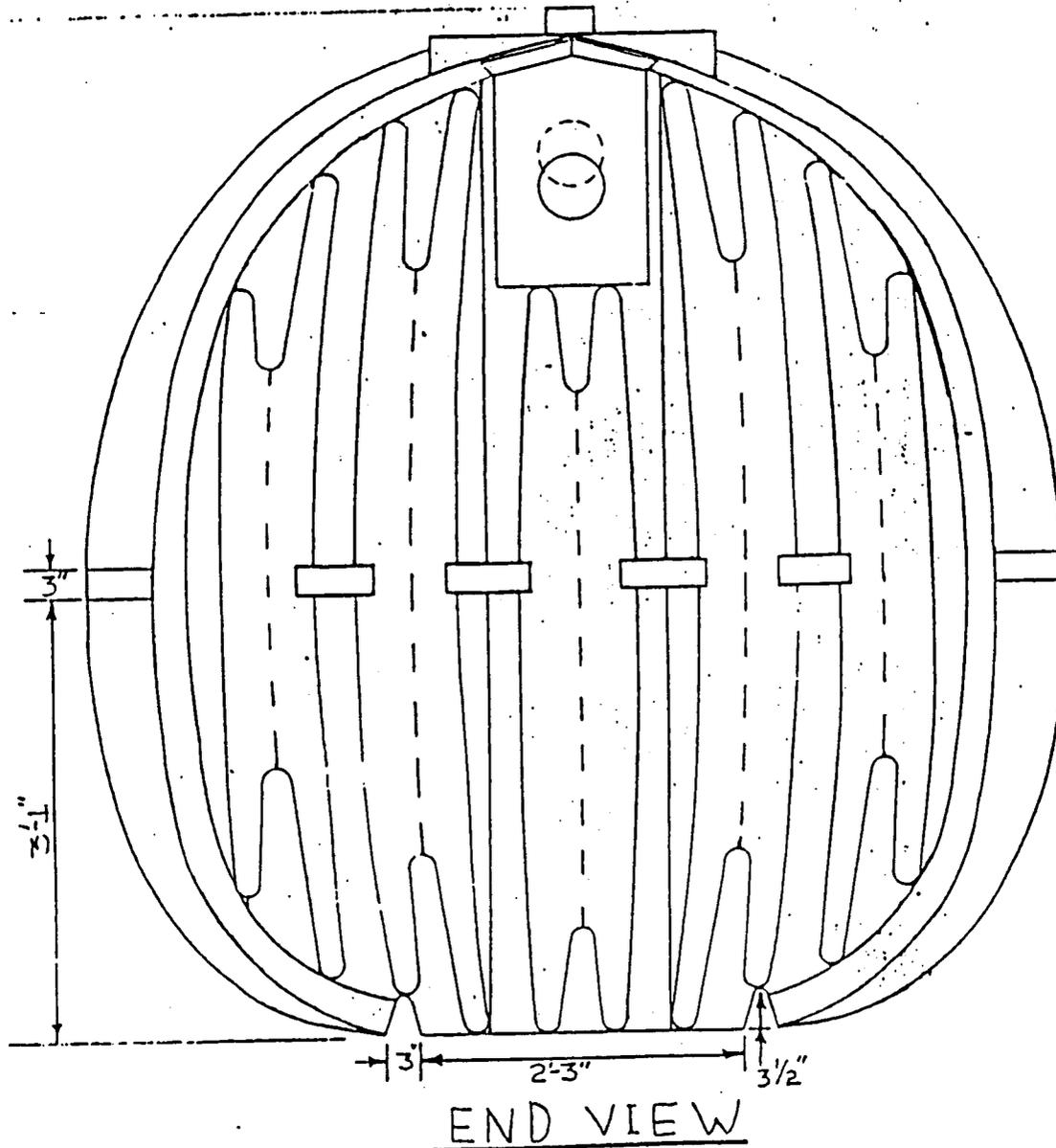
590

SET BACKS



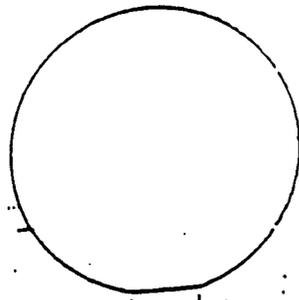
APPENDIX C

Holding Tank and Details

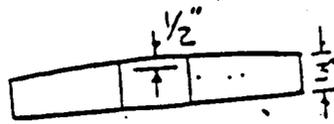


Q2I-1500

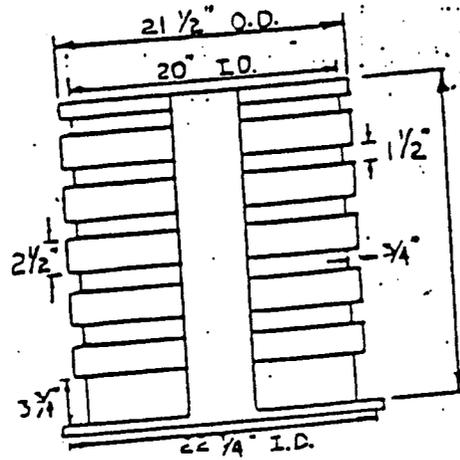
QUADEL INDUSTRIES -
P.O. BOX 1454
COOS BAY OREGON 9742
(503)-269-7351
1-(800)-289-7659
FAX (503)-269-7300
C-1 DRAWN BY TB; STUNTZNER ENGINEER



5"
PLAN



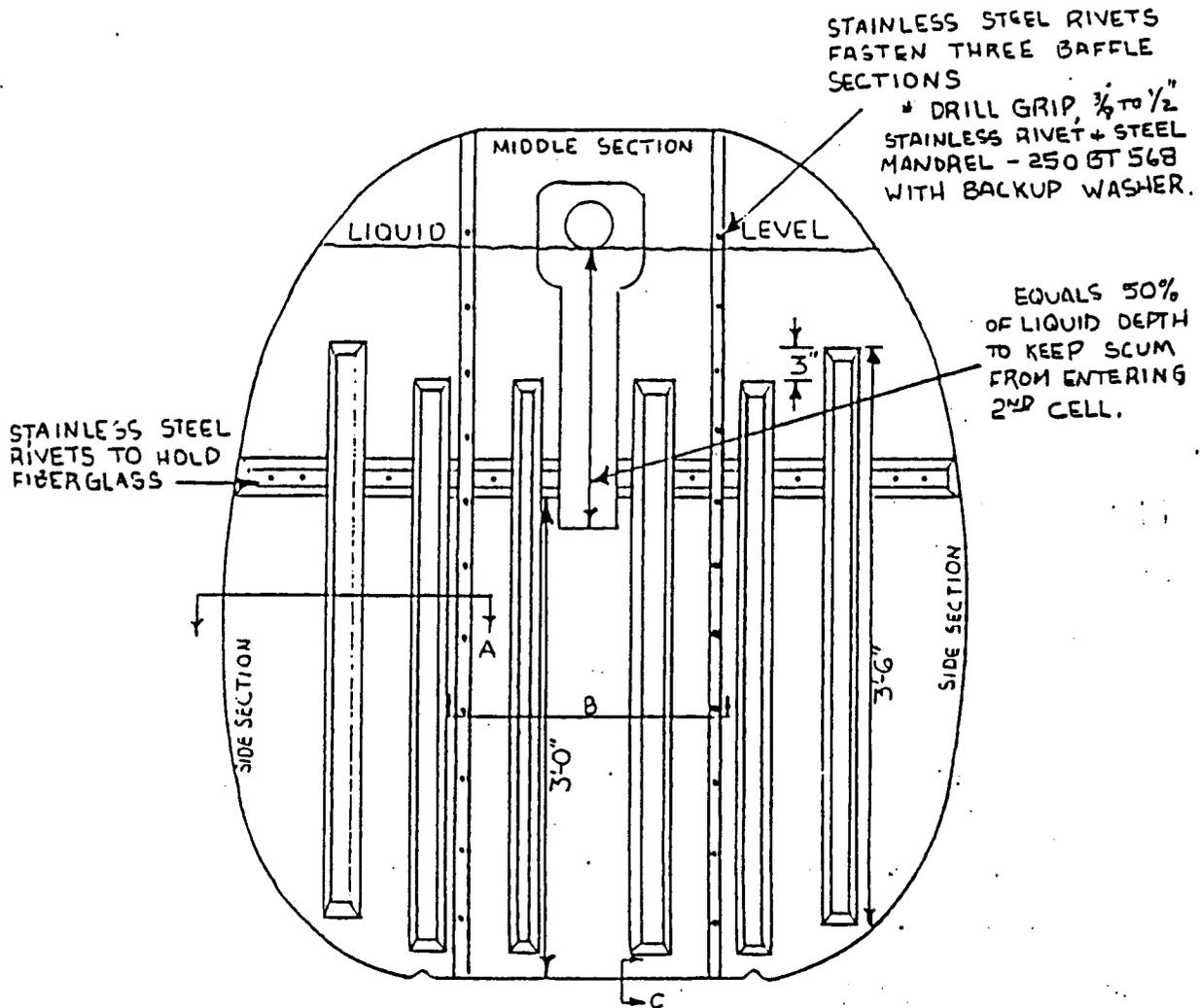
COVER



2 1/4" I.D.
RISER

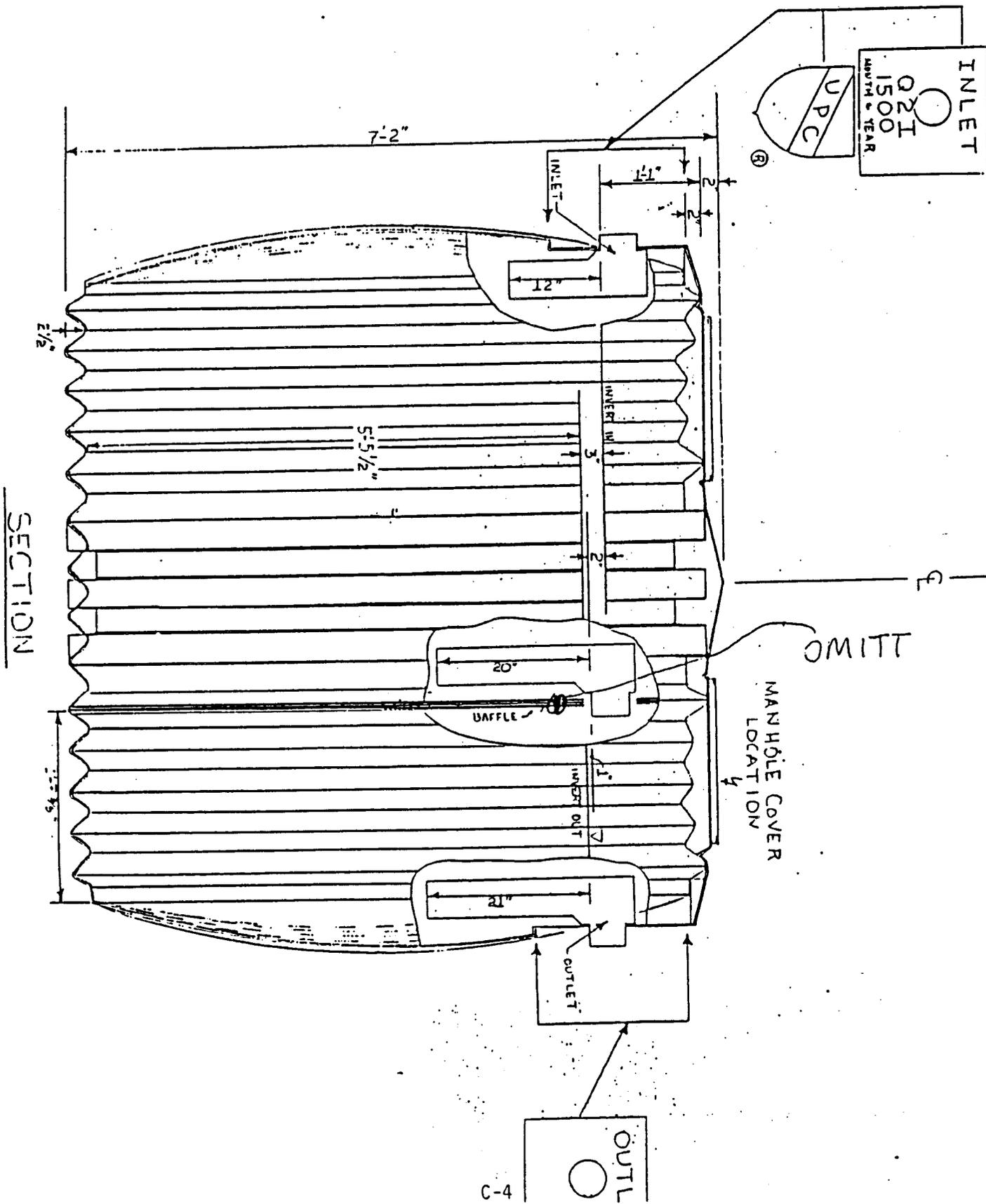
TRIM IN FIELD TO
FIT, 30" MAXIMUM

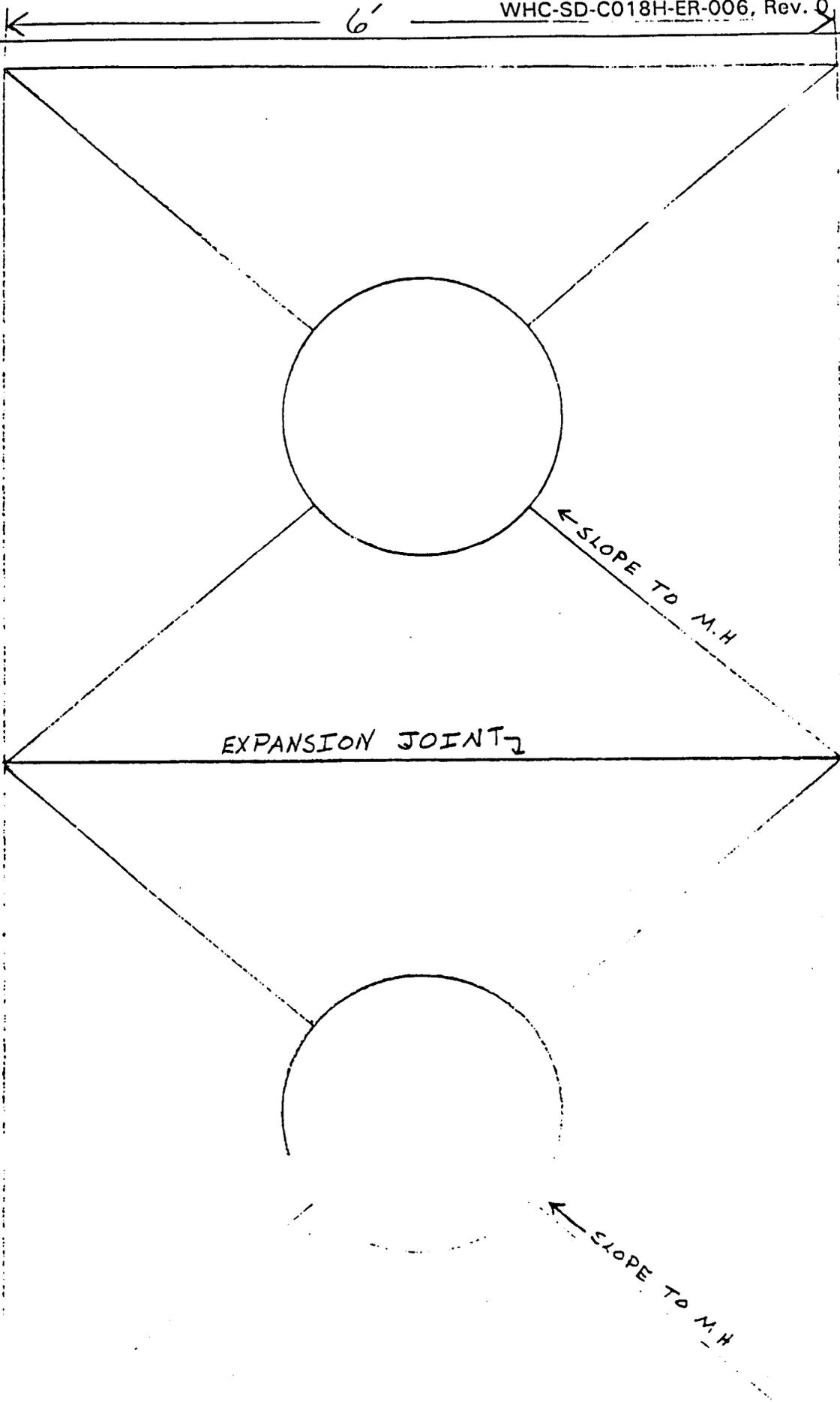
FASTEN RISER TO TANK
W/ NEOPRENE GASKET +
12 NO. 14 STAINLESS STEEL
HEX-WASHER TAPPING SCREWS



FIBERGLASS BAFFLE

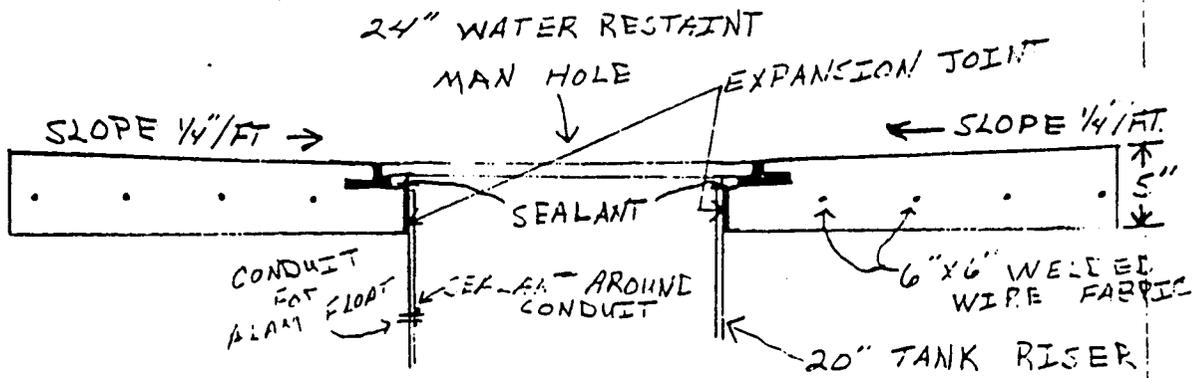
NO SCALE



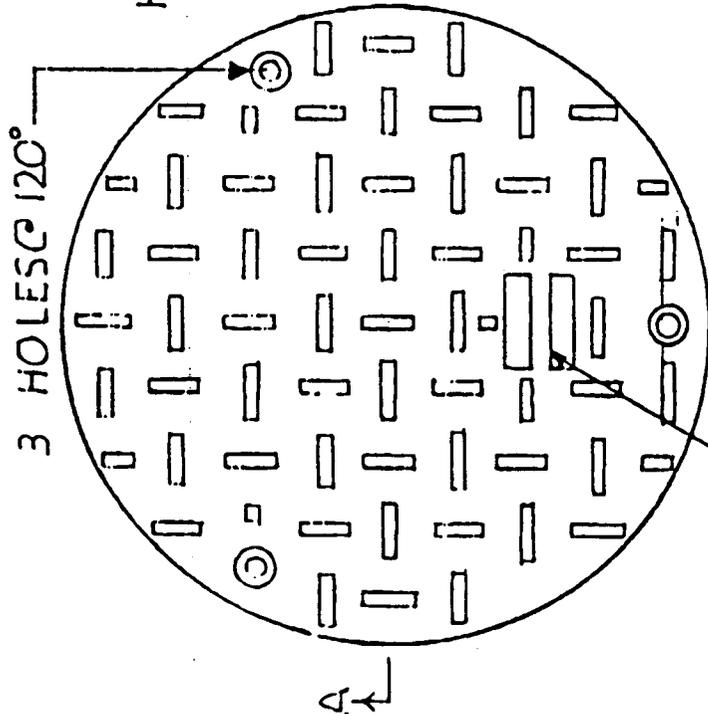


VIEW
A

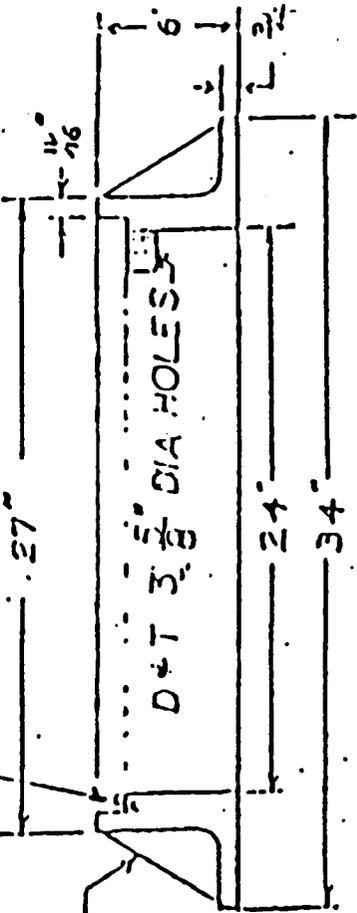
ERD
3/24/93



VIEW A



H₂O LOADING SEAT MACHINE
GROUND

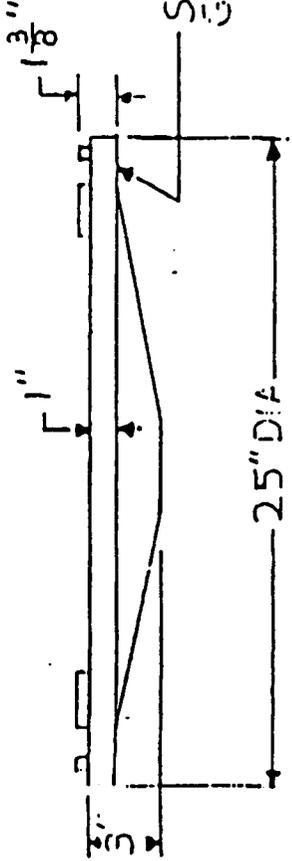


5/16 THS x 3/8 THS NEOPRENE

RECESSED
GASKET

THE COVER IS LOCKED DOWN WITH 3
5/8" S.S. SOCKET HEAD CAP SCREWS
WHEN WATER TIGHTNESS IS REQUIRED THE
COVER IS CAST SOLID WITH A LIFT
HANDLE CAST IN AND A GASKET IS
INSERTED BETWEEN THE RING AND
THE COVER.

6024 Manhole Ring & Cover
WATERVILLE



MAT'L ASTM A48 CLASS 30 CL
SATHER MANUFACTURING, INC
3330 MEDOU GALL AVE
EVERETT WASHINGTON

SEAT MACHINE
GROUND

APPENDIX D

Alarm Panel and Details

MINI-SENSOR™ Control Switch

A compact float switch designed to activate pump control panels, solenoids, relays.

ADVANTAGES

- Two models available
MPC (Pipe Clamp)
MWE (External Weight)
- Single pole, heavy-duty mercury lill switch epoxy encapsulated in a compact non-conductive PVC plastic float.
- Two-year limited warranty.

DESCRIPTION

Both Mini-Sensor Float models are rated (120V A.C. or 230V A.C.). The heavy-duty, normally activated lill switch and the cord conductor are epoxy sealed in a watertight, impact-resistant housing. The mercury lill switch (manufactured by S.J. Electro Systems, Inc.), activates when the float reaches the horizontal position.

Two models provide for flexibility in installation:

MPC (Pipe Clamp): The MPC must be installed by strapping the pipe clamp at the desired level to a discharge pipe or other structure.

MWE (External Weight): The MWE has a justable weight attached to the cable. The MWE is used in applications where the float is suspended from above.

APPLICATIONS

Mini-Sensor floats may be used to activate pump control panels, solenoids, and relays. This liquid level control is frequently used in sewage systems, irrigation systems, and in other water systems.

SPECIFICATIONS

"A" MODEL: 10MPC N.O. NORMALLY CLOSED
10MWE N.O. OPEN

NOTE: Numbers preceding model designation (MPC or MWE) refer to cable length. The Mini-Sensor control switch is available in standard length of 10 ft. (3.04m), 15 ft. (4.57m), 20 ft. (6.09m), 40 ft. (12.19m) and 50 ft. (15.24m). Other lengths are available. (Please specify required.)

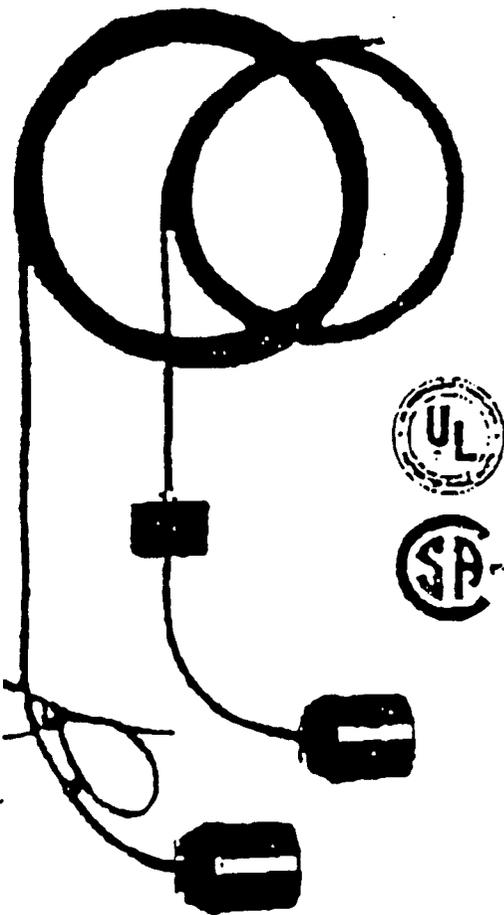
CABLE: Flexible 16 gauge, 2 conductor (UL) SJOW-A-SJOW (CSA) Neoprene, water-resistant.

EXTERNAL WEIGHT: 2 lbs. of cast iron.

FLLOAT: 2.812 inch (7.142cm) diameter x 1.42 inch (3.606cm) long, high-impact resistant, non-conductive.

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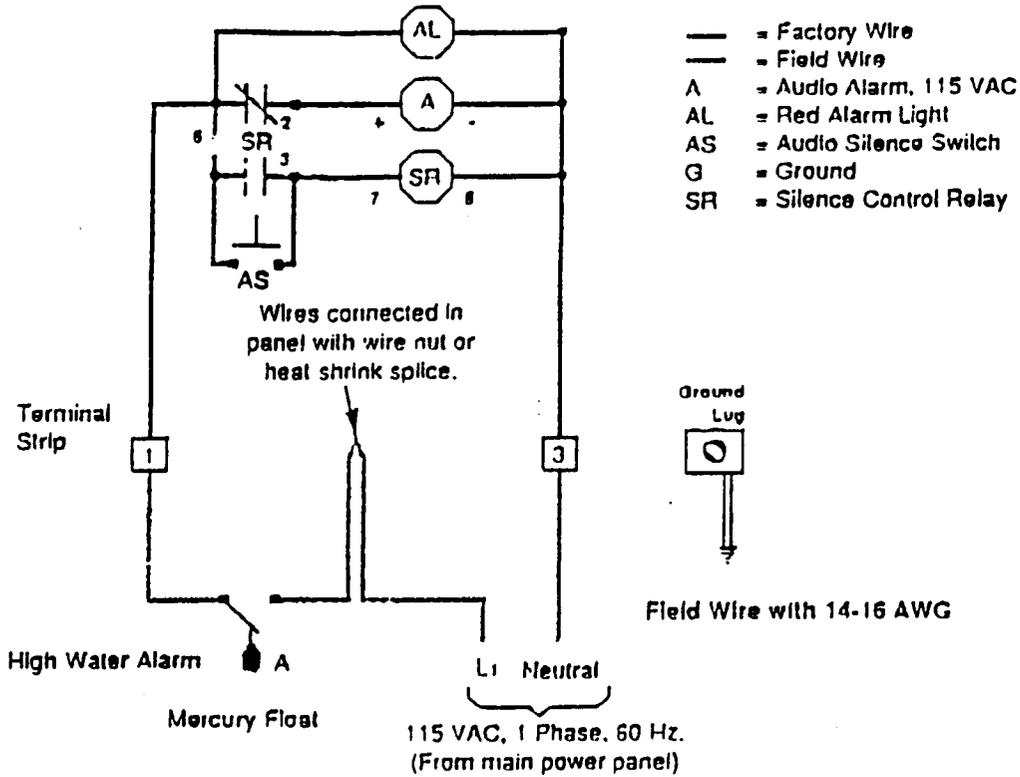
To	From
Co. Kaiser	Co.
Dept.	Phone #
Fax 509-572-0945	Fax #



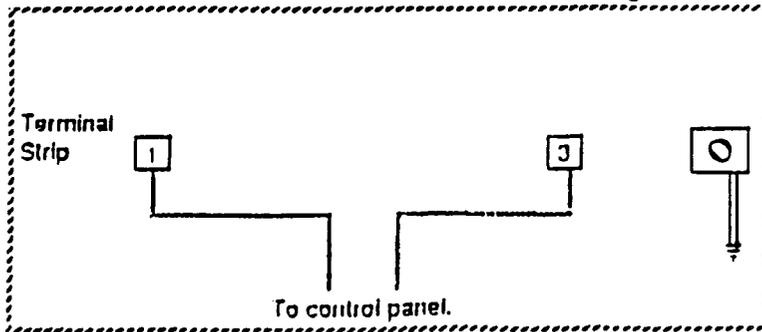
Orenco Systems, Inc.

Wiring Diagram Model AHW

Thermoplastic Raintight Enclosure



* Alternative Remote Alarm Wiring



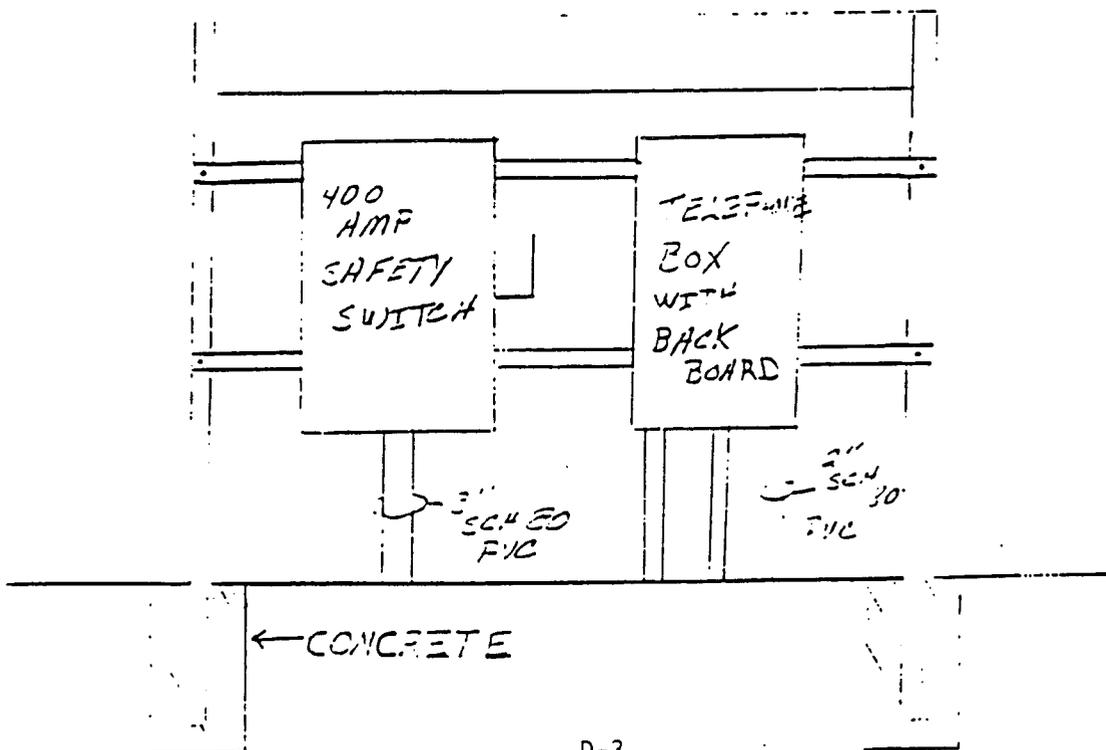
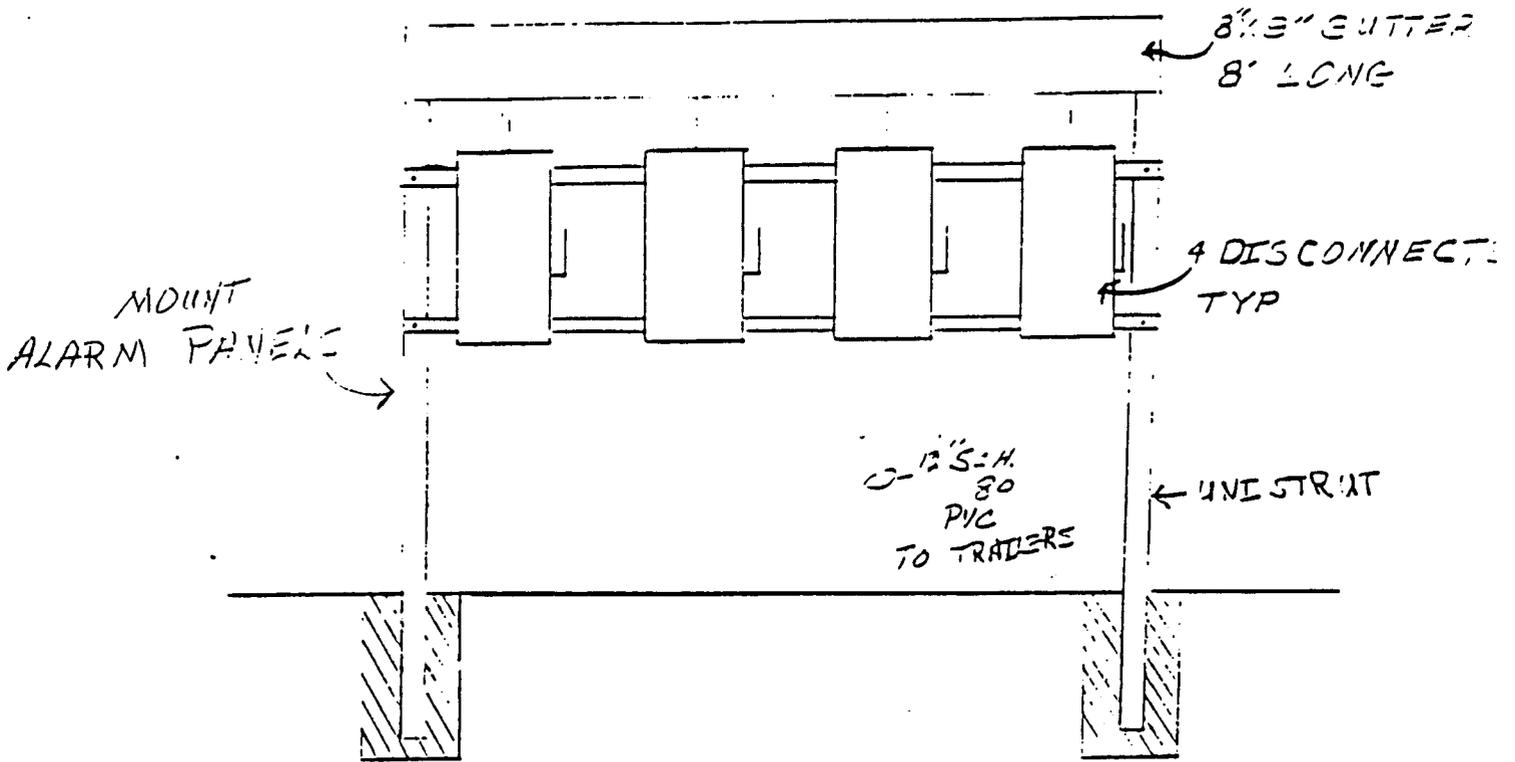
Alarm: Activates the high liquid level alarm light and buzzer. The buzzer may be silenced by pressing the illuminated PUSH TO SILENCE button on the bottom of the control panel. The alarm light will remain on until the high level condition is corrected.

Post-It™ brand fax transmittal memo 7671 # of pages 1

To: <i>Bill Huffman</i>	From: <i>Jeff Bell</i>
Co: <i>Kaiser Eng</i>	Co: <i>OSI</i>
Dept:	Phone #: <i>D-2</i>

PANEL RACK

WHC-SD-C018H-ER-006, Rev. 0



APPENDIX E

Telephone Conference Memo 81173-92-084

TELEPHONE CONFERENCE MEMORANDUM

Company: Westinghouse Hanford Company Address: Richland, Washington

[] INCOMING [X] OUTGOING DATE: July 30 1992 TIME: 2:30 p.m.

WITH: Ms. E. A. Brown (Lisa) OF: DOH PHONE: (509) 456-2754

WITH: Mr. J. S. Hill (Stan) OF: WHC PHONE: (509) 372-0863

Copies to: _____ Name _____ Address _____

RECEIVED
R. W. OLDHAM

AUG 05 1992

ACTION
COPIES
DATE

S. G. Enos	H4-57
C. J. Geler	B2-19
B. C. Harmon	N1-30
J. S. Hill	H4-57
R. W. Oldham	H4-57
S. M. Price	H4-57
A. L. Rodriguez	A5-15
J. E. Turnbaugh	H4-57
A. K. Vogt, Jr.	L4-76
EDMC	H4-22
JSH/File/LB	H4-57

Subject: DISCUSSION OF SEPTIC PROJECTS RELATED TO C-018 AND L-092

Environmental Permits Section J. S. Hill *J. Hill* 372-0863

Department Signature Telephone #

Summary of Conference:

The first topic involved the use of Quadel Industry tanks for a septic holding system to support construction of Project C-018. Ms. E. A. Brown stated that these tanks are approved tanks for use by the State of Washington Department of Health (DOH); however, she needed to know the backfill/bedding requirements.

The second topic was on abandoning the old drainfield for Project L-092 in place since a new drain field was being installed. Project L-092 is for upgrading the septic system for Buildings 2751E, 2752E, and 2753E in the 200 East Area. Ms. Brown stated that it was acceptable to abandon the old drainfield in place.

DOH Concurrence:

Lisa Brown
Ms. E. A. Brown (Lisa)

8/3/92
DATE