7

1221042

GROUT TREATMENT FACILITY
TANK SYSTEM INTEGRITY ASSESSMENT
PLAN

April 12, 1991

Westinghouse Environmental
and Geotechnical Services, Inc.
Northwest Branch Office
1234 Columbia Drive S.E.
Richland, WA 99352
(509) 736-0626

TD-2-1

Independent, Qualified,
Registered Professional Engineer (IQRPE)

Approval of

GROUT TREATMENT FACILITY
TANK SYSTEM INTEGRITY ASSESSMENT
PLAN

"I have reviewed this document and believe the inspections, tests, and analyses described herein to be sufficient for the assessment of the integrity of the tank system(s). I understand that as the designated IQRPE I will be asked to certify the accuracy of reports generated by this assessment in accordance with the specific certifications statement listed in this document. I also understand that the inspections, tests, and analyses described herein are based on currently available information and are subject to change as more information becomes available through the performance of this assessment. As the designated IQRPE, I accept the responsibility and authority to exercise sound engineering judgement in authorizing changes to this document in order to accurately assess the integrity of the tank system(s)."

Leon J. Lindbloom
Washington State PE Registration #17807

4/11/91
Date

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 SCOPE 1
2.1 Objectives 2
2.1.1 Items to be Subjected to Integrity Assessment 2
2.1.2 Items not to be Subjected to Integrity Assessment . . 3
2.2 Deliverables 3

3.0 DESCRIPTION 4
3.1 Process Description 4
3.2 System Description 5
3.2.1 241-AP-02D Waste Pump Pit and Transfer Piping 5
3.2.2 Grout Processing Facilities (GPF) 5
3.3 Waste Characteristics 6
3.4 Tank System Age 7

4.0 INTEGRITY ASSESSMENT 7
4.1 Design and Specification Review 7
4.2 Inspection Records Review 7
4.3 Acceptance Test Procedure (ATP) and Operating Test Procedure (OTP) Review 7
4.4 Waste Characteristics, Compatibility and Corrosion Protection 8
4.5 Integrity Examinations 8
4.5.1 Leak Test 8
4.5.2 Examinations 9
4.6 Acceptance Criteria 9
4.7 Hold Points 10

5.0 CERTIFICATION 10

6.0 ORGANIZATIONAL RESPONSIBILITIES 10
6.1 Internal Organizations 10
6.2 External Organizations 11

7.0 SCHEDULE 11

8.0 COST ESTIMATE 11

9.0 QUALITY ASSURANCE 11

10.0 REFERENCES 13

1.0 INTRODUCTION

The Grout Treatment Facility (GTF) is operated by the Westinghouse Hanford Company (WHC) for the U.S. Department of Energy-Richland Operations Office. Portions of the GTF require an integrity assessment to comply with the Washington State Department of Ecology's Dangerous Waste Regulations, Washington Administrative Code (WAC) 173-303-640 (3) (Ecology, 1989). This integrity assessment must be certified by an Independent, Qualified, Registered Professional Engineer (IQRPE). The integrity assessment will be conducted in accordance with *Procedure for Integrity Assessments of Existing Dangerous Waste Tank Systems* (Dearing, 1990).

This Integrity Assessment Plan (IAP) identifies tasks that will be performed during the assessment phase and describes the intended assessment techniques.

The GTF processes waste solutions from the double-shell tanks (DSTs) on the Hanford Site. The waste is a concentrated salt solution produced by the evaporation of dilute wastes generated by the operating facilities in the 100, 200, 300 and 400 areas of the Hanford Site. The concentrated solution is a mixed waste composed of dangerous and radioactive waste. The waste is mixed with grout-forming solids and chemical liquid additives to form a grout slurry. The slurry is pumped to near-surface concrete vaults for solidification and permanent disposal.

The GTF is comprised of the following facilities:

- The 241-AP-02D waste pump pit and transfer piping
- The Grout Processing Facility (GPF) (formerly called Transportable Grout Equipment)
- Grout disposal units.

Figure 1 shows a schematic of the facility process flow. The transfer piping and liquid collection tank located in the GPF will be assessed.

2.0 SCOPE

This section describes the scope of this IAP, including objectives, a description of the system to be assessed, and the deliverables.

2.1 OBJECTIVES

This IAP establishes inspections, tests, observations, and evaluation procedures required to assess the integrity of those portions of the GTF

identified as a tank (the leachate collection tank (LCT)). This IAP provides the information necessary for the IQRPE to certify the integrity assessment.

The GTF is a new facility. The tank system recently has been tested as a part of the Acceptance Test Procedure (ATP) and Operating Test Procedure (OTP). This tank integrity assessment will not duplicate testing done for the ATP or OTP. Additional testing will be done as necessary to meet regulatory requirements or as required by the IQRPE.

2.1.1 Items to be Subjected to Integrity Assessment

A schematic drawing showing the items to be assessed is included as Figure 2. For dimensions and locations see the following drawings:

- H-2-76506 Instrumentation Engineering Flow Diagram
- H-2-76480 Piping Plan Supernatant Lines
- H-2-77596 Piping Plan
- H-2-77600 Piping Jumper Arrangement Vault Pit
- H-2-77601 Piping Vault Pit Section & Details
- H-2-77602 Piping Jumper Arrangement Excess Water Pump Pit
- H-2-77611 Piping Plan and Details
- H-2-77612 Piping Leachate Pump Pit Jumper Arrangement/Jumper Assembly
- H-2-95881 Leachate Collection Tank/Valve Skid Piping and Instrumentation Diagram
- H-2-98665 Equipment Arrangement LCT/Mix Module Dwg 1 of 5
- H-2-98666 Equipment Arrangement LCT/Mix Module Dwg 2 of 5
- H-2-98667 Equipment Arrangement LCT/Mix Module Dwg 3 of 5
- H-2-98668 Equipment Arrangement LCT/Mix Module Dwg 4 of 5
- H-2-98669 Equipment Arrangement LCT/Mix Module Dwg 5 of 5

The boundaries of the system to be subjected to the integrity assessment are defined as:

- The piping system between the 241-AP-02D waste pump pit and the GPF that introduces liquid waste streams into the facility or transfers materials to the DSTs from the first valve inside the waste pump pit to the LCT

- The LCT within the GPF

- The excess water return line from the LCT to the leachate pump pit 218-E-16-102-A.

A complete list of all equipment to be assessed is included in Appendix A.

2.1.2 Items not to be Subjected to Integrity Assessment

The following items will not be subjected to integrity assessment:

- Dangerous waste feed and drain lines in the 241-AP-02D waste pump pit and between the pump pit and DST 241-AP-102.

- Piping, drains, and valves inside the LCT/mixer module that drain to the LCT sump; the materials of construction of the equipment components will be compared with the specification and appropriate materials will be verified.

- Piping, drains, valves, sumps, secondary containment, and tanks that are a part of the GTF but do not receive, store, accumulate, transfer, or treat Washington State Dangerous Waste or waste components (such as the dry-blend facility).

- Grout disposal vault and vault pits.

- Excess water return line from nonhazardous waste vault 218-E-16-101. This line has been abandoned and will not be used in the future. Thus an integrity assessment is not necessary.

2.2 DELIVERABLES

The deliverable for this project will be a Tank System Integrity Assessment Report (IAR) (Supporting Document) with IQRPE certification. This report will include specific conclusions and recommendations regarding the integrity of the system components and use of the system for management of the wastes. The IAR specifically will include:

- Design standards used for construction

- Dangerous characteristics of the waste (from GTF Part A permit application and *Grout Treatment Facility Land Disposal Restriction Management Plan* (Hendrickson, 1990))

- Corrosion protection review

- Specific recommendations about the acceptance of the tank system for receipt and storage of the designated waste stream

- Recommendation for the frequency of future integrity assessments.
- Leak test report
- Inspection report
- Non-Destructive Examination (NDE) reports (if required)
- Existing system drawings for reference.

The IAR also will include or reference the following information provided by others:

- Quality assurance surveillance reports
- Existing corrosion protection measures
- Documented age of tank system
- Design calculations
- Operating parameters
- Construction material documentation
- Construction records
- Acceptance test procedures and results
- Operating test procedures and results.

Progress reports will be submitted as listed in the schedule. The progress reports will include:

- Expenditures to date
- Capability to meet completion dates
- Specific new information needs
- Description of any unforeseen difficulties.

In addition, progress reports may list meetings with the IQRPE and deficiencies noted by the IQRPE.

3.0 DESCRIPTION

This section describes the grout process, the GTF system components, and the waste characteristics and provides the tank age.

3.1 PROCESS DESCRIPTION

The GTF processes a batch of approximately 1 Mgal of DST waste each campaign. Wastes to be processed at the GTF are received from the waste feed tank, 241-AP-102. The waste is sampled, analyzed, and characterized to ensure that it meets waste feed acceptance criteria before being qualified for treatment and disposal. After being qualified for processing, the waste is pumped from the waste feed tank through an encased below-ground pipe to the GPF. At the GPF, the waste is mixed with various combinations of dry solids and liquid additives to aid in grout processing. The resultant slurry is

pumped through an encased below-ground pipe to concrete vault systems, each including a double liner and a Leachate Detection/Collection and Removal System (LDCRS). The vault retains the grout slurry until it cures. The solidified grout contains immobilized dangerous and radioactive (mixed) wastes. After grout curing, the excess water is pumped to the LCT located in the GPF through the excess water removal pipe. Once at the GPF, the liquid is routed to DSTs where it is stored to await future processing, or to the grout mixer for immediate processing. After the excess water is removed, the vaults are closed as landfills.

3.2 SYSTEM DESCRIPTION

This section describes the major equipment components of the GTF.

3.2.1 241-AP-02D Waste Pump Pit and Transfer Piping

Waste is pumped from the waste feed tank (241-AP-102) using a deep-well turbine pump housed within the 241-AP-02D pump pit located above the eastern quadrant of the tank (see drawing H-2-76506 provided in Appendix B). The 2-inch-waste-feed pipe is encased within a secondary 4-inch-carbon-steel pipe to permit leak detection and provide containment of any leak in the primary piping. This transfer pipe, 2"-SN-621-M25, and the secondary containment pipe will be assessed from the first valve inside the waste pump pit to the GPF (see drawings H-2-76506 and H-2-76480 provided in Appendix B).

3.2.2 Grout Processing Facilities (GPF)

The GPF consists of several modules performing various functions. The system is designed to consolidate waste handling, treating, and storing functions within a single module, the LCT/mixer module. This self-contained, shielded unit contains the grout mixer, grout surge tank, grout pump, a valve skid, an instrument skid, and the LCT. The tanks and equipment to be assessed are contained in the LCT/mixer module. The major components of the LCT/mixer module are described below. Operating parameters are listed in Table 1.

The piping and instrumentation diagrams for the module are depicted on Drawings H-2-95880 and H-2-95881 provided in Appendix B and the equipment arrangement is depicted in Drawings H-2-98665 through H-2-98669 provided in Appendix B.

Screened dry-blend material from the dry-blend module is fed through a 10-inch schedule 80S stainless steel pipe to a discharge chute that directly feeds a twin-screw variable-speed in-line grout mixer (W05). Liquid waste is fed through a valve skid and an instrumentation skid to the grout mixer where it is mixed with the dry-blend material to form a grout slurry.

The grout mixer mixes the liquid waste with the dry solids blend and deposits the resulting grout slurry into a 70-gallon-stainless-steel surge

tank (W09). The surge tank provides a constant supply of material to the grout pump (W06).

The grout pump discharges the grout slurry into a grout feed pipe to the disposal vault. The grout feed pipe is a 2½-inch schedule 160S stainless steel pipe inside the LCT/mixer module and a 2-inch schedule 80 carbon steel pipe outside the LCT/mixer module.

The LCT has a capacity of 800 gallons. The LCT collects all contaminated liquids that are not incorporated into the grout slurry, including any spills or leakage collected in the main sump, spent flush, and decontamination solutions from either internal or external system cleanup, and excess liquid or leachate pumped back to the GPF from the disposal vaults. From the LCT, these solutions can be fed directly to the grout mixer inlet or they can be pumped back to the tank farms by way of the waste feed line.

3.3 Waste Characteristics

The waste managed by the GTF is a concentrated salt solution produced by the evaporation of dilute wastes generated by the operating facilities in 100, 200, 300 and 400 areas of the Hanford Site. The concentrated solution is a mixed waste composed of dangerous and radioactive waste. The chemical composition of the waste varies from run to run. The expected range of compositions for this waste has been determined based on the sample standard deviation and mean of the composition of three tanks of waste currently in storage that are potential grout feed material. The waste in these three tanks is believed to be representative of future grout waste feeds. See *Methods and Data for Use in Determining Source Terms for the Grout Disposal Program* (Hendrickson, 1990), sections 2.2, 2.3, and 2.4, for mean concentrations and sample standard deviations of hazardous waste constituents present in the waste. Additional information may be found in *Tank 214-AN-106 Characterization Results* (Welch, 1991).

The evaporation of the waste before disposal increases the concentration of heat-producing radioactive isotopes in the stored waste. If uncontrolled, the levels of heat-producing isotopes in the stored waste could cause higher temperatures than are desired in the grout vault after it has cured. To avoid these higher temperatures in the vault, limits on the concentration of heat-producing isotopes are set. These limits are determined by thermal modeling of the disposal system for each waste feed. Waste with concentrations of heat-producing isotopes higher than the limits is mixed with more dilute waste to produce a waste that meets the criteria for grout treatment. In each campaign, the waste is processed in the most concentrated form achievable consistent with safe disposal of the waste, thus minimizing the volumes of dangerous waste to be treated and disposed. For more information, see *Grout Vault Heat Transfer Results for M-106 Grout Formulation* (Allen, 1990) and *Radiolytic Heat Loading Calculation Methods for the Hanford Grout Disposal Facility* (Hendrickson, 1990).

The waste is classified as an extremely hazardous waste under Washington state regulations due to the toxicity characteristic and the state toxicity

criteria (book method). The waste is classified as corrosive because the pH exceeds 12.5 due to the high concentration of hydroxide. The waste also is a listed waste, carrying the waste codes F003 and F005.

3.4 TANK SYSTEM AGE

The tank system was constructed in 1988 of all new components. The GTF has not (as of 2/91) been used to process dangerous waste. The GTF was used to transfer corrosive characteristic wastes from the leachate collection sump of nonhazardous waste vault 218-E-16-101 through the LCT to tank 241-AP-102 in 1989.

The system is not expected to be used to process dangerous or mixed waste until the integrity assessment is completed.

4.0 INTEGRITY ASSESSMENT

The following tasks describe the work to be performed in order to assess the integrity of the GTF.

4.1 DESIGN AND SPECIFICATION REVIEW

The design standards used for construction, design calculations (including seismic calculations), design specifications, and operating parameters will be reviewed by the IQRPE, or his authorized representative, to determine if the design of the foundation, structural support, seams, connections, and pressure controls is adequate and the tank system has sufficient structural strength to ensure that it will not collapse, rupture, or fail. See Appendix C for a list of the documents to be reviewed.

4.2 INSPECTION RECORDS REVIEW

All inspection records for the tank and ancillary equipment will be made available to the IQRPE, or his authorized representative, for review. Ten percent of the records, as selected by the IQRPE, for each type of inspection (e.g. NDE, etc.) will be reviewed to assess inspection procedures and completeness. If the records that are reviewed are satisfactory, in the opinion of the IQRPE, the inspections will be deemed satisfactory and the inspections will not be repeated. A plan for further review of inspection records will be developed if the initial records review reveals potential data inconsistencies.

All Nonconformance Reports (NCRs) will be reviewed to determine if the non-conforming item has been satisfactorily resolved.

4.3 ACCEPTANCE TEST PROCEDURE AND OPERATING TEST PROCEDURE REVIEW

Integrity examinations were performed on the GPF as part of the ATP and OTP. The test procedures and results will be reviewed by the IQRPE, or his authorized representative, to determine if the examinations performed meet the requirements of (WAC) 173-303-640 (3). See Appendix C for a list of documents to be reviewed. Integrity examinations that already have been performed will not be duplicated.

4.4 WASTE CHARACTERISTICS, COMPATIBILITY, AND CORROSION PROTECTION

The corrosion protection design information must include information on tank system age, waste characterization, and tank system materials. Waste/tank compatibility must specifically be assessed. The corrosion protection design information will be reviewed by the IQRPE or his authorized representative. If, in the opinion of the IQRPE, additional design information, testing, and/or calculations are required to adequately assess the existing corrosion protection, additional work to identify any deficiencies in the existing external corrosion protection and recommended corrections will be performed under a separate work order.

4.5 INTEGRITY EXAMINATIONS

Leak tests will be performed on the following equipment:

- Leachate collection tank
- Waste feed pipe and encasement pipe from the last valve inside the waste pump pit to the LCT
- Excess water return pipe and encasement pipe from the leachate pump pit to the LCT.

Visual examinations will be performed on the following equipment:

- Leachate collection tank
- Leachate collection tank/mixer module sump
- Piping, drains, and valves inside the LCT/mixer module that drain to the LCT sump.

The equipment to be tested, type of test to be performed, and acceptance criteria are summarized in Table 2. Additional tests and visual examinations may be performed as determined by the IQRPE to meet the integrity assessment requirements. Further examinations and NDE will be performed if leaks are detected during the leak testing or if the planned examinations and analyses suggest evidence of system damage.

4.5.1 Leak Test

Leak testing of the hazardous waste system components will be performed through hydrostatic testing of components and piping under at least operational head of water. Encasement pipes will be pneumatically tested for leaks, as required by the IQRPE.

A specific hydrotest Leak Test Procedure is provided in Appendix D to define the leak test details, e.g., specific volumes, hold times, and examination points. The results of the leak test will be documented completely.

The hydrotest equipment will be submitted to the IQRPE for examination at least 5 working days before the test. The IQRPE will approve the hydrotest equipment to be used.

The pneumatic leak test procedure will be developed after the IQRPE's document review described above. The results will be documented on data sheets included in the pneumatic leak test procedure.

4.5.2 Examinations

The equipment listed above will be examined for leaks, cracks, loose parts and evidence of degradation and deformation due to corrosion, erosion, mechanical stresses, and fatigue. The materials of construction of the equipment components will be compared with the specifications and the use of appropriate materials will be verified. The engineer also will look for differences between the actual system configuration and the process drawings. Differences will be reported in the IAR, along with the IQRPE's opinion on the significance of the differences and recommendations for action.

The examinations will be performed by WHC certified Level II Quality Control personnel with ASME Section XI inspection experience (VT-3). The IQRPE will review the examination reports to verify they are performed in accordance with this IAP.

The latest edition accepted by the Department of Energy of ASME Section XI (ASME, 1990) acceptance criteria will be used as a guide to identify components requiring further evaluation. The examination/NDE procedure will be developed after the IQRPE's document review described above. The results will be documented on data sheets included in the examination/NDE procedure.

4.6 ACCEPTANCE CRITERIA

The following acceptance criteria will be used:

- No design deficiencies are identified that would cause the tank system to collapse, rupture, or fail during use

- Corrosion protection is determined to be adequate for continued use of the system through the assessment period (e.g., until the next integrity assessment) for the projected waste stream

- No detectable leaks are found (minimum detectable leak to be documented at time of test based on equipment used)

- No evidence of degradation or deformation of tank system or components is found that would make failure probable during operation.

See Table 2 for a summary of items to be assessed, the assessment to be performed, and the acceptance criteria.

4.7 HOLD POINTS

Quality Assurance and Safety hold points shall be documented on the appropriate WHC Job Control System forms. The following items shall be verified by WHC Quality Control on behalf of the IQRPE:

- Leak test of the tank system in accordance with the leak test plan
- Examination of the tank system in accordance with examination plan.

The assessment shall not progress beyond these hold points until the appropriate examinations and signatures are obtained.

5.0 CERTIFICATION

On completion of the tank system integrity assessment, the designated IQRPE will certify the accuracy of the report with the following statement:

> "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

6.0 ORGANIZATIONAL RESPONSIBILITIES

This section describes the responsibilities of those organizations involved in carrying out this IAP.

6.1 INTERNAL ORGANIZATIONS

The tank system owner for this assessment is the Grout Facility of the Defense Waste Remediation Division. The Grout Process Engineering Section provides the cognizant engineering staff to the facility.

Authority for disposition of NCRs generated by this integrity assessment specifically remains with the cognizant engineer. The Grout Facility will use the IAR as a basis for determining if the system is "Fit for Use."

The cognizant engineer and manager are as follows:

- Cognizant Engineer: A. R. Tedeschi (373-3000)
- Cognizant Manager: S. H. Rifaey (373-2108)

6.2 EXTERNAL ORGANIZATIONS

The authority to perform the assessment and prepare the report has been delegated to Westinghouse Environmental and Geotechnical Services, Inc. (Westinghouse). SCM Consultants, Inc. (SCM) will serve as a subconsultant.

- Team Leader (Westinghouse): O. Lee Bostic, P.E. (736-0626)
- Team Leader (SCM): Lewis C. Midlam, P.E. (783-1625)

The IQRPE services will be provided through SCM. Leon J. Lindbloom is the designated IQRPE.

The IQRPE will review plans and procedures to ensure that information required to perform the assessment is obtained and will review tests, inspections, and records to ensure that information obtained is interpreted and presented accurately. The IQRPE will certify the IAR on satisfactory completion of the assessment.

7.0 SCHEDULE

A schedule for completion of the integrity assessment and report is provided separately.

8.0 COST ESTIMATE

A cost estimate for completion of the integrity assessment and report is provided separately.

9.0 QUALITY ASSURANCE

Activities associated with this integrity assessment shall be in accordance with *Quality Assurance* (WHC) and *Standard Engineering Practices* (WHC). The tank IAP and IAR shall be IMPACT LEVEL 3 in accordance with *Procedure for Integrity Assessments of Existing Dangerous Waste Tank Systems* (Dearing, 1990).

Technical changes to this IAP shall be in accordance with the Supporting Document procedures described in *Standard Engineering Practices* (WHC), EP 1.12, "Supporting Documents". All changes to this IAP shall be submitted to the IQRPE for approval.

Tests and inspections supporting this assessment shall be controlled through the WHC Job Control System in accordance with *Job Control System* (WHC).

10.0 REFERENCES

Allen, G. K., 1990, "Grout Vault Heat Transfer Results for M-106 Grout Formulation", WHC-SD-WM-ER-064, Rev. 0.

ASME, 1990, "Section XI Acceptance Criteria Dangerous Waste Tank Systems", American Society of Mechanical Engineers, New York, New York.

Dearing, J. I., P. C. Ohl, 1990, "Procedure for Integrity Assessments of Existing Dangerous Waste Tank Systems" WHC-SD-GN-AR-001, Rev. 0.

Ecology, October, 1989, "Dangerous Waste Regulations", Washington Administrative Code, Chapter 173-303, Washington State Department of Ecology, Olympia, WA.

Hendrickson, D. W., 1990, "Grout Treatment Facility Land Disposal Restriction Management Plan", WHC-SD-WM-PLN-005, Rev. 0.

Hendrickson, D. W., 1990, "Methods and Data for Use in Determining Source Terms for the Grout Disposal Program", WHC-SD-WM-TI-355, Rev. 1.

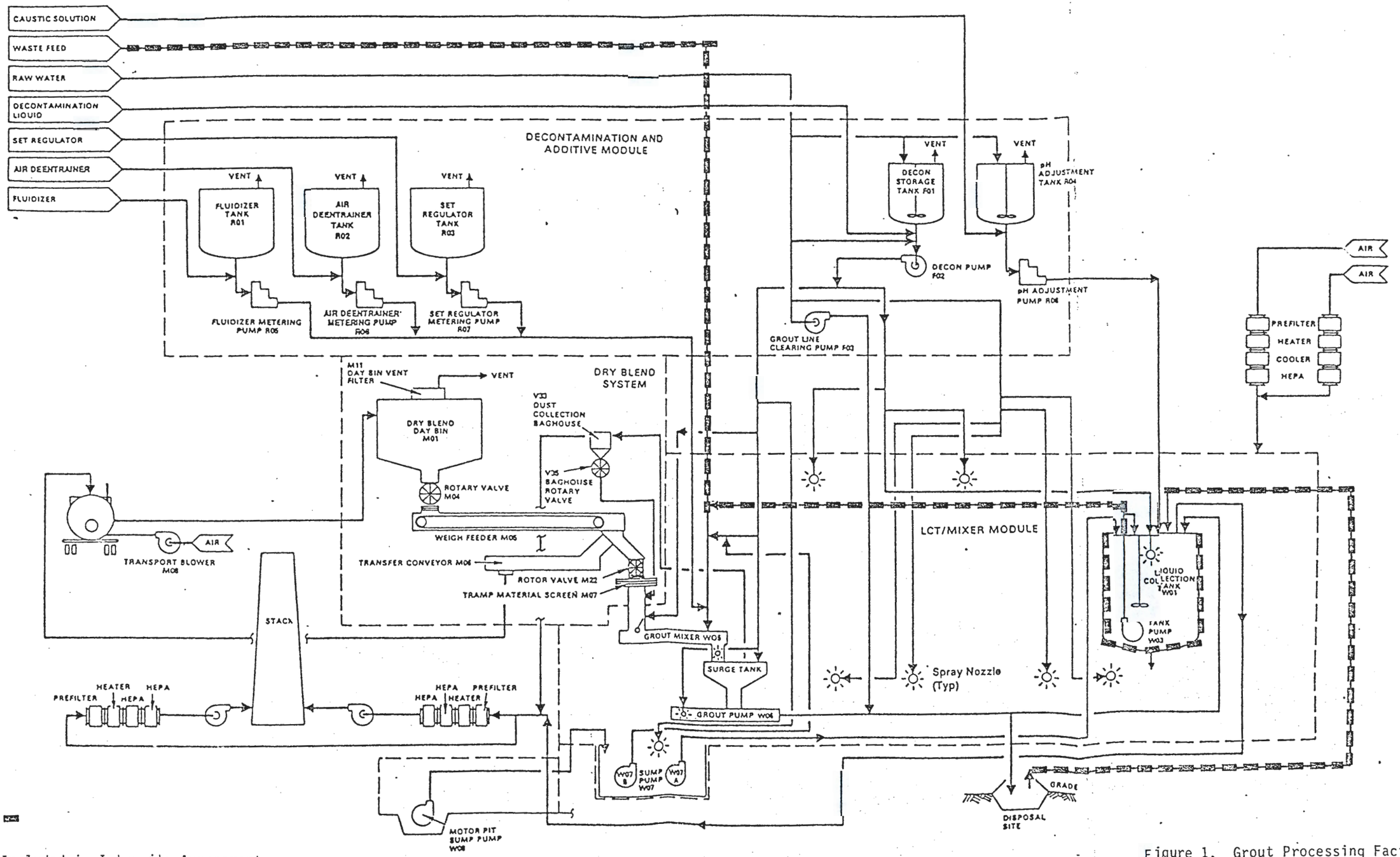
Hendrickson, D. W., 1990, "Radiolytic Heat Loading Calculation Methods for the Hanford Grout Disposal Facility", WHC-SD-WM-TI-455, Rev. 0.

Welch, 1991, "Tank 214-AN-106 Characterization Results", WHC-SD-CP-TP-065, Rev. 0.

WHC, "Job Control System", WHC-CM-8-8, Westinghouse Hanford Company.

WHC, "Quality Assurance", WHC-CM-4-2, Westinghouse Hanford Company.

WHC, "Standard Engineering Practices", WHC-CM-6-1, Westinghouse Hanford Company.



- Included in Integrity Assessment

Figure 1. Grout Processing Facility Process Flow Diagram

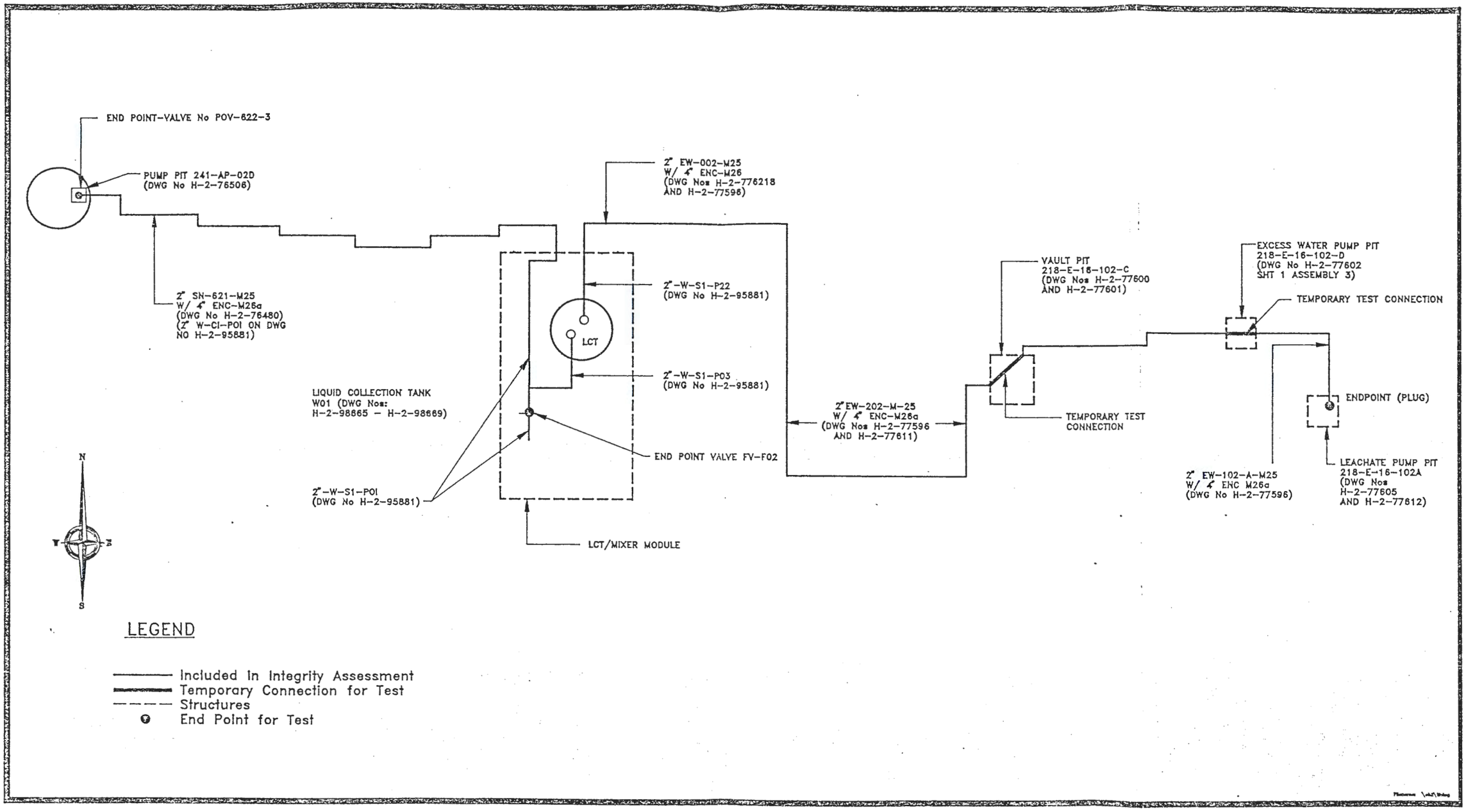


Figure 2 Grout Treatment Facility
Tank Integrity Assessment
System Boundaries.

Table 1. Operating Parameters			
Component	Pressure	Flow	Temperature
Waste Feed Pipeline	20-70 psig	25-55 gpm	50-185°F
LCT W01	Atmospheric	25-55 gpm	40-210°F
Excess Water Pipeline	50-80 psig	30-40 gpm	Ambient

Table 2. Assessment Criteria		
System Component	Required Assessment	Acceptance Criteria
Waste feed pipeline	Leak test	No detectable leaks
LCT	Leak test Visual examination	No detectable leaks No evidence of degradation or deformation of tank system or components that would make failure probable during operation
Excess water return pipeline	Leak test	No detectable leaks
Piping, drains, and valves inside the LCT/mixer module that drain to the LCT sump	Visual examination	No evidence of degradation or deformation of tank system or components that would make failure probable during operation
LCT sump	Visual examination	No evidence of degradation or deformation of tank system or components that would make failure probable during operation
All of the above	Design Review	No design deficiencies that would cause the tank system to collapse, rupture, or fail during use. Corrosion protection adequate for continued use of the system through the assessment period (e.g., until the next integrity assessment) for the projected waste stream.

Appendix A
Equipment to be Assessed

Grout Treatment Facility
Tank Integrity Assessment Plan
Equipment List

LEAK TEST

Equipment

LCT W01 Dwg No. H-2-95881

Piping

PIPE #	DESCRIPTION	DRAWING No.
2"-SN-621-M25	Waste feed from pump pit to LCT/mixer module (appears to be 2"-W-C1-P01 on LCT/mixer drawings)	H-2-76506
2"-W-C1-P01	Buyer's waste feed outside LCT/mixer module	H-2-95881
2"-W-S1-P01	Waste feed inside LCT/mixer module	H-2-95881
2"-W-S1-P03	Waste feed to LCT	H-2-95881
2"-W-S1-P22	Excess water return inside LCT module	H-2-95881
2"-W-C1-P03	Excess water return from vaults to LCT outside LCT/mixer module	H-2-95881
2"-EW-002-M25	Excess water return from vaults to LCT/mixer module (appears to be 2"-W-C1--P03 on LCT/mixer drawings)	H-2-77596
2"-EW-202-M25	Excess water return from vault 102 to 2"EW-002-M25	H-2-77596
2"-EW-102D-M25	Excess water pump pit 218-E-16-102D to vault pit 218-E-16-102-C	H-2-77596
2"-EW-102A-M25	Leachate pump pit 218-E-16-102-A to excess water pump pit 218-E-16-102D	H-2-77596

Secondary Containment - Pneumatic leak test

4" carbon steel pipe encasing 2"SN-621-M25 (2"-W-C1-P01)
4" carbon steel pipe encasing 2"EW-002-M25 (2"-W-C1-P03)
4" carbon steel pipe encasing 2"EW-202-M25
4" carbon steel pipe encasing 2"EW-102A-M25
4" carbon steel pipe encasing 2"EW-102D-M25

VISUAL EXAMINATION

LCT
LCT Sump

Piping, including drains and valves, inside the LCT/mixer module that drain to the LCT or LCT sump

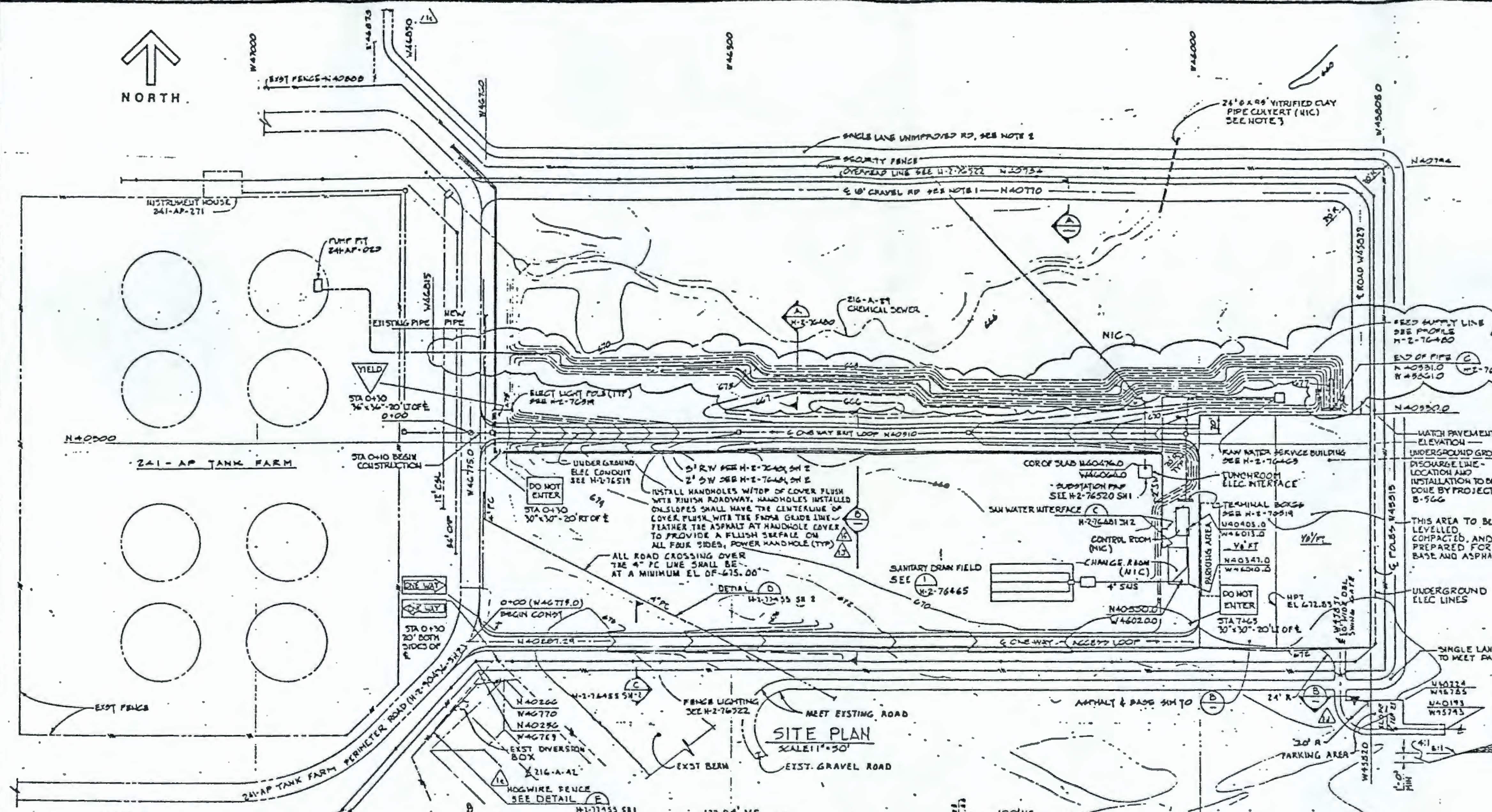
2"-W-S1-P08	Grout pump drain to LCT sump
2-1/2"-W-S4-P01	Grout feed to vault inside LCT/mixer module
2"-H-S5-P01	From groutline clearing pump or grout bypass
2"-W-S1-P05	Grout or groutline clearing bypass (2"-H-S5-P01) to LCT sump
2"-W-S1-P02	Grout bypass to LCT
3/4"-W-S1-P15	LCT sump pump W07A to LCT
2"-W-S1-P04	Return to LCT from 2"-W-S1-P03
3"-W-S1-P13	LCT overflow to LCT sump
2"-W-S1-P12	LCT drain to LCT sump
1"-W-S1-P07 2"-W-S1-P07	Waste decontamination water to LCT sump
2"-F-S1-P02	Decontamination water to waste feed
2"-W-S1-P10	LCT sump pump W07B to waste feed through 2"-F-S1-P02
1"-W-S1-P09	From motor pit sump pump W08 to LCT sump
3"-W-S6-P01	From sample box to LCT sump
1/2"-W-S1-P27	From LCT sump to test riser
1/2"-W-S1-T26	From grout pump to LCT sump

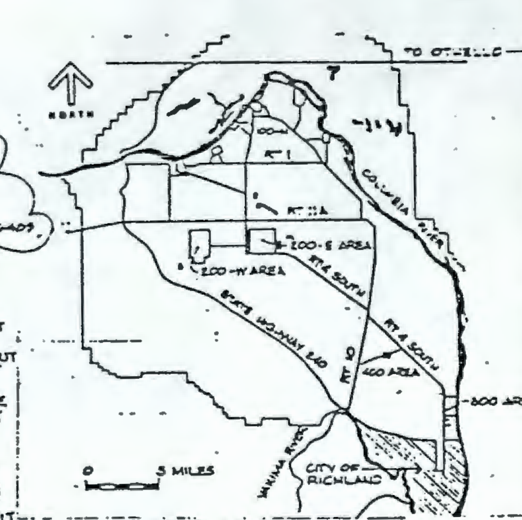
Appendix B
Drawings

Appendix B contains the following drawings:

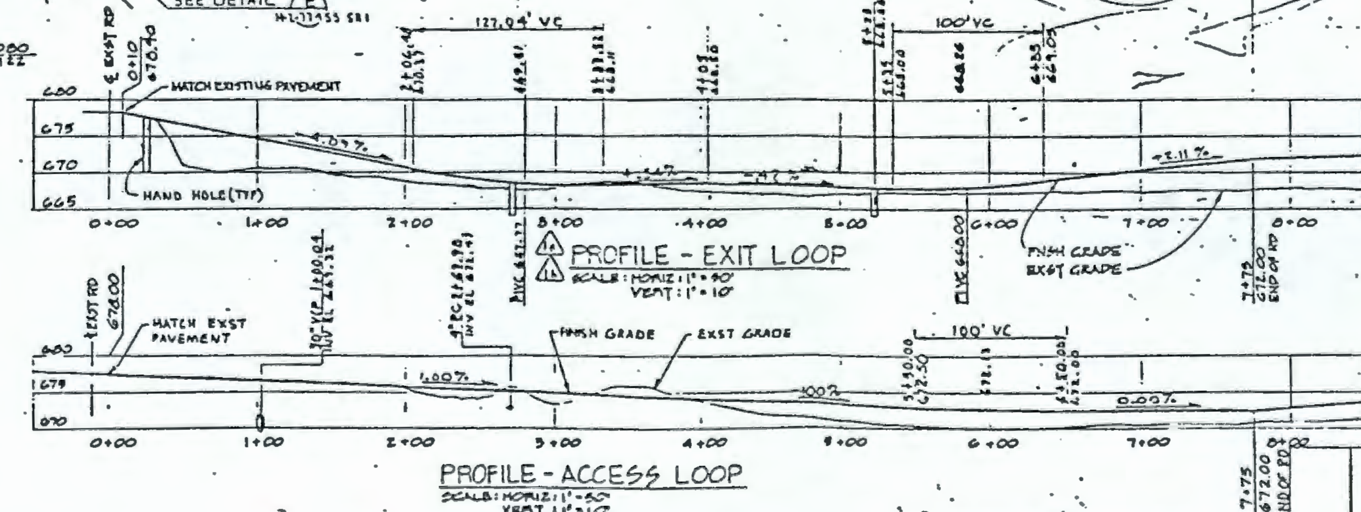
H-2-76455	Civil Site Plan
H-2-76480	Piping Plan Supernatant Lines
H-2-76489	Piping Jumper Arrangement 02D Pump Pit
H-2-76506	Instrumentation Engineering Flow Diagram
H-2-77596	Piping Plan
H-2-77600	Piping Jumper Arrangement Vault Pit
H-2-77601	Piping Vault Pit Section & Details
H-2-77602	Piping Jumper Arrangement Excess Water Pump Pit
H-2-77611	Piping Plan and Details
H-2-77612	Piping Leachate Pump Pit Jumper Arrangement/Jumper Assembly
H-2-77618, sht 1 of 12	Piping and Instrumentation Diagram Underground Vault
H-2-95878	Legend Piping and Instrumentation Diagram
H-2-95880	Grout Mixer System Piping and Instrumentation Diagram
H-2-95881	LCT/Valve Skid Piping and Instrumentation Diagram
H-2-98665	Equipment Arrangement LCT/Mix Module Dwg 1 of 5
H-2-98666	Equipment Arrangement LCT/Mix Module Dwg 2 of 5
H-2-98667	Equipment Arrangement LCT/Mix Module Dwg 3 of 5
H-2-98668	Equipment Arrangement LCT/Mix Module Dwg 4 of 5
H-2-98669	Equipment Arrangement LCT/Mix Module Dwg 5 of 5
H-2-98711	Equipment Jumper Assembly Liquid Collection Tank - W01

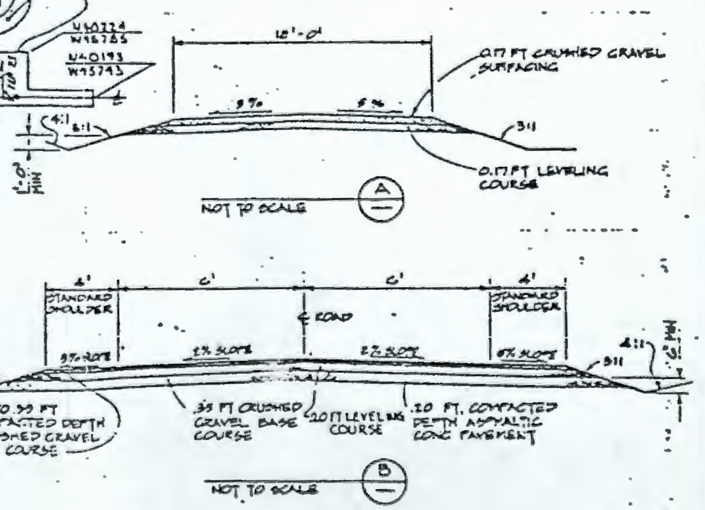
These drawings are 1/4th the size of the original drawings.





U S DEPT OF ENERGY
HANFORD SITE
BENTON COUNTY
STATE OF WASHINGTON





GENERAL NOTES:

1. 18' WIDE GRAVEL ROAD SHALL BE GRADE TO A MAX SLOPE OF ± 6% WITH CHANGES IN GRADE TO BE GRADUAL AND NO GREATER THAN ONE % IN 20 FT.
2. THE UNIMPROVED ROAD AROUND OUTSIDE OF SECURITY FENCE HAS BEEN CLEARED AND GRUBBED OF FOREIGN MATERIALS BY OTHERS. THE CONTRACTOR SHALL GRADE AND CONSTRUCT A 10' WIDE UNIMPROVED ROAD AROUND THE OUTSIDE OF THIS SECURITY FENCE. THE ROAD SHALL BE CONSTRUCTED WITH A CROWN AT THE CENTERLINE AND HAVE A 2% SLOPE EACH WAY. A 1' CUT DITCH ALONG EACH TOE OF ROAD SHALL BE CONSTRUCTED TO PROVIDE FOR DRAINAGE.
3. CULVERT TO BE INSTALL ON A 1½% SLOPE ON A BEARING OF N 13°E. BACKFILL A MIN OF 2 FT ABOVE TOP OF CULVERT. INSTALLATION & BACKFILLING SHALL BE PER CONSTRUCTION SPEC B492-C2. (NIC).

ROAD SIGN NOTES

1. INSTALL STOP SIGNS ON THE 241-AP TANK FARM ROAD AT N40875, W47270 AND N40155, W47430. SIGNS SHALL BE 30"x30" AND SHALL FACE EAST.
2. FOLDING TRUCK SIGNS SHALL BE INSTALLED ON CANTON AVE AT N40270, W47520 & N40995, W47320 FACING NORTH, N39995, W47353 FACING SOUTH AND N40825, W47350 FACING WEST. SIZE SHALL BE 30"x30". "TRUCK CROSSING" SHALL BE PRINTED ON THE SIGN.

N39850 ↑ NEW FENCE ↓ EXST FENCE

NUMBER	TITLE
H-6-706	TOPOGRAPHIC SURVEY EAST OF 200 E AREA
H-2-90486	CIVIL PLOT PLAN, FINISH GRADING PLAN
H-2-46499	200 AREA PLOT PLAN PROCESS WASTE SYSTEM
H-2-66321	CRIB LOCATIONS AND FRENCH DRAINS 216-A-1 TO 216-A-36
H-2-99900	PLOT PLAN
H-2-44500A	KEY MAP, AREA MAP, 200 EAST PLANT FACILITY
H-2-2341	200E AREA PROCESS WASTE SYSTEM
	DRAWING TRACEABILITY LIST

NUMBER	TITLE
H-2-93930	SITE C TOPOGRAPHIC MAP
H-2-76472	PIPING SUPERNATANT LINES
H-2-76401	PIPING
H-2-76515	ELECTRICAL ELEM DIAGRAMS
H-2-76463	RAW WATER SERVICE BLDG & PKG PIT
H-2-76450	PIPING SUPERNATANT LINES
H-2-76450	DRAWING LIST
	REFERENCES
NEXT USED ON	END ITEM

REVISIONS:
AS-BUILT FOR PROJ B492
NCR-B-492-21, E D-7
DATA-TRANS-MAS-10 E D-8
ADD-7-B-492-JAJ-1798, E D-5
NCR-B-492-10, GEN REV
DFC-B-492-13 GEN REV, ADD SH 2
DFC-B-492-47 GEN REV
DFC-B-492-40 - 2N-C6
DFC-B-492-41 2N-C23
DFC-B-492-52 2N-F7
NOT USED
DFC-B-492-16, GEN REVISION

REDUCED

RELEASED FOR CONSTRUCTION
BY ____ DATE ____
DOE

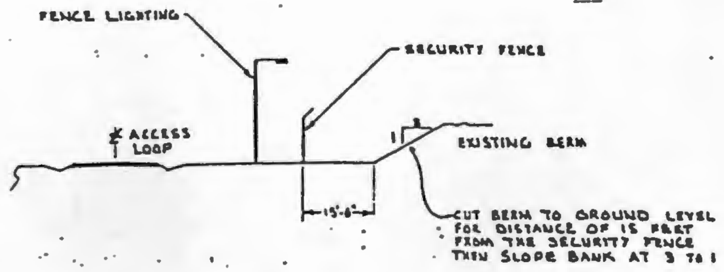
U. S. DEPARTMENT OF ENERGY
Richland Operations Office
KAISER ENGINEERS HANFORD COMPANY

CIVIL
SITE PLAN

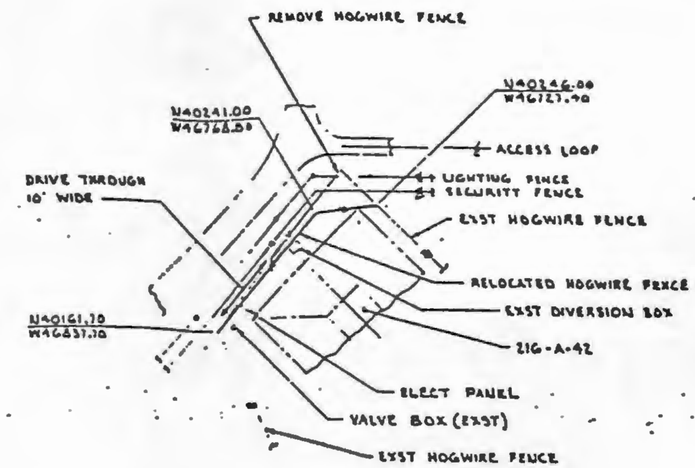
PROJECT TITLE: SHALLOW LAND DISPOSAL SITE

PROJ	WO	JOB
B-492	X49202	R557A2
SCALE: SHOWN	AREA: 200-E	

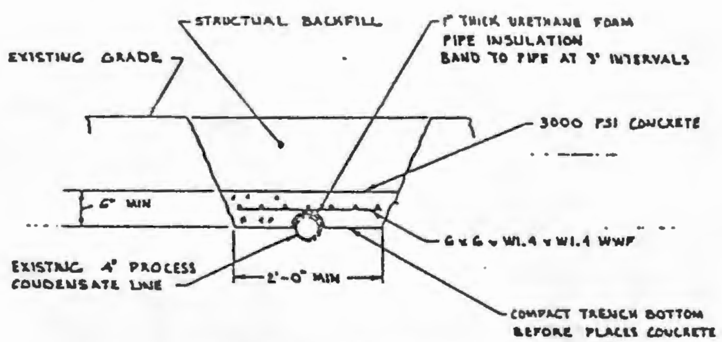
CLASSIFICATION	DRAWING NUMBER	SHEET	OF	REV
NONE	H-2-76455	1	2	1



SECTION (C)
NOT TO SCALE H-2-76455 SH 1



DETAIL (E)
SCALE: 1" = 50' H-2-76455 SH 1



DETAIL (D)
NOT TO SCALE H-2-76455 SH 1

NOTE: CONCRETE SLAB SHALL BE CENTERED OVER PIPE AND SHALL EXTEND FROM APPROXIMATE W46340 TO W46540. FIELD VERIFY THAT THE SLAB WILL EXTEND UNDER THE ACCESS LOOP, THE SINGLE UNIMPROVED ROAD, AND THIER DITCHES.

NEW SHEET ADDED TO REFLECT AS-BUILT CONDITIONS PER DFC B-492 - 19, 25, 40

REDUCED

DRAWING TRACEABILITY LIST	
NUMBER	TITLE

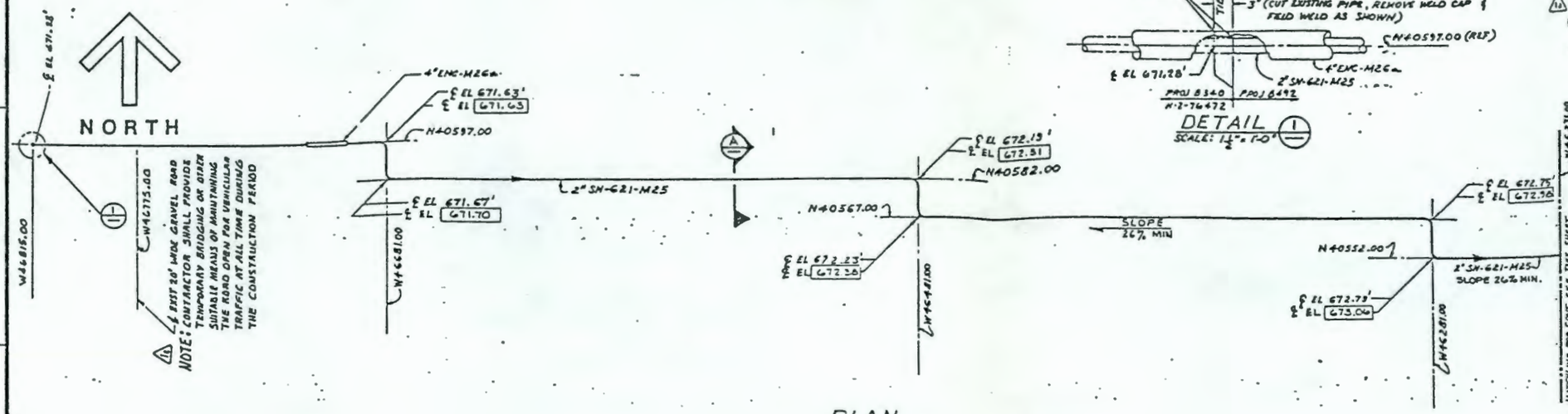
NEXT USED ON	H-2-76455 SH 1
REFERENCES	
DRAWING LIST	
NUMBER	TITLE

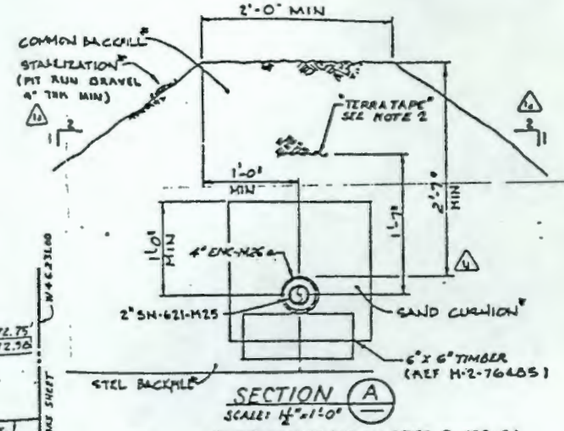
U. S. DEPARTMENT OF ENERGY
Richland Operations Office
KAISER ENGINEERS HANFORD COMPANY

CIVIL
SITE PLAN
DETAILS

PROJECT TITLE	SHALLOW LAND DISPOSAL SITE	
B-492	X49202	R537A3
SCALE SHOWN	100-6	0110
DRAWING NUMBER H-2-76455	SHEET 2 OF 2	REV 0

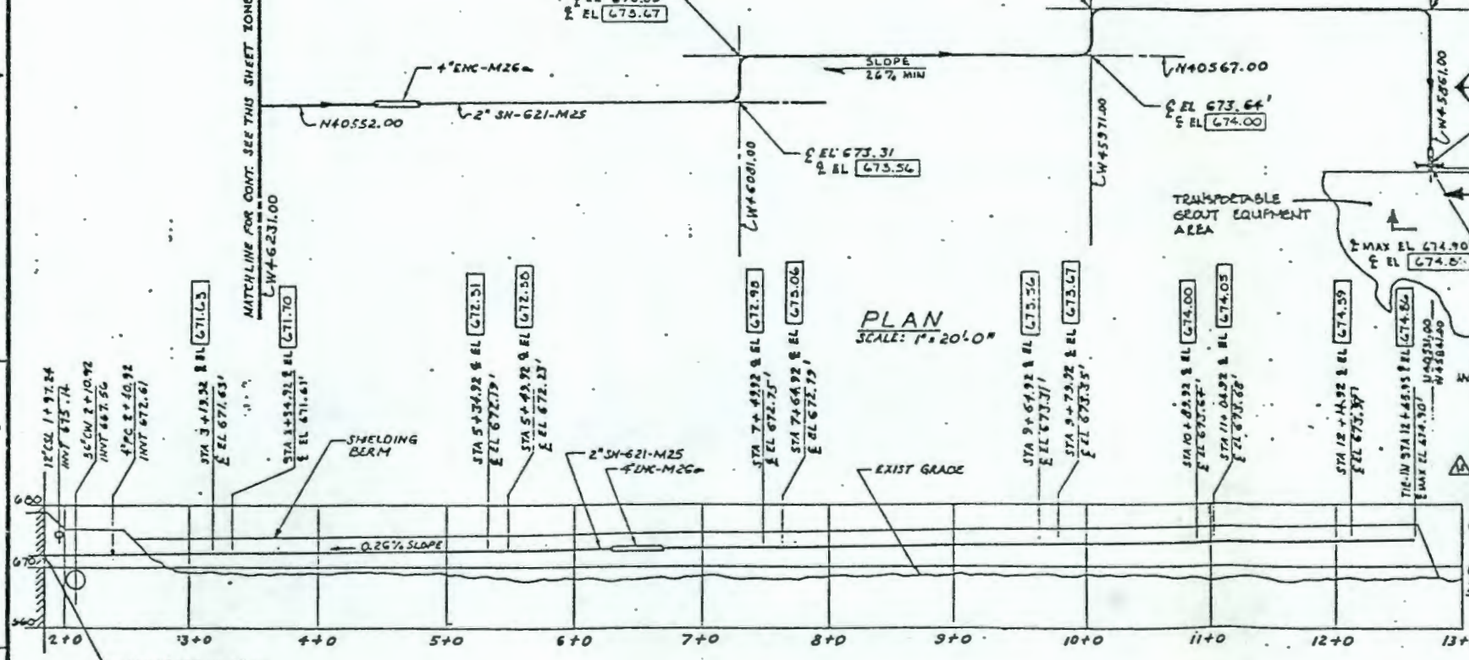
APPROVAL BY	R L ...	7-11-9
	...	7/../84
	NA	
APPROVED BY	NA	
SAFETY	NA	
APPROVED BY	J.D. CUMMINGS	7-8-84
CHECKED BY	M.A. KUBINSKI	
DRAWN BY	P. ESPINOZA	7-3-84
DESIGNED BY	NA	

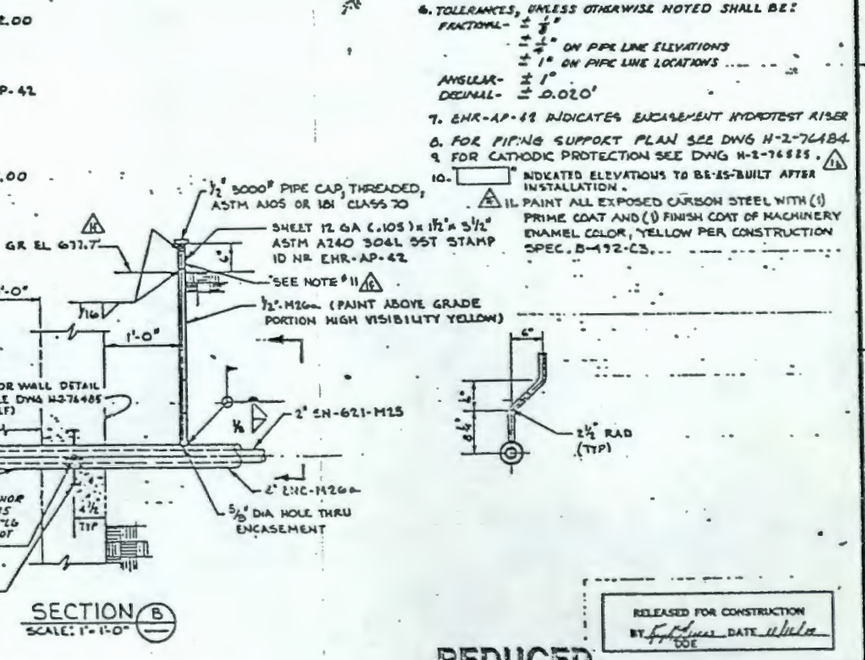




GENERAL NOTES

1. ALL PIPING MATERIALS, FABRICATION, WELDING & WELD INSPECTION, CLEANING, AND TESTING SHALL BE IN ACCORDANCE WITH SPECIFICATION B-492-C4 EXCEPT WHERE OTHERWISE SPECIFIED ON DWG
2. PLASTIC TAPE, YELLOW WITH BLACK LETTERS, "BURIED RADIOACTIVITY" TERRA TAPE, WIDTH AS REQUIRED TO COVER PIPE.
3. PIPE BENDS SHALL HAVE A BEND RADIUS OF 3'-0" EXCEPT WHERE OTHERWISE SPECIFIED.
4. PIPING SHALL HAVE A 2'-7" MINIMUM EARTH COVER AS MEASURED FROM THE TOP OF THE 4" ENCASEMENT OR THE TOP OF THE INSULATION AT EXPENSION VOIDS
5. PIPING SHALL HAVE A MINIMUM SLOPE OF 0.16%, EXCEPT AS NOTED.
6. TOLERANCES, UNLESS OTHERWISE NOTED SHALL BE:
   FRACTIONAL- ± ⅛"
   ± ¼" ON PIPE LINE ELEVATIONS
   ± 1" ON PIPE LINE LOCATIONS
   ANGULAR- ± 1°
   DECIMAL- ± 0.020'
7. EHR-AP-42 INDICATES ENCASEMENT HYDROTEST RISER
8. FOR PIPING SUPPORT PLAN SEE DWG H-2-76484
9. FOR CATHODIC PROTECTION SEE DWG H-2-76485.
10. [ ] INDICATED ELEVATIONS TO BE AS-BUILT AFTER INSTALLATION.
11. PAINT ALL EXPOSED CARBON STEEL WITH (1) PRIME COAT AND (1) FINISH COAT OF MACHINERY ENAMEL COLOR, YELLOW PER CONSTRUCTION SPEC. B-492-C3.





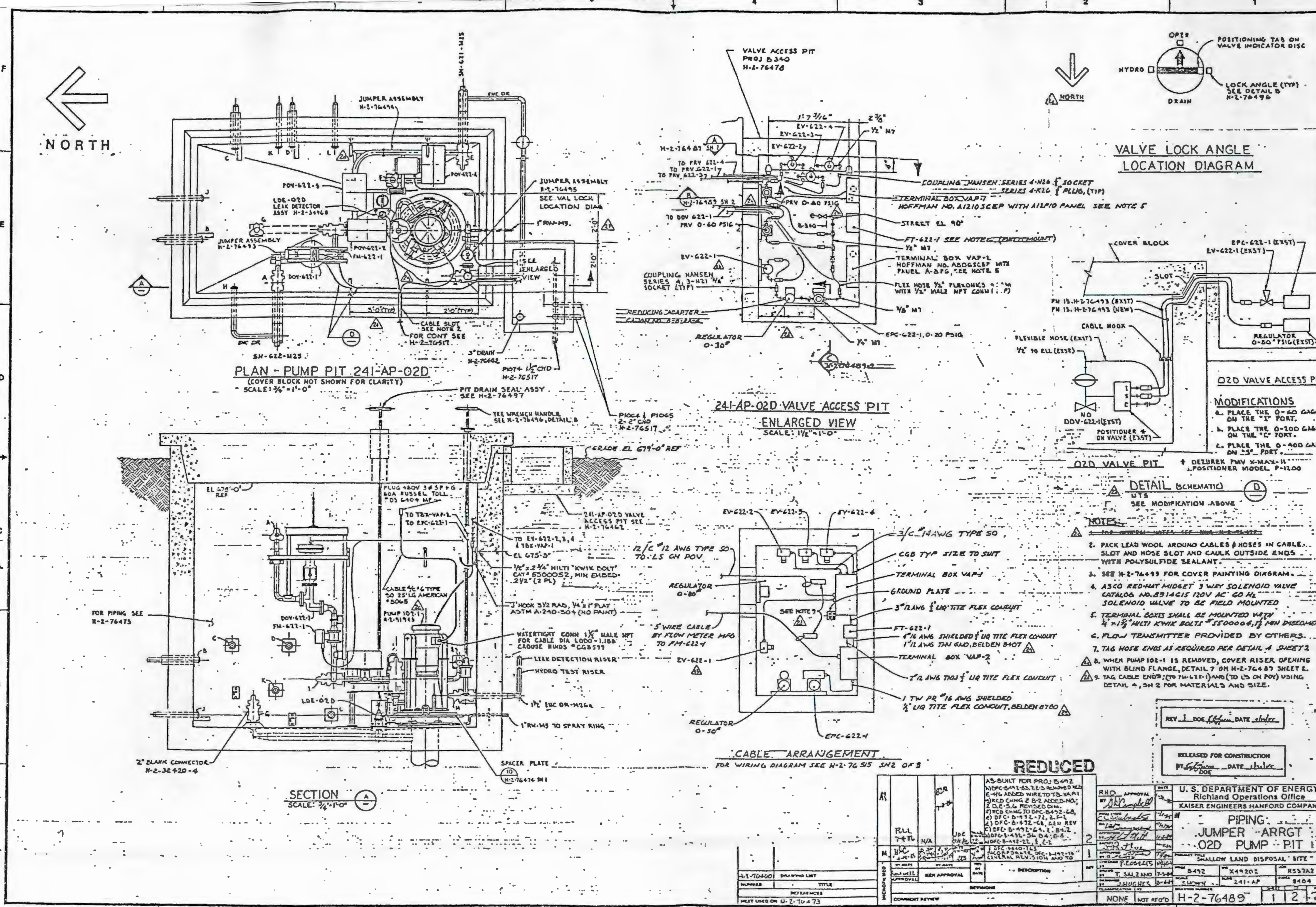
RELEASED FOR CONSTRUCTION
BY [illegible] DATE 11/6/96
SDE

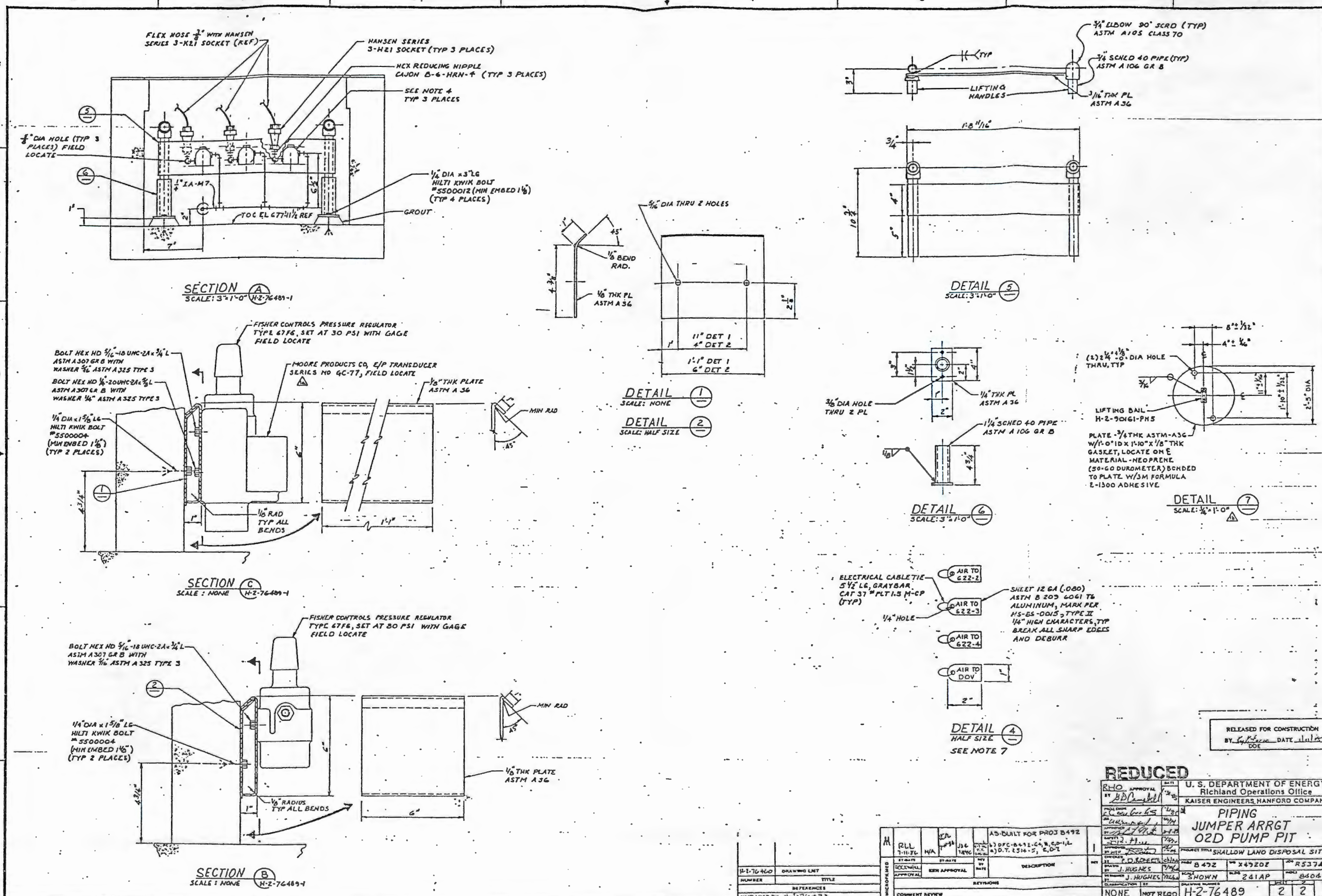
REDUCED

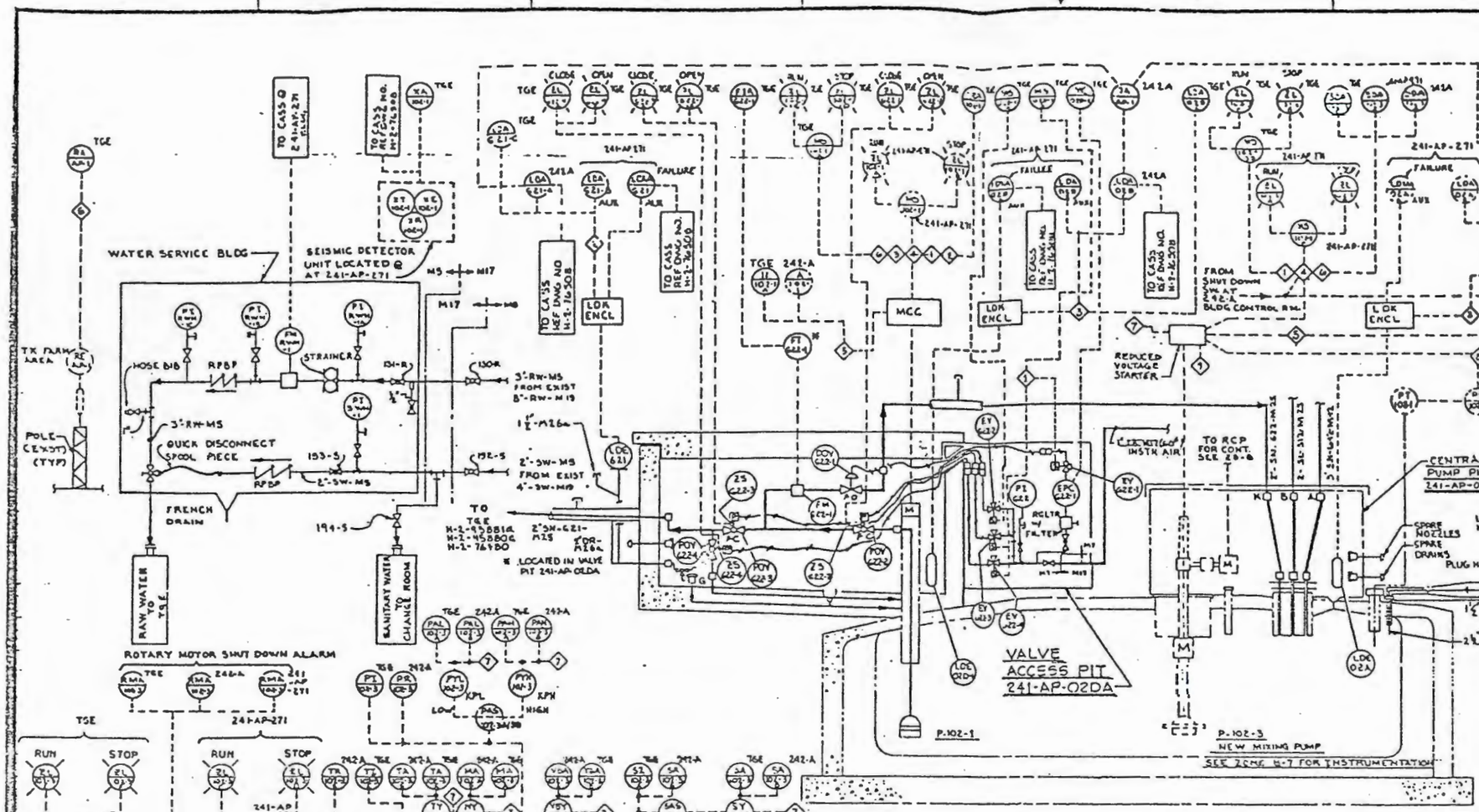
H-2-30437	CIVIL SITE PREP PLAN TANK FARM 241-AP	H-2-76455	CIVIL SITE PLAN
H-2-44501	AREA MAP-200 EAST (SW 56 57)	H-2-76480	DRAWING LIST
NUMBER	TITLE	NUMBER	TITLE
DRAWING TRACEABILITY LIST		REFERENCES	
		NEXT USED ON	H-2-76480

	R.E.L. 11-4-96	M.A.				A-5	AS-BUILT FOR PROJ B492 B-3
MICROFILMED	HANFORD	BY DATE	BY DATE				
	ROCKWELL APPROVAL	BY DATE	KEH APPROVAL				DESCRIPTION
	COMMENT REVIEW		REVISIONS				

RHO APPROVAL BY ADC Caldwell	DATE 11-8-96	U. S. DEPARTMENT OF ENERGY Richland Operations Office	
		KAISER ENGINEERS HANFORD COMPANY	
DESIGN ENGR C.A. KEELER	6-28-96	PIPING PLAN SUPERNATANT LINES	
DRAWN C.A. KEELER	6-28-96	PROJECT TITLE SHALLOW LAND DISPOSAL SITE	
CLASSIFICATION UNCLASS		PROJ B492	WO I49202
SCALE SHOWN		SCALE 200-E	PAGE 0402
NONE	NOT REQD	DRAWING NUMBER H-2-76480	SHEET 1


NORTH
PLAN - PUMP PIT 241-AP-02D
(COVER BLOCK NOT SHOWN FOR CLARITY)
SCALE: 3/4" = 1'-0"
JUMPER ASSEMBLY H-2-76494
JUMPER ASSEMBLY H-2-76495
SEE VAL LOCK LOCATION DIAG
JUMPER ASSEMBLY H-2-76493
LDE-02D LEAK DETECTOR ASSY H-2-34968
POV-622-3
POV-622-2
FM-622-1
DOV-622-1
SN-622-M25
SN-621-M25
SEE ENLARGED VIEW
CABLE SLOT SEE NOTE 2 FOR CONT SEE H-2-76517
3" DRAIN H-2-76462
PIT DRAIN SEAL ASSY SEE H-2-76497
TEE WRENCH HANDLE SEE H-2-76496, DETAIL B
VALVE ACCESS PIT PROJ B340 H-2-76478
COUPLING HANSEN SERIES 4-H26 SOCKET
SERIES 4-K26 PLUG, (TYP)
TERMINAL BOX VAP-1
HOFFMAN NO. A1210SCEP WITH A12P10 PANEL SEE NOTE 5
STREET EL 90°
FT-622-1 SEE NOTE 6
TERMINAL BOX VAP-2
REGULATOR 0-30#
241-AP-02D VALVE ACCESS PIT
ENLARGED VIEW
SCALE: 1 1/2" = 1'-0"
VALVE LOCK ANGLE
LOCATION DIAGRAM
OPEN
HYDRO
DRAIN
POSITIONING TAB ON VALVE INDICATOR DISC
LOCK ANGLE (TYP) SEE DETAIL B H-2-76496
COVER BLOCK
SLOT
CABLE HOOK
FLEXIBLE HOSE (EXST)
DOV-622-1 (EXST)
POSITIONER & ON VALVE (EXST)
REGULATOR 0-80 PSIG (EXST)
02D VALVE ACCESS PIT
MODIFICATIONS
a. PLACE THE 0-60 GAGE ON THE "I" PORT.
b. PLACE THE 0-200 GAGE ON THE "C" PORT.
c. PLACE THE 0-400 GAGE ON "S" PORT.
02D VALVE PIT
* DEZUREK PMV X-MAX-II POSITIONER MODEL P-1200
DETAIL (SCHEMATIC) D
NTS
SEE MODIFICATION ABOVE
SECTION A
SCALE: 3/4" = 1'-0"
GRADE EL 679'-0" REF
FOR PIPING SEE H-2-76473
2" BLANK CONNECTOR H-2-32420-4
SPACER PLATE
1 1/2" SUC DR-M26a
1" RW-M5 TO SPRAY RING
LEAK DETECTION RISER
HYDRO TEST RISER
CABLE ARRANGEMENT
FOR WIRING DIAGRAM SEE H-2-76515 SH2 OF 3
3/C #14AWG TYPE SO
CGB TYP SIZE TO SUIT
TERMINAL BOX VAP-1
GROUND PLATE
FT-622-1
TERMINAL BOX VAP-2
EPC-622-1
REGULATOR 0-80#
REGULATOR 0-30#
EV-622-1
EV-622-2
EV-622-3
EV-622-4
NOTES:
2. PACK LEAD WOOL AROUND CABLES & HOSES IN CABLE SLOT AND HOSE SLOT AND CAULK OUTSIDE ENDS WITH POLYSULFIDE SEALANT.
3. SEE H-2-76499 FOR COVER PAINTING DIAGRAM.
4. ASCO RED-HAT MIDGET 3 WAY SOLENOID VALVE CATALOG NO. 8314C15 120V AC 60 Hz SOLENOID VALVE TO BE FIELD MOUNTED
5. TERMINAL BOXES SHALL BE MOUNTED WITH 1/4" x 1 5/8" HILTI KWIK BOLTS #5500004, 1 1/8 MIN EMBEDMENT
6. FLOW TRANSMITTER PROVIDED BY OTHERS.
7. TAG HOSE ENDS AS REQUIRED PER DETAIL 4 SHEET 2
8. WHEN PUMP 102-1 IS REMOVED, COVER RISER OPENING WITH BLIND FLANGE, DETAIL 7 ON H-2-76487 SHEET 2.
9. TAG CABLE ENDS (TO FM-622-1) AND (TO LS ON POV) USING DETAIL 4, SH 2 FOR MATERIALS AND SIZE.
REV 1 DOE DATE
RELEASED FOR CONSTRUCTION
BY DOE DATE
REDUCED
AS-BUILT FOR PROJ B492
U. S. DEPARTMENT OF ENERGY
Richland Operations Office
KAISER ENGINEERS HANFORD COMPANY
PIPING
JUMPER ARRGT
02D PUMP PIT
SHALLOW LAND DISPOSAL SITE
B492
X49202
R537A2
SHOWN
241-AP
8404
T. SALZANO
J. HUGHES
P. ROBERTS
NONE
NOT REQ'D
H-2-76489
1
2
2
NEXT USED ON H-2-76473


FLEX HOSE 3/8" WITH HANSEN SERIES 3-K21 SOCKET (REF)
HANSEN SERIES 3-H21 SOCKET (TYP 3 PLACES)
HEX REDUCING NIPPLE CAJON B-6-HRN-4 (TYP 3 PLACES)
SEE NOTE 4 TYP 3 PLACES
1/8" DIA HOLE (TYP 3 PLACES) FIELD LOCATE
1/4" DIA x 3" LG HILTI KWIK BOLT #5500012 (MIN EMBED 1 1/8") (TYP 4 PLACES)
TOC EL 677'-11 1/2 REF
GROUT
SECTION A
SCALE: 3"=1'-0" H-2-76489-1
FISHER CONTROLS PRESSURE REGULATOR TYPE 67F6, SET AT 30 PSI WITH GAGE FIELD LOCATE
MOORE PRODUCTS CO, E/P TRANSDUCER SERIES NO GC-77, FIELD LOCATE
BOLT HEX HD 5/16-18 UNC-2A x 3/4 L ASTM A307 GR B WITH WASHER 5/16 ASTM A325 TYPE 3
BOLT HEX HD 1/4-20 UNC-2A x 5/8 L ASTM A307 GR B WITH WASHER 1/4" ASTM A325 TYPE 3
1/4" DIA x 1 5/8" LG HILTI KWIK BOLT #5500004 (MIN EMBED 1 1/8") (TYP 2 PLACES)
1/8" THK PLATE ASTM A 36
MIN RAD
1/8" RAD TYP ALL BENDS
SECTION C
SCALE: NONE H-2-76489-1
FISHER CONTROLS PRESSURE REGULATOR TYPE 67F6, SET AT 80 PSI WITH GAGE FIELD LOCATE
BOLT HEX HD 5/16-18 UNC-2A x 3/4 L ASTM A307 GR B WITH WASHER 5/16 ASTM A325 TYPE 3
1/4" DIA x 1 5/8" LG HILTI KWIK BOLT #5500004 (MIN EMBED 1 1/8") (TYP 2 PLACES)
1/8" THK PLATE ASTM A36
1/8" RADIUS TYP ALL BENDS
SECTION B
SCALE: NONE H-2-76489-1
5/16" DIA THRU 2 HOLES
1/8" BEND RAD.
1/8" THK PL ASTM A36
11" DET 1
4" DET 2
1'-1" DET 1
6" DET 2
DETAIL 1
SCALE: NONE
DETAIL 2
SCALE: HALF SIZE
3/4" ELBOW 90° SCRD (TYP) ASTM A105 CLASS 70
3/4" SCHED 40 PIPE (TYP) ASTM A 106 GR B
LIFTING HANDLES
3/16" THK PL ASTM A36
1'-8 11/16"
DETAIL 5
SCALE: 3"=1'-0"
3/8" DIA HOLE THRU 2 PL
1/4" THK PL ASTM A 36
1 1/4" SCHED 40 PIPE ASTM A 106 GR B
DETAIL 6
SCALE: 3"=1'-0"
(2) 2 1/4" DIA HOLE THRU, TYP
LIFTING BAIL H-2-90161-PN5
PLATE - 3/8 THK ASTM-A36 W/1'-0" ID x 1'-10" x 1/8" THK GASKET, LOCATE ON ℄ MATERIAL - NEOPRENE (50-60 DUROMETER) BONDED TO PLATE W/3M FORMULA E-1300 ADHESIVE
DETAIL 7
SCALE: 3/4"=1'-0"
ELECTRICAL CABLE TIE - 5 1/2" LG, GRAYBAR CAT 37 #PLT 1.5 M-CP (TYP)
1/4" HOLE
AIR TO 622-2
AIR TO 622-3
AIR TO 622-4
AIR TO DOV
SHEET 12 GA (.080) ASTM B 209 6061 T6 ALUMINUM, MARK PER HS-BS-0015, TYPE II 1/4" HIGH CHARACTERS, TYP BREAK ALL SHARP EDGES AND DEBURR
DETAIL 4
HALF SIZE
SEE NOTE 7
RELEASED FOR CONSTRUCTION
BY DOE DATE
REDUCED
U. S. DEPARTMENT OF ENERGY
Richland Operations Office
KAISER ENGINEERS HANFORD COMPANY
PIPING
JUMPER ARRGT
02D PUMP PIT
SHALLOW LAND DISPOSAL SITE
8492
X49202
R53742
SHOWN
241AP
8404
J. HUGHES
NONE
NOT REQD
H-2-76489
2 2 1
AS-BUILT FOR PROJ B492
H-2-76460 DRAWING LIST
NEXT USED ON H-2-76473
DESCRIPTION
REVISIONS
COMMENT REVIEW



TANK 241-AP-102

INTERLOCK LEGEND

1. UPON HIGH SEISMIC ACTIVITY DETECTED BY XE-102-1 THE FOLLOWING SHALL TAKE PLACE:
   (a.) PISTON OPERATED VALVE POV-G22-3 SHALL CLOSE (SOLENOID VALVE EV-G22-3 DE-ENERGILED).
   (b.) PISTON OPERATED VALVE POV-G22-4 SHALL OPEN (SOLENOID VALVE EV-G22-4 DE-ENERGIZED).
   (c.) PUMP P-102-1 SHALL SHUTDOWN
   (d.) PUMP P-102-3 SHALL SHUTDOWN
   (e.) FOV G22-2 (FC) SHALL CLOSE (SOLENOID VALVE "EV-G22-2" DE-ENERGIZED)
   (f.) DOOG 22-1 (FO) SHALL OPEN
2. UPON LEAK DETECTION IN ENCASED SUPERNATANT TRANSFER LINE 2"SN-621-M25 PUMP P-102-1 SHALL SHUTDOWN
3. UPON LEAK DETECTION IN PUMP PIT 241-AP-02A OR 241-AP-02D, PUMP P-102-1 SHALL SHUTDOWN.
4. WHEN MASTER SHUTDOWN SWITCH LOCATED AT 242-A BLDG IS ACTIVATED, PUMPS P-102-1, & P-102-3 SHALL SHUTDOWN
5. WHEN HIGH OR LOW AMPERAGE IS DETECTED PUMP P-102-1 & P-102-3 SHALL SHUTDOWN
6. WHEN HIGH RADIATION IS DETECTED, PUMPS P-102-1, & P-102-3 SHALL SHUTDOWN.
7. WHEN THE FOLLOWING INSTRUMENTS ARE ACTIVATED, PUMP P-102-3 SHALL SHUTDOWN
   (a.) VIBRATION MONITOR
   (b.) TEMPERATURE SENSING OF MOTOR WINDING
   (c.) MOISTURE DETECTOR FOR LEAKAGE INTO MOTOR HOUSING
   (d.) DISCHARGE PRESSURE HIGH OR LOW (10 MIN OVERRIDE OF LOW PRESSURE AT START)
   (e.) COLUMN RMM STRAIN
   (f.) ROTATION MOTOR FAILURE TO START (10 MIN OVERRIDE AT START OF P-102-3)
   (g.) OVERTRAVEL OF LIMIT SWITCH LS-1 OR LS-2
8. TK-102 HIGH PRESS SHALL SHUTDOWN THE MIXING PUMP P-102-3
9. WHEN THE FOLLOWING INTERLOCKS ARE ACTIVATED, THE ROTATION MOTOR SHALL SHUTDOWN
   (a.) SHUTDOWN OF PUMP P-102-3
   (b.) ACTIVATION OF OVERTRAVEL LIMIT SWITCH LS-1 OR LS-2

INSTRUMENT SYMBOL LEGEND

SYMBOL	PROCESS VARIABLE 1ST LETTER	INSTRUMENT FUNCTION 2ND AND 3RD LETTERS
A	AMMETER	ALARM
C		CONTROL, R. CONVERTER
E	ELECTRICAL	ELEMENT
H		HAND
I	CURRENT	INDICATOR
RM	ROTARY MOTOR	
M	MANUAL, MOISTURE	METER
P	PRESSURE	PNEUMATIC
Q	COMPUTER	
S	STRAIN	SWITCH
T	TEMPERATURE	TRANSMITTER
L	LEVEL	LOW, LIGHT
X	POSITION	
LD	LEAK DETECTION	
SD	SHUTDOWN	
VB	VIBRATION	
AN		ANALYZER
R	RADIATION	RECORDER
X	SEISMIC	FAILURE
F	FLOW	
X OR Y	——	RELAY

- LOCAL MOUNTED INSTRUMENT (EXIST)
- LOCAL MOUNTED INSTRUMENT (FIELD)
- REAR PNL MTD INSTRUMENT
- REAR PNL MTD INSTRUMENT (EXIST)
- TGE — PNL MTD INST IN TRANSPORTABLE GROUT CONT RM (TRAILER)
- 242-A — PNL MTD INST IN 242-A BLDG CONT. RM
- 241-AP-271 — PNL MTD INST IN 241-AP-271 INSTRUMENT BLDG
- PNL MTD INSTRUMENT (EXIST)
- PNL MTD INDICATOR LIGHT
- P — PISTON OPERATED BALL VALVE (POV)
- DIAPHRAGM OPERATED CONTROL VALVE (DOV)
- S — 3 WAY SOLENOID OPERATED VALVE (EV)
- MCC — MOTOR CONTROL CENTER
- M — ELECTRICAL MOTOR
- ELECTRICAL INTERLOCK
- ELECTRICAL LINE
- PNEUMATIC SIGNAL/CONTROL LINE
- EXISTING LINE
- FO FAIL OPEN
- FC FAIL CLOSED
- RWH RAW WATER HEADER
- SWH SANITARY WATER HEADER

ESSENTIAL DRAWING
IMPACT LEVEL 2 REDUCED

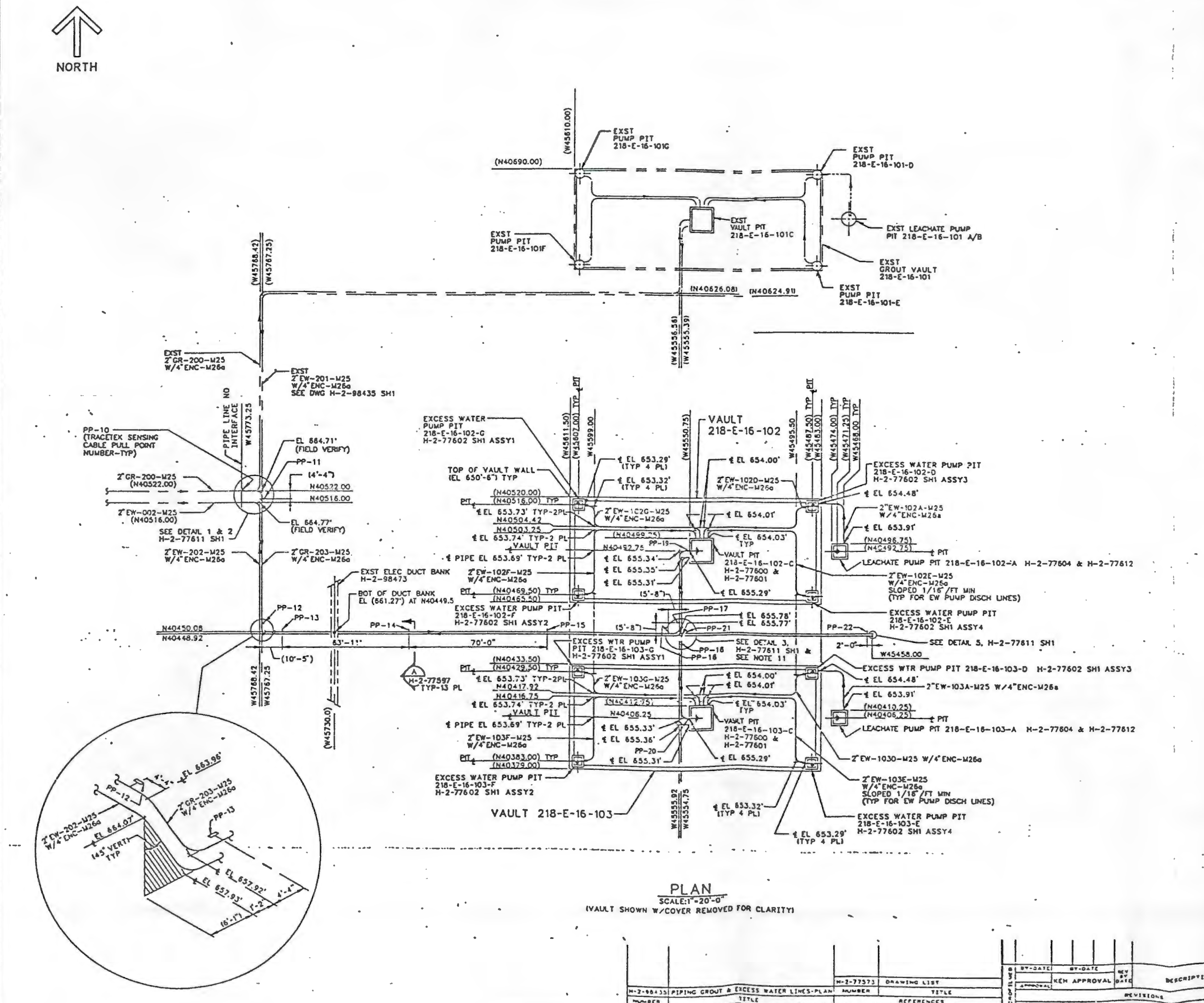
H-2-76509	CASS INTERCONN DIAG		
H-2-76507	INST PNL UPGRADE		
H-2-76471	ENGINEERING FLOW DIAG.		
H-2-76460	DRAWING LIST		

U. S. DEPARTMENT OF ENERGY
Richland Operations Office
KAISER ENGINEERS HANFORD COMPANY

INSTRUMENTATION ENGINEERING FLOW DIAGRAM

SHALLOW LAND DISPOSAL SITE

24590	X49202		R5STAR
NONE	200-E		7008
NONE	H-2-76506	1	1 5



PLAN

SCALE: 1"=20'-0"

(VAULT SHOWN W/COVER REMOVED FOR CLARITY)

GENERAL NOTES:

1. FOR LEGEND & SYMBOLS SEE H-2-77618.
2. UNLESS OTHERWISE SHOWN ALL BENDS SHALL BE 3'-0" RADIUS BENDS.
3. FOR PIPE SUPPORTS, GUIDES AND ANCHORS SEE H-2-77598 FOR LOCATIONS.
4. DIFFUSION BARRIER TO BE INSTALLED PRIOR TO INSTALLATION OF PIPE ON TOP OF VAULT. TRENCHING OR SHORING WILL BE REQUIRED FOR INSTALLATION OF ALL PIPING ON TOP OF VAULT.
5. ALL PIPING MATERIAL FABRICATION AND TESTING SHALL BE IN ACCORDANCE WITH CONSTRUCTION SPECIFICATION B-714-C2.
6. PAINT ALL PIT COVERS PER H-2-77610.
7. LINES SHALL HAVE A 2'-7" MINIMUM EARTH COVER AS MEASURED FROM TOP OF ENCASEMENT OR INSULATION.
8. TOLERANCES: UNLESS OTHERWISE NOTED.
   FRACTIONAL ± 1/8"
   ± 1/4" ON PIPE LINE ELEVATIONS *
   ± 1" ON PIPE LINE SPACING
   ± 2" ON PIPE LINE LOCATIONS
   ANGULAR ± 1° DECIMAL ± .010
   * INTERMEDIATE ELEVATIONS SHALL BE AS REQUIRED TO ESTABLISH AND MAINTAIN MINIMUM PIPE LINE SLOPE OF 3/32" PER FOOT.
9. CORNER ELEVATIONS TO BE DETERMINED BY INTERPOLATION FROM ELEVATIONS AT THE FIRST ADJACENT SUPPORT IN EACH DIRECTION.
10. FOR CATHODIC PROTECTION REQUIREMENTS SEE H-2-77645.
11. SEE DETAILS 4,6,7 & 8 ON DWG H-2-77611 SH1 & 2 FOR FUTURE PIPE ROUTE CHANGES. (NOTE: THE FUTURE PIPING ROUTE CHANGES ARE NOT WITHIN THE PROJECT B-714 SCOPE OF WORK).

OFFICIAL RELEASE BY WHC DATE APR 04 1989

EDT # 101089

REDUCED IMPACT LEVEL 2

H-2-98435	PIPING GROUT & EXCESS WATER LINES-PLAN
H-2-77573	DRAWING LIST
NUMBER	TITLE

KEH APPROVAL

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

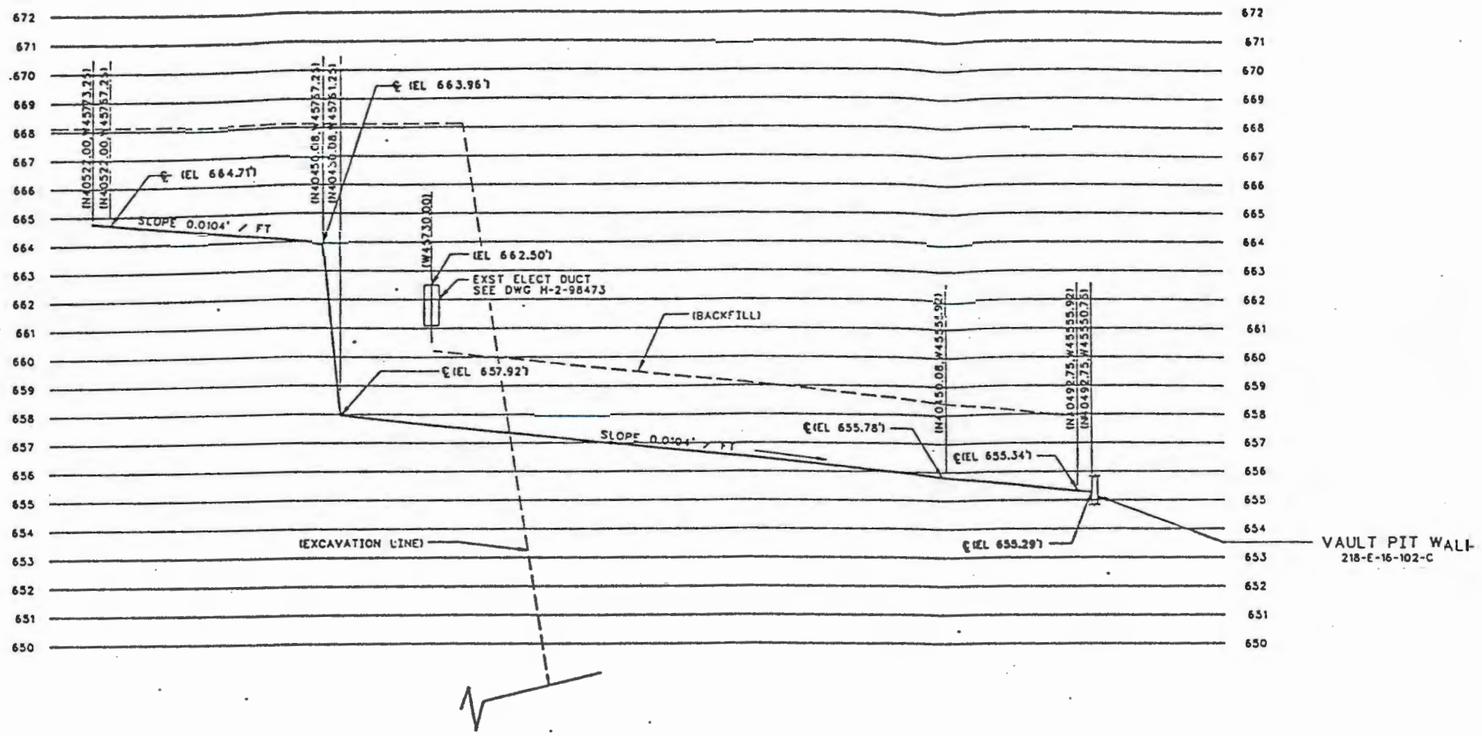
PIPING PLAN

WHC — H. HENRIKSON — WJM/RM ITEN — JLH/AG MINISTER — CRZ/JR COLLINS — L. HALL — D. WILTON — D. WILTON

GROUT VAULT PAIR 218-E-16-102&103

B-714	ER1060	242500
SHOWN	218-E-16	0432

H-2-77596 | 1 | 2 | 0



PROFILE GROUT LINE (GR-203-M25 W/4"ENC-M26a)

SCALE: HORIZ 1"=20'
VERT 1/2"=1'-0"

NOTES:

1. FOR GENERAL NOTES SEE H-2-77596 SH 1.

OFFICIAL RELEASE BY WHC DATE APR 04 1989

EDT = 101089

IMPACT LEVEL 2 REDUCED

WHC APPROVAL		U.S. DEPARTMENT OF ENERGY RICHLAND OPERATIONS OFFICE	
		KAISER ENGINEERS HANFORD COMPANY	
M	PIPING PLAN PROFILE GROUT LINE		
PROJECT TITLE	GROUT VAULT PAIR 218-E-16-102 & 103		
B-714	ER1069	242500	
SHOWN	218-E-16	0402	
B0775968	H-2-77596	2	2 C

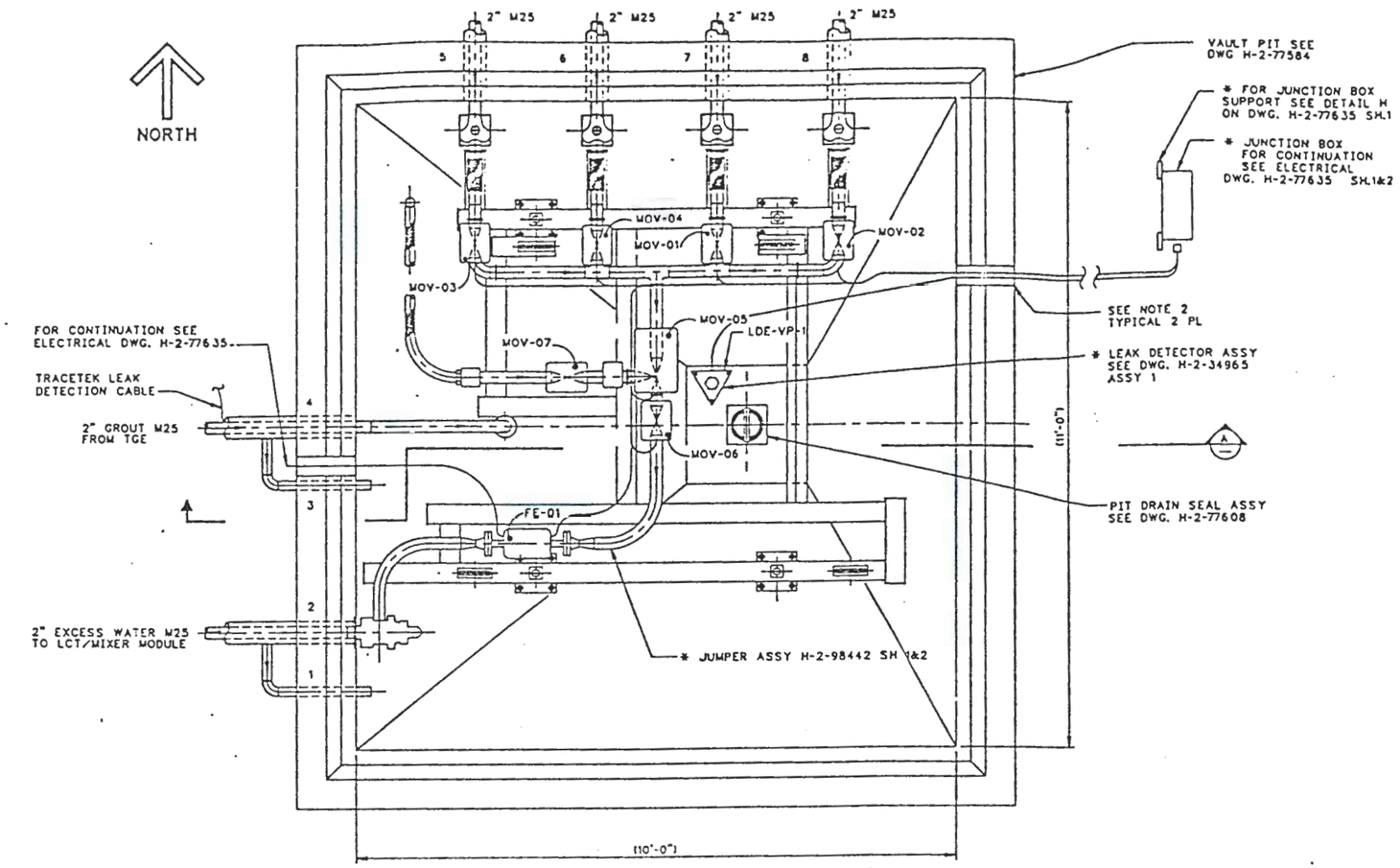
DRAWING TRACEABILITY LIST

NUMBER	TITLE
H-2-77573	DRAWING LIST

NEXT USED ON

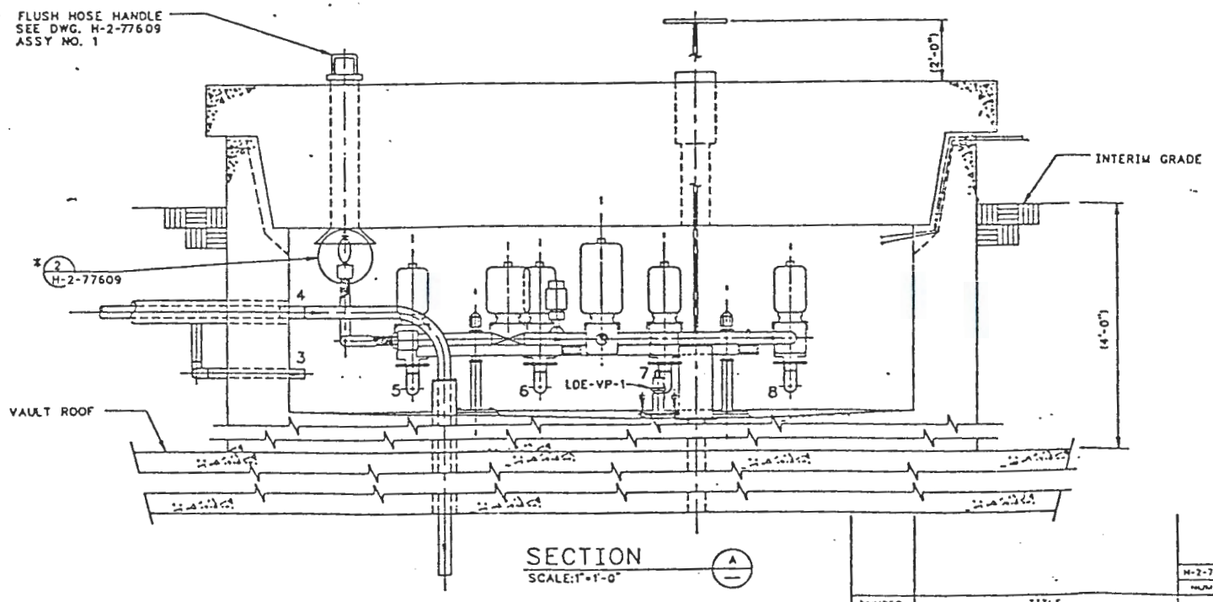
BY-DATE	APPROVAL	REV	BY-DATE	DESCRIPTION
	KEH APPROVAL			COMMENT REVIEW

REVISIONS



PLAN VAULT PIT 218-E-16-102 & 103

(COVER REMOVED FOR CLARITY)



SECTION

SCALE: 1"=1'-0"

NOTES:

1. FOR GENERAL NOTES SEE DWG. H-2-77596.
2. SEAL CABLE SLOT WITH DUCT SEAL INSTALL PER MANUFACTURES SPECIFICATIONS.
3. SEE DWG. H-2-77610 FOR COVER PAINTING DIAGRAM.
4. FOR CONTINUATION OF PIPING SEE DWG. H-2-77596.
5. (*) ASTERISK INDICATES EQUIPMENT TO BE FURNISHED AND INSTALLED BY OTHERS.

OFFICIAL RELEASE BY WHC DATE APR 04 1999

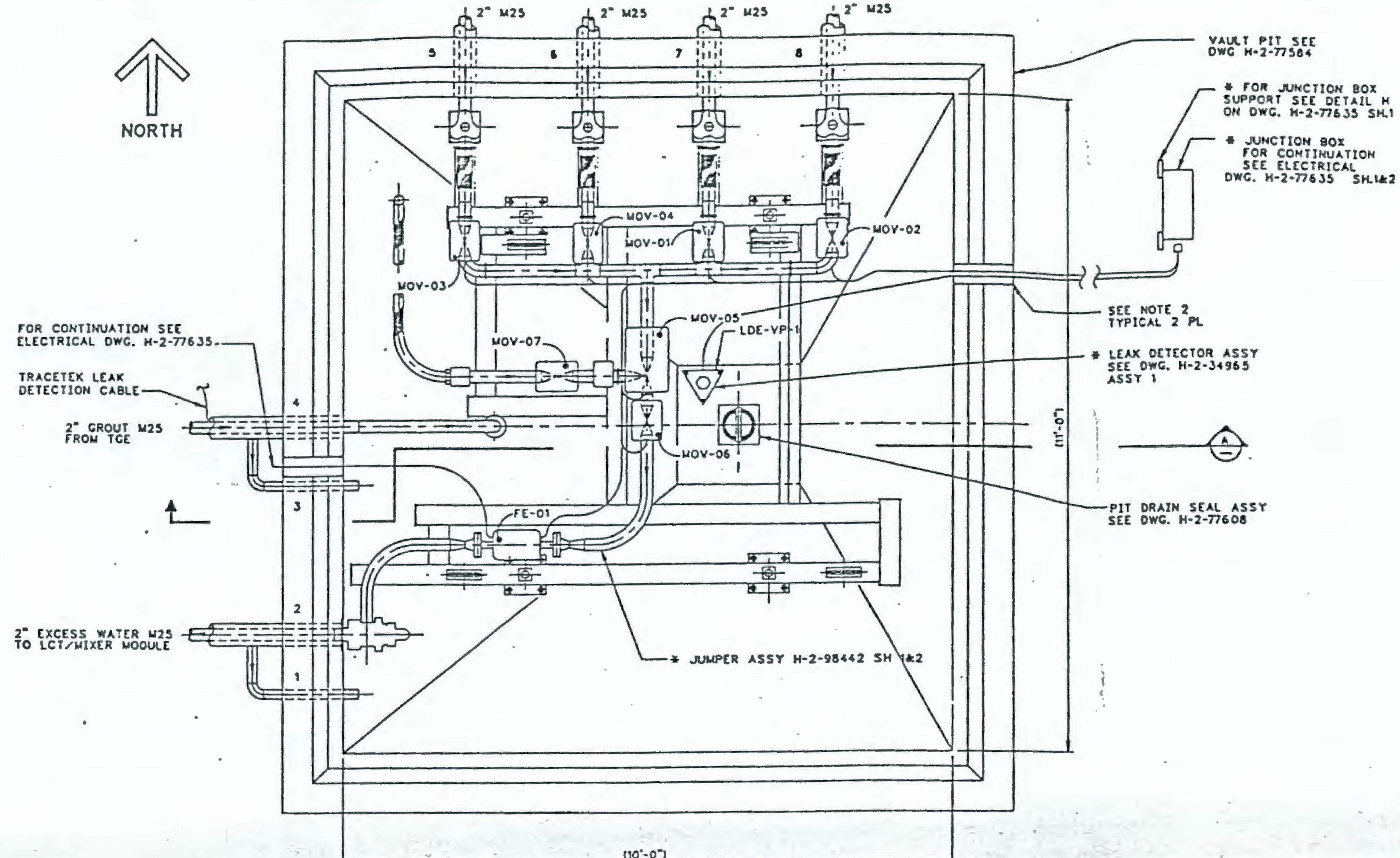
EDT = 101089

REDUCED IMPACT LEVEL 2

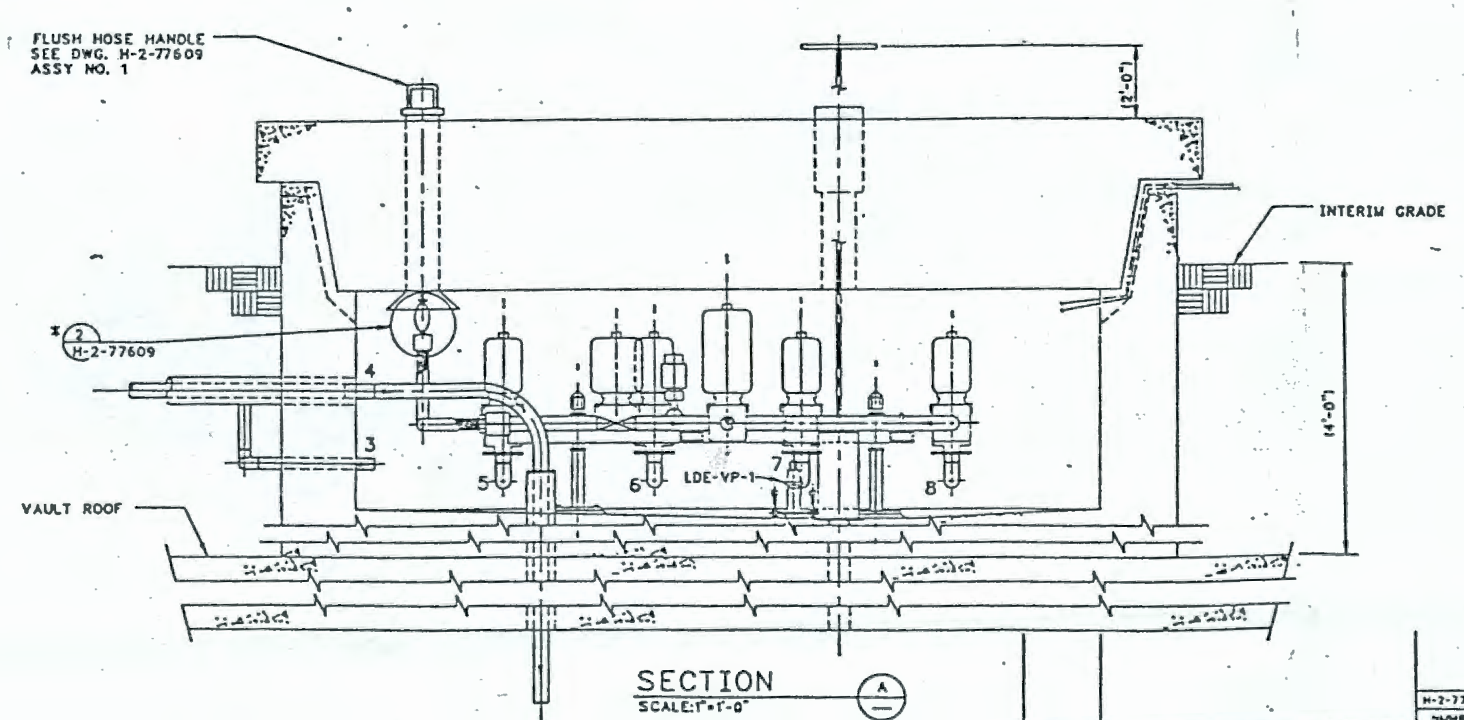
DRAWING TRACEABILITY LIST			
NUMBER	TITLE	NUMBER	TITLE
H-2-77573	DRAWING LIST		
	REFERENCES	NEXT USED CA	

REVISIONS				
BY-DATE	BY-DATE	BY-DATE	DESCRIPTION	REV
APPROVAL	KEH APPROVAL			
COMMENT REVIEW				

WHC		U.S. DEPARTMENT OF ENERGY RICHLAND OPERATIONS OFFICE
		KAISER ENGINEERS HANFORD COMPANY
M		PIPING JUMPER ARRGT VAULT PIT
PROJECT TITLE		GROUT VAULT PAIR 218-E-16-102&*03
B-714	ER1060	242500
SHOWN	218-E-16	0402
DRAWING NUMBER		H-2-77600 1 1 0



PLAN VAULT PIT 218-E-16-102 & 103
(COVER REMOVED FOR CLARITY)



SECTION (A)
SCALE: 1"=1'-0"

NOTES:

1. FOR GENERAL NOTES SEE DWG. H-2-77596.
2. SEAL CABLE SLOT WITH DUCT SEAL INSTALL PER MANUFACTURES SPECIFICATIONS.
3. SEE DWG. H-2-77610 FOR COVER PAINTING DIAGRAM.
4. FOR CONTINUATION OF PIPING SEE DWG. H-2-77596.
5. (*) ASTERISK INDICATES EQUIPMENT TO BE FURNISHED AND INSTALLED BY OTHERS.

OFFICIAL RELEASE BY WHC
DATE APR 04 1989

EDT # 101089

REDUCED IMPACT LEVEL 2

H-2-77573	DRAWING LIST
NUMBER	TITLE
	REFERENCES
NEXT USED ON	

KEH APPROVAL

REVISIONS

COMMENT REVIEW

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

WHC APPROVAL

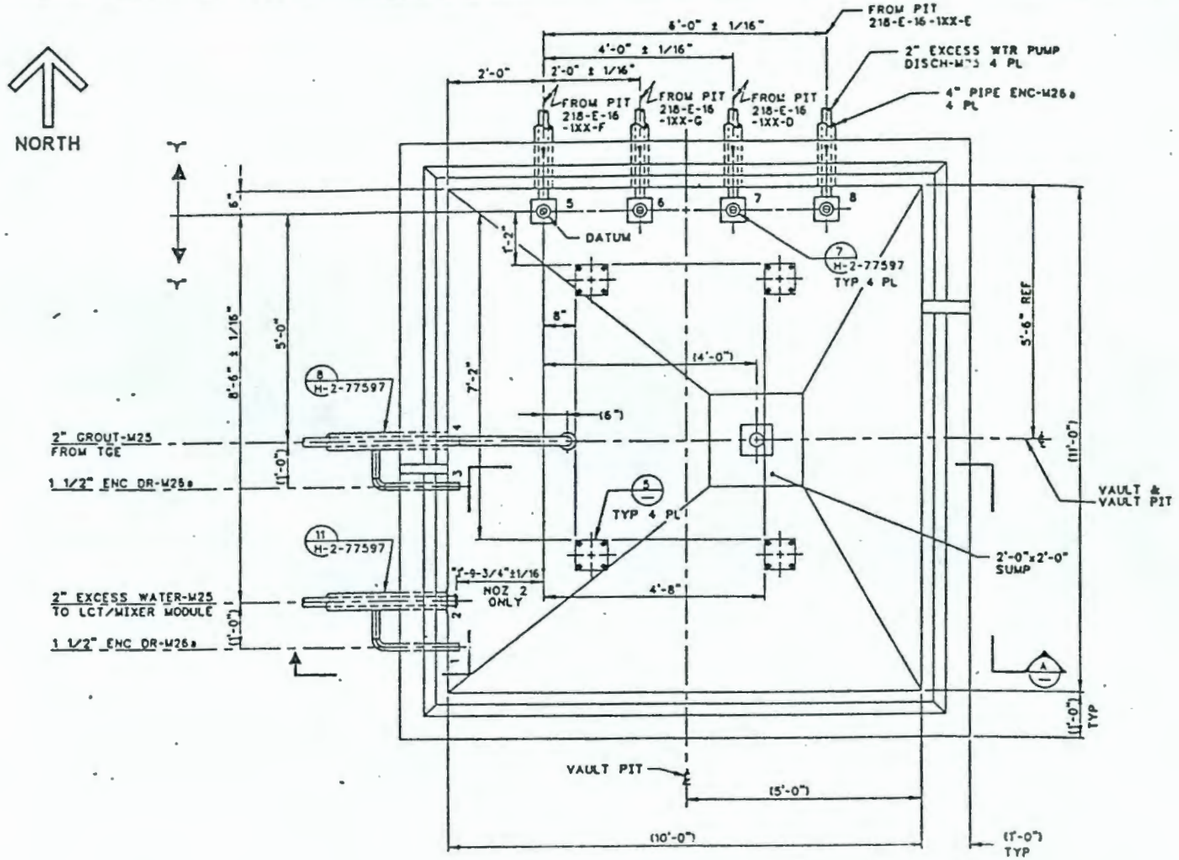
H. HENRIKSON
WJM/RM ITEN
JLH/AG MINISTER
CRZ/JH COLLINS
L.HALL
D.MILTON
D.MILTON

PIPING
JUMPER ARRGT
VAULT PIT

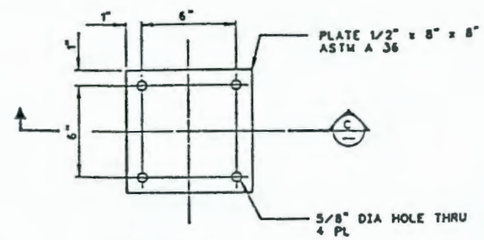
GROUT VAULT PAIR 218-E-16-102 & 103

B-714	ER1060	242500
SHOWN	218-E-16	0402

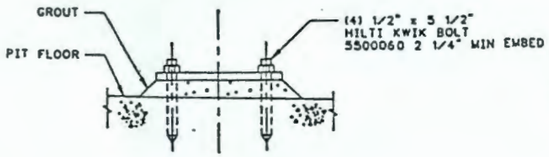
H-2-77600 | 1 | 1 | 0



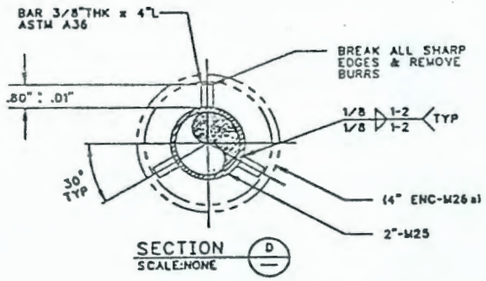
PLAN
VAULT PIT
SCALE:3/4"=1'-0"
SHOWN WITH COVER BLOCKS REMOVED



DETAIL 5
SCALE:3"=1'-0"

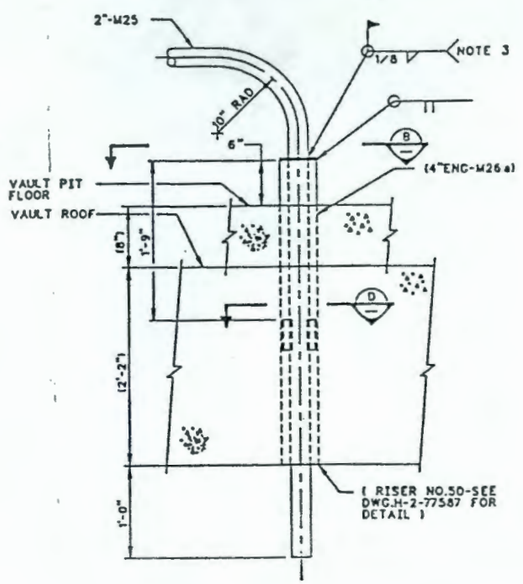


SECTION C
SCALE:3"=1'-0"

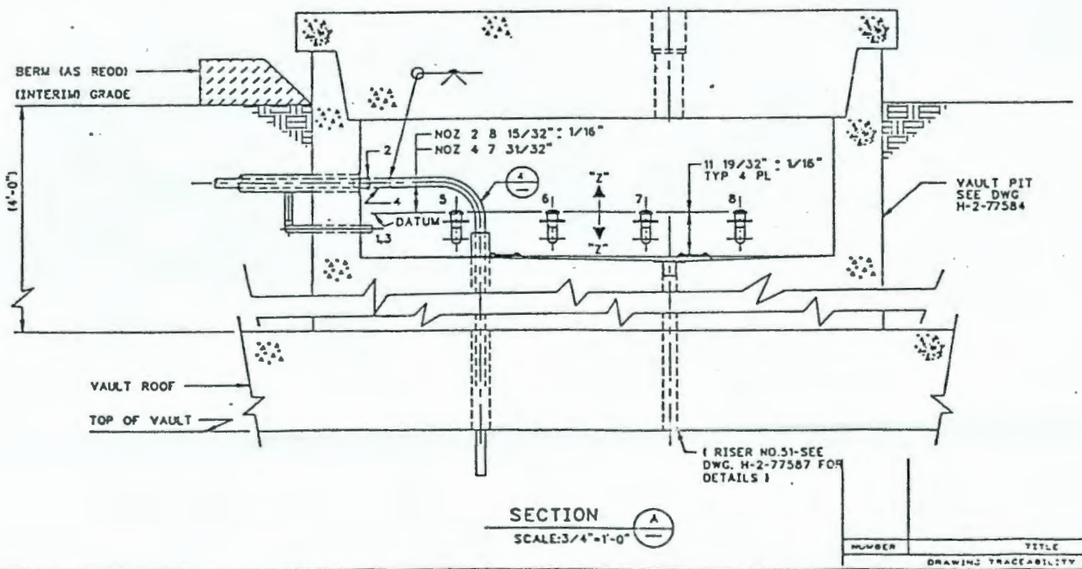


SECTION D
SCALE:NONE

SECTION B
SCALE: 3"=1'-0"



DETAIL 4
SCALE: 1 1/2"=1'-0"



SECTION A
SCALE:3/4"=1'-0"

NOTES:

1. TOLERANCES UNLESS OTHERWISE SPECIFIED SHALL BE FRACTIONAL ± 1/8".
2. FOR CONTINUATION OF PIPING SEE DWG H-2-77596.
3. WELD AFTER PIPE SLOPES HAVE BEEN ESTABLISHED & BACKFILL ACCOMPLISHED.
4. FOR GENERAL NOTES SEE DWG. H-2-77596.

OFFICIAL RELEASE BY WHC DATE APR 04 1989

REDUCED
EDT = 101089

IMPACT LEVEL 2

DRAWING TRACEABILITY LIST			
NUMBER	TITLE	REFERENCES	NEXT USED ON
H-2-77573	DRAWING LIST		

REVISIONS			
BY-DATE	BY-DATE	REV BY DATE	DESCRIPTION
APPROVAL	KEH APPROVAL		
COMMENT REVIEW			

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

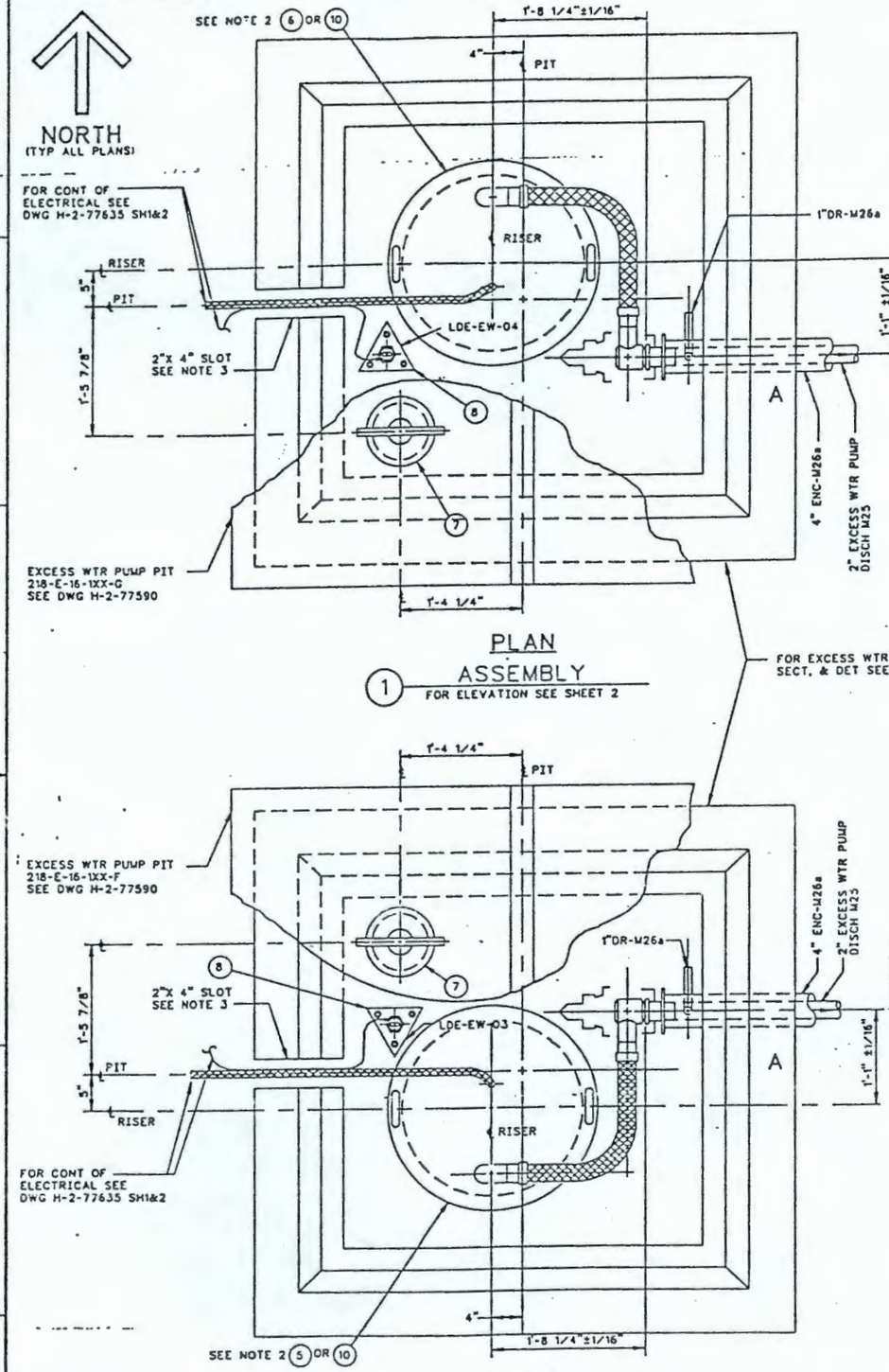
PIPING VAULT PIT SECTION & DETAILS

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

DRAWN L.HALL	B-714	ER1060	242500
DESIGNED D.WILTON	SCALE SHOWN	BLDG 218-E-16	SHEET 0402
CHECKED D.WILTON			
DATE B077601A			

DRAWING NUMBER H-2-77601 | 1 | 1 | 0

NORTH
(TYP ALL PLANS)



FOR EXCESS WTR PMP PIT PLAN, SECT, & DET SEE DWG H-2-77590

QTY			PN	DESCRIPTION	MATL/REF
		X	1	ASSEMBLY (EXCESS WTR PUMP PIT 218-E-16-1XX-G)	
		—	2	ASSEMBLY (EXCESS WTR PUMP PIT 218-E-16-1XX-F)	
		—	3	ASSEMBLY (EXCESS WTR PUMP PIT 218-E-16-1XX-D)	
X		—	4	ASSEMBLY (EXCESS WTR PUMP PIT 218-E-16-1XX-E)	
—	1	1	5	EXCESS WATER PUMP ASSY#1 *	H-2-77606-1
1	—	—	6	EXCESS WATER PUMP ASSY#2 *	H-2-77606-2
1	1	1	7	DRAIN SEAL ASSY#1	H-2-77608-1
1	1	1	8	LEAK DETECTOR ASSY *	H-2-34965-1
1	1	1	9	FLANGE	ASTM-A36
1	1	1	10	PLUG	H-2-77597 DET6
—	1	—	11	JUMPER ASSY LEACHATE RECYCLE *	H-2-77603

NOTES:

1. FOR GENERAL NOTES SEE H-2-77596.
2. USE PLUG PN 10 TO FILL 12" RISER WHEN PUMP PN 5 OR PN 6 IS NOT IN PLACE.
3. SEAL CABLE SLOT WITH DUCT SEAL. INSTALL PER MANUFACTURES SPECIFICATIONS.
4. SUBSTITUTE APPROPRIATE VAULT NUMBER IN PLACE OF "XX".
5. (*1 ASTERISK INDICATES EQUIPMENT TO BE FURNISHED AND INSTALLED BY OTHERS.
6. SEE H-2-77610 FOR EXCESS WATER PUMP PIT COVER PAINTING DIAGRAMS.

OFFICIAL RELEASE BY WHC DATE APR 04 1989

REDUCED

EDT = 101087

Rev 0 1-17-89

IMPACT LEVEL 2

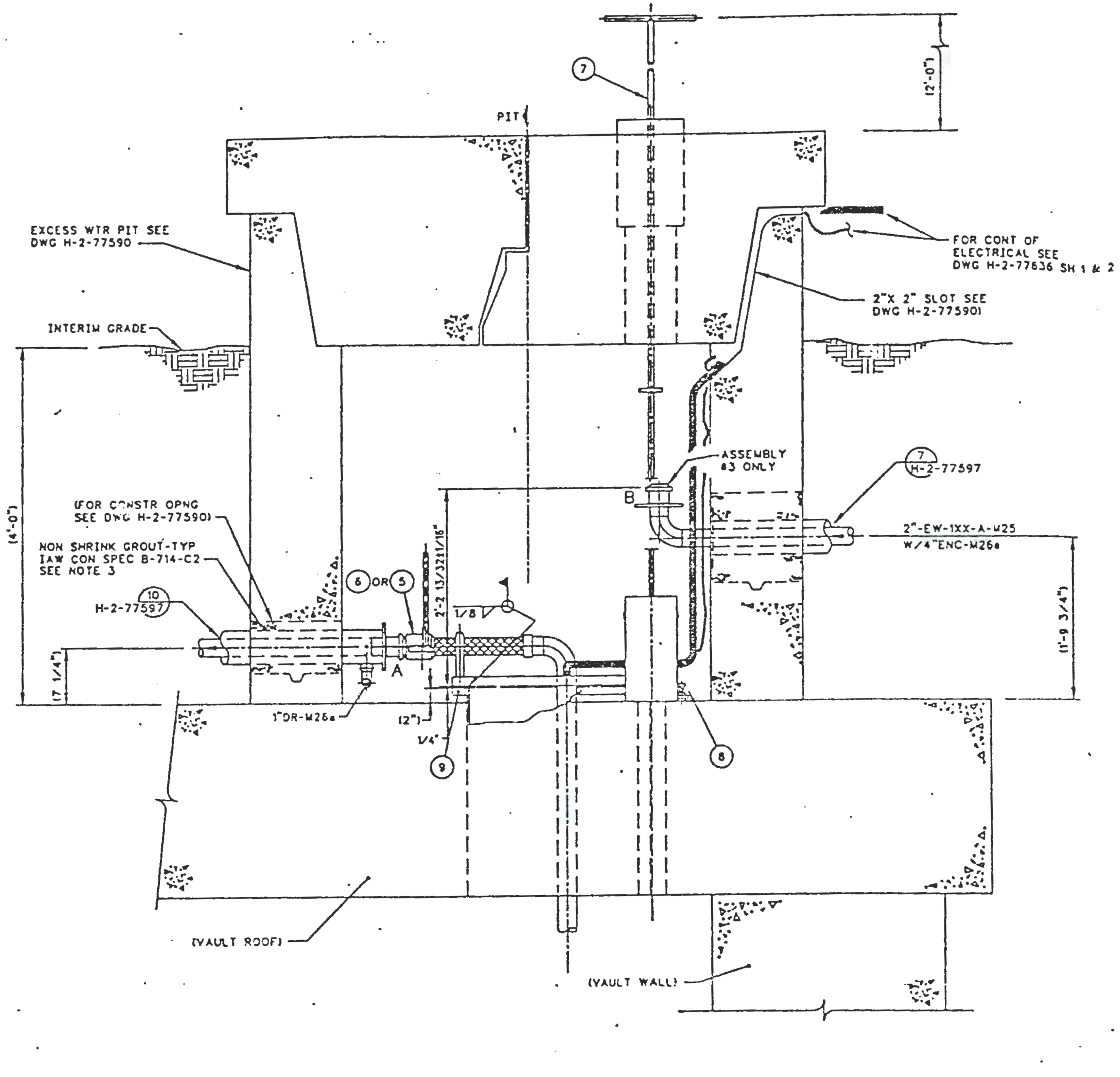
WHC	U.S. DEPARTMENT OF ENERGY RICHLAND OPERATIONS OFFICE
S.R. BRIGGS	KAISER ENGINEERS HANFORD COMPANY
J.D. GOOD	PIPING JUMPER ARRGT EXCESS WTR PMP PIT
H. HENRISON	GROUT VAULT PAIR 218-E-16-102&103
W.M/RW ITEN	B-714 / ER1060 / 242503
A.H/AG MINISTER	1-1/2"=1'-0" / 218-E-16 / 0402
CR7/AR COLLINS	B077602A
L. HALL	H-2-77602 1 2 10
D.J. KOLAR	
D.MILTON	

DRAWING TRACEABILITY LIST

NUMBER	TITLE	DRAWING LIST NUMBER	DRAWING LIST TITLE	REFERENCES NEXT USED ON
		H-2-77573		

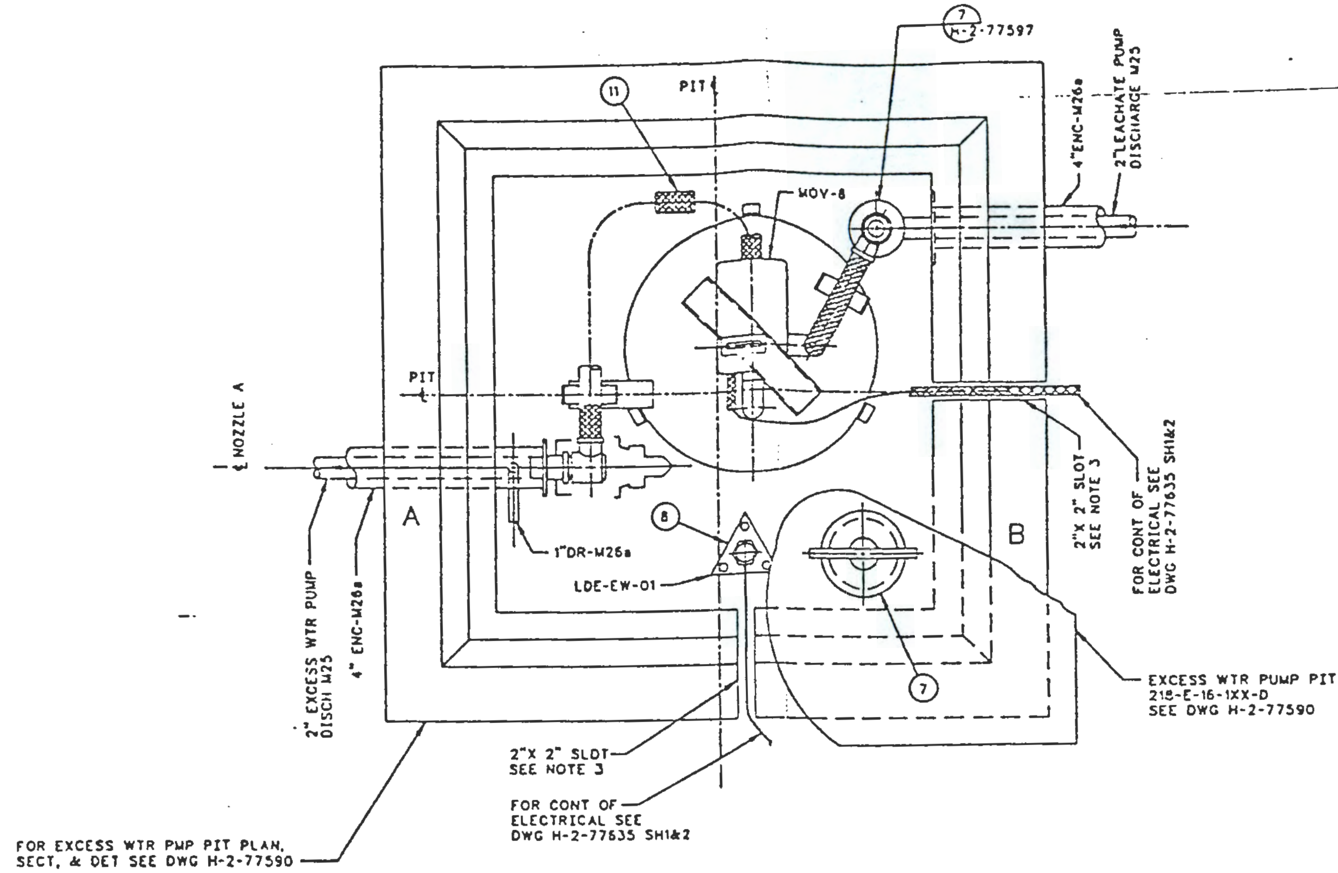
REV	BY-DATE	BY-DATE	REV BY DATE	DESCRIPTION
	APPROVAL	KEM APPROVAL		REVISIONS
	COMMENT REVIEW			

MICROFILMED



ELEVATION

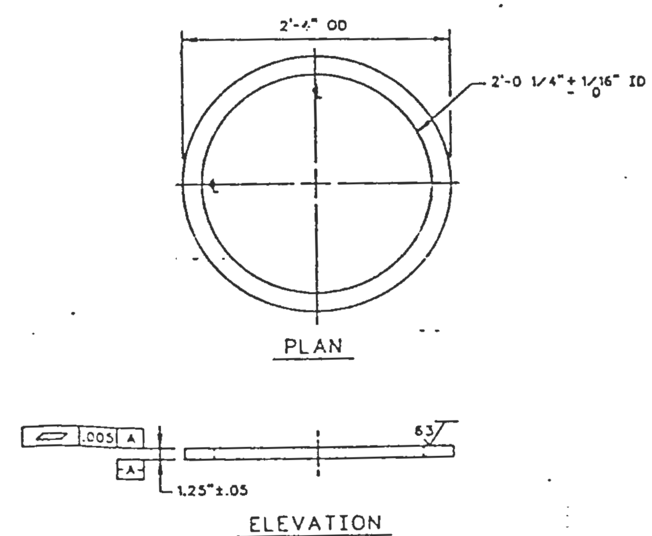
FOR TRUE PLAN ORIENTATION
SEE ASSEMBLY 1,2,3 OR 4 SHEET 1
(SOUTH WALL NOT SHOWN FOR CLARITY)



(ALTERNATE JUMPER ARRANGEMENT)

PLAN

(SIMILAR TO ASSY 3 ON SH D)



9 FLANGE

SCALE: NONE

NOTES:

1. FOR NOTES SEE H-2-77602 SH1.

OFFICIAL RELEASE BY WHC DATE APR 04 1989

REDUCED

EDT = 101089

IMPACT LEVEL 2

WHC S.R. BRIGGS	U.S. DEPARTMENT OF ENERGY RICHLAND OPERATIONS OFFICE
	KAISER ENGINEERS HANFORD COMPANY
H. HENRIKSON	PIPING JUMPER ARRGT EXCESS WTR PMP PIT
WJM/RM ITEN	
JLH/AG MINISTER	
CRZ/ ROLLINS	
L. HALL	GROUT VAULT PAIR 218-E-16-102&103
DJ KOLAR	B-714 / ER1060 / 242500
DJ KOLAR	1-1/2"=1'-0" / 218-E-16 / 0407
80776023	H-2-77602 2 2 0

NUMBER	TITLE
H-2-77573	DRAWING LIST

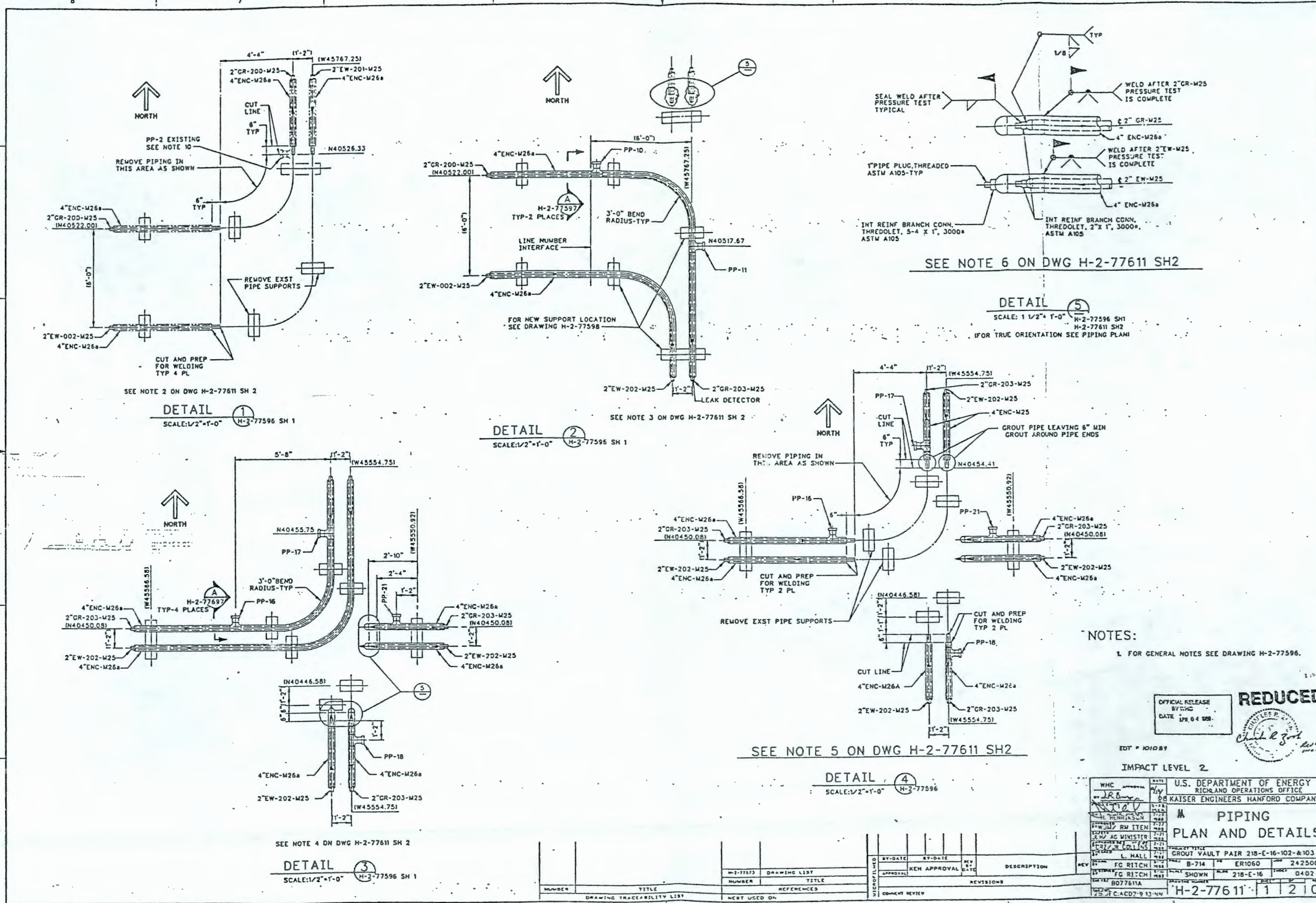
REFERENCES

NEXT USED ON

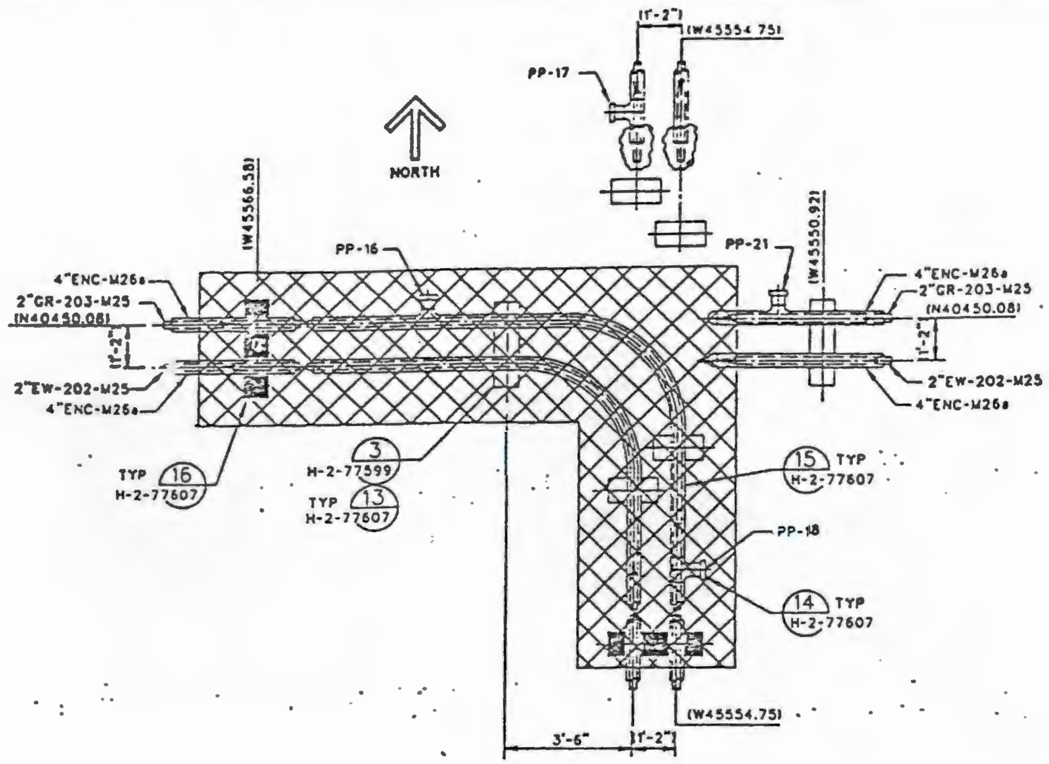
DRAWING TRACEABILITY LIST

KEH APPROVAL

REVISIONS

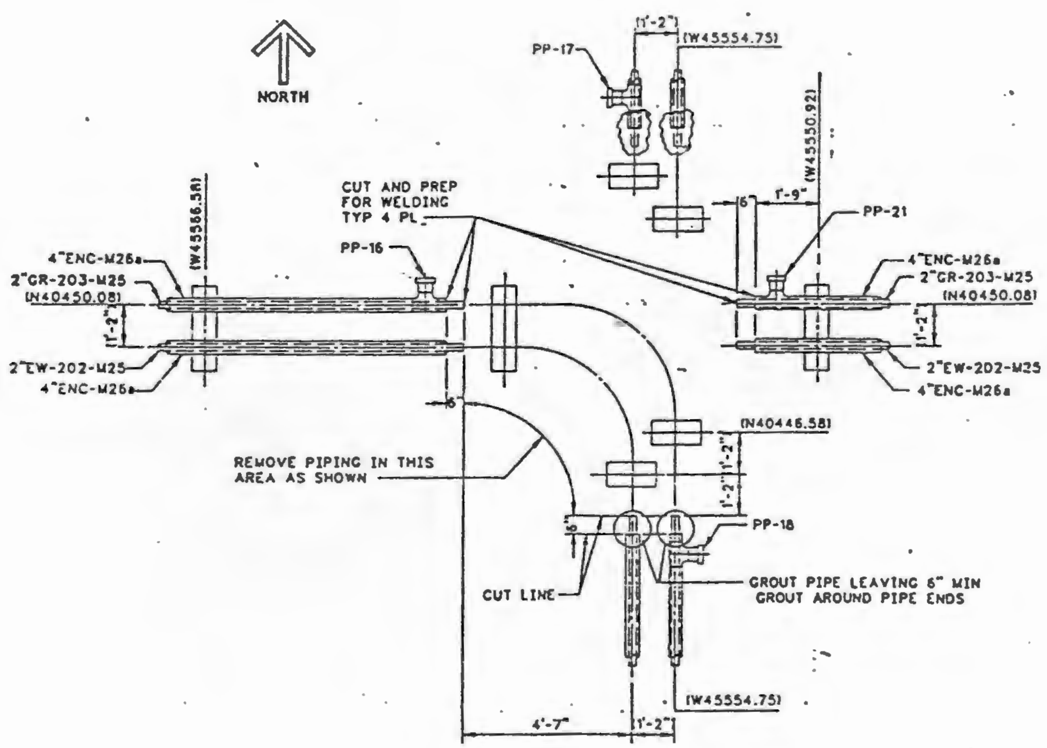


NORTH
PP-2 EXISTING
SEE NOTE 10
REMOVE PIPING IN THIS AREA AS SHOWN
CUT LINE
6" TYP
4"ENC-M26a
2"GR-200-M25
(N40522.00)
(W45767.25)
2"EW-201-M25
N40526.33
REMOVE EXST PIPE SUPPORTS
2"EW-002-M25
CUT AND PREP FOR WELDING TYP 4 PL
SEE NOTE 2 ON DWG H-2-77611 SH 2
DETAIL 1
SCALE:1/2"=1'-0"
H-2-77596 SH 1
PP-10
H-2-77597 TYP-2 PLACES
3'-0" BEND RADIUS-TYP
LINE NUMBER INTERFACE
N40517.67
PP-11
FOR NEW SUPPORT LOCATION SEE DRAWING H-2-77598
2"EW-202-M25
2"GR-203-M25
LEAK DETECTOR
SEE NOTE 3 ON DWG H-2-77611 SH 2
DETAIL 2
SCALE:1/2"=1'-0"
H-2-77596 SH 1
SEAL WELD AFTER PRESSURE TEST TYPICAL
WELD AFTER 2"GR-M25 PRESSURE TEST IS COMPLETE
WELD AFTER 2"EW-M25 PRESSURE TEST IS COMPLETE
1"PIPE PLUG,THREADED ASTM A105-TYP
INT REINF BRANCH CONN. THREDOLET, 5-4 X 1", 3000# ASTM A105
INT REINF BRANCH CONN. THREDOLET, 2"X 1", 3000#, ASTM A105
SEE NOTE 6 ON DWG H-2-77611 SH2
DETAIL 5
SCALE: 1 1/2"=1'-0"
H-2-77596 SH1
H-2-77611 SH2
(FOR TRUE ORIENTATION SEE PIPING PLAN)
PP-17
GROUT PIPE LEAVING 6" MIN GROUT AROUND PIPE ENDS
N40454.41
PP-16
PP-21
(N40450.08)
(W45554.75)
(W45566.58)
(W45550.92)
(N40446.58)
N40455.75
PP-18
CUT LINE
4"ENC-M26A
SEE NOTE 5 ON DWG H-2-77611 SH2
DETAIL 4
SCALE:1/2"=1'-0"
H-2-77596
SEE NOTE 4 ON DWG H-2-77611 SH 2
DETAIL 3
SCALE:1/2"=1'-0"
H-2-77596 SH 1
NOTES:
1. FOR GENERAL NOTES SEE DRAWING H-2-77596.
OFFICIAL RELEASE
REDUCED
IMPACT LEVEL 2
U.S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
KAISER ENGINEERS HANFORD COMPANY
PIPING
PLAN AND DETAILS
GROUT VAULT PAIR 218-E-16-102-&103
B-714
ER1060
242500
SHOWN
218-E-16
0402
H-2-77611
1
2
0
KEH APPROVAL
DESCRIPTION
REVISIONS
DRAWING LIST
REFERENCES
NEXT USED ON
DRAWING TRACEABILITY LIST



SEE NOTE 7

DETAIL 6 H-2-77596
SCALE:1/2"=1'-0"

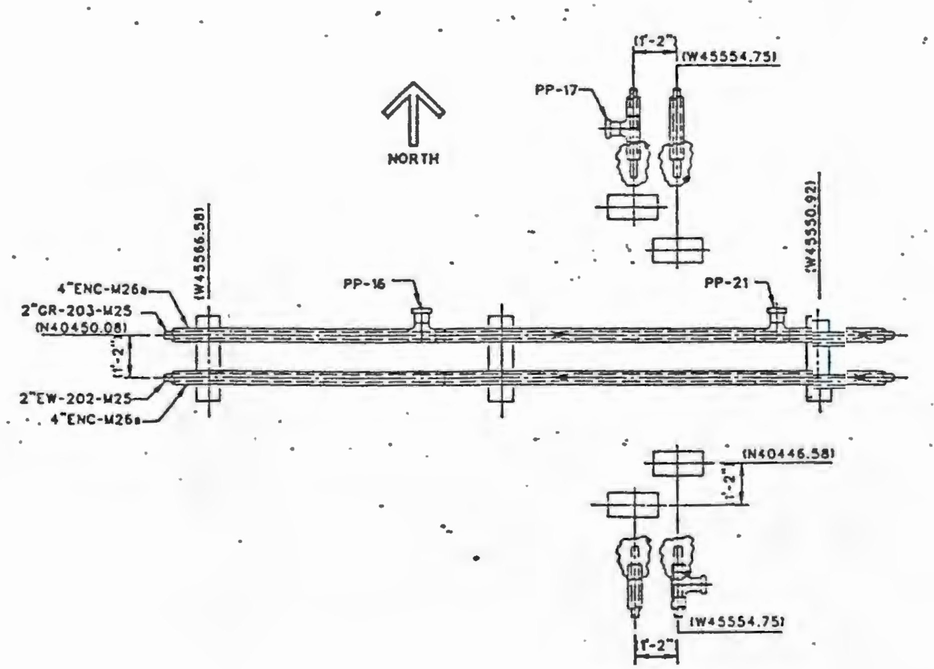


SEE NOTE 8

DETAIL 7 H-2-77596
SCALE:1/2"=1'-0"

NOTES:

1. FOR GENERAL NOTES SEE DRAWING H-2-77596.
2. THIS DETAIL SHOWS HOW THE GROUT LINE 2"GR-200-M25 AND THE EXCESS WATER LINE 2"EW-002-M25 FROM THE TRANSPORTABLE GROUT FACILITY IS DISCONNECTED FROM GROUT LINE 2"GR-201-M25 AND EXCESS WATER LINE 2"-EW-201-M25 ROUTED TO VAULT 101.
3. THIS DETAIL SHOWS HOW THE GROUT LINE 2"GR-200-M25 AND THE EXCESS WATER LINE 2"EW-002-M25 COMING FROM THE TRANSPORTABLE GROUT FACILITY ARE CONNECTED TO THE PIPING ROUTED TO VAULT 102. IT ALSO SHOWS CAPS INSTALLED ON LINES 2"GR-201-M25 & 2"EW-201-M25. THE CAPS ARE TO SEAL THESE LINES UNTIL THEY ARE REQUIRED FOR FUTURE USE.
4. THIS DETAIL SHOWS GROUT FEED LINE 2"GR-203-M25 AND EXCESS WATER LINE 2"EW-202-M25 BEING ROUTED TO VAULT 102. IT ALSO SHOWS THE CAPED EXTENTIONS GOING TO VAULT 103 AND TO FUTURE VAULTS 120 AND 121. EVERYTHING DELINEATED IN DETAIL 3 IS INCLUDED IN THE CONTRACT.
5. THIS DETAIL SHOWS WORK THAT WILL BE PERFORMED BY THE GOVERNMENT IN THE FUTURE AND IS NOT IN THE CONTRACT. THIS DETATIL SHOWS THE WORK WHICH IS REQUIRED TO DISCONNECT THE PIPING FROM VAULT 102 WHEN IT IS TO BE CLOSED. THE DETAIL SHOWS REMOVAL OF THE PIPING CONNECTING THE VAULT, IT ALSO REMOVES THE CAP ON THE GROUT LINE AND EXCESS WATER LINE GOING TO VAULT 103.
6. THIS IS A TYPICAL DETAIL SHOWING THE INSTALLATION OF CAPS ON TERMINATED ENCASED PIPE LINES.
7. THIS DETAIL SHOWS WORK THAT WILL BE PERFORMED BY THE GOVERNMENT IN THE FUTURE AND IS NOT IN CONTRACT. THE WORK INCLUDES CONNECTING THE GROUT FEED LINE 2"GR-203-M25 AND THE EXCESS WATER LINE 2"EW-202-M25 TO THE RESPECTIVE LINE ROUTED TO VAULT 103. IT ASLO SHOWS THE DISCONNECTED LINES BEING FILLED WITH CLEAN GROUT.
8. THIS DETAIL SHOWS WORK TO BE PERFORMED BY THE GOVERNMENT IN THE FUTURE AND IS NOT INCLUDED IN CONTRACT. IT SHOWS THE REMOVAL OF THE GROUT AND EXCESS WATER LINES CONNECTING VAULT 103. THESE PIPES ARE TO BE REMOVED AFTER THE VAULT HAS BEEN FILLED WITH GROUTED WASTE AND PREPARED FOR CLOSURE. IT ALSO SHOWS THE CAPS REMOVED FROM THE PIPES EXTENDING THE PIPING TO FUTUTE VAULTS.
9. THIS DETAIL SHOWS WORK TO BE PERFORMED BY THE GOVERNMENT IN THE FUTURE AND IS NOT INCLUDED IN CONTRACT. THE DETAIL SHOWS THE GROUT AND EXCESS WATER LINES 2"GR-203-M25 AND 2"EW-202-M25 CONNECTED TO THE EXTENTION PIPING GOING TO FUTURE VAULT.
10. UNPLUG EXISTING TRACETEK CABLE AT EXISTING PULL POINT PP-2, AND REMOVE BACK TO PULL POINT PF-1 WHICH IS AROUND ELBOW JUST NORTH OF TGF. PULL NEW TRACETEK CABLE IN ANNULUS FROM PP-1 TO PP-10, PP-10 TO PP-11 ETC PER SPECIFICATION B-714-C2 SECTION 16400.



SEE NOTE 9

DETAIL 8 H-2-77596
SCALE:1/2"=1'-0"

OFFICIAL RELEASE BY WHC
DATE APR 04 1989

EDT # 101081

REDUCED

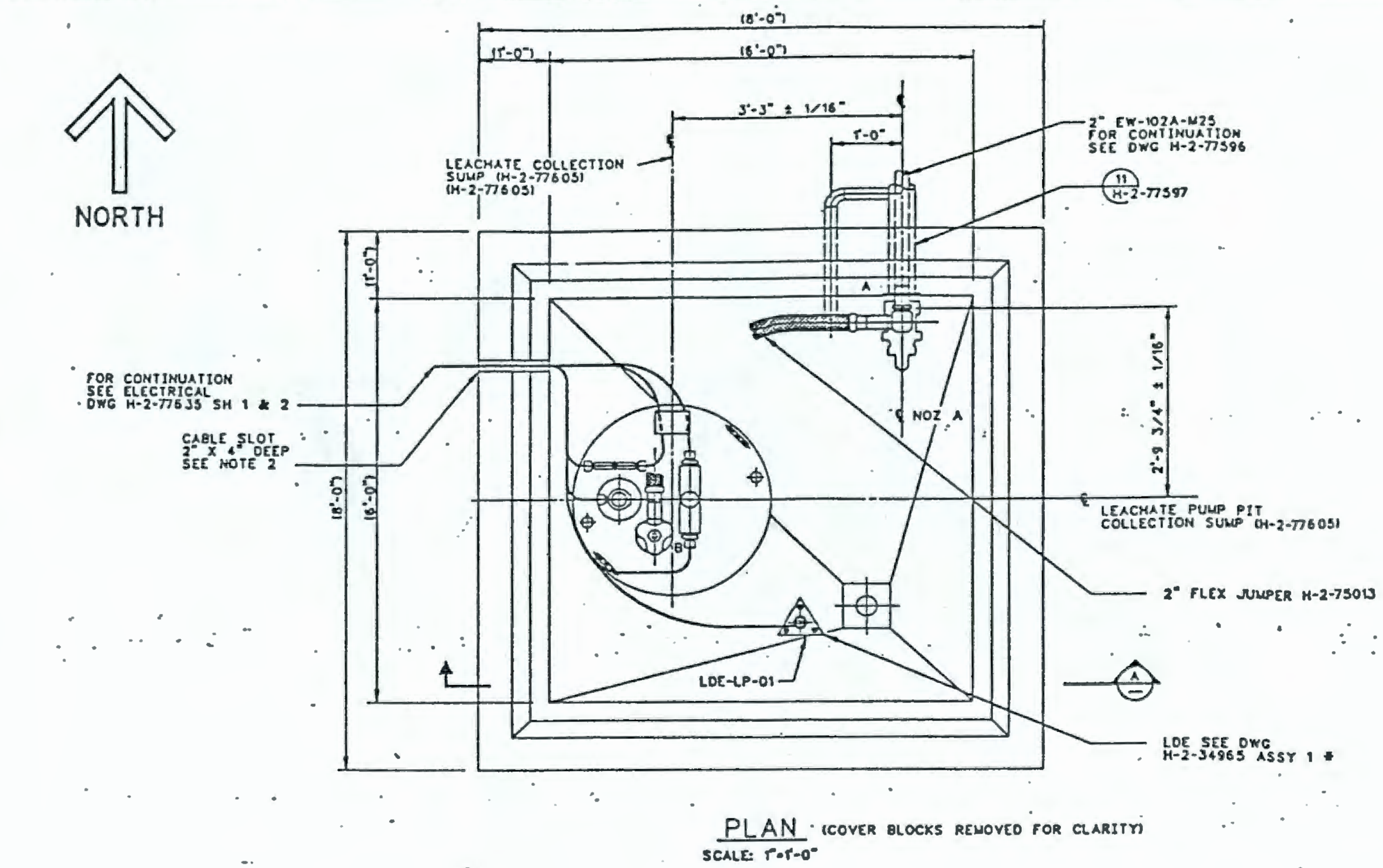
IMPACT LEVEL 2

WHC APPROVAL	U.S. DEPARTMENT OF ENERGY RICHLAND OPERATIONS OFFICE
	KAISER ENGINEERS HANFORD COMPANY
H. HENRIKSON	PIPING PLAN AND DETAILS
WJM/RM ITEN	
JLH/AC VINISTER	
TRZ/JR COLLINS	
L. HALL	GROUT VAULT PAIR 218-E-16-102-&103
RJ LAMOUREUX	B-714 | ER1060 | 242500
RJ LAMOUREUX	SHOWN | 218-E-16 | 0402
BC7761:1B	
2B DEC.ACD2 9 13 NN	H-2-77611 | 2 | 2 | 0

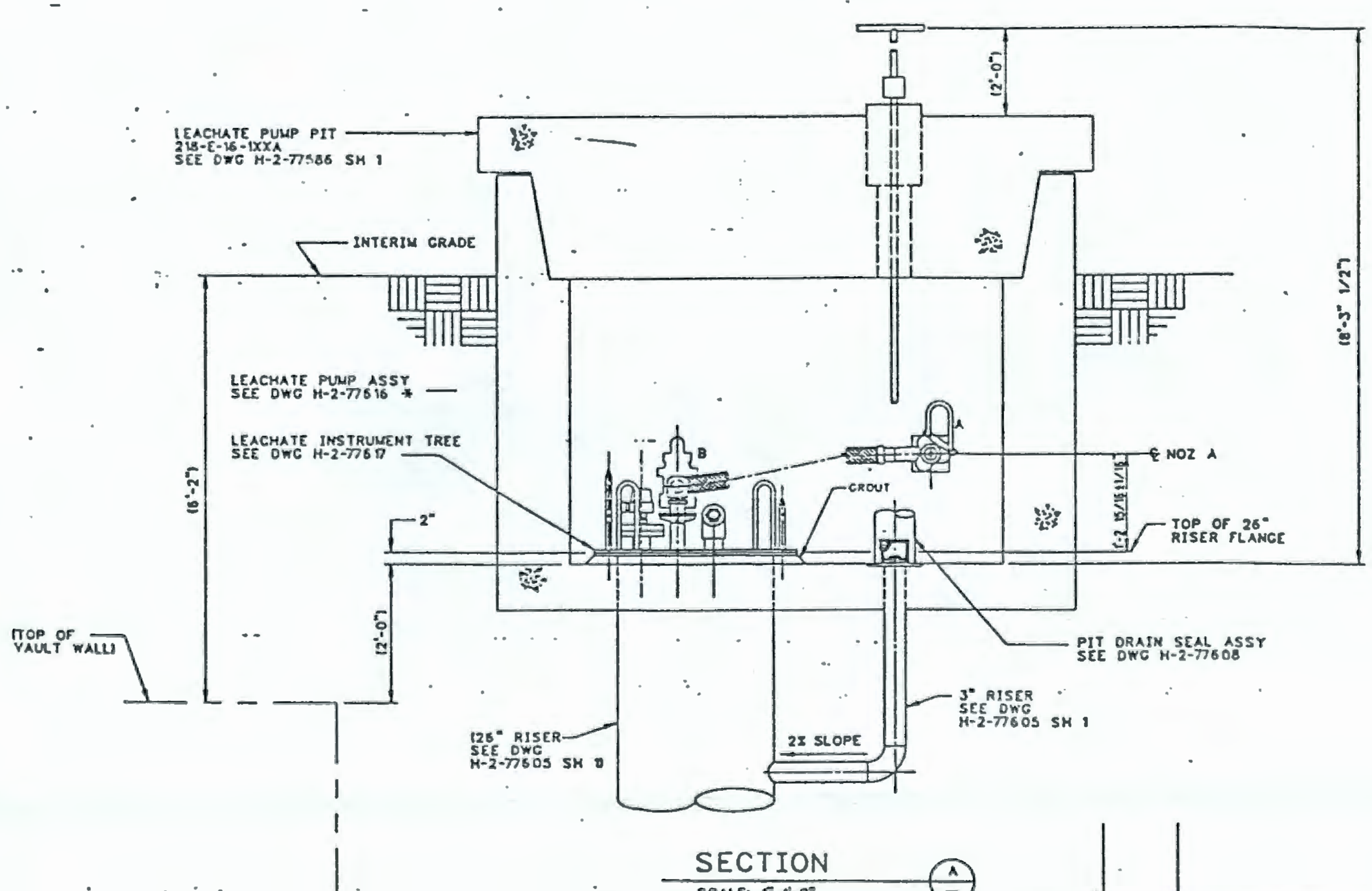
NUMBER	TITLE
	DRAWING TRACEABILITY LIST

NUMBER	TITLE
H-2-77573	DRAWING LIST
	REFERENCES
NEXT USED ON	

BY-DATE	BY-DATE	REV	DESCRIPTION
APPROVAL	KEH APPROVAL		
COMMENT REVIEW			REVISIONS



PLAN (COVER BLOCKS REMOVED FOR CLARITY)
SCALE: 1"=1'-0"



SECTION
SCALE: 1"=1'-0"

NOTES:

1. FOR GENERAL NOTES SEE H-2-77596.
2. PACK CABLE SLOT WITH DUCT SEAL INSTALL PER MANUFACTURES SPECIFICATIONS.
3. SEE H-2-77610 FOR LEACHATE PUMP PIT COVER PAINTING DIAGRAM.
4. (*) ASTERISK INDICATES EXISTING EQUIPMENT TO BE RELOCATED (BY OTHERS) FROM THE PREVIOUS GROUT FILLED CONCRETE VAULT.
5. SUBSTITUTE APPROPRIATE VAULT NUMBER IN PLACE "XX".

OFFICIAL RELEASE BY WHC DATE APR 04 1989

EDT # 101089

IMPACT LEVEL 2

REDUCED

H-2-77573	DRAWING LIST
NUMBER	TITLE
REFERENCES	

BY-DATE	BY-DATE
APPROVAL	KEH APPROVAL
REV	DESCRIPTION
REVISIONS	

WHC APPROVAL S. R. BRIGGS

J D CEDRO

H HENRIKSON

RM ITEN

J H MINISTER

C S COLLINS

L HALL

CK MILTON

CK MILTON

8077612A

U.S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE

KAISER ENGINEERS HANFORD COMPANY

PIPING
LEACHATE PUMP PIT
JMPR ARR/JMPR ASSY

GROUT VAULT PAIR 218-E-16-102&103

B-714	ER1060	242500
SHOWN	218-E-16	0402

H-2-77612 | 1 | 1 | 0

KEHCAD

INSTRUMENT SYMBOL LEGEND

LEGEND

- MAIN PROCESS
- FUTURE
- ELECTRICAL
- LEAK DETECTION CABLE
- SOFTWARE LINK
- DATA COMMUNICATION HIGHWAY
- ENCASED LINE
- CHECK VALVE
- MOTOR OPERATED VALVE (MOV), 3 WAY WITH 3 LIMIT SWITCHES
- MOTOR OPERATED VALVE (MOV), 2 WAY WITH 2 LIMIT SWITCHES
- HOSE CONNECTON
- DRAIN
- FLANGE
- FLEX HOSE
- PIPE REMOTE CONNECTOR
- MC — MOTOR CONTROLLER
- LEVEL ELEMENT
- VACUUM PUMP (PV) OR FAN (F) (AS LABELED)
- EXCESS WATER PUMP (P)
- CCTV CAMERA & LIGHT SOURCE
- LEAK DETECTOR ELEMENT
- TEMPERATURE ELEMENT
- RADIATION ELEMENT
- VOLTAGE TO CURRENT CONVERTER
- TE — AMBIENT TEMPERATURE ELEMENT
- ▲ SEE NOTE 11
- △ SEE NOTE 12

- PLC CRT DISPLAY PORTABLE INSTRUMENT HOUSE (PIH) CONTROL ROOM
- LOCAL MOUNTED INSTRUMENT
- PANEL MOUNTED INSTRUMENT TRANSPORTABLE GROUT EQUIPMENT (TGE) CONTROL ROOM
- PANEL MOUNTED INSTRUMENT, PORTABLE INSTRUMENT HOUSE (PIH) CONTROL ROOM
- PANEL REAR MOUNTED INSTRUMENT, PORTABLE INSTRUMENT HOUSE (PIH) CONTROL ROOM
- PLC CRT DISPLAY, TRANSPORTABLE GROUT EQUIPMENT (TGE) CONTROL ROOM
- PLC INTERLOCK SCHEDULE SEE SH 2
- 17 — ELECTRICAL INTERLOCK
- PLC HARDWARE INPUT TERMINAL PANEL
- PLC HARDWARE OUTPUT TERMINAL PANEL

INSTRUMENT SYMBOL LETTER IDENTIFICATION CHART

SYMBOL	FIRST LETTER: MEASURED OR INITIATING VARIABLE	FIRST LETTER: MODIFIER	SUCCEEDING LETTERS: READOUT OR PASSIVE FUNTION	SUCCEEDING LETTERS: OUTPUT FUNCTION	SUCCEEDING LETTERS: MODIFIER
A			ALARM		
AN			ANALYZER		
C				CONTROLLER	
D		DETECTION		DRIVER	
E			ELEMENT		
EL		LIGHT SOURCE			
F	FLOW				
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT		INDICATOR		
J	POWER				
K			RELAY		
L	LEVEL OR LEAK		LIGHT		LOW
M			MONITOR		
P	PRESSURE				
Q	TROUBLE	TOTALIZE			
R	RADIATION		RECORDER		
S				SWITCH	
SD	SHUTDOWN				
SM	SMOKE				
ST	STATUS				
T	TEMPERATURE			TRANSMITTER	
(1) U	MULTIVARIABLE				
X	TELEVISION	FAILURE			
Y				COMPUTER	
Z	POSITION				

NOTE: NUMBERS IN PARENTHESIS REFER TO SPECIFIC GENERAL NOTES.

ABBREVIATIONS OTHER THAN INSTRUMENT SYMBOL LETTERS

- ARM — AREA RADIATION MONITOR
- ATM — ATMOSPHERE
- CAM — CONTINUOUS AIR MONITOR
- CASS — COMPUTER AUTOMATED SURVEILLANCE SYSTEM
- E/I — VOLTAGE TO CURRENT CONVERTER
- LCT/MM — LIQUID COLLECTION TANK/MIXER MODULE
- TGE — TRANSPORTABLE GROUT EQUIPMENT
- VEAM — VAULT EXHAUST AIR MONITOR
- PIH — PORTABLE INSTRUMENT HOUSE
- CCTV — CLOSED CIRCUIT TELEVISION
- PLC — PROGRAMMABLE LOGIC CONTROLLER
- EL — ENCASED LINE
- LS — LEACHATE SUMP
- VPS — VOLTAGE POWER SUPPLY

PLC HARDWARE TERMINAL PANEL IDENTIFIER

- FIRST LINE
- SECOND LINE
- THIRD LINE

FIRST LINE

XX XXX
- XXX — IDENTIFICATION NUMBER
- XX — INSTRUMENT IDENTIFICATION LETTERS (SEE LETTER IDENTIFICATION CHART)

SECOND LINE

AI-XXX	ANALOG INPUT
AO-XXX	ANALOG OUTPUT
DI-XXX	DISCRETE INPUT
DO-XXX	DISCRETE OUTPUT

XXX — IO RACK IDENTIFICATION

THIRD LINE

SX-X
- X — DISCRETE OUTPUT
- SX — CHANNEL NUMBER
- SLOT NUMBER

PLC CRT DISPLAY IDENTIFIER

- INSTRUMENT SYMBOL LETTER (FIRST THRU FOURTH CHARACTERS)
- INSTRUMENT NUMBER (FIFTH THRU EIGHTH CHARACTERS)

INSTRUMENT IDENTIFIER

XX 1XX-XX
- XX — INSTRUMENT SYMBOL LETTERS
- 1XX-XX — INSTRUMENT NUMBER
- VAULT NUMBER STARTING WITH 102 (WHERE REQUIRED)

LINE IDENTIFICATION

2"-SN-000-MX
- 2" — LINE SIZE
- SN — SERVICE
- MX — MATERIAL CODE
- 000 — LINE NUMBER

- ENC — ENCASEMENT
- EW — EXCESS WATER
- GR — GROUT
- RW — RAW WATER
- SN — SUPERNATANT

EQUIPMENT DESIGNATOR

- VP — VAULT PIT
- GV — GROUT VAULT
- LP — LEACHATE PIT
- P — PUMP

VAULT NUMBERING SEQUENCE

- 101 — FIRST VAULT
- 1XX — SUCCEEDING VAULTS STARTING WITH 102

GENERAL NOTES:

1. USE OF FIRST-LETTER U FOR MULTIVARIABLE IN LIEU OF A COMBINATION OF FIRST-LETTERS.
2. ALL NON-MODULATING CONTROL VALVES TO HAVE POSITION LIMIT SWITCHES FOR CRT GRAPHIC AND STATUS INDICATION.
3. CASS ALARMS WILL BE GROUPED AS FOLLOWS:
   - A) ALL LEACHATE SUMP LEAK DETECTORS
   - B) ALL GROUT ENCASED LINE LEAK DETECTORS
   - C) ARM, CAM AND VEAM HIGH RADIATION
   - D) ARM, CAM AND VEAM MONITOR FAILURE & CAM & VEAM SAMPLE LOW FLOW
   - E) ALL VAULT PIT & EXCESS WATER PITS LEAK DETECTORS
   - F) VAULT HIGH & LOW PRESSURE
   - G) ALARM POWER SUPPLY
4. ALL MICROPROCESSOR CRT DISPLAY DATA, INCLUDING PROCESS INDICATIONS, ALARMS AND EQUIPMENT STATUS INDICATIONS, SHALL BE CONFIGURED SUCH THAT ANY COMBINATION OF THESE DATA POINTS MAY BE, AT SCHEDULED INTERVALS OR ON OPERATOR COMMAND, SENT TO THE PRINTER FOR PRODUCTION OF A HISTORICAL RECORD.

   UPON AN ABNORMAL PROCESS CONDITION, ALL RELATED DATA POINTS SHALL AUTOMATICALLY BE SENT TO THE PRINTER FOR PRODUCTION OF HISTORICAL RECORD.
5. ALL PROCESS VARIABLES DESIGNATED AS RECORDERS BY THE SUCCEEDING LETTER "R" (SUCH AS LR-01, FOR EXAMPLE) SHALL, IN ADDITION TO THE VARIOUS STANDARD CRT DISPLAYS, BE CONFIGURED FOR HISTORICAL TRENDING.
6. THE TGE CONTROL ROOM SHALL HAVE PROVISIONS FOR OPERATION OF UP TO THREE PIH'S. THE PIH'S SHALL BE INDENTIFIED BY PIH-1, PIH-2, OR PIH-3.
7. AVERAGE TEMPERATURE IS TO BE CALCULATED ONLY FROM THERMOCOUPLES SUBMERGED BELOW THE EXCESS WATER/GROUT LEVEL. SUBMERGED THERMOCOUPLES SHALL BE DETERMINED BY USE OF SIGNAL INPUT FROM THE EXCESS WATER/GROUT LEVEL ELEMENT.
8. AREA RADIATION MONITOR (ARM) NUMBERING STARTS WITH 02 DUE TO DELETION OF THE NUMBER 01 JUMPER PIT AREA RADIATION MONITOR.
9. THIS IS THE LEACHATE SUMP ARRANGEMENT FOR VAULT 218-E-1XX DURING THE VAULT FILLING SEQUENCE. THIS ARRANGEMENT CONSISTS OF 2 ASSEMBLIES: (1) THE LEACHATE SUMP PUMP ASSEMBLY WITH A HIGH-HIGH LEVEL ELEMENT LE-LS-01 AND PUMP P-LS-01-1. (2) THE LEACHATE SUMP INSTRUMENT TREE ASSEMBLY WITH LEAK DETECTOR LDE-LS-1XX, LEVEL ELEMENT LE-LS-1XX AND TWO THERMOCOUPLES TE-LS-1XX-1 AND TE-LS-1XX-2. (LDE-LS-1XX READOUT WILL BE DISABLED DURING THE FILL SEQUENCE), AND LONG TERM LEACHATE SUMP PUMP P-LS-1XXA AND P-LS-1XXB.
10. THIS IS THE LEACHATE SUMP ARRANGEMENT FOR VAULT 218-E-1XX FOR LONG TERM STORAGE. AFTER THE GROUT IN THE VAULT HAS HARDENED AND THE EXCESS WATER HAS BEEN PUMPED OUT, ASSEMBLY (1) IN NOTE 9 IS REMOVED AND ASSEMBLY (2) IN NOTE 9 REMAINS PERMANENTLY IN PLACE. (LDE-LS-1XX READOUT WILL BE REINSTATED)
11. EQUIPMENT WITH SYMBOL ▲ IS NEW. ALL OTHER EQUIPMENT IS EXISTING.
12. DISPLAY IDENTIFIER NOTED WITH SYMBOL △ SHALL BE RE-IDENTIFIED FROM THE PREVIOUS DISPLAY IDENTIFIER SHOWN.
13. DRAWINGS H-2-77618, SH 1-12 (P&ID'S) ARE FOR INFORMATION OF FLOWS AND PROCESSES. THE REMAINDER OF THE CONSTRUCTION DRAWINGS DELINEATE THE WORK TO BE PERFORMED UNDER THE CONTRACT.
14. SEE DRAWING H-2-98460 FOR CAM DETAILS.

OFFICIAL RELEASE BY WHC DATE APR 04 1989

3-24-89 EDT 0

EDT # 101089

REDUCED IMPACT LEVEL 2.

WHC			U.S. DEPARTMENT OF ENERGY, RICHLAND OPERATIONS OFFICE
SA BRIGGS		12-28-1988	KAISER ENGINEERS HANFORD COMPANY
WH HENRICKSON		12-28-1988	PIPING & INSTM DIAGRAM UNDERGROUND VAULT
RM ITEN		12-8-1988	
AG WINSTER		12-7-1988	
RD SUMMITT		12-7-1988	PRO-JECT TITLE: GROUT VAULT PAIR (218-E-16-102 & 103)
RC SWAN		3-12-1989	B-714 / ER1060
GF MCKEE		3-23-1989	NONE / 218-E-16
KE WALTERS		3-21-1989	DRAWING NUMBER H-2-77618 / SHEET 1 / REV 12 / 0

DRAWING TRACEABILITY LIST					
NUMBER	TITLE	NUMBER	TITLE		
H-2-98460	INSTM CONTINUOUS AIR MONITOR	H-2-77573	DRAWING LIST		
		REFERENCES			
		NEXT USED ON H-2-77573			

REVISIONS				
BY-DATE APPROVAL	BY-DATE KEH APPROVAL	REV BY DATE	DESCRIPTION	REV
COMPLETED	COMMENT REVIEW			

H-27618 841

EQUIPMENT AND INSTRUMENT IDENTIFICATION

LOCAL PANEL MOUNTED — PT 1234 W10

INSTRUMENT MOUNTED ON EQUIPMENT OR PIPING — FI W10

RADIATION ELEMENT WHICH MONITORS TWO OR MORE LINES — RE

PANEL MOUNTED INSTRUMENT (REAR OF PANEL) — TSH W10

VIDEO DISPLAY — FIC W09

ALARM AND/OR INTERLOCK SWITCH (PLC SOFTWARE) — LAL 111

COMPUTATION FUNCTION (PLC SOFTWARE) — FDY W09, SUBTRACT

SOFTWARE LINK

INSTRUMENT ELECTRIC SIGNAL

MECHANICAL INTERLOCK

NUCLEAR, SONIC OR THERMAL RADIATION SIGNAL

INSTRUMENT AIR SIGNAL

INDICATES ITEM SUPPLIED BY VENDOR WITH MAJOR EQUIPMENT ITEM(S) OR SYSTEM — *

VENDOR SUPPLIED PACKAGE — P — P — P

INPUT TO OR OUTPUT FROM SYSTEM — TO LIQUID WASTE SYSTEM, H-2-35XXX

INPUT TO OR OUTPUT FROM P&ID SHEET — TO EVAPORATOR, H-2-35XXX

SIGNAL TO OR FROM INSTRUMENT ON P&ID SHEET — TE-W27, H-2-35XXX

INSTRUMENT AIR SUPPLY — IAS, H-2-35XXX

CENTRIFUGAL PUMP

METERING, FEED PUMP (DIAPHRAGM OR PISTON)

PROGRESSIVE CAVITY PUMP — M

ROTARY LOBE BLOWER

CENTRIFUGAL FAN

Y STRAINER — X-STR-XXX (SIZE, UNIQUE NO.)

MOISTURE TRAP — T

FILTER, VENDOR SUPPLIED — F

FILL PORT

SHAFT COUPLING

REDUCER

FILTER, PRESSURE REGULATOR — F/R

FILTER, REGULATOR, LUBRICATOR — FEL - XXX, UNIQUE NO.

DIAPHRAGM SEAL

THERMOWELL

FLOW ORIFICE

VENTURI TUBE

BUTTERFLY VALVE OR DAMPER

GATE VALVE

CYLINDER

REGULATOR, VENDOR SUPPLIED — R

BACKPRESSURE CONTROL VALVE

GLOBE VALVE

DIAPHRAGM VALVE

PLUG VALVE

PINCH VALVE

NEEDLE VALVE

BALL VALVE

CHECK VALVE

3-OR 4-WAY VALVE

4-WAY VALVE, MANUAL OPERATOR

SAFETY RELIEF VALVE OR CONSERVATION VENT — PRESSURE, VACUUM

AUTOMATIC VALVE FAILURE POSITION
FA - FAIL AS IS
FC - FAIL CLOSED
FO - FAIL OPEN
FST - FAIL STRAIGHT THROUGH — FC

INLINE DEVICE

JUMPER CONNECTOR, VERTICAL — V

JUMPER CONNECTOR, HORIZONTAL — H

JUMPER CONNECTOR, VERTICAL STUB — VS

REMOTE FLANGE

REDUCED PRESSURE BACKFLOW PREVENTER — BF XXX

PRIMARY PROCESS LINE

PIPE LINE WITH INSULATION

SECONDARY PROCESS OR INSTRUMENT LINE

PROCESS LINE WITH JACKET

ELECTRIC HEAT TRACED PROCESS LINE

DIRECTION OF FLOW

TYPICAL AIRLINE CONTINUITY THROUGH WALL NOZZLE — N, W2A-C3-T34, W2A-C3-T35, W2A-D3-T34, W2A-D3-T35

SOLENOID VALVE ACTUATOR — S

MOTOR VALVE ACTUATOR — M

DIAPHRAGM VALVE ACTUATOR

VANE OR RACK-AND-PINION VALVE ACTUATOR

ELECTRIC MOTOR — M

QUICK DISCONNECT

SWAGELOK TEE WITH PLUG

QUICK DISCONNECT WITH BALL CHECK VALVES

VIBRATION ISOLATOR — VB-XXX, UNIQUE #

FLANGE OR NOZZLE IDENTIFICATION — X

JUNCTION, PIPE SPECIFICATION CLASS — SS | CI

HOSE

SIZE, HOSE, UNIQUE # — X-HS-XXX

5 VALVE MANIFOLD — SIZE, UNIQUE #, X-MN-XXX

DOUBLE ACTING SOLENOID — S, FY

TYPICAL INSTRUMENT PACKAGE SUPPLIED WITH EACH AUTOMATIC 2-WAY VALVE (PNEUMATIC ACTUATOR WITH ELECTRIC OVERRIDE) — IAS, FY W12, VENT, ZS W12 B, FC, FV W12

EXAMPLES:
ZS-W12 A = CONTACT CLOSES WHEN VALVE IS FULLY OPEN
ZS-W12 B = CONTACT CLOSES WHEN VALVE IS FULLY CLOSED

FOR VALVES WITH MULTIPLE POSITIONS A LIMIT SWITCH IS PROVIDED FOR EACH POSITION ZS-W12 A, B, OR C ETC.

INTERLOCK WITH PLC RIP_ OF INTERNAL COIL ADDRESS — IXXX

ALARM — A

PLC OUTPUT WITH OUTPUT ADDRESS — CXXX

LOCAL ALARM WITH PLC OUTPUT ADDRESS — A, OXXX LOCAL

INSTRUMENT TAG IDENTIFICATION

PROCESS VARIABLE

- A - ANALYTICAL
- D - DENSITY
- E - VOLTAGE
- F - FLOW
- FD - FLOW DIFFERENTIAL
- FR - FLOW RATIO
- H - HAND
- I - CURRENT
- L - LEVEL
- P - PRESSURE
- PD - DIFFERENTIAL PRESSURE
- R - RADIATION
- S - SPEED
- T - TEMPERATURE
- U - MULTI VARIABLE
- W - WEIGHT
- X - MISCELLANEOUS
- Z - POSITION OR LIMIT
- SP - SET POINT
- CAM - CONTINUOUS AIR MONITOR
- PR - PRESSURE REGULATING

DEVICE TYPE

- C - CONTROLLER
- E - SENSING ELEMENT
- FY - FUNCTION GENERATOR
- I - INDICATOR
- IC - INDICATOR CONTROLLER
- O - ORIFICE
- Q - TOTALIZER
- R - RECORDER
- S - SWITCH
- S - WITH NO PREFIX IS A SAMPLE POINT
- SH - SWITCH HIGH
- SHH - SWITCH HIGHER THAN SH
- SHL - SWITCH HIGH & LOW
- SL - SWITCH LOW
- SLL - SWITCH LOWER THAN SL
- T - TRANSMITTER
- V - VALVE
- Y - TRANSDUCER OR SOLENOD VALVE
- CV - CONTROL VALVE

SYSTEM CODES

- A - AIR
- F - FLUSH/DECON
- R - RAW WATER
- M - MATERIAL HANDLING
- E - REAGENT
- V - VENTILATION (HVAC)
- W - WASTE MATERIAL

DEVICE TAG — PROCESS VARIABLE, DEVICE TYPE, LOOP NUMBER *, SYSTEM CODE

EXAMPLE: PRESSURE SWITCH LOW, LOOP NUMBER, AIR SYSTEM

* LOOP NO. MAY HAVE SINGLE LETTER OR NUMBER SUFFIX TO DISTINGUISH BETWEEN SIMILAR BUT SEPARATE LOOPS.

PIPE LINE IDENTIFICATION

X-X-X-XXX — PIPE SIZE, PIPING CODE, SPECIFICATION CLASS, PIPE (P) OR TUBING (T), UNIQUE NO.

EXAMPLE: 2-W-SG-P01 — 2" NOM. PIPE, WASTE, SPECIFICATION CLASS SG, PIPE, UNIQUE NO.

PIPING CODES

- A - AIR & INSTR.
- F - DECON SOLUTIONS
- H - RAW WATER
- M - MATERIAL TRANSFER
- R - REAGENT
- V - HVAC VENTILATION
- W - WASTE
- CL - CHILLED WATER
- S - SANITARY WATER

CONSTANT DIFFERENTIAL REGULATOR — FC SAM

HAND VALVE IDENTIFICATION

EXAMPLES: SIZE, VALVE TYPE, SYSTEM CODE, UNIQUE NO. — A-BA 2S-XXX; 2-BA GO-101

VALVE TYPE

- BA - BALL
- BF - BUTTERFLY
- CK - CHECK
- DP - DIAPHRAGM
- GL - GLOBE
- NR - NEEDLE REGULATOR
- PL - PLUG

SYSTEM CODE

FIRST DIGIT	SECOND DIGIT
1 - AIR, REFRIGERANT	0 - BUTT WELD
2 -	1 - BUTT WELD X SCREWED
3 - PH ADJUSTMENT (CAUSTIC)	2 - SCREWED X SCREWED
4 - ADDITIVES	3 - 3-WAY
5 - RAW WATER	4 - SWAGELOK
6 - WASTE, GROUT	5 - SPECIAL
7 - VENTILATION	6 - FLANGED
8 - DECONTAMINATION	7 - SOCKET WELD X SOCKET WELD
9 - LUBRICATION	8 - SOCKET WELD X SCREWED
	9 - SPECIAL

INTERLOCK LEGEND

- OXXX - REAL PLC OUTPUT
- IXXX - REAL PLC INPUT
- AOXXX - AUXILIARY PLC OUTPUT
- AIXXX - AUXILIARY PLC INPUT
- LINE IXXX - ELEMENTARY VIEWS DIAGRAM LINE NUMBER. (INDICATES INTERLOCK IS NOT IN PLC)

REDUCED

OFFICIAL RELEASE DATE: DEC 03 1998

IMPACT LEVEL 4
EDT NO. 100838

ROCKWELL REVIEW COPY ON FILE
SUBMITTAL NO. 00 R-0
DATE 12-14-97

DRAWING TRACEABILITY LIST		REFERENCES	
NUMBER	TITLE	NUMBER	TITLE
		H-2-38814	DRAWING LIST
		NEXT USED ON	H-2-13-19

MICROFILMED

REV	DESCRIPTION	APPROVAL	DATE
	REVISIONS		
	COMMENT REVIEW		

LEAD APPROVAL	BY JD Vanderlaan	DATE	7/1/98
PROJECT ENGR APPROVAL	BY	DATE	7/1/98
QA APPROVAL	BY	DATE	7/1/98
SAFETY	BY NA		
CHECKED	BY		
DRAWN	BY L. MILLER		

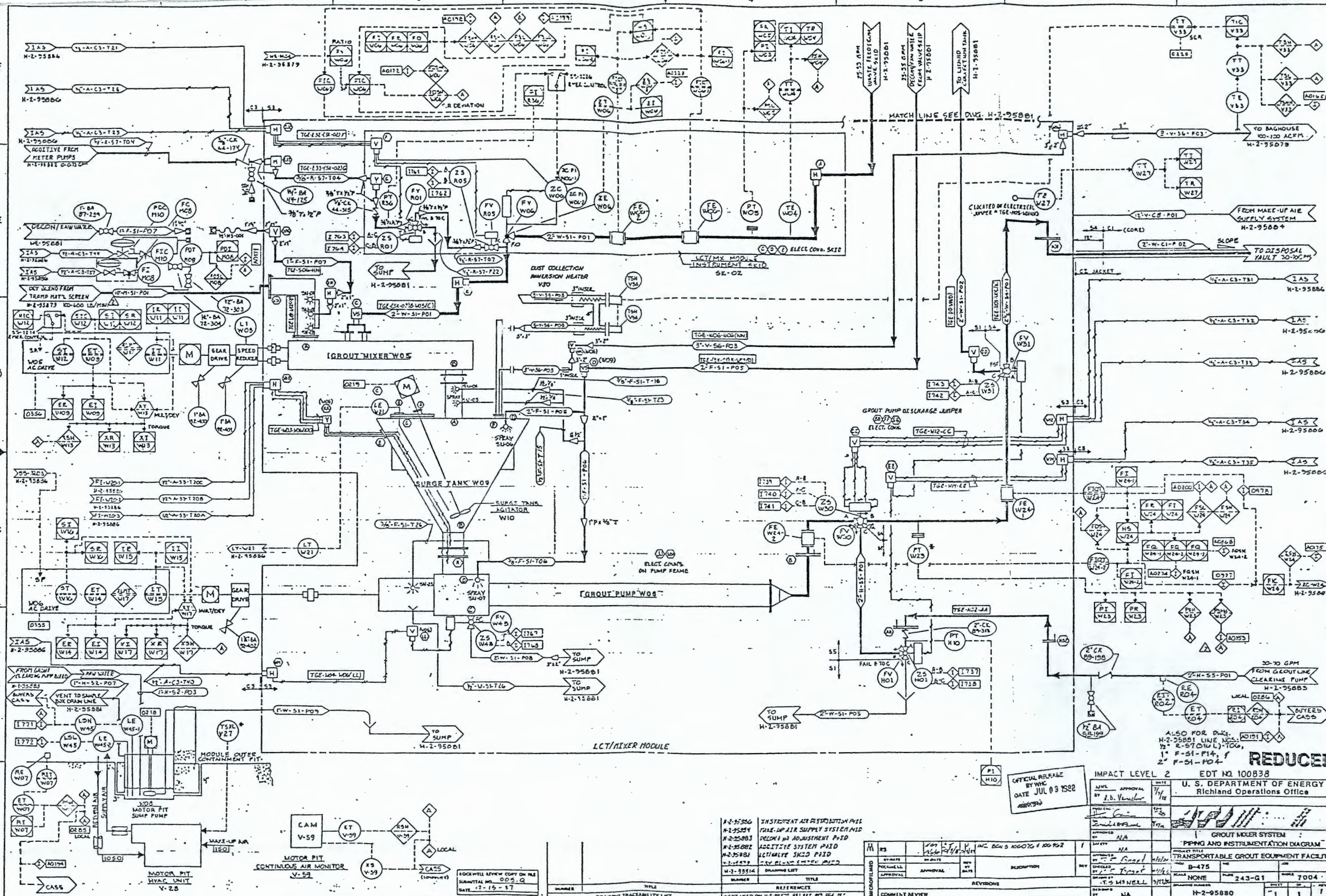
U. S. DEPARTMENT OF ENERGY
Richland Operations Office

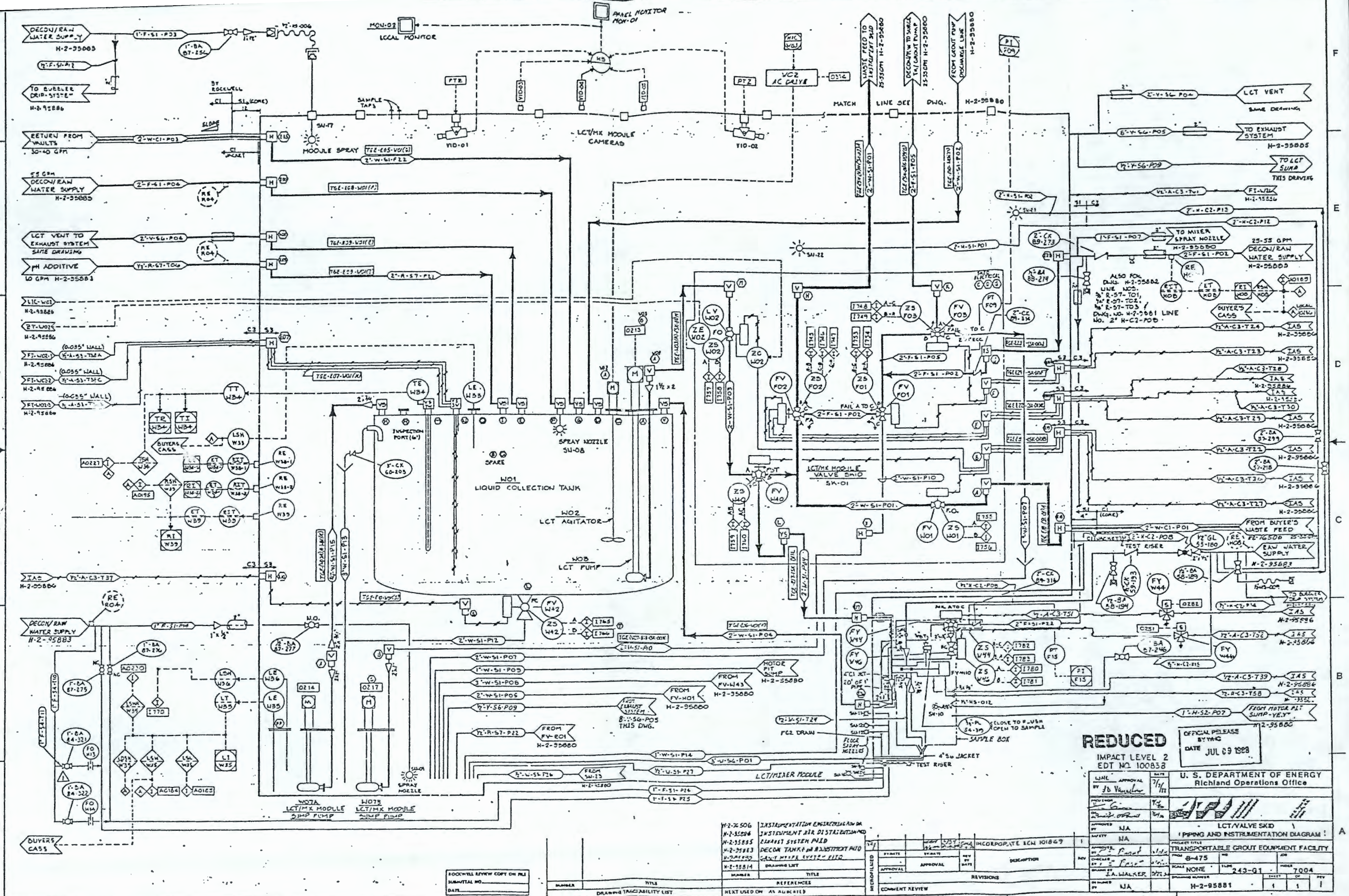
LEGEND
PIPING AND INSTRUMENTATION DIAGRAM

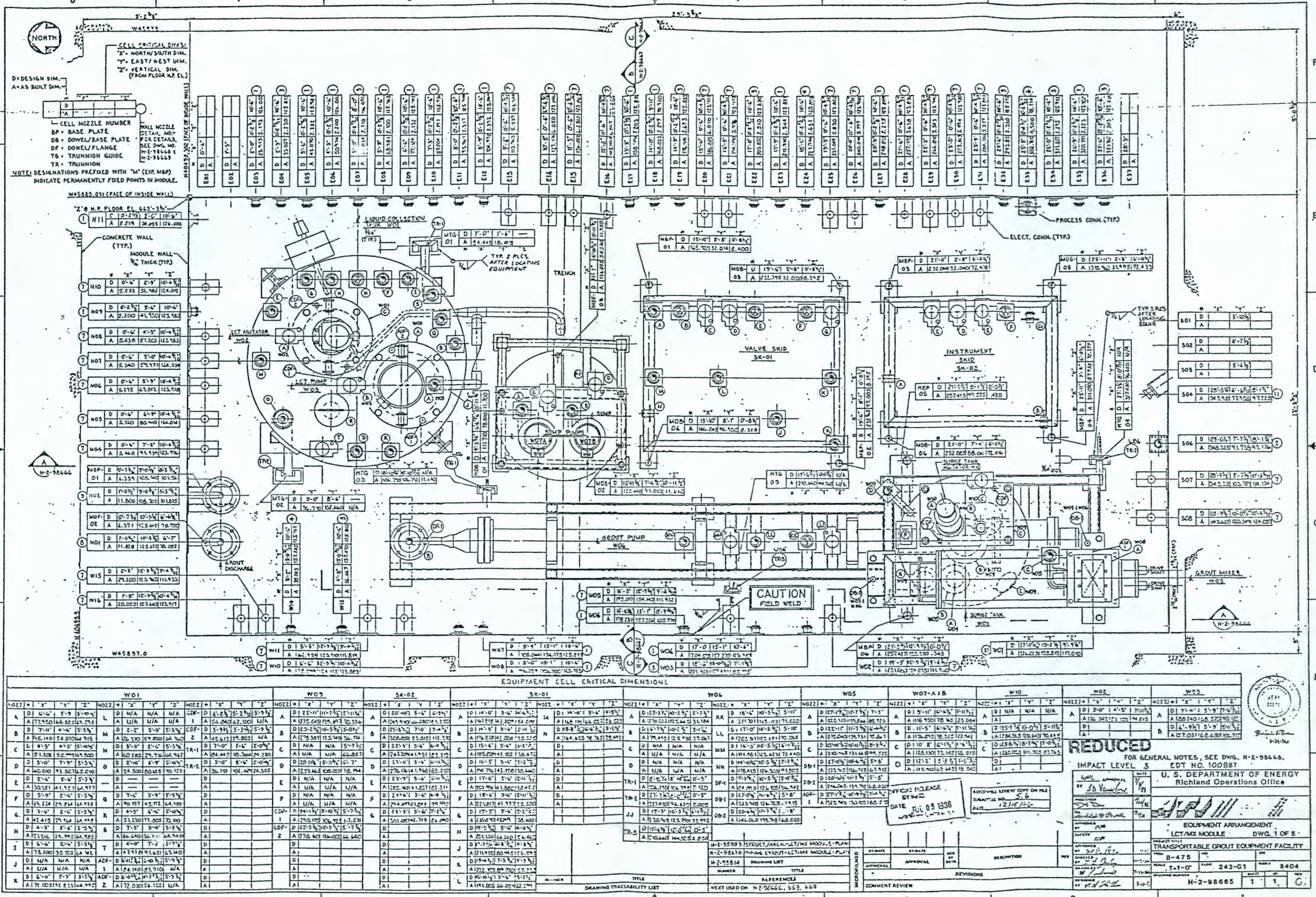
PROJECT NO. 7004
TRANSPORTABLE GROUT EQUIPMENT FACILITY

PROJ	PHS	JOB
B-475		
SCALE NONE	DRAW 243-G1-69	WORK 7004

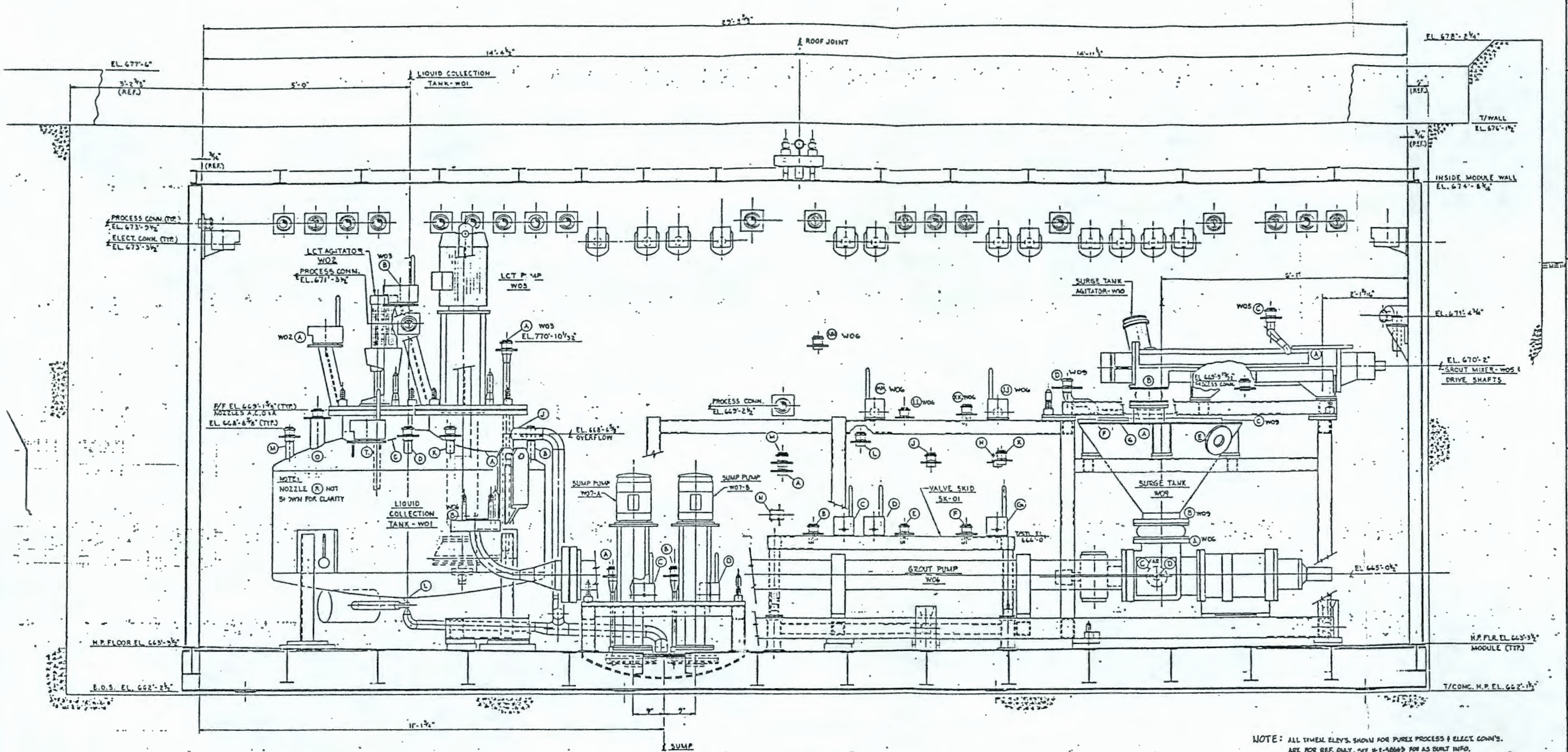
DRAWING NUMBER H-2-95878 — SHEET 1 — DF 1 — REV -


GROUT MIXER W05
SURGE TANK W09
SURGE TANK AGITATOR W10
GROUT PUMP W06
LCT/MIXER MODULE
LCT/MX MODULE INSTRUMENT SKID SK-02
DUST COLLECTION IMMERSION HEATER V50
GROUT PUMP DISCHARGE JUMPER
MATCH LINE SEE DWG. H-2-95881
TO BAGHOUSE
FROM MAKE-UP AIR SUPPLY SYSTEM H-2-95884
TO DISPOSAL VAULT
SLOPE
MOTOR PIT SUMP PUMP
MOTOR PIT HVAC UNIT V-28
MOTOR PIT CONTINUOUS AIR MONITOR V-59
MODULE OUTER CONTAINMENT PIT
ALSO FOR DWG. H-2-95881 LINE NOS: ½" R-57(DIWL)-T06, 1" F-51-P14, 2" F-51-P04
REDUCED
IMPACT LEVEL 2
EDT NO. 100838
U. S. DEPARTMENT OF ENERGY
Richland Operations Office
GROUT MIXER SYSTEM
PIPING AND INSTRUMENTATION DIAGRAM
TRANSPORTABLE GROUT EQUIPMENT FACILITY
B-475
NONE
243-G1
7004
H-2-95880
OFFICIAL RELEASE BY WHC DATE JUL 03 1992
ROCKWELL REVIEW COPY ON FILE SUBMITTAL NO. 005.Q DATE 12-15-87
DRAWING TRACEABILITY LIST
REFERENCES
REVISIONS
COMMENT REVIEW
MICROFILMED


DECON/RAW WATER SUPPLY
H-2-95883
TO BUBBLER DRIP SYSTEM
RETURN FROM VAULTS
30-40 GPM
LCT VENT TO EXHAUST SYSTEM
SAME DRAWING
pH ADDITIVE
10 GPM H-2-95883
LOCAL MONITOR
PANEL MONITOR
MON-01
MODULE SPRAY
LCT/MX MODULE CAMERAS
MATCH LINE SEE DWG. H-2-95880
WASTE FEED TO INSTRUMENT SKID
DECONTAM TO SURGE TK/GROUT PUMP
FROM GROUT PMP DISCHARGE LINE
VC2
AC DRIVE
LCT VENT
SAME DRAWING
TO EXHAUST SYSTEM
H-2-95885
TO LCT SUMP
THIS DRAWING
TO MIXER SPRAY NOZZLE
H-2-95880
25-55 GPM
DECON/RAW WATER SUPPLY
H-2-95883
BUYERS CASS
INSPECTION PORT (6")
SPARE
SPRAY NOZZLE
SW-08
W01
LIQUID COLLECTION TANK
W02
LCT AGITATOR
W08
LCT PUMP
LCT/MX MODULE VALVE SKID
SK-01
FAIL A TO C
FROM BUYER'S WASTE FEED
RAW WATER SUPPLY
TEST RISER
W07A
LCT/MX MODULE SUMP PUMP
W07B
LCT/MX MODULE SUMP PUMP
SPRAY NOZZLE
FROM FV-W43
H-2-95880
FROM FV-W01
H-2-95880
MOTOR PIT SUMP
H-2-95880
EXHAUST SYSTEM
THIS DWG.
FROM FV-E01
H-2-95880
FC2 DRAIN
SAMPLE BOX
4" Sch JACKET
TEST RISER
LCT/MIXER MODULE
FROM MOTOR PIT SUMP
H-2-95880
REDUCED
IMPACT LEVEL 2
EDT NO. 100838
OFFICIAL RELEASE BY WHC
DATE JUL 09 1988
U. S. DEPARTMENT OF ENERGY
Richland Operations Office
LCT/VALVE SKID
PIPING AND INSTRUMENTATION DIAGRAM
TRANSPORTABLE GROUT EQUIPMENT FACILITY
B-475
NONE
243-G1
7004
H-2-95881
J.A. WALKER
INCORPORATE ECN 101869
H-2-36506 INSTRUMENTATION ENGINEERING
H-2-95896 INSTRUMENT AIR DISTRIBUTION
H-2-95885 EXHAUST SYSTEM P&ID
H-2-95883 DECON TANKS P&ID
H-2-95814 DRAWING LIST
REFERENCES
NEXT USED ON AS ALLOCATED
DRAWING TRACEABILITY LIST
ROCKWELL REVIEW COPY ON FILE
REVISIONS
COMMENT REVIEW
MICROFILMED



NORTH
CELL CRITICAL DIMS:
"X" = NORTH/SOUTH DIM.
"Y" = EAST/WEST DIM.
"Z" = VERTICAL DIM. (FROM FLOOR N.P. EL.)
D = DESIGN DIM.
A = AS BUILT DIM.
CELL NOZZLE NUMBER
BP = BASE PLATE
DB = DOWEL/BASE PLATE
DF = DOWEL/FLANGE
TG = TRUNNION GUIDE
TR = TRUNNION
WALL NOZZLE DETAIL NO. - FOR DETAILS, SEE DWG. NO. H-2-98668, H-2-98669
NOTE: DESIGNATIONS PREFIXED WITH "M" (EXP. MBP) INDICATE PERMANENTLY FIXED POINTS IN MODULE.
CONCRETE WALL (TYP.)
MODULE WALL 3/16 THICK (TYP.)
LIQUID COLLECTION TANK W01
LCT AGITATOR W02
LCT PUMP W03
TRENCH
SUMP PUMPS
VALVE SKID SK-01
INSTRUMENT SKID SK-02
PROCESS CONN. (TYP.)
ELECT. CONN. (TYP.)
TYP. 2 PLCS. AFTER LOCATING EQUIPMENT
TYP 3 PLCS AFTER LOCATING EQUIP.
GROUT PUMP W04
GROUT DISCHARGE
SURGE TANK AGITATOR W06
SURGE TANK W07
GROUT MIXER W05
CAUTION FIELD WELD
EQUIPMENT CELL CRITICAL DIMENSIONS
REDUCED
FOR GENERAL NOTES, SEE DWG. H-2-98668.
IMPACT LEVEL 3
EDT NO. 100887
U. S. DEPARTMENT OF ENERGY
Richland Operations Office
EQUIPMENT ARRANGEMENT
LCT/MX MODULE DWG. 1 OF 5
TRANSPORTABLE GROUT EQUIPMENT FACILITY
B-475
243-G1
8404
H-2-98665
DRAWING TRACEABILITY LIST
REFERENCES
REVISIONS
COMMENT REVIEW
OFFICIAL RELEASE
JUL 09 1986



SECTION (A) H-2-98665

NOTE: ALL TIMEAL ELEV'S. SHOWN FOR PUREX PROCESS & ELECT. CONN'S. ARE FOR REF. ONLY. SEE H-2-98665 FOR AS BUILT INFO.

OFFICIAL RELEASE
DATE JUL 09 1987

REDUCED

IMPACT LEVEL 3
EDT * 100887

ROCKWELL REVIEW COPY ON FILE
SUBMITTAL NO. ACS-6
DATE 12-15-86

H-2-98666	EQUIP. ARRANGEMENT-LCT/MX MODULE		
H-2-98614	DRAWING LIST		
NUMBER	TITLE		
NEXT USED ON	REFERENCES		

DRAWING TRACEABILITY LIST

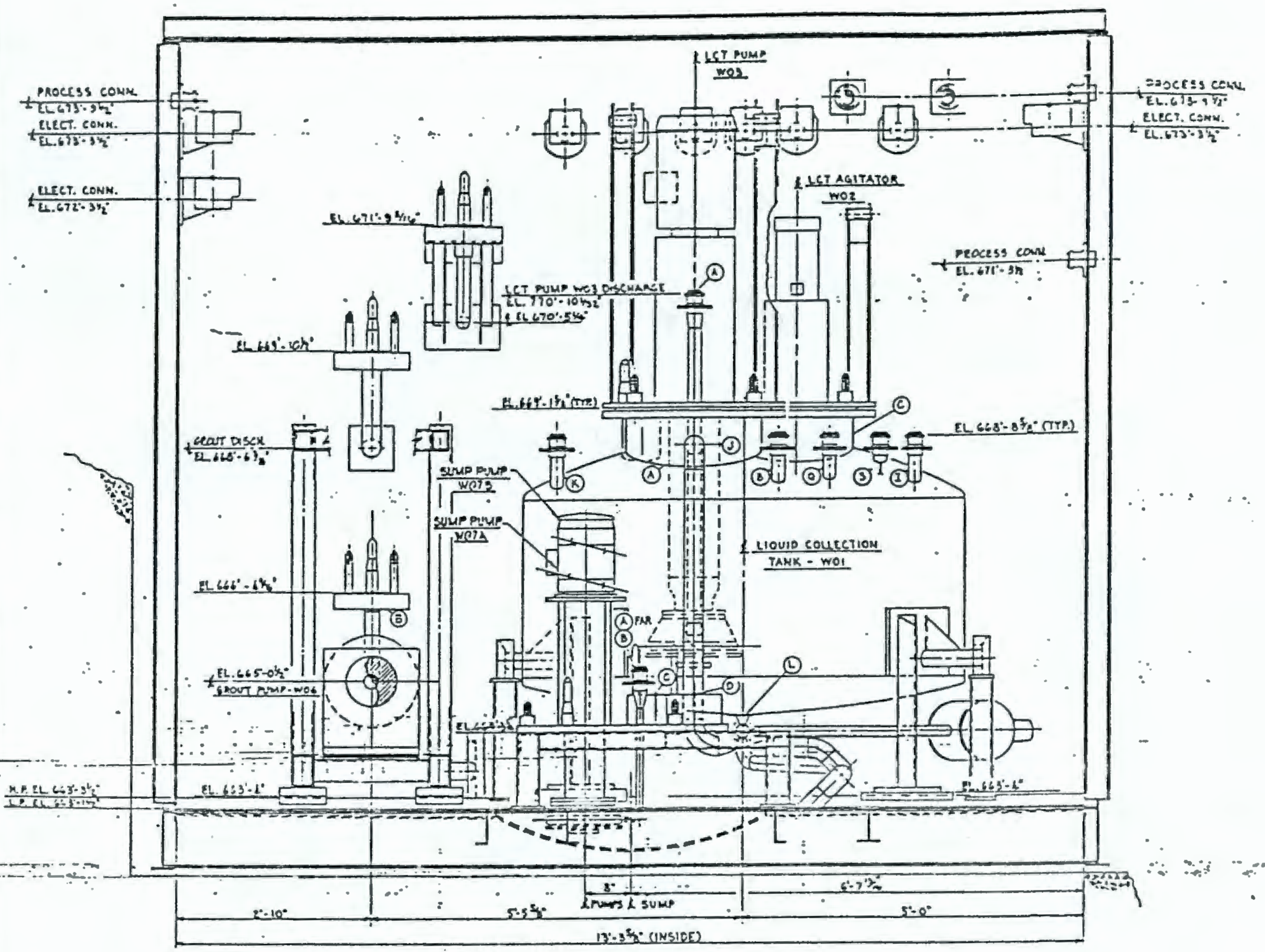
COMMENT REVIEW — REVISIONS

U. S. DEPARTMENT OF ENERGY
Richland Operations Office

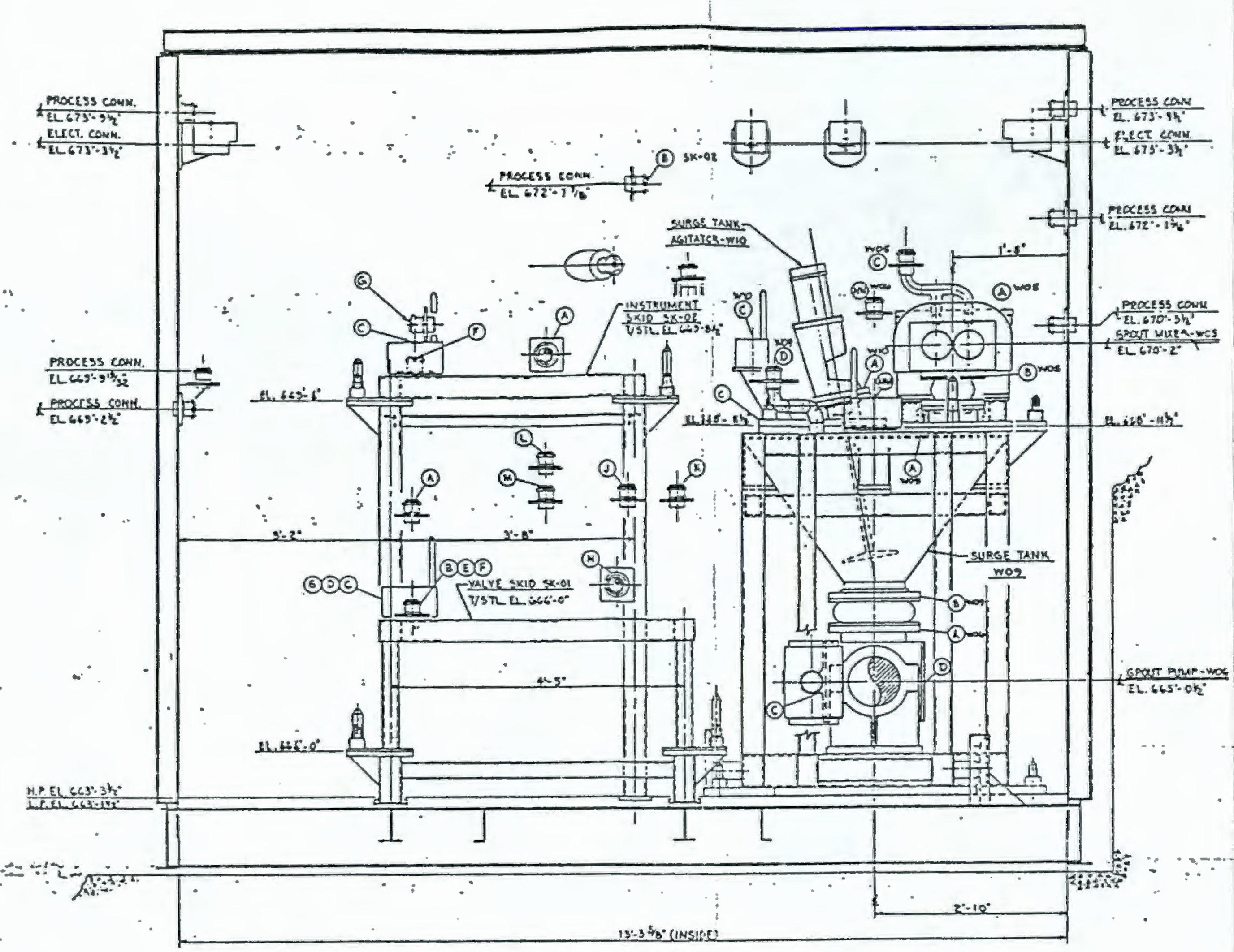
EQUIPMENT ARRANGEMENT
LCT/MX MODULE DWG. 2 OF 5

PROJECT TITLE: TRANSPORTABLE GROUT EQUIPMENT FACILITY

B-475		
SCALE 1'-1-0'	243-G1	8404
DRAWING NUMBER H-2-98668	SHEET 1 OF 1	REV 0



SECTION (B) H-2-98665



SECTION (C) H-2-98665

NOTE: ALL DIMEN. ELEV'S SHOWN FOR PUREX PROCESS & ELECT. CONN'S. ARE FOR REF. ONLY. SEE H-2-98665 FOR AS-BUILT INFO.

OFFICIAL RELEASE BY WHC DATE JUL 06 1988

REDUCED

ROCKWELL REVIEW COPY ON FILE
SUBMITTAL NO. [illegible]
DATE [illegible]

IMPACT LEVEL 3
EDT #100887

NUMBER	TITLE
H-2-98665	EQUIP ARRANGEMENT-LCT/MX MODULE
H-2-98814	DRAWING LIST
REFERENCES	
NEXT USED ON	END ITEM

DRAWING TRACEABILITY LIST

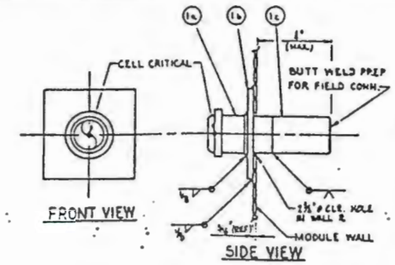
COMMENT REVIEW

REVISIONS

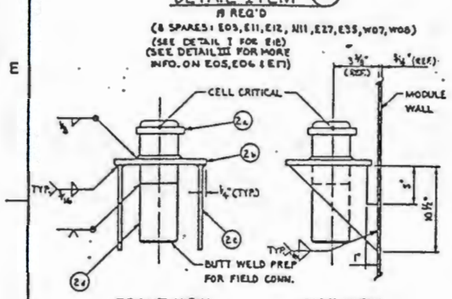
U. S. DEPARTMENT OF ENERGY
Richland Operations Office

EQUIPMENT ARRANGEMENT,
LCT/MX MODULE DWG. 3 OF 5
PROJECT TITLE: TRANSPORTABLE GROUT EQUIPMENT FACILITY

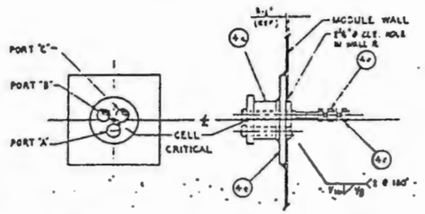
PROJ B-475		
SCALE 1·1-0'	BLDG 243-G1	INDEX 8404
DRAWING NUMBER H-2-98667	SHEET 1	OF 1



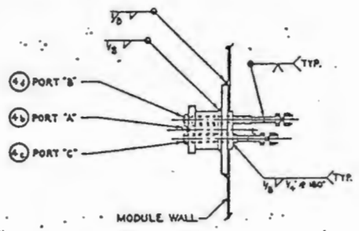
DETAIL ITEM (1)
19 REQ'D
(8 SPARES: E03, E11, E12, N11, E27, E35, W07, W08)
(SEE DETAIL I FOR E16)
(SEE DETAIL III FOR MORE INFO. ON E03, E04 & E17)

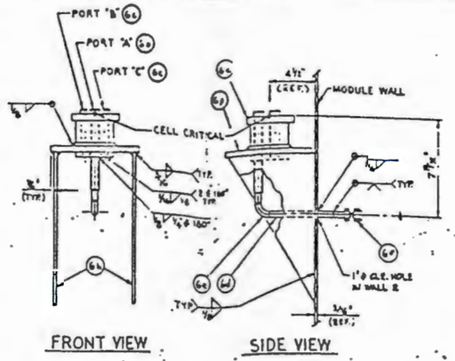


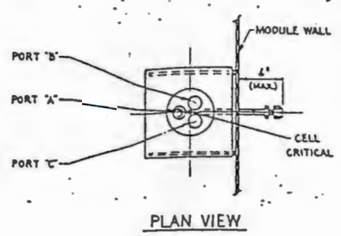
DETAIL ITEM (2)
1 REQ'D



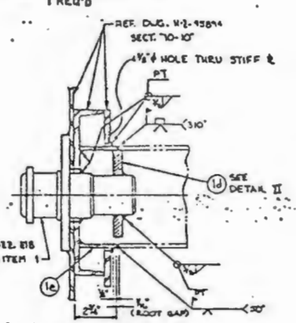
DETAIL ITEM (4)
2 REQ'D

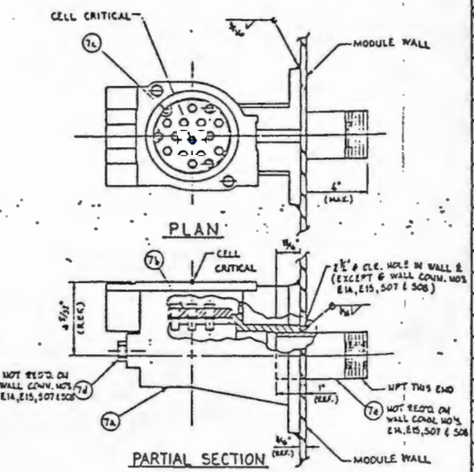






DETAIL ITEM (6)
1 REQ'D





ELECTRICAL WALL CONNECTOR SCHEDULE

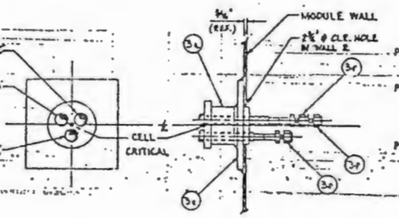
WALL CONN. NO.	ELECTRICAL WIRING DIAGRAM DWG. NO	ELECTRICAL JUMPER NO.	REFERENCES/ SERVICE
E14	H-2-98539	TGE-E14-W07 (C)	SUMP PUMP MTR'S.
E15	H-2-98508	TGE-E15-W07 (PP)	SUMP LEVEL
E20	H-2-98505	TGE-E20-(SK-01) C	VALVE SKID
E21		TGE-E21-(SK-01) D	
E25		TGE-E25-(SK-01) G	
E29	H-2-98506	TGE-E29-(SK-02) C	INSTRUMENT SKID
E30		TGE-E30-(SK-02) D	
E31		TGE-E31-(SK-02) E	
S07	H-2-98540	TGE-S07-W10 (C)	SURGE TK. AGIT. MTR.
S08	H-2-98507	TGE-S08-W10 (B)	LEVEL
W02		TGE-W02-JJ	FV-W43
W05	H-2-98541	TGE-W05-LOW(TH)	STRIP HEATERS
W11	H-2-98504	TGE-W11-BB	GROUT DISCHARGE
W15		TGE-W15-FF	
W16		TGE-W16-GG	
N04	H-2-98507	TGE-N04-W01 (T)	FV-W42
N05	H-2-98508	TGE-N05-W01 (D)	LSH-W35
N06	H-2-98539	TGE-N06-W05 (B)	LCT PUMP MOTOR
N07	H-2-98508	TGE-N07-W01 (M)	LCT TANK (TEMP.)
N08	H-2-98541	TGE-N08-W02 (A)	LCT AGIT. MOTOR
E16	H-2-98540	TGE-E16-W07 (D)	SUMP PUMP MOTOR

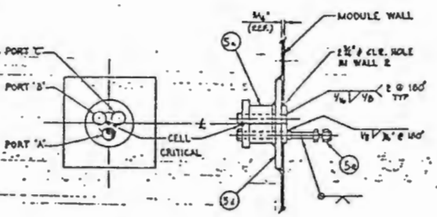
DETAIL ITEM (7)
26 REQ'D
(3 SPARES: E13, E26, E28, W10 & W10)

BILL OF MATERIAL

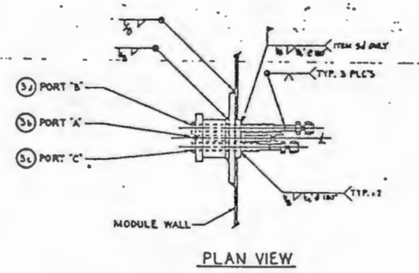
ITEM NO./ EQUIP NO.	QTY.	DESCRIPTION	REMARKS
W01	1	LIQUID COLLECTION TANK (LCT)	H-2-98711
W02	1	LCT AGITATOR ASSEMBLY	H-2-98706
W03	1	LCT PUMP ASSEMBLY	H-2-98705
W05	1	GROUT MIXER ASSEMBLY	H-2-98709
W06/W09	1	GROUT PUMP/ SURGE TANK ASSEMBLY	H-2-98708
W07-A1B	1	SUMP PUMPS ASSEMBLY	H-2-98704
W10	1	SURGE TANK AGITATOR ASSEMBLY	H-2-98710
SK-01	1	VALVE SKID ASSEMBLY	H-2-98703
SK-02	1	INSTRUMENT SKID ASSEMBLY	H-2-98702
1	—	2" HORIZONTAL WALL NOZZLE ASSEMBLY	SEE DETAIL 1
1a	1	2" PUREX NOZZLE ⊕	H-2-32446-3
1b	1	KICK PLATE	H-2-98819-8
1c	1	2" SCH. 40S PIPE NIPPLE x 2 1/32" LG., E.F.W.	ASTM A312 TP 304L S.S.T.
1d	1	1/2" PLATE (SEE DETAIL II)	ASTM A240 304L SST
1e	1	1" ϕ SCH. 40 PIPE	ASTM A106, GR B C.S.
2	—	2" VERTICAL WALL NOZZLE ASSEMBLY	SEE DETAIL 2
2a	1	2" PUREX NOZZLE ⊕	H-2-32446-3
2b	1	KICK PLATE	H-2-98819-3
2c	1	FLAT BAR 6" x 1/2" x 10 1/2" (CUT) S.S.T.	304 ASTM A276
2d	1	2" SCH. 40S PIPE NIPPLE x 6" LG., E.F.W.	ASTM A312 TP 304L S.S.T.
3	—	2" 3 WAY HORIZONTAL WALL NOZZLE ASSEMBLY	SEE DETAIL 3
3a	1	2" 3 WAY PUREX NOZZLE ⊕	H-2-32447-3
3b	1	1/2" PIPE INSERT (4.43" LG.) ⊕	-4
3c	1	1/2" PIPE INSERT (5.43" LG.) ⊕	-5
3d	1	1/2" PIPE INSERT (6.43" LG.) ⊕	-6
3e	1	KICK PLATE	H-2-98819-5
3f	3	1/2" x 1/2" TUBE TO MALE PIPE CONNECTOR	SWAGELOK SS-810-1-RW
4	—	2" 3 WAY HORIZONTAL WALL NOZZLE ASSEMBLY	SEE DETAIL 4
4a	1	2" 3 WAY PUREX NOZZLE ⊕	H-2-32447-3
4b	1	1/2" BLANK INSERT (3.25" LG.) ⊕	-8
4c	1	1/2" PIPE INSERT (4.43" LG.) ⊕	-4
4d	1	1/2" PIPE INSERT (5.43" LG.) ⊕	-5
4e	1	KICK PLATE	H-2-98819-5
4f	2	1/2" x 1/2" TUBE TO MALE PIPE CONNECTOR	SWAGELOK SS-810-1-RW
5	—	2" 3 WAY HORIZONTAL WALL NOZZLE ASSEMBLY	SEE DETAIL 5
5a	1	2" 3 WAY PUREX NOZZLE ⊕	H-2-32447-3
5b	1	1/2" PIPE INSERT (4.43" LG.) ⊕	-4
5c	2	1/2" BLANK INSERT (5.25" LG.) ⊕	-8
5d	1	KICK PLATE	H-2-98819-5
5e	1	1/2" x 1/2" TUBE TO MALE PIPE CONNECTOR	SWAGELOK SS-810-1-RW
6	—	2" 3 WAY VERTICAL WALL NOZZLE ASSEMBLY	SEE DETAIL 6
6a	1	2" 3 WAY PUREX NOZZLE ⊕	H-2-32447-3
6b	1	1/2" PIPE INSERT (6.43" LG.) ⊕	-6
6c	2	1/2" BLANK INSERT (5.25" LG.) ⊕	-8
6d	1	1/2" SCH. 40S PIPE NIPPLE x 4" LG., E.F.W.	ASTM A312 TP 304L S.S.T.
6e	1	1/2" - 90° L.R. ELBOW - SCH. 40S, B.W.	ASTM A403 WP-W304L S.S.T.
6f	1	3/8" x 1/2" TUBE TO MALE PIPE CONNECTOR	SWAGELOK SS-600-1-RW
6g	1	KICK PLATE	H-2-98819-2
6h	1	FLAT BAR 6" x 1 1/2" x 10 1/2" (CUT) S.S.T.	304 ASTM A276
7	—	ELECTRICAL WALL CONNECTOR ASSEMBLY	SEE DETAIL 7
7a	1	WALL RECEPTACLE HOUSING - PUREX TYPE ⊕	H-2-68724-2
7b	1	13 POINT INSULATING PLATE ASSEMBLY ⊕	H-2-32403-2
7c	1	INSULATING PLATE KEY PIN ⊕	H-2-90152-9
7d	1	1" PIPE PLUG, THR'D, SQ. HEAD - 2000# CLASS	ASTM A105 C.S.
7e	1	2" SCH. 40 PIPE NIPPLE x 5" LG.	ASTM A53 GR.B, C.S.

IMPACT LEVEL 2 EDT #100853

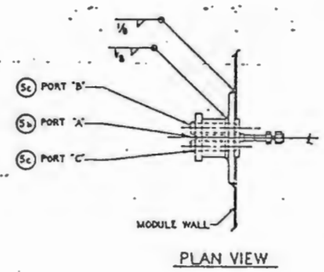


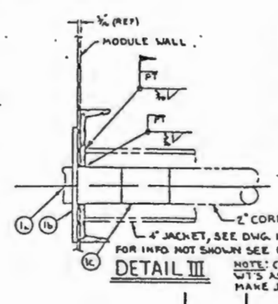


DETAIL ITEM (3)
9 REQ'D
NOTE: WALL CONN. NO'S. E04, E34, & E36 ARE SPARES

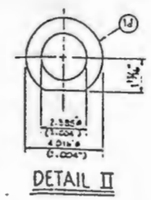


DETAIL ITEM (5)
NOT REQ'D





NOTE: COPE & REPAIR WT'S AS REQ'D TO MAKE JACKET WELDS.



GENERAL NOTES

1. DIMENSIONAL TOLERANCES AND ALL WORK PERFORMED WILL BE IN ACCORDANCE WITH A.T.I. FABRICATION AND ASSEMBLY OF THE LIQUID COLLECTION TANK/MIXER MODULE SPECIFICATION # 203-M-012.
2. ALL PIPING TO BE IN ACCORDANCE WITH A.T.I. SPECIFICATION # 203-M-002.
3. ALL WALL CONNECTIONS TO BE PERPENDICULAR TO THE "X, Y & Z" AXIS ± 1/32".

"OFFICIAL RELEASE" BY WHC DATE JUL 09 1998

ROCKWELL REVIEW COPY ON FILE SUBMITTAL NO. T-1 DATE 12/14/97

REDUCED

DRAWING TRACEABILITY LIST			
NUMBER	TITLE	REFERENCES	
H-2-98665	EQUIP. ARRANGEMENT-LCT/MX MODULE	NEXT USED ON H-2-95894 & H-2-95840	
H-2-98814	DRAWING LIST		

UNCONTROLLED

REVISIONS				
BY	BY DATE	APPROVAL	BY DATE	DESCRIPTION
APPROVAL				
COMMENT REVIEW				

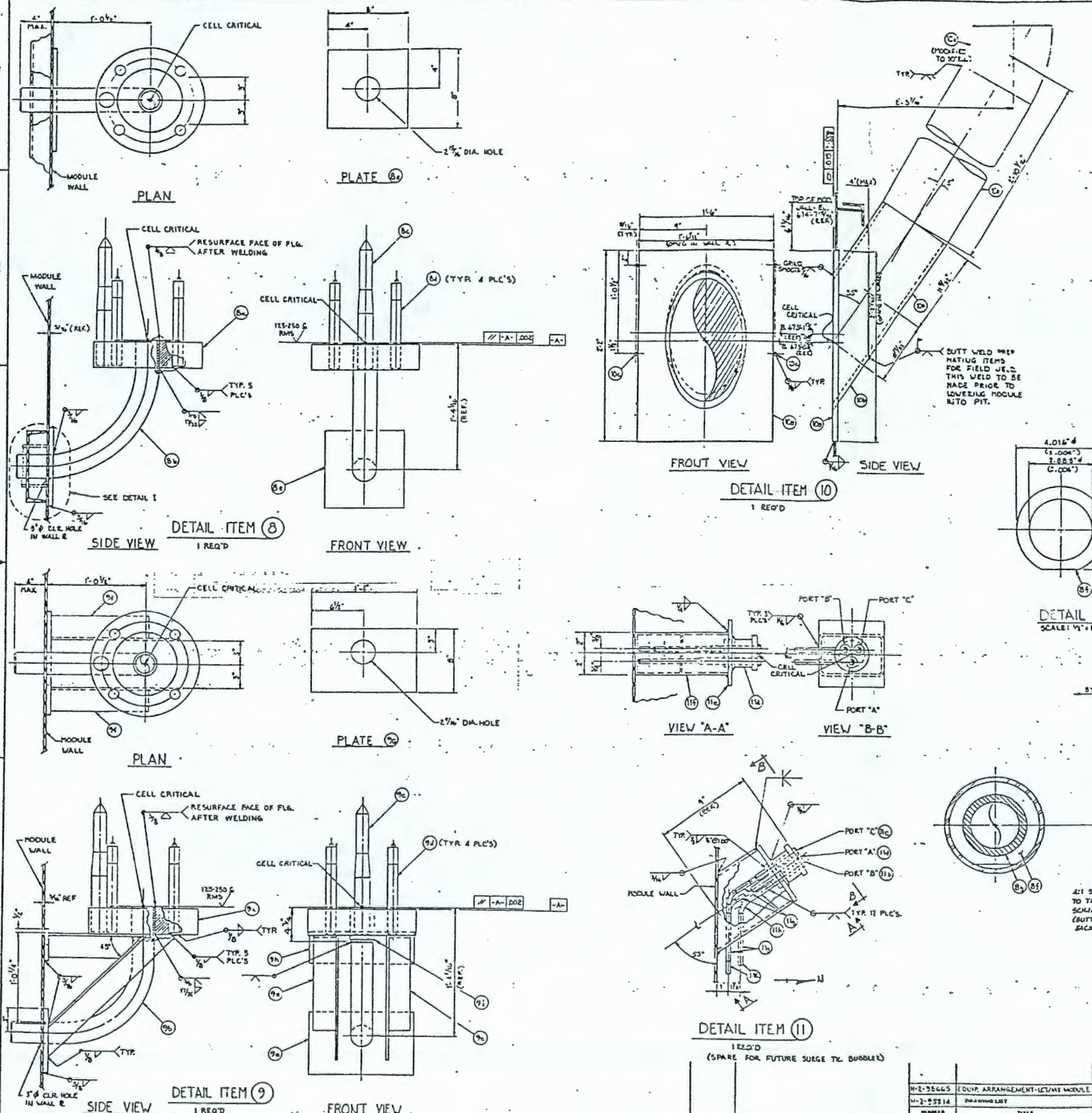
APPROVED BY		DATE	7/1/98
PROJECT			7/1/98
ENGR			7/1/98
APPROVED BY			
SAFETY			
APPROVED BY			7/1/98
CHECKED BY			7/1/98
DRAWN BY			10-2-98
DESIGNED BY			6-2-98

U. S. DEPARTMENT OF ENERGY
Richland Operations Office

EQUIPMENT ARRANGEMENT
LCT/MX MODULE-DETAILS & B/M DWG. 4 OF 5

PROJECT TITLE
TRANSPORTABLE GROUT EQUIPMENT FACILITY

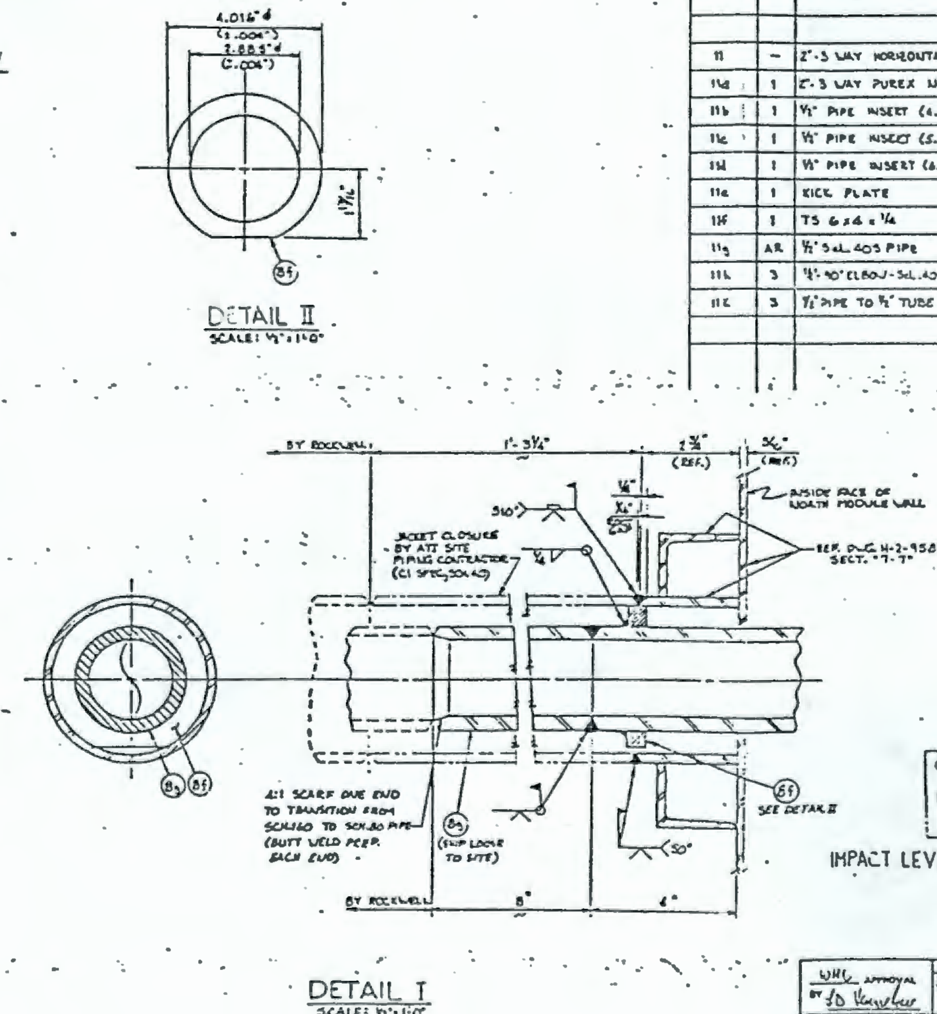
PROJ	NO	JOB
B-475		
SCALE NONE	FLOOR 243-G1	INDEX 8404
DRAWING NUMBER H-2-98668	SHEET 1	OF 1 REV C



NOTES:

1. USE CUT PIPE AS TEMPLATE FOR HOLE IN ITEM 10a.

2. PLATE THICKNESS TO BE DETERMINED AFTER SETTING GROUT PUMP, MIXER, & MIXER FEED CHUTE. (GAP BETWEEN FEED CHUTE & ITEM 10a TO BE 3/8" ± 1/16" EXCLUDING GASKET.)



BILL OF MATERIAL

ITEM NO.	QTY.	DESCRIPTION	REMARKS
8	—	PROCESS WALL CONNECTOR ASSEMBLY	SEE DETAIL 8
8a	1	SPECIAL FLANGE	H-2-98824-1
8b	1	2 1/2"-53° 5 DIA. BEND W/6" TANGENT, PLAIN ENDS, SCH. 160S (FIELD TO MODIFY PER DETAIL ASSEMBLY)	ASTM-A312 TP304L SST SEAMLESS
8c	1	DOWEL	H-2-98819-6
8d	4	STUD	H-2-98818-3
8e	1	PL 1/2" x 8" x 8"	304L SST ASTM-A240
8f	1	1/2" PL (SEE DETAIL II)	ASTM A240, 304L, SST
8g	8"	2 1/2" Ø SCH. 160 PIPE	ASTM A312, TP 304L SST
9	—	PROCESS WALL CONNECTOR ASSEMBLY	SEE DETAIL 9
9a	1	SPECIAL FLANGE	H-2-98824-1
9b	1	2" - 50° 5 DIA. BEND W/6" TANGENT, PLAIN ENDS, SCH. 40S (FIELD TO MODIFY PER DETAIL ASSEMBLY)	ASTM-A312 TP 304L SST, EFW
9c	1	DOWEL	H-2-98819-6
9d	4	STUD	H-2-98818-3
9e	2	∠ 3" x 3" x 1/4" x 1'-4 1/2" LG.	304L SST ASTM-A276
9f	2	∠ 3" x 3" x 1/4" x 1'-0 1/4" LG.	⋮
9g	1	PL 1/4" x 8" x 1'-1"	304L SST ASTM-A240
9h	1	FLAT BAR - 4" x 1/4" x 1'-1"	304 SST ASTM-A276
9i	1	2 1/2" SCH. 40S PIPE x 4 1/4" LG. - BEVEL ONE END	ASTM-A312 TP 304L SST SEAMLESS
10	—	FEED CHUTE WALL CONN. ASS'Y	SEE DETAIL 10
10a	1	PL 3/4" x 18" x 2'-2" LG. SST	ASTM A240 304L (SEE NOTE 2)
10b	AR	10" SCH. 80S, EFW	ASTM A312 TP 304L, SST
10c	4	ROUND BAR 1/2" Ø x 3" LG., SST	ASTM A276, 304L
10d	1	10" 45° ELL, SCH. 80S	ASTM A403, WP304L SST
11	—	2"-3 WAY HORIZONTAL WALL NOZZLE ASS'Y	SEE DETAIL 11
11a	1	2"-3 WAY PUREX NOZZLE *	H-2-32447-3
11b	1	1/2" PIPE INSERT (4.43" LG.)*	H-2-32447-4
11c	1	1/2" PIPE INSERT (5.43" LG.)*	H-2-32447-5
11d	1	1/2" PIPE INSERT (6.43" LG.)*	H-2-32447-6
11e	1	KICK PLATE	H-2-98819-5
11f	1	TS 6 x 4 x 1/4	ASTM A554, 304 SST
11g	AR	1/2" SCH. 40S PIPE	ASTM A312, TP 304L SST
11h	3	1/2"-90° ELBOW-SCH. 40S (MODIFY TO 55°)	ASTM A403, WP304L SST
11i	3	1/2" PIPE TO 1/2" TUBE WELD ADAPTER	CAJON # 304L-8-HPWA-8TSW

OFFICIAL RELEASE BY WHC
DATE JUL 09 1983

REDUCED

IMPACT LEVEL 2, EDT #100853

ROCKWELL REVIEW COPY ON FILE
SUBMITTAL NO. CC 5.5
DATE 72-18-86

SEAL 11571

REFERENCES	
NUMBER	TITLE
H-2-98665	EQUIP. ARRANGEMENT-LCT/MX MODULE
H-2-95814	DRAWING LIST

DRAWING TRACEABILITY LIST

NEXT USED ON | END ITEM

REVISIONS

COMMENT REVIEW

MICROFILMED

U. S. DEPARTMENT OF ENERGY
Richland Operations Office

WHC APPROVAL BY SD Vanghan 1/1/87

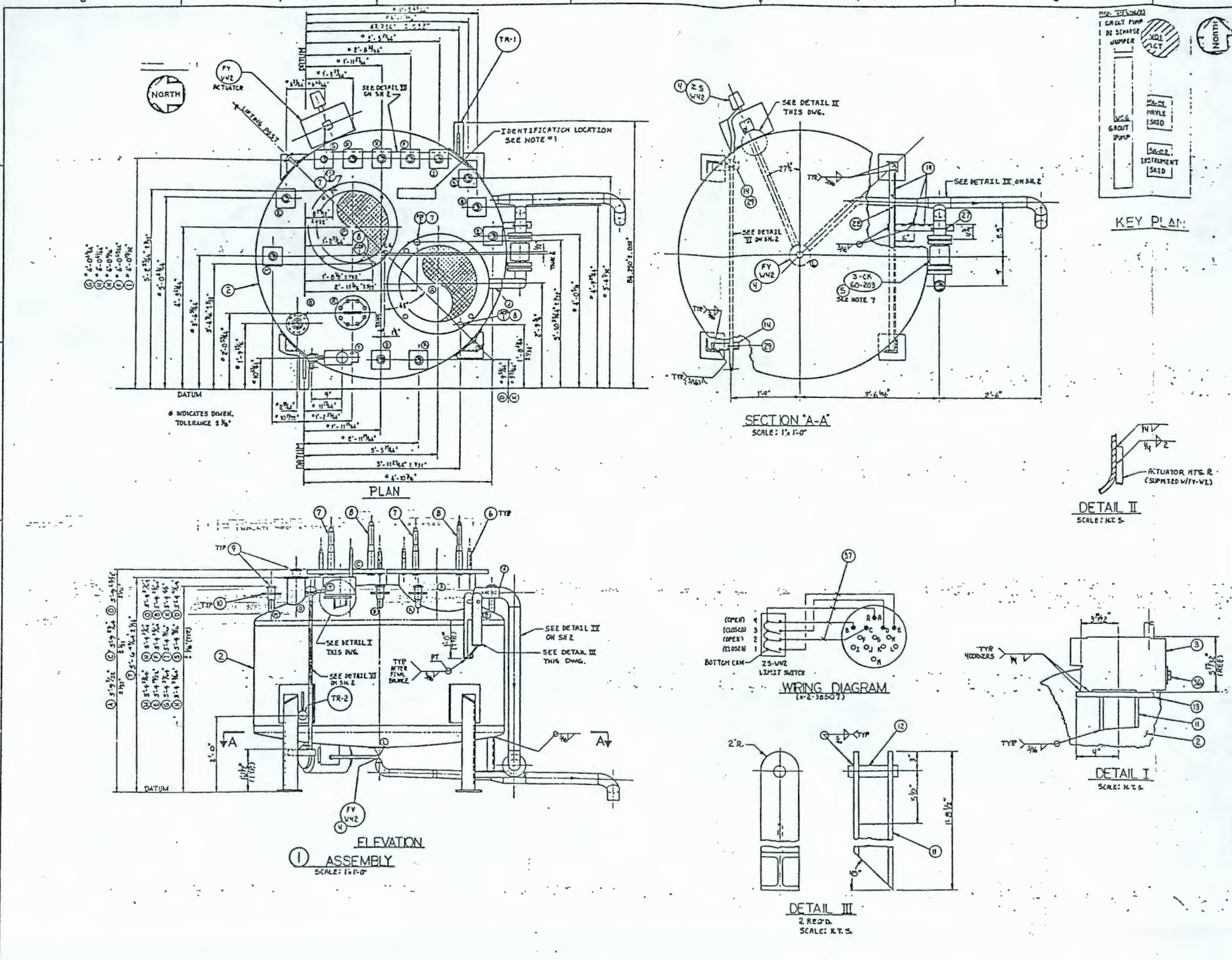
EQUIPMENT ARRANGEMENT
LCT/MX MODULE-DETAILS & B/M DWG. 5 OF 5

PROJECT TITLE: TRANSPORTABLE GROUT EQUIPMENT FACILITY

PROJ.	NO.	JOB
B-475		

SCALE	PLAN	INDEX
NONE	243-G1	8404

DRAWING NUMBER	SHEET	OF	REV
H-2-98669	1	1	0



QTY	PT. No.	DESCRIPTION	MATERIAL/REF
X	1	ASSEMBLY (APPROX. TOTAL WT 3362)	—
1	2	LIQUID COLLECTION TANK-W01	A.T.I. RQ# 203-M2
1	3	COVER EQUIP. ELECT. CONNECTOR-13 PIN	H-2-32401-3 *
1	4	2" FLUSH BOT. BALL VALVE, TAG No. FV-W42	A.T.I. RQ# 203-940 *
1	5	3" CHECK VALVE, TAG No. 3-CK-GC-203	A.T.I. RQ# R 203-944 *
8	6	1¼" Ø STUD, WELD TYPE	A.T.I. RQ# R 203-955 H-2-99919-4 *
2	7	2" Ø SHORT DOWEL, WELD TYPE	A.T.I. RQ# R 203-456 H-2-99919-8 *
2	8	2" Ø LONG DOWEL, WELD TYPE	A.T.I. RQ# R 203-955 H-2-99946-5 *
13	9	2" PUREX MALE CONNECTOR NOZZLE	H-2-32446-3 *
12	10	KICK PLATE	H-2-138B-5
5'-0"	11	W4x13	ASTM A36, C.S.
2	12	1¼" ROUND BAR x 5" LG.	↓
1	13	FLAT BAR 6" x 3/8" x 8" LG. W/½" R CORNERS	↓
11'-0"	14	ANGLE 2" x 2" x ¼"	↓
8	15	STUD BOLT, 5/8"-11UNC-2A x 3¾" LG.	ASTM A193, GR. B-7 ALLOY STL. ZINC PLATED
16	16	HEAVY HEX NUT, 5/8"-11 UNC-2B	ASTM A194 GR. 2H ALLOY STL.
2	17	3"-150# R.F.S.O. FLG S.S.T.	ASTM A182, F304L
2	18	GASKET 3"-150# SPIRAL WOUND (304 SS W/FLEXIBLE FILLER)	FLEXITALLIC TYPE CG 1/8" THK
7'-6"	19	3" SCH. 40S PIPE, E.F.W., S.S.T.	ASTM A312, TP304L
3'-6"	20	2" SCH. 40S PIPE, E.F.W., S.S.T.	↓
1	21	2"-90° B.W. ELL, SCH. 40, S.S.T.	ASTM A403, WP-W304L
1	22	2"-45° B.W. ELL, SCH. 40 S.S.T.	↓
1	23	3x2" B.W. ECC. REDUCER, SCH. 40S	↓
1	24	3" B.W. TEE, SCH. 40, S.S.T.	↓
3	25	3"-90° B.W. ELL, SCH. 40, S.S.T.	↓
1	26	3"-45° B.W. ELL, SCH. 40 S.S.T.	↓
1	27	3" U-BOLT W/HEX NUTS	ITT GRINNELL FIG. 137
1	28	2" U-BOLT W/HEX NUTS	↓
2	29	¾" U-BOLT W/HEX NUTS	↓
11'-0"	30	¾" Ø RIGID CONDUIT	GALV. C.S.
1	31	1 x ¾" FLUSH BUSHING	COMM'L.
1	32	CONDUIT OUTLET BODY, ¾" ELL	CROUSE-HINDS GUAL 26
1	33	¾" LIQUID-TIGHT ADAPTER	T&B # 5273
AR	34	¾" Ø LIQUID-TIGHT FLEXIBLE CONDUIT	COMM'L.
1	35	¾" LIQUID-TIGHT CONDUIT FITTING, STRAIGHT W/S. STL. SEALING RING, A.R.	T&B # 5333
1	36	2" SQ. HD. PIPE PLUG	COMM'L.
AR	37	STRANDED COPPER, SINGLE CONDUCTOR WIRE, [illegible]	COMM'L.
14'-0"	38	½" O.D. x .049" WALL TUBING S. STL.	ASTM A 213, TP 304L
1	39	½" x ¾" MALE CONNECTOR	SWAGELOK 304L-810-1-4
1	40	3" O-RING GASKET	CROUSE-HINDS GASK-456

GENERAL NOTES:

1. DUNNAGE SHALL BE FABRICATED AND ASSEMBLED IN ACCORDANCE WITH A.T.I. FABRICATION AND ASSEMBLY OF THE LIQUID COLLECTION TANK/MIXER MODULE SPECIFICATION No. 203-M-012.
2. ALL PARTS WITH AN ASTERISK(*) IN THE MATERIAL/REF. COLUMN WILL BE SUPPLIED BY A.T.I.
3. USE LIFTING YOKE # H-2-98824, DETAIL.
4. ALL DIMENSIONS MEASURED FROM DATUMS TO HAVE ± 1/16" TOLERANCE.
5. ASSEMBLY TO BE FABRICATED IN ACCORDANCE WITH A.T.I. FABRICATION/ASSEMBLY OF THE LIQUID COLLECTION TANK/MIXER MODULE SPECIFICATION No. 203-M-012.
6. PIPING TO BE IN ACCORDANCE WITH A.T.I. SPECIFICATION No. 203-M-002.
7. DRILL ¼" Ø HOLE THRU DISC ON THE VERTICAL ℄ AT THE BOTTOM OF DISC.
8. BOLT HOLES TO STRADDLE FLANGE CENTERLINES.

NUMBER	TITLE
H-2-98507	ELEMENTARY WIRING DIAGRAM
H-2-98663	EQUIPMENT ARRANGEMENT-LCT/MIX. MOD.
H-2-98814	DRAWING LIST

REFERENCES

NEXT USED ON H-2-98670

MICROFILMED

REVISIONS

COMMENT REVIEW

DRAWING TRACEABILITY LIST

OFFICIAL RELEASE BY WHC
DATE JUL 09 1993

REDUCED

ROCKWELL REVIEW COPY ON FILE
SUBMITTAL NO. ____
DATE ____

IMPACT LEVEL 3
EDT. #100887

WHC APPROVAL BY SD Vanderlyke 7/7/88

U. S. DEPARTMENT OF ENERGY
Richland Operations Office

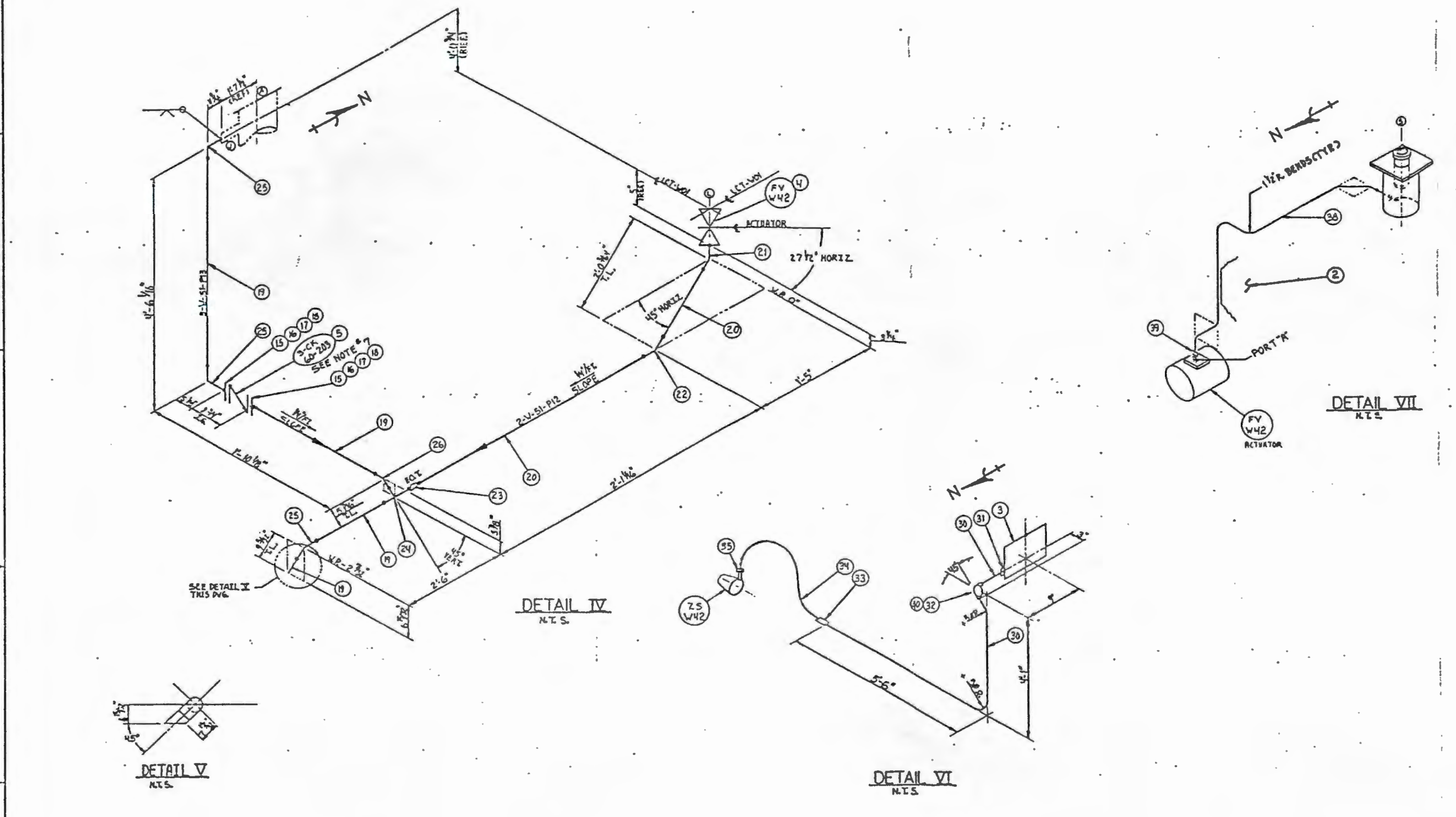
EQUIPMENT JUMPER ASSEMBLY - LIQUID COLLECTION TANK-W01

PROJECT TITLE: TRANSPORTABLE GROUT EQUIPMENT FACILITY

PROJ: B-475 | SCALE: AS NOTED | BLDG: 243-G1 | INDEX: 2500

DRAWN BY: L. L. DEAN

DRAWING NUMBER: H-2-98711 | SHEET 1 | OF 2 | REV 0



OFFICIAL RELEASE BY WHC DATE JUL 09 1993

REDUCED

ROCKWELL REVIEW COPY ON FILE
SUBMITTAL NO.
DATE

IMPACT LEVEL 3
EDT #100837

NUMBER	REFERENCES TITLE
H-2-98507	ELEMENTARY WIRING DIAGRAM
H-2-98555	EQUIPMENT ARRANGEMENT
H-2-98814	DRAWING LIST

NEXT USED ON H-2-98670

DRAWING TRACEABILITY LIST

REVISIONS

COMMENT REVIEW

MICROFILMED

U. S. DEPARTMENT OF ENERGY
Richland Operations Office

EQUIPMENT JUMPER ASSEMBLY
LIQUID COLLECTION TANK-W01-DETAILS

PROJECT TITLE: TRANSPORTABLE GROUT EQUIPMENT FACILITY

BLDG	SCALE	AREA	INDEX	DRAWING NUMBER	SHEET	OF	REV
B-475	AS NOTED	243-G1	2500	H-2-98711	2	2	0

DRAWN BY L.L. DEAN