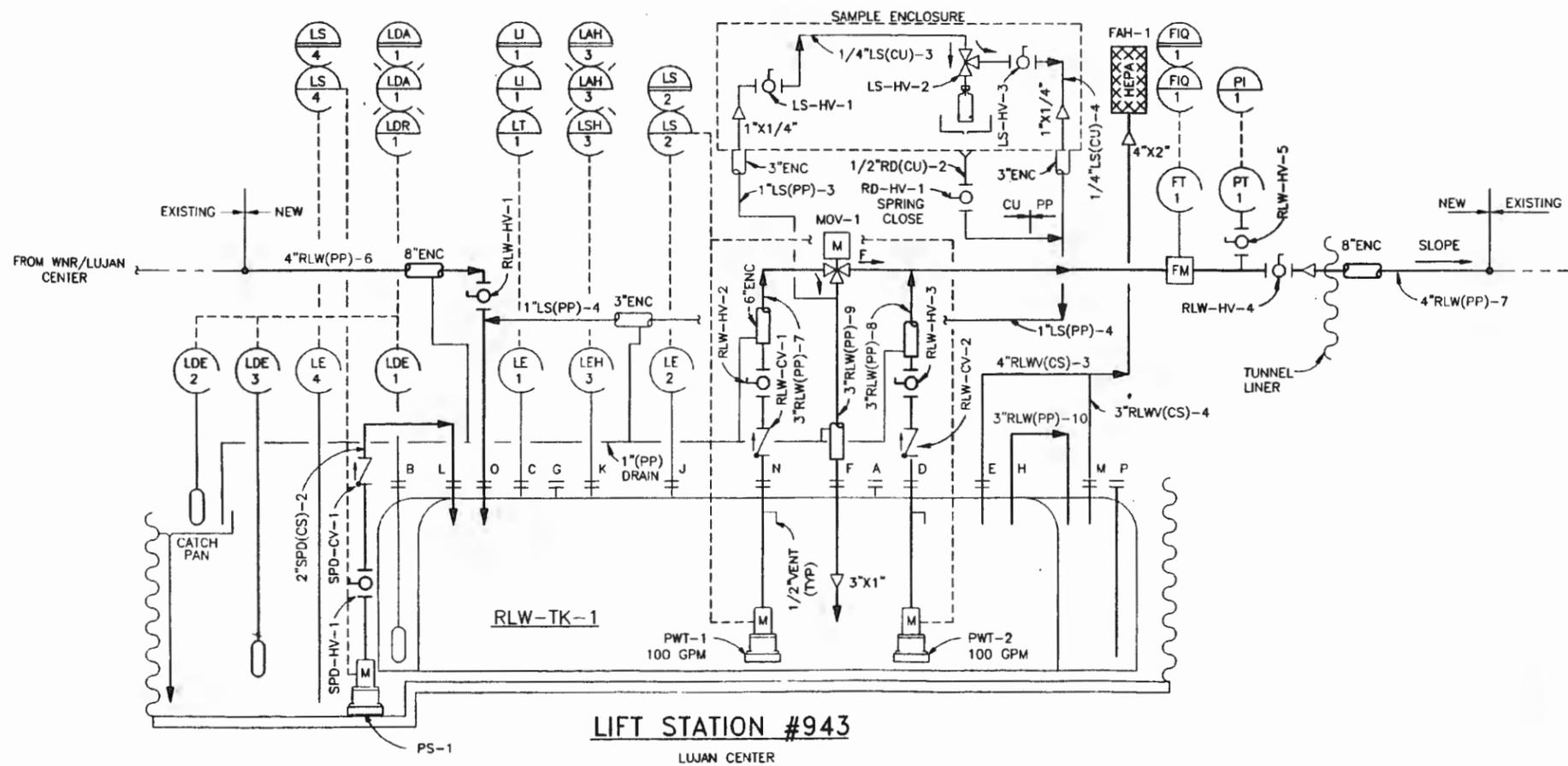


NOTES

1. FOR GENERAL NOTES AND LEGEND, SEE SHEET P1.



NO	DATE	CLASS REV.	REVISIONS	DWN	DES	CHKD	REL	SUB	REC	APP

CHAVEZ-GRIEVES CONSULTING ENGINEERS INC.

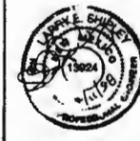
ARES Corporation

TA-53 RADIOACTIVE LIQUID WASTE TANK PROJECT
 PIPING: PIPING & INSTRUMENTATION DIAGRAM

BLDG. 943, 944 TA-53 DATE 11-10-98
 RECOMMENDED APPROVED FOR RELEASE APPROVED FOR RELEASE
 P. DIEPOLDER S. HANSON J. FRASER

Los Alamos Los Alamos National Laboratory Los Alamos, New Mexico 87545

CLASSIFICATION PROJECT I.D. NO. DRAWING NO. REV.
 U 18405 C52075 0



7603P2

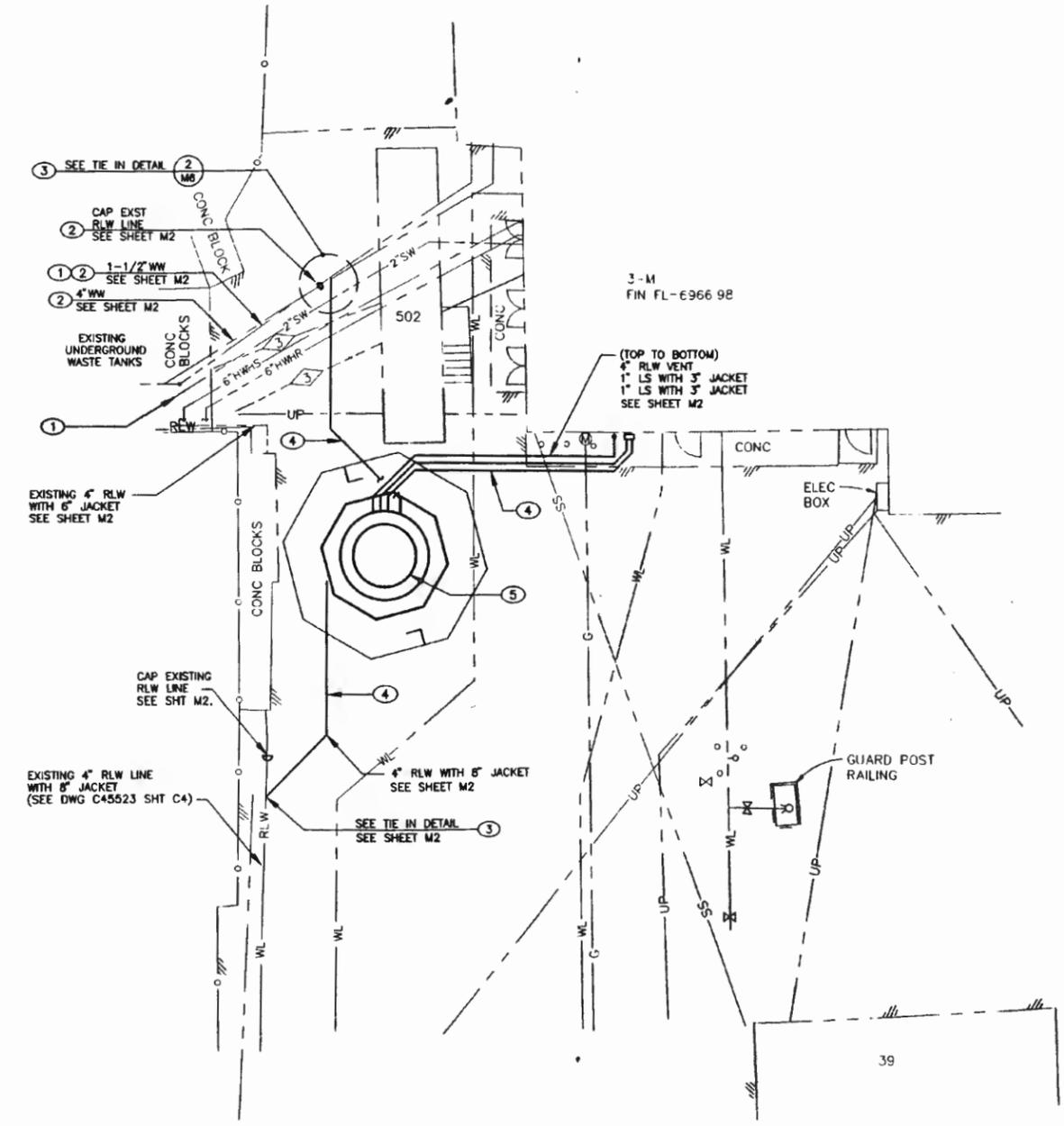
PLOT SCALE: 1=1 FILE: 7603P2.DWG



- KEYED NOTES**
- ① THE 1"-1/2" WW AND 2" SW LINES MAY NOT HAVE BEEN INSTALLED, SEE SHT M2.
 - ② THE EXISTING WW AND RLW LINES ARE ASSUMED TO BE CAST IRON. SEE SHT M2.
 - ③ THE EXACT TIE-IN LOCATIONS SHALL BE DETERMINED PRIOR TO FABRICATION, SEE SHT M2.
 - ④ TRENCH SECTION, SEE $\frac{B}{C6}$
 - ⑤ LIFT STATION TOP OF SLAB ELEVATION 6966.00. SEE SHEET M2.

NOTES

1. SEE GENERAL NOTES ON SHEET M1.



NO	DATE	CLASS REV.	REVISIONS	DWN	DES	CHKD	REL	SUB	REC	APP
REV 6										

CHAVEZ-GRIEVES CONSULTING ENGINEERS INC.
ARES Corporation

TA-53 RADIOACTIVE LIQUID WASTE TANK PROJECT
CIVIL: LIFT STATION NO. 944
UTILITY PLAN

DRAWN	A. BRICENO
DESIGN	J. MILLINGTON
CHECKED	B. PONDER
RELEASED	L. WEBSTER

BLDG. 943,944 TA-53 DATE 11-18-98

RECOMMENDED	APPROVED FOR RELEASE	APPROVED FOR RELEASE
P. DIEPOLD	S. HANSON	J. FRASER

Los Alamos Los Alamos National Laboratory
Los Alamos, New Mexico 87545

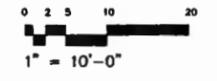
CLASSIFICATION U-REVIEWER *mb* DATE 11/18/98

PROJECT I.D. NO.	DRAWING NO.	REV.
18405	C52075	

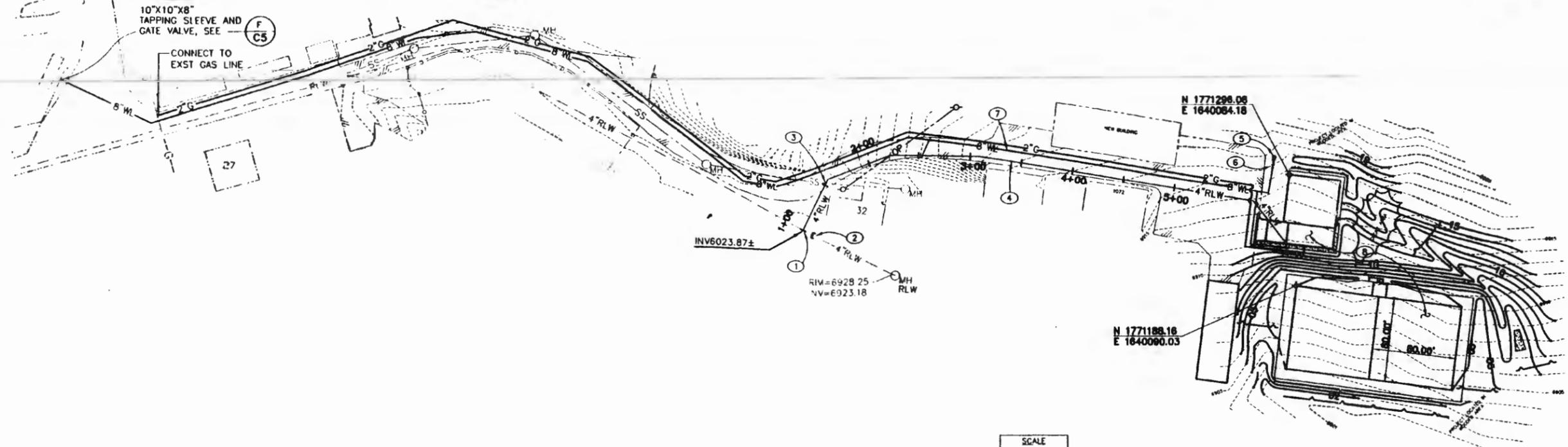
SHEET 6 OF 32
C5

JOB NO: L14-182-5098
 FILE: D062-GD.DWG (PAPER SPACE)
 ENG/TECH: JM/N
 REV: 11-18-98 N

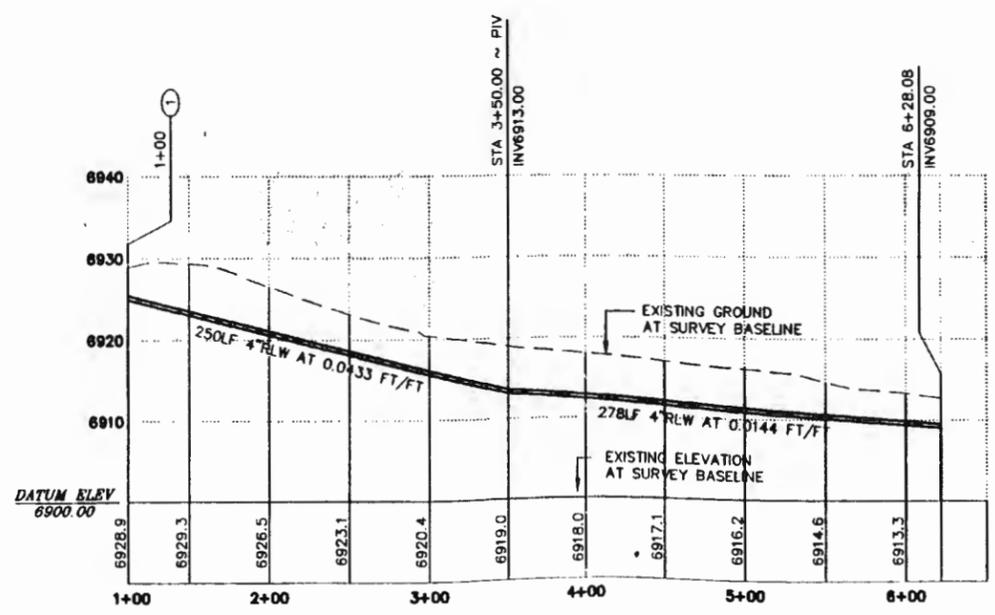
LIFT STATION NO. 944
UTILITY PLAN



D062-GD.DWG



SCALE
 HORZ: 1"=50'
 VERT: 1"=10'



PROFILE RLW LINE

KEYED NOTES

- ① STA 1+00 CONNECT TO EXISTING 4" RLW. VERIFY EXACT LOCATION AND ELEVATION PRIOR TO CONSTRUCTING RLW LINE.
- ② CAP EXISTING 4" RLW LINE TO EAST.
- ③ VERIFY ELEVATION OF EXISTING SANITARY SEWER LINE PRIOR TO CONSTRUCTING RLW LINE.
- ④ 4" DOUBLE WALL RLW LINE, SEE (E/C5) FOR TRENCHING.
- ⑤ FIRE HYDRANT, SEE (C/C5).
- ⑥ 8"x6" WATERLINE, 6" GATE VALVE, SEE (H/C5).
- ⑦ 8" WATERLINE, SEE (D/C5) FOR TRENCHING.
- ⑧ TREATMENT FACILITY CONSTRUCTION.

CONSTRUCTION NOTES

FOR THRUST BLOCKING, SEE (A/C5)

NO	DATE	CLASS REV.	REVISIONS	OWN	DES	CHKD	REL	SUB	REC	APP

CHAVEZ-GRIEVES CONSULTING ENGINEERS INC.
ARES Corporation

TA-53 RADIOACTIVE LIQUID WASTE TREATMENT PROJECT
 CIVIL: UTILITY PLAN

DRAWN	A. BRICENO
DESIGN	J. MILLINGTON
CHECKED	B. PONDER
RELEASED	L. WEBSTER

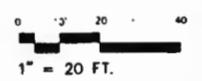
BLDG. 945, 954 TA-53 DATE 11-11-98
 RECOMMENDED P. DIEPOLD APPROVED FOR RELEASE S. HANSON APPROVED FOR RELEASE J. FRASER

Los Alamos National Laboratory
 Los Alamos, New Mexico 87545

CLASSIFICATION U REVIEWER M. Loyd DATE 13 Nov 98
 PROJECT I.D. NO. 18649 DRAWING NO. C52076 REV.



UTILITY PLAN

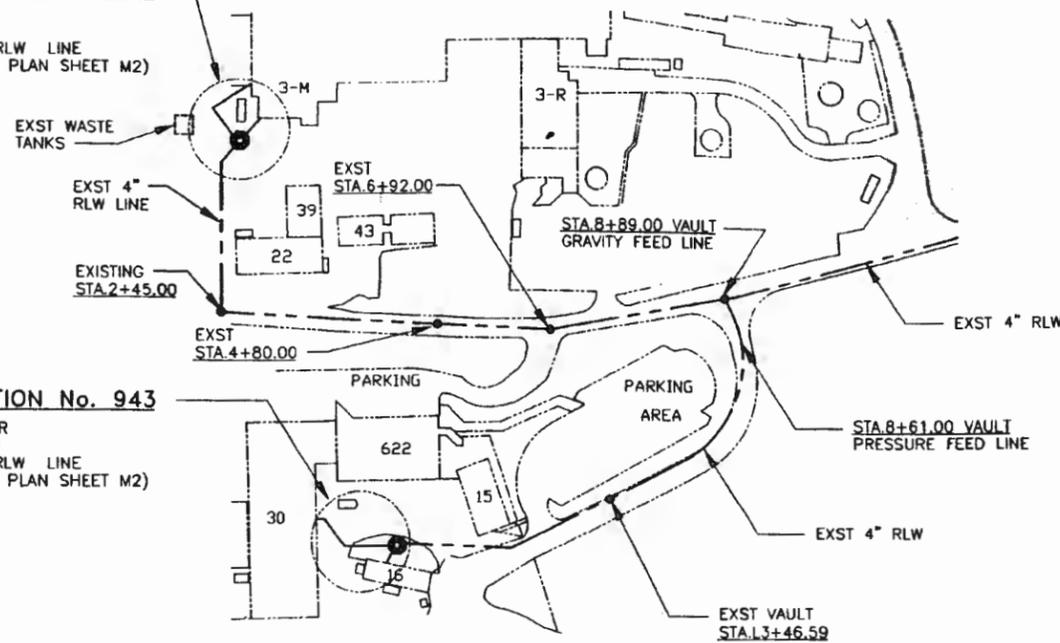


0063-GO.DWG

SEE SHEET 3 FOR TAPPING SLEEVE AND GATE VALVE, SEE (F/C5)
 CONNECT TO EXIST GAS LINE
 10"X10"X8" TAPPING SLEEVE AND GATE VALVE, SEE (F/C5)

LIFT STATION No. 944

AREA A
STA.0+50.00
RECONNECT RLW LINE
(SEE PARTIAL PLAN SHEET M2)



LIFT STATION No. 943

LUJAN CENTER
STA.0+18.00
RECONNECT RLW LINE
(SEE PARTIAL PLAN SHEET M2)

GENERAL NOTES

- EXISTING WASTE STORAGE TANKS WILL BE ISOLATED IN PLACE.
- ELEVATIONS OF SOME EXISTING PIPING RUNS ARE TAKEN FROM NON AS-BUILT DRAWINGS. VERIFY THESE ELEVATIONS PRIOR TO FABRICATION.

MECHANICAL SITE PLAN
SCALE: 1/8" = 1'-0"

NO	DATE	CLASS REV.	REVISIONS	OWN	DES	CHKD	REL	SUB	REC	APP
CHAVEZ-GRIEVES CONSULTING ENGINEERS INC.										
ARES Corporation										
TA-53 RADIOACTIVE LIQUID WASTE TANK PROJECT MECH: MECHANICAL SITE PLAN								DRAWN C. HICKS		
								DESIGN T. SAKANO		
								CHECKED S. SHIPLEY		
								RELEASED R. FRITZ		
BLDG. 943, 944			TA-53			DATE 11-10-98				
RECOMMENDED P. DIEPO			APPROVED FOR RELEASE S. HANSON			APPROVED FOR RELEASE J. FRASER				
Los Alamos Los Alamos National Laboratory Los Alamos, New Mexico 87545										
SHEET 12 OF 32 M1										
CLASSIFICATION U REVIEWER <i>Mike Reynolds</i> DATE 23 Nov 98										
PROJECT I.D. NO. 18405				DRAWING NO. C52075				REV. 0		



7603M1

2. Pipe Encasement Drain: Polypropylene, single-wall pipe. Material shall meet requirements for a Type II copolymer polypropylene material according to ASTM D4101. Standard Dimensional Ratio of SDR-11 and be rated to 150 psi at 73.4 degrees F. Pipe sizes per design drawings. Fittings: Satisfy same requirements as pipe. Manufacturer: Asahi/America.
3. Pipe Sample Enclosure Drain: Copper tubing, ASTM B88 Type K, hard drawn or annealed. Fittings: Socket type, wrought copper solder-joint pressure fittings, ANSI B16.22. Joints: Lead-free solder 95-5 Tin-Antimony (ASTM B32) Flux ASTM B813. Flanges: Bronze pipe flanges and flanged fittings, ANSI B16.24, Class 150.
4. Ball Valves: Brass body, stainless steel ball, UHMWPE seats. Spring return, 3-piece swing-away. Solder ends. Manufacturer: SVF Flow Controls, R6 series.

B. Liquid Sample (LS)

1. Pipe Single Wall: Copper tubing, ASTM B88 Type K, hard drawn or annealed. Fittings: Socket type, wrought copper solder-joint pressure fittings, ANSI B16.22. Joints: Lead-free solder 95-5 Tin-Antimony (ASTM B32) Flux ASTM B813. Flanges: Bronze pipe flanges and flanged fittings, ANSI B16.24, Class 150.
2. Pipe Double Contained: Same as paragraph A above.
3. Pipe Encasement Drain: Same as paragraph A above.
4. Ball Valves, 2- and 3-Way: Brass body, threaded, UHMWPE seats, Whitey "40" series.

C. Radioactive Liquid Waste (RLW)

1. Pipe Double Contained: Same as paragraph A above.
2. Pipe Encasement Drain: Same as paragraph A above.
3. Valves, 3-Way: Three-way ball valve. Bronze body and ball, UHMWPE seats and seals, ANSI 150 flanges, electric actuator with manual override. Full port, side entry, "T" ball port. 90 degree operation. Manufacturer: PBM, MP Series Pattern #1 valve with Keystone actuator.
4. Ball Valves: Two-way, full port ball valve. Bronze body and ball, with UHMWPE seats and seals. Level handle. ANSI 150 flanges. Manufacturer: PBM, SP Series.
5. Check Valves: Wafer type, ANSI 150, spring loaded, non-slam check valve. Bronze body and trim. Manufacturer: Mueller, 101M-BP.

D. Radioactive Liquid Waste Vent (RLWV)

1. Pipe: Standard wall, black steel, ASTM A53. Fittings: Malleable iron, threaded type, ANSI B16.3, Class 150; or standard wall, black steel, butt welding type, ASTM A234, grade WPB. Joints: Threaded for 2 inch or less pipe and welded for larger than 2 inch pipe. Flanges: Steel, weld neck Class 150 raised face, ANSI B16.5. Direct buried pipe shall be coated in accordance with AWWA 203, Section 2.10.3 for factory applied coating and Section 3 for field applied coating.
2. HEPA Filters: The High Efficiency Particulate Air (HEPA) filters for the tanks are Government Furnished Equipment (GFE).

E. Sump Pump Discharge (SPD)

1. Pipe: Standard wall, black steel, ASTM A53. Fittings: Malleable iron, threaded type, ANSI B16.3, Class 150; or standard wall, black steel, butt welding type, ASTM A234, grade WPB. Joints: Threaded for 2 inch or less pipe and welded for larger than 2 inch pipe. Flanges: Steel, weld neck, Class 150, raised face, ANSI B16.5.

2. Check Valves: Wafer type, ANSI 150, spring loaded, non-slam check valve. Cast steel body with stainless steel trim. Manufacturer: Mueller, 101M-DT.
3. Ball Valves: Two-way, threaded, carbon steel, UHMWPE seats. Level handle. Manufacturer: Whitey "60" Series.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not install underground piping when the bedding is wet or frozen.
- B. Verify that excavations are to the required grade.

3.2 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Whenever work is suspended during construction, protect open ends with temporary plugs or caps.
- E. After completion, fill, clean, and treat systems.
- F. Prepare weld ends in accordance with the approved procedure.

3.3 TIE-INS

- A. Tie-ins to existing systems shall be coordinated with and performed by the LANL support services subcontractor. Contractor shall provide materials required for the tie-in and perform the necessary excavation and work to prepare the area.

3.4 LINE COVER

- A. Radioactive Liquid Waste Line Cover
 1. Provide cover, bedding, warning tape, and tracer wire per trench details and below-grade piping details. Refer to Section 02225, Trenching; and Section 15190, Mechanical Identification.

3.5 INSTALLATION

- A. Fabricate and install all piping as shown on the drawings, according to ASME B31.3, manufacturer's recommended procedures, and this specification. The piping shall be field located as indicated on the piping plan. The piping may be offset, lowered, or raised as required to avoid existing interferences. Deviations from locations identified on the drawings shall be approved and documented for incorporation into as-built drawings.
- B. All piping shall be erected to ensure proper draining capability. Localized low or high points without vents and drains shall be avoided.
- C. Flanges or unions shall be provided at connections to all equipment, including valves over 2-inches. The connections shall be made without strain at the pipe connection.
- D. Bend copper tubing using methods and equipment which produce bends free of wrinkles, bulges, or kinks or thinning at the outside of the bend. Bent tubing shall meet the tolerances given in ASME B31.3.

- E. Route pipe in an orderly manner, maintain gradient, and group pipes at common elevations whenever practical.
- F. All piping shall be arranged so as not to interfere with the removal or maintenance of adjacent equipment, valves, or other devices. Maintain headroom and neither interfere with use of space or take more space than necessary.
- G. Valves shall be installed at the locations shown on the drawings and placed to permit easy operation and access. All valves will be installed with their stems horizontal or above.
- H. Pipe sleeves shall be installed and properly secured in place at all points where pipes pass through concrete or caisson walls. Pipe sleeves, except sleeves in footings and beams shall be 24 gauge galvanized steel, and shall be of sufficient diameter to provide approximately ½ inch clearance around the pipe. Openings between piping and sleeves shall be made watertight with plastic cement to a minimum depth of 2 inches.
- I. Remove temporary supports.
- J. Label piping systems according to Section 15190.
- K. Support piping systems according to Section 15060.

3.3 FIELD QUALITY CONTROL

- A. Perform a visual inspection in accordance with ASME B31.3.
- B. Piping shall receive a commercial cleaning. Cleaning procedures shall remove all dirt, oils, metal chips, fluxes, contaminants, and other deleterious substances from internal surfaces.
- C. Leak/Pressure Testing: Perform a leak/pressure test of piping according to Section 15992, "Testing Piping Systems". Visually inspect joints, fittings, connections, and other potential leak sources.

END OF SECTION

SECTION 15200

PROCESS PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. This section includes piping, valves, fittings, and accessories associated with the following process piping:
1. Radioactive Drain (RD)
 2. Liquid Sample (LS)
 3. Radioactive Liquid Waste (RLW)
 4. Radioactive Liquid Waste Vent (RLWV)
 5. Sump Pump Discharge (SPD)

1.2 REFERENCES

- A. American Society of Mechanical Engineers (ASME)
1. ASME B31.3 Chemical Plant and Petroleum Refinery Piping
- B. American National Standards Institute (ANSI)
1. ANSI B16.3 Malleable Iron Threaded Fittings
 2. ANSI B16.5 Pipe Flanges and Flanged Fittings
 3. ANSI B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
 4. ANSI B16.24 Bronze Pipe Flanges and Flanged Fittings, Classes 150 and 300
- C. American Society for Testing and Materials (ASTM)
1. ASTM A53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
 2. ASTM A126 Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
 3. ASTM A234 Standard Specification for Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
 4. ASTM A536 Standard Specification for Ductile Iron Castings
 5. ASTM B16.9 Factory-Made Wrought Steel Butt-Welded Fittings
 6. ASTM B88 Specification for Seamless Copper Water Tube
 7. ASTM D2657 Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings
 8. ASTM D4101 Standard Specification for Propylene Plastic Injection and Extrusion Materials.

D. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS)

1. MSS SP-58 Pipe Hangers and Supports - Materials, Design and Manufacture.
2. MSS SP-69 Pipe Hangers and Supports - Selection and Application.
3. MSS SP-89 Pipe Hangers and Supports - Fabrication and Installation Practices.

E. Pipe Fabrication Institute (PFI)

1. PFI ES-24 Pipe Bending Methods, Tolerances, Process, and Material Requirements

1.3 SUBMITTALS

A. Prior to Final Acceptance of Work:

Item	Description	Copies	Purpose	When Required
1.	Catalog data on pipe materials, fittings, valves, and accessories.	6	Design Records	Construction Completion
2.	Operation and maintenance manuals and material/spare parts lists for all equipment specified in this section.	6	Design Records	Construction Completion
3.	Installation instructions for equipment, valves, and accessories.	6	Facilitate Construction	Before Installation
4.	Certification of welders and qualified welding procedure.	6	Facilitate Construction	Before Installation
5.	Construction Acceptance Test Reports.	6	Design Records	Construction Completion

1.4 QUALITY ASSURANCE

- A. All welders shall be certified in accordance with the latest editions of the ASME Boiler and Pressure Vessel Code. Soldering shall be performed by personnel certified to Section IX.
- B. Installers of double-wall plastic pipe shall be qualified in butt fusion techniques according to ASTM D2657, Section 9.

PART 2 PRODUCTS

2.1 PRODUCT SUBSTITUTION

- A. Refer to Section 01630.

2.2 MATERIALS

A. Radioactive Drain (RD)

1. Pipe, Double Contained: Polypropylene, double-wall containment pipe. Material shall meet requirements for a Type II copolymer polypropylene material according to ASTM D4101. Inner and containment pipes shall have a Standard Dimensional Ratio of SDR-11 and be rated to 150 psi at 73.4 degrees F. Pipe and encasement sizes per design drawings. Fittings: Satisfy same requirements as pipe. Manufacturer: Asahi/America, Duo-Pro 150.