ATTACHMENT 2

INSERVICE INSPECTION PROGRAM PLAN

FOR THE 1993 - 2003 INTERVAL

REVISION 1

INSERVICE INSPECTION PROGRAM PLAN
FOR THE 1993 - 2003 INTERVAL

APPROVAL SHEET

ISI COORDINATOR	9/16/94 DATE
PROGRAM LEAD SPECIAL SERVICES ENGINEERING DEPARTMENT	9/16/94 DATE
SUPERVISOR SPECIAL SERVICES ENGINEERING DEPARTMENT	9/16/94 DATE
SUPERVISOR - SYSTEM ENGINEERING	9/21/94 DATE
MANAGER - NSRG	9/20/94 DATE
MANAGER - STATION ENGINEERING	9/21/94 DATE
MANAGER - FORT CALHOUN STATION	9/28/94 DATE

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT 1

INSERVICE INSPECTION PROGRAM PLAN
FOR THE 1993-2003 INTERVAL

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INTRODUCTION

This report defines the Fort Calhoun Station Inservice Inspection (ISI) Program Plan for Class 1, Class 2, and Class 3 pressure retaining components for the ten year (120 month) interval from September 26, 1993, to September 25, 2003. This reports also covers Class 1, Class 2, and Class 3 pump and valve Inservice Testing (IST) for the ten year (120 month) interval from September 26, 1993, to September 25, 2003.

This program has been developed as required by Section 50.55a of 10CFR Part 50 following the guidance of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI (hereinafter called Section XI), "*Rules for Inservice Inspection of Nuclear Power Plant Components*", and the ASME/ANSI Operation and Maintenance of Nuclear Power Plants manual (hereinafter called O&M Manual) Parts 1, 6, and 10, and the NRC Generic Letter 89-04, dated April 2, 1989. The ISI Program Plan is controlled by the Fort Calhoun Station Unit 1 Technical Specifications 3.3.(1)a.

This program is in compliance, where possible, with the applicable requirements of ASME Section XI, 1989 Edition (Program B) and the ASME/ANSI O&M Manual Parts 1, 6, and 10, 1987 Edition, 1988 Addenda, except as noted below:

> The O&M Manual, Part 6, 1987 Edition and 1988 Addenda have omitted the Figure 1 referred to on Table 3, Note 2 for vibration ranges. OPPD will use the Table 3 as listed in the 1989 addenda of the O&M Manual, Part 6 for vibration ranges for test parameters.

This program incorporates the results of previous inservice and preservice inspections. It is the intent of the Licensee (Omaha Public Power District) to continue to review and apply, as appropriate, changes in the ASME Section XI Code that would improve the total ISI Program Plan, pursuant to 10CFR50.55a.

PART 1: CLASS 1, CLASS 2, AND CLASS 3 PRESSURE RETAINING COMPONENTS

1.0 Program Summary

1.1 The Inservice Inspection (ISI) Program for Class 1, 2, and 3 pressure retaining components was developed in accordance with, and meets the requirements of, the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition. The ISI Program for Class 1, 2, and 3 pressure retaining components will remain in effect for the remainder of the ten year (120 month) interval, which commences on September 26, 1993. The Program will be reviewed and updated as required by the edition of the Code and Addenda in effect not more than 12 months prior to the start of the next (i.e., fourth) 120 month interval (beginning September 26, 2003).

2.0 Scope and Responsibility

2.1 The Piping and Instrumentation Drawings (P&IDs) for Fort Calhoun Station (FCS) identify the class boundaries. These P&IDs are subject to review and are changed as required in accordance with FCS administrative procedures.

2.2 Class 1, Class 2, and Class 3 components and the methods of examination for each component are listed in Tables 1.1, 1.2, and 1.3, respectively. The total number of Class 1, 2, and 3 components and supports required by ASME Section XI 1989 Edition, no Addenda, are listed by category in Tables 1B, 1C, and 1D respectively. The required number of exams per category per forty (40) month period are also shown, as well as a proposed exam schedule per category per forty (40) month period. The specific components to be examined for each class shall be identified in the Fort Calhoun Station Unit 1 Ten Year Inservice Examination Plan by title and/or number. Exceptions to compliance with Subsection IWA, Tables IWB-2500-1, IWC-2500-1, and IWD-2500-1 of Section XI are listed in Appendices 1A, 1B, 1C and 1D respectively.

> Class 3 portions of the Waste Disposal System have been classified as Class 3 in accordance with Subarticle IWA-1320, Paragraph (e) of Section XI. Examination in accordance with the rules of Subsection IWD will not be performed on the Class 3 portion of the Waste Disposal System. (Although the Waste Disposal System at FCS is classified Class 3, it is not considered safety related as required for inspection per IWD-2500.)

2.3 Class 1, Class 2, and Class 3 component supports and the methods of examination for each support are listed in Table 1.4.

2.4 Steam Generator, safety-related snubbers, metallic liners (of Class CC), containment spray nozzles and the concrete component examinations (Class CC) are not performed under this ISI Program Plan, but are performed as described below:

2.4.1 Steam Generator exams are performed under FCS Technical Specification 3.17.

2.4.2 Snubber exams are performed under FCS Technical Specification 3.14.

2.4.3 Metallic liner exams (of Class CC) are not required at the time of this submittal per 10CFR50.

2.4.4 Concrete component exams are performed under FCS Technical Specification 3.5.

2.5 The containment spray nozzles are tested under FCS Technical Specification 3.6.

3.0 Inspection Intervals

3.1 The inspection intervals for Class 1, Class 2, and Class 3 components are ten year (120 month) intervals of service which commenced on September 26, 1973. This program plan covers the third ten year interval, i.e. September 26, 1993 to September 25, 2003.

The ten year Inservice Examination Plan describes the distribution of examinations within the inspection intervals in accordance with IWB-2400, IWC-2400, IWD-2400 and IWF-2400 of Section XI.

3.2 The inspection intervals and periods may be extended by as much as one year to permit inspections to be concurrent with plant outages as permitted by IWA-2430(d) of Section XI.

3.3 Selection of Class 1 pressure retaining piping welds for examination shall be in accordance with the requirements of the 1974 Edition of Section XI, Summer of 1975 Addenda. [As permitted by 10CFR50.55a(b)(2)(ii)]

4.0 Examination Categories

4.1 Class 1 components as described in the ten year examination plan will be examined to the extent and frequency required by Table IWB-2500-1 of Section XI (except as noted in Appendix 1B).

4.2 Class 2 components will be examined to the extent and frequency as required by Table IWC-2500-1 of Section XI (except as noted in Appendix 1C).

4.3 Class 3 components as described in the ten year examination plan shall be examined to the extent and frequency as required by Table IWD-2500-1 of Section XI (except as noted in Appendix 1D).

5.0 Examination Methods

5.1 Class 1 and Class 2 components shall be examined by the required visual, surface, and volumetric examination methods. These examinations shall include one or a combination of the following methods: visual (VT), liquid penetrant (PT), magnetic particle (MT), radiographic (R1), and ultrasonic (UT). Ultrasonic (UT) examinations shall be performed in accordance with the following:

5.1.1 When listing calibration blocks on piping reports, the block thickness shall be within $\pm$25% of the pipe wall thickness examined per the rules of Code Case N-461.

5.1.2 The reactor coolant pumps (RCP) shall be examined per the rules of ASME Code Cases N-481 and N-498.

5.1.3 The selection and examination requirements of Class 1, 2, and 3 integrally welded attachment (categories B-H, B-K-1, C-C, D-A, D-B, and D-C) shall be met per the rules of Code Case N-509.

5.1.4 The examination requirements of Class 2 longitudinal welds in piping (categories C-F-1 and C-F-2) shall be met per the rules of Code Case N-524.

5.2 Class 3 components shall be visually examined for leakage in accordance with Article IWD-2500 of Section XI.

6.0 Evaluation of Examination Results

6.1 Class 1 Components

The evaluation of the nondestructive examination results shall be in accordance with Article IWB-3000 of Section XI. All indications shall be subject to comparison with previous data to help in characterization and in determining origin.

6.2 Class 2 Components

The evaluation of nondestructive examination results shall be in accordance with Article IWC-3000 of Section XI. All indications shall be subject to comparison with previous data to help in characterization and in determining origin.

6.3 Class 3 Components

The evaluation of the nondestructive examination results shall be in accordance with Article IWD-3000 of Section XI. All indications shall be subject to comparison with previous data to help in characterization and in determining origin.

6.4 Indications which have been recorded in the preservice inspection or in a previous inservice inspection which are not characterized as propagating flaws shall be considered acceptable for continued service.

7.0 Repair Requirements

7.1 Repair of Class 1, Class 2, and Class 3 components shall be performed in accordance with Article IWA-4000 of Section XI.

7.2 Surface defects in Class 1 and Class 2 pressure retaining components may be removed by mechanical means when the removal of a defect will not alter the basic configurations of the item. Pressure retaining components that have defects that cannot be removed by mechanical means will be replaced in accordance with Article IWA-7000 of Section XI, or monitored for further growth per IWB-2420 or IWC-2420.

8.0 System Pressure Testing

8.1 General Requirements

8.1.1 System pressure tests will be conducted in accordance with Article IWA-5000 of Section XI and ASME Code Case N-498.

8.1.2 Evaluation of any corroded area will be performed in accordance with Section XI.

8.1.3 Repairs of corroded areas shall be performed in accordance with Section 7 of this Program.

8.2 Class 1 Components

8.2.1 After each Refueling Outage, the system will be leak tested in accordance with Article IWB-5000 of Section XI and in accordance with FCS Technical Specification 2.1 (Figures 2-1A and 2-1B).

8.2.2 The ten year hydrostatic tests for ASME Class 1 systems will not be performed in the ISI Program. In lieu of the hydrostatic tests required by ASME Section XI, alternative testing consisting of system pressure and leakage tests as described in ASME Code Case N-498 will be performed. Refer to ASME Code Case N-498, dated May, 1991, and NRC letter, dated December 19, 1991 (NRC-91-377).

8.2.3 Partial penetration welds on the reactor vessel and the pressurizer shall be examined in accordance with Table IWB-2500 Examination Category B-E of Section XI.

8.3 Class 2 Components

8.3.1 Pressure tests and visual examination of Class 2 components will be performed in accordance with the guidelines of Table IWC-2500 of Section XI.

8.3.2 The ten year hydrostatic tests for ASME Class 2 systems will not be performed in the ISI Program. In lieu of the hydrostatic tests required by Section XI, alternative testing consisting of system pressure and leakage tests as described in ASME Code Case N-498, will be performed. Refer to ASME Code Case N-498, dated May, 1991, and NRC letter, dated December 18, 1991 (NRC-91-377).

8.4 Class 3 Components

Class 3 components shall be pressure tested in accordance with Article IWD-5000 of Section XI.

9.0 Records and Reports

Records and reports made in accordance with this program shall be developed and maintained in accordance with Article IWA-6000 of Section XI.

TABLES

TABLE 1.1

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWB-2500-1

ITEM NO.	EXAMINATION CATEGORY TABLE IWB-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
		<u>REACTOR VESSEL</u>	
B1.10	B-A	Longitudinal and circumferential shell welds	Volumetric
B1.20	B-A	Circumferential and meridional head welds (accessible length)	Volumetric
B1.30	B-A	Shell-to-flange welds	Volumetric
B1.40	B-A	Head-to-flange weld	Volumetric & Surface
B3.90	B-D	Nozzle-to-vessel welds	Volumetric
B3.100	B-D	Nozzle inside radius section	Volumetric
B4.10	B-E	Partial penetration welds, including vessel nozzles, control rod drive nozzles & instrumentation nozzles	Visual, VT-2
B5.10	B-F	Nozzle-to-safe end welds NPS 4 or larger	Volumetric & Surface
B6.10	B-G-1	Closure head nuts	Surface
B6.30	B-G-1	Closure studs, when removed	Volumetric & Surface
B6.40	B-G-1	Threads in flange	Volumetric
B6.50	B-G-1	Closure washers	Visual, VT-1
B7.80	B-G-2	Bolts, studs & nut $\leq$2 in. diameter in CRD housing	Visual, VT-1
B13.10	B-N-1	Vessel interior	Visual, VT-3
B13.50	B-N-2	Interior attachments within beltline region	Visual, VT-1
B13.60	B-N-2	Interior attachments beyond beltline region	Visual, VT-3
B13.70	B-N-3	Core support structure	Visual, VT-3
B14.10	B-O	Pressure retaining welds in Control rod drive housings	Surface or Volumetric
B15.10	B-P	Pressure retaining boundary	Visual, VT-2
B15.11	B-P	Pressure retaining boundary	Visual, VT-2

TABLE 1.1 (Continued)

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWB-2500-1

ITEM NO.	EXAMINATION CATEGORY TABLE IWB-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
		Pressurizer	
B2.10	B-B	Longitudinal and circumferential shell-to-head welds	Volumetric
B3.110	B-D	Nozzle-to-vessel welds	Volumetric
B3.120	B-D	Nozzle inside radius section	Volumetric
B4.20	B-E	Heater penetration welds	Visual, VT-2
B5.40	B-F	Nozzle-to-safe end welds NPS 4 or larger	Volumetric & Surface
B5.50	B-F	Nozzle-to-safe end NPS less than 4	Surface
B7.20	B-G-2	Bolts, studs and nuts ≤2 in. diameter	Visual, VT-1
B10.10	B-K	Integrally welded attachments	Surface or Volumetric
B15.20	B-P	Pressure retaining boundary	Visual, VT-2
B15.21	B-P	Pressure retaining boundary	Visual, VT-2
		Steam Generators (Primary Side)	
B2.30	B-B	Head welds, circumferential and meridional	Volumetric
B2.40	B-B	Tubesheet-to-head weld	Volumetric
B3.130	B-D	Nozzle-to-vessel welds	Volumetric
B3.140	B-D	Nozzle inside radius section	Volumetric
B5.70	B-F	Nozzle-to-safe end welds NPS 4 or larger	Volumetric & Surface
B7.30	B-G-2	Bolts, studs, and nuts ≤2 in. diameter	Visual, VT-1
B10.10	B-K	Integrally welded attachments	Surface
B15.30	B-P	Pressure retaining boundary	Visual, VT-2
B15.31	B-P	Pressure retaining boundary	Visual, VT-2
		Heat Exchanger	
B2.50	B-B	Head welds, circumferential and meridional	Volumetric

TABLE 1.1 (Continued)

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWB-2500-1

ITEM NO.	EXAMINATION CATEGORY TABLE IWB-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
		Heat Exchanger (Continued)	
B2.70	B-B	Longitudinal welds	Volumetric
B2.80	B-B	Tubesheet-to-shell welds	Volumetric
B3.150	B-D	Nozzle-to-vessel welds	Volumetric
B3.160*	B-D	Nozzle inside radius section	Volumetric
B15.40	B-P	Pressure retaining boundary	Visual, VT-2
B15.41	B-P	Pressure retaining boundary	Visual, VT-2
		Piping Pressure Boundary	
B5.130	B-F	NPS 4 or larger dissimilar metal butt welds	Surface & Volumetric
B5.140	B-F	Less than NPS 4 dissimilar metal butt welds	Surface
B7.50	B-G-2	Bolts, studs and nuts $\leq$2 in. diameter	Visual, VT-1
B9.10	B-J	Circumferential welds & longitudinal welds NPS 4 or larger	Volumetric
B9.20	B-J	Circumferential & longitudinal welds less than NPS 4	Surface
B9.31	B-J	Branch pipe connection welds nominal pipe size NPS 4 or larger	Surface & Volumetric
B9.32	B-J	Branch pipe connection welds nominal pipe size less than NPS 4	Surface
B9.40	B-J	Socket welds	Surface
B10.20	B-K	Integrally welded attachments	Surface or Volumetric
B15.50	B-P	Pressure retaining boundary	Visual, VT-2
B15.51	B-P	Pressure retaining boundary	Visual, VT-2
		Pump Pressure Boundary	
B6.180	B-G-1	Bolts and studs >2 in. diameter	Volumetric

* See Appendix 1B

TABLE 1.1 (Continued)

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWB-2500-1

ITEM NO.	EXAMINATION CATEGORY TABLE IWB-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
		<u>Pump Pressure Boundary (Continued)</u>	
B6.190	B-G-1	Flange surface when disassembled (with >2 in. bolting or studs)	Visual, VT-1
B6.200	B-G-1	Nuts, bushings, and washers >2 in.	Visual, VT-1
B7.60	B-G-2	Bolts, studs, and nuts ≤2 in.	Visual, VT-1
B10.30	B-K	Integrally welded attachments	Surface or Volumetric
B12.10	B-L-1	Pump casing welds	Volumetric
B12.20	B-K-2	Pump casings	Visual, VT-3
B15.60	B-P	Pressure retaining boundary	Visual, VT-2
B15.61	B-P	Pressure retaining boundary	Visual, VT-2
		<u>Valve Pressure Boundary</u>	
B7.70	B-G-2	Bolts, studs, and nuts ≤2 in. diameter	Visual, VT-1
B12.30	B-M-1	Valve body welds less than NPS 4	Surface
B12.40	B-M-1	Valve body welds NPS 4 or larger	Volumetric
B12.50	B-M-2	Valve body exceeding NPS 4	Visual, VT-3
B15.70	B-P	Pressure retaining boundary	Visual, VT-2
B15.71	B-P	Pressure retaining boundary	Visual, VT-2

TABLE 1.2

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWC-2500-1

ITEM NO.	EXAMINATION CATEGORY TABLE IWC-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
		<u>Pressure Vessels</u>	
C1.10	C-A	Shell circumferential welds	Volumetric
C1.20	C-A	Head circumferential welds	Volumetric
C1.30	C-A	Tubesheet-to-shell weld	Volumetric
C2.21	C-B	Nozzle-to-shell (or head) weld in vessels >½ in. nominal thickness without reinforcing plate	Volumetric
C2.22	C-B	Nozzle inside radius in vessels >½ in. nominal thickness without reinforcing plate	Volumetric
C7.10	C-H	Pressure retaining boundary	Visual, VT-2
C7.20	C-H	Pressure retaining boundary	Visual, VT-2
		<u>All Piping</u>	
C3.10	C-C	Integrally welded attachments (Pressure Vessels)	Surface
C3.20	C-C	Integrally welded attachments (Piping)	Surface
C7.30	C-H	Pressure retaining boundary	Visual, VT-2
C7.40	C-H	Pressure retaining boundary	Visual, VT-2
		<u>Austenitic Stainless Steel or High Alloy Piping</u>	
C5.10	C-F-1	Circumferential & longitudinal welds ≥3/8 in. nominal wall thickness for piping ≥ NPS 4	Surface & Volumetric
C5.20	C-F-1	Circumferential & longitudinal welds >1/5 in. nominal wall thickness for piping ≥ NPS 2 and ≤ NPS 4	Surface & Volumetric
C5.30	C-F-1	Socket welds	Surface
C5.40	C-F-1	Circumferential & longitudinal welds in pipe branch connections of branch piping ≥ NPS 2	Surface
C5.50	C-F-2	Circumferential & longitudinal welds ≥3/8 in. nominal wall thickness for piping > NPS 4	Surface & Volumetric

TABLE 1.2 (Continued)

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWC-2500-1

ITEM NO.	EXAMINATION CATEGORY TABLE IWC-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
		Austenitic Stainless Steel or High Alloy Piping (Continued)	
C5.60	C-F-2	Circumferential & longitudinal welds >1/5 in. nominal wall thickness for piping $\geq$ NPS 2 and $\leq$ NPS 4	Surface & Volumetric
C5.70	C-F-2	Socket welds	Surface
C5.80*	C-F-2	Circumferential and longitudinal welds in pipe branch connections of branch piping $\geq$ NPS 2	Surface
		Pumps	
C6.10	C-G	Pump casing welds	Surface
C7.50	C-H	Pressure retaining components	Visual, VT-2
C7.60	C-H	Pressure retaining components	Visual, VT-2
		Valves	
C6.20	C-G	Valve body welds	Surface
C7.70	C-H	Pressure retaining components	Visual, VT-2
C7.80	C-H	Pressure retaining components	Visual, VT-2

* See Appendix 1C

TABLE 1.3

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWD-2500-1

CODE CASE N-509 ALTERNATIVE RULES FOR THE SELECTION AND EXAMINATION OF CLASS 1, 2, & 3 INTEGRALLY WELDED ATTACHMENTS SECTION XI, DIVISION I

ITEM NO.	EXAMINATION CATEGORY TABLE IWD-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
D1.10	D-A	Pressure retaining components	Visual, VT-2
D1.20	D-A	Integral attachment, component supports and restraints	Visual, VT-3
D1.30	D-A	Integral attachment, mechanical and hydraulic snubbers	Visual, VT-3
D1.40	D-A	Integral attachment, spring type supports	Visual, VT-3
D1.50	D-A	Integral attachment, constant load type supports	Visual, VT-3
D1.60	D-A	Integral attachment, shock absorbers	Visual, VT-3

TABLE 1.4

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWF-2500

CODE CASE N-491 ALTERNATIVE RULES FOR EXAMINATION OF CLASS 1, 2, 3 AND METAL CONTAINMENT COMPONENT SUPPORTS OF LIGHT-WATER COOLED POWER PLANTS

ITEM NO.	EXAMINATION CATEGORY TABLE IWF-2500	SUPPORT TYPE EXAMINED	METHOD
F1.10	F-A	Class 1 piping supports	Visual, VT-3
F1.20	F-A	Class 2 piping supports	Visual, VT-3
F1.30	F-A	Class 3 piping supports	Visual, VT-3
F1.40	F-A	Supports other than piping supports (Class 1, 2, 3 and MC)	Visual, VT-3

PART 1

APPENDICES

APPENDIX 1A

EXCEPTIONS TO COMPLIANCE WITH SUBSECTION IWA

Item No.	Exception
	None

Clarification to subsection IWA

IWA-2600	Weld identification at Fort Calhoun Station was not performed during preservice. SEI-27 (administrative procedure to control ISI Program Plan activities associated with aspects of implementation at FCS), Appendix A was written in 1991 to proceduralize a system of positively identifying all welds from drawings and marking them only for the following reasons: (1) if deemed necessary by the ISI Engineer, or (2) if there is a reportable UT indication (non-geometric). SEI-27, Appendix A will continue to be used in lieu of IWA-2600.

EXCEPTIONS TO COMPLIANCE WITH TABLE IWB-2500-1 (CLASS 1 COMPONENTS) IN ASME BOILER AND PRESSURE VESSEL CODE, SECTION XI, 1989 EDITION

Item No.	Exception
B3.160	The regenerative heat exchanger vessel is in fact a capped 10" schedule 140 pipe. The geometric configuration of the 2½" and 3" nozzles attached to such a small diameter pipe, make the ultrasonic examination of the nozzle weld inner radius areas labor intensive and yields minimal data. Radiation levels of 1 - 2 R/hr preclude the use of radiography as a volumetric examination technique. Personnel radiation exposure and ineffective volumetric techniques make it impractical to perform volumetric examinations on the regenerative heat exchanger nozzles inner radius weld areas. A surface and ultrasonic examination of the nozzle welds will be performed each interval but no exams will be performed on the inner radius weld areas. OPPD letter #LIC-92-309R, dated October 16, 1992, requested relief from doing the nozzle weld exams on the regenerative H/X. An NRC letter, dated November 18, 1993, is the SER for this relief request and stated the NRC's willingness to entertain a relief request on the inner radius exams for these welds on a permanent basis. Refer to the above documents for details.

APPENDIX 1C

EXCEPTIONS TO COMPLIANCE WITH TABLE IWC-2500-1

Item No.	Exception
	None

Substitute Examinations for Table IWC-2500-1

C5.81 The following are inaccessible branch connection welds due to cable wrapping which holds a system of heavy metal slats in place over the main steam piping in Room 81.

ISO #	Component
B-04	28-MS-2001/12-BC-1 28-MS-2001/12-BC-2 28-MS-2001/15-BC-1 28-MS-2001/15-BC-2
B-06	28-MS-2002/12-BC-1 28-MS-2002/12-BC-2 28-MS-2002/15-BC-1 28-MS-2002/15-BC-3

The Fort Calhoun Updated Safety Analysis Report (USAR), Appendix M, Section 3.5.8 states:

> "A protective enclosure (has been) provided around the main steam and feedwater lines between the penetration sleeves and the first isolation valves, where a large rupture is postulated.
>
> This enclosure, although designed primarily to limit the effects of jet impingement, also serves to minimize the reaction effects of a longitudinal rupture by containing the jet and preventing the formation of an unbalanced external force."

In the past, the NRC has conducted a review of the piping exam areas (Docket 50-285, November 10, 1986) and determined that the required examinations were impractical to perform.

Since one of the eight branch connection welds listed above is required by ASME Section XI, OPPD will substitute a similar branch connection weld on the non-class portion of the main steam line shown on isometric D-01.

It should be noted that the required IWA-5000 system leakage test monitors all the cable wrapped welds.

APPENDIX 1D

EXCEPTIONS TO COMPLIANCE WITH TABLE IWD-2500-1

Item No.	Exception
None	

SUMMARY

TABLES

TABLE 1A

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TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-A PRESSURE RETAINING WELDS IN RPV										
B-A	B1.10	RPV SHELL WELDS								
B-A	B1.11	CIRCUMFERENTIAL	VOL	ALL WELDS	YES	3	3	-	-	3
B-A	B1.12	LONGITUDINAL	VOL	ALL WELDS	YES	9	9	-	-	9
B-A	B1.20	RPV HEAD WELDS								
B-A	B1.21	CIRCUMFERENTIAL	VOL	ACCES. LENGTH ALL WELDS	YES	2	2	-	-	2
B-A	B1.22	MERIDIONAL	VOL	ACCES. LENGTH ALL WELDS	YES	12	12	-	-	12
B-A	B1.30	RPV SHELL-FLANGE WELD	VOL	FLANGE FACE 1ST PERIOD	PART.	1	1	PARTIAL	-	1
B-A	B1.40	RPV HEAD-FLANGE WELD	SUR/VOL	FLANGE FACE 1ST PERIOD	PART.	1	1	PARTIAL	-	1
TOTAL NUMBER OF EXAMS PER COLUMN						28	28	2 PARTIAL	-	28
TOTAL NUMBER OF EXAMS ACCUMULATED										
REQUIRED ACCUMULATED NUMBER PER PERIOD								2 PARTIAL	-	28
B-B PRESSURE RETAINING WELDS IN VESSELS OTHER RPV										
B-B	B2.10	PZR SHELL-HEAD WELDS								
B-B	B2.11	CIRCUMFERENTIAL	VOL	ALL WELDS	NO	2	2	1 (UPPER)	-	1 (LOWER)
B-B	B2.12	LONGITUDINAL	VOL	1' OF WELD INTERSECTING B2.11 WELD	NO	4	2	1 (UPPER)	-	1 (LOWER)
B-B	B2.20	HEAD WELDS	N/A	ONE PIECE HEADS				-	-	-
B-B	B2.30	SG HEAD WELDS								

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-B	B2.31	CIRCUMFERENTIAL	VOL	1 WELD PER HEAD	NO	4	1	-	1	-
B-B	B2.32	MERIDIONAL	VOL	1 WELD PER HEAD	NO	8	1	-	1	-
B-B	B2.40	TUBESHEET-HEAD WELD	VOL	WELD	NO	2	1	-	1	-
B-B	B2.50	HX SHELL (OR HEAD) WELDS								
B-B	B2.51	CIRCUMFERENTIAL (RGHX)	VOL	1 WELD PER HEAD	NO	2	1	-	-	1
B-B	B2.70	LONGITUDINAL (RGHX)	VOL	ENTIRE WELD	NO	2	1	-	-	1
B-B	B2.80	TUBESHEET-SHELL WELD (RGHX)	VOL	WELD	NO	2	1	-	-	1
TOTAL NUMBER OF EXAMS PER COLUMN						26	10	2	3	5
TOTAL NUMBER OF EXAMS ACCUMULATED								2	5	10
REQUIRED ACCUMULATED NUMBER PER PERIOD								2-3	5-6	10
B-D FULL PENETRATION WELD OF NOZZLES IN VESSELS										
B-D	B3.90	RPV NOZZLE-VESSEL WELDS	VOL	ALL NOZZLES	PART.	6	6	-	-	6
B-D	B3.100	RPV NOZZLE INNER RADIUS	VOL	ALL NOZZLES	NO	6	6	-	-	6
B-D	B3.110	PRZ NOZZLE-VESSEL WELDS	VOL	ALL NOZZLES	NO	5	5	2	3	-
B-D	B3.120	PRZ NOZZLE-INNER RADIUS	VOL	ALL NOZZLES	NO	5	5	2	3	-
B-D	B3.130	SG NOZZLE-VESSEL WELDS	VOL	ALL NOZZLES	NO	6	6	3 (LOOP A)	3 (LOOP B)	-
B-D	B3.140	SG NOZZLE-INNER RADIUS	VOL	ALL NOZZLES	NO	6	6	3 (LOOP A)	3 (LOOP B)	-
B-D	B3.150	HX NOZZLE-VESSEL WELDS (RGHX)	VOL	ALL NOZZLES	NO	4	4	2	-	2

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-D	B3.160	HX NOZZLE-INNER RADIUS (RGHX)	VOL	ALL NOZZLES	NO	4	0 (RELIEF)	-	-	-
TOTAL NUMBER OF EXAMS PER COLUMN						42	38	12	12	14
TOTAL NUMBER OF EXAMS ACCUMULATED								12	24	38
REQUIRED ACCUMULATION PER PERIOD *NOTE: SECTION XI CAT. B-D NOTE 2 REQUIRES 25% - 50% IN FIRST PERIOD								*11-21	21-28	38
B-E PRESSURE RETAINING PARTIAL PENETRATION WELDS IN VESSELS			ALL EXAMS PERFORMED UNDER PROCEDURE OP-ST-RC-3007					-	-	-
B-F PRESSURE RETAINING DISSIMILAR METAL WELDS										
B-F	B5.10	RPV NOZ-SAFEEND >4"	SUR/VOL	ALL WELDS	NO	6	6*	-	-	6
B-F	B5.40	PRZ NOZ-SAFEEND >4" (SURGE, SPRAY)	SUR/VOL	ALL WELDS	NO	2	2*	2	-	-
B-F	B5.50	PRZ NOZ-SAFEEND <4"	SUR (PRL^)	ALL WELDS	NO	3	3	^1 (PRL)	2 (SAFETY)	-
B-F	B5.70	SG NOZ-SAFEEND >4"	SUR/VOL	ALL WELDS	NO	6	6*	3 (LOOP A)	3 (LOOP B)	-
B-F	B5.130	BUTT WELD >4" (PRZ A-15/07B)	SUR/VOL	ALL WELDS	NO	1	1	-	-	1
B-F	B5.140	BUTT WELD <4" (PRZ A-19/01)	SUR	ALL WELDS	NO	1	1	-	-	1
TOTAL NUMBER OF EXAMS PER COLUMN						19	19	6	5	8
TOTAL NUMBER OF EXAMS ACCUMULATED								6	11	19
REQUIRED ACCUMULATED NUMBER PER PERIOD								4-6	10-12	19
*NOTE: AUTOMATED EXAMS ^SPRAY NOZZLE WILL RECEIVE AN ADDITIONAL UT EXAM										

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-G-1 PRESSURE RETAINING BOLTING >2" DIAMETER										
B-G-1	B6.10	RPV CLOSURE HEAD NUTS	SUR	ALL NUTS >2"	NO	48	48	24	-	24
B-G-1	B6.30	RPV CLOSURE STUDS REM.	SUR/VOL	ALL STUDS >2"	NO	48	48	-	24	24
B-G-1	B6.40	RPV THREADS IN FLANGE*	VOL	ALL STUD HOLES >2"	NO	48	48	48	-	-
B-G-1	B6.50	RPV CLOSURE WASHERS	VT1	ALL WASHERS >2"	NO	48	48	-	-	48
B-G-1	B6.180	PUMP BOLTS/STUDS (RC-3B)	VOL	ALL BOLTS/STUDS >2"	NO	64	16	-	16	-
B-G-1	B6.190	PUMP FLANGE/SURF.	VT1	WHEN DISASSEMBLED	NO	4	0	-	-	-
B-G-1	B6.200	PUMP NUTS/BUSH./WASHERS (RC-3B)	VT1	ALL >2"	NO	64	16	-	16	-
TOTAL NUMBER OF EXAMS PER COLUMN						324	224	72	56	96
TOTAL NUMBER OF EXAMS ACCUMULATED								72	128	224
REQUIRED ACCUMULATED NUMBER PER PERIOD								36-76	112-150	224
NOTE: DUE TO EXCESSIVE DOSE & STAGING, THREADS IN FLANGE WILL BE PERFORMED AT THE SAME TIME AS SHELL-TO-FLANGE WELD (ITEM #B1.30)										
B-G-2 PRESSURE RETAINING BOLTING 2" AND LESS IN DIAMETER										
B-G-2	B7.20	PRZ BOLTS/STUDS/NUTS	VT1	ALL <2"	NO	1	1	1	-	-
B-G-2	B7.30	SG BOLTS/STUDS/NUTS	VT1	ALL <2"	NO	4	4	2 (LOOP A)	2 (LOOP B)	-
B-G-2	B7.50	PIPING BOLTS/STUDS/NUTS	VT1	ALL <2"	NO	6	6	2	2	2
B-G-2	B7.60	PUMPS BOLTS/STUDS/NUTS	VT1	ALL <2"	NO	4	4	2 (LOOP A)	2 (LOOP B)	-

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-G-2	B7.70	VALVES BOLTS/STUDS/NUTS	VT1	ALL <2"	NO	15	15	2	4	9
B-G-2	B7.80	CRD BOLTS/STUDS/NUTS	VT1	ALL <2" IF DISASSEMBLED	NO	37	-	-	-	-
TOTAL NUMBER OF EXAMS PER COLUMN						67	30	9	10	11
TOTAL NUMBER OF EXAMS ACCUMULATED								9	19	30
REQUIRED ACCUMULATED NUMBER PER PERIOD								5 - 10	15 - 20	30
B-J PRESSURE RETAINING WELDS IN PIPING										
B-J	B9.10	PIPE ≥4"								
B-J	B9.11	CIRCUMFERENTIAL	SUR/VOL	25% ALL WELDS	NO	186	*84	15	15	15
B-J	B9.12	LONGITUDINAL	SUR/VOL	INTERSECT CIRC	NO	SEAMLESS	-	-	-	-
B-J	B9.20	PIPE <4"								
B-J	B9.21	CIRCUMFERENTIAL	SUR	25% ALL WELDS	NO	148	*	13	13	13
B-J	B9.22	LONGITUDINAL	SUR	INTERSECT CIRC	NO	SEAMLESS	-	-	-	-
B-J	B9.30	BRANCH CONNECTIONS		25% ALL WELDS						
B-J	B9.31	PIPE SIZE ≥4"	SUR/VOL		NO	6	*5	-	1	1
B-J	B9.32	PIPE SIZE <4"	SUR		NO	13	*	1	1	1
B-J	B9.40	SOCKET WELDS	SUR	25% ALL WELDS	NO	277	70	24	24	22

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
TOTAL NUMBER OF EXAMS PER COLUMN						630	159	53	53	53
TOTAL NUMBER OF EXAMS ACCUMULATED								53	106	159
REQUIRED ACCUMULATED NUMBER PER PERIOD								25 - 54	80 - 106	159
*NOTE: REQUIRED NUMBER OF EXAMS IS FOR THE TOTALS OF BOTH CIRCUMFERENTIAL WELDS (334 x 25%) AND BOTH BRANCH CONNECTIONS (19 x 25%)										
B-K INTEGRAL ATTACHMENTS FOR CLASS 1 VESSELS, PIPING, PUMPS & VALVES										
B-K	B10.10	SG & PZR INT WELDED ATTACH	SUR	ALL WELDS	NO	9	2	-	1	1
B-K	B10.20	PIPING WELDED ATTACH. (A-42)	SUR	ALL	NO	4	1	1	-	-
B-K	B10.30	PUMP WELDED ATTACH. (RC-3B)	SUR	1 LOOP	NO	12	1	-	1	-
TOTAL NUMBER OF EXAMS PER COLUMN						25	4	1	2	1
NOTE: LOW NUMBER OF EXAM LOCATIONS PRECLUDES TYPICAL SAMPLING PER PERIOD; ALL EXAMS SELECTED PER CODE CASE N-509										
B-L-1 PRESSURE RETAINING WELDS IN PUMPS										
B-L-1	B12.10	PUMP CASING WELDS	VT1	ALL (CODE CASE 481)	YES	4	1	-	1 (RC-3B)	-
B-L-2 PUMP CASINGS										
B-L-2	B12.20	PUMP INTERNALS (& BAFFLE WELDS)	VT3	INTERNAL SURFACES (ONLY IF DISASSEMBLED)	YES	4	-	-	-	-
B-M-1 PRESSURE RETAINING WELDS IN VALVE BODIES										
B-M-1	B12.30	PIPE SIZE <4"	SUR	1 OF EACH SIMILAR IN GROUP	YES	25	7	2	3	2

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY/ NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-M-1	B12.40	PIPE SIZE ≥4"	VOL	1 OF EACH SIMILAR IN GROUP	YES	1	1	-	-	1
TOTAL NUMBER OF EXAMS PER COLUMN						26	8	2	3	3
TOTAL NUMBER OF EXAMS ACCUMULATED								2	5	8
REQUIRED ACCUMULATED NUMBER PER PERIOD								2	4-5	8
B-M-2 VALVE BODIES										
B-M-2	B12.50	VALVE BODIES >4"	VT3	INTERNAL SURFACES	YES	14	3	*	*	*
* THESE EXAMS WILL BE SCHEDULED AROUND VALVE DISASSEMBLY MAINTENANCE (ONE OF EACH SIMILAR IN GROUP)										
B-N-1 RPV INTERIOR										
B-N-1	B13.10	VESSEL INTERIOR	VT3	EACH INSPECTION PERIOD	NO	1	3	1	1	1 (P&R)
B-N-2	B13.50	INTERIOR ATTACHMENTS WITHIN BELTLINE (SURVEILLANCE CAPSULES)	VT1	ACCESSIBLE WELDS	YES	6	6	-	-	6 (P&R)
B-N-2	B13.60	INTERIOR ATTACHMENTS BEYOND BELTLINE (6 CORE SUPPORT LUGS, 9 CORE STOP LUGS)	VT3	ACCESSIBLE WELDS	YES	15	15	-	-	15 (P&R)
B-N-3 REMOVABLE CORE SUPPORT STRUCTURES										
B-N-3	B13.70	CORE SUPPORT STRUCTURE	VT3	ACCESSIBLE WELDS/SURFACES	YES	1	1	-	-	1
B-O PRESSURE RETAINING WELDS IN CONTROL ROD HOUSINGS										
B-O	B14.10	WELDS IN CRD HOUSING	SUR	10% PERIPHERAL HOUSINGS (20)	YES	80 (4 WELDS EACH)	8	2	3	3

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-P ALL PRESSURE RETAINING COMPONENTS										
B-P	ALL	ALL CATEGORY B-P VT2 EXAMS PERFORMED UNDER 3000 SERIES SURVEILLANCE TESTS								
F-A	F1.10	PIPING SUPPORTS	VT3	*25%	NO	**96	24	6	8	10
F-A	F1.40	SUPPORTS OTHER THAN PIPING (REQUIRES ONLY 1 SG, 1 RCP & 1 PRZ)	VT3	*100%	NO	21	8	4	3	1
TOTAL NUMBER OF EXAMS PER COLUMN							32	10	11	11
TOTAL NUMBER OF EXAMS ACCUMULATED								10	21	32
REQUIRED ACCUMULATED NUMBER PER PERIOD								6 - 10	16 - 21	32

NOTE: * EXAMS SELECTED PER CODE CASE N-491

** THERE ARE ALSO 48 SNUBBERS WHICH ARE INSPECTED UNDER TECHNICAL SPECIFICATIONS 3.14

TABLE 1C
INTERVAL 3 CLASS 2 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
C-A PRESSURE RETAINING WELDS IN PRESSURE VESSELS									
C-A	C1.10	SHELL CIRC. WELDS (SG)	VOL	AT GROSS STRUCTURAL DISCONTINUITY	6	3	-	2 (TRANS) 1 (EXT. RING)	-
C-A	C1.20	HEAD CIRC. WELDS (SG, SDHX, RGHX)	VOL	HEAD-TO-SHELL WELD	8	3	1 SD/1 RG	1 (SG)	-
C-A	C1.30	TUBESHEET-TO-SHELL WELD (SG, SDHX, RGHX)	VOL	TUBE-TO-SHELL WELD	6	3	1RG	1 SG	1 SD
TOTAL NUMBER OF EXAMS PER COLUMN					20	9	3	5	1
TOTAL NUMBER OF EXAMS ACCUMULATED							3	8*	9
REQUIRED ACCUMULATED NUMBER PER PERIOD							2-3	5-6	9
* SEE NOTE UNDER CATEGORY C-B									
C-B PRESSURE RETAINING NOZZLE WELDS IN VESSELS									
C-B	C2.20	NOZZLES WITHOUT REINFORCING PLATE IN VESSELS >½" NOMINAL THICKNESS							
C-B	C2.21	NOZZLE-TO-SHELL (OR HEAD) (MS, FW, SDHX, RGHX)	SUR/VOL	ALL NOZZLES UNDER C-F	12	6	2 RGHX	1 MS/1 FW	2 SDHX
C-B	C2.22	NOZZLE INNER RADIUS (MS, FW)	VOL	ALL NOZZLES UNDER C-F	4	2	-	1 MS/1 FW	-
TOTAL NUMBER OF EXAMS PER COLUMN					16	8	2	4	2
TOTAL NUMBER OF ACCUMULATED EXAMS							2	6*	8
REQUIRED ACCUMULATED NUMBER PER PERIOD							2	4-5	8

TABLE 1C
INTERVAL 3 CLASS 2 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
*NOTE: DUE TO THE COST OF SETTING UP AND PERFORMING AUTOMATED EXAMS ON INNER RADIUS AREAS (ITEMS C2.21 & B3.140) & SAFE END WELDS (ITEM C5.51) AS WELL AS RADIOLOGICAL CONCERNS & STAGING FOR COMMON EXAM AREAS (SCAFFOLD & INSULATION R/R), ALL WORK ON SG-B WILL BE PERFORMED IN THE 2ND PERIOD									
C-C INTEGRAL ATTACHMENTS FOR VESSELS, PIPING, PUMPS AND VALVES									
C-C	C3.10	PRESSURE VESSEL ATTACH. (4 RGHX - 1") (4 SG TRUNNIONS)	SUR	≥¾"	8	2	1 (RGHX)	-	1 (SG)
C-C	C3.20	PIPING ATTACHMENTS	SUR	≥¾"	21	13*	-	2	1
C-C	C3.30	PUMP ATTACHMENTS	SUR	≥¾"	0	-	-	-	-
C-C	C3.40	VALVE ATTACHMENTS	SUR	≥¾"	0	-	-	-	-
TOTAL NUMBER OF EXAMS PER COLUMN					29	5	1	2	2
TOTAL NUMBER OF EXAMS ACCUMULATED							1	3	5
REQUIRED ACCUMULATED NUMBER PER PERIOD							1	3	5
*NOTE: ALL EXAMS SELECTED PER CODE CASE N-509									
C-D PRESSURE RETAINING BOLTING >2" DIAMETER				NONE IN PROGRAM					
C-F-1 PRESSURE RETAINING WELDS IN AUSTENITIC STAINLESS STEEL OR HIGH ALLOY PIPING ^(NOTE: 7.5% BUT NOT LESS THAN 28 WELDS)									
C-F-1	C5.10	PIPING WELDS ≥3/8" WALL THICKNESS FOR PIPING > NPS 4							
C-F-1	C5.11	CIRCUMFERENTIAL	SUR/VOL	^SEE NOTE ABOVE	359	45	15	15	15
C-F-1	C5.12	LONGITUDINAL	SUR/VOL	2.5T AT INTER. CIRC.	306	*	-	-	-
C-F-1	C5.20	PIPING WELDS >1/5" NOMINAL WALL THICKNESS FOR PIPING ≥ NPS 2 ≤ NPS 4							

TABLE 1C
INTERVAL 3 CLASS 2 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
C-F-1	C5.21	CIRCUMFERENTIAL	SUR/VOL	*SEE NOTE ABOVE	158	13	5	4	4
C-F-1	C5.22	LONGITUDINAL	SUR/VOL	2.5T AT INTER. CIRC.	0	-	-	-	-
C-F-1	C5.30	SOCKET WELDS	SUR		480	36	12	12	12
C-F-1	C5.40	PIPE BRANCH CONN. OF BRANCH PIPING ≥ NPS 2							
C-F-1	C5.41	CIRCUMFERENTIAL	SUR	*SEE NOTE ABOVE	9	2	-	1	1
C-F-1	C5.42	LONGITUDINAL	SUR	2.5T AT INTER. CIRC.	0	-	-	-	-
C-F-1	N/A	PIPING WELDS > NPS 4 AND < 3/8" WALL THICKNESS			273	0	-	-	-
*NOTE: LONGSEAMS ARE EXAMINED WITH SELECTED INTERSECTING CIRCUMFERENTIAL WELDS									
TOTAL NUMBER OF EXAMS PER COLUMN					1279	96	32	32	32
TOTAL NUMBER OF EXAMS ACCUMULATED							32	64	96
REQUIRED ACCUMULATED NUMBER PER PERIOD							16 - 32	48 - 64	96
C-F-2 PRESSURE RETAINING WELDS IN CARBON OR LOW ALLOY STEEL PIPING *(NOTE: 7.5% BUT NOT LESS THAN 28 WELDS)									
C-F-2	C5.50	PIPING WELDS ≥ 3/8" WALL THICKNESS FOR PIPING > NPS 4							
C-F-2	C5.51	CIRCUMFERENTIAL	SUR/VOL	*SEE NOTE ABOVE	78	33	11	11	11
C-F-2	C5.52	LONGITUDINAL	SUR/VOL	2.5T AT INTER.	0	-	-	-	-
C-F-2	C5.60	PIPING WELDS > 1/5" NOMINAL WALL THICKNESS FOR PIPING ≥ 2 NPS ≤ 4 NPS							
C-F-2	C5.61	CIRCUMFERENTIAL	SUR/VOL	*SEE NOTE ABOVE	0	-	-	-	-

TABLE 1C
INTERVAL 3 CLASS 2 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
C-F-2	C5.62	LONGITUDINAL	SUR/VOL	2.5T AT INTER.	0	-	-	-	-
C-F-2	C5.70	SOCKET WELDS	SUR		0	-	-	-	-
C-F-2	C5.80	PIPE BRANCH CONNECTIONS OF BRANCH PIPING ≥ NPS 2							
C-F-2	C5.82	LONGITUDINAL	SUR	2.5T AT INTER.	0	-	-	-	-
C-F-2	N/A	PIPING WELDS > NPS 4 AND < 3/8" WALL THICKNESS			358	-	-	-	-
TOTAL NUMBER OF EXAMS PER COLUMN					444	34	11	11	12
TOTAL NUMBER OF EXAMS ACCUMULATED							11	22	34
REQUIRED ACCUMULATED NUMBER PER PERIOD							6 - 11	17 - 22	34
C-G PRESSURE RETAINING WELDS IN PUMPS AND VALVES									
C-G	C6.10	PUMP CASING WELDS	SUR	ALL UNDER C-F	0		-	-	-
C-G	C6.20	VALVE BODY WELDS	SUR	ALL UNDER C-F	1	1	-	-	1
C-H	C7.10 THROUGH C7.80	ALL OF THESE EXAMS ARE PERFORMED UNDER OPPD TECHNICAL SPECIFICATION 3.3(1)a							
F-A	F1.20	PIPING SUPPORT	VT3	*15%	**487	74	25	24	25
TOTAL NUMBER OF EXAMS PER COLUMN							25	24	25
TOTAL NUMBER OF EXAMS ACCUMULATED							25	49	74
REQUIRED ACCUMULATED NUMBER PER PERIOD							12 - 25	37 - 49	74

NOTE: * EXAMS SELECTED PER CODE CASE N-491
** THERE ARE ALSO 162 SNUBBERS WHICH ARE INSPECTED UNDER TECHNICAL SPECIFICATIONS 3.14

TABLE 1D
INTERVAL 3 CLASS 3 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
D-B SYSTEMS IN SUPPORT OF EMERGENCY CORE COOLING, CONTAINMENT HEAT REMOVAL, ATMOSPHERE CLEANUP & REACTOR RESIDUAL HEAT REMOVAL									
D-A	D1.10	PRESSURE VESSELS	VT2	PRESSURE RETAINING BOUNDARY	*	*			
D-A	D1.20	PIPING	VT3	INTEGRAL ATTACHMENT	70	7	2	2	3
D-A	D1.30	PUMPS	VT3	INTEGRAL ATTACHMENT	0	0	-	-	-
D-A	D1.40	VALVES	VT3	INTEGRAL ATTACHMENT	0	0	-	-	-
TOTAL NUMBER OF EXAMS PER COLUMN					70	7	2	2	3
TOTAL NUMBER OF EXAMS ACCUMULATED							2	4	7
REQUIRED ACCUMULATED NUMBER PER PERIOD							1 - 2	4	7
* PERFORMED UNDER SURVEILLANCE TESTS; ALL EXAMS SELECTED PER CODE CASE N-509									
F-A SUPPORTS									
F-A	F1.30A	CLASS 3 PIPING SUPPORTS (ONE DIRECTION SUPPORTS)	VT3		272	27	9	9	9
F-A	F1.30B	CLASS 3 PIPING SUPPORTS (MULTI DIRECTIONAL RESTRAINTS)	VT3		222	23	7	8	8
F-A	F1.30C	CLASS 3 PIPING SUPPORTS (SPRING CANS)	VT3		21	2	1	-	1
F-A	F1.40	SEE CLASS 1 EXAMS	VT3		0	0	-	-	-
TOTAL NUMBER OF EXAMS PER COLUMN					**515	52	17	17	18
TOTAL NUMBER OF ACCUMULATED EXAMS							17	34	52
REQUIRED ACCUMULATED NUMBER PER PERIOD							9 - 17	26 - 34	52
NOTE: * EXAMS SELECTED PER CODE CASE N-491 ** THERE ARE ALSO 42 SNUBBERS WHICH ARE INSPECTED UNDER TECHNICAL SPECIFICATIONS 3.14									

PART 2: CLASS 1, CLASS 2, AND CLASS 3 VALVE TESTS

1.0 Program Summary

The Valve Test Program identifies test requirements for safety related valves and ensures that the valves are tested in accordance with the requirements of Subsection IWV of the ASME Section XI Boiler and Pressure Vessel Code, 1989 Edition, as delineated in O&M Part 1 and Part 10 1987 Edition up to and including the 1988 Addenda.

The Valve Test Program will be applicable for the 120-month interval, which begins on September 26, 1993. The Valve Test Program will be reviewed and updated as required with that edition of the Code and Addenda in effect not more than 12 months prior to the start of the next 120-month interval (beginning September 26, 2003).

Individual valve test requirements are presented by coded Valve Test Program Matrix, Table 2.1. The codes used for these tables are defined in Section 2.9. The Valve Test Program Matrix (Table 2.1) is arranged in numerical sequence by valve number. Appendix 2A provides justifications for valve test frequencies other than Quarterly. A basis for the test frequency is given as well as the frequency at which the valve will be tested. Appendix 2B provides justifications for exceptions taken to the ASME Section XI/O&M Code test requirements as provided for in 10CFR50.55a(g)(5)(iii). Two types of justifications are provided. The first is general in nature, and pertain to requirements found to be impractical for many valves. The second type is used to justify Code exceptions for specific valves. Code exceptions are numbered and referenced by number on the Valve Test Program Matrix Table 2.1.

2.0 Scope and Responsibility

2.1 The P&IDs listed in Part 4 of the Plan identify the location of each Class 1, Class 2, and Class 3 and other classes of valves "important to safety" as determined by FCS IST philosophy.

2.2 The Class 1, Class 2, and Class 3 and other classes of valves "important to safety" to be tested under O&M Part 1 and Part 10, the methods of testing for each valve, and exceptions to the tests of O&M Part 1 and Part 10, are found in Section 2.9 (Valve Test Program Matrix) and Appendix 2A and 2B.

2.3 Many safety related systems, particularly those with heat exchangers, have been provided with relief valves. These relief valves are thermal relief valves of small capacity intended to relieve pressure due to a thermal expansion of fluid in a "bottled-up" condition (generally occurring only during maintenance), which is considered a self-limiting transient. Experience has shown that failures of these valves will not result in failure of a system to fulfill its safety related function. Thus, most thermal relief valves are not considered to perform a safety function as defined by O&M Part 1 and Part 10, and such valves have not been included in the ISI Program Plan at the Fort Calhoun Station.

2.4 As a result of regulatory concerns regarding Containment Integrity issues (Reference CID Nos. 883627 and 882025) the following actions are taken and will be required of all future changes/upgrades to applicable surveillance tests required by the Fort Calhoun Station ISI Program Plan.

2.4.1 Surveillance Tests for Containment Isolation Valves Leakage (Type C) tests have been upgraded to include detailed drawings of all designated test tees and require procedural signoffs for removal and reinstallation of test tee caps.

2.4.2 A separate documented and double verified checklist of designated swagelock caps has been developed and this check list will be performed by the Operations Department prior to power operation following a Refueling Outage to ensure Containment Integrity (OI-CO-5).

3.0 Inservice Test Frequency

3.1 The inservice test frequency for Class 1, Class 2 and Class 3 valves and other valves "important to safety" is in accordance with O&M Part 1 and Part 10 with exceptions as found in Appendix 2A and 2B.

3.2 Valves identified herein as being tested at Cold Shutdown frequency shall be tested each Cold Shutdown (as defined by FCS Technical Specifications) where the duration of the shutdown is sufficient to accomplish the tests. Valve testing should commence not later than 48 hours after Cold Shutdown and continue until complete or, the plant is ready to return to power. Completion of all valve testing is not a prerequisite to return to power. Any testing not completed at one Cold Shutdown should be performed during subsequent Cold Shutdowns to meet the Code required testing frequency. Where more than one Cold Shutdown occurs within three months, the test frequency need not exceed once per three-month period (92 days).

4.0 Valve Categories

The valve categories for each Class 1, Class 2, Class 3 and other "important to safety" valves have been determined from O&M Part 1 and Part 10 with exceptions as found in Appendix 2A and 2B.

5.0 Test Methods

5.1 The methods to be used to test Class 1, Class 2, Class 3 and "important to safety" valves have been determined from the appropriate sections of O&M Parts 1 and 10. These methods, along with exceptions, are listed in Section 2.9 and Appendices 2A and 2B (of this Program Plan).

5.2 Valves with remote position indicators shall be observed locally, or verified by other positive methods (such as changes in flow or pressure directly attributed to valve movement) at least once every two years in order to verify that valve operation is accurately indicated.

5.3 Valves with safety related failure positions indicated in the valve tables will be tested by observing valve operation upon loss of actuator power at the frequency specified in the valve table.

5.4 Valve stroke times are measured from actuation of valve operating device to end of valve travel as indicated by remote valve position indication lights. The valves will be timed using the lights in the Control Room as applicable.

5.5 Valve stroke times which exceed the acceptance criteria as stated in Paragraph 4.2.1.8 of O&M Part 10 will be immediately retested and corrective action taken as delineated in Paragraph 4.2.1.9 of O&M, Part 10.

5.6 Valve stroke times which exceed the acceptance criteria as determined by guidance using Paragraph 4.2.1.4 of O&M Part 10 and listed in the Surveillance Test or the Acceptance Criteria Basis Document shall be immediately declared inoperable, and not returned to service until corrective action is taken.

6.0 Evaluation of Test Results

6.1 The evaluation of test results shall be in accordance with the appropriate paragraphs in O&M Part 10.

6.2 If test data show that a valve is operating in the "Alert Range", remedies shall be taken as required in accordance with O&M Parts 1 and 10 until corrective action is taken. If the test data shows that the valve is operating in the "Required Action Range", the valve shall be immediately declared inoperable and not returned to service until corrective action is taken. Corrective action is defined as one or more of the following steps:

6.2.1 Recalibrate the applicable instruments and reperform test, or

6.2.2 Repair or replace the component as required, or

6.2.3 Perform an Engineering Analysis to demonstrate that the valve is still able to perform its required safety design function.

7.0 Records and Reports

7.1 Records and reports for the testing of Class 1, Class 2 and Class 3 and other "important to safety" valves shall be made in accordance with Paragraph 6.3 of O&M Part 10.

7.2 Records of corrective action for Class 1, Class 2, and Class 3 and other "important to safety" valves shall be made and maintained in accordance with Paragraph 6.4 of O&M Part 10.

8.0 Repair Requirements

Tests or examinations required to be performed after completion of valve replacement, repair or maintenance shall be completed as required per ASME, O&M Parts 1 and 10, and Section XI.

9.0 Valve Test Program Matrix

This section provides a tabulation of safety related valves, both those valves that are tested in accordance with the requirements of Part 1 and Part 10 of the O&M, and those valves for which the Code requirements have been found to be impractical. The Valve Test Program Matrix (Table 2.1) is arranged sequentially in numerical order by valve number.

10.0 Additions to Program - Valves

Valves added to the ISI Program Plan as a result of plant/system modifications, engineering changes or re-evaluation of a component eligibility requirement, per the O&M manual, are considered operable based on interim acceptance criteria (established by construction, preservice, post maintenance, or preoperational tests) until a trend is established.

TABLE FORMAT
FORT CALHOUN STATION VALVE TEST PROGRAM MATRIX TABLE 2.1

1. **Valve Number** — Unique number assigned to each valve.

2. **System (SYS)** — Plant system where valve is located. Designated by two (2) or three (3) letters.

   - AFW - Auxiliary Feedwater System
   - CA - Compressed Air System
   - CCW - Component Cooling Water System
   - CH - Charging System
   - CS - Containment Spray
   - DW - Demineralized Water System
   - FO - (Diesel Generator) Fuel Oil System
   - FW - Feedwater System
   - HG - Hydrogen Gas
   - IA - Instrument Air System
   - MS - Main Steam System
   - NG - Nitrogen Gas System
   - RC - Reactor Coolant System
   - RW - Raw Water System
   - SA - (Diesel Generator) Starting Air System
   - SI - Safety Injection System
   - SL - Primary Sample System
   - VA - Ventilating Air System
   - WD - Waste Disposal System

3. **Category (CAT)** — Valve category as defined in O&M Part 10.

   a. Category A — Valves for which seat leakage is limited to a specific maximum amount in the closed position to fulfill their function.

   b. Category B — Valves for which seat leakage in the closed position is inconsequential for fulfillment of their function.

   c. Category C — Valves which are self-actuating in response to some system characteristic such as relief valves or check valves.

   d. Category D — Valves which are actuated by an energy source capable of only one operation, such as rupture disks or explosive-actuated valves.

4. **Class (CL)** — ASME Class (1, 2, 3, 4, or N)

5. **P&ID** — Plant drawing number where valve is found.

6. **Coordinates** — Location of valve on plant drawing.

7. **Valve Type** — The following is a list of the type of valves with the code used in the Valve Test Program Tables.

- BU - Butterfly
- GA - Gate
- BL - Ball
- GL - Globe
- CK - Check
- DI - Diaphragm
- PG - Plug
- RL - Relief

8. **Operator Type (OPER TYPE)**

The following is a list of the type of operator used to change the position of the valve, with the code used in the Valve Test Program Table to reflect the operator type.

- A - Air Operator
- C - Self Actuated
- M - Motor Operator
- S - Solenoid Operator
- R - Relief
- H - Manual (Hand)
- P - Piston Operator

9. **Valve Size** — Nominal diameter of valve in inches.

10. **Normal Position (NOR POS)**

The following is a list of valve positions during normal operation and the code used in the Valve Test Program Table to reflect that position.

- A - Automatic
- NO - Normally Open
- LO - Locked Open
- NC - Normally Closed
- LC - Locked Closed
- \- - Valve position determined by other system parameters as in the case of check valves

11. **Fail Position (FAIL POS)**

The following is a list of valve failure positions and the code used in the Valve Test Program Table to reflect that position.

- FC - Fails Closed
- FAI - Fails As Is
- FO - Fails Open
- \- - Valve failure position determined by other system parameters as in the case of check valves.

12. **Testing Requirements (TEST REQ)**

This column indicates the position to which the valve is to be tested in order to satisfy the Code test requirements which apply to the valve. The following is a list of the codes used in the Valve Test Program Table.

- O - Valve shall be exercised to the **Open** position
- C - Valve shall be exercised to the **Closed** position
- T - Valve shall be tested to ensure meeting a specific **Trip** position
- L - Valve shall be tested for seat tightness and **Leak** criteria

13. **Type Test** The following is a list of tests required to be performed per ASME O&M Part 1 and Part 10 Code and the code used in the Valve Test Program Table to reflect that test.

- FS - Full-Stroke Test
- PS - Partial-Stroke Test
- LT - Leak Test
- ST - Stroke-Time Test
- SP - Setpoint Trip Test
- SD - Sample Disassembly
- ME - Manual Exercise

14. **Testing Frequency (TEST FREQ)**

The codes used in this column indicate the plant operational status that must be achieved before a particular valve can be safely and practically tested.

- Q - Quarterly

  Valves in this category shall be tested Quarterly during normal plant operation. (Technical Specification Modes 1 through 3)

- CS - Cold Shutdown

  Cold shutdown conditions are defined in the FCS Technical Specifications. (See Section 2.3.2 of this Program Plan for further explanation).

- CS* - Pressure Isolation Valves

  Surveillance of the RCS Pressure Isolation Valves (PIV) -Plant Technical Specification 3.3.(2) Periodic leakage testing on each valve listed in Table 2.9 as a PIV shall be accomplished:

  (1) prior to entering the power operation mode every time the plant is placed in the Cold Shutdown condition for refueling;

  (2) each time the plant is placed in a Cold Shutdown condition for 72 hours if testing has not been accomplished in the preceding nine months; and

  (3) prior to returning the valve to service after maintenance, repair or replacement work is performed.

- RO - Refueling Outage

  Refueling conditions are defined in the FCS Technical Specifications.

- RO* - Refueling Outage

  The valves in this category will be sample disassembled and inspected at an interval not to exceed once every six (6) years.

- 2YR - Periodic valve leakage rate determination for Category A valves shall be performed at a minimum of two year intervals in accordance with O&M Part 10.

- OM - The relief valves will be tested in accordance with the frequency established by O&M Part 1.

- OM* - The relief valve will be tested once every third refueling outage.

15. **Valve Position Indication Test (VPI TEST)**

This column indicates if a remote Valve Position Indication verification test is required. Valves with remote position indicators, which are used to verify valve exercising or timing, will have their remote position indicators verified in accordance with O&M Paragraph 4.1 of Part 10.

16. **Code Exception (CODE EXPT)**

If the valve is being tested at the Code required frequency (e.g., Quarterly) in accordance with O&M Part 1 or Part 10 requirements, this column will have a "-". However, for valves with impractical O&M Part 1 and Part 10 frequency requirements, this column will have a reference frequency justification number (JXX). This number is addressed in Appendix 2A.

If the valve is being tested in accordance with O&M Part 1 or Part 10 requirements, this column will have a "-". However, for valves which the O&M Part 10 requirements have been found to be impractical, this column will have a reference code exception number (EXX). This reference number is addressed in Appendix 2B with a complete explanation of the specific exception and the justification for that exception.

17. **Remarks**

This column is provided for pertinent information as appropriate. Notes in Column 17 of the Instrument Air (IA) Check Valves refer to Notes 1 through 5 listed below.

NOTE #1 These valves are check valves on Instrument Air accumulators attached to process valves that are specified for testing elsewhere in the ISI Program Plan. The IA check valves will be tested on the same schedule as the process valve to which it is attached.

NOTE #2 These valves are check valves on IA accumulators on bubblers that are part of the level indication/control system for the SIRWT Tank. The ISI Program Plan speaks only to the testing of the check valve in this system.

NOTE #3 These valves are check valves on IA accumulators attached to HCV-238 and HCV-239 (which are located inside the containment). The process valves are remotely stroke tested Quarterly, but due to inaccessibility accumulator check valves IA-HCV-238-C and IA-HCV-239-C will be tested at Cold Shutdown.

NOTE #4 These valves are check valves on IA accumulators attached to PCV-6680A-1, PCV-6680A-2, PCV-6680B-1, PCV-6680B-2 and PCV-6682. The valves are located in Room 81. The dampers are not required to be tested; however, the IA accumulator check valves are required to be tested at Cold Shutdown.

NOTE #5 These valves are check valves on IA accumulators attached to HCV-480, HCV-484, and HCV-485. The check valves are tested opened and closed quarterly. Reference MR-FC-89-032.

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE "	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
SI-100	SI	C	2	210-130-3	C1	CK	C	6	-	-	O	PS	Q	-	J1	OP-ST-SI-3008
SI-100	SI	C	2	210-130-3	C1	CK	C	6	-	-	O	FS	RO	-	J1	OP-ST-SI-3007
AC-101	CCW	C	3	M-10-2	E6	CK	C	12	-	-	O	FS	Q	-	-	OP-ST-CCW-3002
AC-101	CCW	C	3	M-10-2	E6	CK	C	12	-	-	C	FS	Q	-	-	OP-ST-CCW-3012/3022
PCV-102-1	RC	B	1	210-110-1A	E7	GL	S	2.5	NC	FC	C	ST	CS	Y	J2	OP-ST-RC-3004
PCV-102-1	RC	B	1	210-110-1A	E7	GL	S	2.5	NC	FC	O	ST	CS	Y	J2	OP-ST-RC-3004
PCV-102-2	RC	B	1	210-110-1A	E8	GL	S	2.5	NC	FC	O	ST	CS	Y	J2	OP-ST-RC-3004
PCV-102-2	RC	B	1	210-110-1A	E8	GL	S	2.5	NC	FC	C	ST	CS	Y	J2	OP-ST-RC-3004
SI-102	SI	C	2	210-130-3	C4	CK	C	4	-	-	O	FS	RO	-	J3	OP-ST-SI-3007
SI-102	SI	C	2	210-130-3	C4	CK	C	4	-	-	C	FS	RO	-	J3	OP-ST-SI-3007
AC-104	CCW	C	3	M-10-2	D6	CK	C	12	-	-	O	FS	Q	-	-	OP-ST-CCW-3012
AC-104	CCW	C	3	M-10-2	D6	CK	C	12	-	-	C	FS	Q	-	-	OP-ST-CCW-3002/3022
FO-104	FO	C	3	M-262-1	F6	CK	C	1	-	-	C	FS	Q	-	-	OP-ST-FO-3002
FO-104	FO	C	3	M-262-1	F6	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-FO-3002
SI-104	SI	C	2	210-130-3	C4	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-SI-3008
FO-105	FO	C	3	M-262-1	E6	CK	C	1	-	-	C	FS	Q	-	-	OP-ST-FO-3002
FO-105	FO	C	3	M-262-1	E6	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-FO-3002
FO-106	FO	C	3	M-262-1	D6	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-FO-3001
FO-106	FO	C	3	M-262-1	D6	CK	C	1	-	-	C	FS	Q	-	-	OP-ST-FO-3001
AC-107	CCW	C	3	M-10-2	C6	CK	C	12	-	-	O	FS	Q	-	-	OP-ST-CCW-3022
AC-107	CCW	C	3	M-10-2	C6	CK	C	12	-	-	C	FS	Q	-	-	OP-ST-CCW-3002/3012
FO-107	FO	C	3	M-262-1	C6	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-FO-3001
FO-107	FO	C	3	M-262-1	C6	CK	C	1	-	-	C	FS	Q	-	-	OP-ST-FO-3001
SI-108	SI	C	2	210-130-3	D4	CK	C	4	-	-	O	FS	RO	-	J3	OP-ST-SI-3007
SI-108	SI	C	2	210-130-3	D4	CK	C	4	-	-	C	FS	RO	-	J3	OP-ST-SI-3007
SI-110	SI	C	2	210-130-3	E4	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-SI-3008

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
SI-113	SI	C	2	210-130-3	E1	CK	C	8	-	-	O	PS	Q	-	J1	OP-ST-SI-3008
SI-113	SI	C	2	210-130-3	E1	CK	C	8	-	-	O	FS	RO	-	J1	OP-ST-SI-3007
RW-115	RW	C	3	M-100-1	B4	CK	C	20	-	-	O	FS	Q	-	-	OP-ST-RW-3031
RW-115	RW	C	3	M-100-1	B4	CK	C	20	-	-	C	FS	Q	-	-	OP-ST-RW-3004
SI-115	SI	C	2	210-130-3	E4	CK	C	4	-	-	O	FS	RO	-	J3	OP-ST-SI-3007
SI-115	SI	C	2	210-130-3	E4	CK	C	4	-	-	C	FS	RO	-	J3	OP-ST-SI-3007
RW-117	RW	C	3	M-100-1	B5	CK	C	20	-	-	O	FS	Q	-	-	OP-ST-RW-3021
RW-117	RW	C	3	M-100-1	B5	CK	C	20	-	-	C	FS	Q	-	-	OP-ST-RW-3004
SI-117	SI	C	2	210-130-3	F4	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-SI-3008
RW-121	RW	C	3	M-100-1	B6	CK	C	20	-	-	O	FS	Q	-	-	OP-ST-RW-3011
RW-121	RW	C	3	M-100-1	B6	CK	C	20	-	-	C	FS	Q	-	-	OP-ST-RW-3004
SI-121	SI	C	2	210-130-1	A4	CK	C	8	-	-	O	FS	CS	-	J4	OP-ST-SI-3003
SI-121	SI	C	2	210-130-1	A4	CK	C	8	-	-	C	FS	CS	-	J4	OP-ST-SI-3003
RW-125	RW	C	3	M-100-1	B7	CK	C	20	-	-	C	FS	Q	-	-	OP-ST-RW-3004
RW-125	RW	C	3	M-100-1	B7	CK	C	20	-	-	O	FS	Q	-	-	OP-ST-RW-3001
SA-127	SA	C	3	B120F07001-1	E7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
SA-128	SA	C	3	B120F07001-1	E7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
CH-129	CH	C	3	210-121-1	A6	CK	C	3	-	-	O	FS	Q	-	-	CH-4A DISCHARGE OP-ST-CH-3002
CH-129	CH	C	3	210-121-1	A6	CK	C	3	-	-	C	FS	Q	-	-	CH-4A DISCHARGE OP-ST-CH-3002
SA-129	SA	C	3	B120F07001-1	C7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
SI-129	SI	C	2	210-130-1	B4	CK	C	8	-	-	O	FS	CS	-	J4	OP-ST-SI-3003
SI-129	SI	C	2	210-130-1	B4	CK	C	8	-	-	C	FS	CS	-	J4	OP-ST-SI-3003
CH-130	CH	C	3	210-121-1	B7	CK	C	3	-	-	O	FS	Q	-	-	CH-4A DISCHARGE OP-ST-CH-3002

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
CH-130	CH	C	3	210-121-1	B7	CK	C	3	-	-	C	FS	Q	-	-	CH-4A DISCHARGE OP-ST-CH-3002
SA-130	SA	C	3	B120F07001-1	B7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
SI-135	SI	C	2	210-130-1	C4	CK	C	8	-	-	O	FS	CS	-	J36	OP-ST-SI-3003
SI-135	SI	C	2	210-130-1	C4	CK	C	8	-	-	C	FS	CS	-	J36	OP-ST-SI-3003
SI-139	SI	A/C	2	210-130-1	D2	CK	C	20	-	-	O	SD	RO*	-	E1	SS-ST-SI-3018
SI-139	SI	A/C	2	210-130-1	D2	CK	C	20	-	-	O	PS	Q	-	E1	OP-ST-SI-3008
SI-139	SI	A/C	2	210-130-1	D2	CK	C	20	-	-	L	LT	2YR	-	-	SE-ST-SI-3005
SI-139	SI	A/C	2	210-130-1	D2	CK	C	20	-	-	C	FS	RO	-	-	SE-ST-SI-3005
SI-140	SI	A/C	2	210-130-1	C2	CK	C	20	-	-	O	PS	Q	-	E1	OP-ST-SI-3008
SI-140	SI	A/C	2	210-130-1	C2	CK	C	20	-	-	O	SD	RO*	-	E1	SS-ST-SI-3018
SI-140	SI	A/C	2	210-130-1	C2	CK	C	20	-	-	L	LT	2YR	-	-	SE-ST-SI-3005
SI-140	SI	A/C	2	210-130-1	C2	CK	C	20	-	-	C	FS	RO	-	-	SE-ST-SI-3005
RC-141	RC	C	1	210-110-1A	F6	RL	R	3	-	-	T	SP	RO	-	-	SENT OFFSITE PE-ST-RC-3001
RC-142	RC	C	1	210-110-1A	F6	RL	R	3	-	-	T	SP	RO	-	-	SENT OFFSITE PE-ST-RC-3001
CH-143	CH	C	2	210-121-2	B5	CK	C	3	-	-	O	FS	RO	-	J5	OP-ST-CH-3006
SI-143	SI	C	2	210-130-1	D4	CK	C	8	-	-	O	FS	CS	-	J36	OP-ST-SI-3003
SI-143	SI	C	2	210-130-1	D4	CK	C	8	-	-	C	FS	CS	-	J36	OP-ST-SI-3003
SA-147	SA	B	3	B120F07001-1	D3	DI	A	1.5	NC	FO	O	ST	Q	-	-	DG START ACCEPT OP-ST-DG-0001
SA-148	SA	B	3	B120F07001-1	C3	DI	A	1.5	NC	FO	O	ST	Q	-	-	DG START ACCEPT OP-ST-DG-0002
SI-149	SI	C	2	210-130-1	E4	CK	C	8	-	-	O	FS	CS	-	J36	OP-ST-SI-3003
SI-149	SI	C	2	210-130-1	E4	CK	C	8	-	-	C	FS	CS	-	J36	OP-ST-SI-3003
HCV-150	RC	B	1	210-110-1A	D8	GA	M	2.5	NO	FAI	C	ST	Q	Y	-	OP-ST-RC-3002
HCV-150	RC	B	1	210-110	G8	FA	M	2.5	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3015

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
CH-151	CH	C	2	210-121-2	C7	CK	C	3	-	-	C	FS	Q	-	-	OP-ST-CH-3002
HCV-151	RC	B	1	210-110-1A	D7	GA	M	2.5	NO	FAI	C	ST	Q	Y	-	OP-ST-RC-3002
HCV-151	RC	B	1	210-110	G8	GA	M	2.5	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3015
SI-153	SI	C	2	210-130-1	E5	CK	C	6	-	-	O	FS	Q	-	-	OP-ST-SI-3008
CH-155	CH	C	2	210-121-2	A5	CK	C	3	-	-	O	FS	RO	-	J5	OP-ST-CH-3006
CH-156	CH	C	2	210-120-1	E3	CK	C	3	-	-	O	FS	RO	-	J5	OP-ST-CH-3006
SI-159	SI	C	2	210-130-3	B6	CK	C	24	-	-	O	SD	RO*	-	E2	SS-ST-SI-3016
SI-160	SI	C	2	210-130-3	B6	CK	C	24	-	-	O	SD	RO*	-	E2	SS-ST-SI-3016
FW-161	FW	C	2	M-253-1	D4	CK	C	16	-	-	C	FS	CS	-	J6	SE-ST-FW-3002
FW-162	FW	C	2	M-253-1	D6	CK	C	16	-	-	C	FS	CS	-	J6	SE-ST-FW-3002
FW-163	AFW	C	2	M-253-4	F7	CK	C	3	-	-	O	FS	CS	-	J7	OP-ST-AFW-3007
FW-164	AFW	C	2	M-253-4	F8	CK	C	3	-	-	O	FS	CS	-	J7	OP-ST-AFW-3007
CH-166	CH	C	2	210-120-1	C2	CK	C	4	-	-	C	FS	RO	-	J35	OP-ST-CH-3006
FW-173	AFW	C	3	M-253-4	C6	CK	C	4	-	-	O	FS	Q	-	-	OP-ST-AFW-3007
FW-173	AFW	C	3	M-253-4	C6	CK	C	4	-	-	C	FS	Q	-	-	SE-ST-AFW-3005/3006
FW-174	AFW	C	3	M-253-4	C5	CK	C	4	-	-	O	FS	Q	-	-	SE-ST-AFW-3005/3006
FW-174	AFW	C	3	M-253-4	C5	CK	C	4	-	-	C	FS	Q	-	-	SE-ST-AFW-3005
SI-175	SI	C	2	210-130-2	B1	CK	C	12	-	-	O	SD	RO*	-	E3	SS-ST-SI-3017
HCV-176	RC	B	2	D-4078	E5	GL	S	1	NC	FC	O	ST	RO	Y	J8	OP-ST-RC-3005
HCV-176	RC	B	2	D-4078	E5	GL	S	1	NC	FC	C	ST	RO	Y	J8	OP-ST-RC-3005
HCV-176	RC	B	2	D-4078	E5	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
SI-176	SI	C	2	210-130-2	D1	CK	C	12	-	-	O	SD	RO*	-	E3	SS-ST-SI-3017
HCV-177	RC	B	2	D-4078	D5	GL	S	1	NC	FC	O	ST	RO	Y	J8	OP-ST-RC-3005
HCV-177	RC	B	2	D-4078	D5	GL	S	1	NC	FC	C	ST	RO	Y	J8	OP-ST-RC-3005
HCV-177	RC	B	2	D-4078	D5	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
SA-177	SA	C	3	B120F07001-2	E7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-178	RC	B	2	D-4078	C5	GL	S	1	NC	FC	O	ST	RO	Y	J8	OP-ST-RC-3005
HCV-178	RC	B	2	D-4078	C5	GL	S	1	NC	FC	C	ST	RO	Y	J8	OP-ST-RC-3005
HCV-178	RC	B	2	D-4078	C5	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
SA-178	SA	C	3	B120F07001-2	E7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
HCV-179	RC	B	2	D-4078	C5	GL	S	1	NC	FC	O	ST	RO	Y	J8	OP-ST-RC-3005
HCV-179	RC	B	2	D-4078	C5	GL	S	1	NC	FC	C	ST	RO	Y	J8	OP-ST-RC-3005
HCV-179	RC	B	2	D-4078	C5	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
SA-179	SA	C	3	B120F07001-2	C7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
HCV-180	RC	B	2	D-4078	E3	GL	S	1	NC	FC	O	ST	RO	Y	J8	OP-ST-RC-3005
HCV-180	RC	B	2	D-4078	E3	GL	S	1	NC	FC	C	ST	RO	Y	J8	OP-ST-RC-3005
HCV-180	RC	B	2	D-4078	E3	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
SA-180	SA	C	3	B120F07001-2	B7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
CH-181	CH	C	2	210-120-1	F7	RL	R	1.5	-	-	T	SP	OM	-	-	PE-ST-VX-3001
HCV-181	RC	B	2	D-4078	C3	GL	S	1	NC	FC	O	ST	RO	Y	J8	OP-ST-RC-3005
HCV-181	RC	B	2	D-4078	C3	GL	S	1	NC	FC	C	ST	RO	Y	J8	OP-ST-RC-3005
HCV-181	RC	B	2	D-4078	C3	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
CH-182	CH	C	2	210-120-1	D7	RL	R	1.5	-	-	T	SP	OM	-	-	PE-ST-VX-3001
CH-183	CH	C	2	210-120-1	B7	RL	R	1.5	-	-	T	SP	OM	-	-	PE-ST-VX-3001
SI-183	SI	A	2	210-130-1	E6	GL	H	2	NC	-	L	LT	2YR	-	-	SE-ST-SI-3005
SI-184	SI	A	2	210-130-1	D6	GA	H	6	NC	-	L	LT	2YR	-	-	SE-ST-SI-3005
SI-185	SI	A	2	210-130-1	E8	GL	H	2	NC	-	L	LT	2YR	-	E5	APPENDIX J
CH-187	CH	C	2	210-120-1	E7	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-CH-3003
CH-188	CH	C	2	210-120-1	C7	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-CH-3003
CH-189	CH	C	2	210-120-1	A7	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-CH-3003
SI-194	SI	A/C	1	210-130-2A	D7	CK	C	6	-	-	O	FS	CS	-	J9	OP-ST-SI-3003
SI-194	SI	A/C	1	210-130-2A	D7	CK	C	6	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE *	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
SI-195	SI	A/C	1	210-130-2A	D8	CK	C	2	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
SI-195	SI	A/C	1	210-130-2A	D8	CK	C	2	-	-	O	FS	RO	-	J10	OP-ST-SI-3007
SI-196	SI	C	1	210-130-2A	D8	CK	C	2	-	-	O	PS	CS	-	J11	OP-ST-SI-3014
SI-196	SI	C	1	210-130-2A	D8	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-SI-3007
SA-197	SA	B	3	B120F07001-2	D3	DI	A	1.5	NC	FO	O	ST	Q	-	-	DG START ACCEPT
SI-197	SI	A/C	1	210-130-2A	D6	CK	C	6	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
SI-197	SI	A/C	1	210-130-2A	D6	CK	C	6	-	-	O	FS	CS	-	J9	OP-ST-CH-3003
CH-198	CH	C	2	210-120-1A	B2	CK	C	2	-	-	O	PS	Q	-	J12	OP-ST-CH-3003
CH-198	CH	C	2	210-120-1A	B2	CK	C	2	-	-	O	FS	RO	-	J12	SE-ST-CH-3003
CH-198	CH	C	2	210-120-1A	B2	CH	C	2	-	-	C	FS	RO	-	J12	SE-ST-CH-3004
SA-198	SA	B	3	B120F07001-2	C3	DI	A	1.5	NC	FO	O	ST	Q	-	-	DG START ACCEPT
SI-198	SI	A/C	1	210-130-2A	D6	CK	C	2	-	-	O	FS	RO	-	J10	OP-ST-SI-3007
SI-198	SI	A/C	1	210-130-2A	D6	CK	C	2	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
SI-199	SI	C	1	210-130-2A	C7	CK	C	2	-	-	O	PS	CS	-	J11	OP-ST-SI-3014
SI-199	SI	C	1	210-130-2A	C7	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-SI-3007
SI-200	SI	A/C	1	210-130-2A	D5	CK	C	6	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
SI-200	SI	A/C	1	210-130-2A	D5	CK	C	6	-	-	O	FS	CS	-	J9	OP-ST-SI-3003
SI-201	SI	A/C	1	210-130-2A	D5	CK	C	2	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
SI-201	SI	A/C	1	210-130-2A	D5	CK	C	2	-	-	O	FS	RO	-	J10	OP-ST-SI-3007
SI-202	SI	C	1	210-130-2A	C5	CK	C	2	-	-	O	PS	CS	-	J11	OP-ST-SI-3014
SI-202	SI	C	1	210-130-2A	C5	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-SI-3007
TCV-202	CH	A	1	210-120-1A	E5	GL	A	2	A	FC	C	ST	CS	Y	J13	OP-ST-CH-3005
TCV-202	CH	A	1	210-120-1A	E5	GL	A	2	A	FC	L	LT	2YR	-	E5	APPENDIX J
TCV-202	CH	A	2	210-120-1A	E5	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3009
CH-203	CH	C	1	210-120-1A	C5	CK	C	2	-	-	O	PS	Q	-	J12	OP-ST-CH-3003
CH-203	CH	C	1	210-120-1A	C5	CK	C	2	-	-	O	FS	RO	-	J12	SE-ST-CH-3003

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
SI-203	SI	A/C	1	210-130-2A	D3	CK	C	6	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
SI-203	SI	A/C	1	210-130-2A	D3	CK	C	6	-	-	O	FS	CS	-	J9	OP-ST-SI-3003
CH-204	CH	C	1	210-120-1A	A5	CK	C	2	-	-	O	PS	Q	-	J12	OP-ST-CH-3003
CH-204	CH	C	1	210-120-1A	A5	CK	C	2	-	-	O	FS	RO	-	J12	SE-ST-CH-3003
HCV-204	CH	A	2	210-120-2	A2	GL	A	2	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-204	CH	A	2	210-120-2	A2	GL	A	2	NO	FC	C	ST	CS	Y	J13	OP-ST-CH-3005
HCV-204	CH	A	2	210-120-2	A7	A2	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3009
SI-204	SI	A/C	1	210-130-2A	D3	CK	C	2	-	-	O	FS	RO	-	J10	OP-ST-SI-3007
SI-204	SI	A/C	1	210-130-2A	D3	CK	C	2	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
CH-205	CH	C	1	210-120-1A	B6	CK	C	2	-	-	O	PS	Q	-	J14	OP-ST-CH-3006
CH-205	CH	C	1	210-120-1A	B6	CK	C	2	-	-	O	FS	RO	-	J14	SE-ST-CH-3003
SI-205	SI	C	1	210-130-2A	C4	CK	C	2	-	-	O	PS	CS	-	J11	OP-ST-SI-3014
SI-205	SI	C	1	210-130-2A	C4	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-SI-3007
HCV-206	CH	A	2	210-120-1A	E1	GL	A	0.75	NO	FC	C	ST	CS	Y	J15	OP-ST-CH-3005
HCV-206	CH	A	2	210-120-1A	E1	GL	A	0.75	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-206	CH	A	2	210-120-1A	E1	GL	A	0.75	NO	FC	-	VPI		Y		OP-ST-VX-3009
SI-207	SI	A/C	1	210-130-2A	F7	CK	C	12	-	-	L	LT	CS*	-	-	OP-ST-SI-3008
SI-207	SI	A/C	1	210-130-2A	F7	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3008
SI-207	SI	A/C	1	210-130-2A	F7	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-208	SI	A/C	1	210-130-2A	C7	CK	C	12	-	-	L	LT	CS*	-	-	PIV OP-ST-SI-3013
SI-208	SI	A/C	1	210-130-2A	C7	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-208	SI	A/C	1	210-130-2A	C7	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3013
SI-208	SI	A/C	1	210-130-2A	C7	CK	C	12	-	-	O	PS	CS	-	E4	OP-ST-SI-3003
SI-209	SI	C	2	210-130-2B	E3	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3001
SI-211	SI	A/C	1	210-130-2A	F6	CK	C	12	-	-	L	LT	CS*	-	-	PIV OP-ST-SI-3008
SI-211	SI	A/C	1	210-130-2A	F6	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3008

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
SI-211	SI	A/C	1	210-130-2A	F6	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-212	SI	A/C	1	210-130-2A	C6	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3013
SI-212	SI	A/C	1	210-130-2A	C6	CK	C	12	-	-	L	LT	CS*	-	-	PIV OP-ST-SI-3013
SI-212	SI	A/C	1	210-130-2A	C6	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-212	SI	A/C	1	210-130-2A	C6	CK	C	12	-	-	O	PS	CS	-	E4	OP-ST-SI-3003
SI-213	SI	C	2	210-130-2B	E6	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3001
SI-215	SI	A/C	1	210-130-2A	F4	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3008
SI-215	SI	A/C	1	210-130-2A	F4	CK	C	12	-	-	L	LT	CS*	-	-	OP-ST-SI-3008
SI-215	SI	A/C	1	210-130-2A	F4	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-216	SI	A/C	1	210-130-2A	C4	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3013
SI-216	SI	A/C	1	210-130-2A	C4	CK	C	12	-	-	L	LT	CS*	-	-	PIV OP-ST-SI-3013
SI-216	SI	A/C	1	210-130-2A	C4	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-216	SI	A/C	1	210-130-2A	C4	CK	C	12	-	-	O	PS	CS	-	E4	OP-ST-SI-3003
SI-217	SI	C	2	210-130-2	E6	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3001
FO-218	FO	C	3	M-262-1	B3	CK	C	2	-	-	O	FS	Q	-	-	
LCV-218-2	CH	B	2	210-120-1	C2	GA	M	4	NO	FAI	C	ST	CS	Y	J16	OP-ST-CH-3005
LCV-218-2	CH	B	2	210-120-1	C2	GA	M	4	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3009
LCV-218-3	CH	B	2	210-120-1	E3	GA	M	3	NC	FAI	O	ST	CS	Y	J16	OP-ST-CH-3005
LCV-218-3	CH	B	2	210-120-1	E3	GA	M	3	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3009
FO-219	FO	C	3	M-262-1	B3	CK	C	2	-	-	O	FS	Q	-	-	
SI-219	SI	A/C	1	210-130-2A	F3	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3008
SI-219	SI	A/C	1	210-130-2A	F3	CK	C	12	-	-	L	LT	CS*	-	-	PIV OP-ST-SI-3008
SI-219	SI	A/C	1	210-130-2A	F3	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-220	SI	A/C	1	210-130-2A	C3	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-220	SI	A/C	1	210-130-2A	C3	CK	C	12	-	-	C	FS	CS*	-	E4	PIV OP-ST-SI-3013
SI-220	SI	A/C	1	210-130-2A	C3	CK	C	12	-	-	L	LT	CS*	-	-	OP-ST-SI-3013

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE *	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
SI-220	SI	A/C	1	210-130-2A	C3	CK	C	12	-	-	O	PS	CS	-	E4	OP-ST-SI-3003
SI-221	SI	C	2	210-130-2	E3	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3001
HCV-238	CH	B	1	210-120-1A	D5	GL	A	2	NO	FO	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-238	CH	B	1	210-120-1A	D5	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CH-3001
HCV-238	CH	B	1	210-120-1A	C5	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-239	CH	B	1	210-120-1A	A5	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CH-3001
HCV-239	CH	B	1	210-120-1A	A5	GL	A	2	NO	FO	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-239	CH	B	1	210-120-1A	A5	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-240	CH	B	1	210-120-1A	B5	GL	A	2	NC	FC	C	ST	CS	Y	J17	OP-ST-CH-3005
HCV-240	CH	B	1	210-120-1A	B5	GL	A	2	NC	FC	O	ST	CS	Y	J17	OP-ST-CH-3005
HCV-240	CH	B	1	210-120-1A	B5	GL	A	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3009
HCV-241	CH	A	2	210-120-1A	E5	GL	A	0.75	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-241	CH	A	2	210-120-1A	E5	GL	A	0.75	NO	FC	C	ST	CS	Y	J15	OP-ST-CH-3005
HCV-241	CH	A	2	210-120-1A	E5	GL	A	0.75	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3009
HCV-247	CH	B	2	210-120-1A	C5	GL	S	2	NO	FO	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-247	CH	B	2	210-120-1A	C5	GL	S	2	NO	FO	O	ST	Q	Y	-	OP-ST-CH-3001
HCV-247	CH	B	2	210-120-1A	C5	GL	S	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-248	CH	B	2	210-120-1A	A5	GL	S	2	NO	FO	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-248	CH	B	2	210-120-1A	A5	GL	S	2	NO	FO	O	ST	Q	Y	-	OP-ST-CH-3001
HCV-248	CH	B	2	210-120-1A	A5	GL	S	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-249	CH	B	1	210-120-1A	B5	GL	S	2	NC	FC	O	ST	CS	Y	J17	OP-ST-CH-3005
HCV-249	CH	B	1	210-120-1A	B5	GL	S	2	NC	FC	C	ST	CS	Y	J17	OP-ST-CH-3005
HCV-249	CH	B	1	210-120-1A	B5	GL	S	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3009
HCV-257	CH	B	3	210-121-1	D7	GL	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-257	CH	B	3	210-121-1	D7	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-258	CH	B	3	210-121-1	B5	GA	M	3	NC	FAI	O	ST	Q	Y	-	OP-ST-CH-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-258	CH	B	3	210-121-1	B5	GA	M	3	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-264	CH	B	3	210-121-1	D4	GL	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-264	CH	B	3	210-121-1	D4	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-265	CH	B	3	210-121-1	B3	GA	M	3	NC	FAI	O	ST	Q	Y	-	OP-ST-CH-3001
HCV-265	CH	B	3	210-121-1	B3	GA	M	3	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-268	CH	B	3	210-121-2	B4	GA	M	3	NC	FAI	O	ST	CS	Y	J18	OP-ST-CH-3005
HCV-268	CH	B	3	210-121-2	B4	GA	M	3	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3009
FCV-269	CH	B	3	210-121-1	C7	GL	A	3	A	FC	C	ST	Q	Y	-	OP-ST-CH-3001
FCV-269	CH	B	3	210-121-1	C7	GL	A	3	A	FC	-	VPI	2YR	Y	-	OP-ST-VX-3008
MS-275	MS	C	2	M-252-1	F8	RL	R	6	-	-	T	SP	RO	-	-	IC-ST-MS-3001/3002
MS-276	MS	C	2	M-252-1	F8	RL	R	6	-	-	T	SP	RO	-	-	IC-ST-MS-3001/3002
MS-277	MS	C	2	M-252-1	F7	RL	R	6	-	-	T	SP	RO	-	-	IC-ST-MS-3001/3002
MS-278	MS	C	2	M-252-1	F7	RL	R	6	-	-	T	SP	RO	-	-	IC-ST-MS-3001/3002
MS-279	MS	C	2	M-252-1	E8	RL	R	6	-	-	T	SP	RO	-	-	IC-ST-MS-3001/3002
MS-280	MS	C	2	M-252-1	E7	RL	R	6	-	-	T	SP	RO	-	-	IC-ST-MS-3001/3002
VA-280	VA	A	2	M-1-2	A8	BU	H	4	LC	-	L	LT	2YR	-	E5	APPENDIX J
MS-281	MS	C	2	M-252-1	E7	RL	R	6	-	-	T	SP	RO	-	-	IC-ST-MS-3001/3002
MS-282	MS	C	2	M-252-1	E6	RL	R	6	-	-	T	SP	RO	-	-	IC-ST-MS-3001/3002
SA-282	SA	C	3	B120F07001-1	B7	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-SA-3001
SA-285	SA	C	3	B120F07001-1	F7	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-SA-3001
SA-288	SA	C	3	B120F07001-2	B7	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-SA-3001
VA-289	VA	A	2	M-1-2	A8	BU	H	4	LC	-	L	LT	2YR	-	E5	APPENDIX J
MS-291	MS	C	2	M-252-1	F7	RL	R	2.5	-	-	T	SP	RO	-	-	IC-ST-MS-3001/3002
SA-291	SA	C	3	B120F07001-2	F7	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-SA-3001
MS-292	MS	C	2	M-252-1	E7	RL	R	2.5	-	-	T	SP	RO	-	-	IC-ST-MS-3001/3002
SI-300	SI	C	2	210-130-1	B4	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-SI-3008

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
SI-301	SI	C	2	210-130-1	D4	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-SI-3008
SI-302	SI	C	2	210-130-1	F4	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-SI-3008
SI-303	SI	C	2	210-130-1	E4	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-SI-3008
SI-304	SI	C	2	210-130-1	A4	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-SI-3008
SI-306	SI	A	2	210-130-1	D7	GA	H	6	LC	-	L	LT	2YR	-	-	SE-ST-SI-3005
HCV-308	SI	B	2	210-130-1	D6	GA	M	2	NC	FAI	O	ST	CS	Y	J19	OP-ST-SI-3002
HCV-308	SI	B	2	210-130-3	D6	GA	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3019
HCV-311	SI	B	2	210-130-2A	C3	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-311	SI	B	2	210-130-2A	C3	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-312	SI	B	2	210-130-2A	C4	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-312	SI	B	2	210-130-2A	C4	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-314	SI	B	2	210-130-2A	C5	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-314	SI	B	2	210-130-2A	C5	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-315	SI	B	2	210-130-2A	C5	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-315	SI	B	2	210-130-2A	C5	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-317	SI	B	2	210-130-2A	C8	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-317	SI	B	2	210-130-2A	C8	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-318	SI	B	2	210-130-2A	C8	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-318	SI	B	2	210-130-2A	C8	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-320	SI	B	2	210-130-2A	C6	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-320	SI	B	2	210-130-2A	C6	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-321	SI	B	2	210-130-2A	C6	GL	M	2	NC	FAI	C	ST	Q	Y	-	OP-ST-SI-3001
HCV-321	SI	B	2	210-130-2A	E6	GL	N	2	BC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
SI-323	SI	C	2	210-130-3	E6	CK	C	4	-	-	O	FS	RO	-	J20	OP-ST-SI-3007
SI-323	SI	C	2	210-130-3	E6	CK	C	4	-	-	C	FS	RO	-	J20	SE-ST-SI-3010
HCV-327	SI	B	2	210-130-2A	C3	GL	M	4	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-327	SI	B	2	210-130-2A	C3	GL	M	4	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-329	SI	B	2	210-130-2A	C4	GL	M	4	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-329	SI	B	2	210-130-2A	C4	GL	M	4	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-331	SI	B	2	210-130-2A	C7	GL	M	4	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-331	SI	B	2	210-130-2A	C7	GL	M	4	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-333	SI	B	2	210-130-2A	C6	GL	M	4	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-333	SI	B	2	210-130-2A	C6	GL	M	4	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
AC-341	CCW	C	3	M-10-2	C3	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3001
SI-342	SI	A	2	210-130-1	E7	GL	H	1	LC	-	L	LT	2YR	-	-	SE-ST-SI-3005
SI-343	SI	C	2	210-130-3	D6	CK	C	2	-	-	O	PS	CS	-	J11	SE-ST-CH-3003
SI-343	SI	C	2	210-130-3	D6	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-CH-3006
HCV-344	SI	B	2	210-130-1	D8	BL	A	8	NC	FO	O	ST	CS	Y	J21	OP-ST-SI-3002
HCV-344	SI	B	2	210-130-1	D8	BL	A	8	NC	FO	C	ST	CS	Y	J21	OP-ST-SI-3002
HCV-344	SI	B	2	210-130-1	D8	BL	A	8	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3019
NG-HCV-344-S2	NG	C	3	C-4175-2	D2	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
HCV-345	SI	B	2	210-130-1	B8	BL	A	8	NC	FO	O	ST	CS	Y	J21	OP-ST-SI-3002
HCV-345	SI	B	2	210-130-1	D8	BL	A	8	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3019
HCV-347	SI	A	1	210-130-3	F7	GA	M	10	LC	FAI	L	LT	2YR	-	-	APPENDIX J
HCV-347	SI	A	1	210-130-3	F7	GA	M	10	LC	FAI	C	ST	CS	Y	J22	OP-ST-SI-3002
HCV-347	SI	A	1	210-130-3	F7	GA	M	10	LC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3019
HCV-348	SI	A	1	210-130-2A	C2	GA	M	12	LC	FAI	L	LT	2YR	-	-	APPENDIX J
HCV-348	SI	A	1	210-130-2A	C2	GA	M	12	LC	FAI	C	ST	CS	Y	J22	OP-ST-SI-3002
HCV-348	SI	A	1	210-130-2A	C2	GA	M	12	LC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3019
MS-351	MS	C	3	M-252-1	E5	CK	C	2	-	-	O	FS	Q	-	-	SE-ST-AFW-3006
MS-352	MS	C	3	M-252-1	E5	CK	C	2	-	-	O	FS	Q	-	-	SE-ST-AFW-3006
AC-364	CCW	C	3	M-10-2	D4	RL	R	2	-	-	T	SP	OM	-	-	PE-ST-VX-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-383-3	SI	A	2	210-130-3	B7	BU	M	24	NC	FAI	O	ST	CS	Y	J40	OP-ST-SI-3001
HCV-383-3	SI	A	2	210-130-3	B7	BU	M	24	NC	FAI	L	LT	2YR	-	-	APPENDIX J
HCV-383-3	SI	A	2	210-130-1	D1	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-383-4	SI	A	2	210-130-3	B7	BU	M	24	NC	FAI	O	ST	CS	Y	J40	OP-ST-SI-3001
HCV-383-4	SI	A	2	210-130-3	B7	BU	M	24	NC	FAI	L	LT	2YR	-	-	APPENDIX J
HCV-383-4	SI	A	2	210-130-1	D1	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
LCV-383-1	SI	A	2	210-130-1	D1	BU	A	20	NO	FO	C	ST	CS	Y	J40	OP-ST-SI-3001
LCV-383-1	SI	A	2	210-130-1	D2	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
LCV-383-1	SI	A	2	210-130-1	D1	BU	A	20	NO	FO	O	ST	CS	Y	J40	OP-ST-SI-3001
LCV-383-1	SI	A	2	210-130-1	D1	BU	A	20	NO	FO	L	LT	2YR	-	-	SE-ST-SI-3005
LCV-383-2	SI	A	2	210-130-1	D2	BU	A	20	NO	FO	O	ST	CS	Y	J40	OP-ST-SI-3001
LCV-383-2	SI	A	2	210-130-1	D2	BU	A	20	NO	FO	C	ST	CS	Y	J40	OP-ST-SI-3001
LCV-383-2	SI	A	2	210-130-1	D2	BU	A	20	NO	FO	L	LT	2YR	-	-	SE-ST-SI-3005
LCV-383-2	SI	A	2	210-130-1	D2	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
NG-LCV-383-1-S2	NG	C	3	C-4175-2	D2	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
NG-LCV-383-2-S2	NG	C	3	C-4175-2	D2	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
HCV-385	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	O	ST	CS	Y	J34	OP-ST-SI-3002
HCV-385	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	C	ST	CS	Y	J34	OP-ST-SI-3002
HCV-385	SI	A	2	2[illegible]-130-1	F4	GL	A	4	NO	FO	L	LT	2YR	-	-	SE-ST-SI-3005
HCV-385	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-386	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	C	ST	CS	Y	J34	OP-ST-SI-3002
HCV-386	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	O	ST	CS	Y	J34	OP-ST-SI-3002
HCV-386	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	L	LT	2YR	-	-	SE-ST-SI-3005
HCV-386	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-400A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-400A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	C	ST	Q	Y	-	

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE *	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
HCV-400A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-400A-S2	NG	C	3	C-4175-2	D2	RL	R	0.75	-	-	T	SP	OM	-	-	
HCV-400B	CCW	B	2	M-40-1	B7	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-400B	CCW	B	2	M-40-1	B7	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-400B-S2	NG	C	3	C-4175-2	D3	RL	R	0.75	-	-	T	SP	OM	-	-	
HCV-400C	CCW	B	2	M-40-1	D2	BL	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-400C	CCW	B	2	M-40-1	D2	BL	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-400C	CCW	B	2	M-40-1	D2	BL	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-400D	CCW	B	2	M-40-1	B2	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-400D	CCW	B	2	N-40-1	B2	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-401A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-401A-S2	NG	C	3	C-4175-2	D3	RL	R	0.75	-	-	T	SP	OM	-	-	
HCV-401B	CCW	B	2	M-40-1	B7	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401B	CCW	B	2	M-40-1	B7	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-401B-S2	NG	C	3	C-4175-2	D3	RL	R	0.75	-	-	T	SP	OM	-	-	
HCV-401C	CCW	B	2	M-40-1	D3	BL	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401C	CCW	B	2	M-40-1	D3	BL	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401C	CCW	B	2	N-40-1	D3	BL	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-401D	CCW	B	2	M-40-1	B3	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401D	CCW	B	2	M-40-1	B3	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-402A	CCW	B	2	M-40-1	C6	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-402A	CCW	B	2	M-40-1	C6	BU	A	6	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-402A	CCW	B	2	M-40-1	C6	BU	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-402A-S2	NG	C	3	C-4175-2	C3	RL	R	0.75	-		T	SP	OM	-	-	

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-402B	CCW	B	2	M-40-1	B6	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-402B	CCW	B	2	M-40-1	B6	BU	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-402B-S2	NG	C	3	C-4175-2	C3	RL	R	0.75	-	-	T	SP	OM	-	-	
HCV-402C	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-402C	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-402C	CCW	B	2	M-40-1	D4	FL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-402D	CCW	B	2	M-40-1	B4	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-402D	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-403A	CCW	B	2	M-40-1	C5	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403A	CCW	B	2	M-40-1	C5	BU	A	6	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403A	CCW	B	2	M-40-1	C5	BU	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-403A-S2	NG	C	3	C-4175-2	C3	RL	R	0.75	-	-	T	SP	OM	-	-	
HCV-403B	CCW	B	2	M-40-1	B5	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403B	CCW	B	2	M-40-1	B5	BU	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-403B-S2	NG	C	3	C-4175-2	C3	RL	R	0.75	-	-	T	SP	OM	-	-	
HCV-403C	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403C	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403C	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-403D	CCW	B	2	M-40-1	B4	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403D	CCW	B	2	M-40-1	B4	BU	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-425A	CCW	A	2	M-40-3	C6	GL	A	3	NO	FC	C	ST	CS	Y	J23	OP-ST-CCW-3004
HCV-425A	CCW	A	2	M-40-3	C6	GL	A	3	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-425A	CCW	A	2	M-40-3	C6	GL	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-425B	CCW	A	2	M-40-1	D1	GL	A	3	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-425B	CCW	A	2	M-40-1	D1	GL	A	3	NO	FC	C	ST	CS	Y	J23	OP-ST-CCW-3004
HCV-425B	CCW	A	2	M-40-1	D1	GL	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-425C	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	C	ST	CS	Y	J23	OP-ST-CCW-3004
HCV-425C	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-425C	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-425D	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-425D	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-425D	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	C	ST	CS	Y	J23	OP-ST-CCW-3004
HCV-438A	CCW	A	2	M-40-2	F8	GL	A	6	NO	FO	C	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438A	CCW	A	2	M-40-2	F8	GL	A	6	NO	FO	L	LT	2YR	-	E5	APPENDIX J
HCV-438A	CCW	A	2	M-40-2	F8	GL	A	6	NO	FO	O	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438A	CCW	A	2	M-40-2	F8	GL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-438B	CCW	A	2	M-40-1	A6	GL	A	6	NO	FO	O	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438B	CCW	A	2	M-40-1	A6	GL	A	6	NO	FO	L	LT	2YR	-	E5	APPENDIX J
HCV-438B	CCW	A	2	M-40-1	A6	GL	A	6	NO	FO	C	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438B	CCW	A	2	M-40-1	A6	GL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3006
NG-HCV-438B-S2	NG	C	3	C-4175-2	E2	RL	R	0.75	-	-	T	SP	OM	-	-	OP-ST-CCW-3004
HCV-438C	CCW	A	2	M-40-2	F2	GL	A	6	NO	FO	C	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438C	CCW	A	2	M-40-2	F2	GL	A	6	NO	FO	L	LT	2YR	-	E5	APPENDIX J
HCV-438C	CCW	A	2	M-40-2	F2	GL	A	6	NO	FO	O	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438C	CCW	A	2	M-40-2	F2	GL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-438D	CCW	A	2	M-40-1	A3	GL	A	6	NO	FO	C	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438D	CCW	A	2	M-40-1	A3	GL	A	6	NO	FO	L	LT	2YR	-	E5	APPENDIX J
HCV-438D	CCW	A	2	M-40-1	A3	GL	A	6	NO	FO	O	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438D	CCW	A	2	M-40-1	A3	GL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3006
NG-HCV-438D-S2	NG	C	3	C-4175-2	E2	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
HCV-467A	CCW	A	2	M-40-3	E3	GL	A	1.5	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-467A	CCW	A	2	M-40-3	E3	GL	A	1.5	NO	FC	C	ST	CS	Y	J25	OP-ST-CCW-3004

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-467A	CCW	A	2	M-40-3	E3	GL	A	1.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-467B	CCW	A	2	M-40-1	A3	GL	A	1.5	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-467B	CCW	A	2	M-40-1	A3	GL	A	1.5	NO	FC	C	ST	CS	Y	J25	OP-ST-CCW-3004
HCV-467B	CCW	A	2	M-40-1	A3	GL	A	1.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-467C	CCW	A	2	M-40-3	E1	GL	A	1.5	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-467C	CCW	A	2	M-40-3	E1	GL	A	1.5	NO	FC	C	ST	CS	Y	J25	OP-ST-CCW-3004
HCV-467C	CCW	A	2	M-40-3	E1	GL	A	1.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-467D	CCW	A	2	M-40-1	A2	GL	A	1.5	NO	FC	C	ST	CS	Y	J25	OP-ST-CCW-3004
HCV-467D	CCW	A	2	M-40-1	A2	GL	A	1.5	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-467D	CCW	A	2	M-40-1	A2	GL	A	1.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
CH-469	CH	C	1	210-120-1A	B5	CK	C	2	-	-	O	PS	CS	-	J11	SE-ST-CH-3003
CH-469	CH	C	1	210-120-1A	B5	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-CH-3003
HCV-474	CCW	B	3	M-10-3	F8	GL	A	2	NO	FO	O	ST	CS	Y	J37	OP-ST-CCW-3001
HCV-474	CCW	B	3	M-10-3	F8	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-478	CCW	B	3	M-10-3	D2	BU	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3001
HCV-478	CCW	B	3	M-10-3	D2	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-478	CCW	B	3	M-10-3	D2	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-480	CCW	B	3	M-10-3	C6	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-480	CCW	B	3	M-10-3	C6	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
NG-HCV-480-S2	NG	C	3	C-4175-2	C3	RL	R	0.75	-	-	T	SP	OM	-	-	
HCV-481	CCW	B	3	M-10-3	B7	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-481	CCW	B	3	M-10-3	B7	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
NG-HCV-481-S2	NG	C	3	C-4175-2	C3	RL	R	0.75	-	-	T	SP	OM	-	-	
HCV-482A	RW	B	3	M-10-3	C5	BU	A	14	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003
HCV-482A	RW	B	3	M-10-3	C5	BU	A	14	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-482B	RW	B	3	M-10-3	A4	BU	A	14	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE "	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
HCV-482B	RW	B	3	M-10-3	A4	BU	A	14	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-483A	RW	B	3	M-10-3	B7	BU	A	14	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003
HCV-483A	RW	B	3	M-10-3	B7	BU	A	14	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-483B	RW	B	3	M-10-3	A5	BU	A	14	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003
HCV-483B	RW	B	3	M-10-3	A5	BU	A	14	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-484	CCW	B	3	M-10-3	B4	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-484	CCW	B	3	M-10-3	B4	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-485	CCW	B	3	M-10-3	A5	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-485	CCW	B	3	M-10-3	A5	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-489A	CCW	B	3	M-10-3	B2	BU	A	10	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-489A	CCW	B	3	M-10-3	B2	BU	A	10	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-489B	CCW	B	3	M-10-2	A6	BU	A	10	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-489B	CCW	B	3	M-10-2	A6	BU	A	10	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-490A	CCW	B	3	M-10-3	B2	BU	A	10	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-490A	CCW	B	3	M-10-3	B2	BU	A	10	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-490B	CCW	B	3	M-10-2	A6	BU	A	10	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-490B	CCW	B	3	M-10-2	A6	BU	A	10	NO	FO	-	VPI		Y		OP-ST-VX-3005
HCV-491A	CCW	B	3	M-10-3	C2	BU	A	10	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-491A	CCW	B	3	M-10-3	C2	BU	A	10	NO	FO	-	VPI		Y		OP-ST-VX-3005
HCV-491B	CCW	B	3	M-10-2	B6	BU	A	10	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-491B	CCW	B	3	M-10-2	B6	BU	A	10	NO	FO	-	VPI		Y		OP-ST-VX-3005
HCV-492A	CCW	B	3	M-10-3	C2	BU	A	10	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-492A	CCW	B	3	M-10-3	C2	BU	A	10	NO	FO	-	VPI		Y		OP-ST-VX-3005
HCV-492B	CCW	B	3	M-10-2	C6	BU	A	10	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-492B	CCW	B	3	M-10-2	C6	BU	A	10	NO	FO	-	VPI		Y		OP-ST-CCW-3005
HCV-500A	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX															
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-500A	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-500A	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	-	VPI	2YR	Y		OP-ST-VX-3025
HCV-500B	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-500B	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-500B	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	-	VPI	2YR	Y		OP-ST-VX-3025
HCV-506A	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-506A	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-506A	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-506B	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-506B	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-506B	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-507A	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-507A	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-507A	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-507B	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-507B	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-507B	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-508A	WD	A	2	M-98-3	C7	DI	A	0.5	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-508A	WD	A	2	M-98-3	C7	DI	A	0.5	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-508A	WD	A	2	M-98-3	C7	DI	A	0.5	NO	FC	-	VPI	2YR	Y		OP-ST-VX-3025
HCV-508B	WD	A	2	M-98-3	C6	DI	A	0.5	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-508B	WD	A	2	M-98-3	C6	DI	A	0.5	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-508B	WD	A	2	M-98-3	C6	DI	A	0.5	NO	FC	-	VPI	2YR	Y		OP-ST-VX-3025
HCV-509A	WD	A	2	M-98-3	B7	DI	A	0.5	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-509A	WD	A	2	M-98-3	B7	DI	A	0.5	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-509A	WD	A	2	M-98-3	B7	DI	A	0.5	NO	FC	-	VPI	2YR	Y		OP-ST-VX-3025

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-509B	WD	A	2	M-98-3	B6	DI	A	0.5	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-509B	WD	A	2	M-98-3	B6	DI	A	0.5	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-509B	WD	A	2	M-98-3	B6	DI	A	0.5	NO	FC	-	VPI	2YR	Y		OP-ST-VX-3025
CA-555	CA	A	2	M-13	F3	GA	H	4	NO	-	L	LT	2YR	-	-	APPENDIX J
FW-658	AFW	C	3	M-254-2	D5	CK	C	1.5	-	-	C	ME	Q	-	-	MANUALLY EXERCISE OP-ST-AFW-3006
FW-658	AFW	C	3	M-254-2	D5	CK	C	1.5	-	-	O	ME	Q	-	-	MANUALLY EXERCISE
FW-672	AFW	C	3	M-253-4	B6	CK	C	2	-	-	O	FS	Q	-	-	SE-ST-AFW-3006
A/HCV-742	VA	A	2	M-1-2	D8	DI	A	1	NO	FO	L	LT	2YR	-	-	APPENDIX J
B/HCV-742	VA	A	2	M-1-2	D8	DI	A	1	NO	FO	L	LT	2YR	-	-	APPENDIX J
C/HCV-742	VA	A	2	M-1-2	D8	DI	A	1	NO	FO	L	LT	2YR	-	-	APPENDIX J
D/HCV-742	VA	A	2	M-1-2	C8	DI	A	1	NO	FO	L	LT	2YR	-	-	APPENDIX J
PCV-742A	VA	A	2	M-1-1	D2	BU	A	42	A	FC	L	LT	2YR	-	E5	APPENDIX J
PCV-742B	VA	A	2	M-1-2	C7	BU	A	42	A	FC	L	LT	2YR	-	E5	APPENDIX J
PCV-742C	VA	A	2	M-1-1	C2	BU	A	42	A	FC	L	LT	2YR	-	E5	APPENDIX J
PCV-742D	VA	A	2	M-1-2	B8	BU	A	42	A	FC	L	LT	2YR	-	E5	APPENDIX J
PCV-742E	VA	A	2	M-1-1	F2	DI	A	1	A	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742E	VA	A	2	M-1-1	F2	DI	A	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
PCV-742E	VA	A	2	M-1-1	F2	DI	A	1	A	FC	C	ST	Q	Y	-	OP-ST-VA-3001
PCV-742F	VA	A	2	M-1-2	E8	DI	A	1	A	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742F	VA	A	2	M-1-2	E8	DI	A	1	A	FC	C	ST	Q	Y	-	OP-ST-VA-3001
PCV-742F	VA	A	2	M-1-2	E8	DI	A	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
PCV-742G	VA	A	2	M-1-1	E2	DI	A	1	A	FC	C	ST	Q	Y	-	OP-ST-VA-3001
PCV-742G	VA	A	2	M-1-1	E2	DI	A	1	A	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742G	VA	A	2	M-1-1	E2	DI	A	1	NO	FC	-	VPI	2YR	Y		OP-ST-VX-3024
PCV-742H	VA	A	2	M-1-2	E8	DI	A	1	NO	FC	C	ST	Q	Y	-	OP-ST-VA-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
PCV-742H	VA	A	2	M-1-2	E8	DI	A	1	NO	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742H	VA	A	2	M-1-2	E8	DI	A	1	NO	FC	-	VPI	2YR	Y		OP-ST-VX-3024
HCV-746A	VA	A	2	M-1-1	D2	GL	A	2	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-746A	VA	A	2	M-1-1	D2	GL	A	2	NC	FC	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-746A	VA	A	2	M-1-1	D2	GL	A	2	NC	FC	-	VPI	2YR	Y		OP-ST-VX-3024
HCV-746B	VA	A	2	M-1-2	C7	GL	A	2	NC	FC	C	ST	Q	Y	-	OP-ST-CA-3001
HCV-746B	VA	A	2	M-1-2	C7	GL	A	2	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-746B	VA	A	2	M-1-2	C7	GL	A	2	NC	FC	-	VPI	2YR	Y		OP-ST-VX-3024
HCV-820A	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-820A	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-820A	VA	A	2	M-1-2	B8	GL	S	1	NO	FC	-	VPI	2YR	Y		OP-ST-VX-3024
HCV-820B	VA	A	2	M-1-1	C2	GL	S	1	NC	FO	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-820B	VA	A	2	M-1-1	C2	GL	S	1	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-820B	VA	A	2	M-1-1	C2	GL	S	1	NC	FO	L	LT	2YR	-	-	APPENDIX J
HCV-820B	VA	A	2	M-1-1	C2	GL	S	1	NO	FO	-	VPI	2YR	Y		OP-ST-VX-3024
HCV-821A	VA	A	2	M-1-2	A8	GL	S	1	NC	FC	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-821A	VA	A	2	M-1-2	A8	GL	S	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-821A	VA	A	2	M-1-2	A8	GL	S	1	NO	FC	-	VPI	2YR	Y		OP-ST-VX-3024
HCV-821B	VA	A	2	M-1-1	A2	GL	S	1	NC	FO	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-821B	VA	A	2	M-1-1	A2	GL	S	1	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-821B	VA	A	2	M-1-1	A2	GL	S	1	NC	FO	L	LT	2YR	-	-	APPENDIX J
HCV-821B	VA	A	2	M-1-1	A2	GL	S	1	NO	FO	-	VPI	2YR	Y		OP-ST-VX-3024
HCV-881	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-881	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-881	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	L	LT	2YR	-	-	APPENDIX J, E5
HCV-881	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3024

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE *	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
HCV-882	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-882	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-882	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	L	LT	2YR	-	-	APPENDIX J, E5
HCV-882	VA	A	2	M-1-1	B2	BU	A	4	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-883A	VA	A	2	M-1-1	C2	PG	A	1	NC	FO	L	LT	2YR	-	-	APPENDIX J
HCV-883A	VA	A	2	M-1-1	C2	PG	A	1	NC	FO	C	ST	Q	Y		OP-ST-VA-3001
HCV-883A	VA	A	2	M-1-1	C2	PG	A	1	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-883A	VA	A	2	M-1-1	C2	PG	A	1	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-883B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-883B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-883B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-884A	VA	A	2	M-1-1	C2	GL	A	1	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-884A	VA	A	2	M-1-1	C2	GL	A	1	NC	FO	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-884A	VA	A	2	M-1-1	C2	GL	A	1	NC	FO	L	LT	2YR	-	-	APPENDIX J
HCV-884A	VA	A	2	M-1-2	C2	PG	A	1	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-884B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-884B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-884B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-1041A	MS	B	2	M-252-1	F6	CK	A	28	NO	FC	C	ST	CS	Y	J26	OP-ST-MS-3002
HCV-1041A	MS	B	2	M-252-1	F6	CK	A	28	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3013
HCV-1041B	MS	C	2	M-252-1	F6	CK	C	28	-	-	C	SD	RO*	-	J39	SE-ST-MS-3003
HCV-1041C	MS	B	2	M-252-1	F6	GL	M	2	NC	FAI	C	ST	CS	Y	J27	OP-ST-MS-3002
HCV-1041C	MS	B	2	M-252-1	F6	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3013
HCV-1042A	MS	B	2	M-252-1	E6	CK	A	28	NO	FC	C	ST	CS	Y	J26	OP-ST-MS-3002
HCV-1042A	MS	B	2	M-252-1	E6	CK	A	28	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3013
HCV-1042B	MS	C	2	M-252-1	E6	CK	C	28	-	-	C	SD	RO*	-	J39	SE-ST-MS-3003

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE *	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
HCV-1042C	MS	B	2	M-252-1	E6	GL	M	2	NC	FAI	C	ST	CS	Y	J27	OP-ST-MS-3002
HCV-1042C	MS	B	2	M-252-1	E6	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3013
YCV-1045	MS	B	3	M-252-1	C5	GL	A	2	NC	FO	O	ST	Q	Y	-	SE-ST-AFW-3006
YCV-1045	MS	B	3	M-252-1	C5	GL	A	2	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3001
YCV-1045A	MS	B	2	M-252-1	F5	GL	A	2	NC	FO	O	ST	Q	Y	-	OP-ST-MS-3001
YCV-1045A	MS	B	2	M-252-1	F5	GL	A	2	NC	FO	C	ST	Q	Y	-	OP-ST-MS-3001
YCV-1045A	MS	B	2	M-252-1	F5	GL	A	2	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3012
YCV-1045B	MS	B	2	M-252-1	E5	GL	A	2	NC	FO	O	ST	Q	Y	-	OP-ST-MS-3001
YCV-1045B	MS	B	2	M-252-1	E5	GL	A	2	NC	FO	C	ST	Q	Y	-	OP-ST-MS-3001
YCV-1045B	MS	B	2	M-252-1	E5	GL	A	2	NC	FO	-	VPI	2YR	Y		OP-ST-VX-3012
HCV-1103	FW	B	N	M-253-1	C3	GA	M	16	NO	FAI	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1103	FW	B	N	M-253-1	C3	GA	M	16	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1104	FW	B	N	M-253-1	E3	GA	M	16	NO	FAI	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1104	FW	B	N	M-253-1	E3	GA	M	16	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1105	FW	B	N	M-253-1	D3	GL	A	6	NC	FC	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1105	FW	B	N	M-253-1	D3	GL	A	6	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1106	FW	B	N	M-253-1	E3	GL	A	6	NC	FC	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1106	FW	B	N	M-253-1	E3	GL	A	6	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1107A	AFW	B	2	M-253-4	F8	GL	A	3	NC	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1107A	AFW	B	2	M-253-4	F8	GL	A	3	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002
HCV-1107B	AFW	B	2	M-253-4	E8	GL	A	3	NC	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1107B	AFW	B	2	M-253-4	E8	GL	A	3	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002
HCV-1108A	AFW	B	2	M-253-4	F7	GL	A	3	NC	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1108A	AFW	B	2	M-253-4	F7	GL	A	3	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002
HCV-1108B	AFW	B	2	M-253-4	E7	GL	A	3	NC	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1108B	AFW	B	2	M-253-4	E7	GL	A	3	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE *	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
FCV-1368	AFW	B	3	M-253-4	C6	GL	A	1	A	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
FCV-1368	AFW	B	3	M-253-4	C6	GL	A	1	A	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002
FCV-1369	AFW	B	3	M-253-4	B5	GL	A	2	A	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002
FCV-1369	AFW	B	3	M-253-4	B5	GL	A	2	A	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1384	AFW	B	3	M-253-4	D7	GA	M	4	NC	FAI	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1384	AFW	B	3	M-253-4	D7	GL	M	4	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3002
HCV-1385	FW	B	2	M-253-1	D3	GA	M	16	NO	FAI	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1385	FW	B	2	M-253-1	D3	GA	M	16	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1386	FW	B	2	M-253-1	C6	GA	M	16	NO	FAI	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1386	FW	B	2	M-253-1	C6	GA	M	16	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1387A	FW	B	2	M-253-1	C3	GL	A	2	NO	FC	C	ST	CS	Y	J29	OP-ST-FW-3002
HCV-1387A	FW	B	2	M-253-1	C3	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1387B	FW	B	2	M-253-1	B3	GL	A	2	NO	FC	C	ST	CS	Y	J29	OP-ST-FW-3002
HCV-1387B	FW	B	2	M-253-1	B3	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1388A	FW	B	2	M-253-1	C8	GL	A	2	NO	FC	C	ST	CS	Y	J29	OP-ST-FW-3002
HCV-1388A	FW	B	2	M-253-1	C8	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1388B	FW	B	2	M-253-1	B8	GL	A	2	NO	FC	C	ST	CS	Y	J29	OP-ST-FW-3002
HCV-1388B	FW	B	2	M-253-1	B8	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
FW-1443	FW	C	3	M-253-4	B5	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
FW-1444	FW	C	3	M-253-4	B5	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3001
FW-1525	AFW	C	3	M-253-4	B4	RL	R	0.75	-	-	T	SP	OM*	-	E6	OP-ST-DW-3001
HCV-1559A	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-1559A	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	C	ST	Q	Y	-	OP-ST-DW-3001
HCV-1559A	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3010
HCV-1559B	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-1559B	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	C	ST	Q	Y	-	OP-ST-DW-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-1559B	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3010
HCV-1560A	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-1560A	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	C	ST	Q	Y	-	OP-ST-DW-3001
HCV-1560A	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3010
HCV-1560B	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	C	ST	Q	Y	-	OP-ST-DW-3001
HCV-1560B	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-1560B	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3010
HCV-1749	CA	A	2	M-13	F4	GL	A	4	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-1749	CA	A	2	M-13	F4	GL	A	4	NC	FC	C	ST	Q	Y	-	OP-ST-CA-3001
HCV-1749	CA	A	2	M-13	F4	GL	A	4	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3003
PCV-1849A	IA	A	2	M-264-1	C8	GL	A	2	NO	FC	L	LT	2YR	-	E5	APPENDIX J
PCV-1849A	IA	A	2	M-264-1	C8	GL	A	2	NO	FC	C	ST	CS	Y	J30	OP-ST-CA-3002
PCV-1849A	IA	A	2	M-264-1	C8	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3004
PCV-1849B	IA	A	2	M-264-1	F5	GL	A	2	NO	FC	L	LT	2YR	-	E5	APPENDIX J
PCV-1849B	IA	A	2	M-264-1	F5	GL	A	2	NO	FC	C	ST	CS	Y	J30	OP-ST-CA-3002
PCV-1849B	IA	A	2	M-264-1	F5	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3004
HCV-2504A	SL	A	2	M-12-1	F7	GL	A	0.5	NO	FC	C	ST	Q	Y	-	OP-ST-SL-3001
HCV-2504A	SL	A	2	M-12-1	F7	GL	A	0.5	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-2504A	SL	A	2	M-12-1	F7	GL	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3021
HCV-2504B	SL	A	2	M-12-1	F7	GL	A	0.5	NO	FC	C	ST	Q	Y	-	OP-ST-SL-3001
HCV-2504B	SL	A	2	M-12-1	F7	GL	A	0.5	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-2504B	SL	A	2	M-12-1	F7	GL	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3021
HCV-2506A	SL	B	2	M-12-1	D7	GL	A	0.5	NO	FC	C	ST	CS	Y	J31	OP-ST-SL-3002
HCV-2506A	SL	B	2	M-12-1	D7	GL	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3022
HCV-2506B	SL	B	2	M-12-1	D7	GL	A	0.5	NO	FC	C	ST	CS	Y	J31	OP-ST-SL-3002
HCV-2506B	SL	B	2	M-12-1	D7	GL	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3022

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2507A	SL	B	2	M-12-1	C7	GL	A	0.5	NO	FC	C	ST	CS	Y	J31	OP-ST-SL-3002
HCV-2507A	SL	B	2	M-12-1	C7	GL	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3022
HCV-2507B	SL	B	2	M-12-1	C7	GL	A	0.5	NO	FC	C	ST	CS	Y	J31	OP-ST-SL-3002
HCV-2507B	SL	B	2	M-12-1	C7	GL	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3022
HCV-2603A	NG	A	2	M-42-1	D8	GL	A	1	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-2603A	NG	A	2	M-42-1	D8	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-NG-3001
HCV-2603A	NG	A	2	M-41-1	D8	GL	A	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3014
HCV-2603B	NG	A	2	M-42-1	D8	GL	A	1	NC	FC	C	ST	Q	Y	-	OP[illegible]-NG-3001
HCV-2603B	NG	A	2	M-42-1	D8	GL	A	1	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-2603B	NG	A	2	M-42-1	D8	GL	A	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3014
HCV-2604A	NG	A	2	M-42-1	D5	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-NG-3001
HCV-2604A	NG	A	2	M-42-1	D5	GL	A	1	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-2604A	NG	A	2	N-42-1	D5	GL	A	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3014
HCV-2604B	NG	A	2	M-42-1	D5	GL	A	1	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-2604B	NG	A	2	M-42-1	D5	GL	A	1	NO	FC	C	ST	Q	Y	-	OP-ST-NG-3001
HCV-2604B	NG	A	2	M-42-1	D5	GL	A	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3014
HCV-2808A	CCW	B	3	M-10-4	E5	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2808A	CCW	B	3	M-10-4	E5	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2808B	CCW	B	3	M-10-4	B5	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2808B	CCW	B	3	M-10-4	B5	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2808C	RW	B	3	M-10-4	D5	GL	A	1.5	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003
HCV-2808C	RW	B	3	M-10-4	D5	GL	A	1.5	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2808D	RW	B	3	M-10-4	A5	GL	A	1.5	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003
HCV-2808D	RW	B	3	M-10-4	A5	GL	A	1.5	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2809A	CCW	B	3	M-10-4	E4	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2809A	CCW	B	3	M-10-4	E4	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2809B	CCW	B	3	M-10-4	B4	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2809B	CCW	B	3	M-10-4	B4	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2809C	RW	B	3	M-10-4	D5	GL	A	1.5	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003
HCV-2809C	RW	B	3	M-10-4	D5	GL	A	1.5	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2809D	RW	B	3	M-10-4	B4	GL	A	1.5	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003
HCV-2809D	RW	B	3	M-10-4	B4	GL	A	1.5	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2810A	CCW	B	3	M-10-4	E3	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2810A	CCW	B	3	M-10-4	E3	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2810B	CCW	B	3	M-10-4	B3	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2810B	CCW	B	3	M-10-4	B3	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2811A	CCW	B	3	M-10-4	E2	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2811A	CCW	B	3	M-10-4	E2	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2811B	CCW	B	3	M-10-4	B2	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2811B	CCW	B	3	M-10-4	B2	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2812A	CCW	B	3	M-10-4	E1	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2812A	CCW	B	3	M-10-4	E1	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2812B	CCW	B	3	M-10-4	B1	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2812B	CCW	B	3	M-10-4	B1	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2813A	CCW	B	3	M-10-4	E6	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2813A	CCW	B	3	M-10-4	E6	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2813B	CCW	B	3	M-10-4	B6	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2813B	CCW	B	3	M-10-4	B6	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2814A	CCW	B	3	M-10-4	E8	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2814A	CCW	B	3	M-10-4	E8	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2814B	CCW	B	3	M-10-4	B8	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2814B	CCW	B	3	M-10-4	B8	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2815A	CCW	B	3	M-10-4	E7	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2815A	CCW	B	3	M-10-4	E7	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2815B	CCW	B	3	M-10-4	B7	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2815B	CCW	B	3	M-10-4	B7	GL	A	1.5	NO	FO	-	VPI	2YR	Y		OP-ST-VX-3005
HCV-2850	RW	B	3	M-100-1	B7	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2850	RW	B	3	M-100-1	B7	BU	A	20	NO	FO	-	VPI	2YR	Y		OP-ST-VX-3017
HCV-2851	RW	B	3	M-100-1	B6	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2851	RW	B	3	M-100-1	B6	BU	A	20	NO	FO	-	VPI	2YR	Y		OP-ST-VX-3017
HCV-2852	RW	B	3	M-100-1	B5	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2852	RW	B	3	M-100-1	B5	BU	A	20	NO	FO	-	VPI	2YR	Y		OP-ST-VX-3017
HCV-2853	RW	B	3	M-100-1	B4	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2853	RW	B	3	M-100-1	B4	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2874A	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2874A	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2874A	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2874B	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2874B	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2874B	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2875A	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2875A	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2875A	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2875B	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2875B	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2875B	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2876A	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2876A	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE *	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
HCV-2876A	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2876B	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2876B	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2876B	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2877A	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2877A	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2877A	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2877B	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2877B	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2877B	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2878A	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	-	VPI	Q	Y	-	OP-ST-VX-3017
HCV-2878A	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2878A	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2878B	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2878B	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2878B	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2879A	RW	B	3	M-100-1	C4	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2879A	RW	B	3	M-100-1	C4	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2879A	RW	B	3	M-100-1	C4	BU	A	14	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2879B	RW	B	3	M-100-1	B4	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2879B	RW	B	3	M-100-1	B4	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2879B	RW	B	3	M-100-1	B4	BU	A	14	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2880A	RW	B	3	M-100-1	E3	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2880A	RW	B	3	M-100-1	E3	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2880B	RW	B	3	M-100-1	E1	BU	A	12	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2880B	RW	B	3	M-100-1	E1	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2881A	RW	B	3	M-100-1	C3	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2881A	RW	B	3	M-100-1	C3	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2881B	RW	B	3	M-100-1	C1	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2881B	RW	B	3	M-100-1	C1	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2882A	RW	B	3	M-100-1	F3	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2882A	RW	B	3	M-100-1	F3	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2882B	RW	B	3	M-100-1	F1	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2882B	RW	B	3	M-100-1	F1	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2883A	RW	B	3	M-100-1	B3	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2883A	RW	B	3	M-100-1	B3	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2883B	RW	B	3	M-100-1	B1	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2883B	RW	B	3	M-100-1	B1	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2893	SI	A	2	210-130-2	B5	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2894	SI	A	2	210-130-2	C5	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2898A	CCW	B	3	M-10-1	D6	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2898A	CCW	B	3	M-10-1	D6	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2898B	CCW	B	3	M-10-1	D4	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2898B	CCW	B	3	M-10-1	D4	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2898C	RW	B	3	M-10-1	D6	GL	A	2	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003
HCV-2898C	RW	B	3	M-10-1	D6	GL	A	2	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2898D	RW	B	3	M-10-1	D6	GL	A	2	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003
HCV-2898D	RW	B	3	M-10-1	D6	GL	A	2	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2899A	CCW	B	3	M-10-1	C6	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2899A	CCW	B	3	M-10-1	C6	GL	A	2	NO	FO	-	BPI	2YR	Y	-	OP-ST-VX-3005
HCV-2899B	CCW	B	3	M-10-1	C4	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2899B	CCW	B	3	M-10-1	C4	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2899C	RW	B	3	M-10-1	C6	GL	A	2	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003
HCV-2899C	RW	B	3	M-10-1	C6	GL	A	2	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2899D	RW	B	3	M-10-1	C4	GL	A	2	NC	FO	O	ST	RO	Y	J41	OP-ST-RW-3003
HCV-2899D	RW	B	3	M-10-1	C4	GL	A	2	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
PCV-2909	SI	A	2	210-130-2	B5	GL	A	1	A	FC	C	ST	Q	Y	-	OP-ST-SI-3001
PCV-2909	SI	A	2	210-130-2	B5	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
PCV-2909	SI	A	2	210-130-2	B5	GL	A	1	A	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-2916	SI	A	2	210-130-2	C5	GL	A	1	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-2916	SI	A	2	210-130-2	C5	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
HCV-2916	SI	A	2	210-130-2	C5	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
PCV-2929	SI	A	2	210-130-2	B8	GL	A	1	A	FC	L	LT	2YR	-	E5	APPENDIX J
PCV-2929	SI	A	2	210-130-2	B8	GL	A	1	A	FC	C	ST	Q	Y	-	OP-ST-SI-3001
PCV-2929	SI	A	2	210-130-2	B8	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-2936	SI	A	2	210-130-2	C7	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
HCV-2936	SI	A	2	210-130-2	C7	GL	A	1	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-2936	SI	A	2	210-130-2	C7	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
PCV-2949	SI	A	2	210-130-2B	B8	GL	A	1	A	FC	L	LT	2YR	-	E5	APPENDIX J
PCV-2949	SI	A	2	210-130-2B	B8	GL	A	1	A	FC	C	ST	Q	Y	-	OP-ST-SI-3001
PCV-2949	SI	A	2	210-130-2B	B8	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-2956	SI	A	2	210-130-2B	C7	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
HCV-2956	SI	A	2	210-130-2B	C7	GL	A	1	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-2956	SI	A	2	210-130-2B	C7	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
PCV-2969	SI	A	2	210-130-2B	B5	GL	A	1	A	FC	L	LT	2YR	-	E5	APPENDIX J
PCV-2969	SI	A	2	210-130-2B	B5	GL	A	1	A	FC	C	ST	Q	Y	-	OP-ST-SI-3001
PCV-2969	SI	A	2	210-130-2B	B5	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-2976	SI	A	2	210-130-2B	C4	GL	A	1	NC	FC	L	LT	2YR	-	E5	APPENDIX J

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2976	SI	A	2	210-130-2B	C4	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
HCV-2976	SI	A	2	210-130-2B	C4	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-2983	SI	A	2	210-130-1	E8	GL	A	2	NC	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-2983	SI	A	2	210-130-1	E8	GL	A	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-2987	SI	B	2	210-130-3	E7	GA	P	4	NO	FO	C	ST	CS	Y	J32	OP-ST-SI-3002
HCV-2987	SI	B	2	210-130-3	E7	GA	P	4	NO	FO	O	ST	CS	Y	J32	OP-ST-SI-3002
HCV-2987	SI	B	2	210-130-3	E8	GA	A	4	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3019
HCV-2988	SI	B	2	210-130-3	D6	GL	S	2	NC	FC	C	ST	CS	Y	J19	OP-ST-SI-3002
HCV-2988	SI	B	2	210-130-3	D6	GL	S	2	NC	FC	O	ST	CS	Y	J19	OP-ST-SI-3002
HCV-2988	SI	B	2	210-130-3	D6	GL	S	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3019
IA-HCV-238-C	IA	C	3	C-4175-2	B7	CK	C	0.5	-	-	O	FS	CS	-	J33	NOTE 3 IC-ST-IA-3002
IA-HCV-238-C	IA	C	3	C-4175-2	B7	CK	C	0.5	-	-	C	FS	CS	-	J33	NOTE 3 IC-ST-IA-3002
IA-HCV-239-C	IA	C	3	C-4175-2	B7	CK	C	0.5	-	-	O	FS	CS	-	J33	NOTE 3 IC-ST-IA-3002
IA-HCV-239-C	IA	C	3	C-4175-2	B7	CK	C	0.5	-	-	C	FS	CS	-	J33	NOTE 3 IC-ST-IA-3002
IA-HCV-240-C	IA	C	3	C-4175-2	B7	CK	C	0.5	-	-	C	FS	CS	-	J17	NOTE 1 IC-ST-IA-3002
IA-HCV-240-C	IA	C	3	C-4175-2	B7	CK	C	0.5	-	-	O	FS	CS	-	J17	NOTE 1 IC-ST-IA-3002
IA-HCV-344-C	IA	C	3	C-4175-2	D7	CK	C	0.5	-	-	O	FS	CS	-	J21	NOTE 1 OP-ST-SI-3002
IA-HCV-344-C	IA	C	3	C-4175-2	D7	CK	C	0.5	-	-	O	FS	CS	-	J21	NOTE 1 OP-ST-SI-3002
IA-A/FIC-383-C	IA	C	3	M-264-4	D3	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-A/FIC-383-C	IA	C	3	M-264-4	D3	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-B/FIC-383-C	IA	C	3	M-264-4	B3	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-B/FIC-383-C	IA	C	3	M-264-4	B3	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-C/FIC-383-C	IA	C	3	M-264-4	C3	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-C/FIC-383-C	IA	C	3	M-264-4	C3	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-D/FIC-383-C	IA	C	3	M-264-4	A3	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-D/FIC-383-C	IA	C	3	M-264-4	A3	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 2 IC-ST-IA-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX															
VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE *	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
IA-LCV-383-1-C	IA	C	3	C-4175-2	N/A	CK	C	0.375	-	-	O	FS	CS	-	J40	NOTE 1 OP-ST-SI-3001
IA-LCV-383-1-C	IA	C	3	C-4175-2	D7	CK	C	0.375	-	-	C	FS	CS	-	J40	NOTE 1 OP-ST-SI-3001
IA-LCV-383-2-C	IA	C	3	C-4175-2	D7	CK	C	0.375	-	-	C	FS	CS	-	J40	NOTE 1 OP-ST-SI-3001
IA-LCV-383-2-C	IA	C	3	C-4175-2	D7	CK	C	0.375	-	-	O	FS	CS	-	J40	NOTE 1 OP-ST-SI-3001
IA-HCV-385-C	IA	C	3	C-4175-2	D7	CK	C	0.5	-	-	O	FS	CS	-	J34	NOTE 1 IC-ST-IA-3004
IA-HCV-385-C	IA	C	3	C-4175-2	D7	CK	C	0.5	-	-	C	FS	CS	-	J34	NOTE 1 IC-ST-IA-3004
IA-HCV-386-C	IA	C	3	C-4175-2	D7	CK	C	0.5	-	-	O	FS	CS	-	J34	NOTE 1 IC-ST-IA-3004
IA-HCV-386-C	IA	C	3	C-4175-2	D7	CK	C	0.5	-	-	C	FS	CS	-	J34	NOTE 1 IC-ST-IA-3004
IA-HCV-400A-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400A-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400B-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400B-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400C-TV	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400C-TV	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400D-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400D-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401A-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401A-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401B-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401B-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401C-TV	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401C-TV	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401D-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401D-C	IA	C	3	C-4175-2	D3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402A-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402A-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE "	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
IA-HCV-402B-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402B-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402C-TV	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402C-TV	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402D-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402D-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403A-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403A-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403B-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403B-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403C-TV	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403C-TV	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403D-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403D-C	IA	C	3	C-4175-2	C3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-438B-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	C	FS	CS	-	J24	NOTE 1 OP-ST-CCW-3004
IA-HCV-438B-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	O	FS	CS	-	J24	NOTE 1 OP-ST-CCW-3004
IA-HCV-438D-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	C	FS	CS	-	J24	NOTE 1 OP-ST-CCW-3004
IA-HCV-438D-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	O	FS	CS	-	J24	NOTE 1 OP-ST-CCW-3004
IA-HCV-480-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE #5
IA-HCV-480-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE #5
IA-HCV-481-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE #5
IA-HCV-481-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE #5
IA-HCV-484-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE #5
IA-HCV-484-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE #5
IA-HCV-485-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE #5
IA-HCV-485-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	C	FW	Q	-	-	NOTE #5

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX																
VALVE					COORD-	VALVE	OPER	VALVE	NORM	FAIL	TEST	TYPE	TEST	VPI	CODE	
NUMBER	SYS	CAT	CLASS	P&ID	INATES	TYPE	TYPE	SIZE *	POS	POS	REQ	TEST	FREQ	TEST	EXPT	REMARKS
IA-YCV-1045A-C	IA	C	3	C-4175-2	F7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-MS-3001
IA-YCV-1045A-C	IA	C	3	C-4175-2	F7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-MS-3001
IA-YCV-1045B-C	IA	C	3	C-4175-2	B7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-MS-3001
IA-YCV-1045B-C	IA	C	3	C-4175-2	B7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-MS-3001
IA-HCV-1107A-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	C	FS	RO	-	J38	IC-ST-AFW-3002
IA-HCV-1107A-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	O	FS	RO	-	J38	IC-ST-AFW-3002
IA-HCV-1107B-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	C	FS	RO	-	J38	IC-ST-AFW-3002
IA-HCV-1107B-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	O	FS	RO	-	J38	IC-ST-AFW-3002
IA-HCV-1108A-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	C	FS	RO	-	J38	IC-ST-AFW-3002
IA-HCV-1108A-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	O	FS	RO	-	J38	IC-ST-AFW-3002
IA-HCV-1108B-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	C	FS	RO	-	J38	IC-ST-AFW-3002
IA-HCV-1108B-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	O	FS	RO	-	J38	IC-ST-AFW-3002
IA-FCV-1368-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	C	FS	RO	-	J38	IC-ST-AFW-3001
IA-FCV-1368-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	C	FS	RO	-	J38	IC-ST-AFW-3001
IA-FCV-1369-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	C	FS	RO	-	J38	IC-ST-AFW-3001
IA-FCV-1369-C	IA	C	3	C-4175	N/A	CK	C	0.5	-	-	O	FS	RO	-	J38	IC-ST-AFW-3001
IA-HCV-2850-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2850-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2851-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2851-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2852-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2852-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2853-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2853-C	IA	C	3	C-4175-2	E7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2987-C	IA	C	3	C-4175-2	E7	CK	C	0.375	-	-	O	FS	CS	-	J32	NOTE 1 IC-ST-IA-3005
IA-HCV-2987-C	IA	C	3	C-4175-2	E7	CK	C	0.375	-	-	C	FS	CS	-	J32	NOTE 1 IC-ST-IA-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE *	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
IA-3092	IA	A	2	M-264-4	B5	DI	H	0.5	-	-	L	LT	2YR	-	-	APPENDIX J
IA-3093	IA	A	2	M-264-4	B5	DI	H	0.5	-	-	L	LT	2YR	-	-	APPENDIX J
IA-3094	IA	A	2	M-264-4	B5	DI	H	0.5	-	-	L	LT	2YR	-	-	APPENDIX J
IA-PCV-6680A-1-C	IA	C	3	P-49323	N/A	CK	C	0.5	-	-	C	FS	CS	-	J38	NOTE 4 IC-ST-IA-3006
IA-PCV-6680A-2-C	IA	C	3	P-49323	N/A	CK	C	0.5	-	-	C	FS	CS	-	J38	NOTE 4 IC-ST-IA-3007
IA-PCV-6680B-1-C	IA	C	3	P-49323	N/A	CK	C	0.5	-	-	C	FS	CS	-	J38	NOTE 4 IC-ST-IA-3007
IA-PCV-6680B-2-C	IA	C	3	P-49323	N/A	CK	C	0.5	-	[illegible]	C	FS	CS	-	J38	NOTE 4 IC-ST-IA-3007
IA-PCV-6682-C	IA	C	3	P-49323	N/A	CK	C	0.5	-	-	C	FS	CS	-	J38	NOTE 4 IC-ST-IA-3007
PCV-1849A-20B	IA	A	2	M-264-1	D8	GL	S	0.5	O	FC	C	LT	2YR	-	-	APPENDIX J
PCV-1849A-20A	IA	A	2	M-264-1	D8	GL	S	0.5	O	FC	C	LT	2YR	-	-	APPENDIX J

APPENDIX 2A

JUSTIFICATION FOR TESTS FREQUENCIES OTHER THAN CODE PREFERRED

JUSTIFICATION FOR TEST FREQUENCIES
OTHER THAN CODE PREFERRED

This section provides justification for alternate frequencies other than those preferred in the Code. Each frequency justification is identified by a unique number and identifies the valve(s) for which the frequency justification is presented. The specific Code test frequency requirement found to be impractical is defined and the justification for an alternative test frequency is given. Frequency justifications are numbered and referenced by number (Jx) on the Valve Test Program Matrix Table 2.1 for specific valves.

1. Frequency Justification Number J1 - Refueling Outage Justification

- Components:

  SI-100, SI-113

- Function:

  HPSI Pump Suction Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction

- Basis for Justification:

  These valves cannot be full-stroke exercised open Quarterly during plant operation or during Cold Shutdowns, since to do so would require a flow path to the RCS. That flow path cannot be utilized during power operation because the High Pressure Safety Injection (HPSI) pumps do not develop sufficient discharge pressure to overcome RCS pressure. This same flow path cannot be utilized during Cold Shutdowns because there is insufficient volume in the RCS to accommodate the flow required and a low temperature overpressure condition of the RCS could result.

- Alternate Testing:

  Valves will be partial-stroke exercised using the minimum recirculation flow path Quarterly during normal operations, and full-stroke exercised open during Refueling Outages.

  This method of partial-stroke exercising Quarterly and full-stroke exercising open during Refueling Outages is in accordance with the guidance set forth in Paragraph 4.2.1.2 O&M Part 10.

2. **Frequency Justification Number J2 - Cold Shutdown Justification**

- Components:

  PCV-102-1, PCV-102-2

- Function:

  Power Operated Relief Valves (PORV) for the Pressurizer

- Class:

  1

- Test Requirements:

  Quarterly Stroke-Timing Open and Closed

- Basis for Justification:

  These valves can only be opened or closed when there is a pressure differential across the valve. The valves have solenoid pilot valves that control their actuation. Since valves of this type have a history in the industry of sticking open and the PORVs are not credited in the safety analysis for overpressure protection during power operations, it is impractical to stroke these valves Quarterly during power operation. These valves cannot be partial-stroke tested because they are either fully opened or fully closed.

- Alternate Testing:

  The PORVs will be stroke-timed in the open and closed direction during the transition to Cold Shutdown (primary plant pressure is between 350 - 450 psia and primary plant temperature is between 300 - 350°F) prior to entering Mode 4. The PORVs will be tested during the transition from Hot Shutdown to Cold Shutdown (as defined by FCS Technical Specifications) whenever practical, i.e., normal plant shutdown. During a Technical Specification mandated shutdown, the PORVs will be tested during plant startup prior to entering Mode 2 (when primary plant pressure is between 350 - 450 psia and primary plant temperature is between 300 - 350°F).

3. **Frequency Justification Number J3 - Refueling Outage Justification**

- Components:

  SI-102, SI-108, SI-115

- Function:

  HPSI Pump Discharge Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in both the Open and Closed Directions

- Basis for Justification:

  These valves cannot be full-stroke or partial-stroke exercised open or closed during plant operation, Quarterly or during Cold Shutdowns, since to do so would require a flow path to the RCS. That flow path cannot be utilized during power operation because the HPSI pumps do not develop sufficient discharge pressure to overcome RCS pressure. This same flow path cannot be utilized during Cold Shutdowns because there is insufficient volume in the RCS to accommodate the flow required, and a low temperature overpressure condition of the RCS could result. Additionally, these valves cannot be exercised during Quarterly pump tests or miniflow because the minimum flow lines branch off upstream of the check valves and no flow occurs through these valves.

- Alternate Testing:

  Valves will be full-stroke exercised open and closed during Refueling Outages when the Reactor Vessel head is removed. This will provide an expansion volume to accommodate the flow required.

4. **Frequency Justification Number J4 - Cold Shutdown Justification**

- Components:

  SI-121, SI-129

- Function:

  LPSI Pump Discharge Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full-Stroke Exercising in both the Open and Closed Directions

- Basis for Justification:

  These valves cannot be partial-stroke or full-stroke exercised in the open or close direction Quarterly during power operation because there is no flow path available except during shutdown cooling. Additionally, these valves cannot be exercised open or closed during Quarterly pump tests or using the miniflow line because the minimum flow lines branch off upstream of the check valves and no flow occurs through these valves.

- Alternate Testing:

  Valves will be full-stroke exercised open and closed during Cold Shutdown.

5. **Frequency Justification Number J5 - Refueling Outage Justification**

- Components:

  CH-143, CH-155, CH-156

- Function:

  CH-143 - Charging Pump Boric Acid Supply Check Valve
  CH-155 - Charging Pump Boric Acid Gravity Feed Check Valve
  CH-156 - Charging Pump Safety Injection and Refueling Water Tank (SIRWT) Suction Check Valve

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction

- Basis for Justification:

  These check valves serve to permit direct feed of concentrated boric acid solution to the charging pump suction header. These check valves cannot be full-stroke or partial-stroke exercised Quarterly during power operation or Cold Shutdown. The only flow path through these valves is into the RCS; exercising would result in injecting highly concentrated boric acid into the RCS. Injecting concentrated boric acid into the RCS during power operation could cause a reactivity excursion or a plant shutdown. Injecting concentrated boric acid into the RCS during Cold Shutdown could delay reactor startup because of the requirement to establish the proper boron concentration prior to the reactor startup.

- Alternate Testing:

  Valves will be full-stroke exercised open during Refueling Outages.

6. Frequency Justification Number J6 - Cold Shutdown Justification

- Components:

  FW-161, FW-162

- Function:

  Steam Generator Normal Feedwater Inlet Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full-Stroke Exercising in the Closed Direction

- Basis for Justification:

  These check valves function to prevent the loss of inventory of the Steam Generators in the event of a line break upstream between valves HCV-1386 (HCV-1385) and check valve FW-161 (FW-162). These check valves cannot be full-stroke exercised closed Quarterly during power operation because the only flow paths are the Steam Generators. During power operation, the feedwater paths to the Steam Generators must not be isolated as this would remove the "heat sink" for the Reactor Coolant System.

- Alternate Testing:

  Valves will be full-stroke exercised closed during Cold Shutdown as defined in the FCS Technical Specifications, provided the feedwater system is able to be isolated from the Steam Generator and the feedwater lines are able to be drained as required to permit testing.

7. **Frequency Justification Number J7 - Cold Shutdown Justification**

- Components:

  FW-163, FW-164

- Function:

  Steam Generator Auxiliary Feedwater Injection Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full-Stroke Exercising in the Open Direction

- Basis For Justification:

  These check valves open for auxiliary feedwater flow to the Steam Generators. Exercising these valves during power operation would result in cold water injection to a portion of the Steam Generators normally at 400 - 500°F, which would cause unnecessary and possibly damaging thermal stresses in the Steam Generators.

- Alternate Testing:

  These check valves are exercised open during Cold Shutdown. Since failure of these valves to function in the reverse flow direction would **not** interfere with the plant's ability to shutdown or to mitigate the consequences of an accident, these check valves shall be full-stroke exercised only in the open direction.

8. Frequency Justification Number J8 - Refueling Outage Justification

- Components:

  HCV-176, HCV-177, HCV-178, HCV-179, HCV-180, HCV-181

- Function:

  Reactor Vessel Head and Pressurizer Vents

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing Open and Closed

- Basis for Justification:

  These valves are intended to be used to vent the Reactor Pressure Vessel (RPV) head and pressurizer. These valves are Target Rock solenoid valves, which have a history of sticking open when exercised. This could result in a small break Loss of Coolant Accident (LOCA) if these valves are stroke-timed at power or at Cold Shutdown. Therefore, partial or full-stroke timing during normal operation or Cold Shutdown is impractical.

- Alternate Testing:

  These valves will be stroke-timed in the open and closed directions during Refueling Outages.

9. **Frequency Justification Number J9 - Cold Shutdown Justification**

- Components:

  SI-194, SI-197, SI-200, SI-203

- Function:

  Shutdown Cooling Injection Check Valves

- Class:

  1

- Testing Requirements:

  Quarterly Full-Stroke Exercising in the Open Direction and Leakage Test During Cold Shutdown

- Basis for Justification:

  These check valves cannot be full-stroke exercised open or partial-stroke exercised Quarterly during power operation because no flow path is available at operating pressure due to system configuration. Since the SI pumps are not able to develop sufficient discharge pressure to overcome RCS pressure, the valves are not able to be exercised. Valves SI-194, SI-197, SI-200 and SI-203 are pressure isolation valves as defined by NRC GL 89-04 and as listed in the FCS Technical Specifications.

- Alternate Testing:

  These check valves are full-stroke exercised open during Cold Shutdown when the Shutdown Cooling system is in service. These check valves will be leak tested during Cold Shutdown in accordance with the requirements of FCS Technical Specification 2.1, Table 2-9, and Item 14 of the table format of this Program Plan.

10. **Frequency Justification Number J10 - Refueling Outage Frequency**

- Components:

  SI-195, SI-198, SI-201, SI-204

- Function:

  High Pressure Safety Injection to Reactor Coolant Loop Check Valves

- Class:

  1

- Test Requirements:

  Quarterly Full-Stroke Exercising in the Open Direction and Leakage Test During Cold Shutdown

- Basis for Justification:

  These check valves cannot be full-stroke or partial-stroke exercised open Quarterly during power operation because the only flow path available is into the RCS. Since the HPSI pumps do not develop sufficient discharge pressure to overcome RCS operating pressure, the valves cannot be exercised during Cold shutdown because the RCS does not contain an adequate expansion volume and a low temperature overpressurization of the RCS could result. Valves SI-195, SI-198, SI-201 and SI-204 are pressure isolation valves (PIVs) as defined by NRC GL 89-04 and as listed in the FCS Technical Specifications.

- Alternate Testing:

  These check valves will be full-stroke exercised open during Refueling Outages when the RCS is depressurized and the Reactor Vessel Head is removed in order to provide an expansion volume to accommodate the flow required. These check valves will be leak tested during Cold Shutdown in accordance with the requirements of FCS Technical Specification 2.1, Table 2-9, and Item 14 of the table format of this Program Plan.

11. Frequency Justification Number J11 - Refueling Outage Frequency

- Components:

  SI-196, SI-199, SI-202, SI-205, SI-343, CH-469

- Function:

  High Pressure Safety Injection to Reactor Coolant Loop Check Valves

- Class:

  1 - SI-196, SI-199, SI-202, SI-205, CH-469

  2 - SI-343

- Testing Requirements:

  Quarterly Full-Stroke Exercising in the Open Direction

- Basis for Justification:

  These valves function to prevent backflow through the Safety Injection pump discharge headers. These valves cannot be full-stroke or partial-stroke exercised open during power operation utilizing flow because the HPSI pumps do not develop sufficient discharge pressure to overcome RCS pressure. The charging pumps cannot be used during power operation because the flow path from the pumps would bypass the Regenerative Heat Exchanger and result in injecting cold water, causing thermal shock to the injection nozzles and a reactivity transient. Check valve SI-343 cannot be partial-stroke exercised during Cold Shutdowns because using the HPSI pumps could cause an overpressurization of the RCS; the HPSI pumps are therefore tagged out to prevent inadvertent operation.

- Alternate Testing:

  Check valves SI-196, SI-199, SI-202, and SI-205 will be partial stroke exercised during Cold Shutdown using the Charging Pumps and full-stroke exercised during Refueling Outages.

  Check valve CH-469 will be partial-stroke exercised open during Cold Shutdown using the charging pumps. Both check valves CH-469 and SI-343 will be full-stroke exercised open during Refueling Outages using the charging pumps and the HPSI pumps as necessary.

12. Frequency Justification Number J12 - Refueling Outage Justification

- Components:

  CH-198, CH-203, CH-204

- Function:

  Charging Pump discharge to RCS Check Valve (CH-198)
  Loop Charging Line to RCS Check Valves (CH-203, CH-204)

- Class:

  2 (CH-198)
  1 (CH-203, CH-204)

- Test Requirements:

  Quarterly Full-Stroke Exercising CH-198 in the Open and Close Directions
  Quarterly full-stroke exercising CH-203 and CH-204 in the Open Direction

- Basis for Justification:

  These check valves cannot be full-stroke exercised open or closed (for CH-198) during plant operations Quarterly or during Cold Shutdowns, since to do so would require the charging and HPSI pumps to be run which would require a flow path to the RCS. That flow path cannot be utilized during power operation because the HPSI pumps do not develop sufficient discharge pressure to overcome RCS pressure. This same flow path cannot be utilized during Cold Shutdowns because there is insufficient volume in the RCS to accommodate the flow required and a low temperature overpressure condition of the RCS could result.

- Alternate Testing:

  The check valves CH-198, CH-203, and CH-204 will be partial-stroke exercised in the open direction Quarterly during power operation using the charging pumps. The check valves will be full-stroke exercised in the open direction during Refueling Outages when the Reactor Vessel head is removed, using the charging pumps and the HPSI pumps. Check valve CH-198 will be full-stroke exercised in the close direction during Refueling Outages.

13. Frequency Justification Number J13 - Cold Shutdown Justification

- Component:

  TCV-202, HCV-204

- Function:

  Letdown Temperature Control Valve, Letdown Isolation Valve

- Class:

  1 - (TCV-202)
  2 - (TCV-204)

- Test Requirements:

  Quarterly Stroke-Timing Closed

- Basis for Justification:

  These valves are used for RCS Loop 2A, letdown isolation and temperature regulation. Stroking these valves Quarterly during power operation could result in the termination of letdown flow. This would isolate the RCS purification process and could potentially cause a reactivity excursion. These valves cannot be partial-stroked because the valves are either fully open or fully closed.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown when the RCS is depressurized.

14. **Frequency Justification Number J14 - Cold Shutdown Justification**

- Component:

  CH-205

- Function:

  Auxiliary Pressurizer Spray Check Valve

- Class:

  1

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction

- Basis for Justification:

  This check valve cannot be full-stroke exercised during plant operations Quarterly or during Cold Shutdowns, since to do so would require a flow path to the RCS. That flow path cannot be utilized during power operation because the HPSI pumps do not develop sufficient discharge pressure to overcome RCS pressure. This same flow path cannot be utilized during Cold Shutdowns because there is insufficient volume in the RCS to accommodate the flow required and a low temperature overpressure condition of the RCS could result.

- Alternate Testing:

  The check valves will be partial-stroke exercised in the open direction Quarterly during power operation using the charging pumps. The check valves will be full-stroke exercised in the open direction during Refueling Outages when the Reactor Vessel head is removed, using the charging pumps and the HPSI pumps.

15. Frequency Justification Number J15 - Refueling Outage Justification

- Component:

  HCV-206, HCV-241

- Function:

  RC Pump Control Bleedoff Isolation Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing Closed

- Basis for Justification:

  The Reactor Coolant Pump (RCP) seals serve as an RCS pressure boundary; therefore, seal failure could result in unisolable coolant leakage from the RCS. Isolation of the RCP seal bleed-off by stroking these valves closed would cause the seal bleed-off line relief valve (CH-208) to lift, directing reactor coolant directly to the Reactor Coolant Drain Tank (RCDT). If the leakage remained unchecked, the RCDT relief valve could lift directing reactor coolant to the Containment floor, causing a Ventilation Isolation Actuation Signal (VIAS). Additionally, the temporary isolation of pump seal flow (until the relief valve lifted) would eliminate the ability of the RC pump seal to break down RCS pressure and could potentially cause localized overheating of the seals. The pump seals can be damaged by overheating if seal water flow is stopped while the pumps are running. It is impractical to exercise these valves Quarterly or during any plant conditions that could result in abnormal seal wear. This could lead to failure of the RCP seals, creating unisolable leakage equivalent to a small break Loss of Cooling Accident (LOCA).

- Alternate Testing:

  The valves will be stroke-timed in the closed direction during cold shutdown, when the RCS is depressurized and the RCPs are secured.

16. Frequency Justification Number J16 - Cold Shutdown Justification

- Components:

  LCV-218-2, LCV-218-3

- Function:

  Volume Control Tank Outlet Isolation Valve and Charging Pump Suction From Safety Injection and Refueling Water Tank (SIRWT) Isolation Valve

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing Closed for LCV-218-2 and Quarterly Stroke-Timing Open for LCV-218-3

- Basis for Justification:

  These valves function to provide Volume Control Tank (VCT) level control and switch charging suction to the Safety Injection and Refueling Water Storage Tank (SIRWT). The valves cannot be stroke-tested Quarterly because doing so would terminate charging flow to the RCS and would have the potential for disrupting pressurizer level regulation or boron concentration regulation. Pressurizer level regulation disruption can lead to RCS pressure transients and disruption of boron concentration could cause reactivity excursions.

- Alternate Testing:

  Valve LCV-218-2 will be stroke-timed in the closed direction and valve LCV-218-3 will be stroke-timed in the open direction during Cold Shutdowns.

17. **Frequency Justification Number J17 - Cold Shutdown Justification**

- Components:

  IA-HCV-240-C, HCV-240, HCV-249

- Function:

  Instrument Air Accumulator Check Valve for HCV-240, Auxiliary Pressurizer Spray Isolation Valves

- Class:

  3 (IA-HCV-240-C), Class 1 (HCV-249, HCV-240)

- Test Requirements:

  Quarterly Exercising in the Open and Closed Directions for IA-HCV-240-C,
  Quarterly Exercising Open for HCV-249 and
  Stroke-Testing in the Open and Closed Directions for HCV-240

- Basis for Justification:

  These valves (HCV-240 and HCV-249) cannot be stroke-timed Quarterly during power operation because doing so will lead to large scale depressurization of the RCS and thermal shock of the pressurizer spray nozzle. The IA accumulator check valve (IA-HCV-240-C) cannot be full-stroke exercised in the open direction Quarterly during power operation, as exercising of the check valve will cause HCV-240 to cycle. This could cause large scale depressurization of the RCS and thermal shock of the pressurizer spray nozzle. The check valve (IA-HCV-240-C) cannot be partial-stroke exercised for the same reason.

- Alternate Testing:

  Valve IA-HCV-240-C will be exercised in the open and closed directions during Cold Shutdowns. Valves HCV-240 and HCV-249 will be stroke-timed in both the open and close directions during Cold Shutdowns.

18. Frequency Justification Number J18 - Cold Shutdown Justification

- Components:

  HCV-268

- Function:

  Concentrated Boric Acid to Charging Pump Suction Isolation Valves

- Class:

  3

- Test Requirements:

  Quarterly Stroke-Timing in the Open Direction

- Basis for Justification:

  These valves serve to isolate concentrated boric acid from the charging pump suction header. These valves cannot be stroke-timed Quarterly during power operation because doing so would allow concentrated boric acid solution to be injected into the RCS. Boration of the primary system during normal power operation would cause reactivity transients and possibly result in a plant shutdown. These valves cannot be partial-stroked for the same reason.

- Alternate Testing:

  Valves will be stroke-timed in the open direction during Cold Shutdown.

19. Frequency Justification Number J19 - Cold Shutdown Justification

- Components:

  HCV-308, HCV-2988

- Function:

  Parallel Charging Pump Discharge to HPSI Isolation Valve

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Open Direction for Valve HCV-308 and in the Open and Closed Directions for Valve HCV-2988

- Basis for Justification:

  These valves provide an alternate charging flow path into the HPSI header and an alternate source for long term core cooling. They cannot be stroke-timed Quarterly during power operation because a charging pump is continuously operating during power operation. Opening one of these valves would expose the HPSI header to charging pressure at a time when this is not a desired charging flow path. It is impractical to shut down the charging flow to perform this test because of the thermal and flow transients that would result.

- Alternate Testing:

  Valve HCV-2988 will be stroke-tested both in the open and closed directions during Cold Shutdown. HCV-308 will be stroke-tested in the open direction only, during Cold Shutdown.

20. **Frequency Justification Number J20 - Refueling Outage Justification**

- Component:

  SI-323

- Function:

  High Pressure Safety Injection Header Check Valve

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open and Closed Directions

- Basis for Justification:

  This check valve functions to prevent backflow of charging flow to the lower design pressure HPSI piping when the alternate charging flow path is active. The only flow path available is into the RCS and since the HPSI pumps do not develop sufficient discharge pressure to overcome RCS operating pressure, this valve cannot be exercised Quarterly during power operation. This valve cannot be exercised during Cold Shutdowns because the RCS does not contain an adequate expansion volume and a low-temperature overpressurization of the RCS could result. Additionally, this valve cannot be partial-stroke exercised during pump test or miniflow because the minimum flow lines branch off upstream of the check valve and no flow occurs through this valve.

- Alternate Testing:

  This check valve will be exercised full open and full closed during Refueling Outages.

21. Frequency Justification Number J21 - Cold Shutdown Justification

- Components:

  HCV-344, HCV-345
  IA-HCV-344-C

- Function:

  Containment Spray Header Isolation Valves
  Instrument Air Accumulator Check Valve

- Class:

  2 (HCV-344, HCV-345)
  3 (IA-HCV-344-C)

- Test Requirements:

  Quarterly Stroke-Timing in Both the Open and Closed Directions for HCV-344 and the Open Direction Only, for HCV-345. Quarterly Exercising to the Closed Direction for IA-HCV-344-C.

- Basis for Justification:

  Valves HCV-344 and HCV-345 serve as CS isolation. Valves cannot be stroke-tested Quarterly during power operation since the potential for spraying down the Containment is increased. These valves represent the only boundary between the CS and Safety Injection pump headers and the CS nozzles when manual valves SI-177 and SI-178 are open. The valves cannot be partial-stroked for the same reason.

  Valve IA-HCV-344-C is the IA accumulator check valve for process valve HCV-344, and functions to allow the valve to be closed on loss of IA, if required. This check valve cannot be exercised Quarterly as required as this would stroke the process valve, HCV-344.

- Alternate Testing:

  Valve HCV-344 shall be stroke-timed in both the open and closed direction during Cold Shutdown. HCV-345 shall be stroke-timed in the open direction during Cold Shutdown. The IA check valve IA-HCV-344-C shall be exercised in the closed direction during Cold Shutdown.

22. **Frequency Justification Number J22 - Cold Shutdown Justification**

- Components:

  HCV-347, HCV-348

- Function:

  Shutdown Cooling from Loop Isolation Valves

- Class:

  1

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves cannot be Quarterly stroke-timed closed during power operation because they are interlocked closed to ensure the integrity of the pressure boundary between Class 2501 and Class 301 piping when the RCS pressure is > 250 psia.

- Alternate Testing:

  These valves will be stroke-timed in the close direction during Cold Shutdown prior to initiating Shutdown Cooling (<300°F and <250 psi) while the Steam Generator is still available for removing decay heat from the primary.

23. **Frequency Justification Number J23 - Cold Shutdown Justification**

- Components:

  HCV-425A, HCV-425B, HCV-425C, HCV-425D

- Function:

  Inlet and Outlet Isolation Valves to SI Tank Leakage Coolers

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves serve to isolate Containment Penetrations M-39 and M-53, Component Cooling System penetrations. They cannot be Quarterly stroke-timed closed during power operation because failure of these valves in the closed position would terminate cooling flow to Safety Injection Tank leakage coolers. This would have the potential for lifting the relief valve (SI-222) to the Reactor Coolant Drain Tank (RCDT) which could eventually cause reactor coolant to overflow to the Containment floor, causing a Ventilation Isolation Actuation Signal (VIAS). These valves cannot be partial-stroked because they are either fully opened or fully closed.

- Alternate Testing:

  These valves will be stroke-timed in the close direction during Cold Shutdowns.

24. **Frequency Justification Number J24 - Refueling Outage Justification**

- Components:

  HCV-438A, HCV-438B, HCV-438C, HCV-438D, IA-HCV-438B-C, IA-HCV-438D-C

- Function:

  RCP Cooler Isolation Valves, Instrument Air Supply Check Valves

- Class:

  2 (HCV-438A, HCV-438B, HCV-438C, HCV-438D)
  3 (IA-HCV-438B-C, IA-HCV-438D-C)

- Test Requirements:

  HCV-438A, HCV-438B, HCV-438C and HCV-438D are Required to be Stroke-Timed Both in the Open and Close Directions Quarterly. IA Accumulator Check Valves (IA-HCV-438B-C and IA-HCV-438D-C) are Required to be Exercised Quarterly in the Open and Closed Directions.

- Basis for Justification:

  These valves serve to isolate Containment Penetrations M-18 and M-19, RCP seal cooling water. Exercising these valves would isolate cooling water flow to the RC Pumps which could damage the pumps if they are operating. RC pump failure during power operation could result in a plant shutdown. Therefore, it is not practical to exercise these valves Quarterly during power operations. During some Cold Shutdowns, Reactor Coolant temperature may be held above 130°F and plant conditions may not allow further cooldown or stopping all RC pumps. Exercising these valves during Cold Shutdowns when RC temperature is greater than 130°F or when any RC pump is running could result in RC pump damage. Therefore, it is not practical to exercise these valves when those plant conditions exist. These valves cannot be partial-stroked because they are either fully opened or fully closed.

  The IA accumulator check valves cannot be exercised Quarterly during power operation as exercising these check valves will cause cycling of the process valves.

24. **Frequency Justification Number J24 - Refueling Outage Justification (Continued)**

- Alternate Testing:

  Valves HCV-438A, HCV-438B, HCV-438C and HCV-438D will be stroke-timed in both the open and close direction during Cold Shutdown, provided the RCS is depressurized, RCS temperature is less than 130°F, and RCPs are secured. IA accumulator check valves (IA-HCV-438B-C, IA-HCV-438D-C) will be exercised closed during Cold Shutdown, provided the RCS is depressurized, RCS temperature is less than 130°F and the RCPs are secured.

25. **Frequency Justification Number J25 - Cold Shutdown Justification**

- Components:

  HCV-467A, HCV-467B, HCV-467C, HCV-467D

- Function:

  Nuclear Detector Well Cooling Units Cooling Water Isolation Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves serve to isolate containment Penetrations M-15 and M-11, Component Cooling Water (CCW) penetrations. These valves cannot be stroke-timed Quarterly during power operation because failure of these valves during testing would render the Nuclear Detector Well Cooling Units inoperable. This would cause the Nuclear Instrumentation to have erratic indication. Should the Nuclear Detector well cooling units fail, the LCO specified in Technical Specification 2.13 would be entered and could result in a plant shutdown. These valves cannot be partial-stroked because they are either fully opened or fully closed.

- Alternate Testing:

  These valves shall be stroke-timed in the close direction during Cold Shutdown.

26. **Frequency Justification Number J26 - Cold Shutdown Justification**

- Components:

  HCV-1041A, HCV-1042A

- Function:

  Main Steam Isolation Stop Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves serve to isolate the Main Steam headers. They cannot be tested Quarterly during power operation because doing so would isolate steam flow in the Steam Generators and result in a turbine and reactor trip. These valves cannot be partial-stroked because they are either fully opened or fully closed.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown.

27. **Frequency Justification Number J27 - Cold Shutdown Justification**

- Components:

  HCV-1041C, HCV-1042C

- Function:

  Main Steam Isolation Bypass Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves serve to provide a pathway from the Steam Generators to the steam dump and bypass valves in the event that the Main Steam Isolation Valves (MSIV) close. Stroke-timing these valves Quarterly during power operation is not acceptable because the valves are interlocked closed when the MSIVs are open. Bypassing this interlock could cause the MSIVs to close, causing the turbine to trip and resulting in a reactor trip. The valves cannot be partial-stroked for the same reason.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown.

28. **Frequency Justification Number J28 - Cold Shutdown Justification**

- Components:

  HCV-1385, HCV-1386

- Function:

  Main Feedwater Isolation Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  Valves HCV-1385 and HCV-1386 cannot be stroke-timed Quarterly during power operation because doing so would isolate feedwater to Steam Generators resulting in a reactor trip. These valves cannot be partial-stroked because they are either fully opened or fully closed.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown.

29. **Frequency Justification Number J29 - Cold Shutdown Justification**

- Components:

  HCV-1387A, HCV-1387B, HCV-1388A, HCV-1388B

- Function:

  Steam Generator Blowdown Isolation Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves cannot be Quarterly stroke-timed during power operation because doing so would terminate the Steam Generator blowdown and disrupt all volatile chemistry control. They cannot be partial-stroked because they are either fully opened or fully closed.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdowns.

30. Frequency Justification Number J30 - Refueling Outage Justification

- Components:

  PCV-1849A, PCV-1849B

- Function:

  Instrument Air Containment Isolation Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves serve to isolate IA pressure (via Penetration M-73) to containment systems. PCV-1849A (inboard) and PCV-1849B (outboard) were added during the refueling and maintenance outage (Fuel Cycle 12) in 1988 by Modification MR-FC-88-11 (OSAR 87-10). Stroke-timing cannot be performed Quarterly during power operations or Cold Shutdown with RCS temperature greater than 130°F and the RCS is not depressurized. The valves cannot be partial-stroked, because they are either fully opened or fully closed.

  The closing of these valves could:

  (1) cause fluctuations in the pressure control of the pressurizer (PCV-103-1, PCV-103-2),

  (2) result in damage to RCP seals (HCV-241),

  (3) disrupt RCS letdown to CVCS (TCV-202, LCV-101-1, LCV-101-2),

  (4) damage the Nuclear Detector instrumentation (HCV-467A/C),

  (5) cause level fluctuation in the SIT level (HCV-2916, HCV-2936, HCV-2956, HCV-2976), and

  (6) cause loss of the Steam Generator Blowdown (HCV-1387A and HCV-1388A).

  The ripple effect caused by the exercise stroking of PCV-1849A/B would be detrimental during power operation or when in Cold Shutdown with RCS temperature greater than 130°F and not depressurized.

30. **Frequency Justification Number J30 - Refueling Outage Justification (Continued)**

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown when the RCS temperature is less than 130°F with RCPs off and the RCS depressurized.

31. **Frequency Justification Number J31 - Cold Shutdown Justification**

- Components:

  HCV-2506A, HCV-2506B, HCV-2507A, HCV-2507B

- Function:

  Steam Generator Blowdown Sample Isolation Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves serve to isolate Steam Generator Blowdown sampling lines. These valves cannot be Quarterly stroke-timed during power operation because doing so would terminate blowdown sample line flow. The Steam Generator blowdown activity monitor is on the sample line. Technical Specification 2.9(1)e requires that blowdown activity shall be continuously monitored by the Steam Generator blowdown sample monitoring system when blowdown is occurring. Steam generator blowdown is a continuous function at the FCS. Partial-stroking cannot be performed since these valves are either fully opened or fully closed.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown.

32. **Frequency Justification Number J32 - Cold Shutdown Justification**

- Component:

  HCV-2987, IA-HCV-2987-C

- Function:

  High Pressure Safety Injection Alternate Header Isolation Valve, Instrument Air Accumulator Check Valve

- Class:

  2 (HCV-2987)
  3 (IA-HCV-2987-C)

- Test Requirements:

  Quarterly Stroke-Timing in Both the Open and Closed Direction (HCV-2987). Quarterly Full Flow Exercising in the Open and Closed Directions (IA-HCV-2987-C).

- Basis for Justification:

  Valve HCV-2987 closes to provide a Long Term Core Cooling (LTCC) flow path. It cannot be Quarterly stroke-timed during power operation because failure in a non-conservative position would block one of the Safety Injection flow paths. This could cause the plant to enter into an LCO and cause undue cycling of plant equipment. The IA accumulator check valve cannot be exercised Quarterly during power operation as exercising of this check valve will cause cycling of the process valve.

- Alternate Testing:

  This valve will be stroke-timed both in the open and closed directions during Cold Shutdowns. The IA accumulator check valve will be exercised in the open and closed directions during Cold Shutdown.

33. Frequency Justification Number J33 - Cold Shutdown Justification

- Components:

  IA-HCV-238-C, IA-HCV-239-C

- Function:

  Instrument Air Supply Check Valves

- Class:

  3

- Test Requirements:

  Quarterly Full-Stroke Exercising in Both the Open and Closed Directions

- Basis for Justification:

  These valves are check valves on IA accumulators attached to HCV-238 and HCV-239, which are located inside the Containment. The process valves (HCV-238 and HCV-239) are remotely stroke-tested in both the open and closed directions Quarterly, but due to inaccessibility during power operation, the check valves are not able to be tested.

- Alternate Testing:

  These check valves will be exercised in the open and closed directions at Cold Shutdown.

34. **Frequency Justification Number J34 - Cold Shutdown Justification**

- Components:

  IA-HCV-385-C, IA-HCV-386-C
  HCV-385, HCV-386

- Function:

  Instrument Air Supply Check Valves
  SIRWT Minimum Recirculation Isolation Valves

- Class:

  3 (IA-HCV-385-C, IA-HCV-386-C)
  2 (HCV-385, HCV-386)

- Test Requirements:

  Quarterly Full-Stroke Exercising in Both the Open and the Closed Direction.

  Quarterly Stroke Timing in Both the Open and the Closed Direction.

- Basis for Justification:

  These valves (IA-HCV-385-C and IA-HCV-386-C) are check valves on IA accumulators attached to HCV-385 and HCV-386 (Safety Injection Mini Flow Bypass Isolation Valves). The test methodology for the IA accumulator check valves requires the process valves to be closed greater than one hour each. This isolates the SI miniflow recirculation line, which, if the SI pumps start, could cause these pumps to operate at shutoff head. Therefore, the check valves are not able to be tested Quarterly. Running the SI pumps at shutoff head could cause the pumps to overheat and cavitate. Prolonged closure of these valves could cause equipment damage.

  These valves (HCV-385 and HCV-386) are Safety Injection Minimum Recirculation Flow isolation valves to the SIRWT (SI-5). The test methodology for these valves requires these valves to be stroke tested closed which isolates SI pump minimum recirculation flow path. During the time where one or both minimum-recirculation isolation valves are closed and a real or inadvertent start of a Safety Injection Pump occurs the pump would be deadheaded. This could cause damage to the SI pump and potentially degrade the margin of safety inherent to the SI system. Although the probability that a small Break LOCA would occur at the same time is very remote. Fort Calhoun Station has decided to stroke time HCV-385 and HCV-386 during Cold Shutdown. It is also important to know that during normal ops valves HCV-385 and HCV-386 are Normally Open, Fail Open, and are only required to close during a Recirculation Actuation Signal (RAS).

34. **Frequency Justification Number J34 - Cold Shutdown Justification (Continued)**

Fort Calhoun Station is confident the performing the stroke testing of HCV-385 and HCV-386 during Cold Shutdown in accordance with the ISI Program Plan will provide an acceptable alternative test frequency and will provide a reasonable assurance of the ability of the valves to function as required during a design accident condition.

- Alternate Testing:

These valves (IA-HCV-385-C and IA-HCV-386-C) will be full-stroke exercised in the open and closed directions at Cold Shutdown.

Valves HCV-385 and HCV-386 will be stroke-timed in both the Open and Closed directions at Cold Shutdown.

35. **Frequency Justification Number J35 - Refueling Outage Justification**

- Component:

  CH-166

- Function:

  Volume Control Tank Outlet Check Valve

- Class:

  2

- Test Requirements:

  Quarterly Full-Stroke Exercising in the Closed Direction

- Basis for Justification:

  This check valve serves to prevent a divergent path from the Boric Acid Injection system to the VCT. A divergent path may reduce the concentration of Boric Acid required to be injected into the RCS.

  This check valve cannot be full-stroke exercised in the closed direction Quarterly during power operation or Cold Shutdown. The only flow path through this valve is to the RCS, and would result in injecting highly concentrated boric acid into the RCS. Injecting concentrated boric acid into the RCS during Cold Shutdown could delay reactor startup because of the requirement to establish the proper boron concentration prior to reactor startup. The check valve cannot be partial-stroke exercised closed during power operation or Cold Shutdowns for the same reasons.

- Alternate Testing:

  Valve will be full-stroke exercised in the closed direction during Refueling Outages.

36. **Frequency Justification Number J36 - Refueling Outage Justification**

- Components:

  SI-135, SI-143, SI-149

- Function:

  Containment Spray Pump Discharge Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in both the Open and Closed Directions

- Basis for Justification:

  These valves cannot be full-stroke open or close exercised Quarterly during power operation because the only full flow path is into the CS headers. This would result in the spraying down of the equipment in containment, possibly causing equipment damage and requiring extensive cleanup. Also, these valves cannot be partial-stroke exercised during the Quarterly CS pump tests because the minimum flow lines branch off upstream of the check valves and therefore no flow occurs through these valves. Using the discharge tap downstream of the minimum flowlines will overflow the floor drains in the Auxiliary Building potentially creating an increase in radioactive contamination and background radiation levels.

- Alternate Testing:

  Valves will be full-stroke exercised in the open and closed direction during Cold Shutdown when the CS pumps are able to be aligned for shutdown cooling to the Shutdown Cooling Heat Exchangers (< 120°F primary temperature) in accordance with the FCS Technical Specifications.

37. **Frequency Justification Number J37 - Cold Shutdown Justification**

- Components:

  HCV-474

- Function:

  SI Pump SI-1A, SI-1B, SI-2A, SI-2B, SI-2C, Containment Spray Pumps SI-3A, SI-3B and SI-3C, Bearing Cooler CCW Isolation Valve

- Class:

  3

- Test Requirements:

  Quarterly Stroke-Timing in the Open Direction

- Basis for Justification:

  This valve serves to isolate Component Cooling Water (CCW) from the SI and CS pump bearing coolers. This valve cannot be Quarterly stroke-timed during power operation because failure of this valve in a non-conservative position could render the SI and Containment spray pumps inoperable depending on the condition of the pump seals and/or bearings (Ref. EA-FC-91-14). Should the CCW to bearing coolers fail, the LCO in Technical Specification 2.0.1 would be entered and could result in a forced plant shutdown. This valve cannot be partial stroked because it is either fully open or fully closed.

- Alternate Testing Methodology:

  Valve HCV-474 shall be stroke-timed in the open direction during Cold Shutdown.

38. **Frequency Justification Number J38 - Cold Shutdown Justification**

- Components:

  IA-PCV-6680A-1-C, IA-PCV-6680A-2-C, IA-PCV-6680B-1-C,
  IA-PCV-6680B-2-C, and IA-PCV-6682-C
  IA-HCV-1107A-C, IA-HCV-1107B-C, IA-HCV-1108A-C
  IA-HCV-1108B-C, IA-FCV-1368-C, and IA-FCV-1369-C

- Function:

  These check valves are Instrument Air supply header check valves for dampers PCV-6680A-1, PCV-6680A-2, PCV-6680B-1, PCV-6680B-2, and PCV-6682 (Control Room HVAC dampers).

  These check valves are Instrument Air supply header check valves for Auxiliary Feedwater isolation valves HCV-1107A/B and HCV-1108A/B and for the Auxiliary Feedwater pump FW-6 and FW-10 recirculation isolation valves.

- Class:

  3

- Test Requirements:

  Quarterly Full Flow Exercising in the Closed Direction

- Basis for Justification:

  These valves (IA-PCV-6680A-1-C/-2-C, 6680B-1-C/-2-C and IA-PCV-6682-C) cannot be exercised Quarterly during power operation, as exercising these check valves will cause isolation of the Control Room (CR) air filtration dampers. Failure of the CR air filtration dampers in a non-conservative position would cause the CR filtration system to be inoperable. This would require the plant to be in Cold Shutdown per Technical Specification 2.12. Failure of the dampers in the OPEN position would not allow the CR to be isolated during a toxic gas release. This would result in entry into Technical Specification 2.0.1.

  Check valves IA-HCV-1107A/B-C, -1108A/B-C, and FCV-1368-C/1369-C cannot be exercised Quarterly during power operation as exercising these check valves will cause possible isolation of Auxiliary Feedwater and render Auxiliary Feedwater inoperable for an extended period of time, possibly requiring the plant to be in Cold Shutdown per Technical Specification 2.5. Failure of the isolation valves in the open direction would not allow the required flow rate to the Steam Generator assuming loss of FW-10. This would result in entry into Technical Specification 2.0.1 (NOUE).

38. **Frequency Justification Number J38 - Cold Shutdown Justification (Continued)**

- Alternate Testing:

  Check valves IA-PCV-6680A-1-C, IA-PCV-6680A-2-C, IA-PCV-6680B-1-C, IA-PCV-6680B-2-C, and IA-PCV-6682-C will be full-stroke exercised in the close direction during cold shutdown. Check valves IA-HCV-1107A-C, IA-HCV-1107B-C, IA-HCV-1108A-C, IA-HCV-1108B-C, IA-FCV-1368-C, and IA-FCV-1369-C will be full-stroke exercised in both the open and close directions during cold shutdown.

39. Frequency Justification Number J39 - Refueling Outage Justification

- Components:

  HCV-1041B, HCV-1042B

- Function:

  Main Steam Stop Check (Reverse Flow) Valve.

- Class:

  2

- Test Requirements:

  Quarterly Reverse Full Flow Test Exercise

- Basis for Exception from O&M Part 10, Subsection 4.3.2.4:

  These check valves are swing type check valves which are installed to provide a positive isolation of the Steam Generators. If Main Steam header pressure is greater than Steam Generator pressure, the check valves prevent reverse back flow into a faulted Steam Generator. These check valves cannot be exercised Quarterly during power operation because doing so would cause steam to be isolated to the Main Steam header, causing the turbine to trip and resulting in a reactor trip. It is impractical to reverse flow test these check valves during Cold Shutdown; to do so would require the downstream side of the valves to have reverse flow sufficient to close the ~600 pound; 28 inch disks. To close these disks would require extensive modifications to the secondary side of the Main Steam system to permit sufficient ΔP to close the valve disks. Another method would be to fill the downstream side of the valve disks with fluid. To do this would require extensive piping and support modifications because of excessive loading on the Main Steam piping. To perform any type of successful reverse flow test on these check valves would require extensive plant modifications and manpower, and would subject the Main Steam system to potentially detrimental conditions, without providing a commensurate increase in public safety or check valve reliability.

- Alternate Testing:

  Check Valves HCV-1041B and HCV-1042B will be alternately disassembled and inspected one each Refueling Outage. Sample disassembly of these check valves is in accordance with O&M Part 10 and the NRC guidelines established in Generic Letter 89-04, Attachment 1, Position 2. For an 18-month refueling cycle, this method of sample disassembly and inspection ensures that each check valve is disassembled and inspected at least once every three years.

40. Frequency Justification Number J40 - Cold Shutdown Justification

- Components:

  LCV-383-1, LCV-383-2, HCV-383-3, HCV-383-4
  IA-LCV-383-1-C, IA-LCV-383-2-C

- Functions:

  LCV-383-1, LCV-383-2; SIRWT Isolation Valves
  HCV-383-3, HCV-383-4: Containment Sump Isolation Valves
  LCV-383-1-C, LCV-383-2-C; Instrument Air Supply Check Valves

- Class:

  2 (LCV-383-1, LCV-383-2, HCV-383-3, HCV-383-4)
  3 (IA-LCV-383-1-C, IA-LCV-383-2-C)

- Test Requirements:

  LCV-383-1, LCV-383-2; Quarterly stroke timing in both the Open and the Closed direction.

  HCV-383-3, HCV-383-4; Quarterly stroke timing in the Open direction.

  LCV-383-1-C, LCV-383-2-C: Quarterly full-flow exercising in both the Open and Closed direction.

- Basis for Justification:

  <u>Tech Spec Implications</u>

  OP-ST-SI-3001, Attachment 5, prior to PC 42612 contained a caution stating that "Closing LCV-383-1 renders LPSI Pump SI-1B, HPSI Pump SI-2B, and CS pumps SI-3C and 3B INOPERABLE." The applicable LCO action statements of Technical Specifications 2.1.1, 2.3, 2.4, and 2.7 must be implemented.

  Technical Specification 2.3(2) specifically states that during power operation, the Minimum Requirements may be modified to allow **one** of the following conditions to be true at any one time. If the system is not restored to meet the minimum....

  ...a. One low-pressure safety injection pump may be inoperable provided the pump is restored to operable status within 24 hours.

  ...b. One high-pressure safety injection pump may be inoperable provided the pump is restored to operable status within 24 hours.

40. **Frequency Justification Number J40 - Cold Shutdown Justification (Continued)**

By performing this test at power, two provisions of Tech Spec 2.3(2) are violated concurrently, requiring entry into Technical Specification 2.0.1.

Safeguards Implications

Operations reviewed the possibility of utilizing a dedicated operator during performance of this surveillance test. Using the guidance of the NRC Generic Letter 91-18, Operations Memo 93-11, and Standing Order G-100 (approved and issued), the following conclusions can be drawn. The Generic Letter information is explicit in stating that, generally, equipment is inoperable during surveillance. The use of a dedicated operator must be reviewed to ensure that the operator and his necessary actions would result in a configuration where the system did not need to be considered inoperable. In the case of LCV-383-1 and -2, this determination cannot be made. Even if a dedicated operator were stationed at the valve and were to immediately return the valve to an open condition in the event of an accident signal, the open travel time of the valves is roughly 30 seconds. The sequencer timer for a HPSI pump is approximately 3 seconds, with LPSI pumps following shortly in less than 15 seconds. Adding in reaction time of the operator, even a few seconds, there is a high probability that more than on SI pump would start without a suction source. Practically speaking, the most prudent action to prevent equipment damage would be to place the respective pumps in pull-out. This, however, renders the pump inoperable and the Tech Specs noted above apply. Thus, no positive operability determination can be made; instead, Tech Spec 2.0.1 again applies.

Testing of HCV-383-3 and -383-4 is performed in conjunction with the testing of LCV-383-1 and -383-2 (during the time frame when these valves are closed) because of the possibility that the check valves in the recirculation lines may not hold. If the check valve did not hold, and LCV-383-1 or -2 was left open, cycling.

HCV-383-3 or -4 could result in backing the SIRWT up into the containment sump. Among possible consequences of this, violating the Technical Specification on SIRWT level is one possibility. Consequently, it is preferable to close LCV-383-1/2 during cycling of HCV-383-3 or -4. Closing LCV-383-1/2 during power operation results in entry to Tech Spec 2.0.1 (see discussion for LCV-383-1/2, above).

40. **Frequency Justification Number J40 - Cold Shutdown Justification (Continued)**

Testing of LCV-383-1-C and -383-2-C is performed to demonstrate the ability of th instrument air check valve to isolate instrument air and continue to hold the valve closed with backup Nitrogen. The purpose of the test is to demonstrate the ability of nitrogen to hold the valve closed, and thus must be performed with LCV-383-1/2 in the closed condition. The closure of LCV-383-1/2 during power operation results in entry to Tech Spec 2.0.1 (see discussion for LCV-383-1/2, above). Therefore, testing of these check valves must be deferred to a cold/refueling condition.

- Alternate Testing

Valves (LCV-383-1, LCV-383-2) shall be stroke-timed in both the Open and Close directions at cold shutdown frequency.

Valves (HCV-383-3, HCV-383-4) shall be stroke-timed in the Open direction at cold shutdown frequency.

Valves (LCV-383-1-C, LCV-383-2-C) shall be exercised in the Open and Close directions at cold shutdown frequency.

41. **Frequency Justification Number J41 - Refueling Outage Justification**

- Components:

  HCV-482A, HCV-482B, HCV-483A, HCV-483B, HCV-2808C, HCV-2808D, HCV-2809C, HCV-2809D, HCV-2898C, HCV-2898D, HCV-2899C, HCV-2899D

- Functions:

HCV-482A, HCV-482B:	Shutdown Cooling Heat Exchanger, AC-4A, Backup Raw Water Inlet and Outlet Valves.
HCV-483A, HCV-483B:	Shutdown Cooling Heat Exchanger, AC-4B, Backup Raw Water Inlet and Outlet Valves.
HCV-2808C, HCV-2808D:	Low Pressure Safety Injection (LPSI) Pump SI-1A Bearing Cooling Backup Raw Water Inlet and Outlet Valves.
HCV-2809C, HCV-2809D:	Low Pressure Safety Injection (LPSI) Pump SI-1B Bearing Cooler Backup Raw Water Inlet and Outlet Valves.
HCV-2898C, HCV-2898D:	Control Room VA Unit VA-46A Backup Raw Water Inlet and Outlet Valves.
HCV-2899C, HCV-2899D:	Control Room VA Unit VA-46B Backup Raw Water Inlet and Outlet Valves.

- Class:

  3

- Test Requirements:

  Quarterly stroke timing in the Open direction.

- Basis for Justification:

  The subject valves provide backup Raw Water for cooling plant loads such as Control Room HVAC, LPSI Brg. Coolers, SDC HX normally cooled by Component Cooling Water (CCW) in the event of a loss of CCW for an extended period of time. The valves cannot be stroked quarterly or during cold shutdown because the performance of this test requires complete RW outage and securing CCW so as to not allow nitrates to contaminate the river water, (which is an environmental concern), nor to contaminate the CCW system with sand from the RW system. The RW system must be secured and drained as much as practical and the CCW system pressure must be low so as not to contaminate the RW system. Securing CCW and RW during every cold shutdown may not be practical due to the high decay heat experienced during cold shutdowns of short duration.

41. **Frequency Justification Number J41 - Refueling Outage Justification (Continued)**

- Alternate Testing:

  These valves will be stroke-timed in the Open direction during Refueling Outages.

APPENDIX 2B

JUSTIFICATION FOR EXCEPTION TO ASME SECTION XI/O&M MANUAL PARTS 1 AND 10, CODES FOR VALVES

JUSTIFICATION FOR EXCEPTION
TO ASME SECTION XI/O&M PARTS 1 AND 10 CODES FOR VALVES

This section provides justification for the exceptions taken to Code test requirements as allowed for in 10CFR50.55a(g)(5)(iii). Each Code exception is identified by a unique number and identifies the valve(s) for which the Code exception is being taken. The specific Code test requirement found to be impractical is defined and the basis for exclusion from Code requirements is presented. Any testing performed in lieu of Code requirements is specified. Two types of justifications are provided. The first is general in nature and pertain to Code requirements found to be impractical for numerous valves. The second type is used to justify Code exceptions for specific valves. Code exceptions for specific valves are numbered (Ex) and referenced by number on the Valve Test Program Matrix Table 2.1 for specific valves.

General: Code Exception Number G1

- Components:

  Category C Thermal Relief Valves

- Function:

  Thermal relief valves on safety related systems

- Class:

  1, 2, and 3

- Test Requirements:

  O&M Part 1 Subsection 1.1 Scope

- Basis for Exception from O&M Part 1, Subsection 1.1:

  The O&M Code Part 1 provides general requirements for periodic performance testing and monitoring of pressure relief devices utilized in nuclear power plant systems which are required to perform a specific function in shutting down a reactor or in mitigating the consequences of an accident. Thermal relief valves will not be tested in accordance with O&M Part 1 guidance as part of the FCS ISI Program Plan, as FCS has determined that the thermal relief valves do not fully meet the intent of the scope of O&M Part 1. Many safety related systems, particularly those with heat exchangers, have been provided with relief valves. These relief valves are thermal relief valves of small capacity intended to relieve pressure due to a thermal expansion of fluid in a "bottled-up" condition, which is considered a self-limiting transient. Experience has shown that failure of these valves will not result in a failure of the system to fulfill its safety function. Thus, most thermal relief valves are not considered to perform a function "important to safety", and as such have not been included in the FCS ISI Program Plan.

General: Code Exception Number G1 (Continued)

- Alternate Testing:

  Tests and test frequency for thermal relief valves will be controlled under the FCS Preventive Maintenance (PM) Program and be conducted in a similar manner as the FCS ISI Program Plan.

1. Code Exception Number E1 - Relief Request

- Components:

  SI-139, SI-140

- Function:

  SIRWT Discharge Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction and Leakage Testing Once Every Two Years

- Basis for Exception from O&M Part 10, Subsection 4.2.1.2:

  These check valves function to prevent backflow to the Safety Injection and Refueling Water Tank (SIRWT). These check valves are located in the lines leading from the SIRWT to the suctions of the Containment Spray (CS) pumps, the Low Pressure Safety Injection (LPSI) pumps and the High Pressure Safety Injection (HPSI) Pumps. The check valves under certain accident conditions must open sufficiently to provide design basis flow to all of these pumps. Because of this requirement the system design full-stroke exercising of these check valves Quarterly or during Cold Shutdowns cannot be performed. During power operation, no full flow path exists for the combination of pumps because the HPSI and LPSI pumps cannot overcome the RCS pressure, and the CS system cannot be permitted to spray down the Containment. No full flow path is available during Cold Shutdowns because operating the HPSI pumps could create a low-temperature overpressurization condition in the RCS. CS cannot be used because the Containment would be sprayed down. Additionally it is not possible to achieve the maximum design accident flow through the check valves during full flow exercising.

1. **Code Exception Number E1 - Relief Request (Continued)**

The corrective maintenance history of these two check valves has been limited to gasket/bolt/nut replacements since installation. In addition, the check valves are 20 inch stainless steel Mission-Duochek type valves which see very little flow during normal operations. OPPD has previously disassembled and inspected each of these check valves once with the results being that the check valves were "like new". The industry has experienced no failures with these type of check valves in similar applications at other facilities. The disassembly and subsequent inspection of these valves requires unnecessary radiation exposure as well as creating significant (i.e., > 50 gallons) liquid radwaste requiring disposal. Also, frequent disassembly and reassembly of the valves (i.e., every Refueling Outage) introduces unnecessary potential for valve failure due to damage caused by maintenance without providing a commensurate increase in plant safety or check valve reliability.

- Alternate Testing:

OPPD will require Check valves SI-139 and SI-140 to be alternately disassembled and inspected every other Refueling Outage. This sample disassembly of these check valves is in accordance with the NRC guidelines established in Generic Letter 89-04, Attachment 1, Position 2. In addition the check valves will be partial-stroke exercised in the open direction Quarterly and after reassembly during Refueling Outages. The check valves will be full-stroke exercised in the close direction during each Refueling Outage. This method of sample disassembly and inspection will ensure that each check valve is disassembled and inspected at least once every six years and will help to maintain personnel exposure ALARA, while at the same time providing reasonable assurance that integrity, quality and the ability to detect component degradation are maintained.

2. Code Exception Number E2 - Relief Request

- Components:

  SI-159, SI-160

- Function:

  Containment Recirculation Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction

- Basis for Exception from O&M Part 10, Subsection 4.2.1.2:

  These valves function to prevent backflow to the Containment lower level. These valves are backed up by motor operated isolation valves HCV-383-3 and HCV-383-4 which are normally closed, fail-as-is, and open only upon receipt of a containment Recirculation Actuation Signal (RAS). Due to system design, these valves cannot be partial-stroke or full-stroke exercised open during power operation, Cold Shutdown or Refueling Outage because the Containment sump is normally dry and there is no flow path available for testing. Full-stroke exercising these valves open requires that the Containment sump be filled with water and provided with a source of makeup water in addition to operating the CS pumps and the HPSI pumps at rated capacity. Therefore, system configuration renders flow testing of these valves impractical.

  The corrective maintenance history of these two check valves has been limited to gasket/bolt/nut replacements since installation. In addition, the check valves are 24 inch stainless steel Mission-Duochek type valves which see no flow during normal operations. OPPD has previously disassembled and inspected each of these check valves with the results being that the check valves were "like new". The industry has experienced no failures with this type of check valves in similar applications at other facilities. The disassembly and subsequent inspection of these valves requires unnecessary radiation exposure as well as creating significant (i.e., > 50 gallons) liquid radwaste requiring disposal, with minimal benefits. Also, frequent disassembly and reassembly of the valves (i.e., every Refueling Outage) introduces unnecessary potential for valve failure due to damage caused by maintenance without providing a commensurate increase in plant safety or check valve reliability.

2. **Code Exception Number E2 - Relief Request (Continued)**

- Alternate Testing:

  OPPD will require Check valves SI-159 and SI-160 to be alternately disassembled and inspected every other Refueling Outage. This sample disassembly of these check valves is in accordance with the NRC guidelines established in Generic Letter 89-04, Attachment 1, Position 2 with the exception of partial-stroke exercising. This method of sample disassembly and inspection will ensure that each check valve is disassembled and inspected at least once every six years and will help to maintain personnel exposure ALARA, while at the same time providing reasonable assurance that the integrity, quality and the ability to detect component degradation is maintained.

3. **Code Exception Number E3 - Relief Request**

- Components:

  SI-175, SI-176

- Function:

  Containment Spray Header Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction

- Basis for Exception from O&M Part 10, Subsection 4.2.1.2:

  These check valves are located inside Containment. These valves cannot be full-stroke or partial-stroke exercised open using system flow during any plant operating conditions because the only flow path is into the CS headers and would result in spraying down the Containment, causing equipment damage and requiring extensive cleanup.

  The corrective maintenance history of these two check valves has been limited to gasket/bolt/nut replacements since installation. In addition, the check valves are 12 inch stainless steel Mission-Duochek type valves which see no flow during normal operations. OPPD has previously disassembled and inspected each of these check valves with the results being that the check valves were "like new". The industry has experienced no failures with this type of check valves in similar applications at other facilities. The disassembly and subsequent inspection of these valves requires unnecessary radiation exposure with minimal benefits. Also, frequent disassembly and reassembly of the valves (i.e., every Refueling Outage) introduces unnecessary potential for valve failure due to damage caused by maintenance without providing a commensurate increase in plant safety or check valve reliability.

3. **Code Exception Number E3 - Relief Request (Continued)**

- Alternate Testing:

  Check valves SI-175 and SI-176 will be alternately disassembled every other refueling outage. The sample disassembly of these check valves is in accordance with the NRC guidelines established in Generic Letter 89-04, Attachment 1, Position 2 with the exception of partial-stroking. This method of sample disassembly and inspection will ensure that each check valve is disassembled and inspected at least once every six years and will help to maintain personnel exposure ALARA, while at the same time providing reasonable assurance that the integrity, quality and the ability to detect component degradation is maintained.

4. **Code Exception Number E4 - Relief Request**

- Components:

  SI-207, SI-208, SI-211, SI-212, SI-215, SI-216, SI-219, SI-220

- Function:

  Safety Injection Tank (SIT) Check Valves

- Class:

  1

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction
  Quarterly Full Flow Exercising in the Closed Direction and Leak Testing during Cold Shutdown

- Basis for Exception from O&M Part 10, Subsection 4.2.1.2:

  These valves cannot be exercised during power operation because a flow path does not exist due to the higher RCS pressure. The Safety Injection Tank pressure is less than RCS pressure during power operation. Also, these check valves cannot be exercised during Cold Shutdowns because the RCS does not contain sufficient volume to accept the flow required and a low temperature overpressure condition of the RCS could result.

- Alternate Testing:

  Check Valves will be full-stroke exercised in the open direction during Refueling Outages by "dumping" the Safety Injection Tanks to the Reactor Vessel. Test parameters such as SI tank level decrease vs. time, SI tank pressure, valve differential pressure, flow rate etc. are used to determine a flow coefficient. The minimum flow coefficient was determined using the safety analysis data provided by the NSSS vendor. Comparing this minimum flow coefficient as acceptance criteria to the flow coefficient determined by testing, assures FCS the valve is able to perform its safety function. This method of testing the check valves complies with the guidance provided in Generic Letter 89-04, Attachment 1, Position 1. Additionally, valves SI-208, SI-212, SI-216 and SI-220 will be partial-stroke exercised at Cold Shutdown frequency in the open direction using Shutdown Cooling flow.

5. Code Exception Number E5 - Relief Request

- Components:

CONTAINMENT PENETRATION NUMBER	VALVE NUMBER
M-2	HCV-204, *TCV-202
M-7	HCV-206, *HCV-241
M-8	*HCV-506A, HCV-506B
M-11	*HCV-467C, HCV-467D
M-14	*HCV-507A, HCV-507B
M-15	*HCV-467A, HCV-467B
M-18	*HCV-438C, HCV-438D
M-19	*HCV-438A, HCV-438B
M-20	HCV-500A, *HCV-500B
M-22	*HCV-2916, *HCV-2936, *HCV-2956, *HCV-2976, HCV-2983, *PCV-2909, *PCV-2929, *PCV-2949, *PCV-2969, SI-185
M-24	*HCV-509A, HCV-509B
M-25	*HCV-508A, HCV-508B
M-30	*HCV-882, VA-289
M-39	*HCV-425A, HCV-425B
M-42	HCV-2603A, *HCV-2603B
M-43	*HCV-2604A, HCV-2604B
M-45	*HCV-2504A, HCV-2504B
M-53	*HCV-425C, HCV-425D
M-69	*HCV-881, VA-280
M-73	*PCV-1849A, PCV-1849B
M-79	*HCV-1560A, HCV-1560B
M-80	*HCV-1559A, HCV-1559B
M-87	*PCV-742A, PCV-742B
M-88	*PCV-742C, PCV-742D

* Valve is tested in the reverse direction

- Function:

  Containment Isolation Valves

- Class:

  2

- Test Requirements:

  Valve Leak Test once every two years.

5. **Code Exception Number E5 - Relief Request (Continued)**

- Basis for Justification:

  These valves are tested in accordance with 10CFR50, Appendix J by pressurizing between the valves as permitted by IWV-3424(b), versus pressurizing the valves in the same direction as when the valves are performing their function as noted in IWV-3422. The valves cannot be tested in the direction of their design function due to system configuration, without extensive modifications to the piping system adjacent to each valve. These valves must be tested in pairs. Testing of these valves in the reverse direction results in higher leakage rates than testing in the accident direction. This is a more conservative approach to testing. Testing between the valves does not allow leak rate trending by valve.

- Alternative Testing:

  The valves marked with an asterisk will be leak tested in the direction opposite to the design function but in accordance with 10CFR50, Appendix J. Leak rates will be measured, recorded and trended by penetration.

6. **Code Exception Number E6 - Periodic Testing of Relief Valves**

- Components:

  FW-1525

- Function:

  Auxiliary Feedwater Pump Oil Cooler Relief Valve

- Class:

  3

- Test Requirements:

  A Minimum of 20% of Each Type and Manufacture Shall be Tested Within any 48 Months.

- Basis for Exception from O&M Part 1 Subsection 1.3.5(b):

  The relief valve is the only one of its type and manufacturer in its respective group. The intent of the Code is that all Class 3 relief valves be tested at least once every ten years (Reference O&M Part 1, Subsection 1.3.5(b)). This intent will be met. The current Refueling Outage frequency is 18 months. A review of historical maintenance records reveals that there have been no maintenance problems which justify testing the relief valve every other refueling outage. The scope of O&M Part 1 is to verify valve operability and detect any degradation in valve performance.

- Alternate Testing:

  The relief valve will be tested every third refueling outage.

PART 3: CLASS 1, CLASS 2, AND CLASS 3 PUMP TESTS

1.0 Program Summary

The Inservice Testing (IST) Program for ASME Class 1, 2 and 3 pumps was developed in accordance with and meets the requirements of ASME Operation and Maintenance of Nuclear Power Plants (O&M) 1987 Edition, 1988 Addenda. The IST for pumps will remain in effect for the remainder of the 120-month interval which began on September 26, 1993. The Program will be reviewed and updated, as appropriate, with that Edition of the Code in effect not more than 12 months prior to the start of the next 120-month interval.

The function of each pump in the Program is described in Section 3.8. Section 3.9 contains individual pump test requirements and exceptions to the Code (Table 3.1), as well as the codes used in the Table. Appendix 3A contains justifications for exceptions taken to the Code test requirements as provided for in 10CFR50.55a(g)(5)(iii). Justifications are general in nature and pertain to requirements found to be impractical. Code exceptions are numbered and referenced by number on the Pump Test Program Table 3.1.

2.0 Scope and Responsibility

2.1 The P&IDs of Part 4 identify the location of each Class 1, Class 2, and Class 3 pump.

2.2 Class 1, Class 2, and Class 3 pumps are to be tested in accordance with Part 6 of the O&M Manual. The test methods for each pump, and exceptions to the tests of O&M Part 6, are found in Appendix 3A.

3.0 Inservice Test Frequency

The inservice test frequency for Class 1, Class 2, and Class 3 pumps are in accordance with Part 6 of the O&M Manual, with exceptions as found in Table 3.1 and Appendix 3A.

4.0 Test Methods

The methods to be used to test Class 1, Class 2, and Class 3 pumps have been determined from Part 6 of the O&M manual. These methods, along with exceptions, are listed in Table 3.1 and Appendix 3A.

5.0 Evaluation of Test Results

The allowable ranges of test results shall be in accordance with Table 3 of Part 6 of the O&M Manual, as appropriate. All test data shall be analyzed within 96 hours after completion of a test in accordance with Part 6 of the O&M Manual.

If test data show that a pump is operating in the "Alert Range", remedies shall be taken, as required in accordance with O&M Part 6, until corrective action is taken. If the test data show that a pump is operating in the "Required Action Range," the pump shall be declared inoperable until corrective action is taken. Corrective action is defined as one or more of the following steps:

5.1 Recalibrate the applicable instruments and reperform the test, or

5.2 Repair or replace the component as required, or

5.3 Perform an Engineering Analysis to demonstrate that the pump is still able to perform its required safety design function.

6.0 **Records and Reports**

Records and reports for the testing of Class 1, Class 2, and Class 3 pumps shall be made in accordance with Part 6, Subsection 7, of the O&M Manual.

7.0 **Repair Requirements**

Tests, after pump replacement, repair or servicing, shall be made as required by O&M Part 6, Subsection 4.4

8.0 **Function of Pumps in the Program**

8.1 Auxiliary Feedwater (AFW) Pumps

FW-6 and FW-10 are the motor driven and the steam driven AFW pumps respectively. They supply makeup water to the Steam Generators during startup/shutdown condition. Subsequent to an automatic initiation signal when normal feedwater flow is unavailable, they supply water to the Steam Generators.

8.2 Component Cooling Water (CCW) Pumps

AC-3A, AC-3B and AC-3C are the three CCW Pumps. They supply cooling water to safety related components in the Containment and Auxiliary Buildings, including components containing radioactive or potentially radioactive fluids. They provide cooling water to Containment air coolers and the Control Room air conditioning units during both normal and accident conditions. In the event of a design basis accident, these pumps provide sufficient cooling water to the Engineered Safeguards equipment. Additionally, they supply cooling water to components to support normal plant operation, and to remove heat from the RCS via the Shutdown Cooling Heat Exchangers during normal plant cooldowns.

8.3 Raw Water Pumps

AC-10A, AC-10B, AC-10C and AC-10D are the four Raw Water Pumps. They supply cooling water to the CCW Heat Exchangers. They also supply cooling water directly to select safety related components in the event the CCW System is unavailable. Additionally, they supply water to the Demineralized Water System.

8.4 Safety Injection Pumps

SI-1A and SI-1B are the two LPSI Pumps. They inject borated water into the reactor coolant system following a LOCA. Additionally, they serve as Shutdown Cooling pumps by supplying water to the Shutdown Cooling Heat Exchangers for removal of residual heat during normal plant cooldown.

SI-2A, SI-2B and SI-2C are the three HPSI Pumps. They inject borated water into the reactor coolant system following a LOCA. Additionally, they are used to maintain the required water level in the Safety Injection Tanks.

SI-3A, SI-3B and SI-3C are the three CS Pumps. They spray borated water into the Containment to remove energy from the Containment vapor space after the initiation of a pressurization event in containment. Although there is a possibility of physically aligning the CS Pumps for Shutdown Cooling, that alignment should only be considered when the RCS is below 120°F and the RCS is vented to the Containment atmosphere with the vent area equivalent to a twelve-inch diameter pipe.

8.5 Chemical Volume and Control Pumps

CH-1A, CH-1B and CH-1C are the three Charging Pumps. CH-4A and CH-4B are the two Boric Acid Pumps. These five pumps inject concentrated borated water into the RCS under emergency conditions. These pumps also serve several non-safety related functions.

8.6 Diesel Generator Fuel Oil Transfer Pumps

FO-4A-1, FO-4A-2 and FO-4B-1, FO-4B-2 are the four Diesel Generator Fuel Oil Transfer Pumps. They take suction from the underground fuel oil storage tank and transfer fuel oil to the wall mounted auxiliary tanks.

9.0 Pump Test Program Table (Table 3.1)

This section provides a tabulation of all safety related pumps, both those pumps that are tested in accordance with the requirements of O&M Manual Part 6, and those pumps for which the Code requirements have been found to be impractical.

10.0 Additions to Program - Pumps

Pumps added to the ISI Program Plan as a result of plant/system modifications, engineering changes or re-evaluation of component eligibility requirements as per O&M Manual, Part 6, are considered operable based on interim acceptance criteria (established by construction or preoperational tests) until a reference value is able to be established.

PUMP TABLES

TABLE FORMAT
FORT CALHOUN STATION PUMP TEST PROGRAM MATRIX TABLE 3.1

The Pump Test Program Table has been coded to provide the following information:

1. **System and Drawing Number** - System the pump is in and the P&ID number.

2. **Coordinates** - Location on the P&ID where the pump is found.

3. **Pump Number** - Unique number assigned to each pump.

4. **Speed n** - This parameter is addressed with one of the following entries, which indicate test applicability, interval, or Code exception number respectively.

   - NR - Not Required
   - Q - Quarterly Test
   - E1, E2, E3, E4 - Code Exception Number

5. **Inlet Pressure P_i** - Same as number 4.

6. **Differential Pressure ΔP** - Same as number 4.

7. **Flow Rate Q** - Same as number 4.

8. **Vibration Amplitude V** - Same as number 4.

   V_d - Displacement (peak-peak)
   V_v - Velocity (peak)

9. **Discharge Pressure (P)** - Same as number 4.

10. **Code Exceptions** - If the pump is being tested in accordance with O&M Part 6 requirements, this column will be blank. However, for pumps which the O&M Part 6 requirements have been found to be impractical, a reference number is entered in this column. The reference number is addressed in Appendix 3A with a complete explanation of the specific exception and justification for that exception.

FORT CALHOUN NUCLEAR POWER STATION UNIT NO.1
PUMP TEST PROGRAM TABLE 3.1

SYSTEM & DRAWING NUMBER	COORDINATES	PUMP NUMBER	SPEED n*	INLET PRESSURE (P_i)	DIFFERENTIAL PRESSURE (ΔP)	FLOW RATE (Q)	VIBRATION DISPLACEMENT (V_d) Velocity (V_v)+	DISCHARGE PRESSURE (P) **	CODE EXCEPTIONS
AUX. FEEDWATER ++	C-6	FW-6	NR	Q	Q	Q	Q	Q	
11405-M-253	B-5	FW-10	Q	Q	Q	Q	Q	Q	
SHEET 4									
COMPONENT ++	E-6	AC-3A	NR	Q	Q	Q	Q	Q	E4
COOLING WATER	D-6	AC-3B	NR	Q	Q	Q	Q	Q	E4
11405-M-10	C-6	AC-3C	NR	Q	Q	Q	Q	Q	E4
SHEET 2									
RAW WATER ++	A-7	AC-10A	NR	E1	E1	Q	Q	Q	E1, E4
11405-M-100	A-6	AC-10B	NR	E1	E1	Q	Q	Q	E1, E4
	A-5	AC-10C	NR	E1	E1	Q	Q	Q	E1, E4
	A-4	AC-10D	NR	E1	E1	Q	Q	Q	E1, E4
SAFETY ++	B-3	SI-1A	NR	E1	E1	E2	Q	Q	E1, E2
INJECTION	A-3	SI-1B	NR	E1	E1	E2	Q	Q	E1, E2
E-23866-210-130	E-3	SI-2A	NR	E1	E1	E2	Q	Q	E1, E2.
SHEETS 1 AND 3	C-3	SI-2B	NR	E1	E1	E2	Q	Q	E1, E2
	D-5	SI-2C	NR	E1	E1	E2	Q	Q	E1, E2.
	C-3	SI-3A	NR	E1	E1	E2	Q	Q	E1, E2
	D-3	SI-3B	NR	E1	E1	E2	Q	Q	E1, E2
	E-3	SI-3C	NR	E1	E1	E2	Q	Q	E1, E2
CHEMICAL VOLUME	A-6	*+ CH-1A	NR	NR	NR	E3	Q	Q	E3
AND CONTROL *+/++	C-6	*+ CH-1B	NR	NR	NR	E3	Q	Q	E3
E-23866-210-120	E-6	*+ CH-1C	NR	NR	NR	E3	Q	Q	E3
SHEET 1 OF 2	A-3	++ CH-4A	NR	E1	E1	Q	Q	Q	E1
E-23866-210-121	B-6	++ CH-4B	NR	E1	E1	Q	Q	Q	E1
DIESEL GENERATOR	D-6	FO-4A-1	NR	NR	NR	Q	Q	Q	
FUEL OIL ++	C-6	FO-4B-1	NR	NR	NR	Q	Q	Q	
11405-M-262	F-6	FO-4A-2	NR	NR	NR	Q	Q	Q	
SHEET 1	E-6	FO-4B-2	NR	NR	NR	Q	Q	Q	

* SYNCHRONOUS OR INDUCTION MOTORS DO NOT REQUIRE SPEED CHECK (O&M PART 6, SUBSECTION 4.6.3)
** REQUIRED FOR POSITIVE DISPLACEMENT PUMPS (O&M PART 6, SUBSECTION 5.2 TABLE 2)

\+ VIBRATION DISPLACEMENT (P-P) FOR < 600 RPM, VIBRATION VELOCITY (PEAK) FOR ≥ 600 RPM (O&M PART 6, SUBSECTION 4.6.4 TABLE 3A)
++ PUMP SPEED ≥ 600 RPM
*+ PUMP SPEED ≤ 600 RPM

APPENDIX 3A

JUSTIFICATION FOR EXCEPTION TO O&M MANUAL PART 6 FOR PUMPS

JUSTIFICATION FOR EXCEPTION TO O&M MANUAL PART 6 FOR PUMPS

1. Code Exception Number E1 - Relief Request

- Components:

  Raw Water Pumps AC-10A, AC-10B, AC-10C, AC-10D
  Low Pressure Safety Injection Pumps SI-1A, SI-1B
  High Pressure Safety Injection Pumps SI-2A, SI-2B, SI-2C
  Containment Spray Pumps SI-3A, SI-3B, SI-3C
  Boric Acid Pumps CH-4A, CH-4B

- Class:

  2
  3

- Test Requirements:

  Measurement of Pump Inlet Pressure and Differential Pressure

Raw Water Pumps

- Basis for Exception O&M Part 6, Subsection 4.6.2.2, 5.2 and Table 2:

  System design does not include instrumentation for direct measurement of inlet and differential pressure.

- Alternate Testing:

  The pump inlet pressure will be calculated based on the river level and the elevation of the pump suction bells. The pump differential pressure will then be calculated based on the measured discharge pressure and the calculated inlet pressure. Since (1) the river provides the required positive pressure at the suction of the pumps, (2) the river level does not change when a pump is started, and (3) at least one pump is usually in service, the calculated inlet pressure prior to starting a pump is the same as with a pump running.

LPSI, HPSI and Containment Spray Pumps

- Basis for Exception from O&M Part 6, Subsections 4.6.2.2, 5.2 and Table 2:

  System design does not include instrumentation for direct measurement of inlet and differential pressure.

1. **Code Exception Number E1 - Relief Request (Continued)**

- Alternate Testing:

  The LPSI, HPSI and CS pumps take their suction directly from the Safety Injection and Refueling Water Tank and have inlet pressures due to the level of water in the tank above the pump inlets. The pump inlet pressures will be calculated based on the tank level and the difference in elevation between the tank and the pump inlets. Pump differential pressures will then be calculated by subtracting the calculated inlet pressure from the measured discharge pressures. Since the Safety Injection and Refueling Water Tank provides the required positive pressure at the suction of the pumps and since the tank level does not significantly change when a pump is started, the calculated pump inlet pressure prior to starting a pump is the same as with a pump running. Flow losses through the suction piping of these pumps are negligible. Since the losses would be the same from test to test, not including them in the test would still enable pump degradation to be identified.

Boric Acid Pumps

- Basis for Exception for O&M Part 6, Subsections 4.6.2.2, 5.2 and Table 2:

  System design does not include instrumentation for direct measurement of inlet and differential pressure.

- Alternate Testing:

  The Boric Acid Pumps take their suction directly from the Boric Acid Tanks and have an inlet pressure due to the level of acid in the tanks above the pump inlet. The pump inlet pressure will be calculated based on the Boric Acid Storage Tank level and the elevation difference between the tank level and the pump inlet. Pump differential pressure will then be calculated by subtracting the calculated inlet pressure from the measured discharge pressure.

2. **Code Exception Number E2 - Relief Request**

- Components:

  Low Pressure Safety Injection Pumps SI-1A, SB
  High Pressure Safety Injection Pumps SI-2A, B, C
  Containment Spray Pumps SI-3A, B, C

- Class:

  2

- Test Requirements:

  Measurement of Flow Rate Quarterly

Pressure Safety Injection Pumps

- Basis for Exception from O&M Part 6, Subsection 5.1 and Table 2:

  The flow rate of the LPSI pumps cannot be measured while they are operating on the minimum flow recirculation line because flow measurement instrumentation is not installed on this line. The pump minimum flow recirculation line must be used when testing these pumps Quarterly during power operation, because the only other flow path is into the RCS. This flow path cannot be utilized because the pump discharge pressure cannot overcome the RCS pressure.

- Alternate Testing:

  In addition to the Quarterly mini-flow test, pump flow rate will be measured on a Cold Shutdown frequency when an instrumented flow path to the RCS is available. This is in accordance with Position 9 (Pump Testing Using Minimum Flow Line With or Without Flow Measuring Devices) of Attachment 1 to the Generic Letter 89-04.

2. Code Exception Number E2 - Relief Request (Continued)

Containment Spray Pumps

- Basis for Exception from O&M Part 6, Subsection 5.1 and Table 2:

  The flow rate of the CS Pumps cannot be measured while they are operating on the minimum flow recirculation line because the flow measurement instrumentation is not installed on this line. The pump minimum flow recirculation line must be used when testing these pumps Quarterly during power operation, because the only other flow path is into the Containment spray headers which would result in water damage to equipment in Containment. Additionally, as approved by Amendment 136, Technical Specifications 2.1.1 states that the CS pumps will not be lined up on the shutdown cooling flow path until RCS temperature is below 120°F and a vent path is available. This is due to the fact that the suction side piping is designed to DBA conditions (60 psig) and valves on the suction piping are designed to 150 psig.

- Alternate Testing:

  In addition to the Quarterly mini-flow test, pump flow rate will be measured on a refueling outage frequency when an instrumented flow path to the RCS is available. This is in accordance with Item 9 (Pump Testing Using Minimum Flow Line With or Without Flow Measuring Devices) of Attachment 1 to Generic Letter 89-04.

High Pressure Safety Injection Pumps

- Basis for Exception from O&M Part 6, Subsection 5.1 and Table 2:

  The flow rate of the HPSI pumps cannot be measured while they are operating on the minimum flow recirculation line because the flow measurement instrumentation is not installed on this line. The pump minimum flow recirculation line must be used when testing these pumps Quarterly during power operation, because the only other flow path is into the RCS which cannot be utilized because the pump discharge pressure cannot overcome the RCS pressure.

- Alternate Testing:

  In addition to the Quarterly mini-flow test, pump flow rate will be measured on a refueling outage frequency when an instrumented flow path to the RCS is available. This is in accordance with Position 9 (Pump Testing Using Minimum Flow Line With or Without Flow Measuring Devices) of Attachment 1 to Generic Letter 89-04.

3. **Code Exception Number E3 - Relief Request**

- Components:

  Charging Pumps CH-1A, CH-1B, CH-1C

- Class:

  2

- Test Requirements:

  Any deviations from reference values shall be compared to the limits given in Table 3b of Subsection 6.1 of the O&M Part 6, and the specified corrective action taken.

- Basis for Exception from O&M Part 6, Subsection 6.1 and Table 3b:

  There is no minimum flow rate mentioned in the USAR for the charging pumps. A maximum flow rate of 40 gpm per pump is identified in the post-LOCA long term cooling section of the USAR. The reference flow rate value associated with these pumps is approximately 38 gpm. The charging pumps are positive displacement (reciprocating) type pumps. The flow rates for the charging pumps are established by the geometry of the positive displacement pump. The flow rate is a direct function of the amount of water displaced by the pump plungers with a constant speed pump.

- Alternate Testing:

  The discharge pressure for each pump will be set and recorded, then the flow rate measured Quarterly. The acceptable range for flow will be $35 \leq Q \leq 40$. The "Required Action" range will be < 35 gpm and > 40 gpm. It is not crucial to double the frequency as flow rates approach 35 gpm because there is no minimum required flow rate given in the USAR, and unless instrumentation has drifted out-of-calibration or test conditions have changed, the flow rate should not increase.

4. **Code Exception Number E4 - Relief Request**

- Components

  Component Cooling Water Pumps AC-3A, AC-3B, AC-3C
  Raw Water Pumps AC-10A, AC-10B, AC-10C, AC-10D

- Class

  3

- Test Requirements

  Section 5.2 of OM-6 requires that the system resistance be varied until either the measured differential pressure or measured flow rate equals the corresponding reference value. The quantities listed in Table 2 of OM-6 are then measured or observed and compared to the corresponding reference value. Rather than set the applicable pumps at a reference value, the licensee proposes to establish a range of values (pump curves) and test the pumps in the as-found operating condition.

- Basis for Exception from O&M Part 6, Subsection 5.2 Table 2:

  The Raw Water (RW) and Component Cooling Water (CCW) systems at Fort Calhoun Station (FCS) are designed such that the total pump flow cannot be adjusted to one specific value for the purpose of testing without adversely affecting the system flow balance and technical specification operability requirements. Therefore, the RW and CCW pumps must be tested in a manner that the RW and CCW loops remain properly flow balanced during and after the testing. In addition, certain supplied loads (e.g. cooling of Control Element Drive Mechanisms) must remain fully operable per Technical Specifications to maintain the required level of plant safety during power operation.

4. **Code Exception Number E4 - Relief Request (Continued)**

The RW and CCW systems loops are not designed with full flow test lines with single throttle valves. Therefore, the flow cannot be throttled to a fixed reference value every time a pump test is performed. Total pump flow rate can only be measured using the total flow indication as installed and read on the supply headers. There are no valves available in any of the loops, on either the supply or return lines, for the purpose of throttling total RW or CCW system flows. Only the flow of the served components are able to be individually throttled. The main loops of RW and CCW are piped in parallel with each other. Many loads are throttled to flow ranges specified in the FCS Design Basis Documents (DBD). All loads are aligned in parallel, and receive RW/CCW flow when the RW/CCW pumps are running regardless of which served components are in service. During power operation, certain loops of RW/CCW are required to be operable per Technical Specifications. Specific loops/components of RW/CCW cannot be taken out of service for testing without entering an action statement for a Limiting Condition for Operation (LCO). Also, exceeding certain individual component flows/temperatures (e.g., reactor coolant pump seals) can require plant shutdown in two hours, depending on the load in question.

Certain RW/CCW loops are flow balanced during each refueling outage (at a nominal 18-month frequency) to ensure that all loads are adequately supplied. Flow ranges are specified for these loads in order to balance flows against each other. Once properly flow balanced, minimal flow adjustment can be made for any one particular load without adversely impacting the operability of the remaining loads (i.e., increasing flow for one load reduces flow for all of the others). Each time the system is flow balanced, proper individual component flows are produced, but this in turn does not necessarily result in one specific value for total flow. Because certain loads have an acceptable flow range, overall system full flow (the sum of the individual component flows) also has a range. Consequently, the Code requirements to quarterly adjust RW/CCW loop flow to one specific flow value for the performance of inservice testing conflicts with FCS system design and component operability requirements (i.e., flow balance) as required by Technical Specifications.

4. **Code Exception Number E4 - Relief Request (Continued)**

- Alternate Testing

As discussed above in the Test Requirements section, it is extremely difficult to return to a specific value of flow rate or differential pressure for testing of these pumps. Multiple reference points could be established according to the Code, but obtaining reference values at every possible point, even over a small range is not feasible. An alternative to the testing requirements of OM Part 6, Section 5.2, is to base the acceptance criteria on a reference pump curve. Flow rate and differential pressure are measured/calculated during inservice testing and compared to an established baseline reference curve. In addition, trending is accomplished by taking the ratio of the reference curve differential pressure versus flow and the actual differential pressure versus flow.

The following elements are used in developing and implementing the reference pump curves:

1. A reference pump curve (differential pressure vs. flow) has been established for RW pumps AC-10A, AC-10B, AC-10C, and AC-10D, and for CCW pumps AC-3A, AC-3B, and AC-3C from data taken on these pumps when they were known to be operating acceptably. These pump curves represent pump performance close to the original manufacturer's pump test data.

2. Pump curves are based on four or more test points whenever possible. Rated capacities of these pumps are 6,000 - 7,000 gpm for the RW pumps and 4,500 - 5,500 gpm for the CCW pumps.

3. To reduce the uncertainty associated with the pump curves and to ensure the adequacy of the acceptance criteria, all instruments used in establishing the baseline reference pump curves either meet or exceed the Code required accuracy.

4. The reference baseline pump curves are compared to the manufacturer's pump curves which were validated during plant preoperational testing.

5. Review of the pump hydraulic data trend plots indicates close correlation with established pump reference curves, thus validating the accuracy of the pump curves to assess the pumps' operational readiness.

4. **Code Exception Number E4 - Relief Request (Continued)**

6. The reference pump curves are based on differential pressure vs. flow. See the attached sample AC-3A and AC-10A pump acceptance criteria sheets [see Figures 1 and 2]. Areas for Required Action are as shown for AC-3A in [Figure 1]. Areas for Acceptable, Alert, and Required Action are as shown for AC-10A in [Figure 2]. These acceptance criteria limits do not conflict with operability criteria (minimum operability) as shown on [Figures 1 and 2].

7. Only a small portion of the established reference curve is being used to accommodate flow rate variance due to flow balancing of various system loads.

8. Review of recent vibration data trend plots indicates that the change in vibration readings over the range of the pump curves being used is insignificant; therefore, only one fixed reference value has been assigned for each vibration measurement location.

9. After maintenance or repair that may affect the existing baseline reference pump curves, a new reference pump curve is determined or the existing pump curve revalidated by an inservice test. The design of the FCS RW and CCW systems and the Technical Specification requirements make it impractical to adjust system flows to a fixed reference value for inservice testing without adversely affecting the system flow balance and Technical specification operability requirements. Proposed alternate testing using a reference pump curve for each pump provides adequate assurance and accuracy in monitoring pump condition to assess pump operational readiness and will adequately detect pump degradation. The proposed alternate testing will have no adverse impact on plant or public safety.

- Conclusion

Relief to use pump curves for testing the RW and CCW pumps is granted pursuant to 10CFR50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the Code requirements to test pumps at a reference value of either differential pressure and measure flow or flow and measure differential pressure. The granting of relief is in consideration of the adequacy of an alternative method of testing and the burden if the Code requirements were imposed.

PART 4 REFERENCES

1. Fort Calhoun Station Technical Specifications.

2. ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition.

3. ASME/ANSI Operation and Maintenance of Nuclear Power Plants, 1987 Edition, 1988 Addenda.

4. NRC Generic Letter No. 89-04, "*Guidance on Developing Acceptable Inservice Testing Programs*".

5. NRC's Safety Evaluation Report on Revision 3 and 4 of the Fort Calhoun Station's Inservice Inspection/Testing Program Plan (1983-1993), Dated December 22, 1988 and July 3, 1989.

6. NRC's Safety Evaluation Report on Revision 5 of the Fort Calhoun Station's Inservice Inspection/Testing Program Plan (1983-1993), Dated March 13, 1990.

7. ASME Code Cases

Code Cass N-461*	Alternative Rules for Piping Calibration Block Thickness. Approval Date: November 30, 1988
Code Case N-481*	Alternative Examination Requirements for Cast Austenitic Pump Casings. Approval Date: March 5, 1990
Code Case N-491*	Alternative Rules for Examination of Class 1, 2, 3 and MC Component Supports of Light-Water Cooled Power Plants. Approval Date: March 14, 1991
Code Case N-498*	Alternative Rules for Ten-year Hydrostatic Pressure Testing for Class 1 and 2 Systems. Approval Date: May 13, 1991
Code Case N-509	Alternative Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments, Section XI, Division 1.
Code Case N-524	Alternative Examination Requirements for Longitudinal Welds in Class 1 and 2 Piping, Section XI, Division 1.

* Code cases approved by NRC-Reference NRC Regulatory Guide 1.147.

8. The following OPPD Piping and Instrumentation Drawings:

Number	**Title**
11405-M-1	*Containment Heating Cooling & Ventilating System*
11405-M-5	*Demineralized Water System*
11405-M-6	*Waste Disposal System*
11405-M-7	*Waste Disposal System*
11405-M-10	*Auxiliary Coolant Component Cooling System*
11405-M-12	*Primary Plant Sampling System*
11405-M-13	*Plant Air System*
11405-M-40	*Auxiliary Coolant Component Cooling System Flow*
11405-M-42	*Nitrogen, Hydrogen, Methane, Propane & Oxygen Gas System*
11405-M-98	*Waste Disposal System*
11405-M-100	*Raw Water System*
11405-M-252	*Steam System*
11405-M-253	*Steam Generator Feedwater & Blowdown System*
11405-M-254	*Condensate System*
11405-M-262	*Fuel Oil System*
11405-M-264	*Instrument Air System*
E-23866-210-110	*Reactor Coolant System*
E-23866-210-120	*Chemical & Volume Control System*
E-23866-210-121	*Chemical & Volume Control System*
E-23866-210-130	*Safety Injection & Containment Spray System*
B120F07001	*Diesel Generator Starting Air System*
C-4175	*Control Valve Air Source Valve Lineup/Listing*
D-4078	*Reactor Coolant Gas Vent System*

ATTACHMENT 3

PIPING AND INSTRUMENTATION DIAGRAMS FOR ISI PROGRAM PLAN

DWG. NUMBER		SYSTEM	FILE #
11405-M-10	SH.2	AUXILIARY COOLING	55195
11405-M-10	SH.3	AUXILIARY COOLING	55196
11405-M-10	SH.4	AUXILIARY COOLING	55197
11405-M-40	SH.1	AUXILIARY COOLING	35367
11405-M-40	SH.2	AUXILIARY COOLING	35368
11405-M-40	SH.3	AUXILIARY COOLING	35369
11405-M-100		RAW WATER	10454
11405-M-252	SH.1	MAIN STEAM	10458
11405-M-253	SH.1	FEEDWATER	10459
11405-M-254	SH.2	AUXILIARY FEEDWATER	55540
23866-210-110	SH.1	REACTOR COOLANT	10475
23866-210-110	SH.1A	REACTOR COOLANT	42107
23866-210-120	SH.1	VOLUME CONTROL	10476
23866-210-120	SH.1A	VOLUME CONTROL	55158
23866-210-130	SH.1	SAFETY INJECTION	10479
23866-210-130	SH.2	SAFETY INJECTION	10480
23866-210-130	SH.2A	SAFETY INJECTION	41901
23866-210-130	SH.2B	SAFETY INJECTION	41902
23866-210-130	SH.3	SAFETY INJECTION	56027

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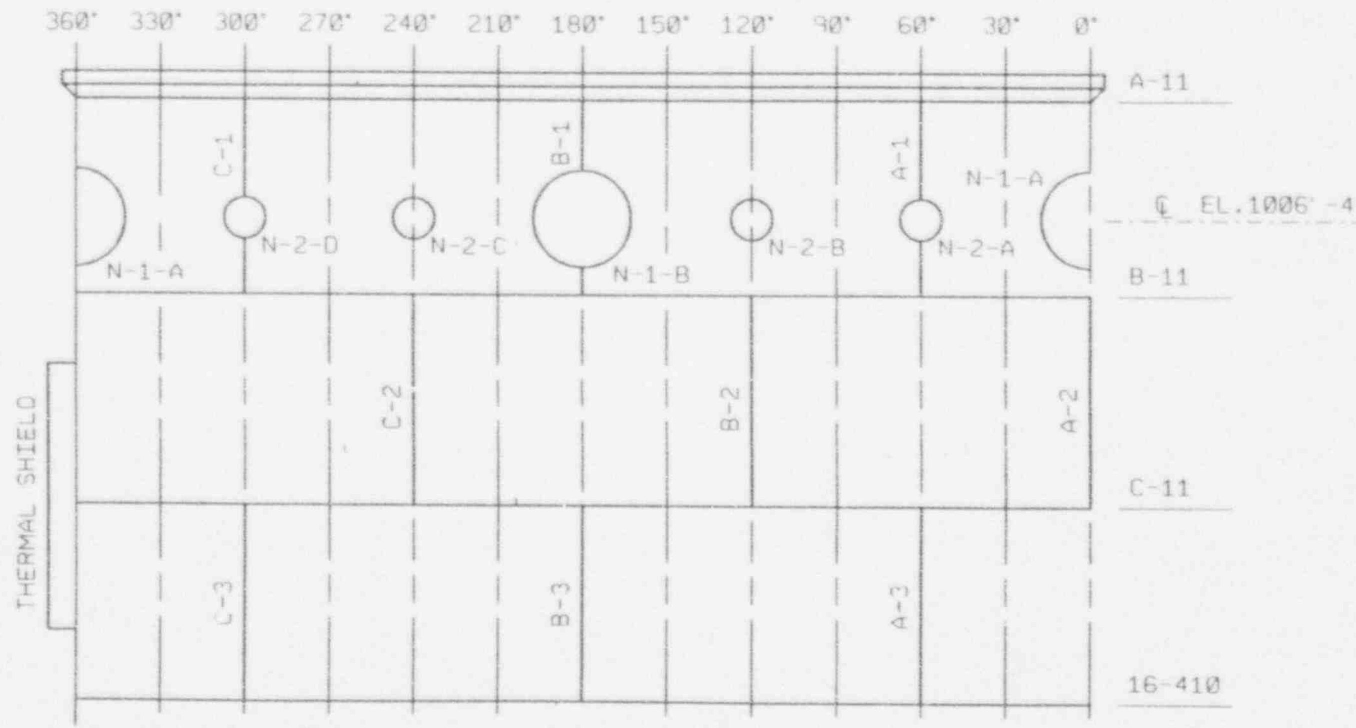
ATTACHMENT 4

ISI ISOMETRIC DRAWINGS FOR CLASS 1, 2, AND 3 PIPING

NOTE: CLASS 1 ARE LABELED "A", CLASS 2 ARE LABELED "B" AND "D", AND CLASS 3 ARE LABELED "C". ALL SNUBBER LOCATIONS ARE DESIGNATED WITH A SOLID CIRCLE ON THE PIPE WHILE ALL OTHER SUPPORTS ARE SHOWN WITH AN OPEN CIRCLE.

ERRATA:
- B-10 SHOULD SHOW WELD 5 AS THE TEE TO REDUCER.
- B-48 SHOULD SHOW SUPPORT 14-PR (ACH-270) AS PART OF SUPPORT 14-PS (ACS-92).
- C-12 SHOULD SHOW SUPPORT FWH-132 AS AN OPEN CIRCLE.
- C-14 SHOULD SHOW SUPPORT FWS-83 AS A SOLID CIRCLE AND SUPPORT FWH-224 AS AN OPEN CIRCLE.
- C-19 SHOULD SHOW THE 16-RW-1 LINE AS CONTINUING ON C-22.
- C-20 SHOULD SHOW THE ROOM LOCATION AS ROOM 69.
- C-25 SHOULD SHOW SUPPORT RWS-42 AS RWH-42 AND SUPPORT RWH-34 RWS-34.
- C-61 SHOULD SHOW SUPPORT 19-PR AS INTEGRAL.



REACTOR PRESSURE VESSEL WELDS

CALIBRATION BLOCKS:
- 2 - FCL
- 5 - FCL
- 7 - FCL
- 8 - FCL

RPV-N1-1 (VESSEL INTERIOR)
RPV-N3-CSS-1 (CORE SUPPORT STRUCTURE)

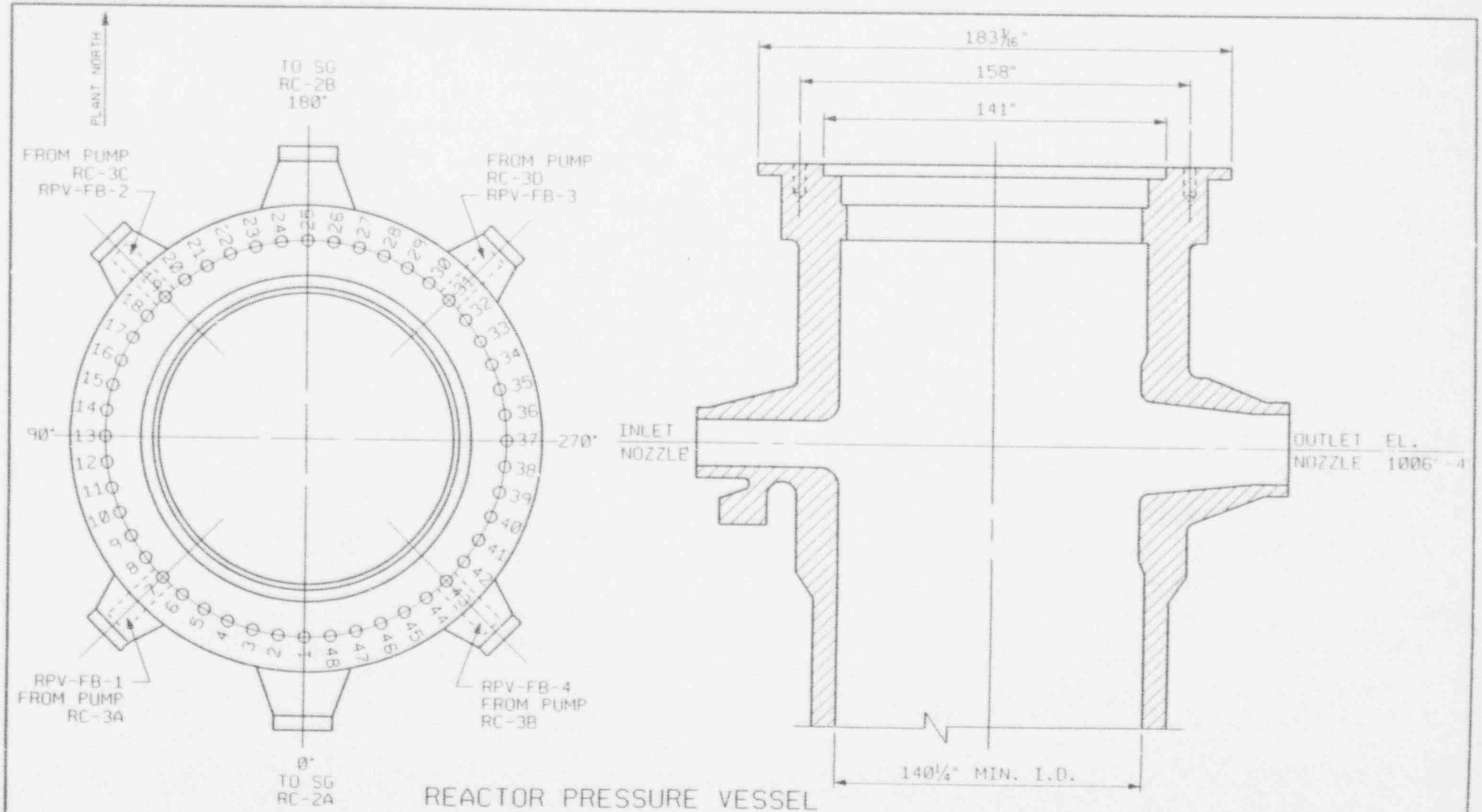
REF.DWGS.
E-232-408-5

CONTAINMENT

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-1
DWG. FIGURE A-1, SH.1 OF 1

DATE	TASK/MR #

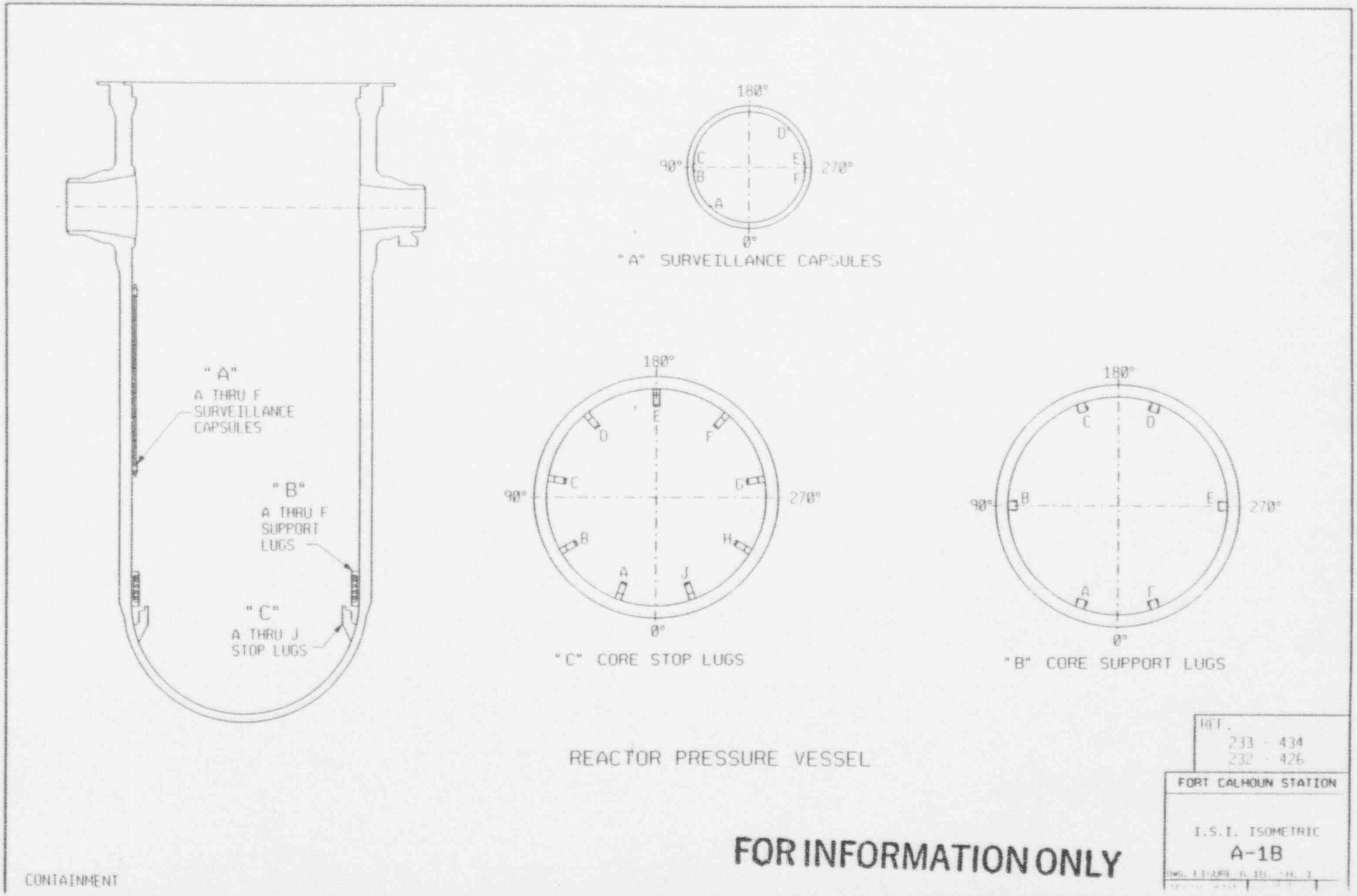


REACTOR PRESSURE VESSEL

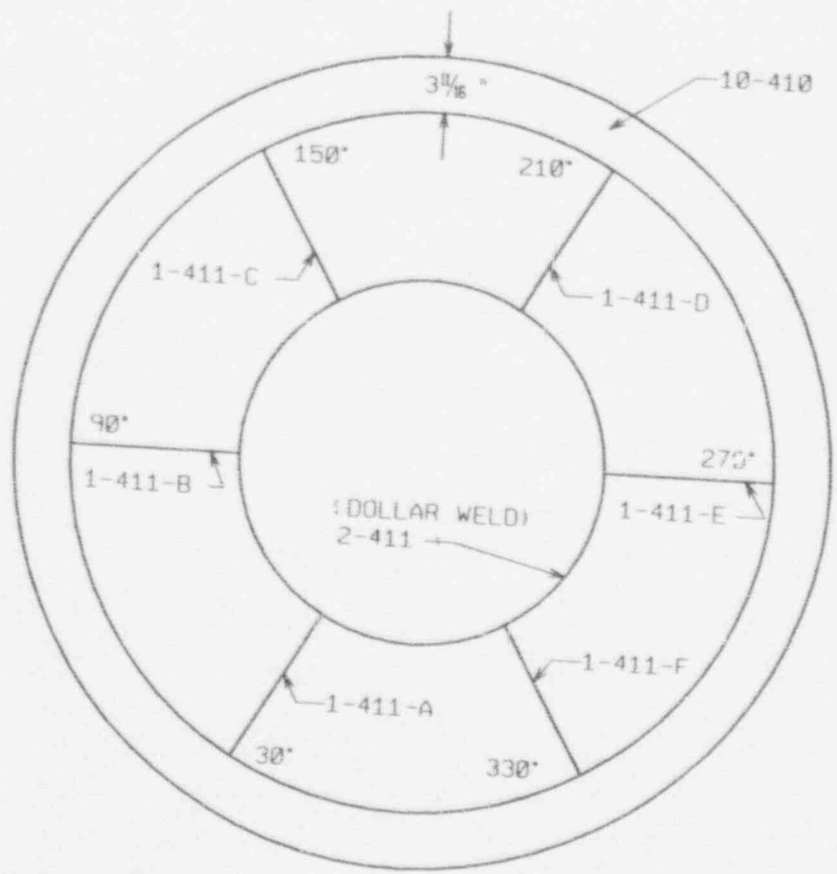
CONTAINMENT

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-1A



FOR INFORMATION ONLY



REACTOR PRESSURE VESSEL LOWER HEAD

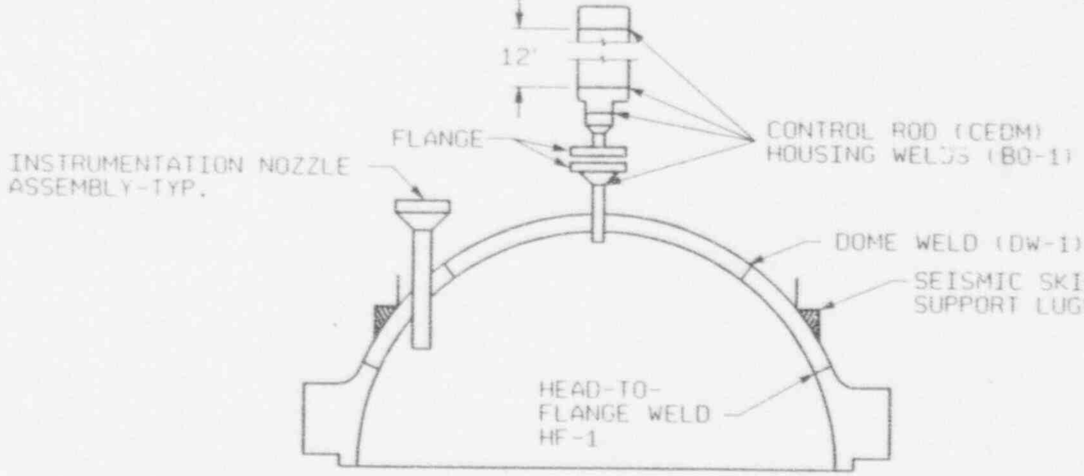
CONTAINMENT

REF. DWGS.
E-232-439

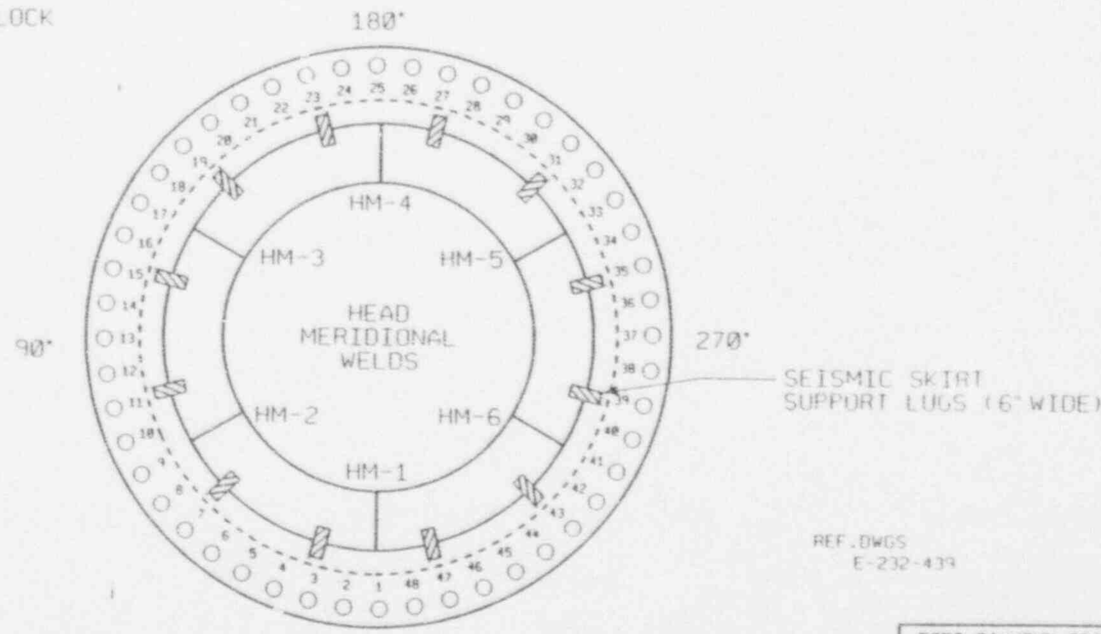
FOR INFORMATION ONLY

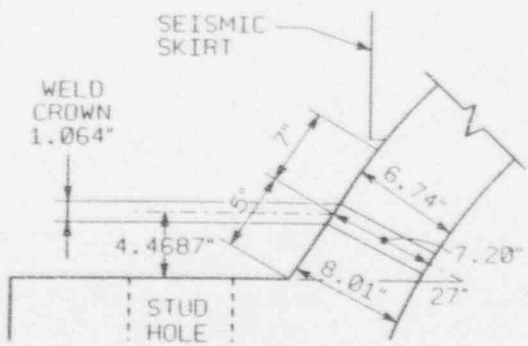
FORT CALHOUN STATION
I.S.I. ISOMETRIC A-2
DWG. FIGURE A-2, SH. 1 OF 2

TASK/MR #



CALIBRATION BLOCK
7 - FCL





CLOSURE HEAD WELD
HF-1 LOCATION

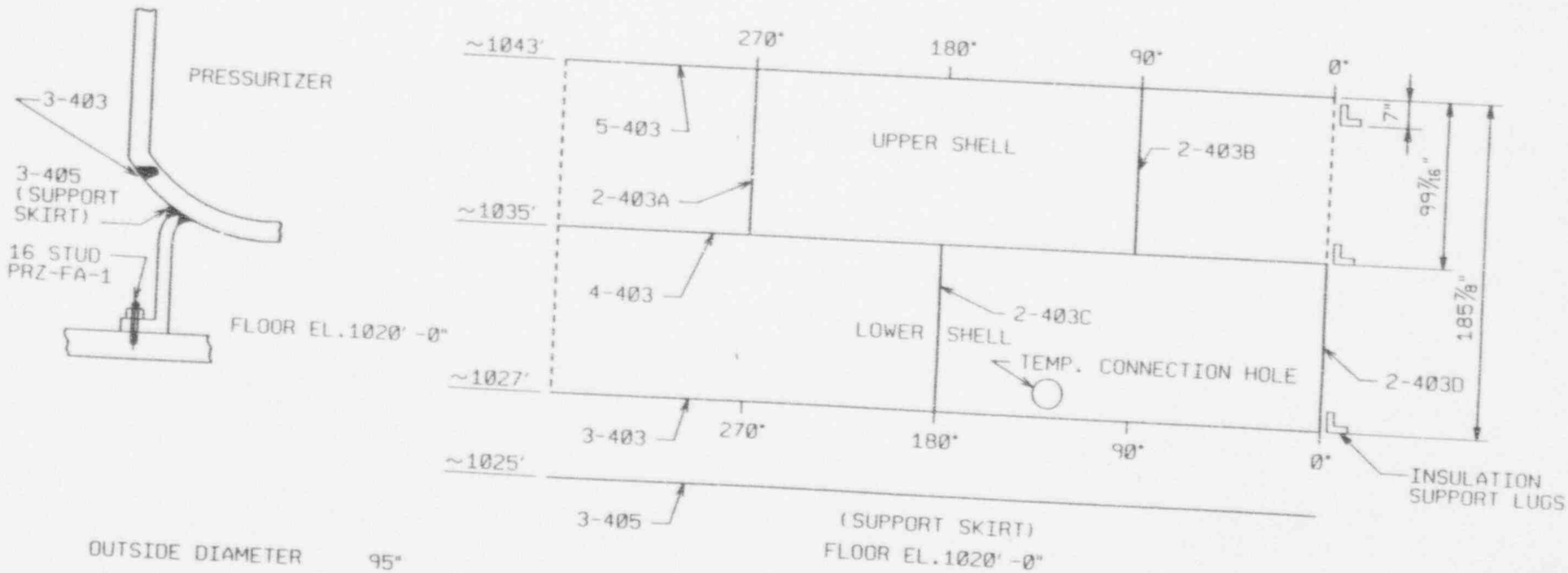
REACTOR PRESSURE VESSEL
CLOSURE HEAD

REF.DWGS
E-232-439

CONTAINMENT

FORT CALHOUN STATION
I.S.I. ISOMETRIC A-2A
DWG. FIGURE 6-2A, SH. 2

FOR INFORMATION ONLY



OUTSIDE DIAMETER	95"
LONGITUDINAL WELDS	99 7/16"
THICKNESS VESSEL	4 5/8"
THICKNESS HEAD	3 1/4"
STANDARD 6-FCL	

PRESSURIZER VESSEL

CONTAINMENT

REF.DWGS.
E-232-530

FOR INFORMATION ONLY

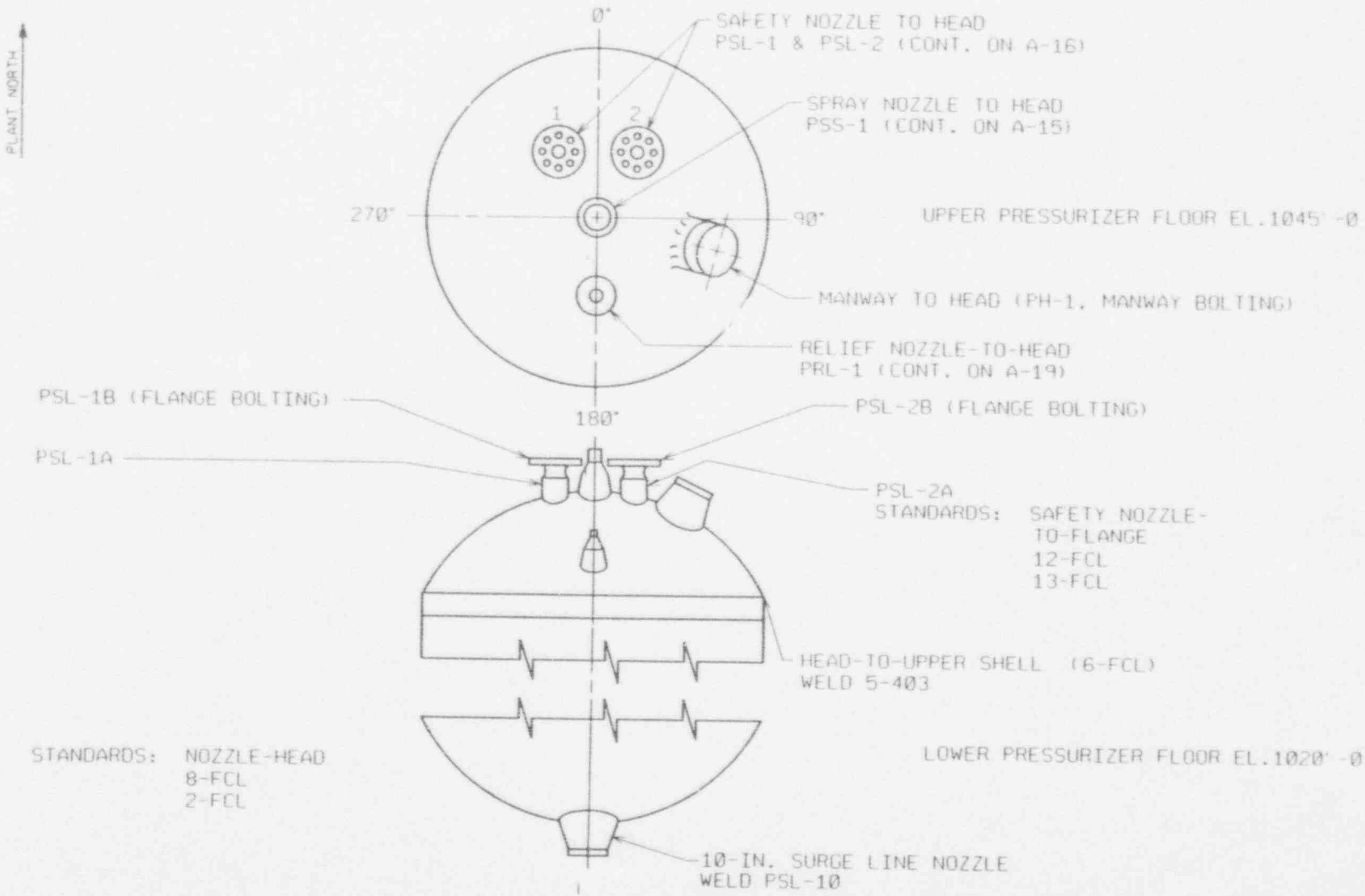
FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-3

DWG. FIGURE A-3, SH.1 OF 1

TASK/HR



PRESSURIZER NOZZLE -TO- UPPER HEAD AND LOWER HEAD

CONTAINMENT

FOR INFORMATION ONLY

REF.DWGS.

FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-4

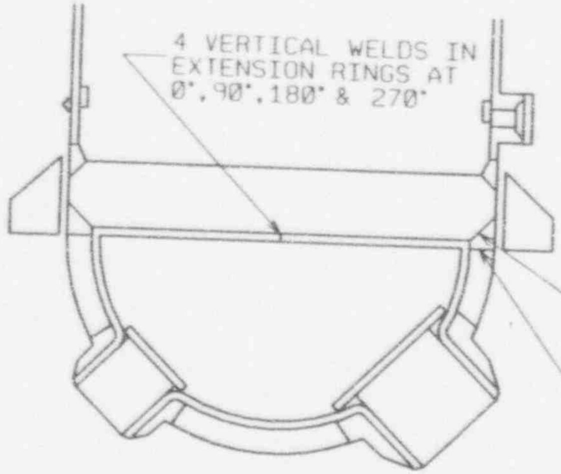
DWG. FIGURE A-4, SH. 1

PLANT NORTH →

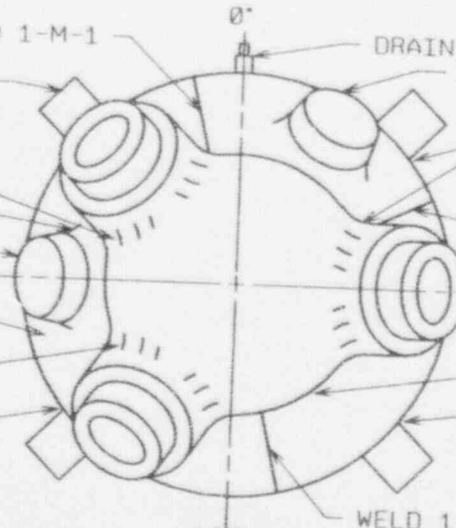
SG-1-1 INLET MANWAY BOLTING
SG-1-2 OUTLET MANWAY BOLTING

INLET NOZZLE WELD
ID = 32⅛"
OD = 35⅛"

OUTLET NOZZLE WELD
ID = 32⅛"
OD = 35⅛"



OUTSIDE DIA	126"
MERIDIONAL WELD LENGTH	55"
THICKNESS	
SUPPORT LUG	4⅜"
LOWER HEAD	6"
CLADDING	7/32"
STANDARD	7-FCL
	3-FCL
STANDARD (FOR INSIDE RADIUS SECTION)	2-FCL



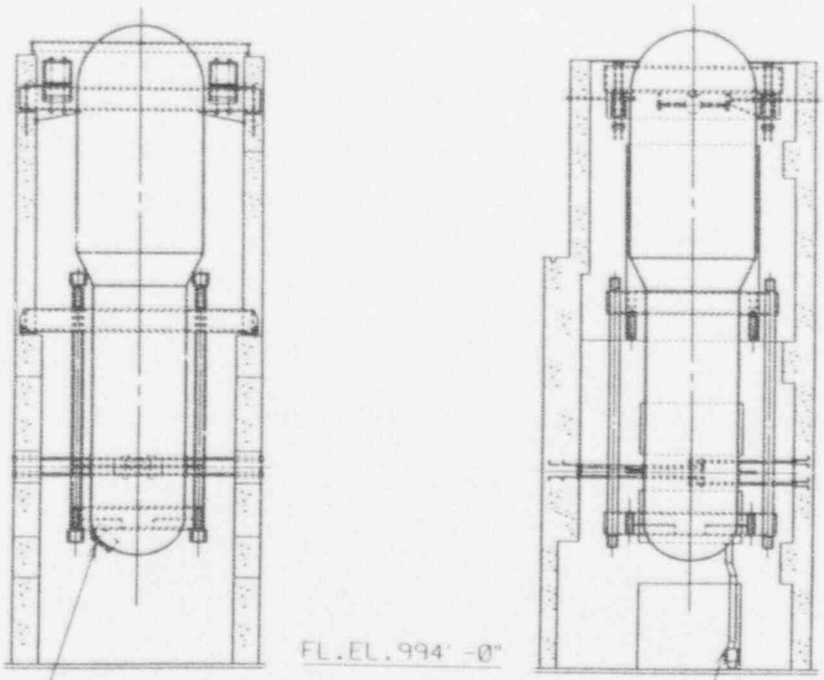
BOTTOM VIEW
STEAM GENERATOR No.1(A)

CONTAINMENT
LOOP A & B

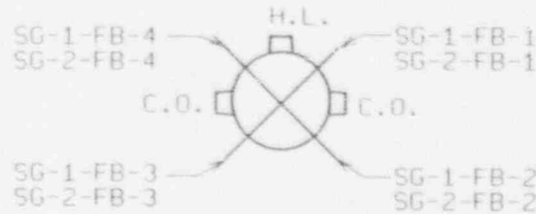
REF.DWGS.
E-232-511
E-232-515-2

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-5
DWG. FIGURE A-5, SH.1 OF 1
REV.SH. 21/30

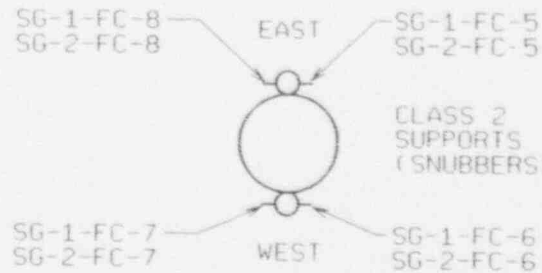
FOR INFORMATION ONLY



STEAM GENERATOR SUPPORT ASSEMBLY



I.D. OF VERTICAL SUPPORTS



I.D. OF HORIZONTAL SUPPORTS

SG-1-FB-5 SG CL2 SUPPORT ASSEMBLY
SG-2-FB-5 SG CL2 SUPPORT ASSEMBLY

CONTAINMENT
LOOP A & B

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-5A

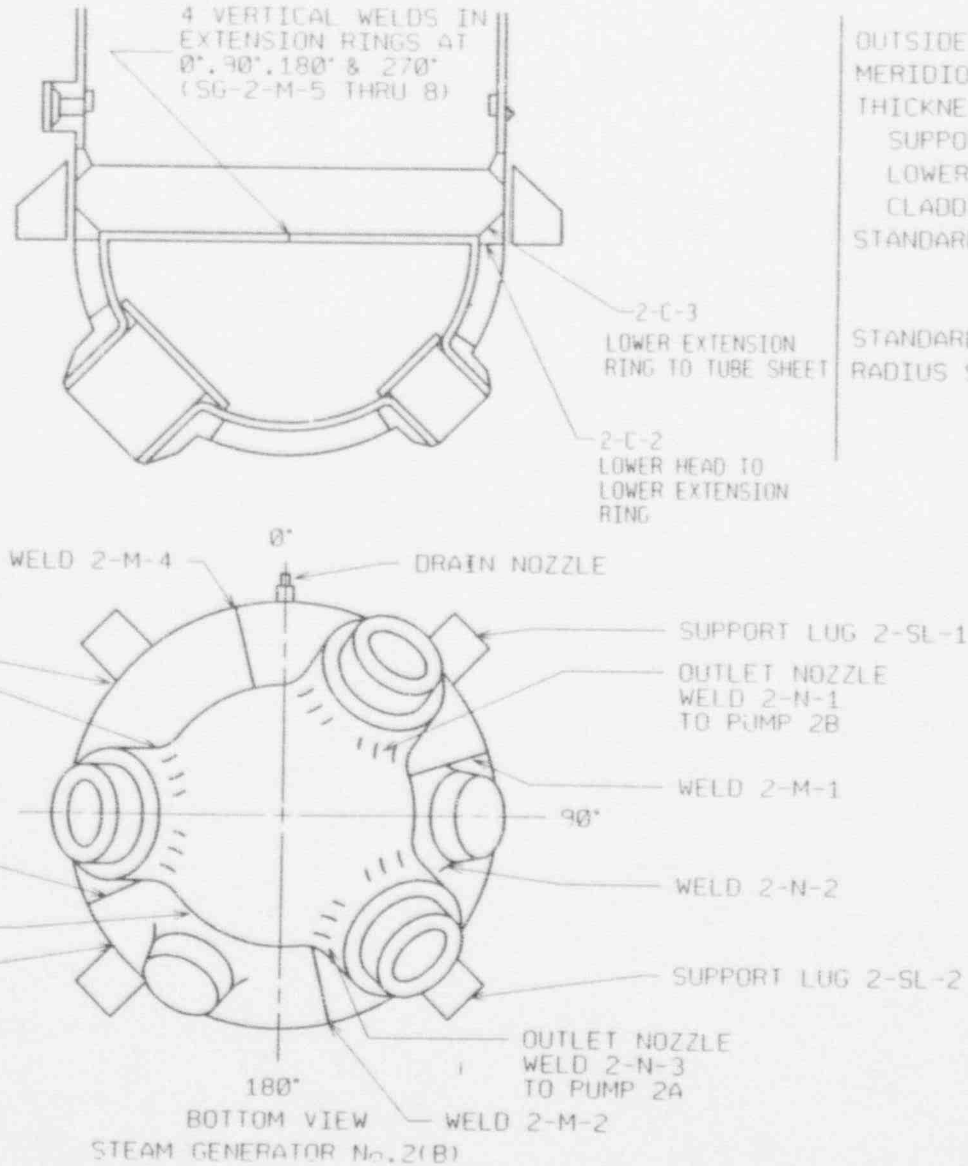
FOR INFORMATION ONLY

PLANT NORTH

INLET NOZZLE WELD
ID= 32⅛"
OD= 35⅛"

OUTLET NOZZLE WELD
ID= 32⅛"
OD= 35⅛"

SG-2-1 INLET MANWAY BOLTING
SG-2-2 OUTLET MANWAY BOLTING



BOTTOM VIEW
STEAM GENERATOR No.2(B)

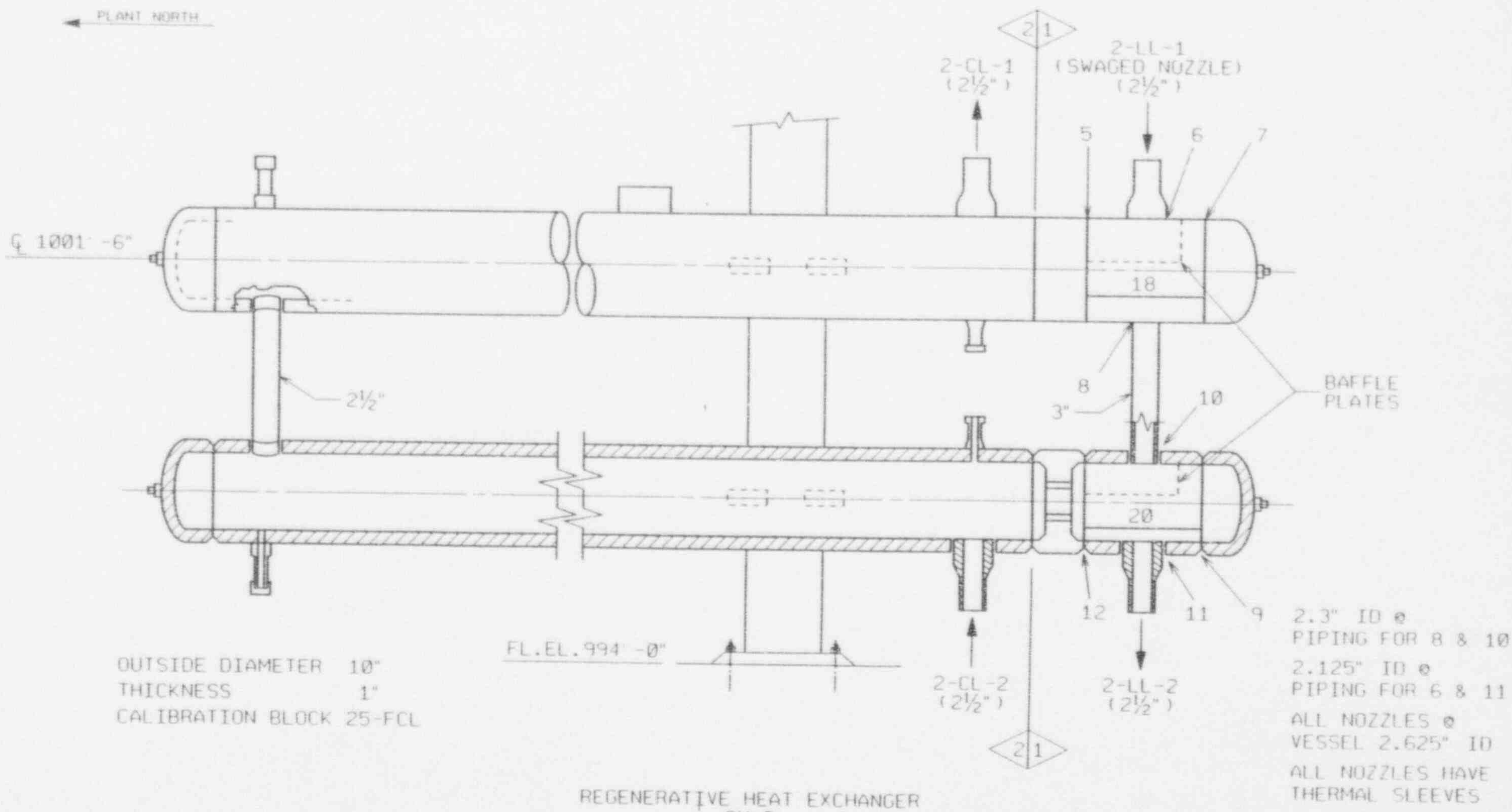
OUTSIDE DIA	126"
MERIDIONAL WELD LENGTH	55"
THICKNESS	
SUPPORT LUG	4⅜"
LOWER HEAD	6"
CLADDING	7/32"
STANDARD	7-FCL
	3-FCL
STANDARD (FOR INSIDE RADIUS SECTION)	2-FCL

CONTAINMENT
LOOP A & B

REF. DWGS.
E-232-470
E-232-506-1

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-6
DWG. FIGURE A-6, SH. 1

FOR INFORMATION ONLY



REGENERATIVE HEAT EXCHANGER
CH-6

REF.DWGS.
B-1853-5

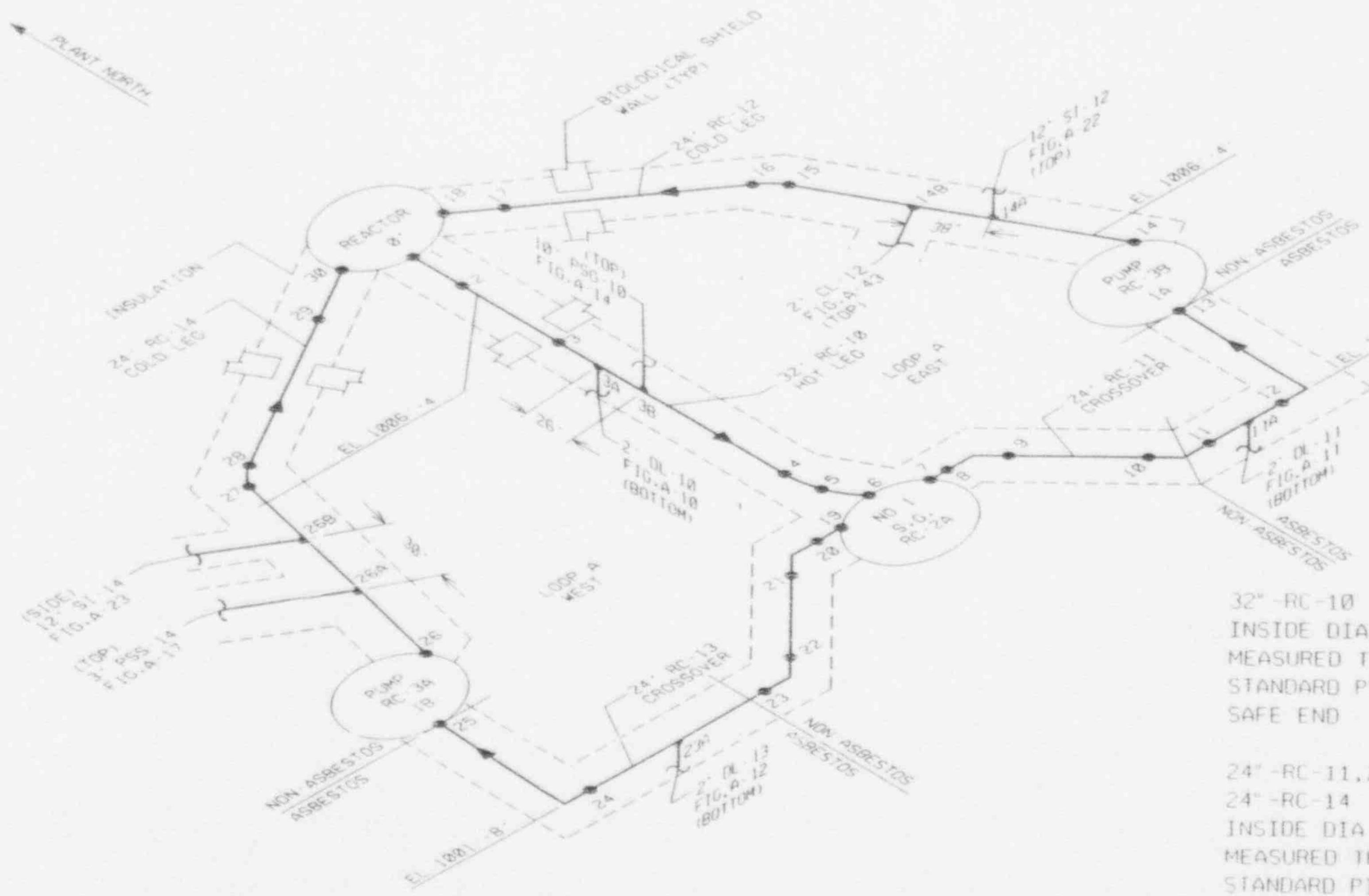
CONTAINMENT
REGEN. HEAT EXCHANGER ROOM EL.994'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-7

DWG. FIGURE A-7, SH. 1

FOR INFORMATION ONLY



MAIN REACTOR COOLANT-LOOP 1 (A)
FLOOR EL.994'-0"

32"-RC-10	
INSIDE DIA	32"
MEASURED THICKNESS	3.4"
STANDARD PIPING	64-FCL
SAFE END	9-FCL
24"-RC-11, 24"-RC-12, 24"-RC-13, 24"-RC-14	
INSIDE DIA	24"
MEASURED THICKNESS	2.5"
STANDARD PIPING	66-FCL
SAFE END	10-FCL

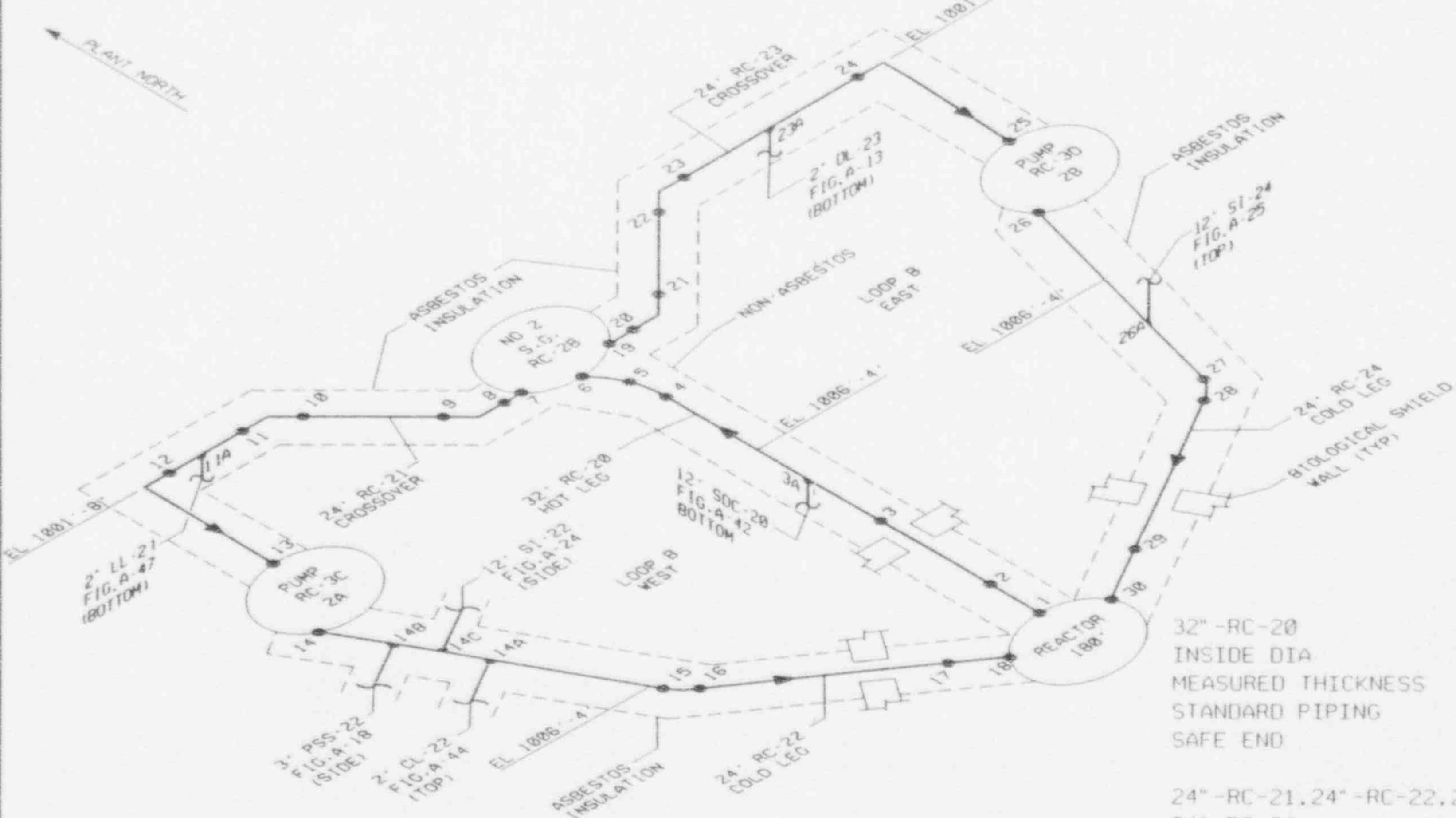
NOTE:
THERMAL SLEEVES ON SURGE NOZZLE & CHARGING NOZZLES (USAR 4.3.6)

CONTAINMENT
LOOP A EL.994'-0"

REF.DWGS.
P&ID E-23866-210-110
ISO NONE

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-8



32"-RC-20	
INSIDE DIA	32"
MEASURED THICKNESS	3.4"
STANDARD PIPING	64-FCL
SAFE END	9-FCL

24"-RC-21.24"-RC-22.24"-RC-23. 24"-RC-24	
INSIDE DIA	24"
MEASURED THICKNESS	2.5"
STANDARD PIPING	66-FCL
SAFE END	10-FCL

MAIN REACTOR COOLANT-LOOP 2 (B)
FLOOR EL.994'-0"

NOTE:
THERMAL SLEEVES
ON CHARGING NOZZLES
& SDC NOZZLE
(USAR 4.3.6)

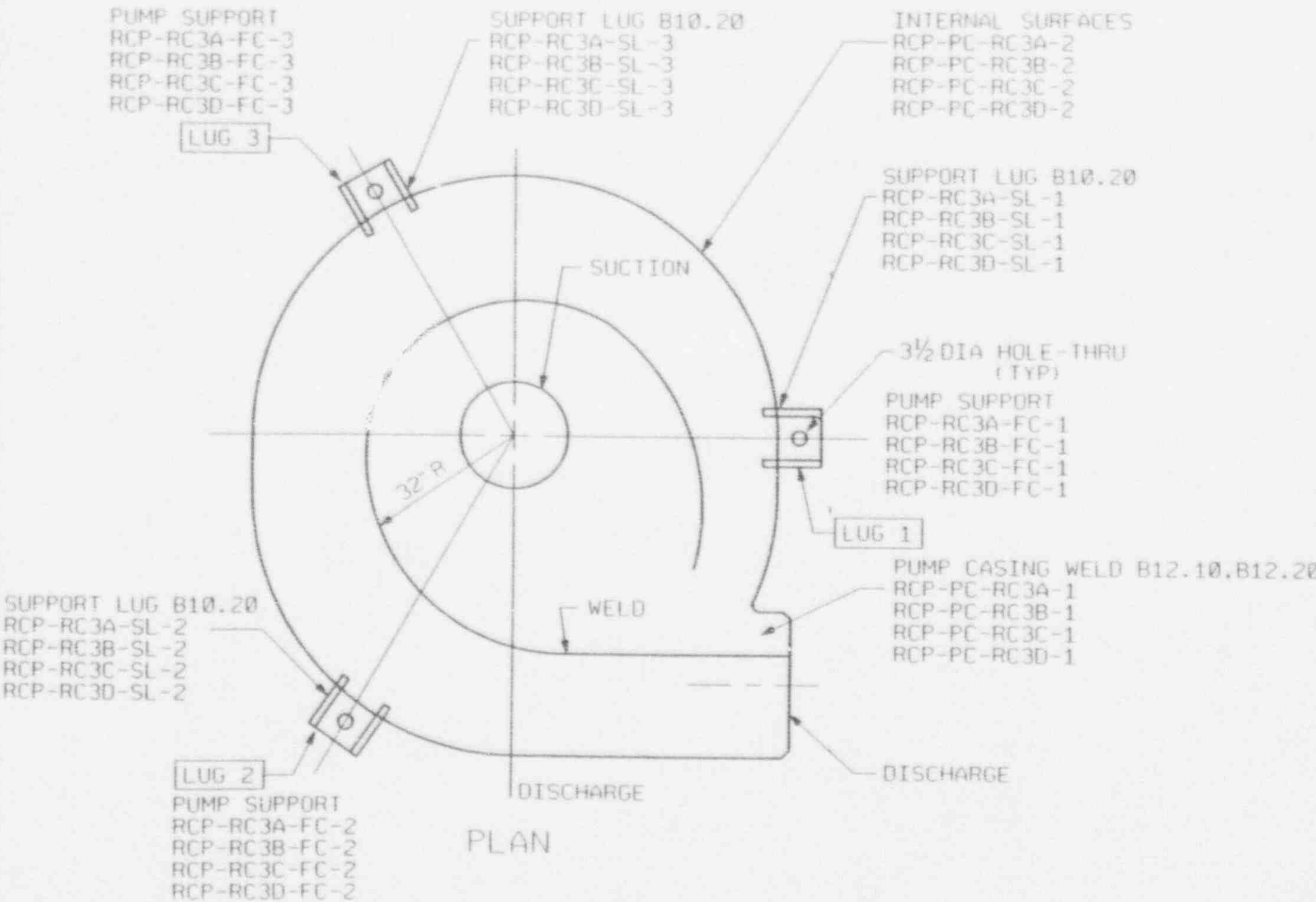
CONTAINMENT
LOOP B EL.994'-0"

REF.DWGS.
P&ID E-23866-210-110
ISO NONE

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-9



PLAN

REACTOR COOLANT PUMP CASING

FLOOR EL. 994'-0"

CONTAINMENT
LOOP A & B EL. 994'-0"

REF. DWGS.
2E3033 R/0

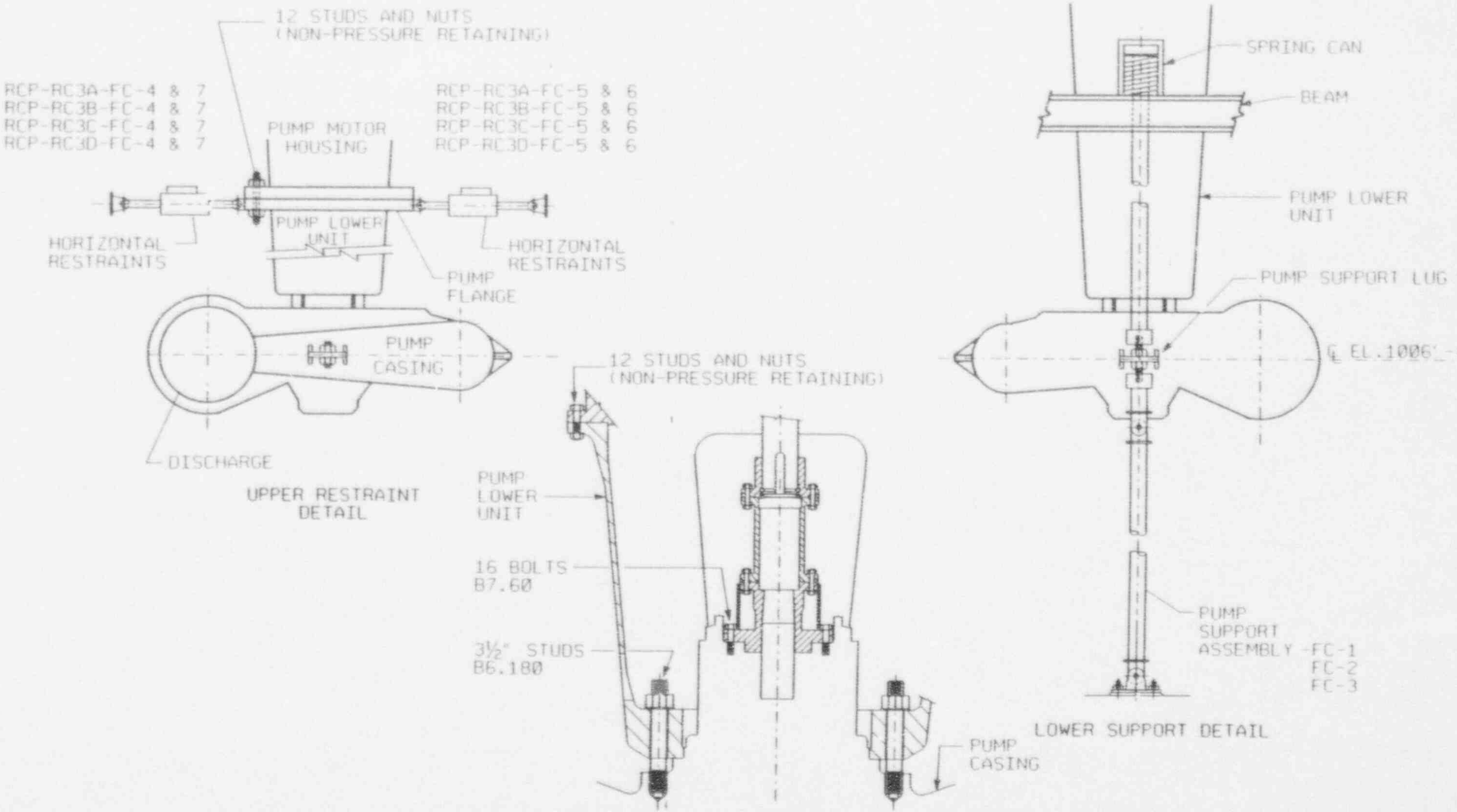
FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-9A

DWG. FIGURE A-9A, SH. 1

FOR INFORMATION ONLY



FOR INFORMATION ONLY

CONTAINMENT
LOOP A & B EL.994'-0"

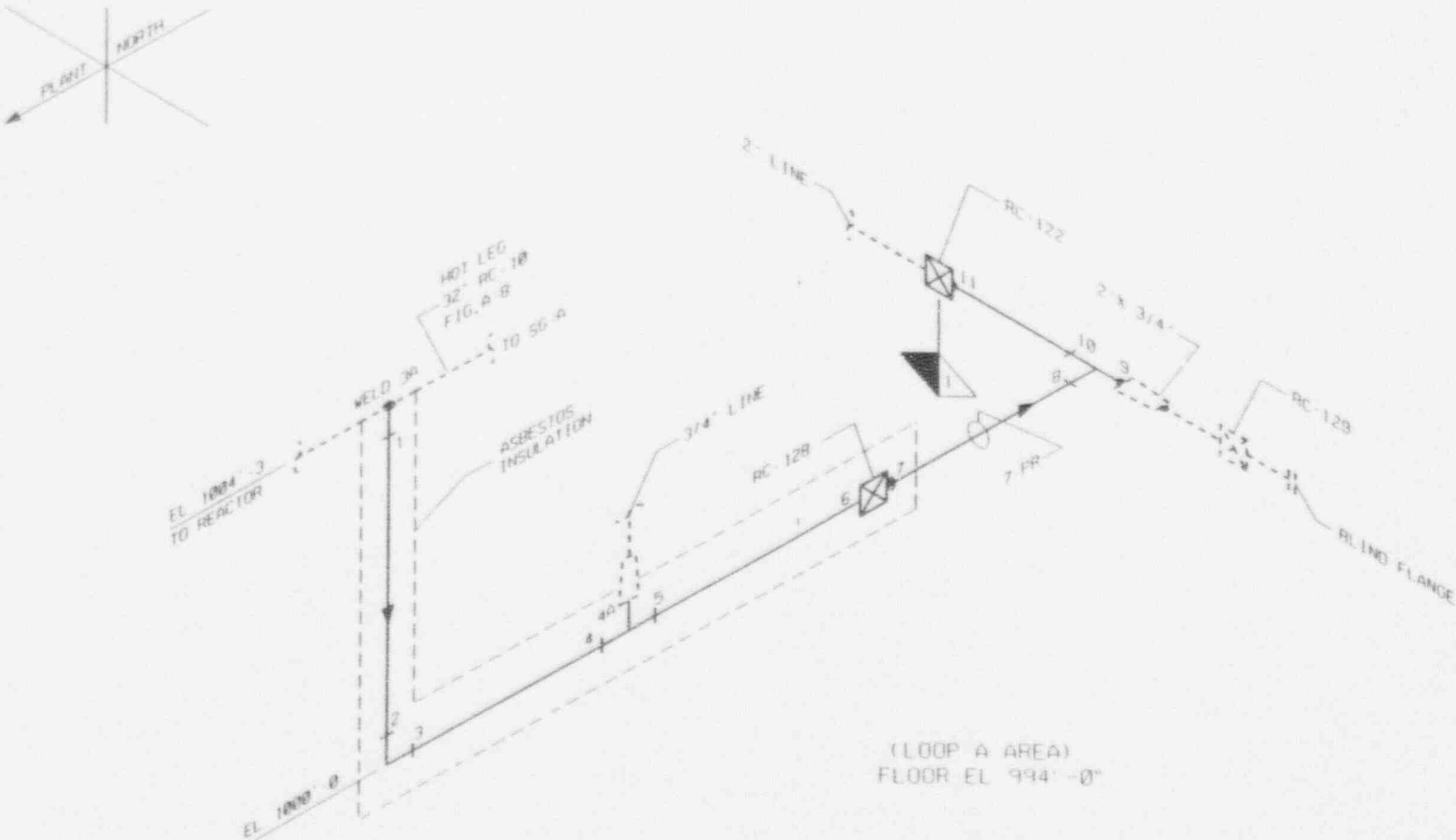
REACTOR COOLANT PUMPS
FLOOR EL.994'-0"

REF.DWGS.
2E3033 R/0

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-9B

DWG. FIGURE A-9B, SH. 1



2-DL-10

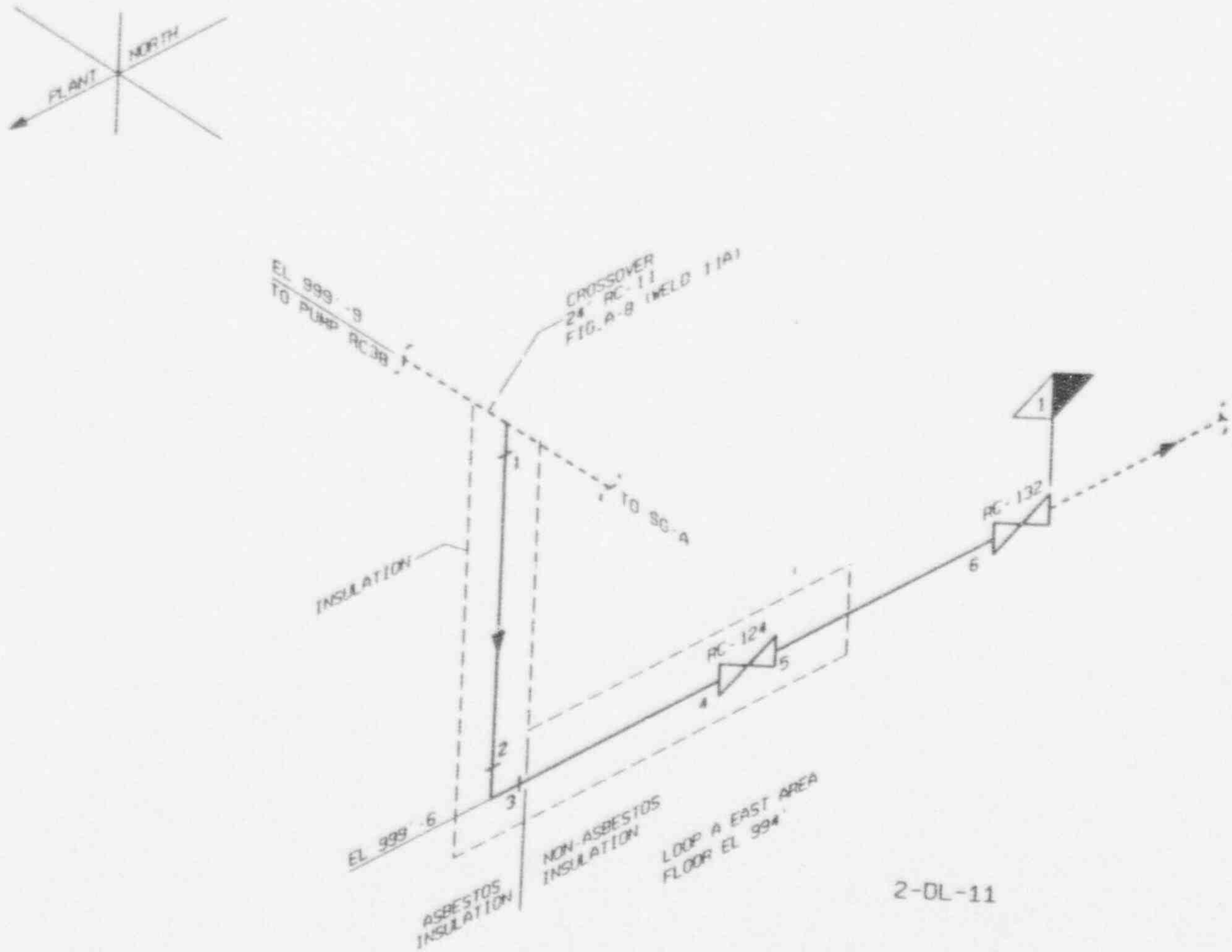
CONTAINMENT
LOOP A AREA CENTER EL.994'-0"

REF.DWGS.
P&ID E-23866-210-110
ISO WD 2050 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-10



TASK/MR #

CONTAINMENT

LOOP A EAST AREA EL.994'-0"

REF.DWGS.
P&ID E-23866-210-110
ISO WD 2060 I

FORT CALHOUN STATION

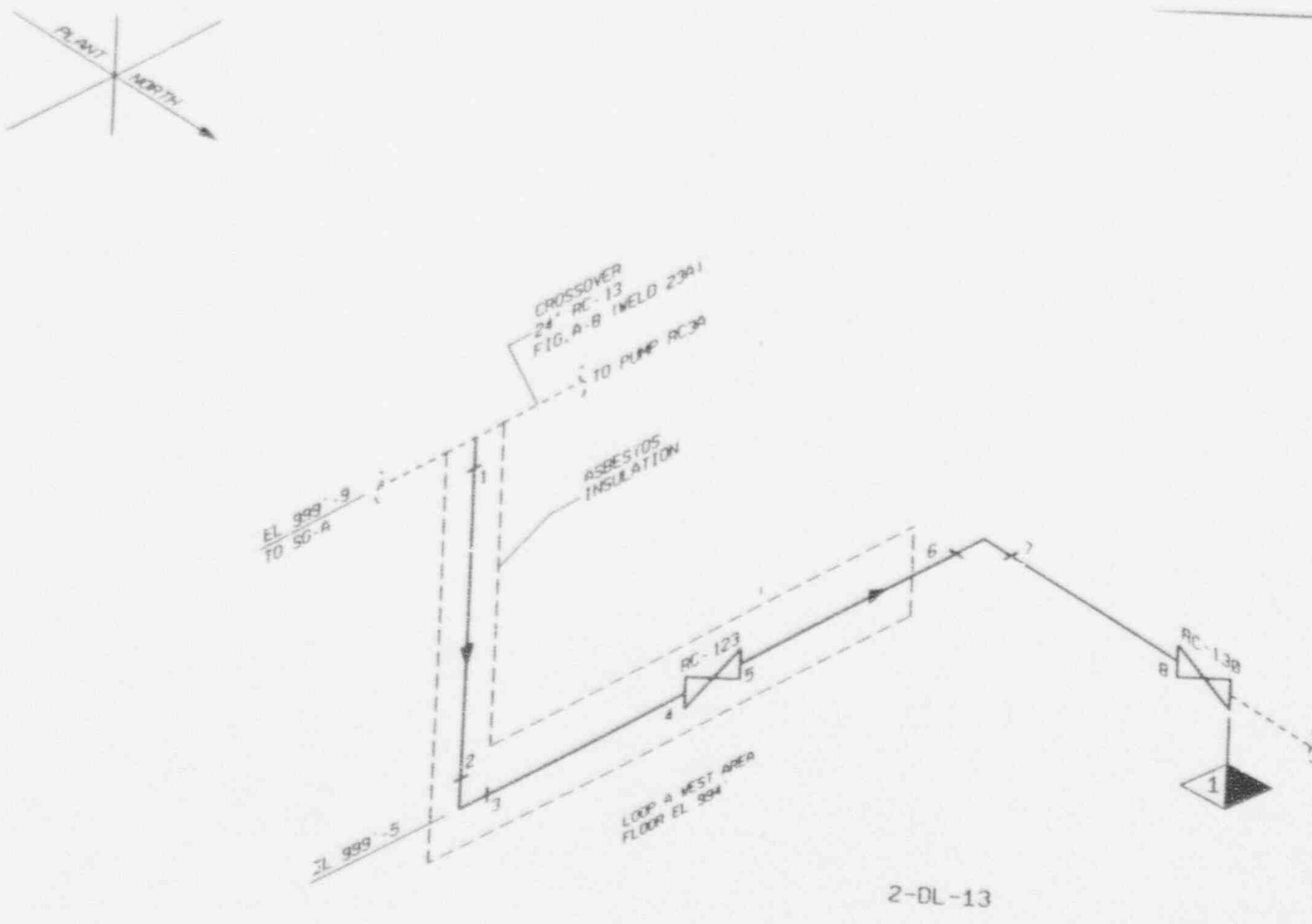
I.S.I. ISOMETRIC

A-11

DWG. FIGURE A-11, SH.1 OF 1

REV.SH. 26997 | APVD | REV

FOR INFORMATION ONLY



CONTAINMENT
LOOP A WEST AREA EL.994'-0"

REF.DWGS.
P&ID E-23866-210-110
ISO WD-2047 1

FOR INFORMATION ONLY

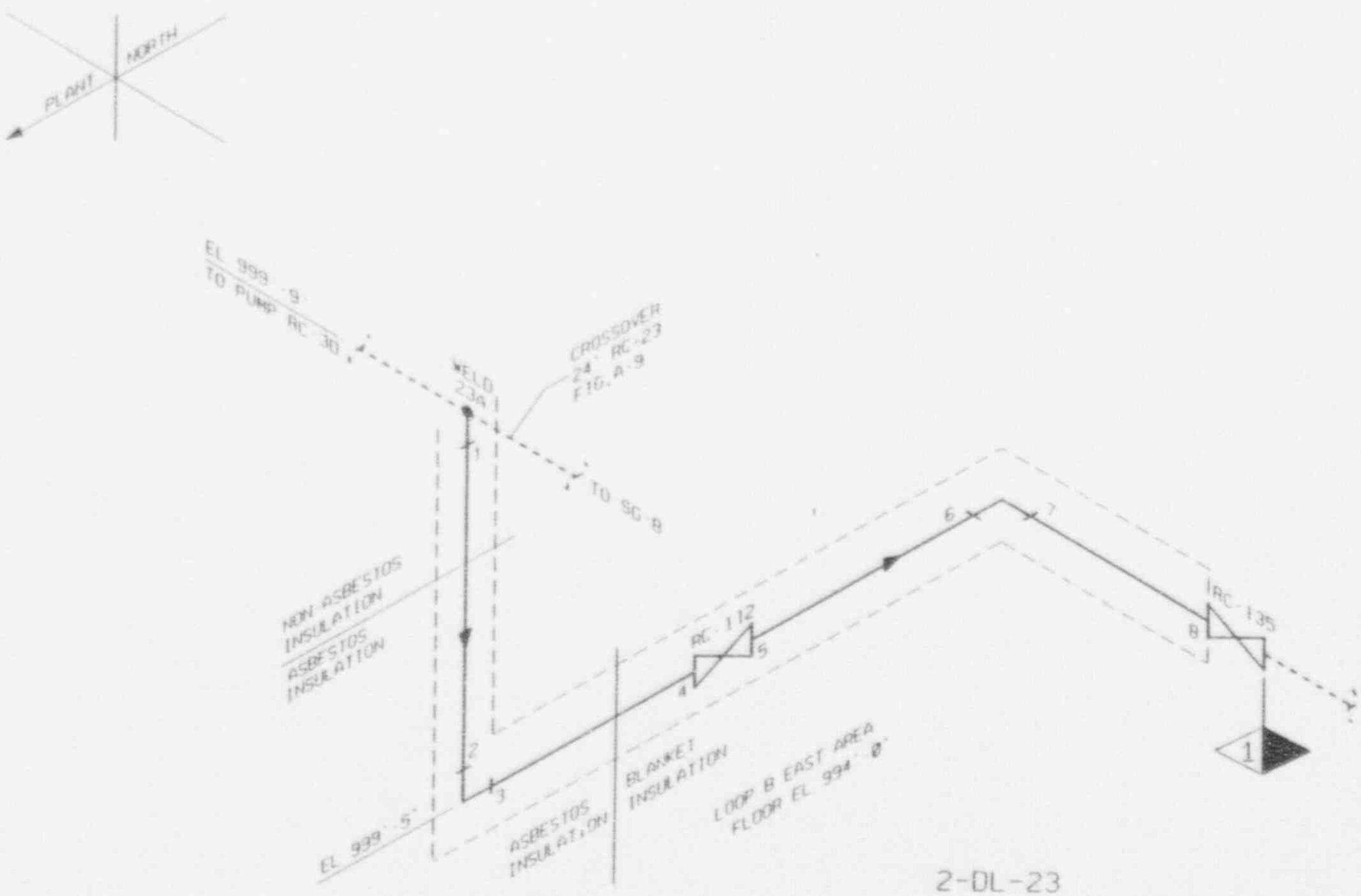
FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-12

DWG. FIGURE A-12, SH.1 OF 1

TASK/MR #

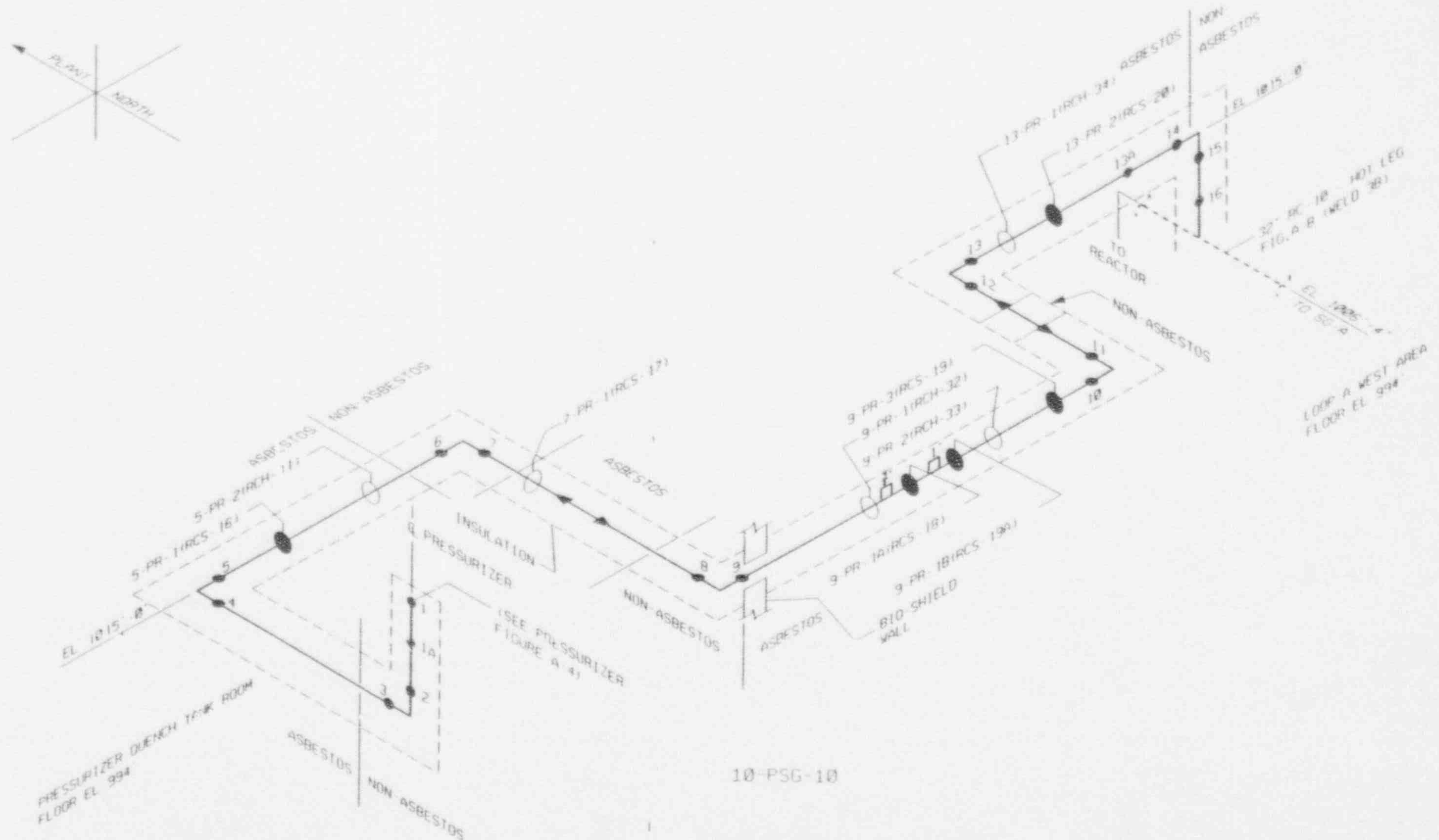


REF.DWGS.
P&ID E-23866-210-110
ISO WD 2073 I

CONTAINMENT
LOOP B EAST AREA EL 994'-0"

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-13



CONTAINMENT
LOOP A WEST AREA EL 994'-0"
PRESS.QUENCH TANK ROOM EL 994'-0"

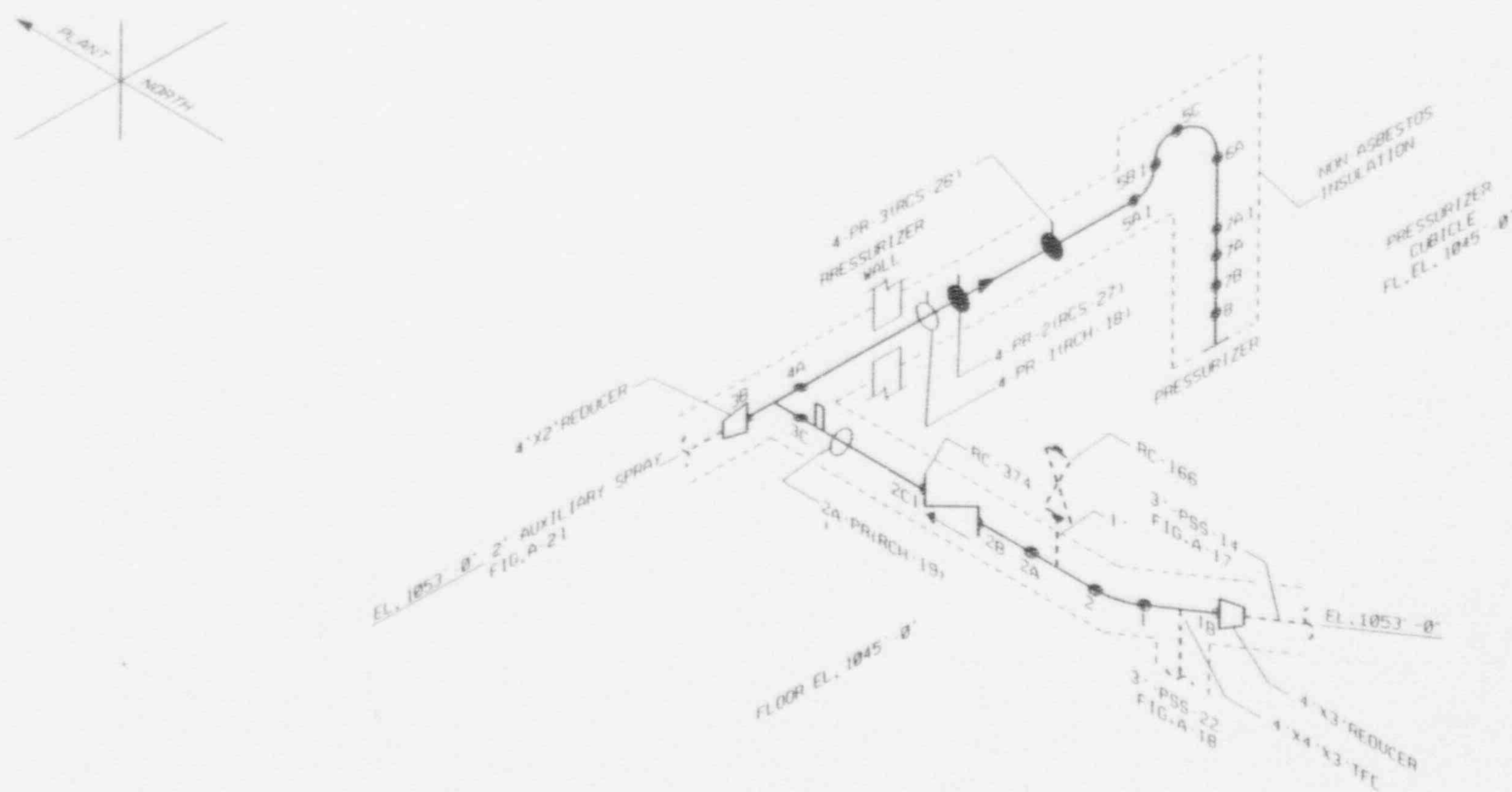
REF.DWGS.
P&ID E-23866-210-110
ISO IC 153 II, D-4248,SH.1

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-14



NOMINAL DIA	4"
SCHEDULE	160
NOMINAL THICKNESS	0.531
STANDARD	45-FCL

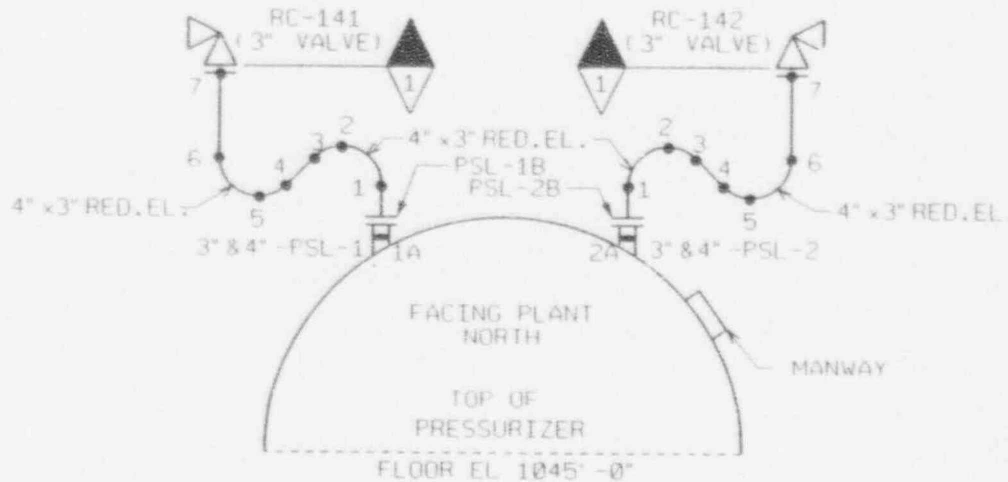
PRESSURIZER SPRAY
4-PSS-1

REF.DWGS.
P&ID E-23866-210-110
ISO IC 154 I, D-4249,SH.1

CONTAINMENT
PRESSURIZER CUBICLE EL.1045'-0"

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-15

FOR INFORMATION ONLY



ALSO SEE ISO A-4

• 4" X 3" REDUCING ELBOWS

NOMINAL DIAMETER	4"
SCHEDULE	160
NOMINAL THICKNESS	0.531"
STANDARD	45-FCL

PRESSURIZER SAFETY
3-PSL-1 & 3-PSL-2
4-PSL-1 & 4-PSL-2

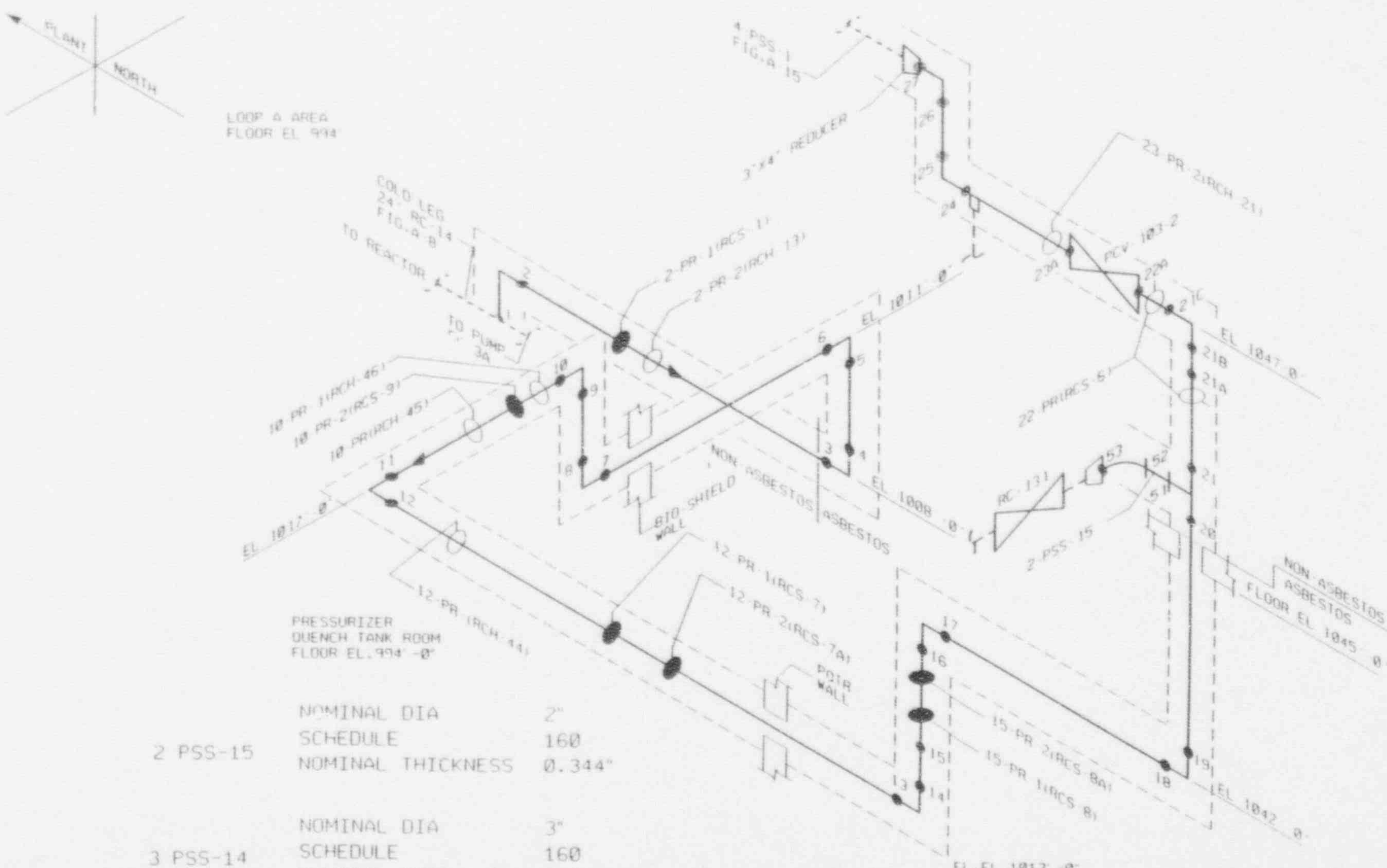
FOR INFORMATION ONLY

CONTAINMENT
PRESSURIZER CUBICLE EL.1045' -0"

REF.DWGS.
P&ID E-23866-210-110
ISO IC 151 III

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-16



2 PSS-15	NOMINAL DIA	2"
	SCHEDULE	160
	NOMINAL THICKNESS	0.344"
3 PSS-14	NOMINAL DIA	3"
	SCHEDULE	160
	NOMINAL THICKNESS	0.437"
	STANDARD	43-FCL

PRESSURIZER SPRAY
3-PSS-14
2-PSS-15

CONTAINMENT
OUTSIDE PRESS.CUB. EL.1045'-0"
OUTSIDE PRESS. EL.1013'-0"
POT ROOM EL.994'-0"
LOOP A EL.994'-0"

FOR INFORMATION ONLY

REF.DWGS.
P&ID E-23866-210
ISO RC-21151
ISO IC 154 I, IC 155 I,D-4243,SH.1

FORT CALHOUN STATION

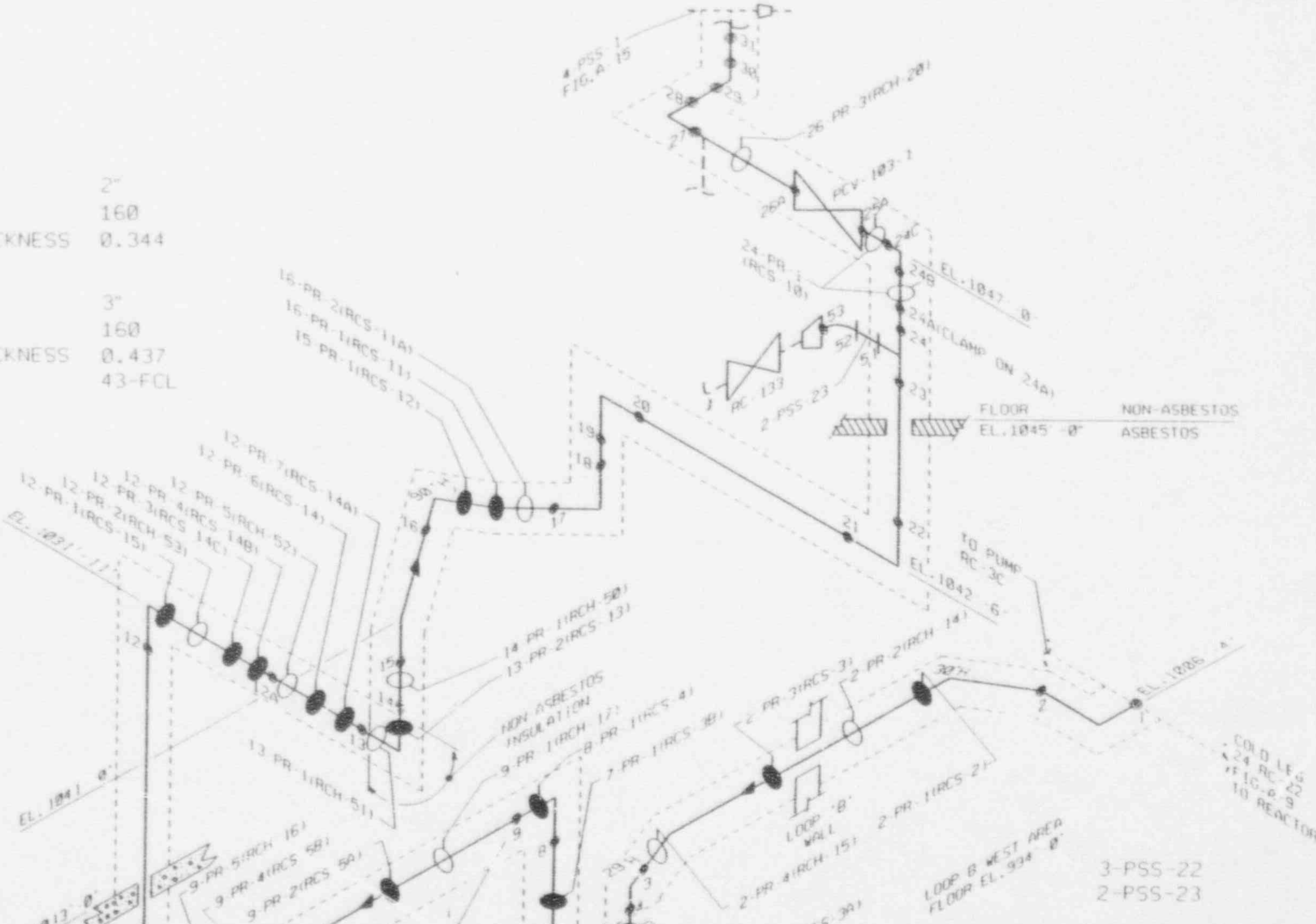
I.S.I. ISOMETRIC

A-17

2-PSS-23	NOMINAL DIA	2"
	SCHEDULE	160
	NOMINAL THICKNESS	0.344
3-PSS-22	NOMINAL DIA	3"
	SCHEDULE	160
	NOMINAL THICKNESS	0.437
	STANDARD	43-FCL

CLIMBING REQUIRED FOR WELDS 12 THRU 22

AREA FROM 12 THRU 13 RUNS BEHIND (WEST) THE FUEL TRANSFER CANAL



3-PSS-22
2-PSS-23

CONTAINMENT
OUTSIDE PRESS.CUB. EL.1045'-0"
ABOVE RGHX ROOM EL.1013'-0"
RGHX ROOM EL.994'-0"
LOOP B WEST AREA EL.994'-0"

REF.DWGS.
P&ID E-23866-210-110
ISO IC-154 I. IC-256 III
IC-157. IC-156 I. RC-211[illegible]

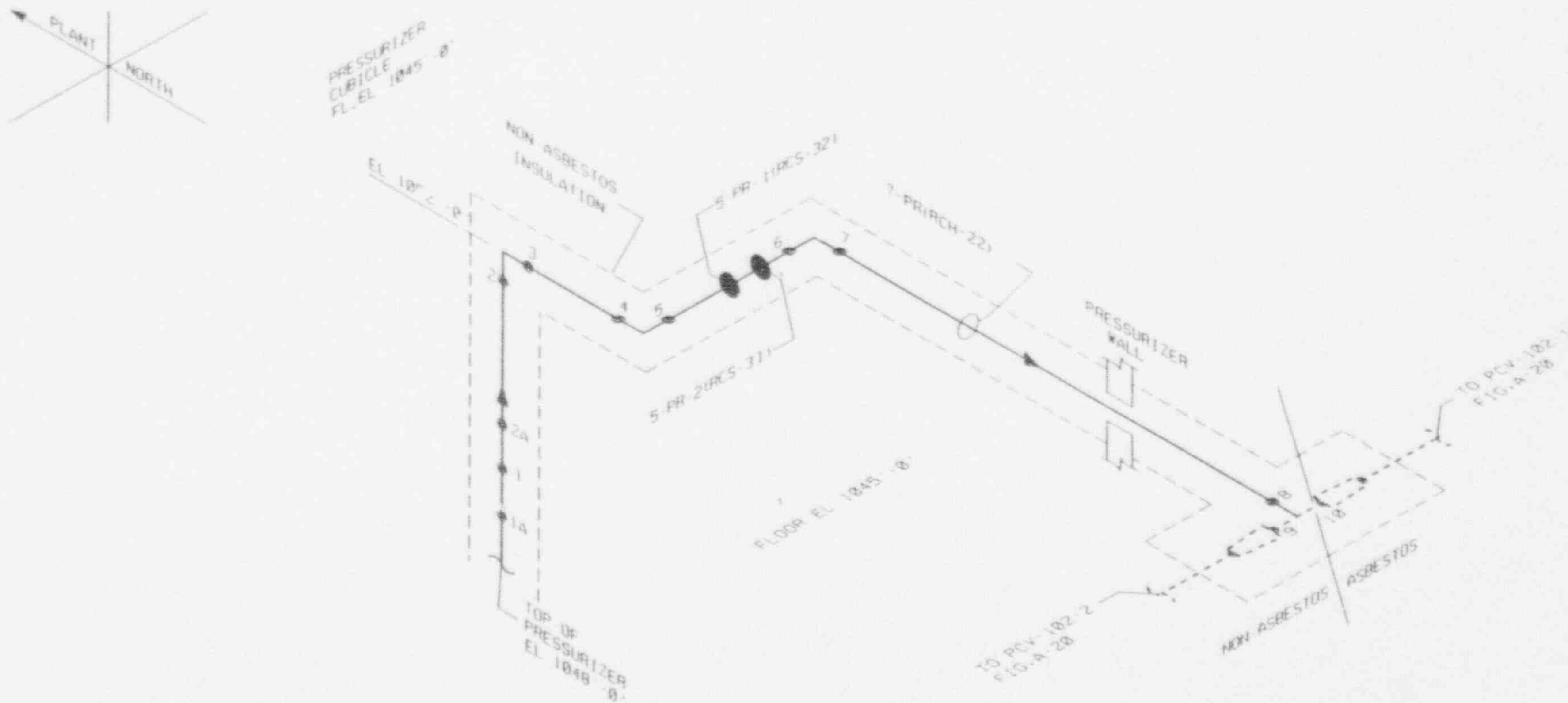
FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-18

DWG. FIGURE A-18, SH. 1

FOR INFORMATION ONLY



NOMINAL DIA	3"
SCHEDULE	160
NOMINAL THICKNESS	0.437"
STANDARD	43-FCL

PRESSURIZER RELIEF
3-PRL-1

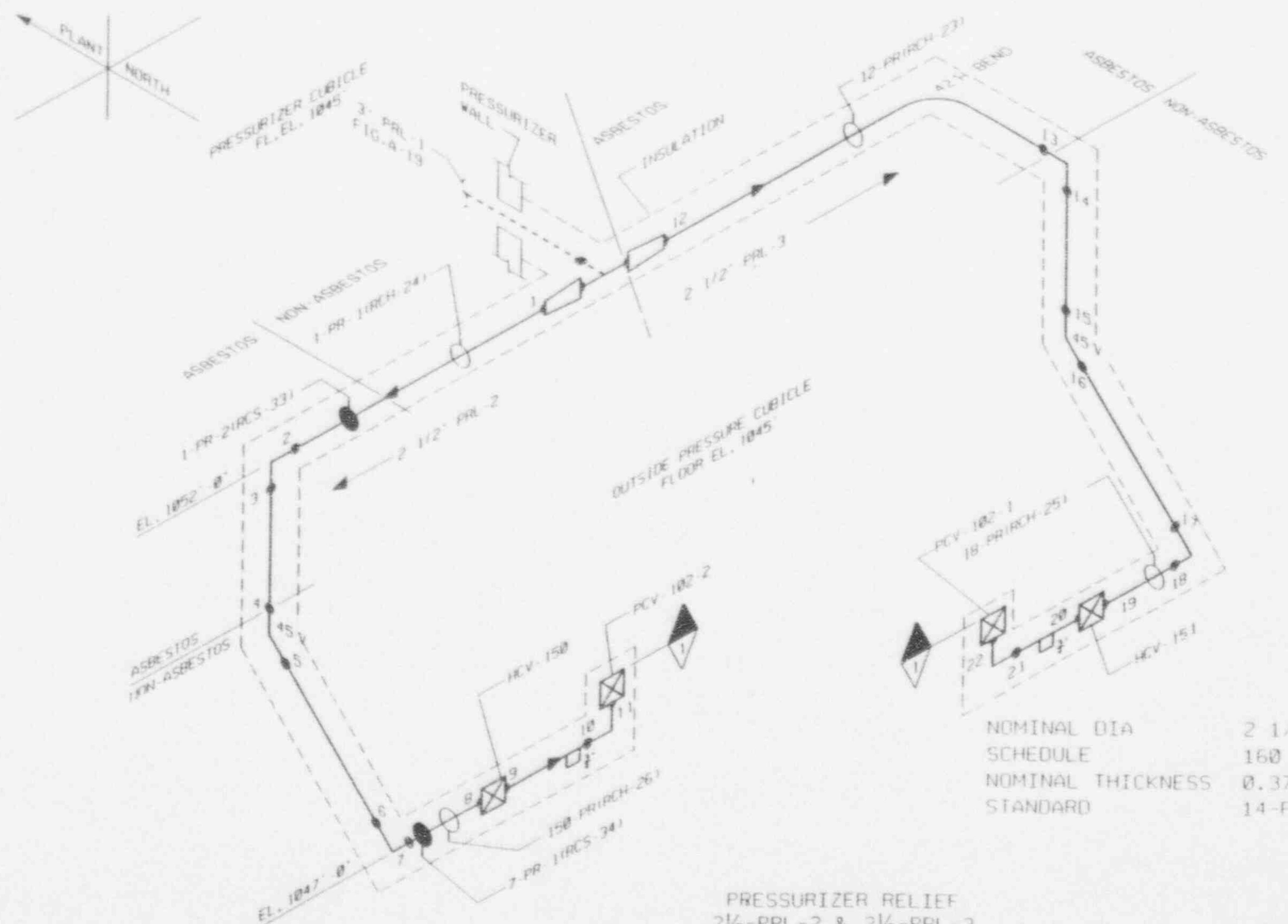
REF.DWGS.
P&ID E-23866-210-110
ISO IC 158 II

CONTAINMENT
PRESS.CUBICLE EL.1045'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-19



NOMINAL DIA	2 1/2"
SCHEDULE	160
NOMINAL THICKNESS	0.375"
STANDARD	14-FCL

PRESSURIZER RELIEF
2½-PRL-2 & 2½-PRL-3

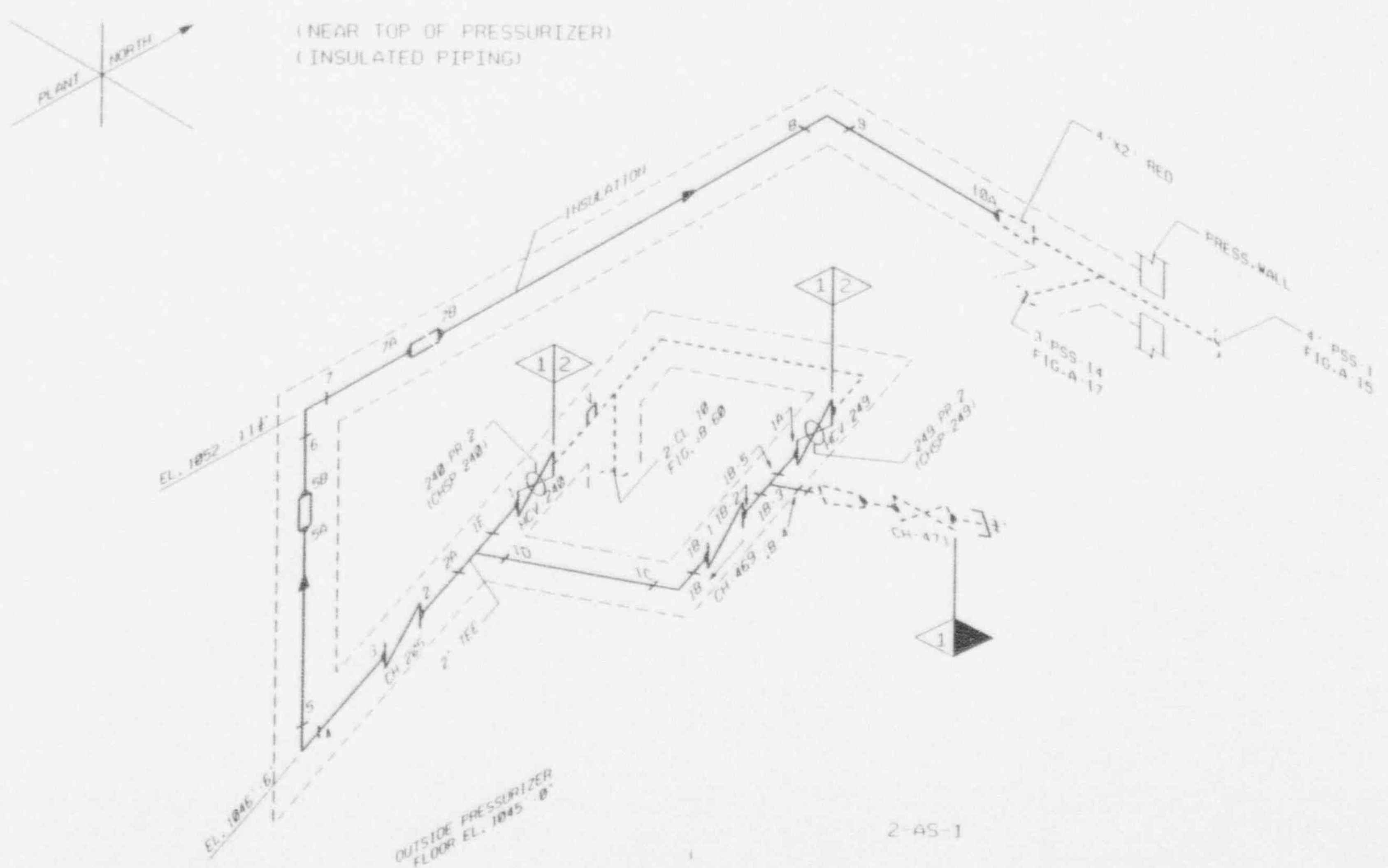
REF.DWGS.
P&ID E-23866-210-1 J
ISO IC 158 II

CONTAINMENT
OUTSIDE PRESS.CUBICLE EL.1045'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-20

FOR INFORMATION ONLY



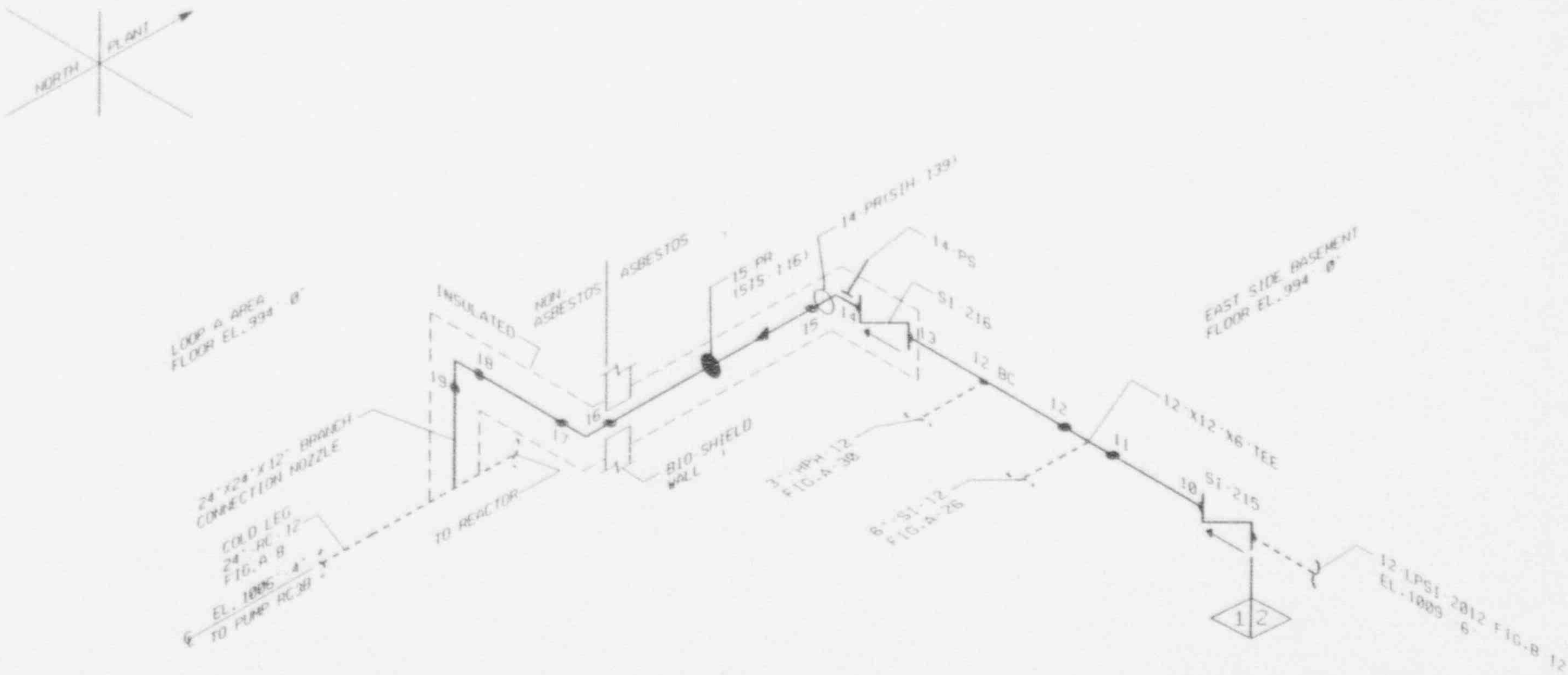
REF.DWGS.
P&ID E-23866-210-120
E-23866-210-110
ISO CH 2014 I: D-4249,SH.1

CONTAINMENT
OUTSIDE PRESS.CUB. EL.1045'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-21

FOR INFORMATION ONLY



SCAFOLDING REQ FOR ISI ON WELDS 12 THRU 16

NOMINAL DIA	12"
SCHEDULE	160
NOMINAL THICKNESS	1.312"
STANDARD	39-FCL

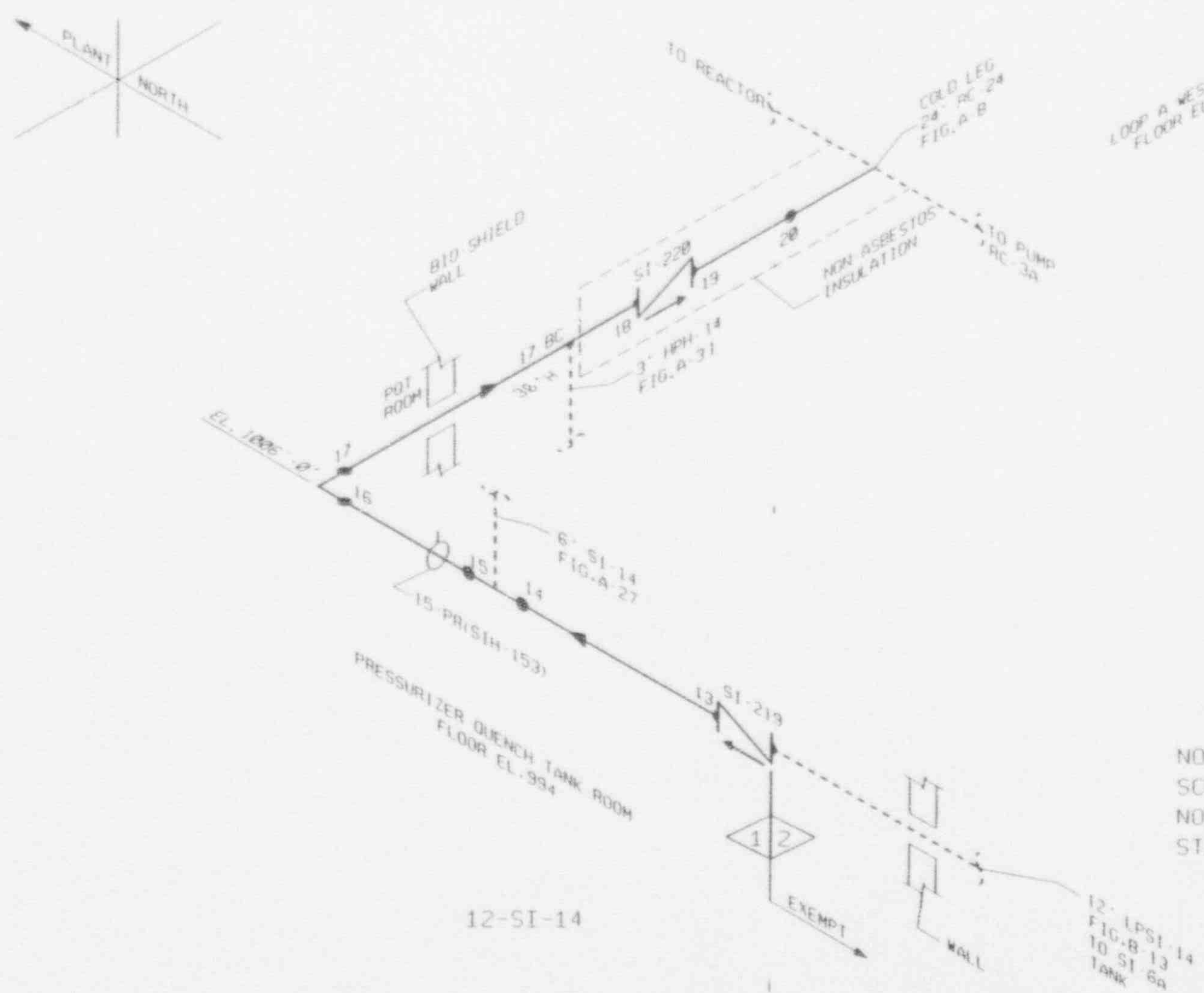
12-SI-12

CONTAINMENT
LOOP A EAST AREA EL.994'-0"
EAST SIDE BASEMENT EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
E-23866-210-110
ISO IC 76 I. D-4255,SH.1

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-22



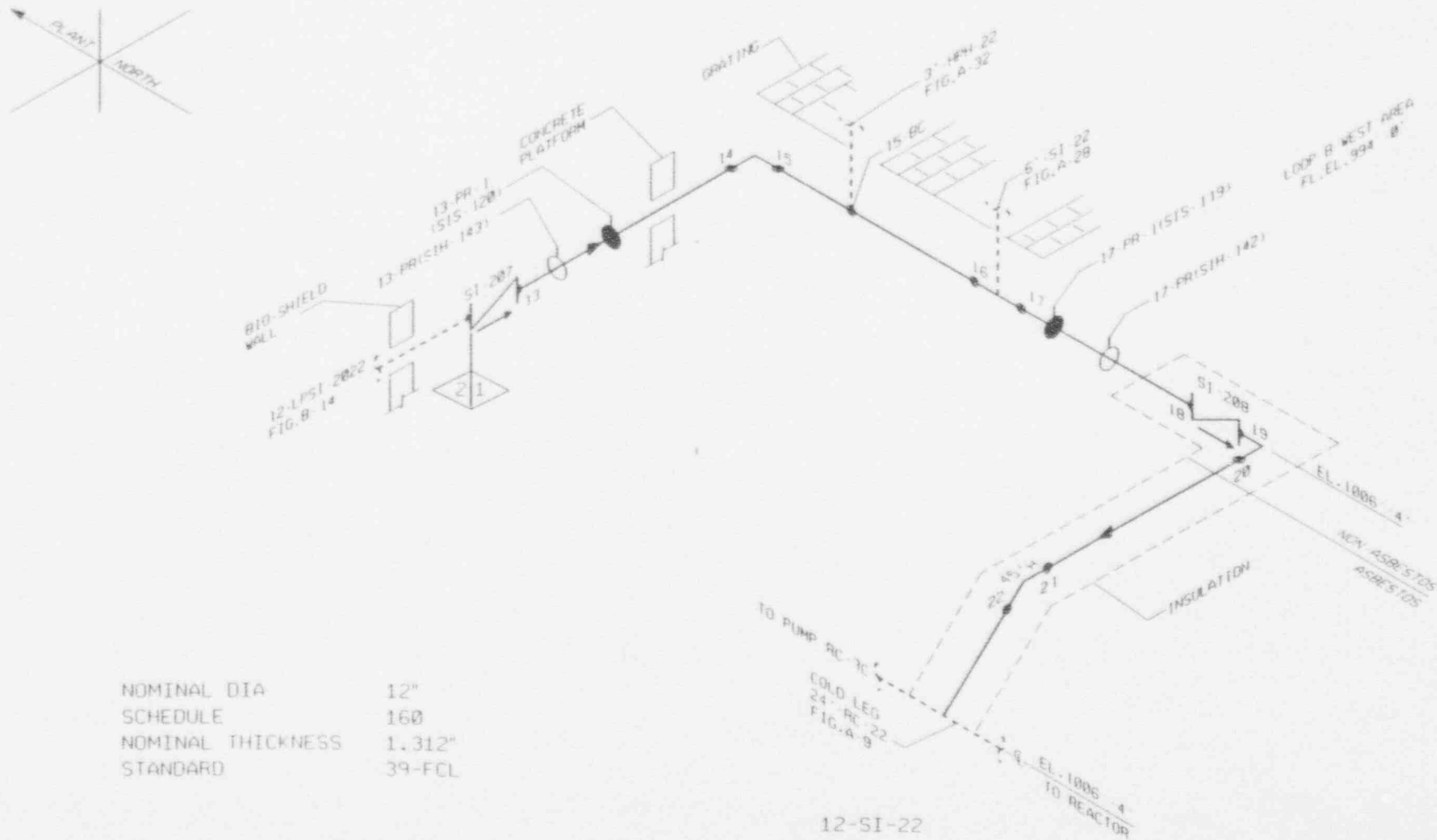
NOMINAL DIA	12"
SCHEDULE	160
NOMINAL THICKNESS	1.312"
STANDARD	39-FCL

REF. DWGS.
P&ID E-23866-210-130
E-23866-210-110
ISO IC 75 II. D-4256.SH.2

CONTAINMENT
LOOP A WEST AREA EL. 994'-0"
POT ROOM EL. 994'-0"

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-23
DWG. FIGURE A-23, SH. 1

FOR INFORMATION ONLY



NOMINAL DIA	12"
SCHEDULE	160
NOMINAL THICKNESS	1.312"
STANDARD	39-FCL

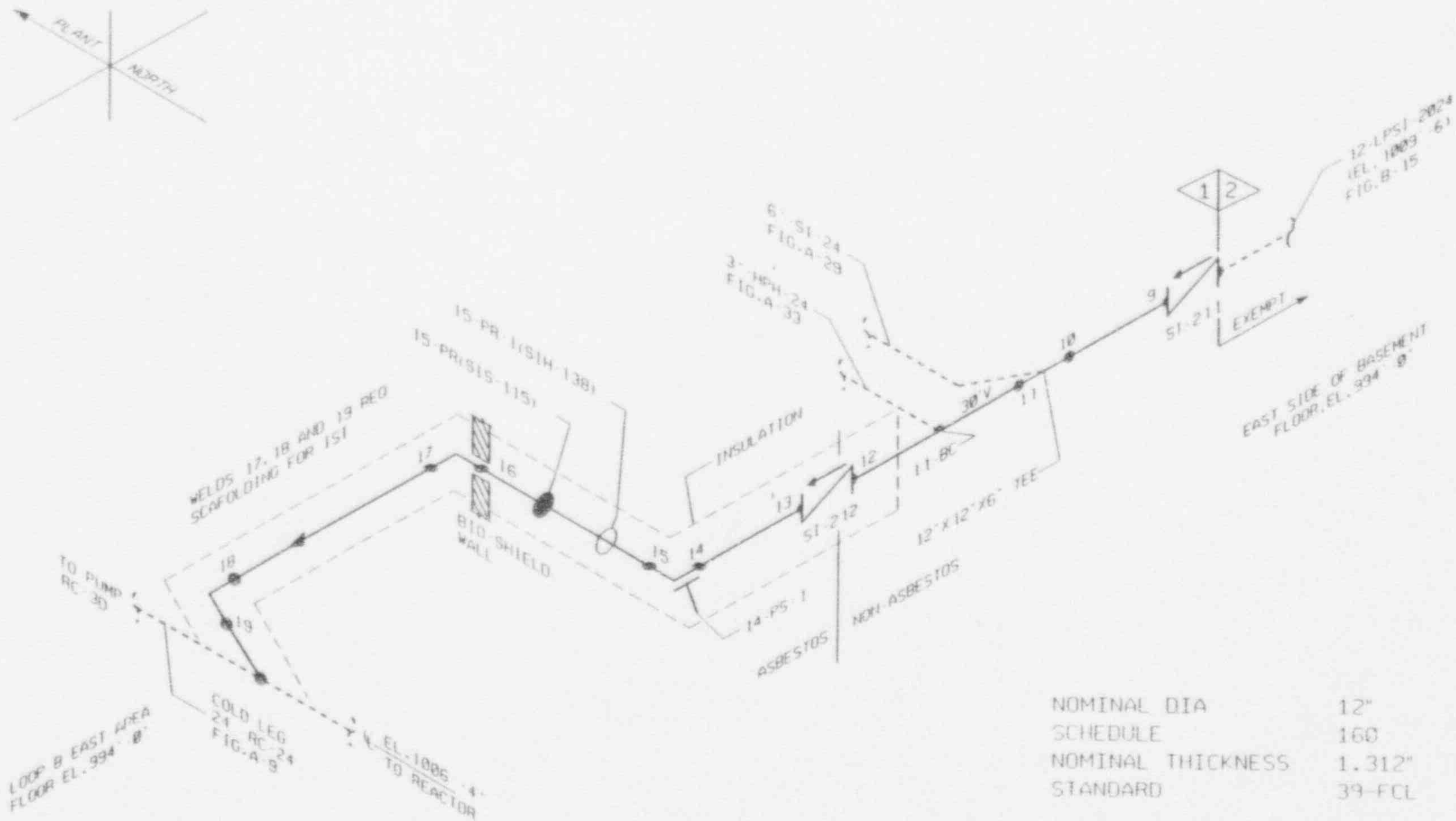
12-SI-22

REF.DWGS.
P&ID E-23866-210-130
E-23866-210-110
ISO IC 75 II. D-4293,SH.1

CONTAINMENT
LOOP B WEST AREA EL.994'-0"
WEST SIDE BASEMENT EL.994'-0"

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-24



NOMINAL DIA	12"
SCHEDULE	160
NOMINAL THICKNESS	1.312"
STANDARD	39-FCL

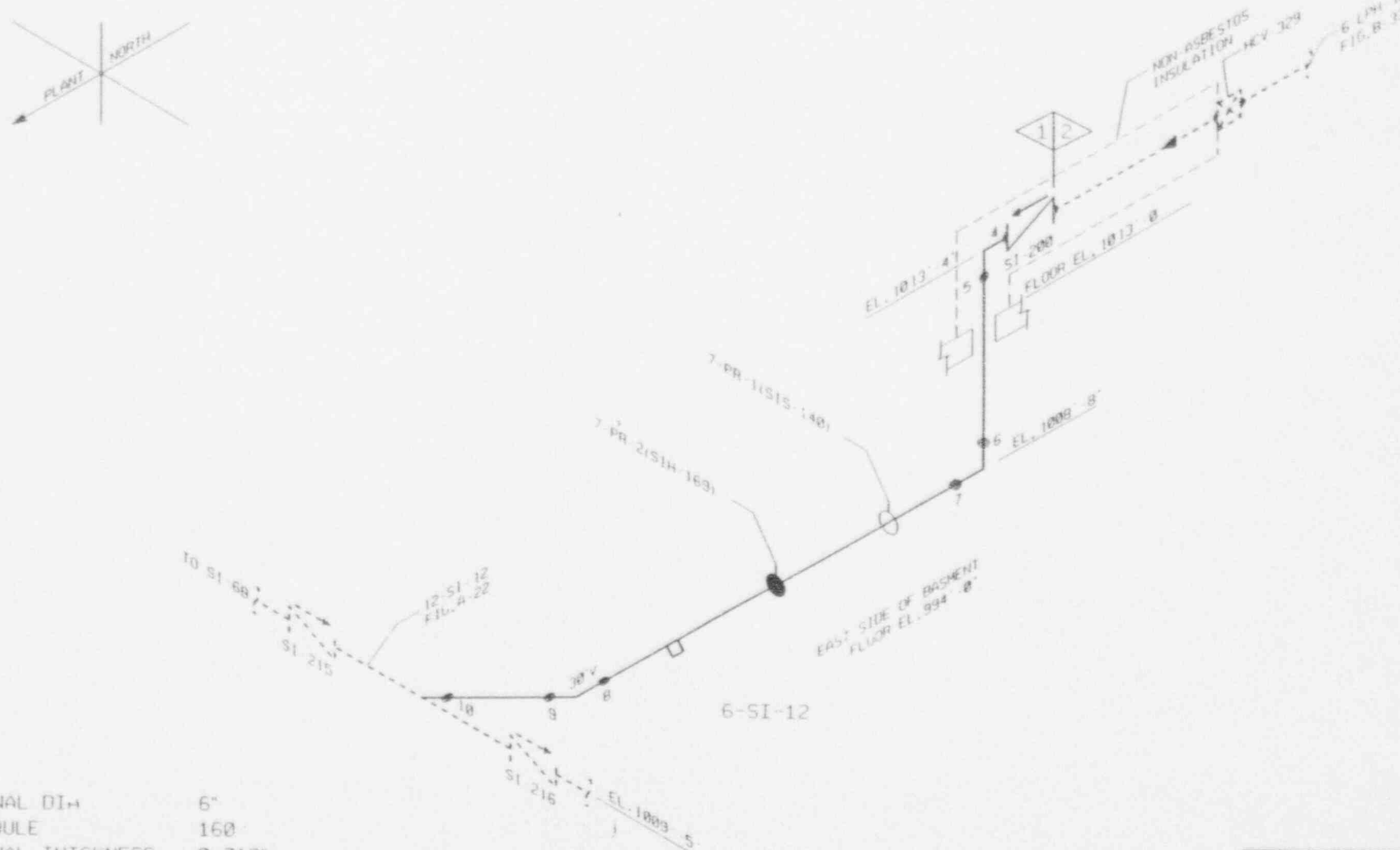
12-SI-24

REF. DWGS.
P&ID E-23866-210-130
E-23866-210-110
ISO IC 76 I: D-4258, SH.1

CONTAINMENT
LOOP B EAST AREA EL.994'-0"
EAST SIDE BASEMENT EL.994'-0"

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-25



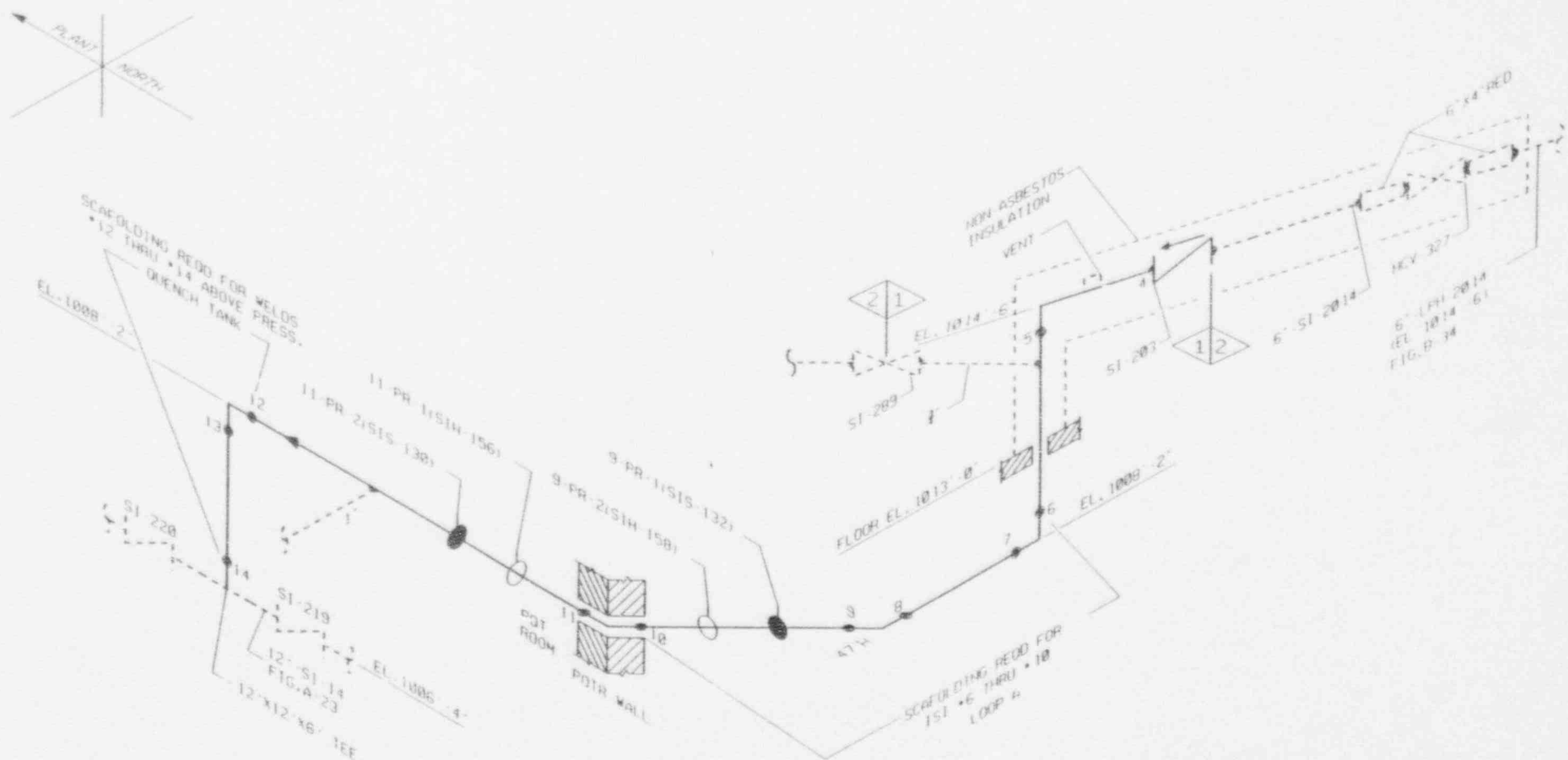
NOMINAL DIA 6"
SCHEDULE 160
NOMINAL THICKNESS 0.719"
STANDARD 41-FCL

CONTAINMENT
EAST SIDE EL.1013'-0"
EAST SIDE EL.994'-0"

REV.DWGS.
P&ID E-23866-210-130
ISO IC 76 I, IC 79 I;
D-4255,SH.1

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-26



NOMINAL DIA 6"
SCHEDULE 160
NOMINAL THICKNESS 0.719"
STANDARD 41-FCL

FLOOR EL.994'-0"

6-SI-14

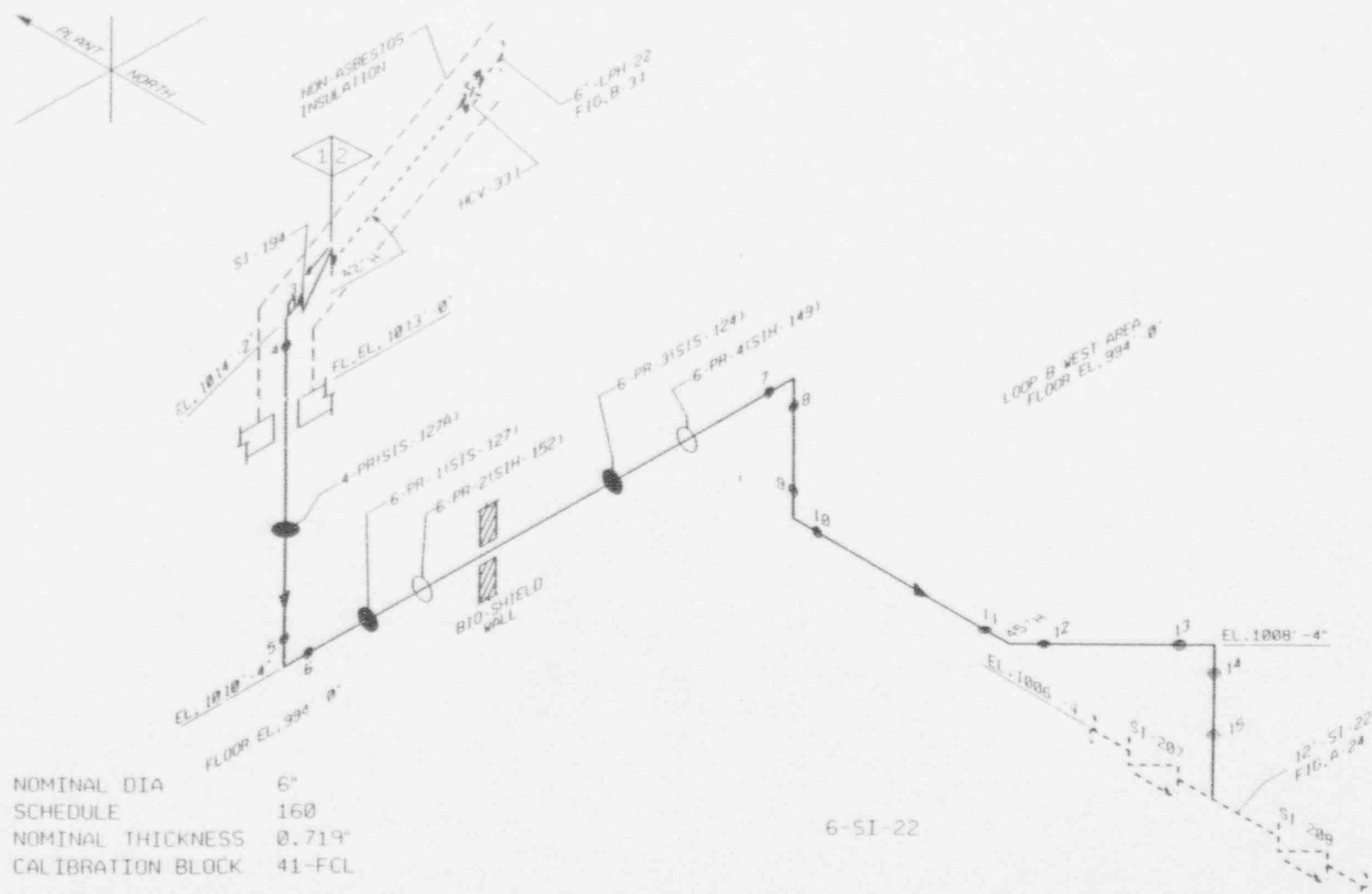
CONTAINMENT
SOUTH SIDE EL.1013'-0"
SOUTHWEST SIDE EL.994'-0"
PRESS.QUENCH TANK ROOM EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 77 II. D-4256,SH.1

FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-27



NOMINAL DIA 6"
SCHEDULE 160
NOMINAL THICKNESS 0.719"
CALIBRATION BLOCK 41-FCL

CONTAINMENT
WEST SIDE CONTAINMENT EL.1013'-0"
WEST SIDE BASEMENT EL.994'-0"
LOOP B WEST AREA EL.994'-0"

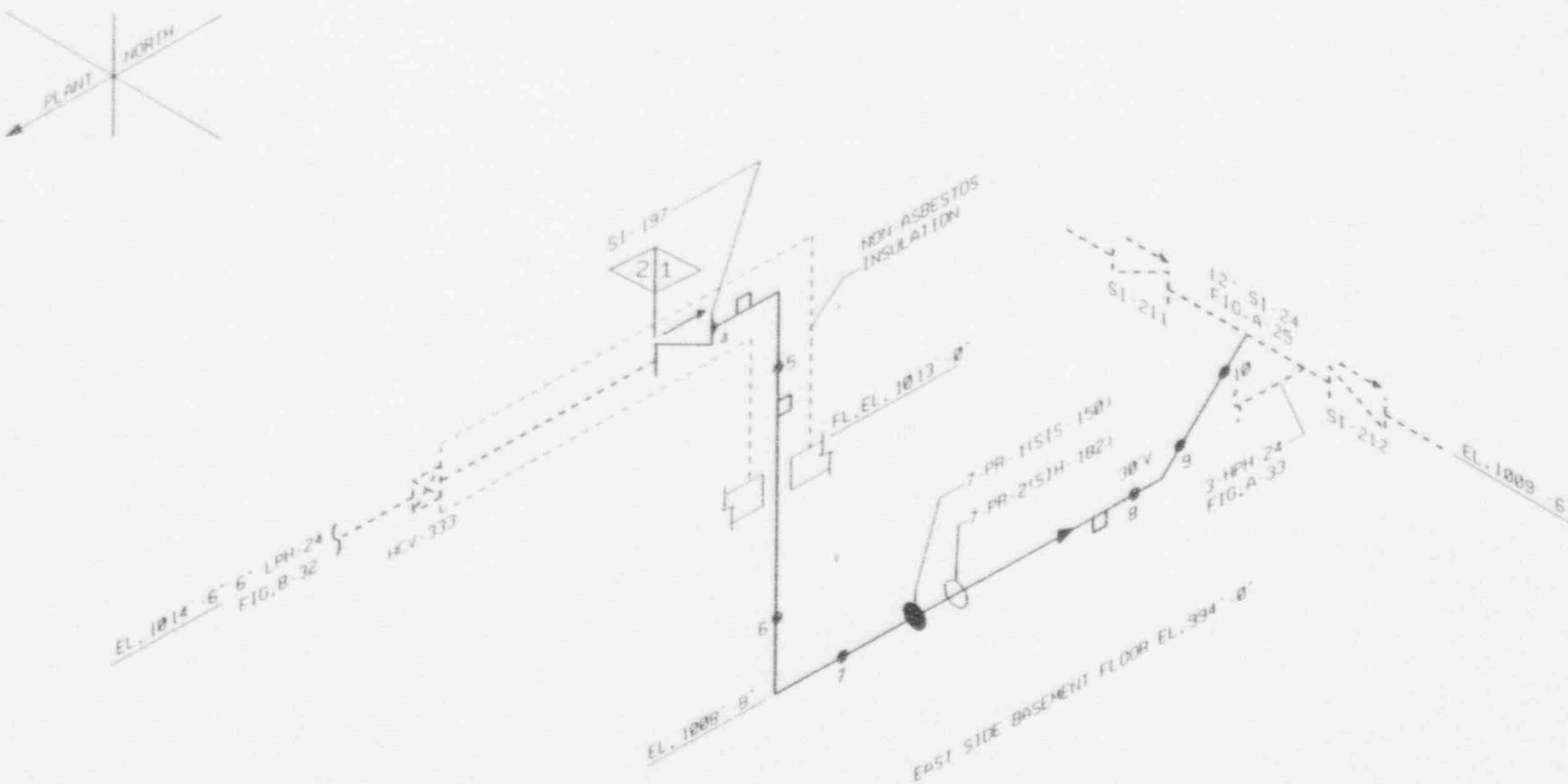
REF.DWGS.
P&ID E-23866-210-130
ISO IC 80 I. D-4299,SH.1

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-28



NOMINAL DIA 6"
SCHEDULE 160
NOMINAL THICKNESS 0.719
STANDARD 41-FCL

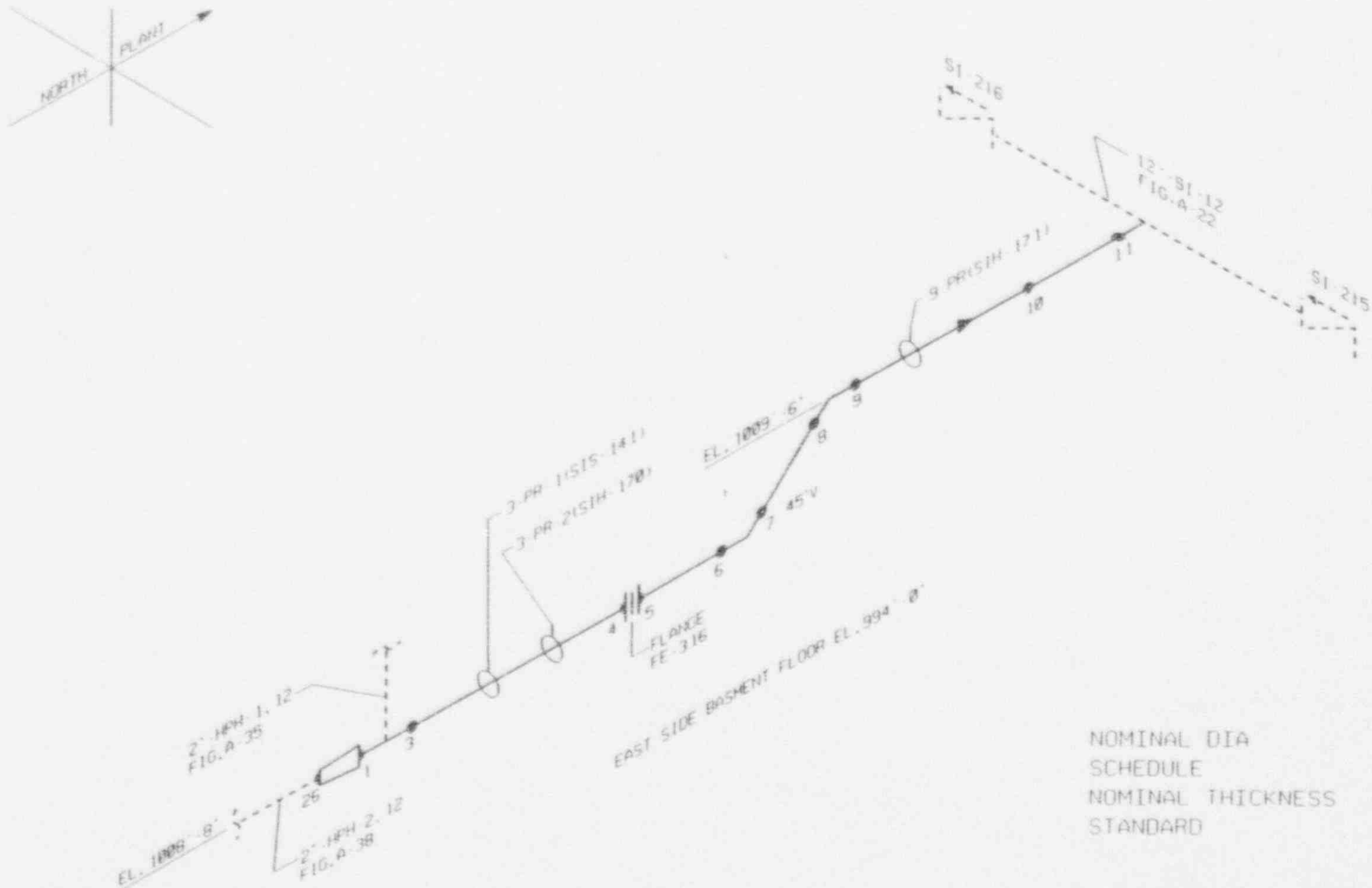
6-SI-24

CONTAINMENT
EAST SIDE CONT. EL.1013'-0"
EAST SIDE BASEMENT EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC-79 I, IC-76 I;D-4258,SH.1

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-29



NOMINAL DIA	3"
SCHEDULE	160
NOMINAL THICKNESS	0.437"
STANDARD	43-FCL

3-HPH-12

REF.DWGS.
P&ID E-23866-210-130
ISO IC 81 II: D-4255,SH.1

CONTAINMENT
EAST SIDE BASEMENT EL.994'-0"

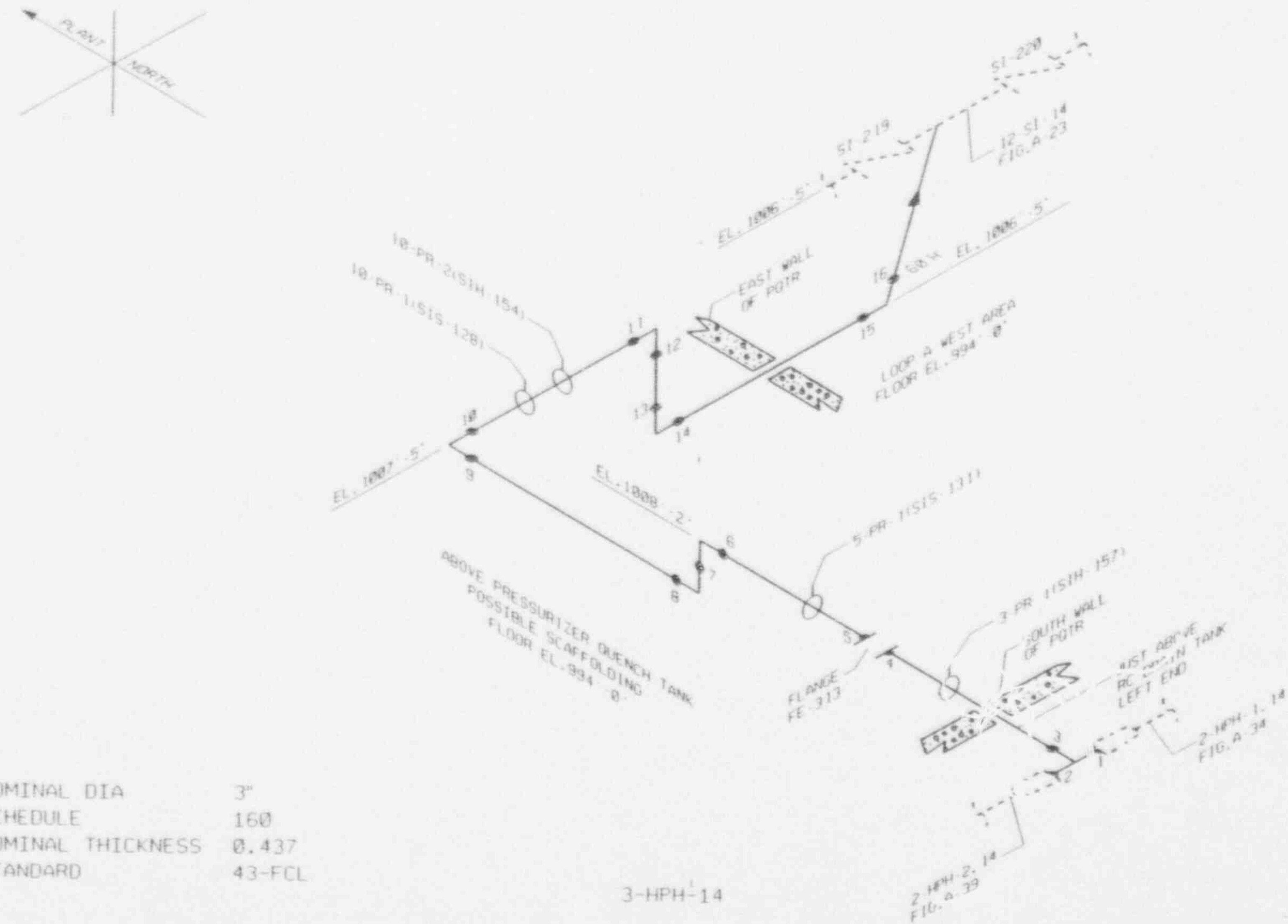
FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-30

DWG. FIGURE A-30, SH. 1

FOR INFORMATION ONLY



NOMINAL DIA	3"
SCHEDULE	160
NOMINAL THICKNESS	0.437
STANDARD	43-FCL

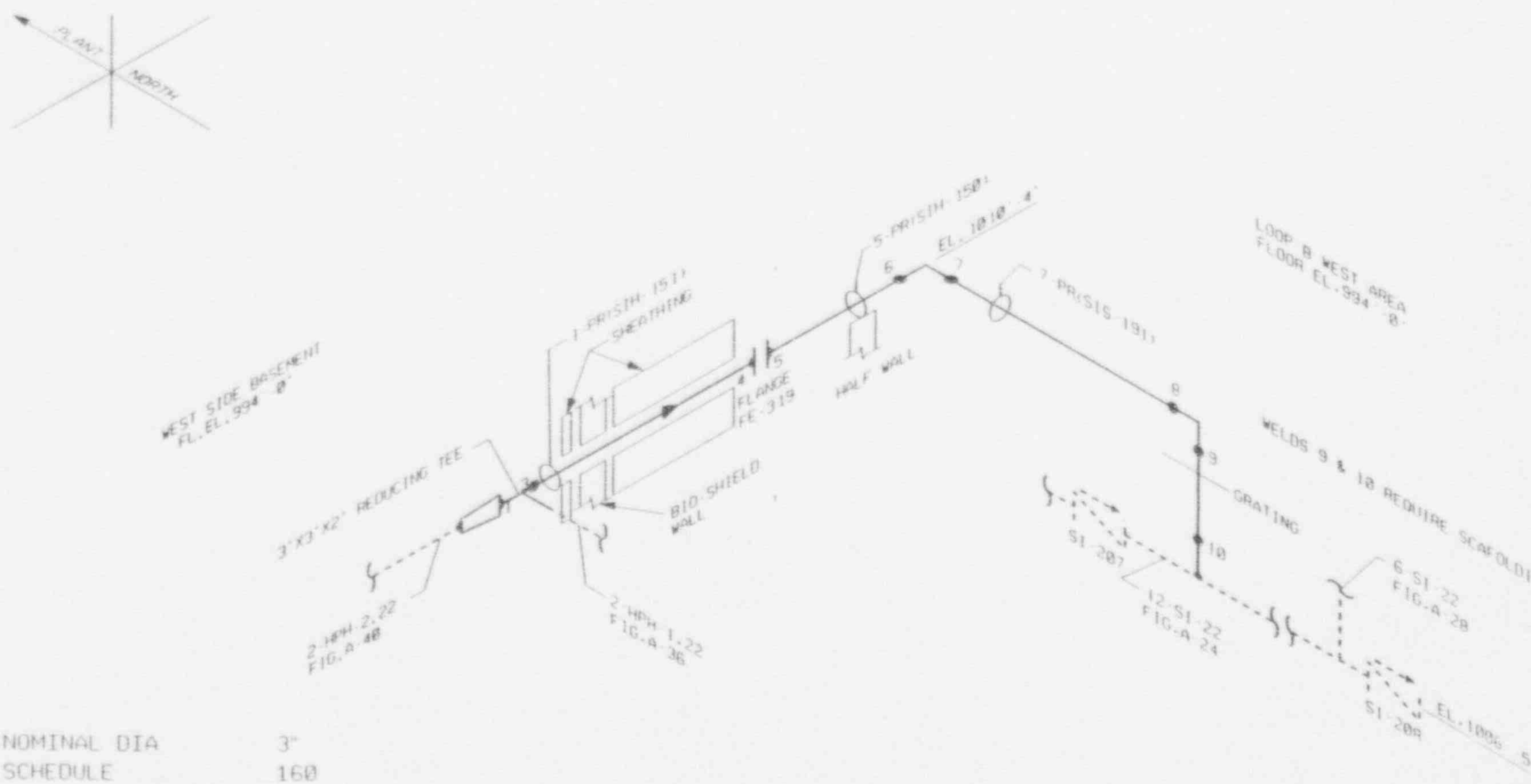
3-HPH-14

CONTAINMENT
LOOP A WEST AREA EL.994'-0"
PQT ROOM EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 162 II, IC 75 II;

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-31



NOMINAL DIA	3"
SCHEDULE	160
NOMINAL THICKNESS	0.437
STANDARD	43-FCL

3-HPH-22

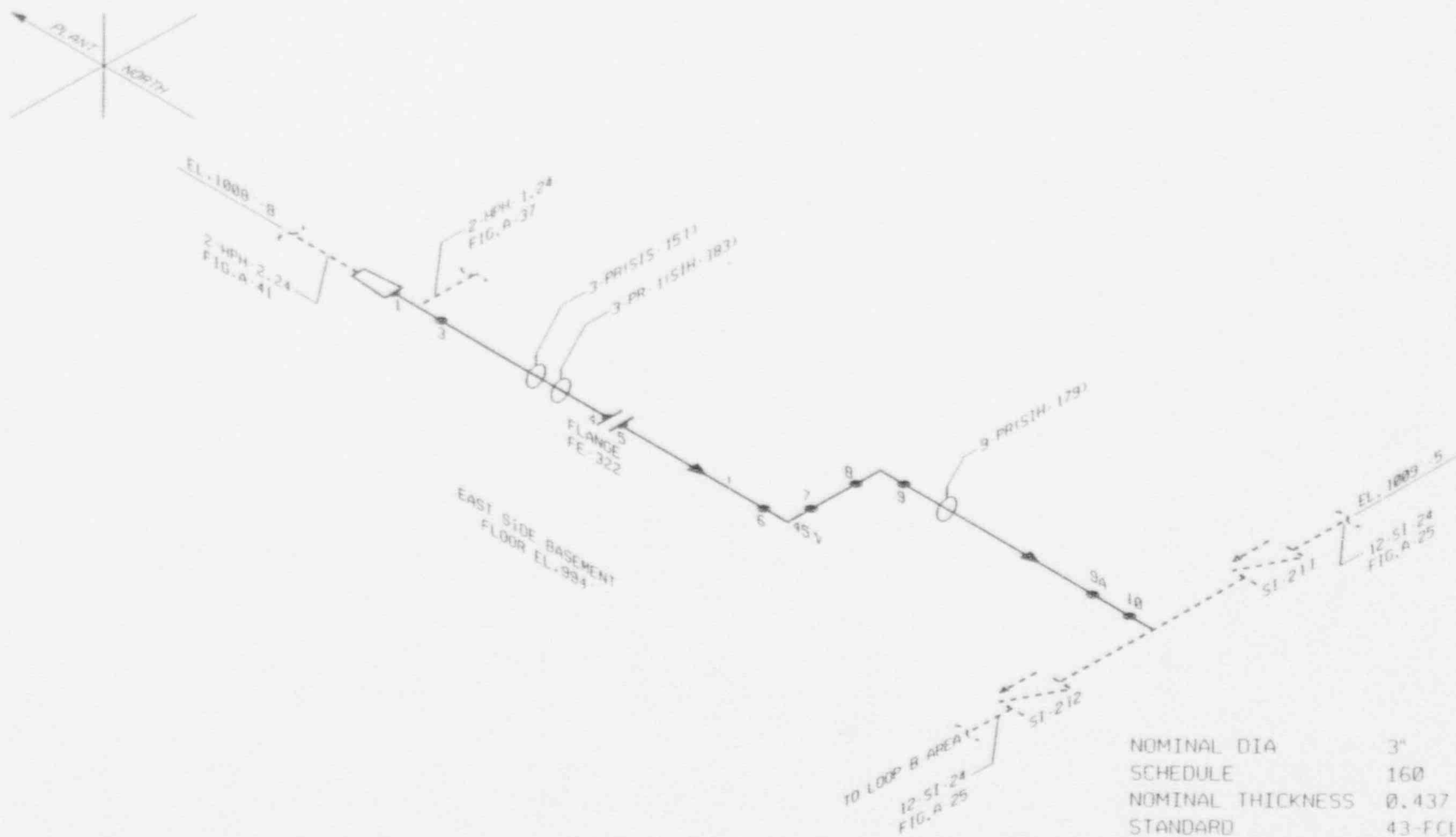
REV.DWGS.
P&ID E-23866-210-130
ISO IC 162 II, IC 75 II;
D-4299,SH.1

CONTAINMENT
LOOP B WEST AREA EL.994'-0"
WEST SIDE BASEMENT EL.994'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-32

FOR INFORMATION ONLY



NOMINAL DIA	3"
SCHEDULE	160
NOMINAL THICKNESS	0.437
STANDARD	43-FCL

3-HPH-24

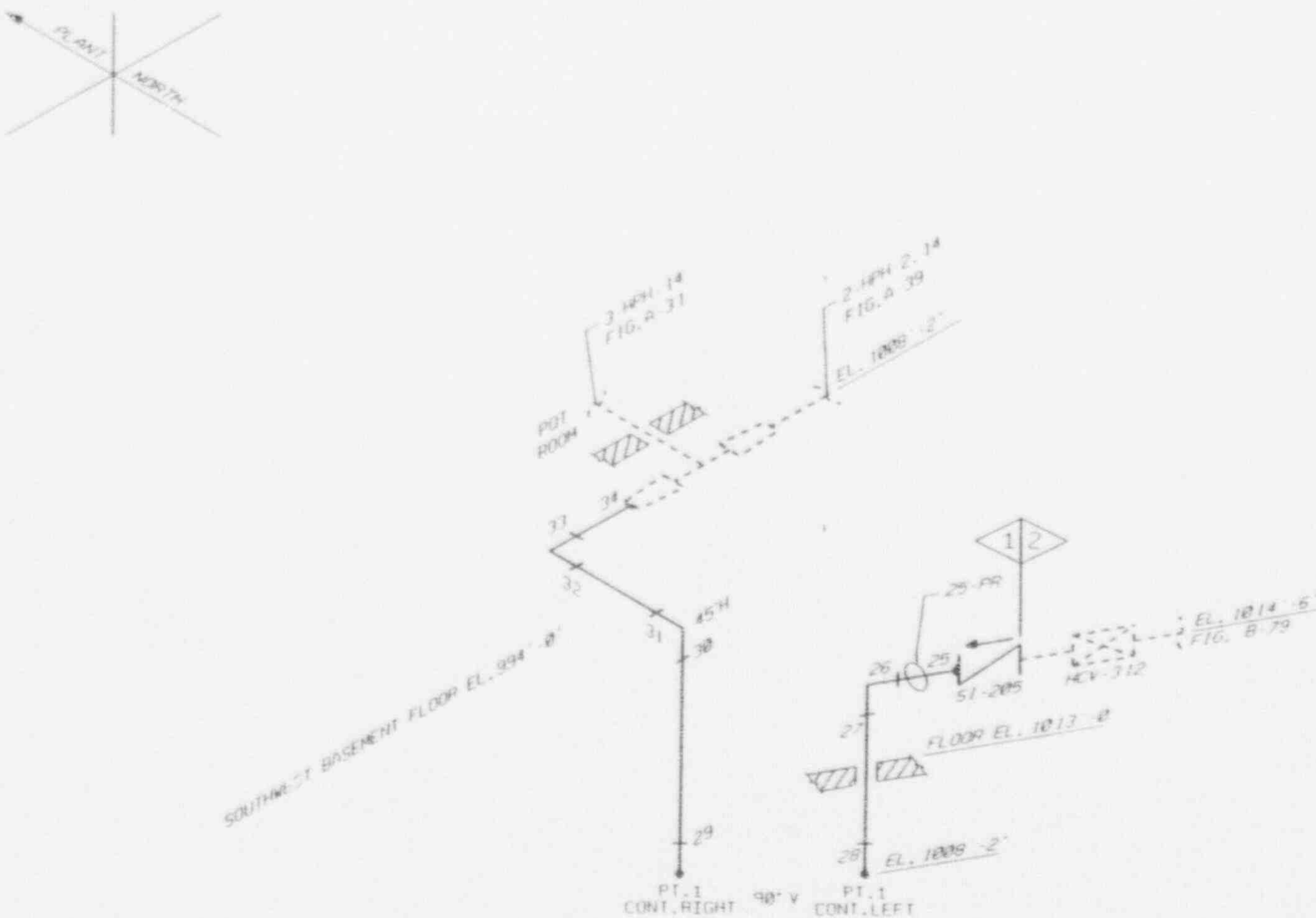
REF.DWGS.
P&ID E-23866-210-130
ISO IC 81 II: D-4258.SH.1

CONTAINMENT
EAST SIDE BASEMENT EL.994'

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-33

FOR INFORMATION



2-HPH-1.14

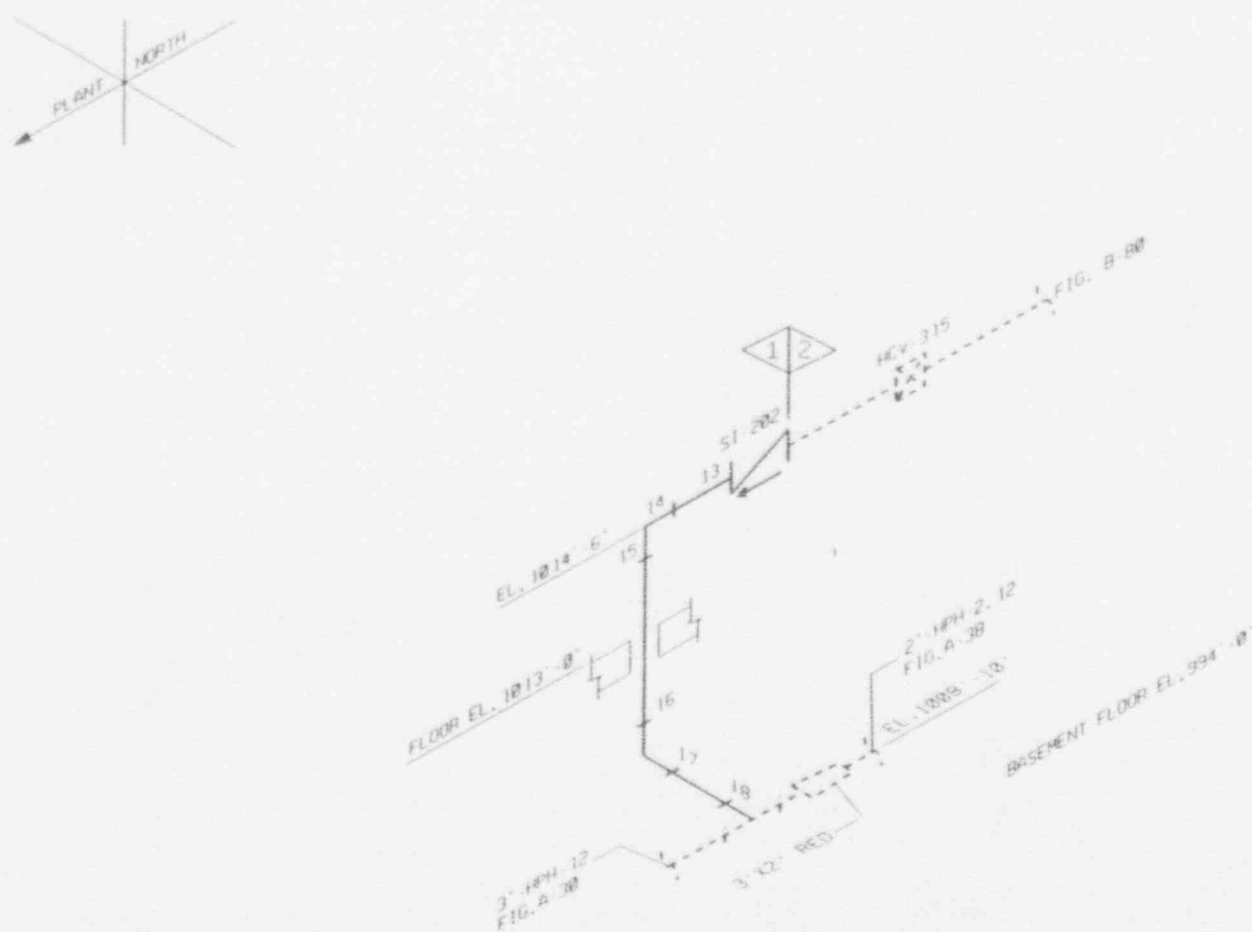
CONTAINMENT
SOUTHWEST EL.1013'-0"
SOUTHWEST BASEMENT EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO SI 2041 I: D-4256.SH.2

FORT CALHOUN STATION

I.S.I ISOMETRIC

A-34



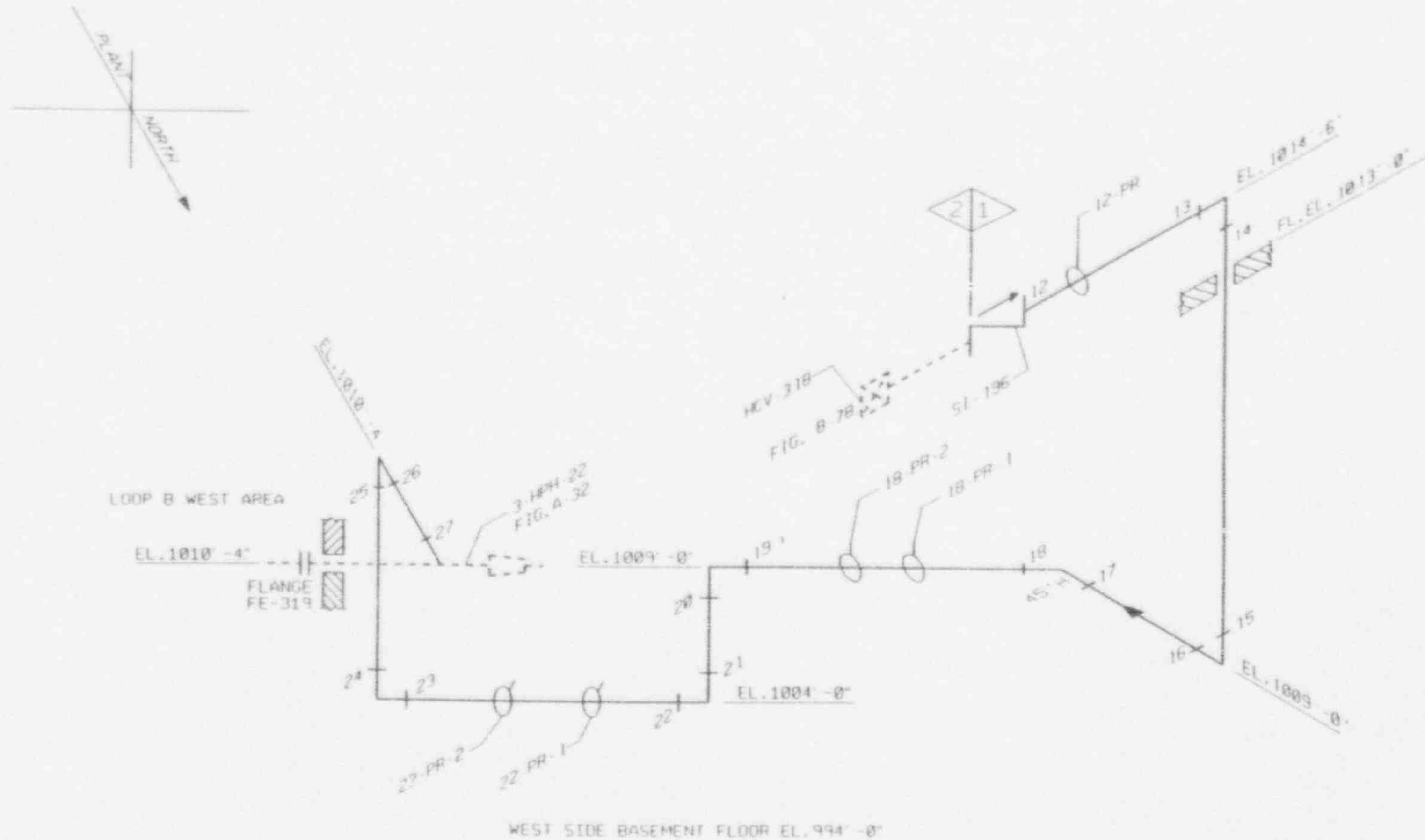
2-HPH-1.12

REF. DWGS.
P&ID E-23866-210-130
ISO SI-2042 I: D-4255, SH. 1

CONTAINMENT
EAST SIDE EL. 1013'-0"
EAST SIDE EL. 994'-0"

FOR INFORMATION ...

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-35



2-HPH-1.22

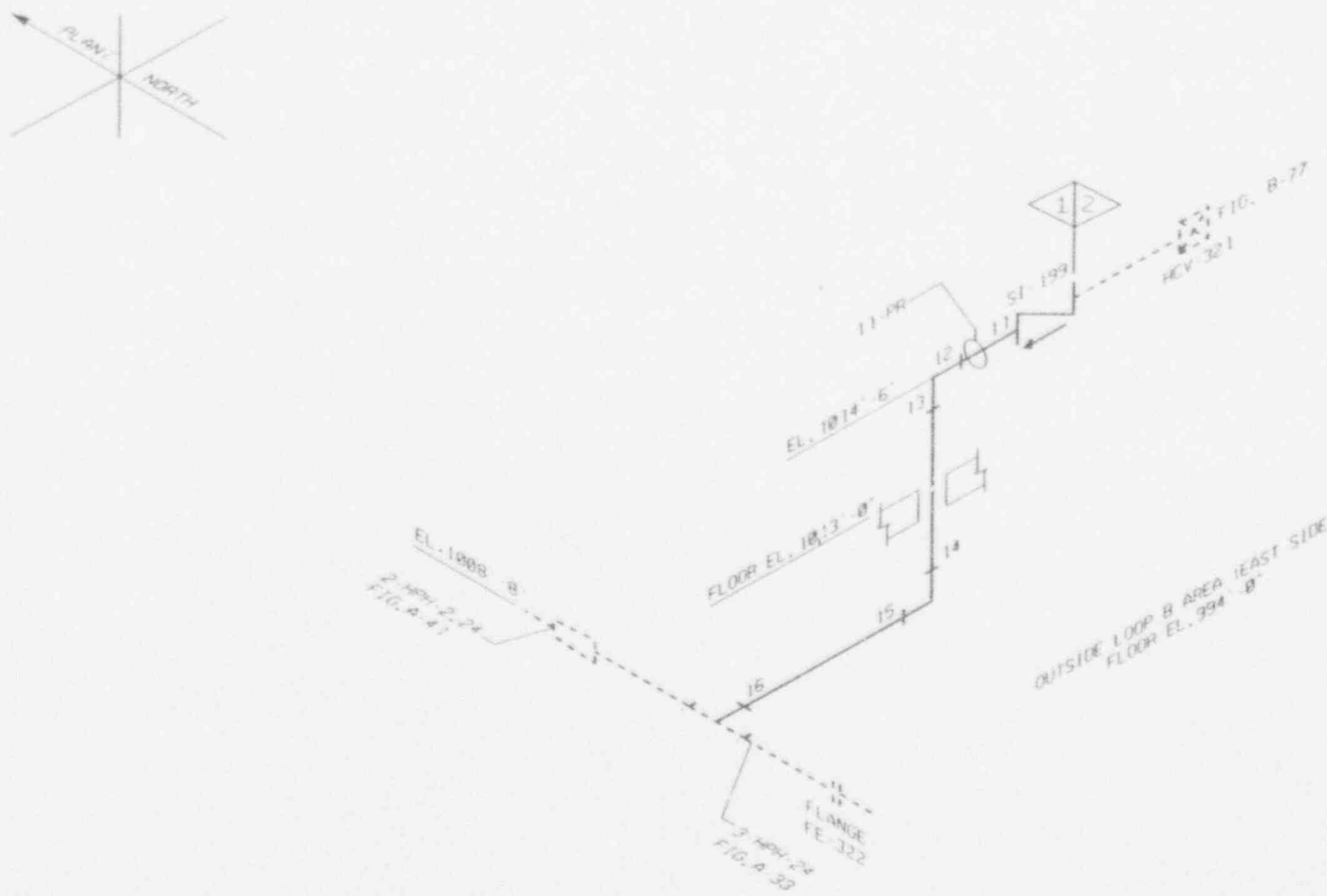
REF.DWGS
P&ID E-23866-210-130
ISO SI 2044 I: D-4299,SH.1

CONTAINMENT
NORTHWEST EL.1013'-0"
WEST SIDE EL.994'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-36



2-HPH-1.24

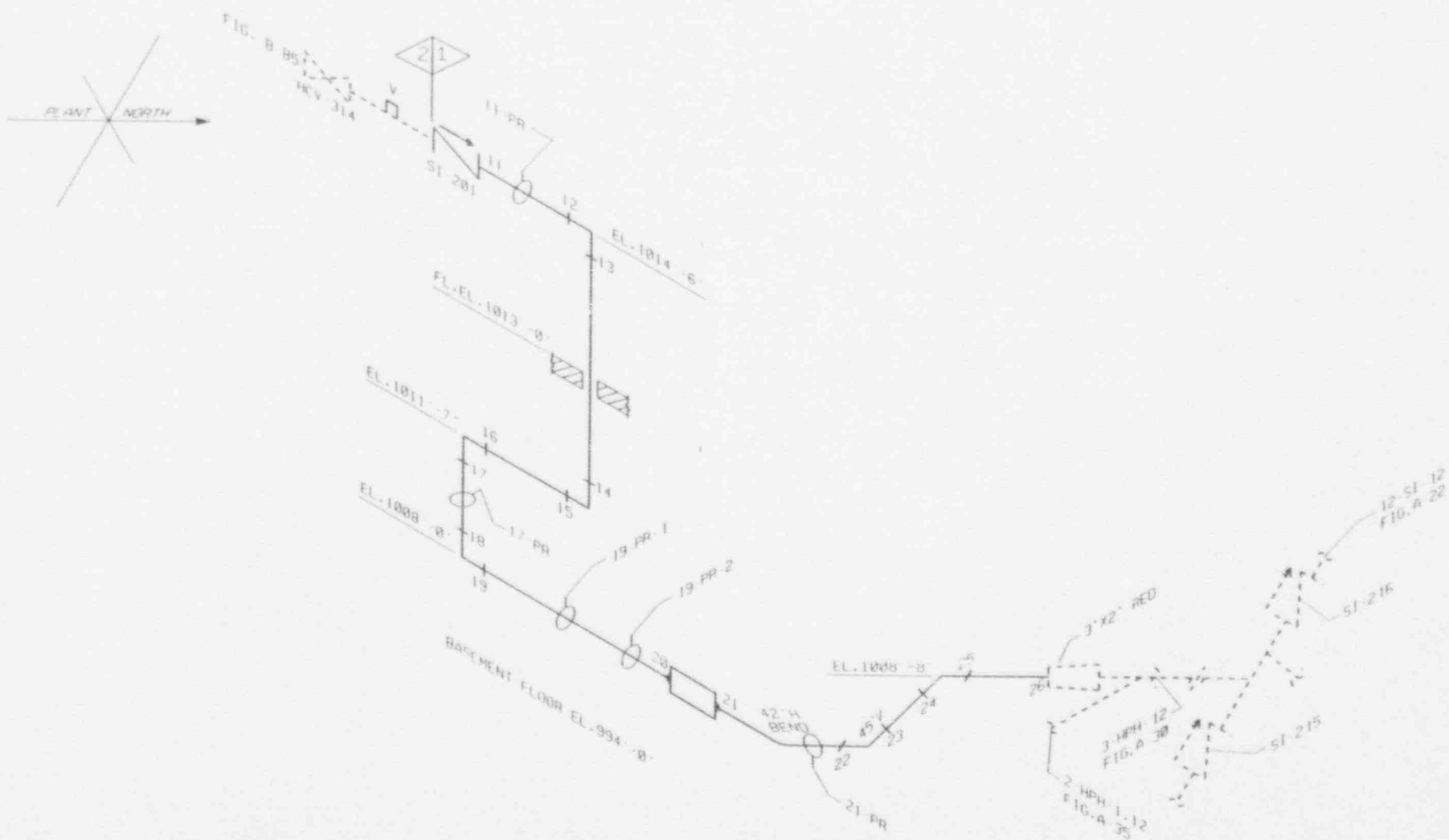
CONTAINMENT
EAST SIDE EL.1013'-0"
EAST SIDE EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO SI 2040 I:D-4258,SH.1

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-37



2-HPH-2.12

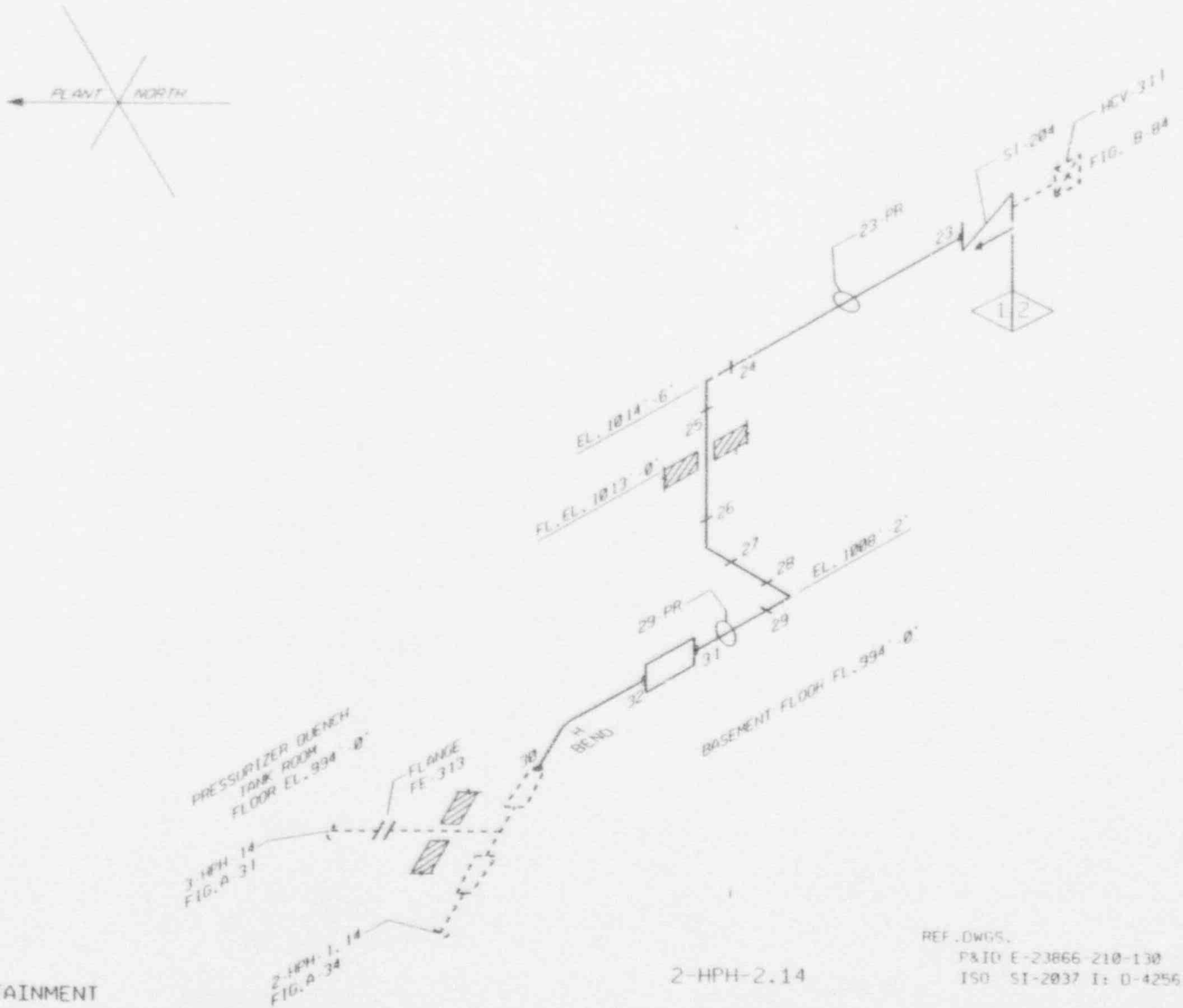
CONTAINMENT
SOUTHEAST EL.1013'-0"
EAST SIDE EL.994'-0"

REF.DWGS
P&ID E-23866-210-130 REV.31
ZONE E6, SH.2
ISO SI 2038 I:D-4255,SH.1

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-38



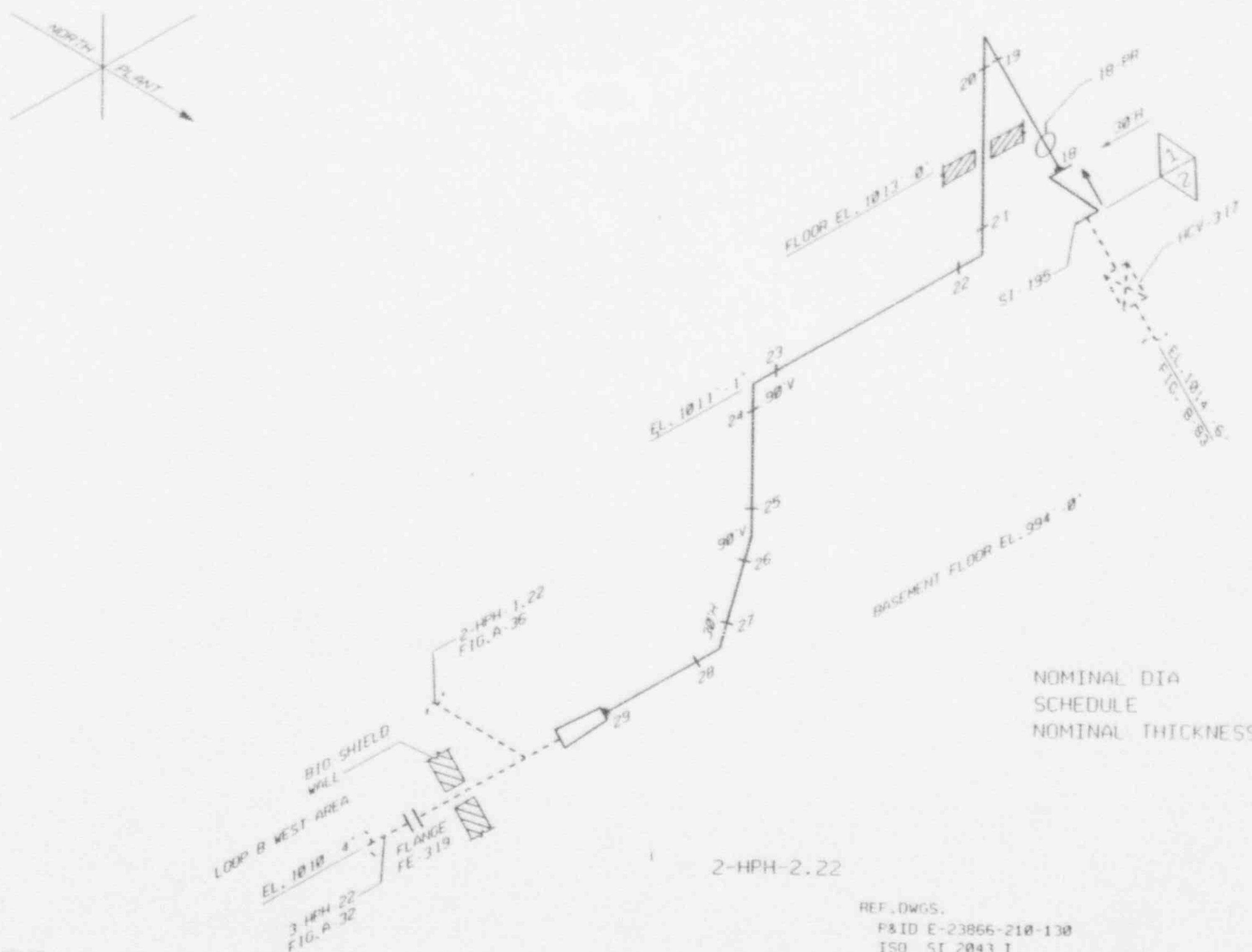
2-HPH-2.14

REF. DWGS.
P&ID E-23866-210-130
ISO SI-2037 I: D-4256, SH.2

CONTAINMENT
SOUTH SIDE EL. 1013'-0"
SOUTHWEST EL. 994'-0"

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-39

FOR INFORMATION ONLY



NOMINAL DIA	2.375"
SCHEDULE	160
NOMINAL THICKNESS	.344

2-HPH-2.22

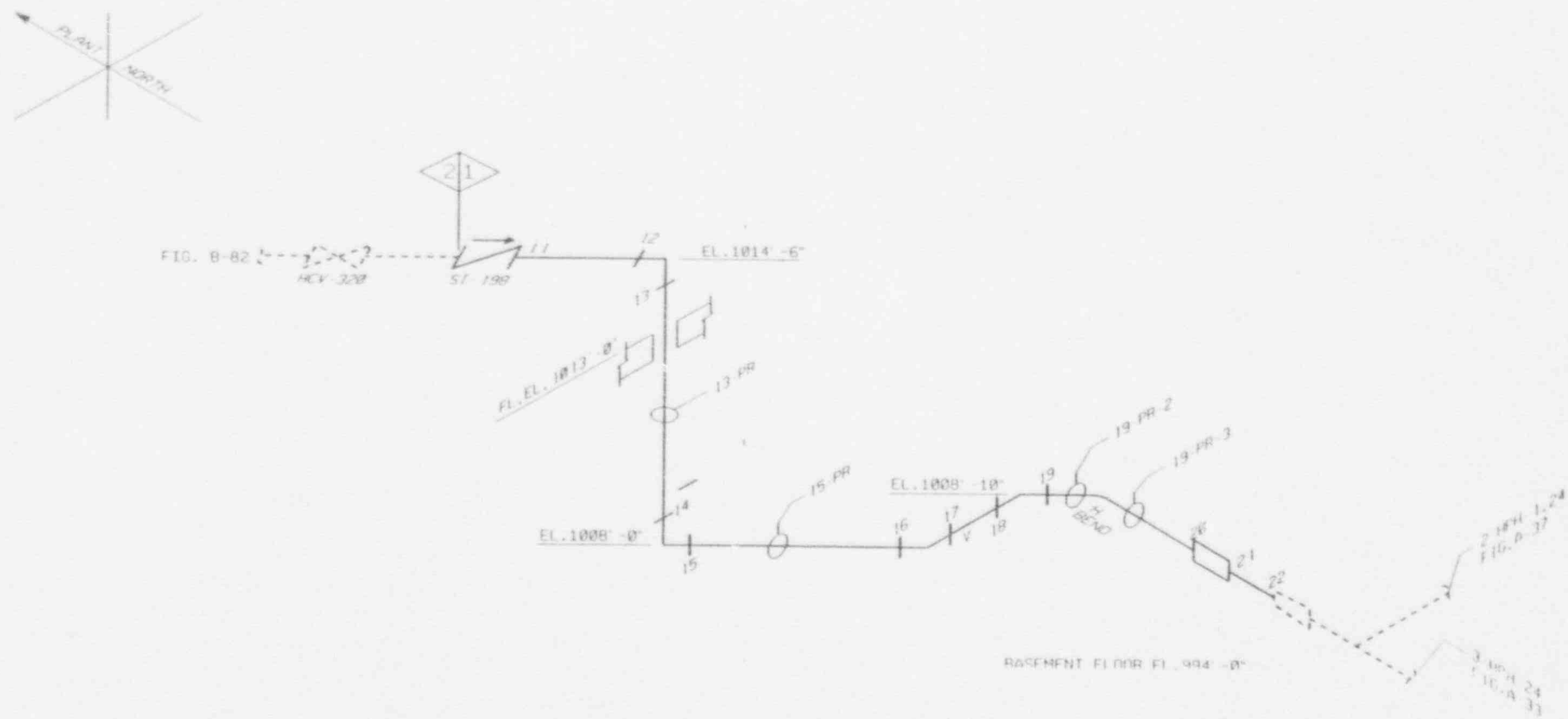
REF. DWGS.
P&ID E-23866-210-130
ISO SI 2043 I

CONTAINMENT
WESTSIDE EL.1013'-0"
WESTSIDE EL.994'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC
A-40

FOR INFORMATION ONLY



2-HPH-2.24

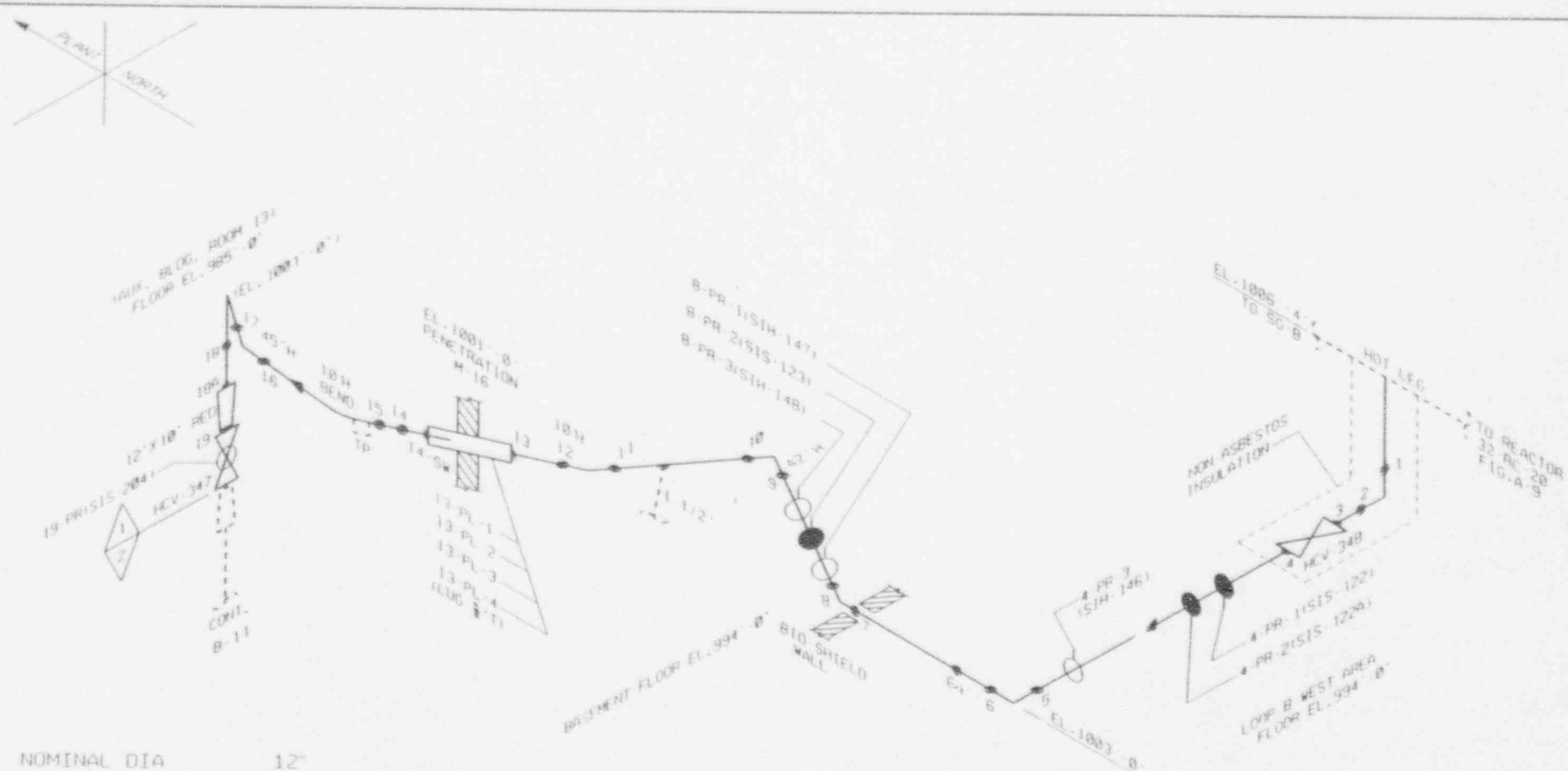
CONTAINMENT
NORTHEAST EL.1013'-0"
NORTHEAST EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO SI 2039 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-41



NOMINAL DIA	12"
SCHEDULE	160
NOMINAL THICKNESS	1.312
STANDARD	39-FCL

12-SDC-20

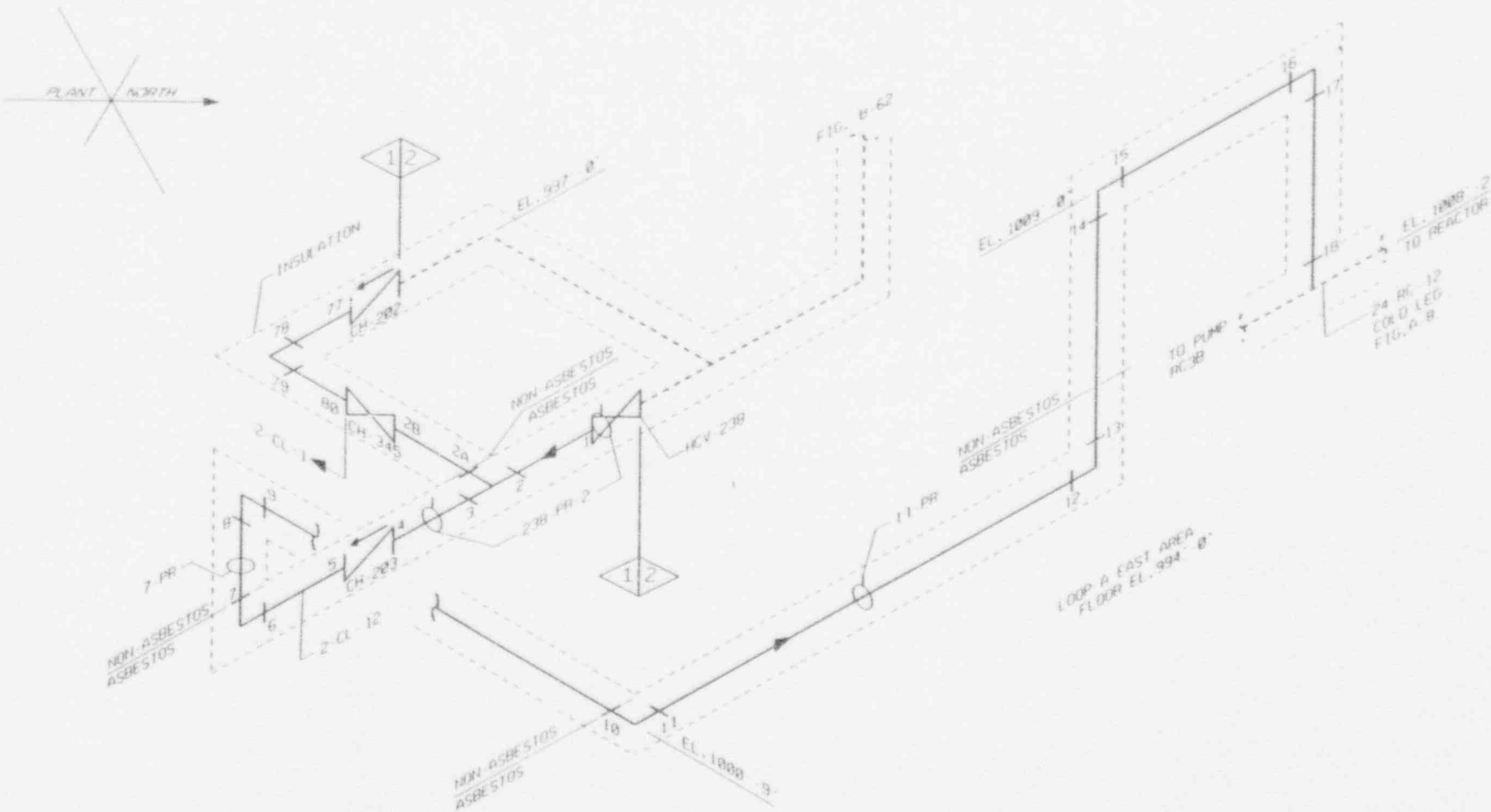
AUX. BLDG.
ROOM 13
CONTAINMENT
LOOP B WEST AREA EL. 994'-0"
NORTHSIDE EL. 994'-0"

REF. DWGS.
P&ID E-23866-210-130
E-23866-210-130
ISO IC 82 IV, IC 212 V;
D-4260, SH.1; D-4270, SH.1

FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-42



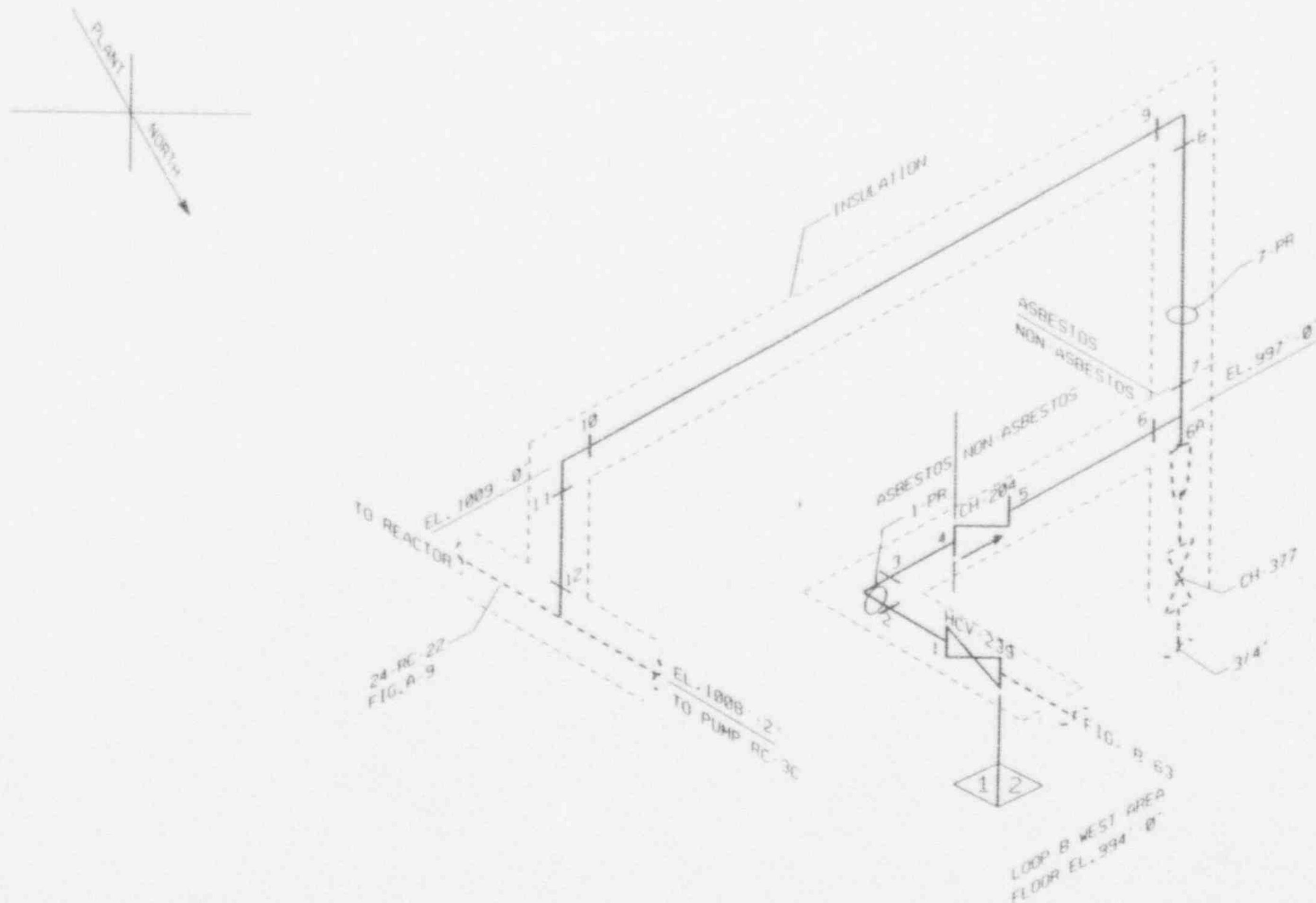
2-CL-12
2-CL-1

CONTAINMENT
LOOP A EAST AREA EL. 994' -0"

FOR INFORMATION ONLY

REF. DWGS.
P&ID E-23866-210-110
E-23866-210-120
ISO CH 2014 Iv

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-43



2-CL-22

CONTAINMENT
LOOP B WEST AREA EL. 994'-0"

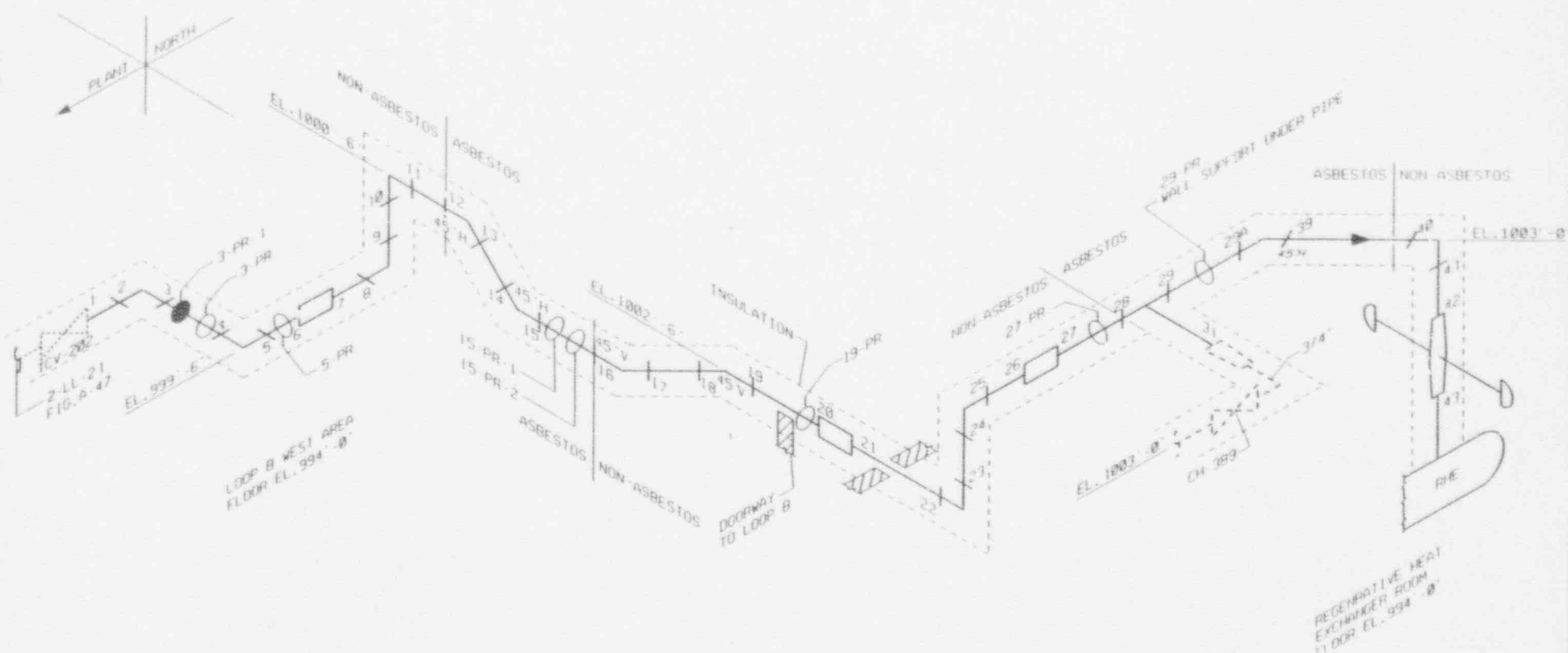
REF. DWGS.
P&ID E-23866-210-110
E-23866-210-120
ISO CH 2014 VI

FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-44

FOR INFORMATION ONLY



2-LL-1

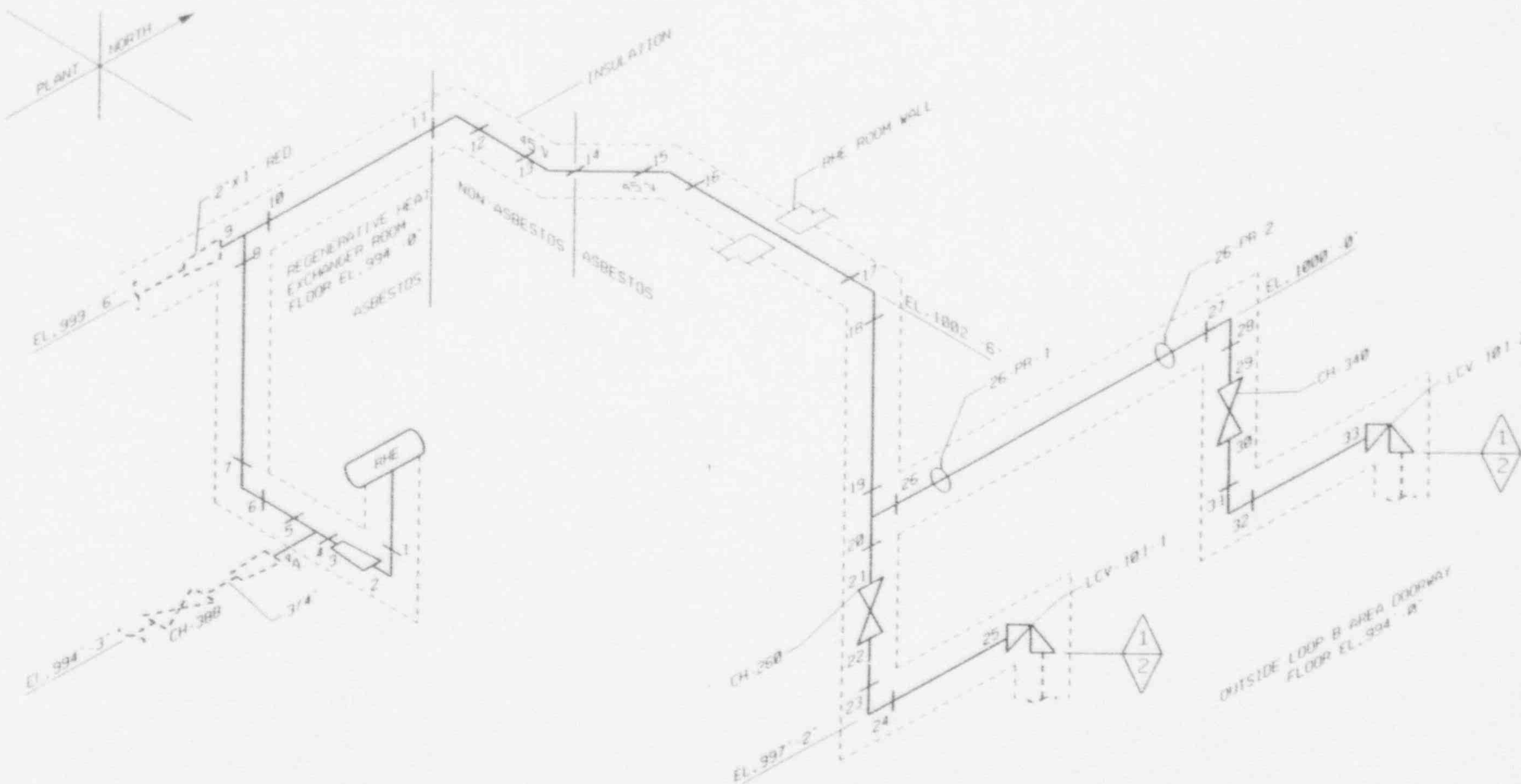
CONTAINMENT
LOOP B WEST AREA EL.994'-0"
BASEMENT WESTSIDE EL.994'-0"
RHEX ROOM EL.994'-0"

REF.DWGS.
P&ID E-23866-210-120
ISO CH 2049 I.WD-2072 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-45



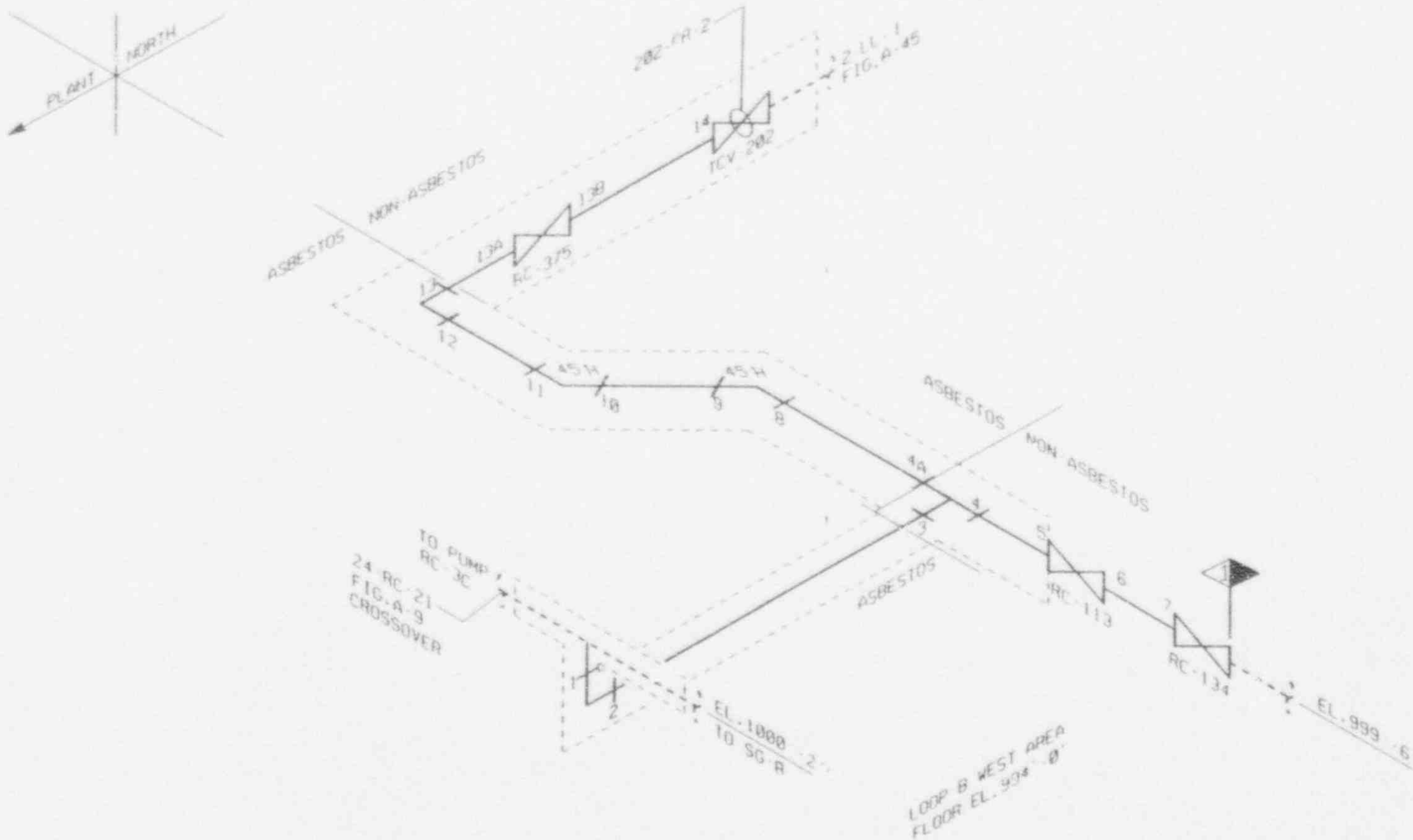
2-LL-2

CONTAINMENT
WEST SIDE EL.994'-0"
RHEX ROOM EL.994'-0"

REF.DWGS.
P&ID E-23866-210-120
ISO CH-2048 I, CH-2048 II

FOR INFORMATION

FORT CALHOUN STATION
I.S.I. ISOMETRIC
A-46



2-LL-21

REF.DWGS.
P&ID E-23866-210-110
E-23866-210-120
ISO WD 2072 I

CONTAINMENT
LOOP B WEST AREA EL.994'-0"

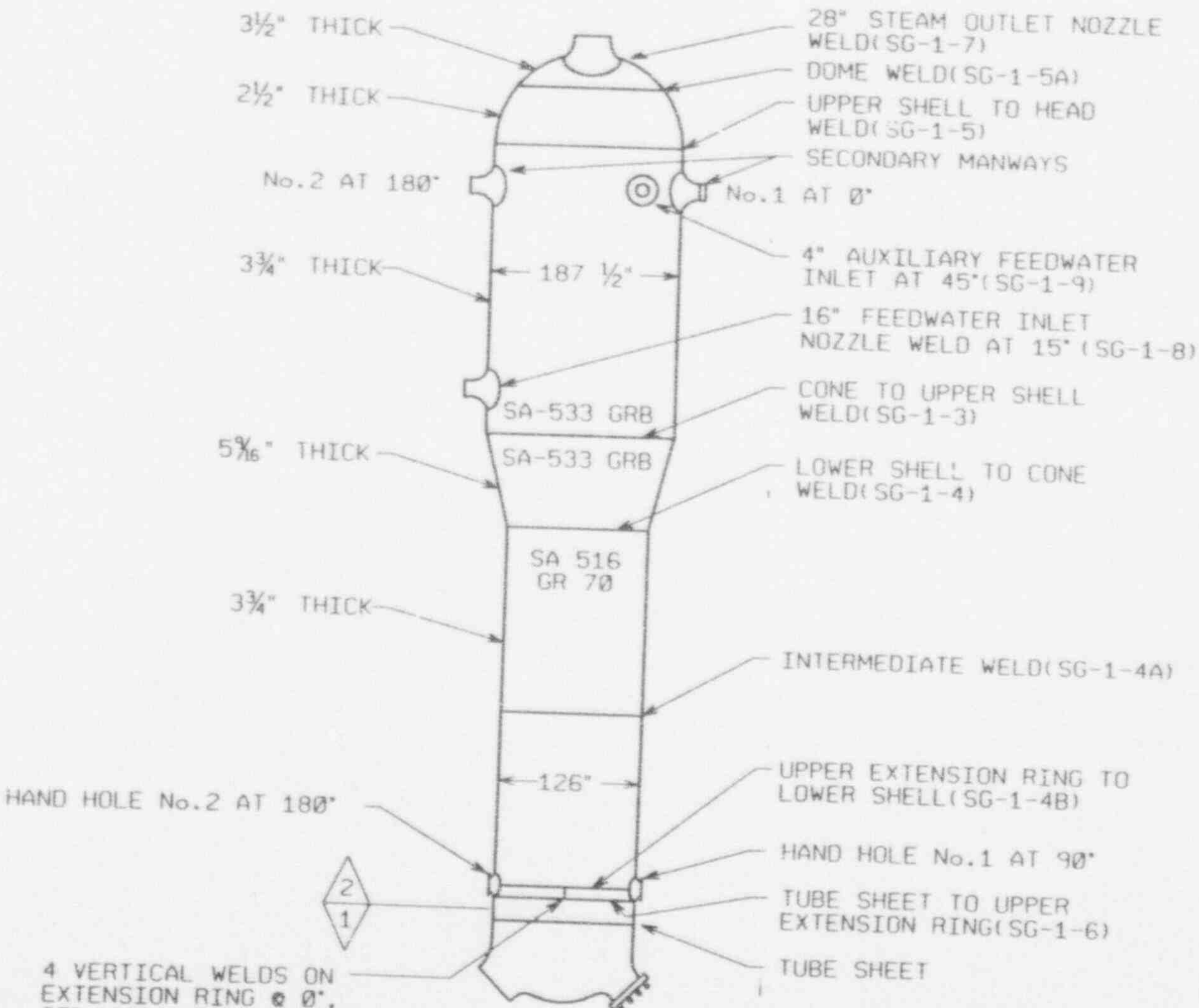
FORT CALHOUN STATION

I.S.I. ISOMETRIC

A-47

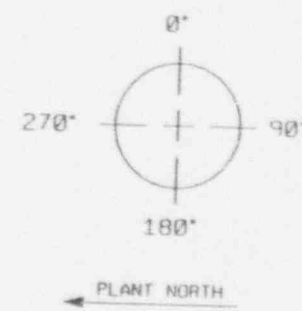
DWG. FIGURE A-47, SH. 1

FOR INFORMATION ONLY



STEAM GENERATOR A
RC-2A

NOT A TRUE PERSPECTIVE-
NOZZLES AND ACCESS PORTS
ARE LOCATED PER AZIMUTH
ANGLES SHOWN BELOW
LOOKING DOWN



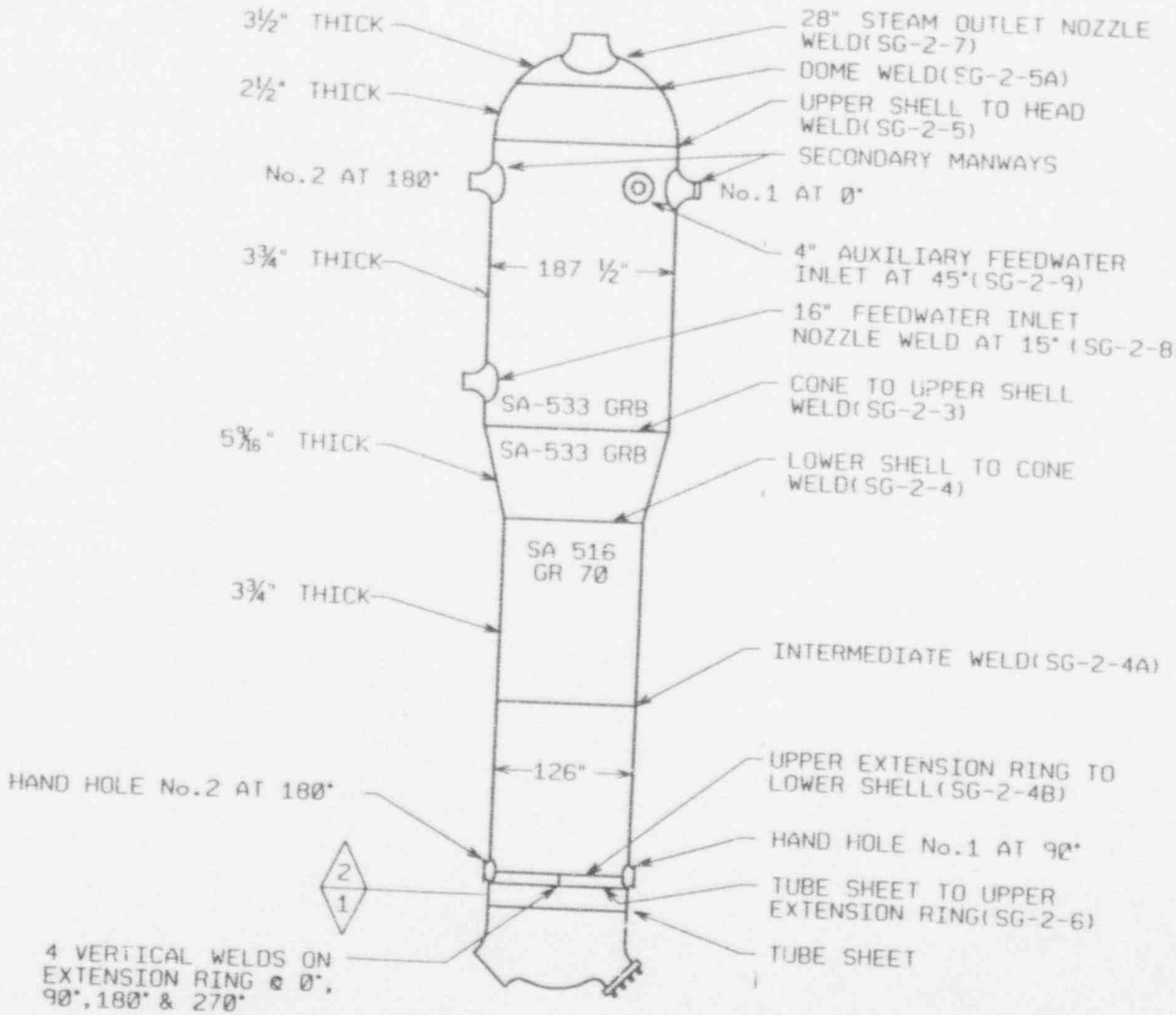
CAL.BLK. 8-FCL

CONTAINMENT
LOOP A AREA

REV.DWGS.
E-232-477-7
E-232-478-8
E-232-511-3

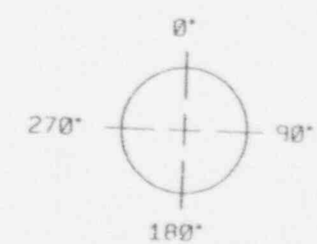
FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-1
DWG. FIGURE B-1, SH.1 OF 1

DATE
TASK/MR #



STEAM GENERATOR B
RC-2B

NOT A TRUE PERSPECTIVE-
NOZZLES AND ACCESS PORTS
ARE LOCATED PER AZIMUTH
ANGLES SHOWN BELOW
LOOKING DOWN



PLANT NORTH

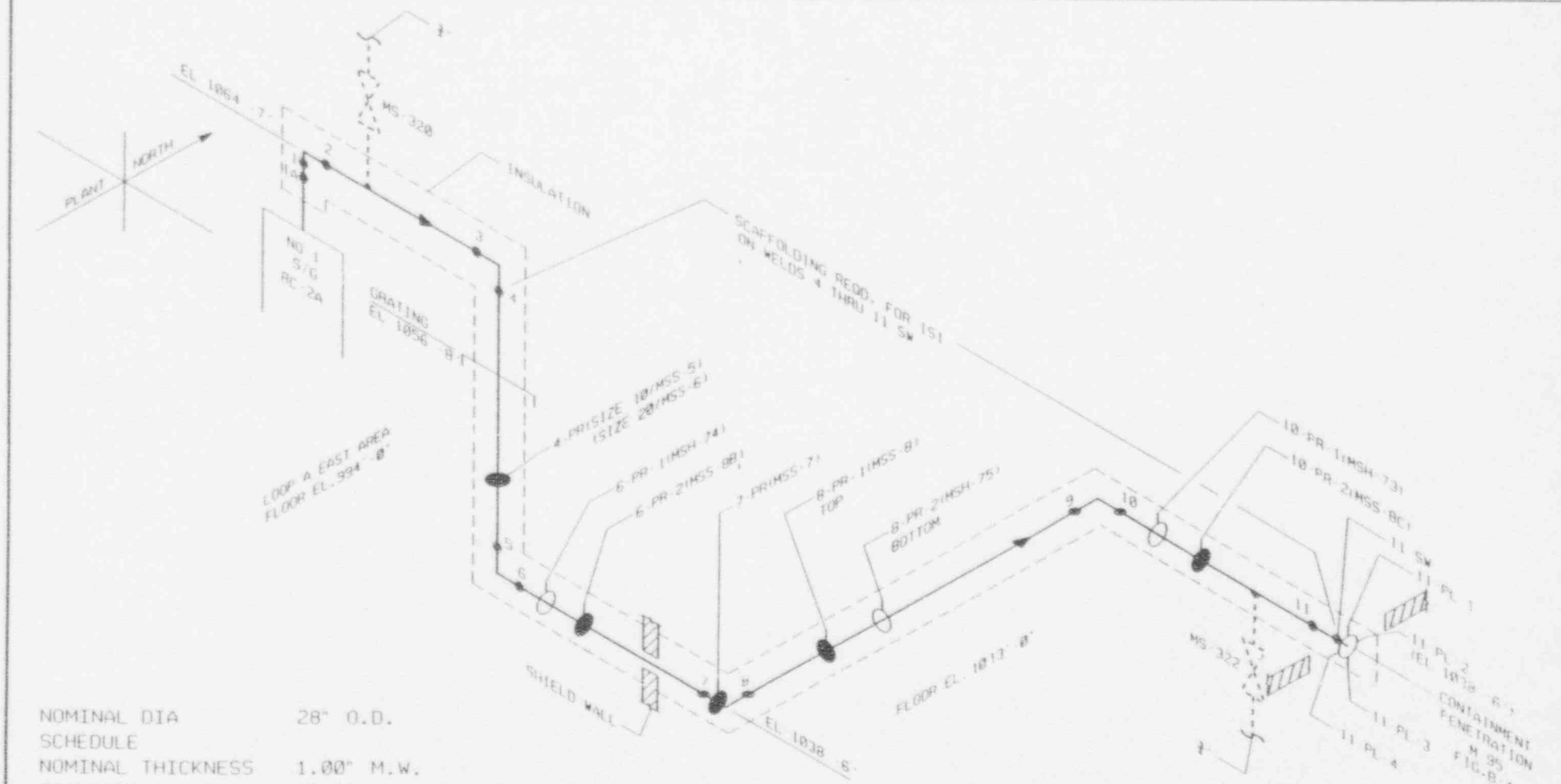
CAL.BLK. 8-FCL

CONTAINMENT
LOOP B AREA

REV.DWGS.
E-232-477-7
E-232-478-8
E-232-511-3

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-2
DWG. FIGURE B-2, SH.1 OF 1



NOMINAL DIA 28" O.D.
SCHEDULE
NOMINAL THICKNESS 1.00" M.W.
STANDARD 15-FCL
CARBON STEEL PIPE

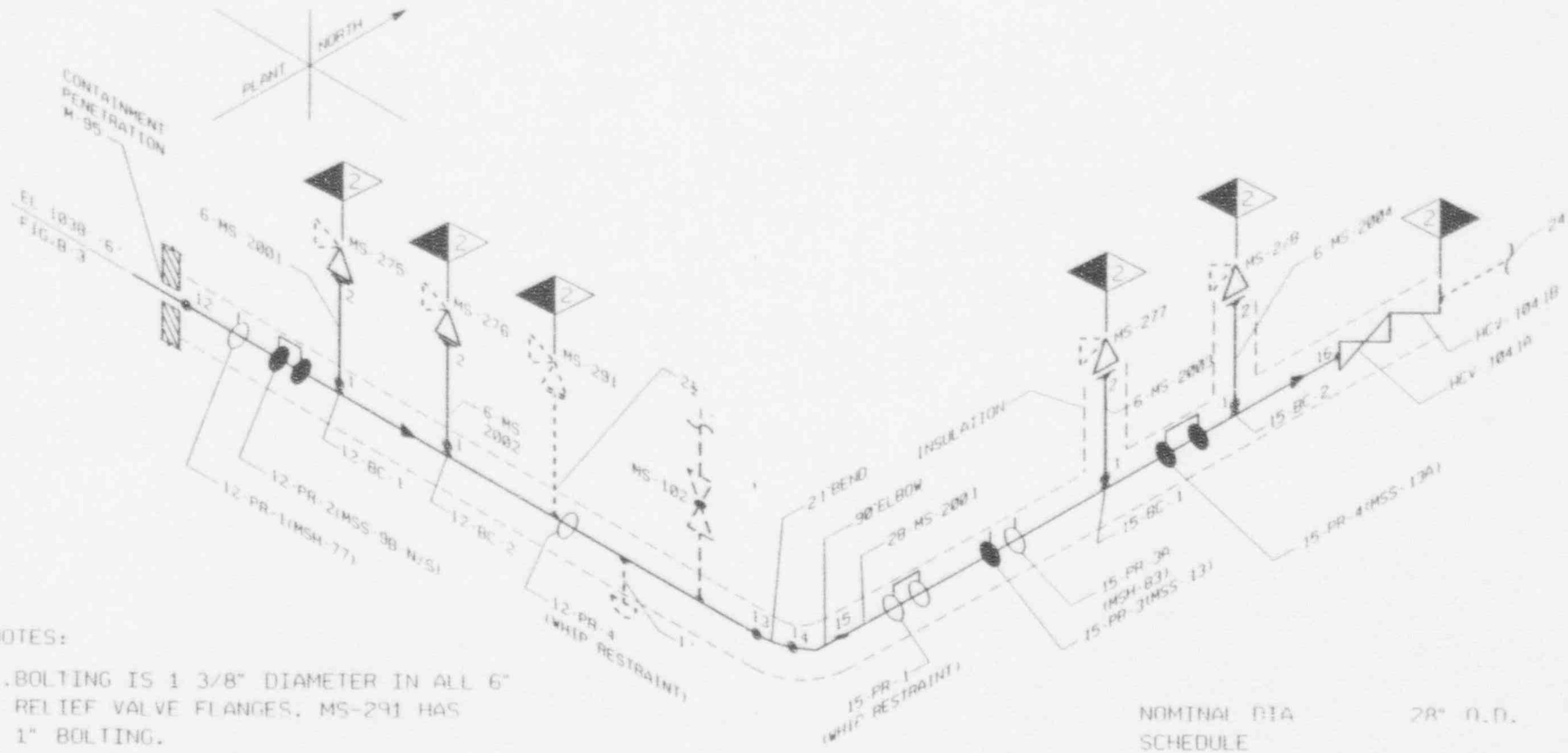
28-MS-2001

REF.DWGS.
P&ID 11405-M-252
ISO IC 66. D-4286 I

CONTAINMENT
LOOP A EAST AREA EL.994'-0"
EASTSIDE EL.1013'-0"

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-3

FOR INFORMATION ONLY



NOTES:

1. BOLTING IS 1 3/8" DIAMETER IN ALL 6" RELIEF VALVE FLANGES. MS-291 HAS 1" BOLTING.

2. ALL PIPING IS CABLE WRAPPED.

3. CARBON STEEL PIPE

6-MS-2001	6" DIA.
6-MS-2002	SCHEDULE 80
6-MS-2003	NOMINAL THICKNESS 0.432"
6-MS-2004	

28-MS-2001
6-MS-2001
6-MS-2002
6-MS-2003
6-MS-2004

NOMINAL DIA	28" O.D.
SCHEDULE	
NOMINAL THICKNESS	1.00" M.W.
STANDARD	15-FCL

REF. DWGS.
P&ID 11405-M-252
ISO IC 381, D-4311

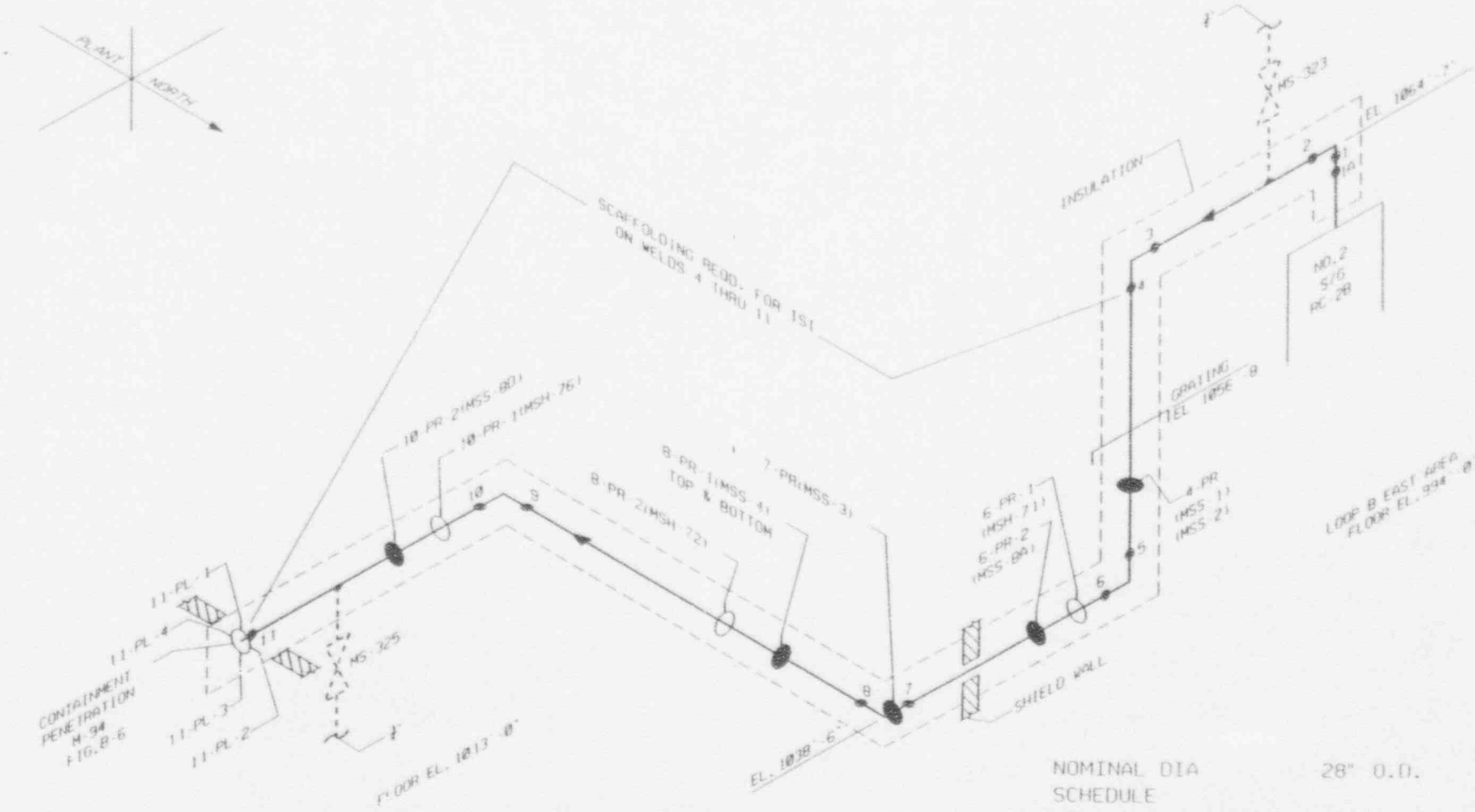
AUX. BLDG.
ROOM 81 EL.1036'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-4

DWG. FIGURE B-4, SH. 1



NOMINAL DIA	28" O.D.
SCHEDULE	
NOMINAL THICKNESS	1.00" M.W.
STANDARD	15-FCL
CARBON STEEL PIPE	

28-MS-2002

CONTAINMENT
LOOP B EAST AREA EL.994'-0"
EAST SIDE EL.1013'-0"

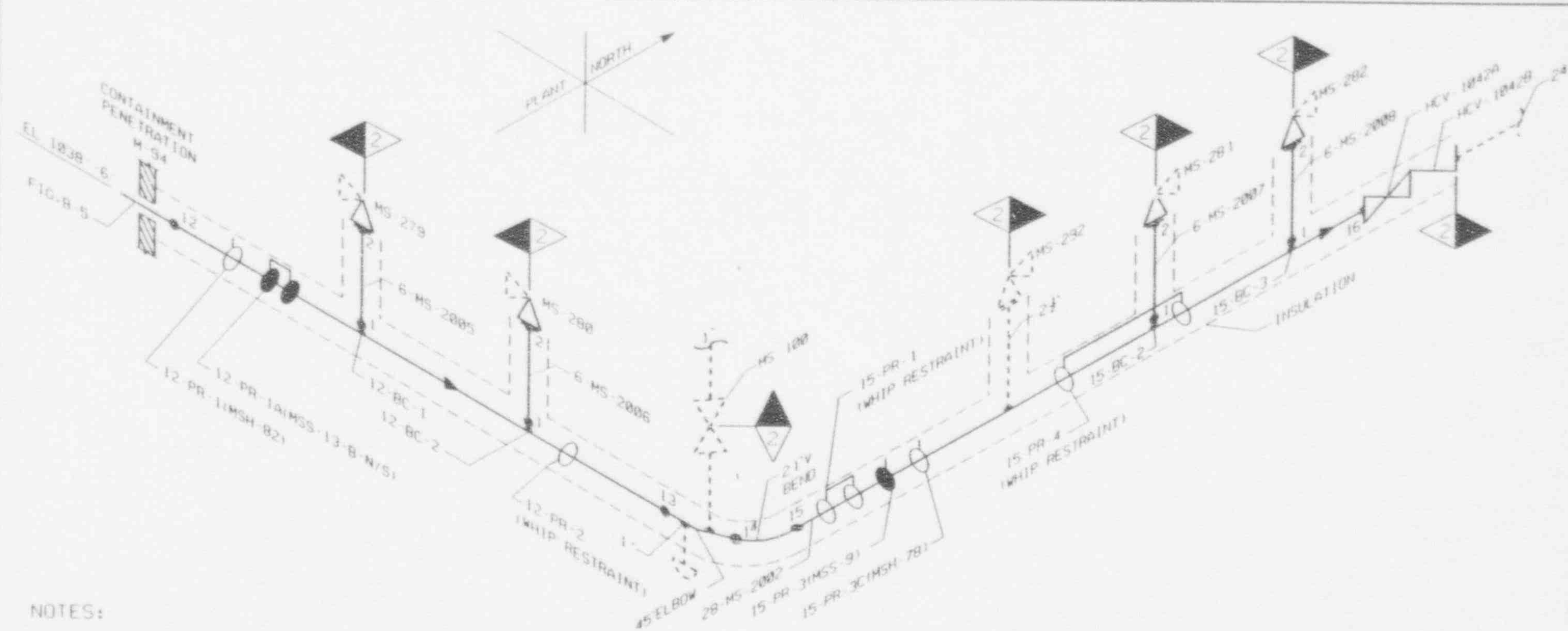
REF.DWGS.
P&ID 11405-M-252
ISO IC 66, D-4286 I

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-5



NOTES:

1. BOLTING IS 1 3/8" DIAMETER IN ALL 6" RELIEF VALVE FLANGES. HCV-1038 HAS 1" BOLTING.

2. ALL PIPING IS CABLE WRAPPED.

3. CARBON STEEL PIIPE

NOMINAL DIA	28" O.D.
SCHEDULE	
NOMINAL THICKNESS	1.00" M.W.
STANDARD	15-FCL

28-MS-2002
6-MS-2005
6-MS-2006
6-MS-2007
6-MS-2008

6" BRANCH LINES

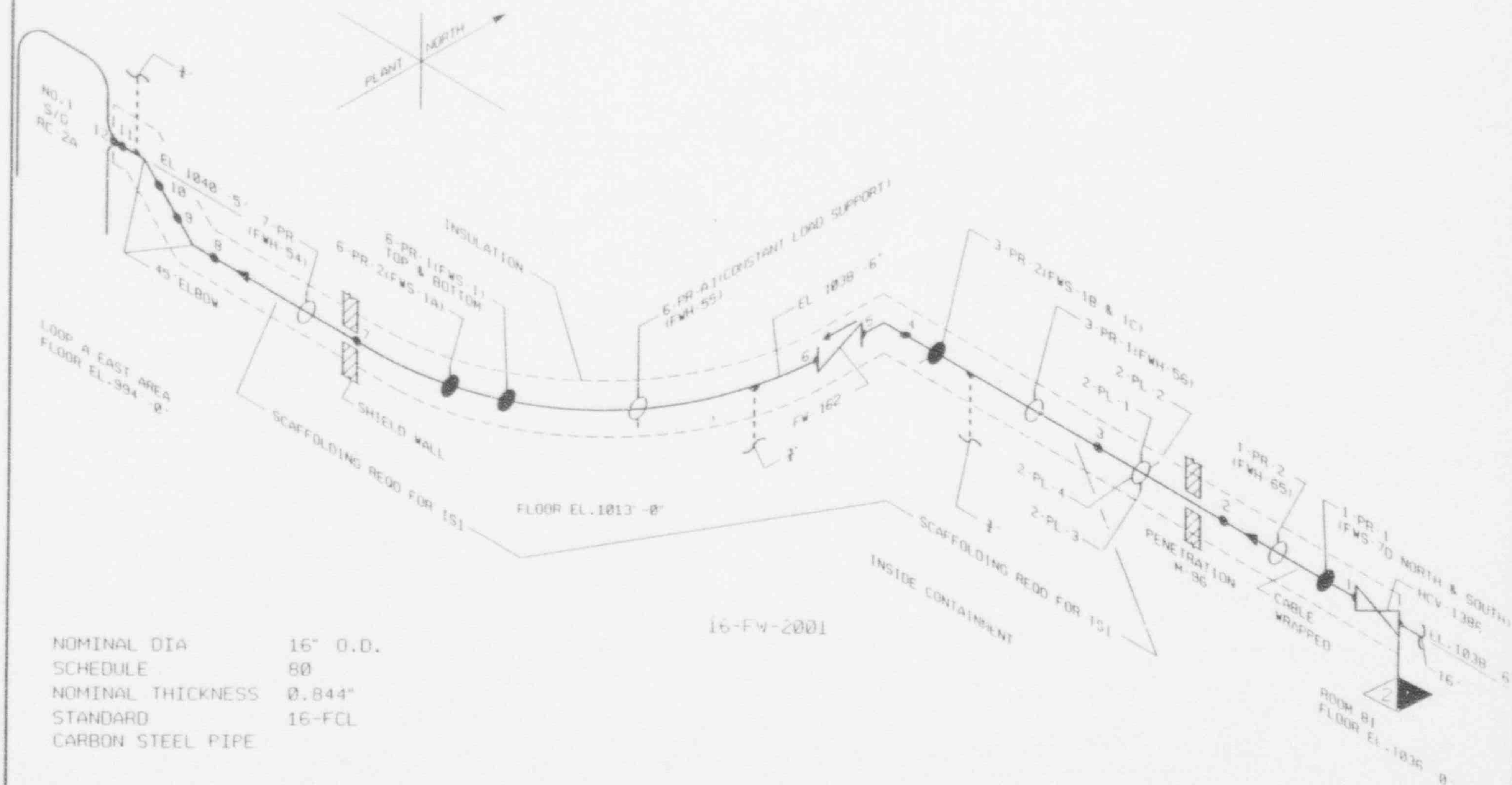
6-MS-2005	6" DIA.
6-MS-2006	SCHEDULE 80
6-MS-2007	NOMINAL THICKNESS 0.432"
6-MS-2008	

AUX. BLDG.
ROOM 81 EL. 1036'-0"

REF. DWGS.
P&ID 11405-M-252 REV. 31
ZONE A1
ISO IC-383 VI. D-4312

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-6



16-FW-2001

NOMINAL DIA	16" O.D.
SCHEDULE	80
NOMINAL THICKNESS	0.844"
STANDARD	16-FCL
CARBON STEEL PIPE	

REF. DWGS.
P&ID 11405-M-253
ISO IC 67 IV, IC 342 IV,
IC 347, D-4314

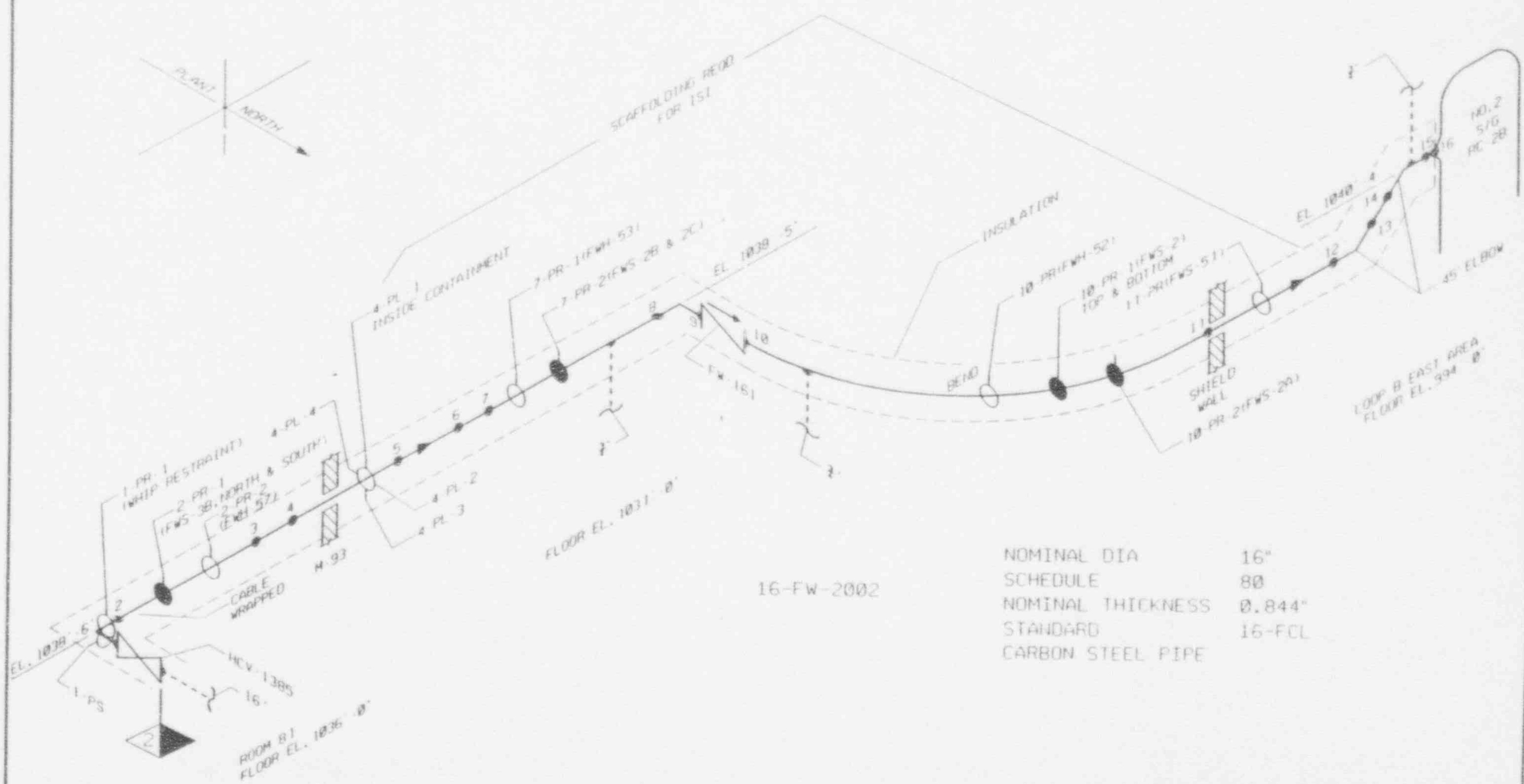
FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-7

CONTAINMENT
LOOP A EAST AREA EL.994'-0"
EAST SIDE EL.1013'-0"

AUX.BLDG.
ROOM 81 EL.1036'-0"

FOR INFORMATION



16-FW-2002

NOMINAL DIA	16"
SCHEDULE	80
NOMINAL THICKNESS	0.844"
STANDARD	16-FCL
CARBON STEEL PIPE	

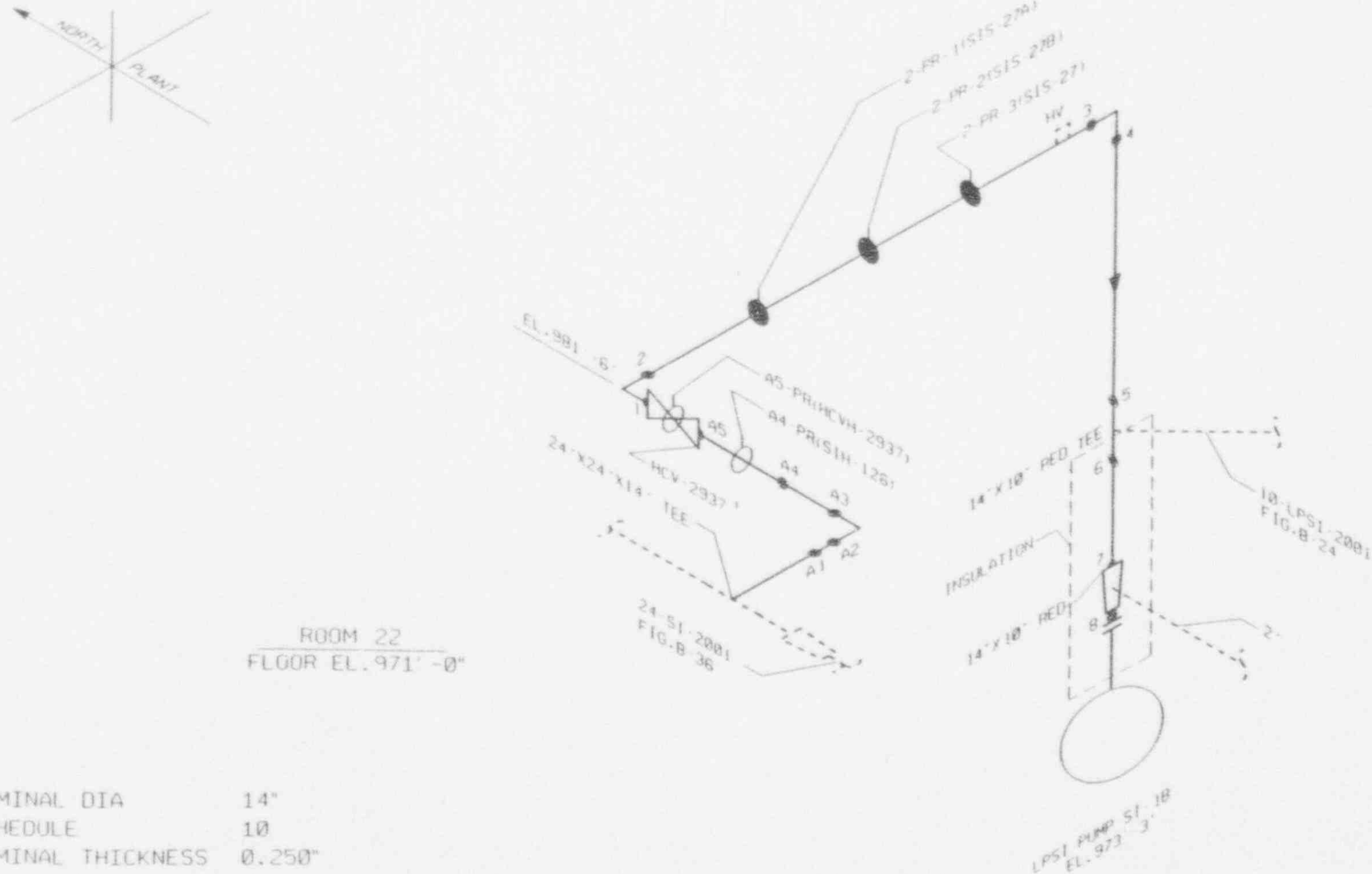
CONTAINMENT
LOOP B EAST AREA EL.994'-0"
EAST SIDE EL.1013'-0"

AUX.BLDG.
ROOM 81 EL.1036'-0"

REF.DWGS.
P&ID 11405-M-253
ISO IC 67 IV. IC 342 IV.
D-4171 I. D-4313

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-8

FOR INFORMATION ONLY



ROOM 22
FLOOR EL.971'-0"

NOMINAL DIA	14"
SCHEDULE	10
NOMINAL THICKNESS	0.250"

14-LPSI-2001
EXEMPT

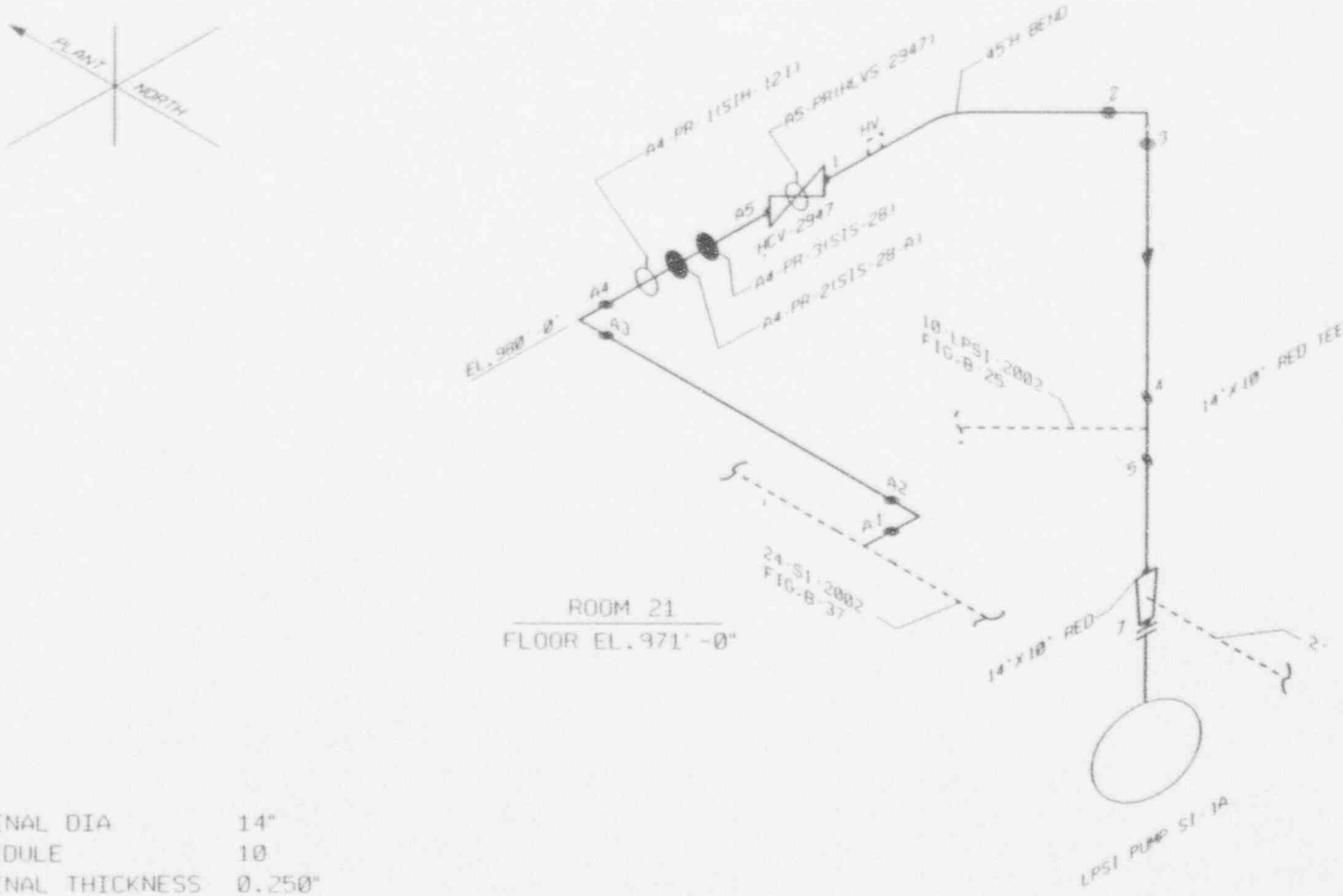
REF.DWGS.
P&ID E-23866-210-130
ISO IC 201 VI. IC 206 VII.
D-4272 I

AUX.BLDG.
ROOM 22 EL.971'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-9

FOR INFORMATION ONLY



NOMINAL DIA 14"
SCHEDULE 10
NOMINAL THICKNESS 0.250"

14-LPSI-2002
EXEMPT

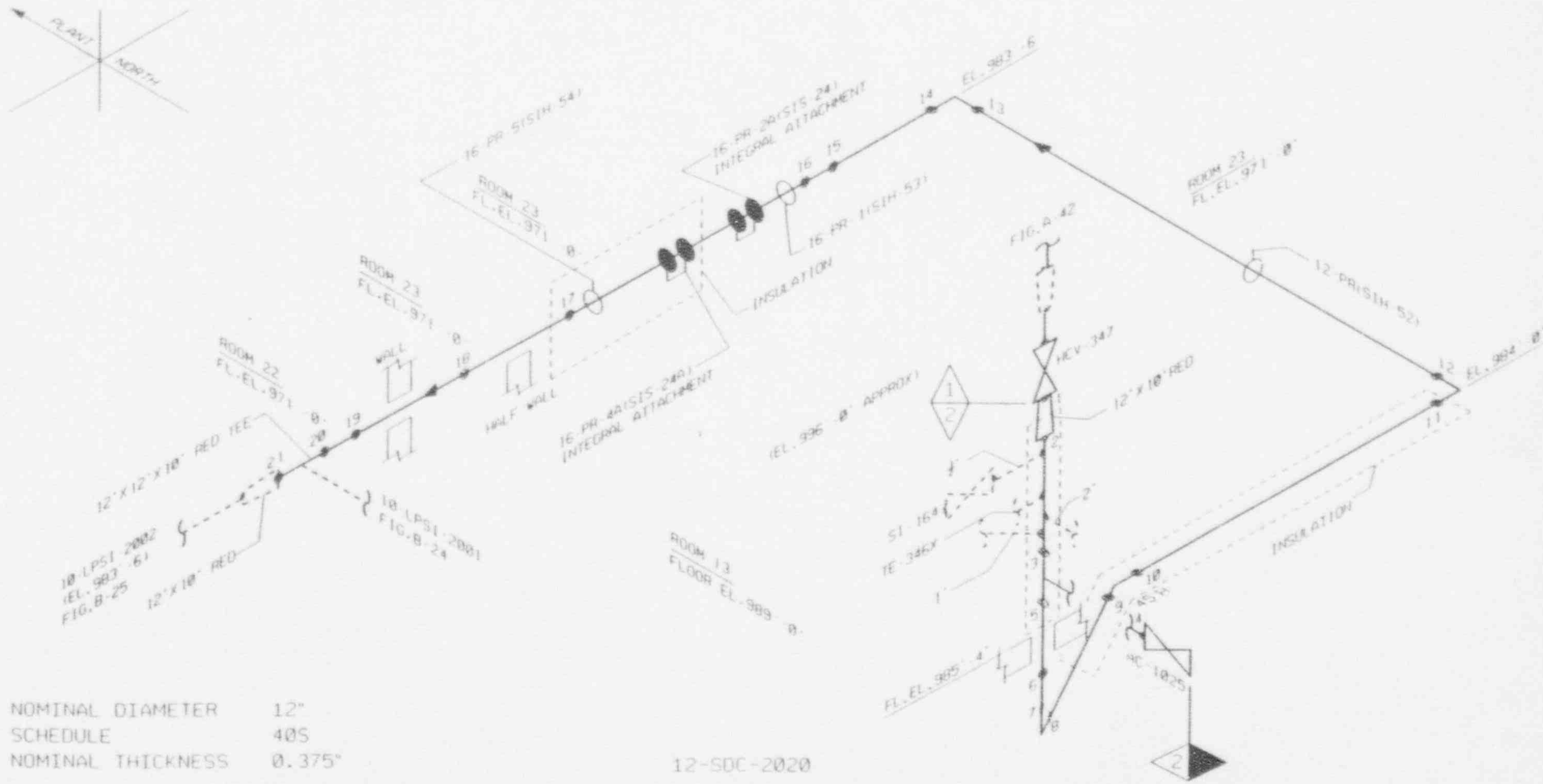
REF.DWGS.
P&ID E-23866-210-130
ISO IC 202 III, D-4273 I

AUX.BLDG.
ROOM 21 EL.971'-0"

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-10



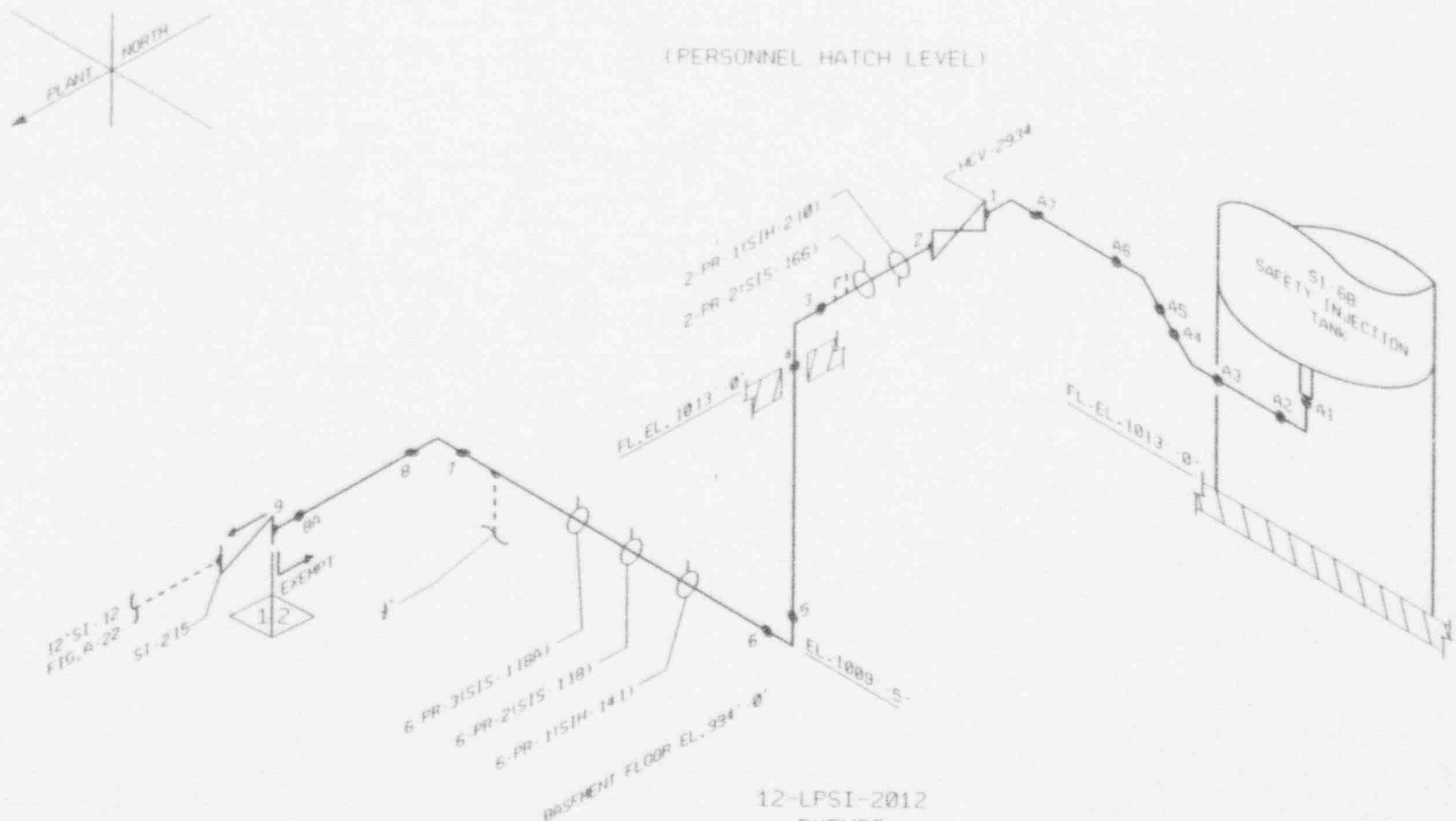
NOMINAL DIAMETER 12"
SCHEDULE 40S
NOMINAL THICKNESS 0.375"

12-SDC-2020

AUX.BLDG.
ROOM 13 EL.989'-0"
ROOM 23 EL.971'-0"
ROOM 22 EL.971'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 201 VI.D-4270 I.
D-4271 I

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-11



12-LPSI-2012
EXEMPT

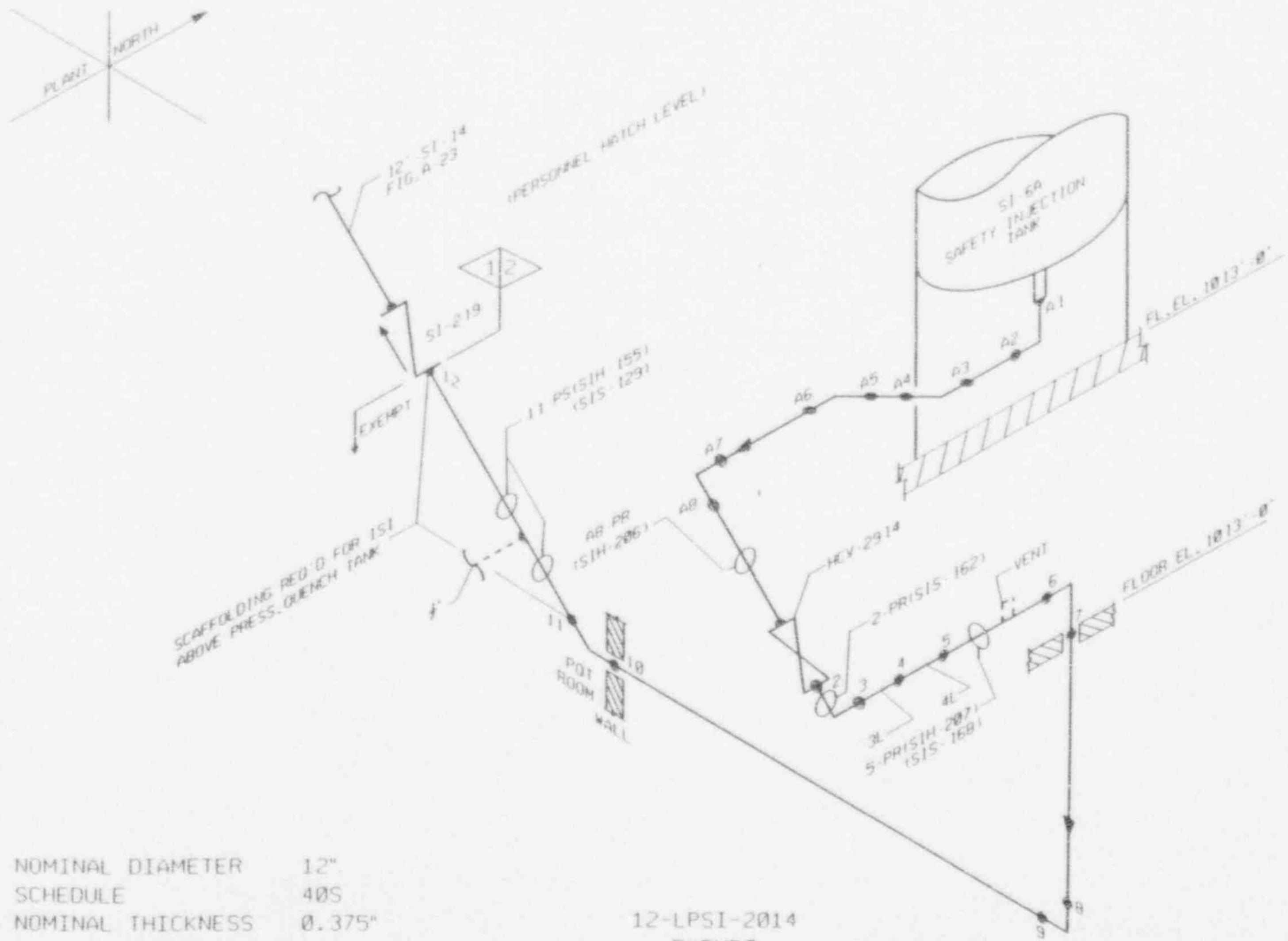
NOMINAL DIAMETER 12"
SCHEDULE 40S
NOMINAL THICKNESS 0.375"

CONTAINMENT
EAST SIDE EL.1013'-0"
EAST SIDE EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 71 III, D-4255 I

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-12

FOR INFORMATION ONLY



NOMINAL DIAMETER 12"
SCHEDULE 40S
NOMINAL THICKNESS 0.375"

12-LPSI-2014
EXEMPT

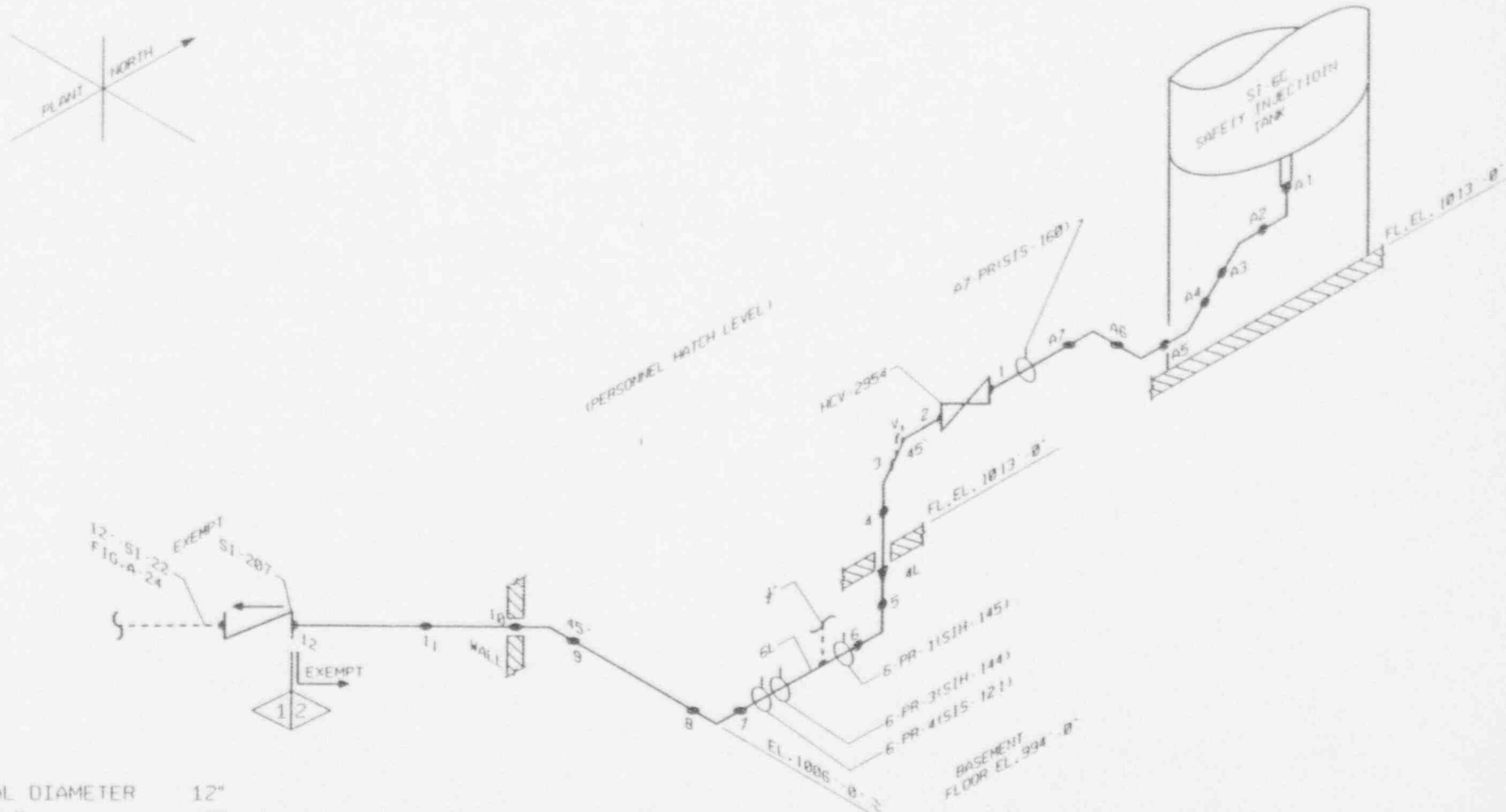
CONTAINMENT
SOUTHWEST EL.1013'-0"
SOUTHWEST EL.994'-0"
POT ROOM EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC-70 IV, D-4256 II

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-13

FOR INFORMATION ONLY



NOMINAL DIAMETER 12"
SCHEDULE 40S
NOMINAL THICKNESS 0.375"

12-LPSI-2022
EXEMPT

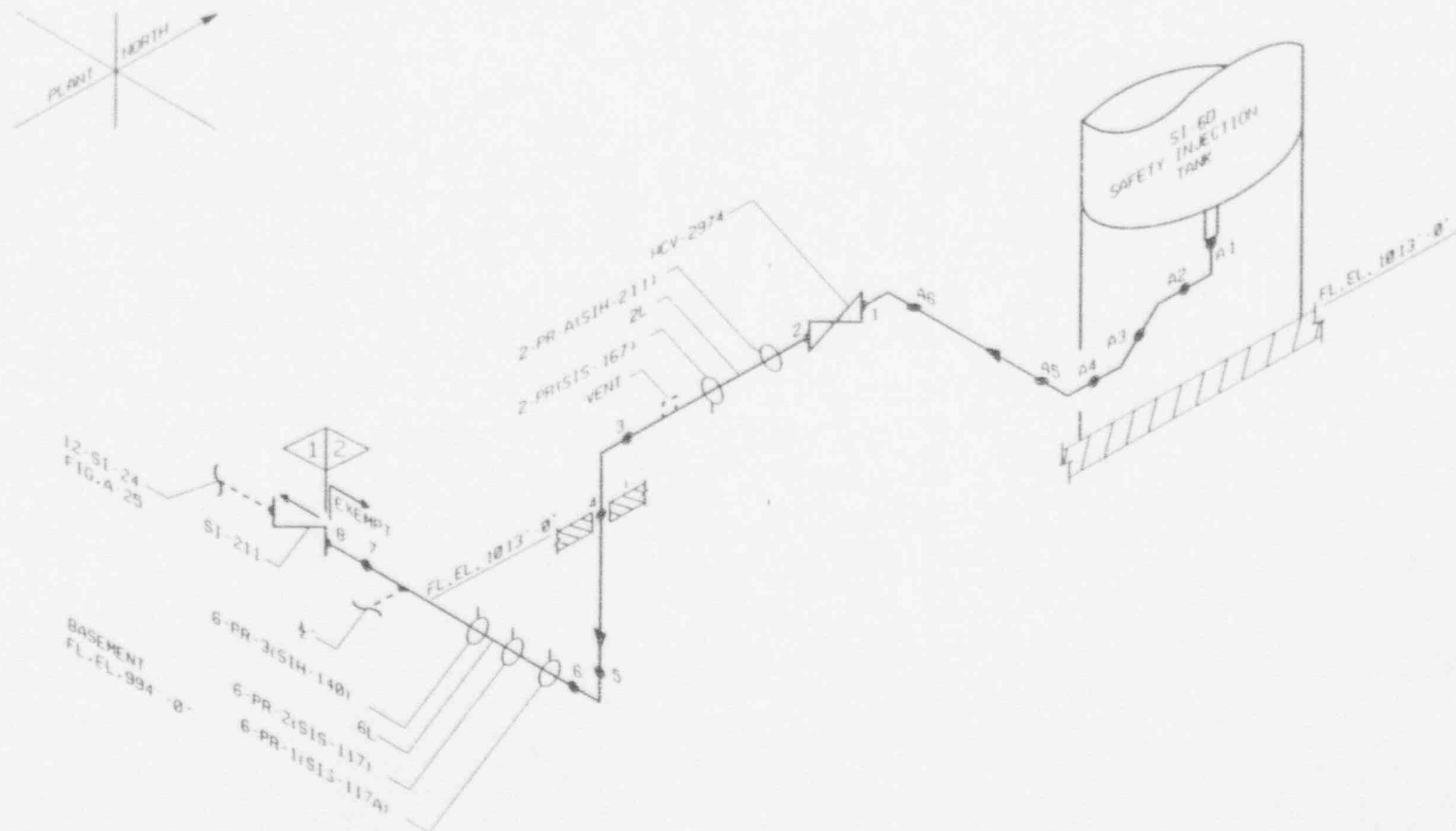
REF.DWGS.
P&ID E-23866-210-130
ISO IC 70 IV, D-4299 I

CONTAINMENT
NORHTWEST EL.1013'-0"
NORTHWEST EL.994'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-14

FOR INFORMATION ONLY



12-LPSI-2024
EXEMPT

NOMINAL DIAMETER 12"
SCHEDULE 40S
NOMINAL THICKNESS 0.375"

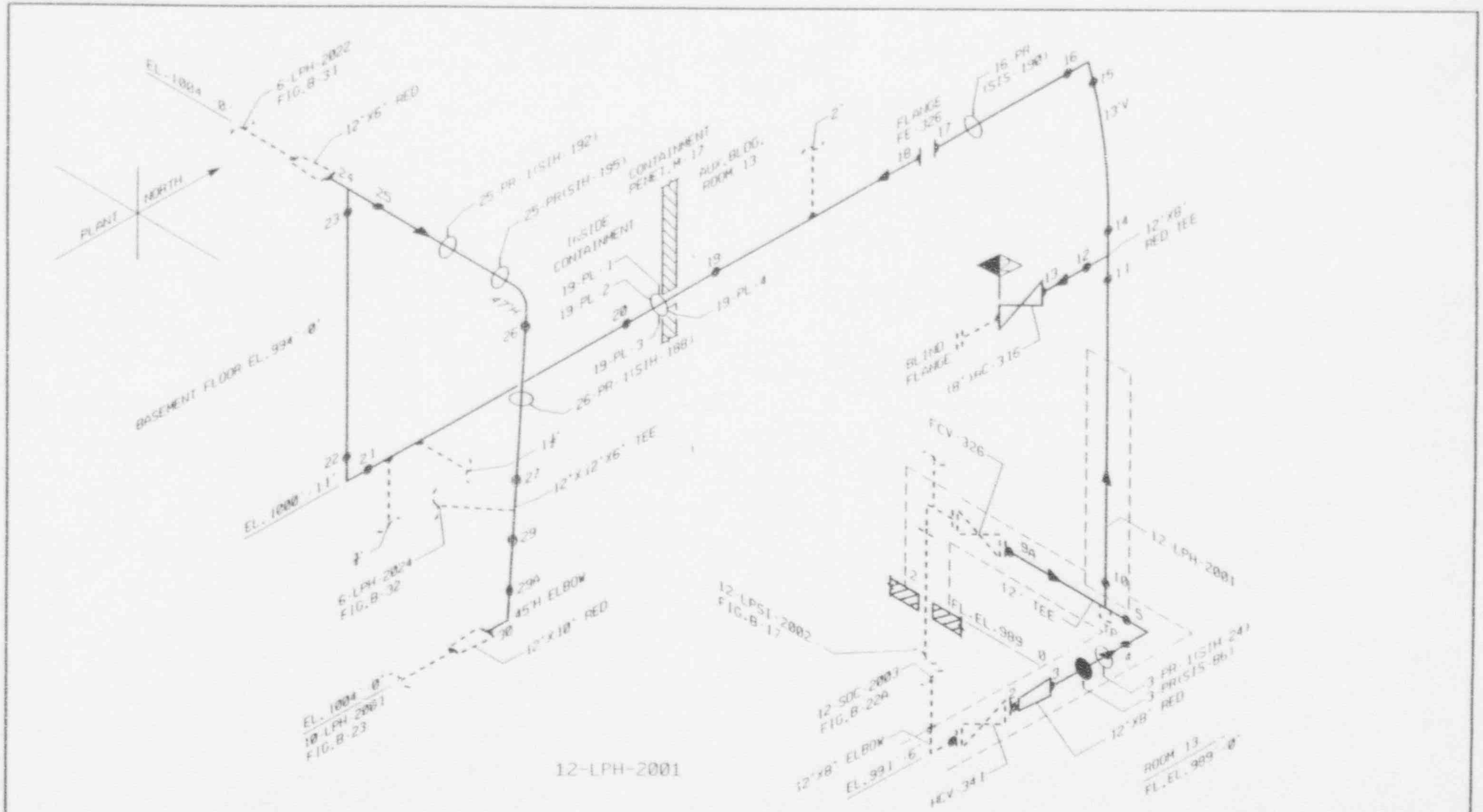
REF.DWGS.
P&ID E-23866-210-130
ISO IC 71 III

CONTAINMENT
EAST SIDE EL.1013'-0"
EAST SIDE EL.994'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-15

FOR INFORMATION ONLY



12-LPH-2001

NOMINAL DIA	12"	8"	
SCHEDULE	40S	40S	CONTAINMENT
NOMINAL THICKNESS	0.375"	0.322"	NORTH SIDE EL.994'-0"
			AUX.BLD.
			ROOM 13 EL.989'-0"

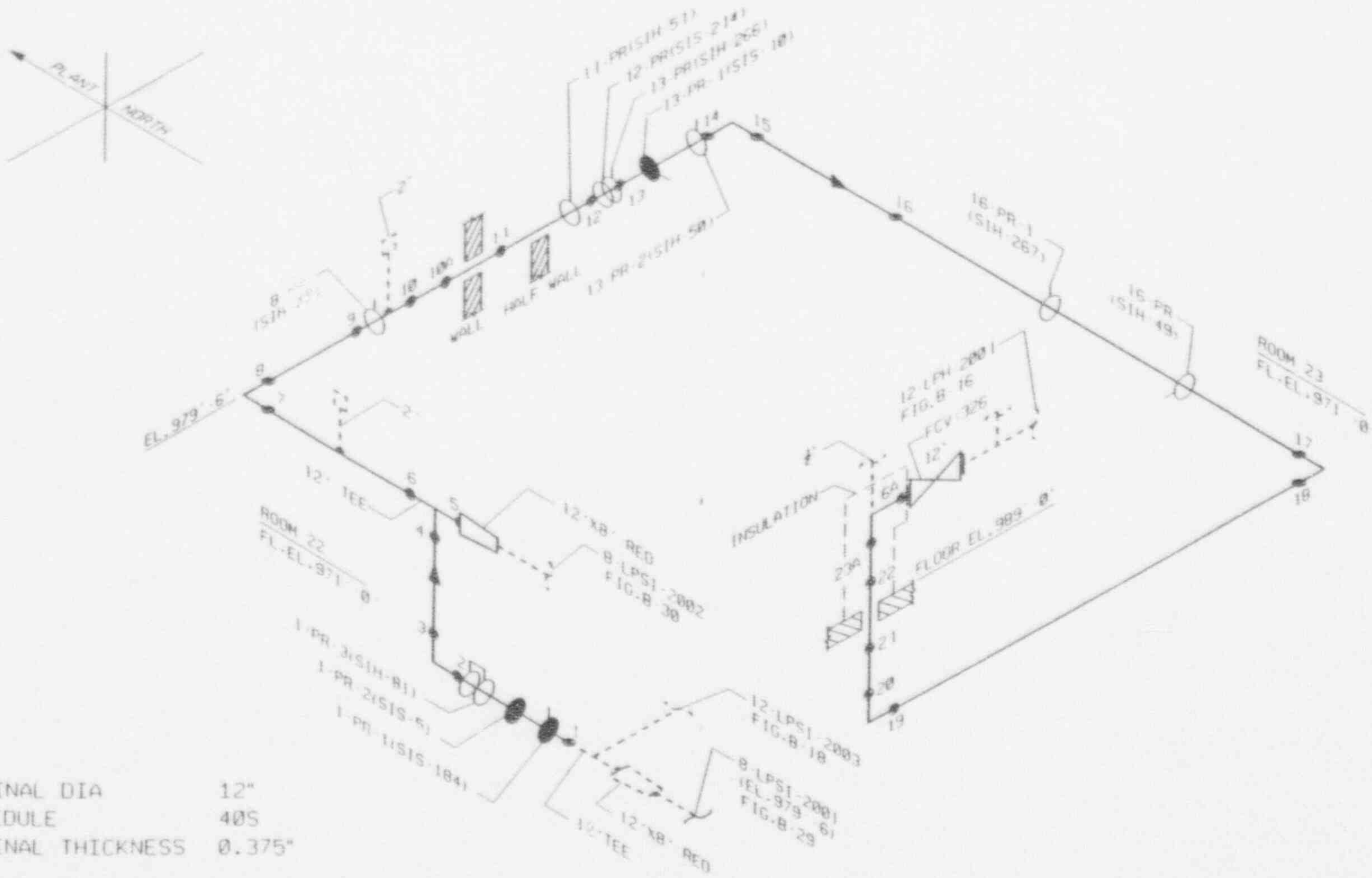
REF.DWGS.
P&ID E-23866-210-130
ISO IC 72 III, IC 192, D-4258 I, D-4265 I, D-4299 II

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-16

FOR INFORMATION ONLY



NOMINAL DIA 12"
SCHEDULE 40S
NOMINAL THICKNESS 0.375"

12-LPSI-2002

AUX.BLDG.
ROOM 22 EL.971'-0"
ROOM 23 EL.971'-0"

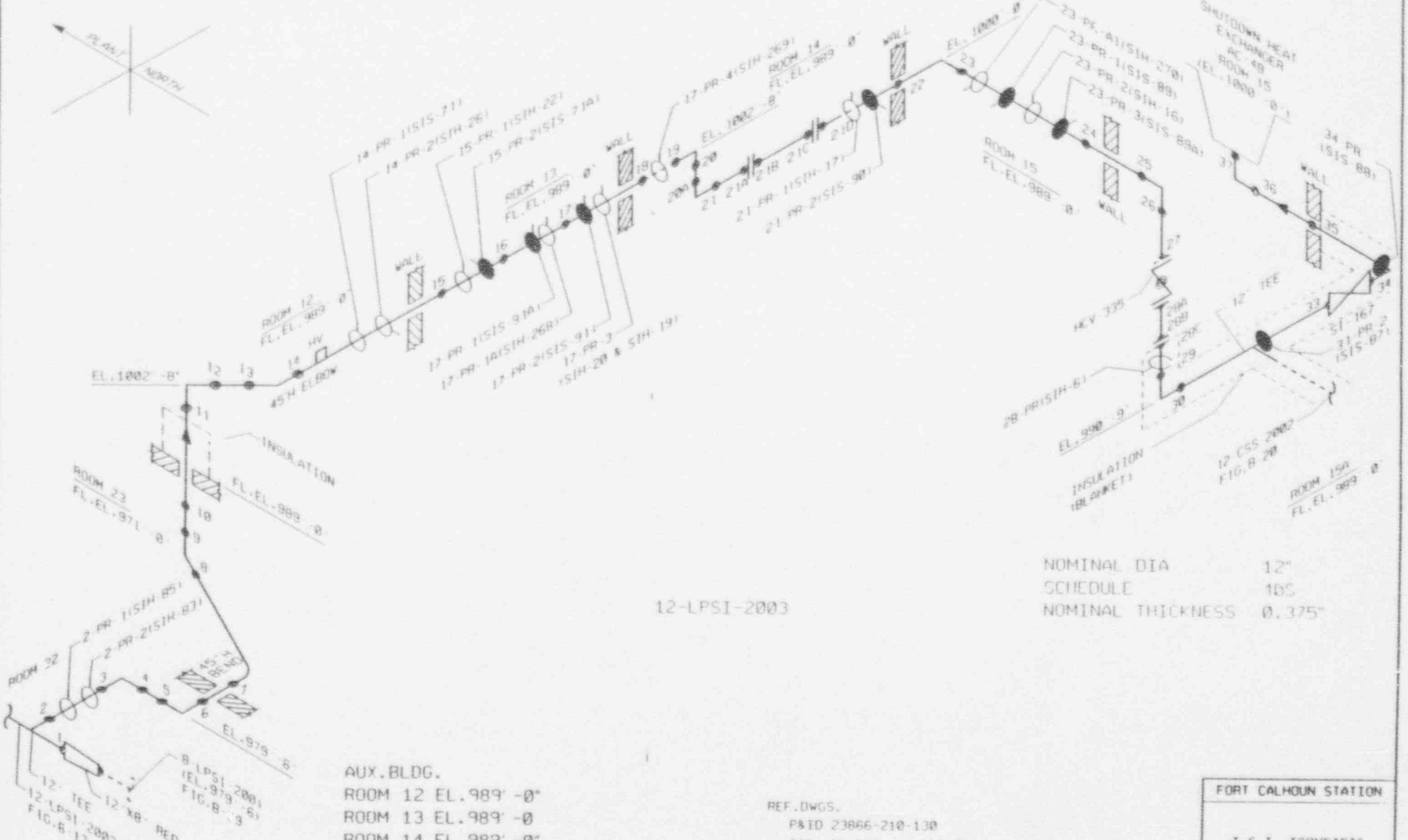
REF.DWGS.
P&ID E-23866-210-130
ISO IC 189 III, IC 191 III, IC 192, D-4264 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-17

DWG. FIGURE B-17, SH. 1



12-LPSI-2003

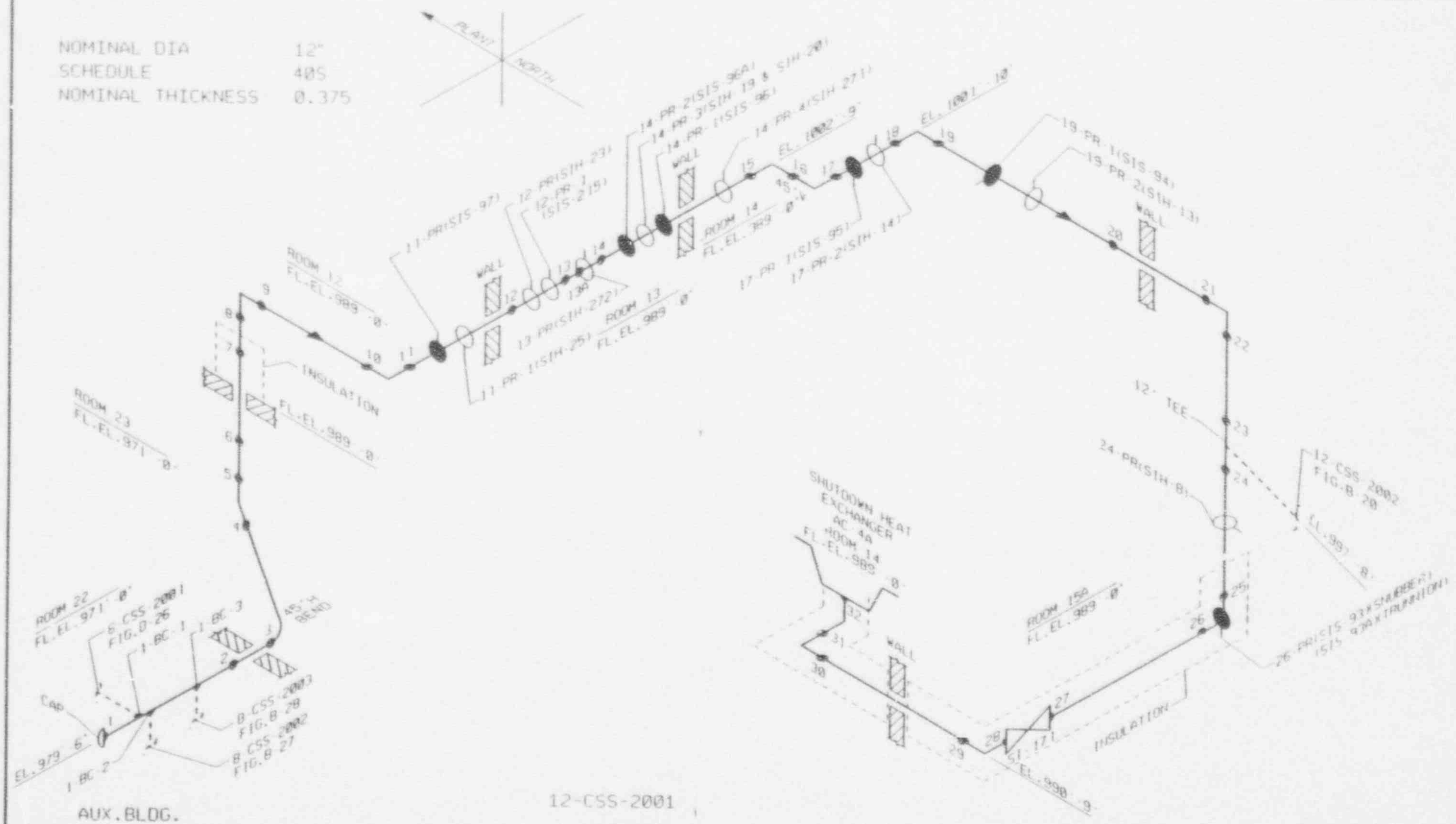
NOMINAL DIA	12"
SCHEDULE	10S
NOMINAL THICKNESS	0.375"

AUX.BLDG.
ROOM 12 EL.989'-0"
ROOM 13 EL.989'-0
ROOM 14 EL.989'-0"
ROOM 15 EL.989'-0"
ROOM 15A EL.989'-0"

REF.DWGS.
P&ID 23866-210-130
ISO IC 187, IC 188 III.
IC 189 III. D-4263 I. D-4264 I

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-18
DWG. FIGURE B-18

NOMINAL DIA 12"
SCHEDULE 40S
NOMINAL THICKNESS 0.375



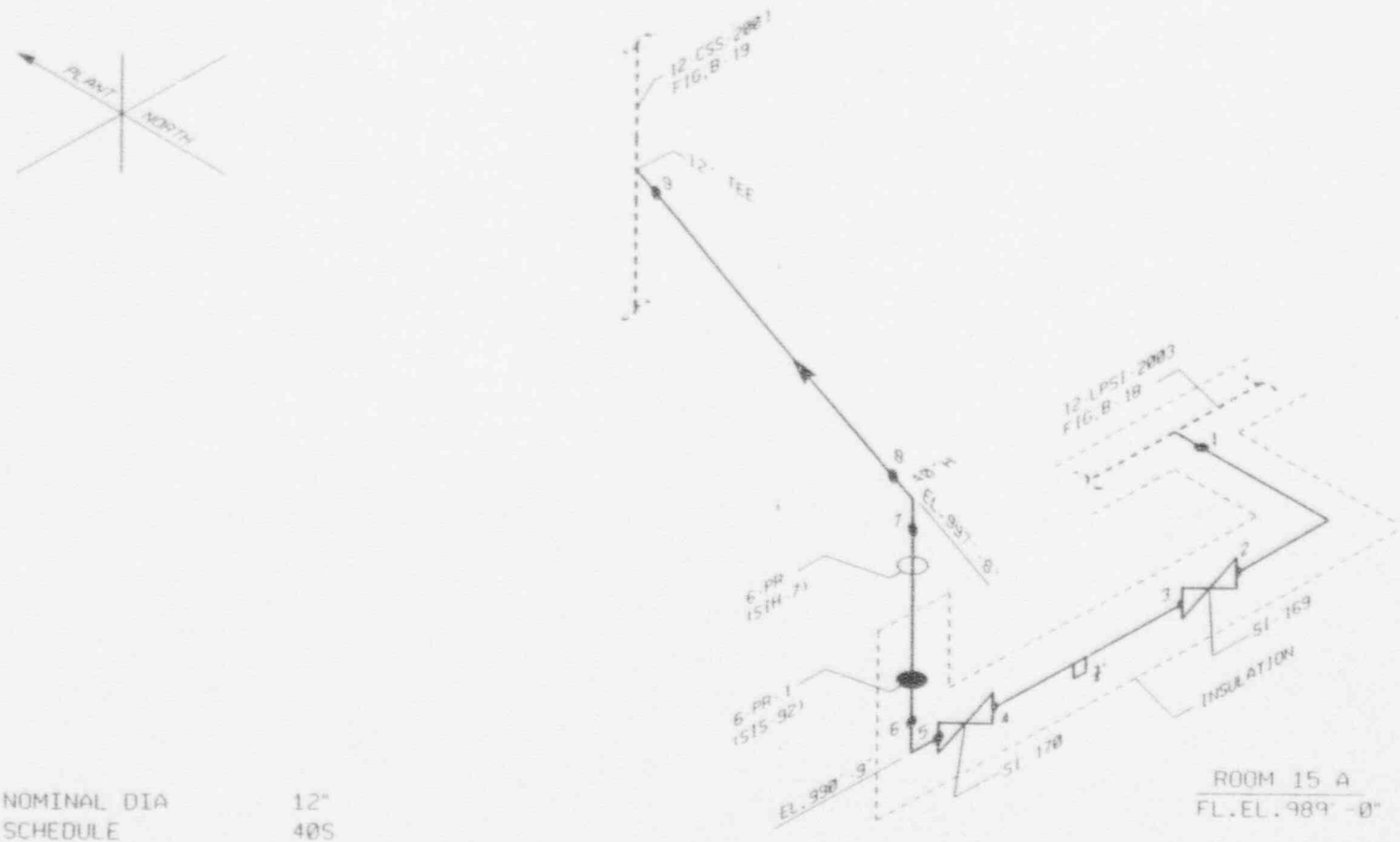
12-CSS-2001

AUX.BLDG.
ROOM 22 EL.971'-0"
ROOM 23 EL.971'-0"
ROOM 12 EL.989'-0"
ROOM 13 EL.989'-0"
ROOM 14 EL.989'-0"
ROOM 15A EL.989'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 185 IV, IC 186 IV,
D-4262 I, D-4263 II

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-19



NOMINAL DIA 12"
SCHEDULE 40S
NOMINAL THICKNESS 0.375"

12-CSS-2002

AUX.BLDG.
ROOM 15A EL.989'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 186 IV, IC 187, D-4263 II

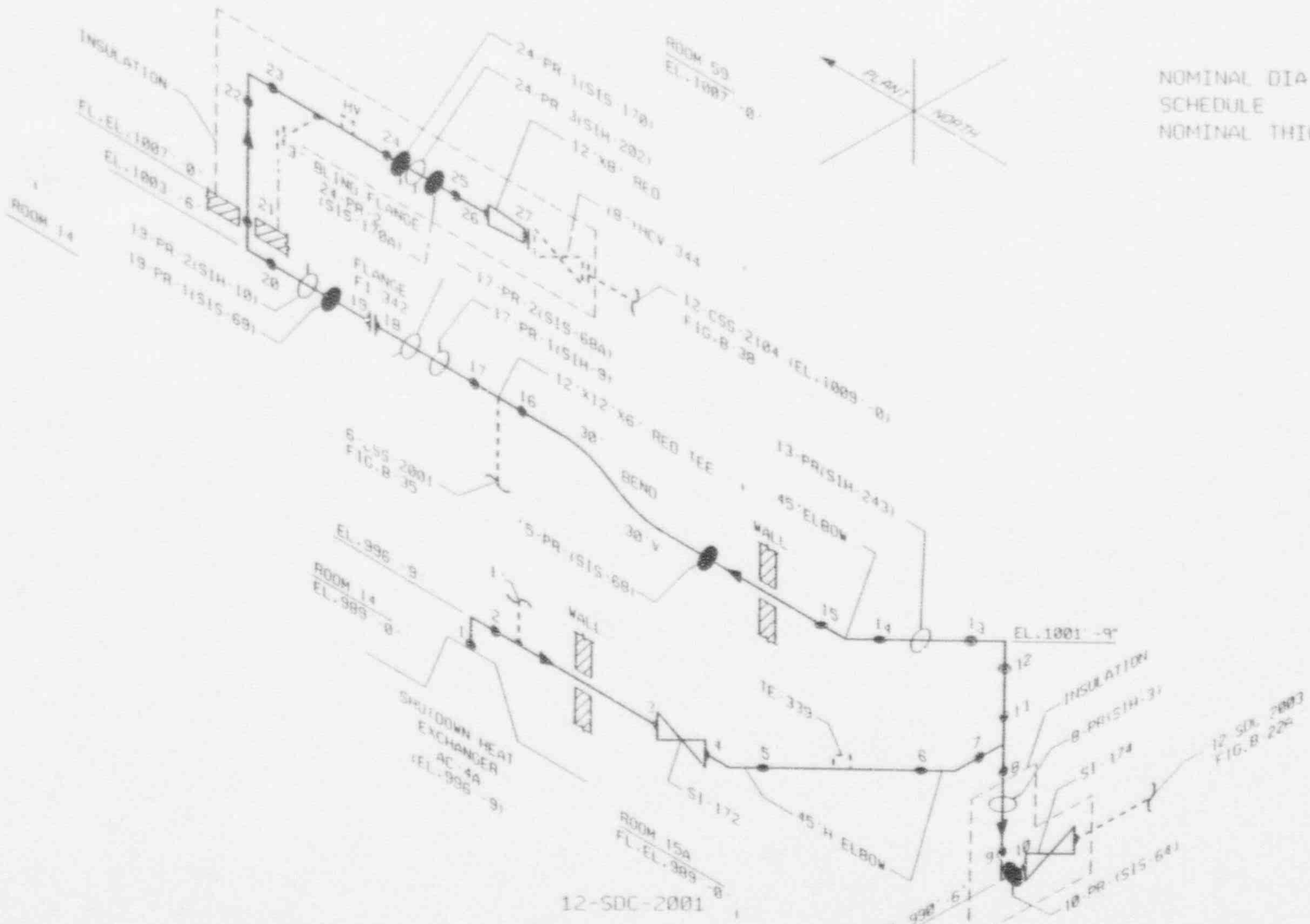
FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-20

FOR INFORMATION ONLY

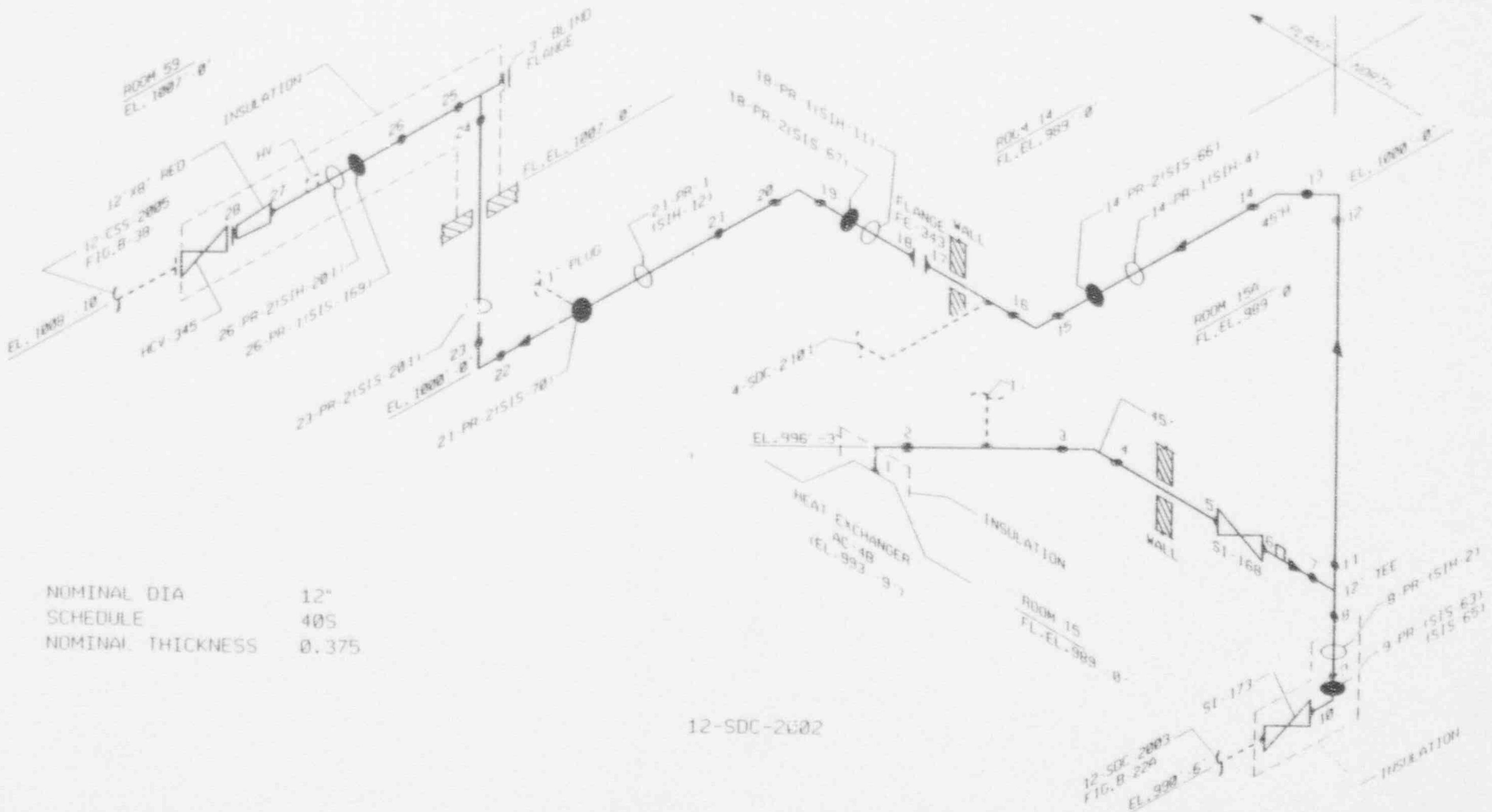
NOMINAL DIA 12"
SCHEDULE 40S
NOMINAL THICKNESS 0.375"



AUX.BLDG.
ROOM 59 EL.1007'-0"
ROOM 14 EL.989'-0"
ROOM 15A EL.989'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 193 V, IC 195 VI, D-4266 I

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-21
DWG. FIGURE B-21, SH. 1



NOMINAL DIA	12"
SCHEDULE	40S
NOMINAL THICKNESS	0.375

12-SDC-2002

AUX.BLDG.
ROOM 59 EL.1007'-0"
ROOM 14 EL.989'-0"
ROOM 15 EL.989'-0"
ROOM 15A EL.989'-0"

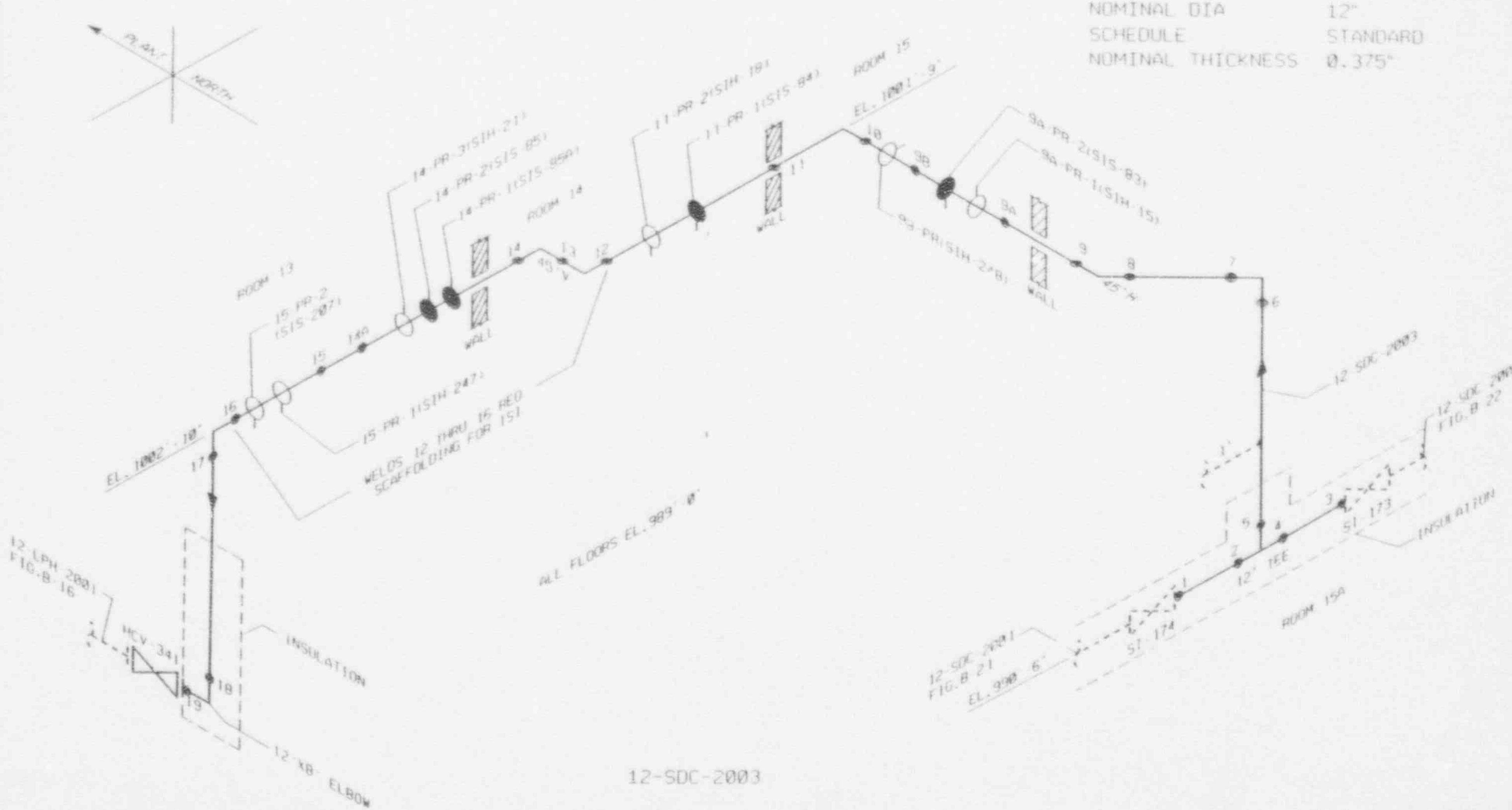
REF.DWGS.
P&ID E-23866-210-130
ISO IC 193 V, IC 194 III,
IC 204 IV, D-4279 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-22

FOR INFORMATION ONLY



12-SDC-2003

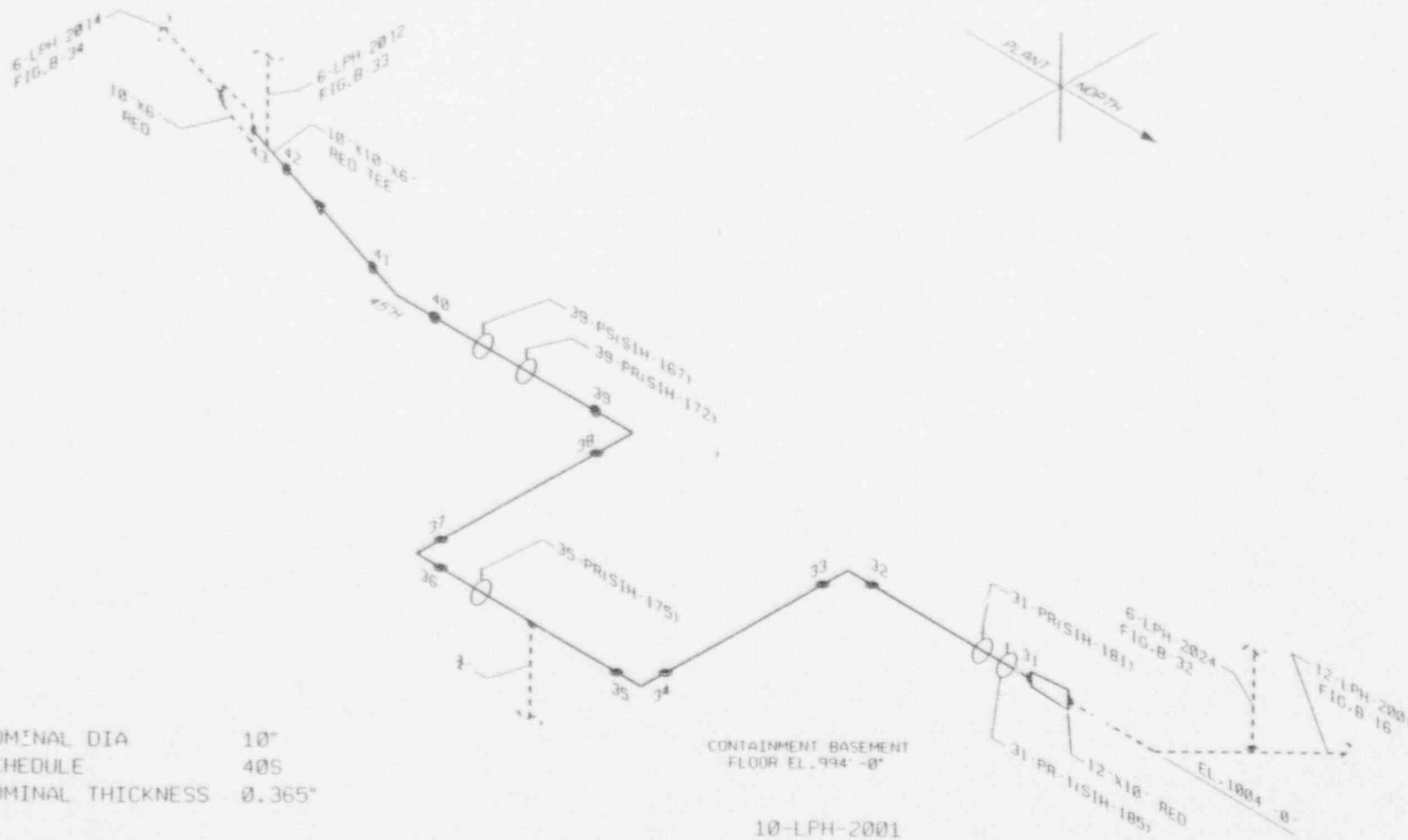
AUX.BLDG.
ROOM 13 EL.989'-0"
ROOM 14 EL.989'-0"
ROOM 15 EL. -0"
ROOM 15A EL.989'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 192, IC 193 v. D-4265 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-22A

FOR INFORMATION ONLY



NOMINAL DIA 10"
SCHEDULE 40S
NOMINAL THICKNESS 0.365"

10-LPH-2001
EXEMPT

CONTAINMENT
EAST SIDE EL.994'-0"

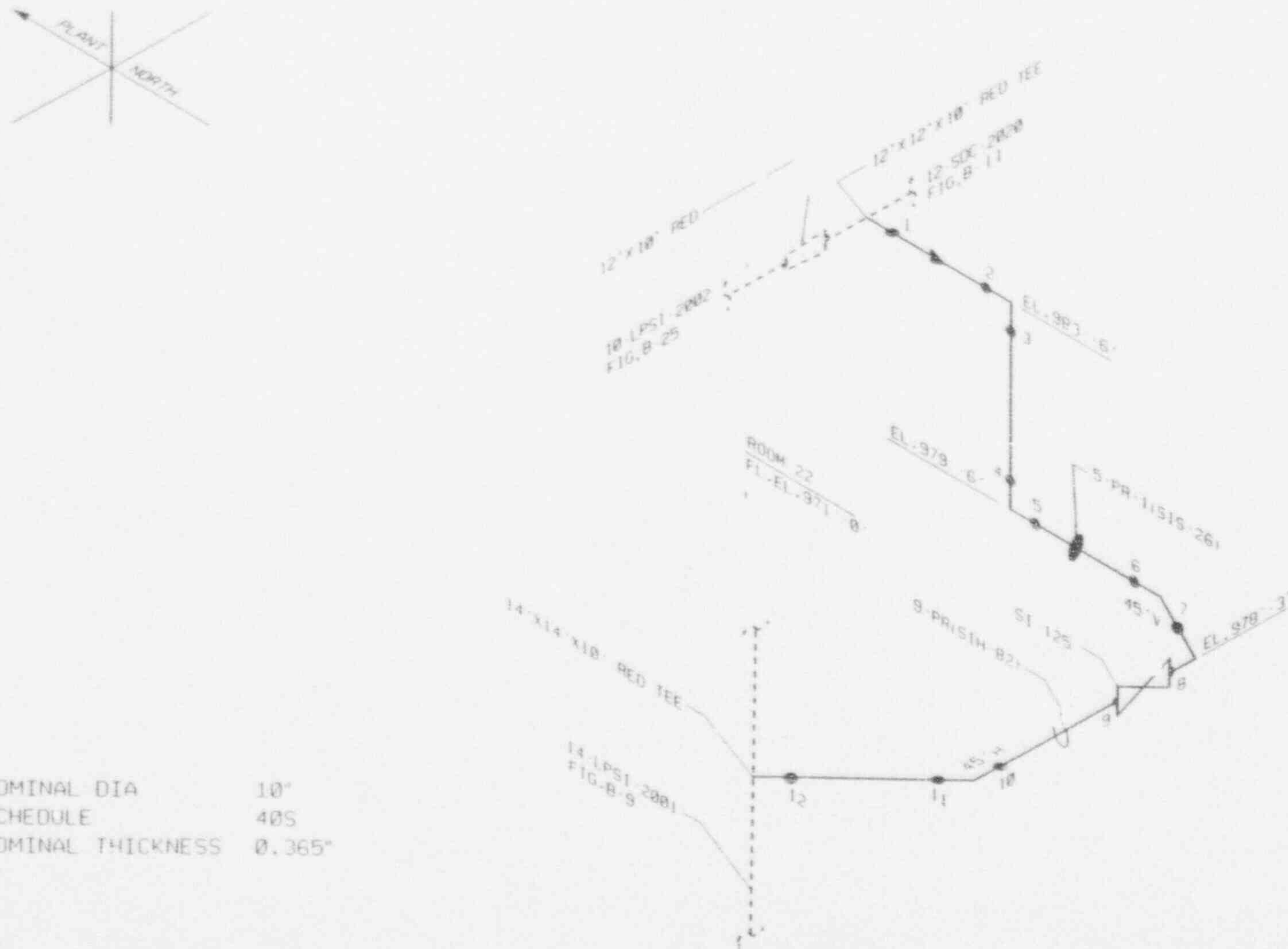
REF.DWGS.
P&ID E-23866-210-130
ISO IC 73 II. D-4255 I.
D-4258 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-23

DWG. FIGURE B-23, SH. 1

FOR INFORMATION ONLY



NOMINAL DIA 10"
SCHEDULE 40S
NOMINAL THICKNESS 0.365"

10-LPSI-2001
EXEMPT

AUX.BLDG.
ROOM 22 EL.971'-0"

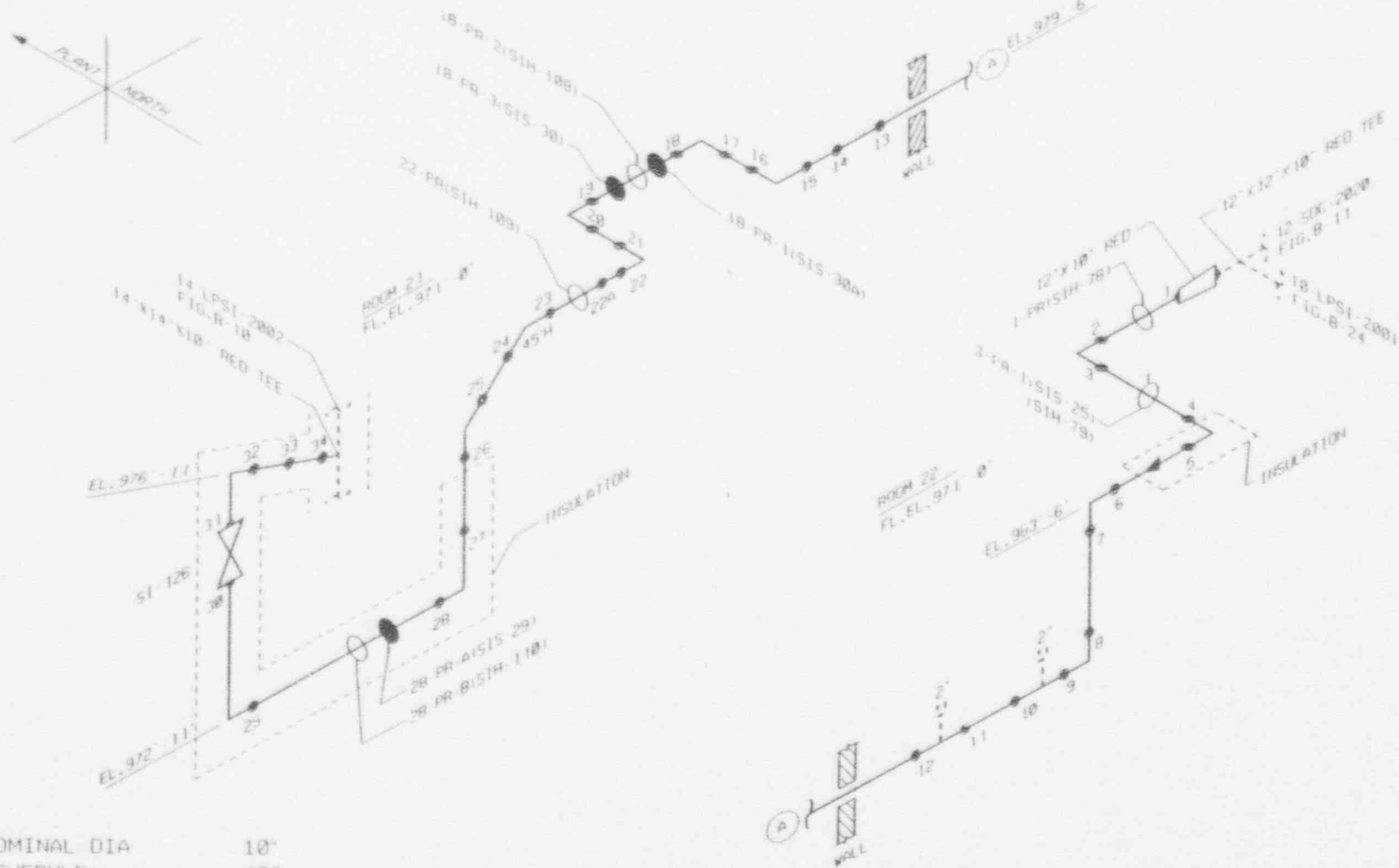
REF.DWGS.
P&ID E-23866-210-130
ISO IC 201 VI. D-4272 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-24

FOR INFORMATION ONLY



NOMINAL DIA 10"
SCHEDULE 40S
NOMINAL THICKNESS 0.365"

10-LPSI-2002
EXEMPT

AUX.BLDG.
ROOM 21 EL.971'-0"
ROOM 22 EL.971'-0"

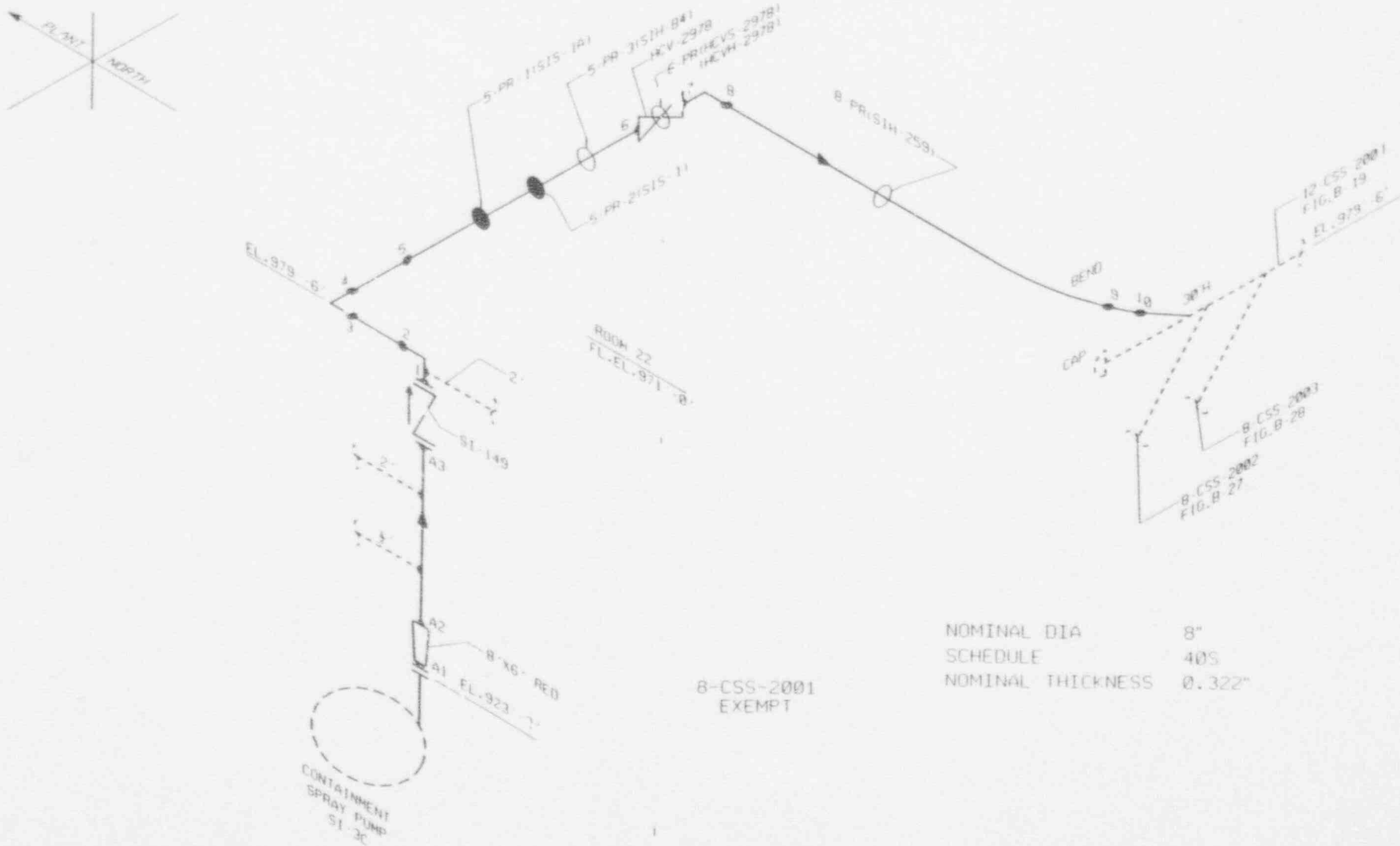
REF.DWGS.
P&ID E23866-210-130
ISO IC-201 VI. IC-202 III.
D-4271 I. D-4273 II

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-25



NOMINAL DIA	8"
SCHEDULE	40S
NOMINAL THICKNESS	0.322"

8-CSS-2001
EXEMPT

REF.DWGS.
P&ID E-23866-210-130
ISO IC 185 IV. D-4262 I

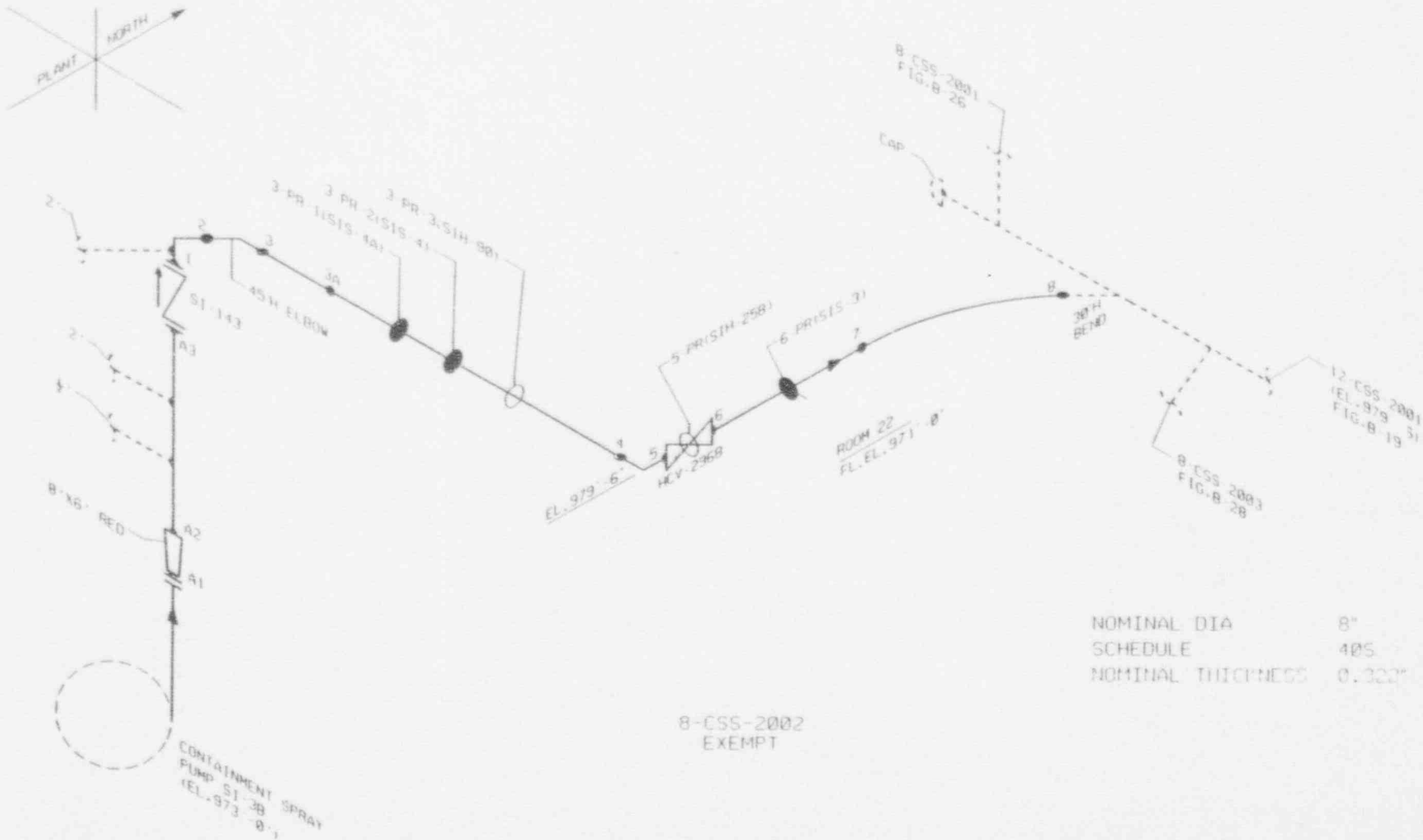
AUX.BLDG.
ROOM 22 EL.971'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-26

DWG. FIGURE B-26, SH. 1

FOR INFORMATION ONLY



NOMINAL DIA 8"
SCHEDULE 40S
NOMINAL THICKNESS 0.322"

8-CSS-2002
EXEMPT

REF.DWGS.
P&ID E-2866-210-130
ISO IC 185 IV, D-4262 I

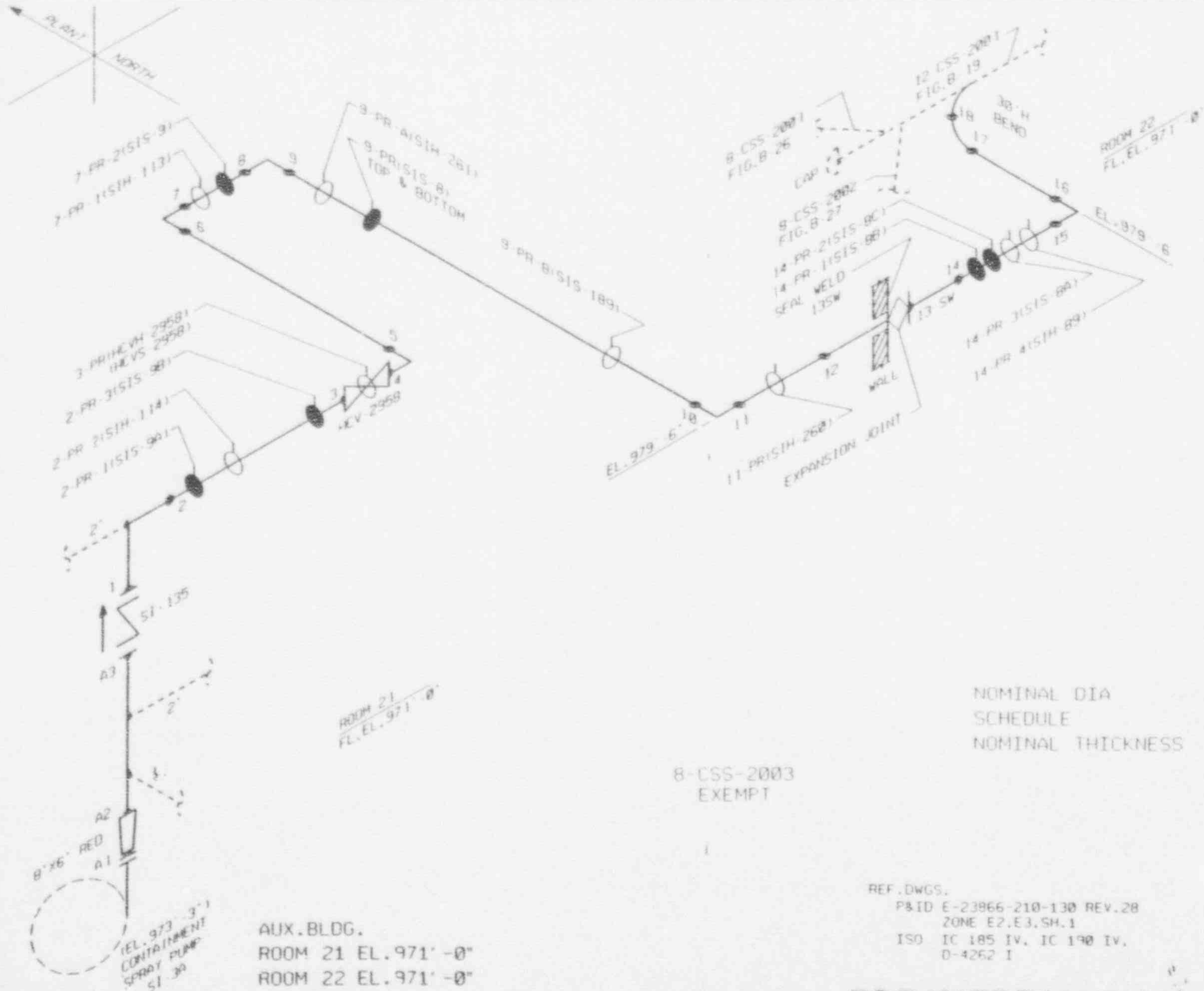
AUX.BLDG
ROOM 22 EL.971'-0"

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-27



AUX.BLDG.
ROOM 21 EL.971'-0"
ROOM 22 EL.971'-0"

8-CSS-2003
EXEMPT

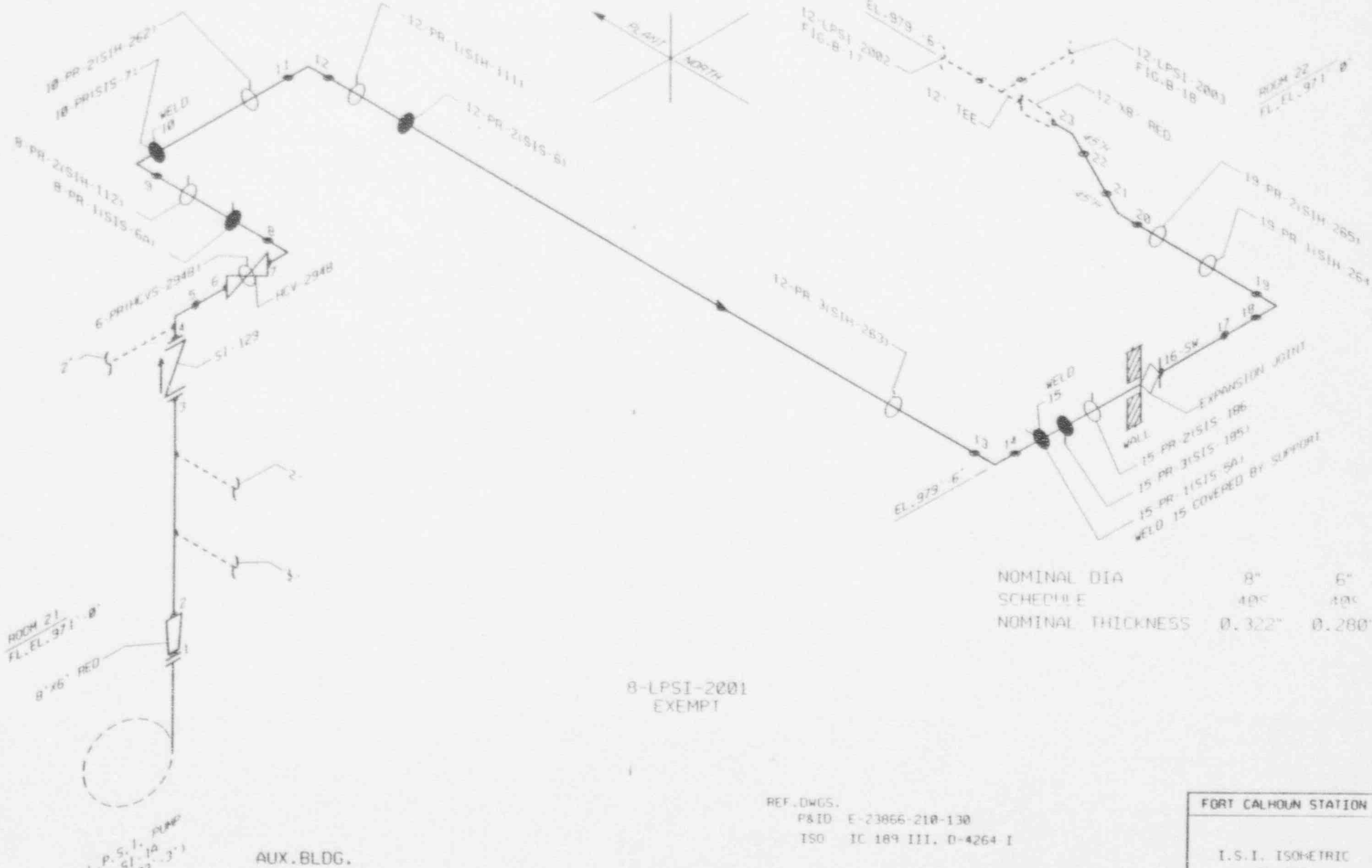
NOMINAL DIA	8" O.D.
SCHEDULE	40S
NOMINAL THICKNESS	0.322"

REF.DWGS.
P&ID E-23866-210-130 REV.28
ZONE E2.E3.SH.1
ISO IC 185 IV. IC 190 IV.
D-4262 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-28

FOR INFORMATION ONLY



NOMINAL DIA	8"	6"
SCHEDULE	40S	40S
NOMINAL THICKNESS	0.322"	0.280"

8-LPSI-2001
EXEMPT

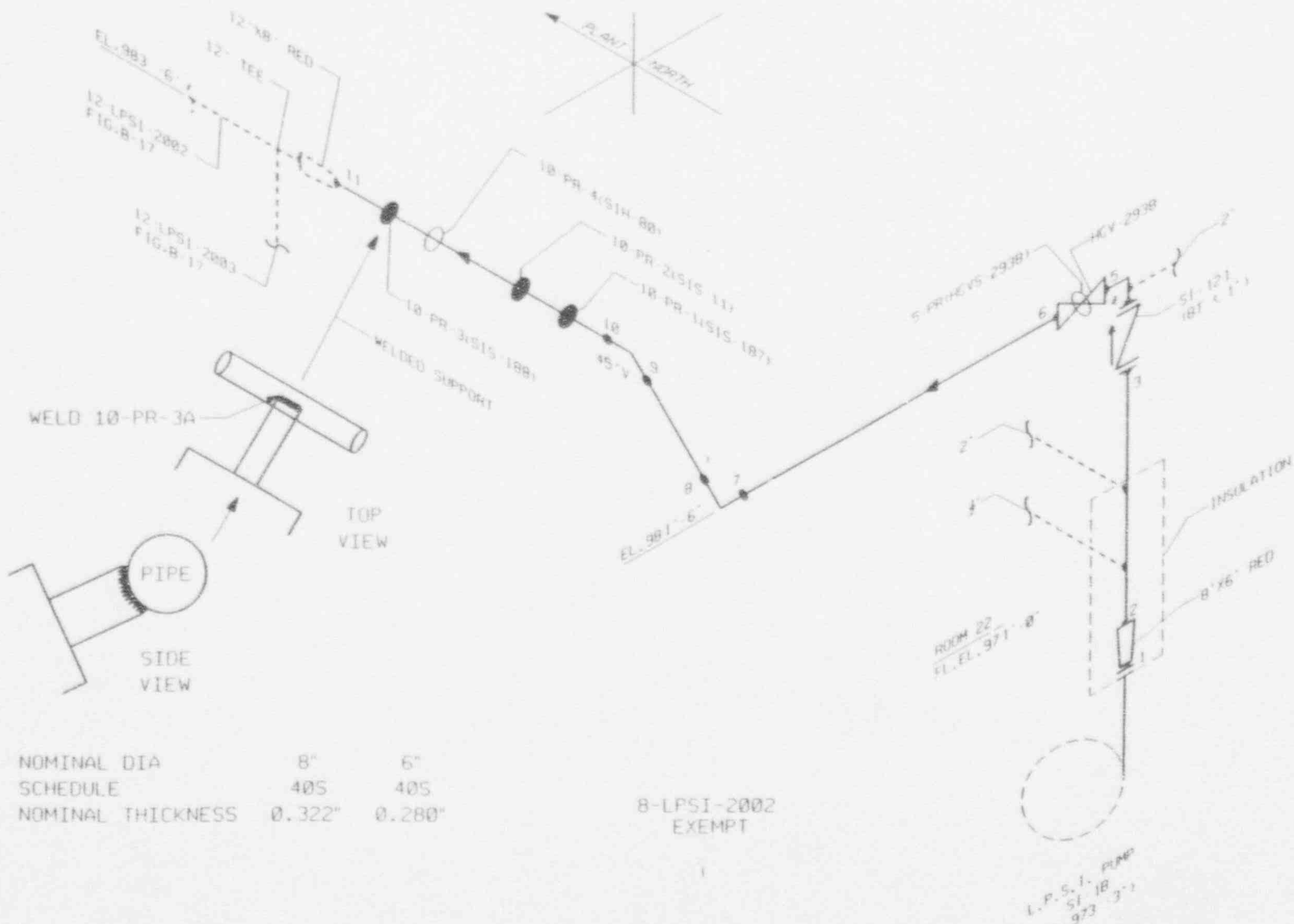
REF.DWGS.
P&ID E-23866-210-130
ISO IC 189 III, D-4264-I

AUX.BLDG.
ROOM 21 EL.971'-0"
ROOM 22 EL.971'-0"

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-29



NOMINAL DIA	8"	6"
SCHEDULE	40S	40S
NOMINAL THICKNESS	0.322"	0.280"

8-LPSI-2002
EXEMPT

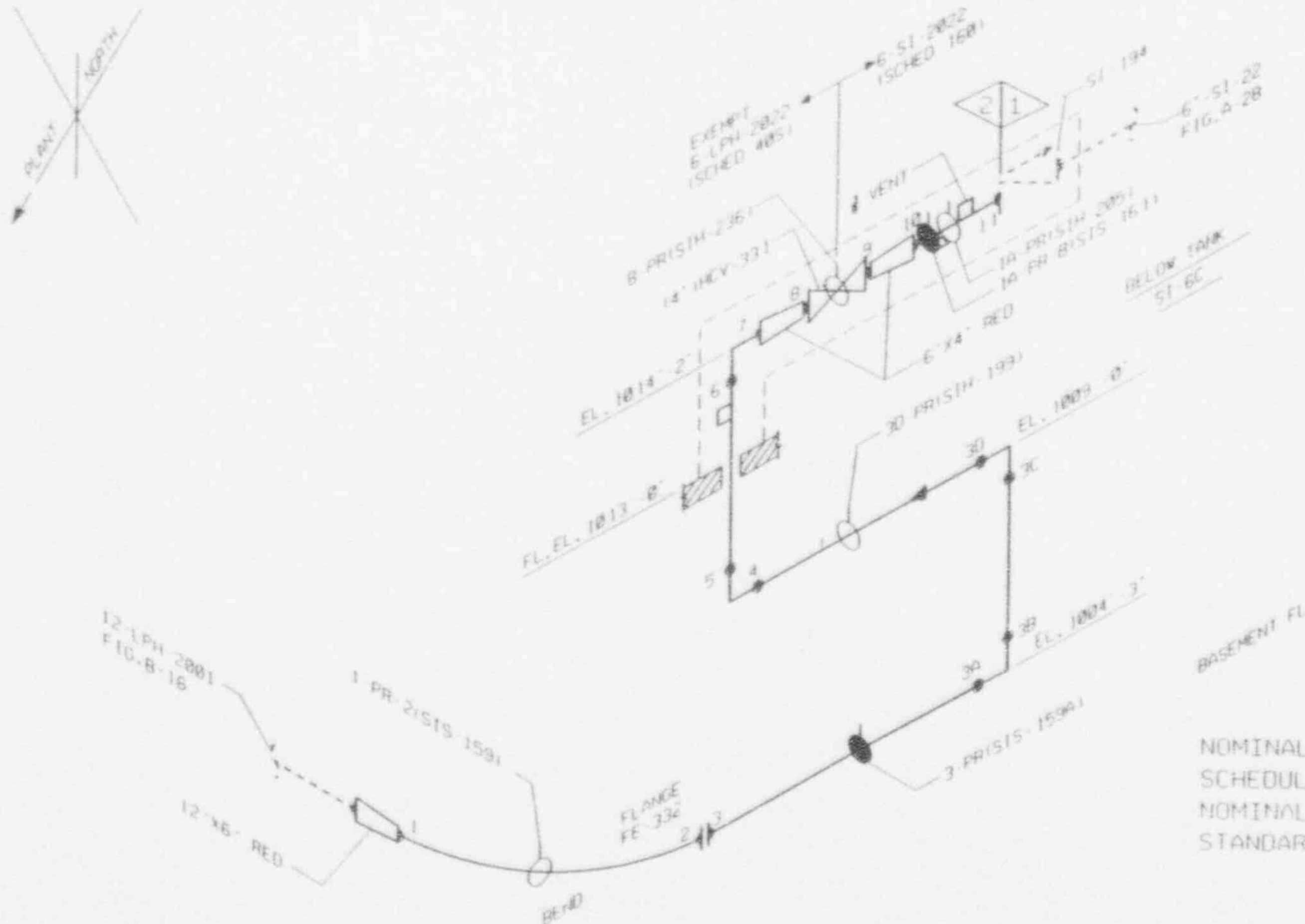
REF.DWGS.
P&ID E-23866-210-130
ISO IC 191 III. D-4264 I

AUX.BLDG.
ROOM 22 EL.971'-0

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-30

FOR INFORMATION



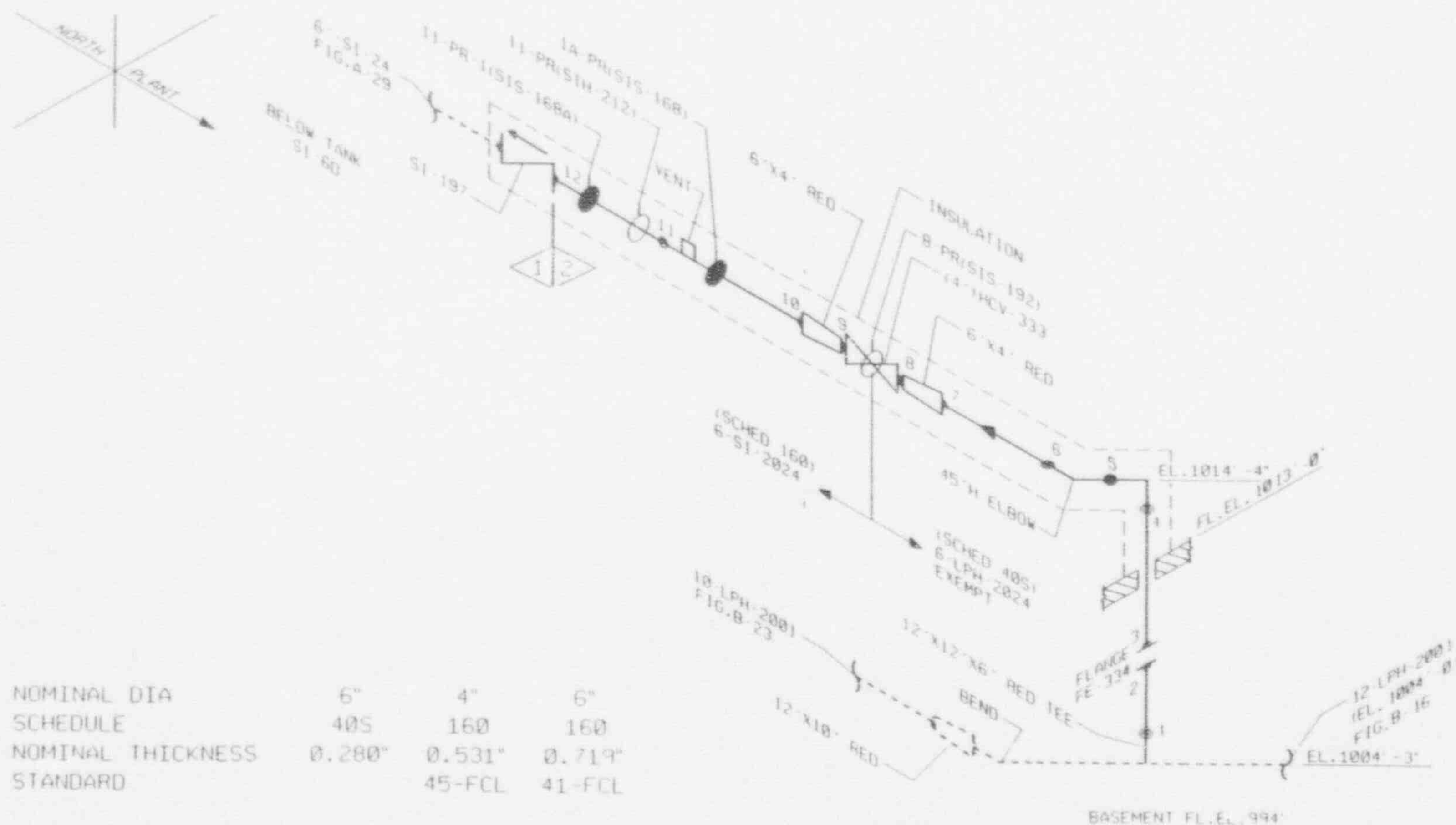
NOMINAL DIA	6"	4"	6"
SCHEDULE	40S	160	160
NOMINAL THICKNESS	0.280"	0.531"	0.719"
STANDARDS		45-FCL	41-FCL

6-LPH-2022 (EXEMPT)
6-SI-2022
4-LPH-2022/08
4-SI-2022/09

CONTAINMENT
NORTHWEST EL.1013'-0"
NORTHWEST EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 72 III, IC 80, D-4299 I & II

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-31



NOMINAL DIA	6"	4"	6"
SCHEDULE	40S	160	160
NOMINAL THICKNESS	0.280"	0.531"	0.719"
STANDARD		45-FCL	41-FCL

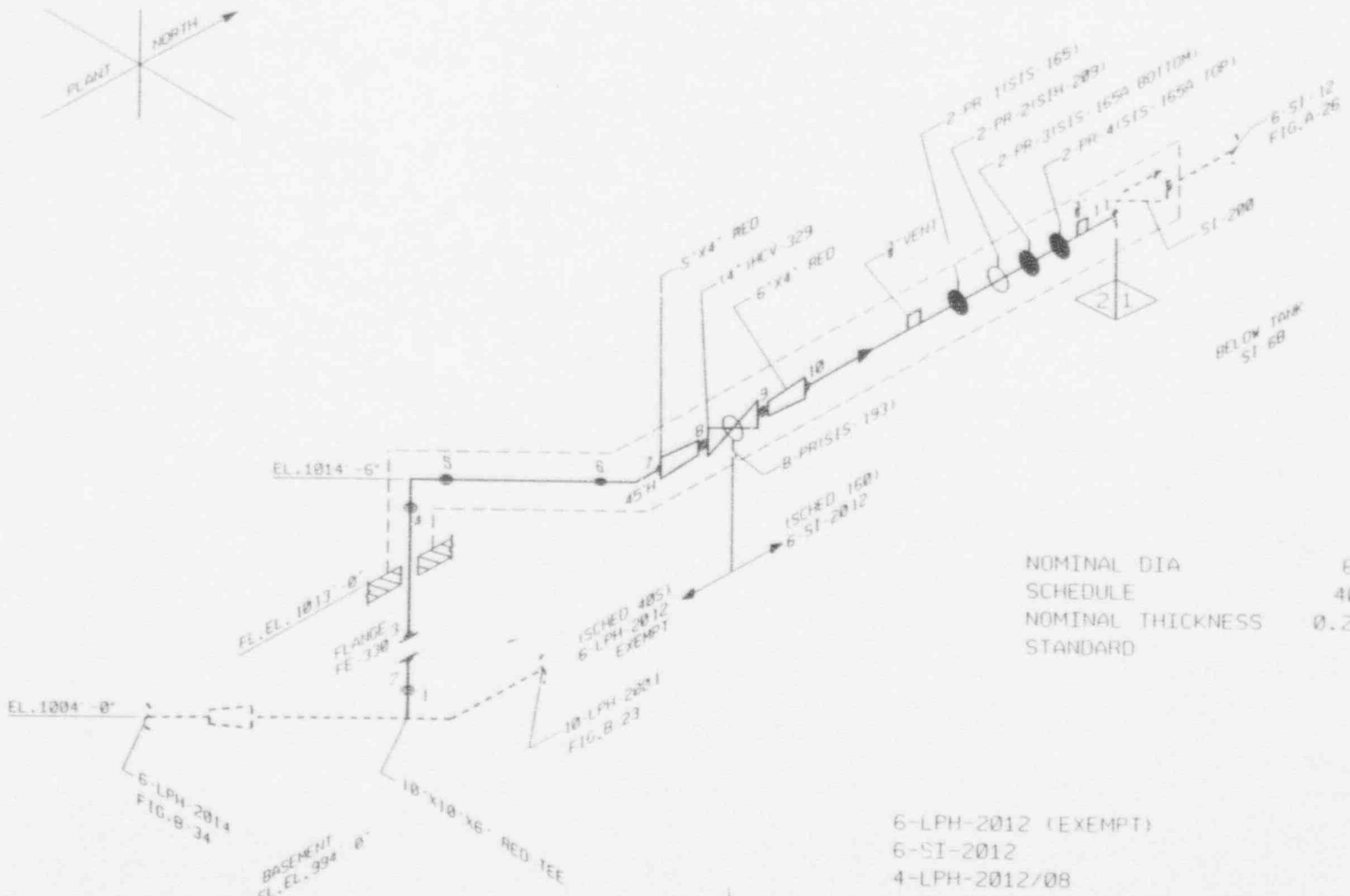
6-LPH-2024 (EXEMPT)
6-SI-2024
4-LPH-2024/08
4-SI-2024/09

REF.DWGS.
P&ID E-23866-210-130
ISO IC 72 III, IC 79, D-4258 I

CONTAINMENT
EAST SIDE EL.1013'-0"
NORTHEAST EL.994'-0"

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-32
DWG. FIGURE B-32, SH. 1



NOMINAL DIA	6"	4"	6"
SCHEDULE	40S	160	160
NOMINAL THICKNESS	0.280"	0.531"	0.719"
STANDARD		45-FCL	41-FCL

6-LPH-2012 (EXEMPT)
6-SI-2012
4-LPH-2012/08
4-SI-2012/09

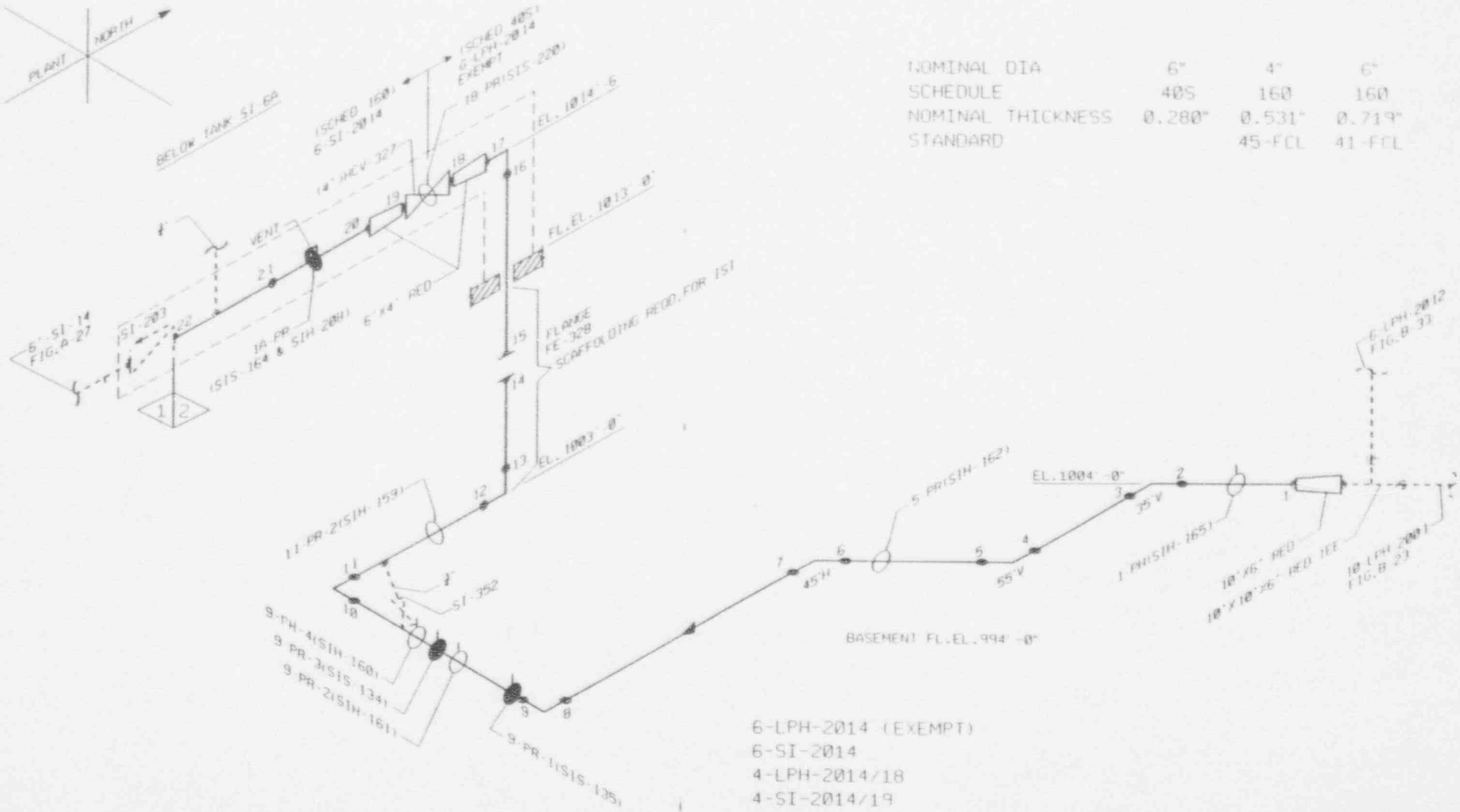
CONTAINMENT
EAST SIDE EL.1013'-0"
SOUTHEAST EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 73 I1, IC 79, D-4255 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-33



NOMINAL DIA	6"	4"	6"
SCHEDULE	40S	160	160
NOMINAL THICKNESS	0.280"	0.531"	0.719"
STANDARD		45-FCL	41-FCL

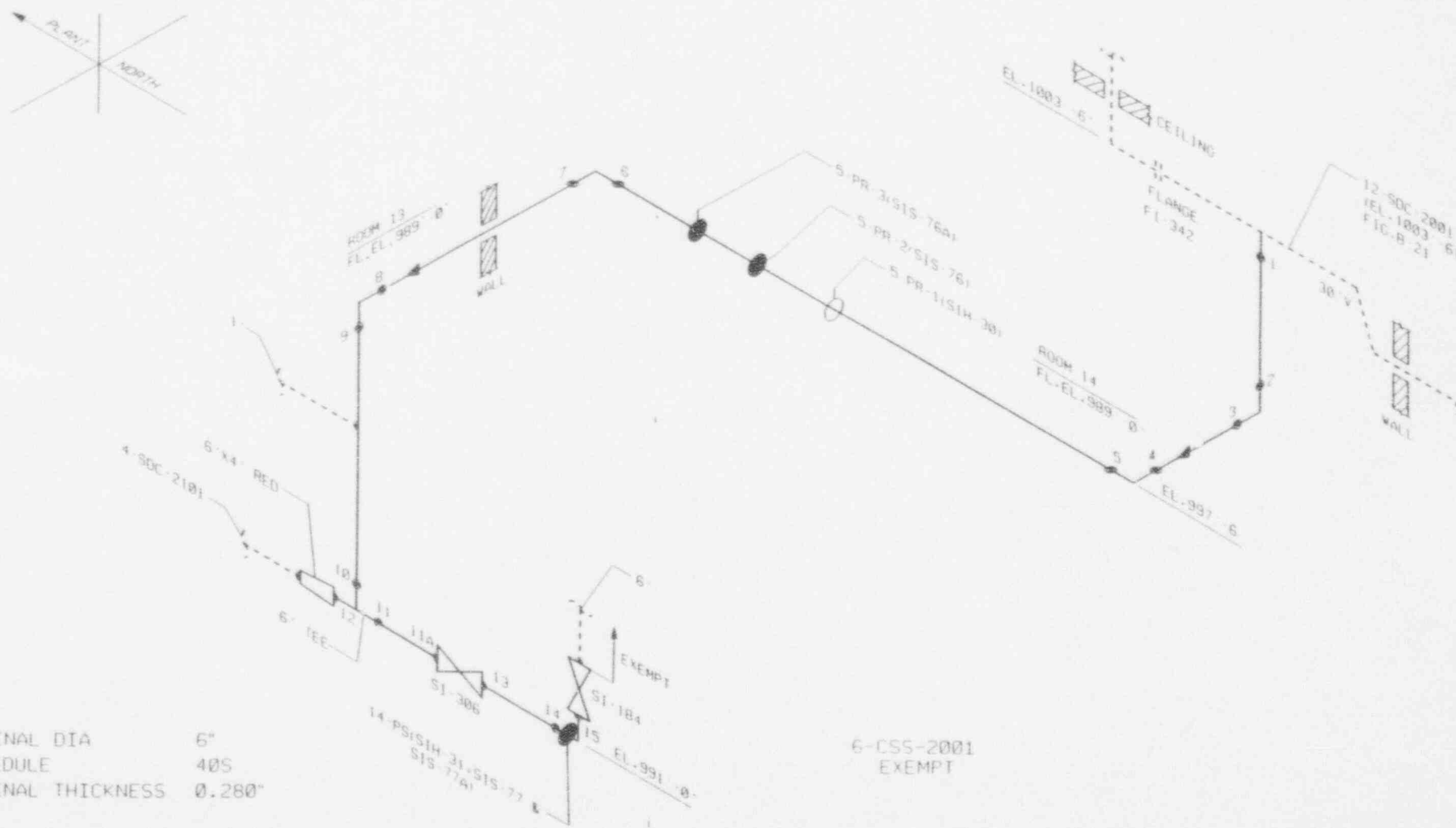
6-LPH-2014 (EXEMPT)
6-SI-2014
4-LPH-2014/18
4-SI-2014/19

CONTAINMENT
SOUTH SIDE EL.1013'-0"
SOUTHEAST EL.994'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 74 II. IC 77 II. D-4255 I.
D-4256 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-34



NOMINAL DIA		6"
SCHEDULE		40S
NOMINAL THICKNESS		0.280"

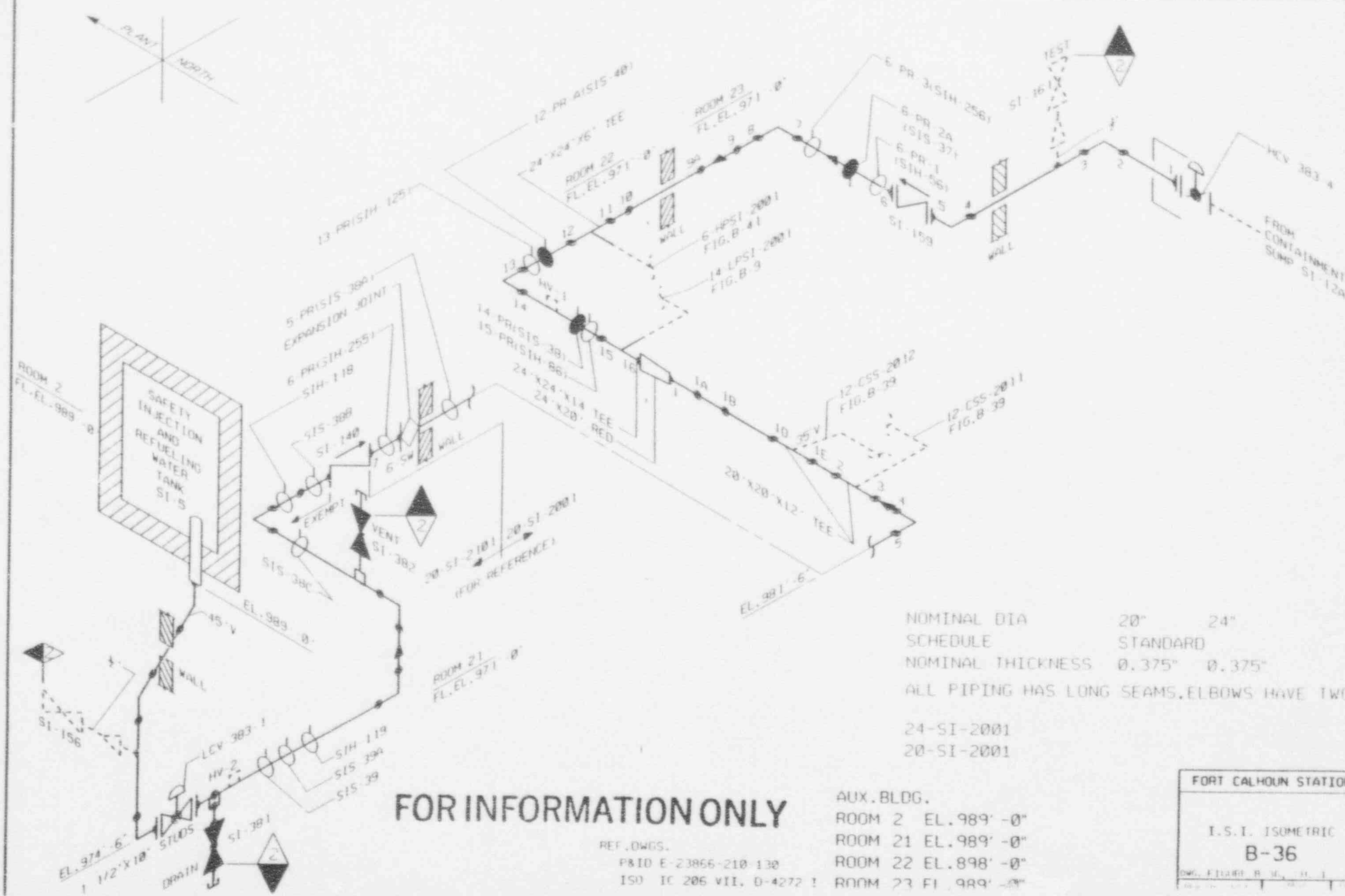
AUX.BLDG.
ROOM 13 EL.989'-0"
ROOM 14 EL.989'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 196 V, D-4266 I,
D-4267 II

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-35

FOR INFORMATION ONLY



NOMINAL DIA	20"	24"
SCHEDULE	STANDARD	
NOMINAL THICKNESS	0.375"	0.375"

ALL PIPING HAS LONG SEAMS.ELBOWS HAVE TWO

24-SI-2001
20-SI-2001

AUX.BLDG.
ROOM 2 EL.989'-0"
ROOM 21 EL.989'-0"
ROOM 22 EL.898'-0"
ROOM 23 EL.989'-0"

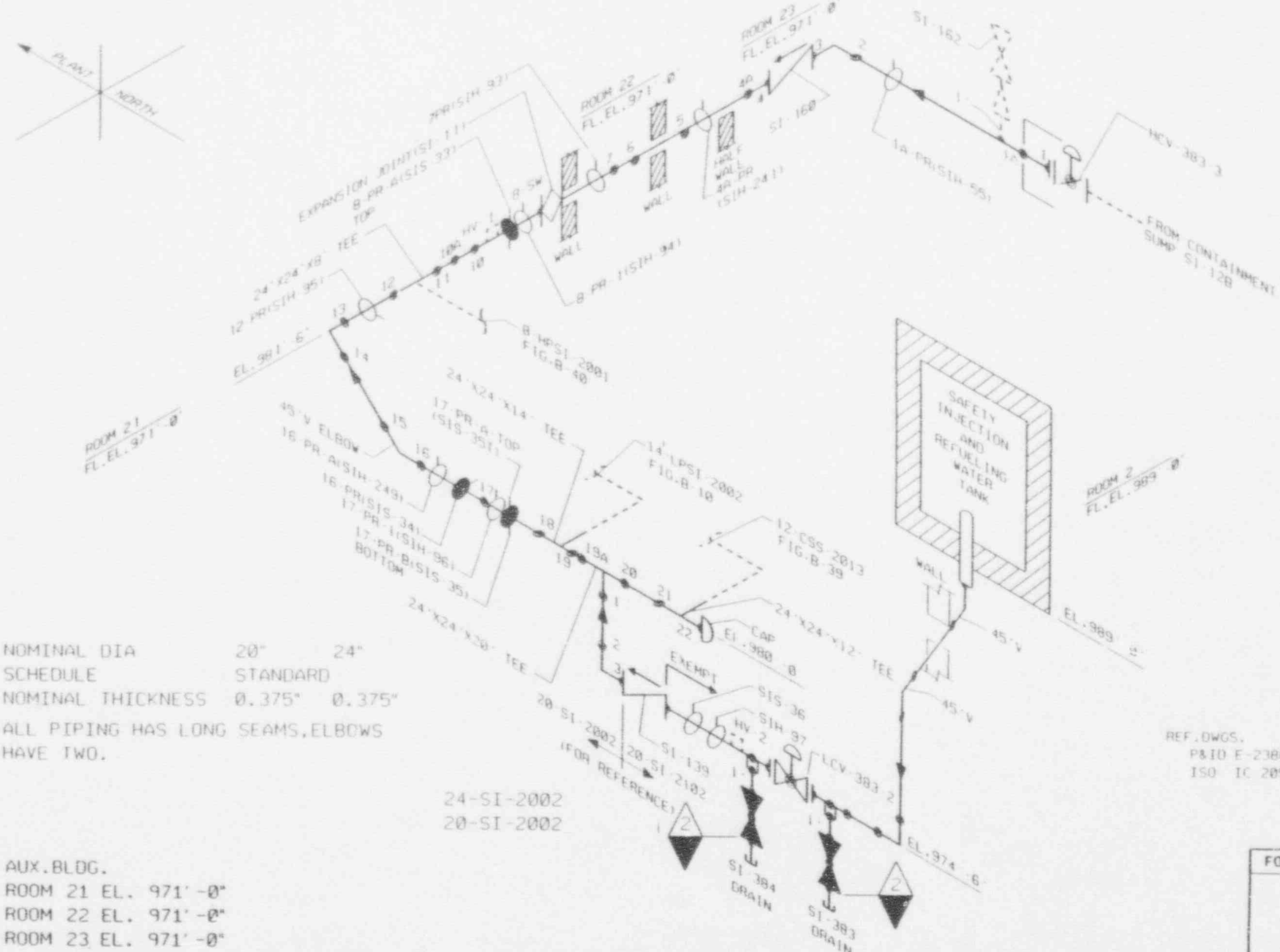
FOR INFORMATION ONLY

REF.DWGS.
P&ID E-23866-210-130
ISO IC 206 VII. D-4272 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-36



24-SI-2002
20-SI-2002

NOMINAL DIA	20"	24"
SCHEDULE	STANDARD	
NOMINAL THICKNESS	0.375"	0.375"

ALL PIPING HAS LONG SEAMS, ELBOWS HAVE TWO.

AUX.BLDG.
ROOM 21 EL. 971'-0"
ROOM 22 EL. 971'-0"
ROOM 23 EL. 971'-0"

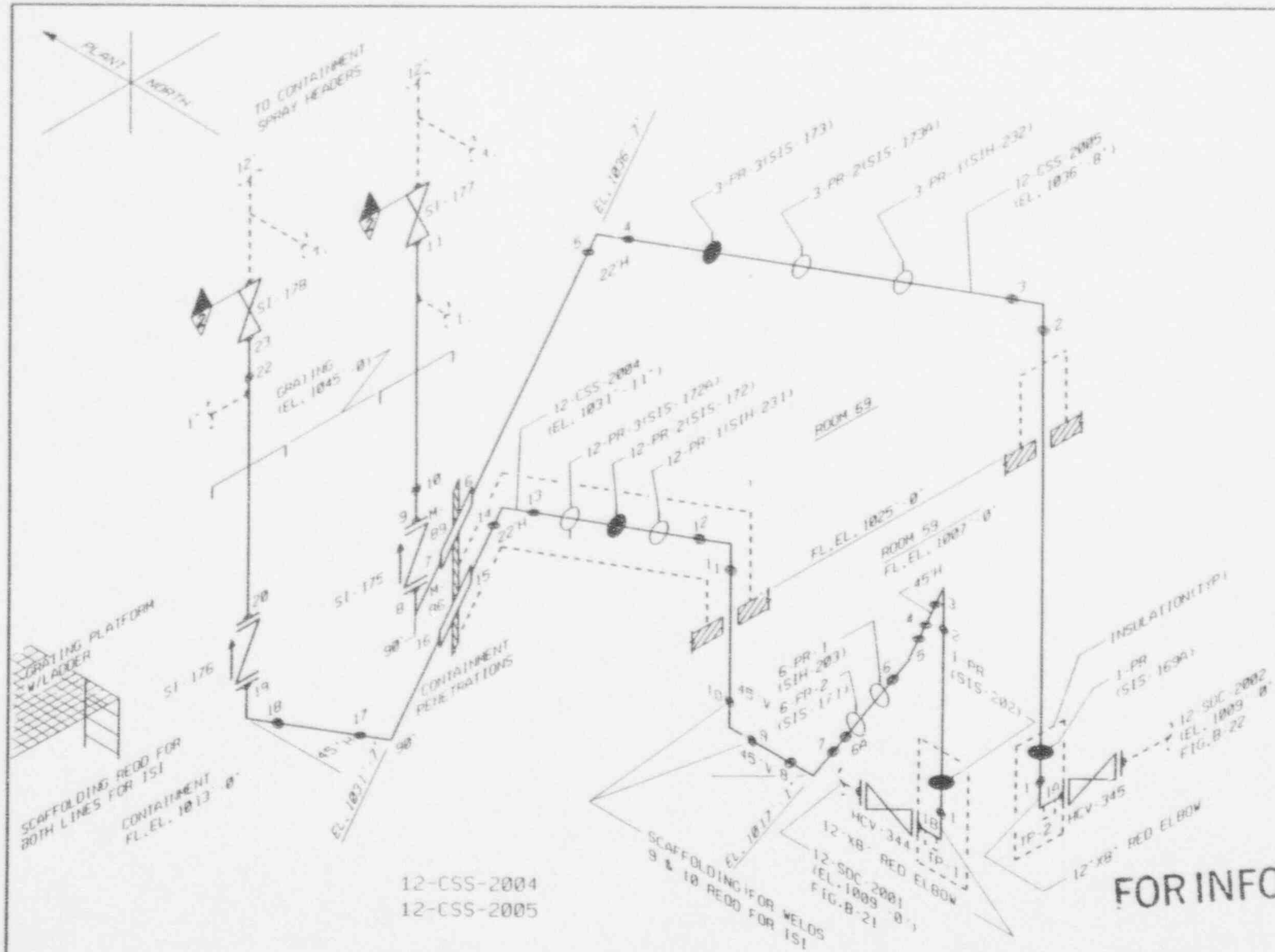
REF.DWGS.
P&ID E-23866-210-130
ISO IC 205 V, D-4273 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-37

DWG. FIGURE B-37, SH. 1

FOR INFORMATION ONLY



NOMINAL DIA	12"
SCHEDULE	40S
NOMINAL THICKNESS	0.375"

FOR INFORMATION ONLY

12-CSS-2004
12-CSS-2005

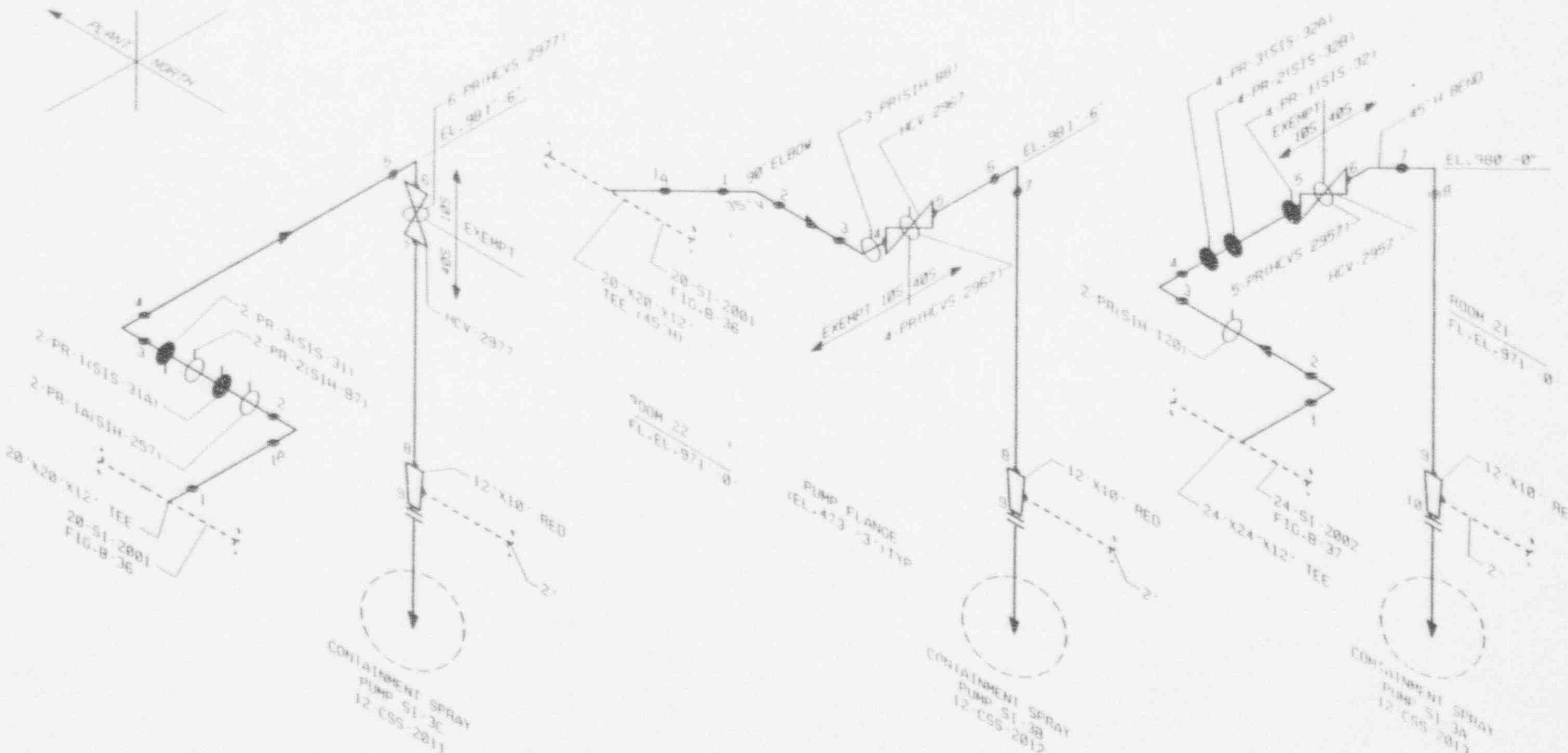
AUX.BLDG.
ROOM 69 EL.1025'-0"
ROOM 59 EL.1007'-0"

CONTAINMENT
NORTH SIDE EL.1045'-0"
NORTH SIDE EL.1013'-0"

REF.DWGS.
P&ID E-23866-210-130 REV.28,31
ZONE B3,H3,SH.1 & 2
ISO IC 169 II, IC 181 II,
IC 341 II, D-4266 I.

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-38



NOMINAL DIA	12"	12"
SCHEDULE	40S	10S
NOMINAL THICKNESS	0.375"	0.180"

12-CSS-2011
12-CSS-2012
12-CSS-2013

AUX.BLDG.
ROOM 21 EL.971'-0"
ROOM 22 EL.971'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 203 IV, D-4272 I,
D-4273 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-39

FOR INFORMATION ONLY

1

IMAGE EVALUATION TEST TARGET (MT-3)

150mm

6"

1

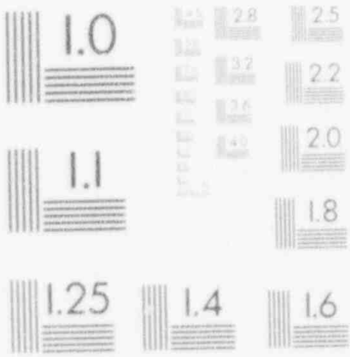
IMAGE EVALUATION TEST TARGET (MT-3)

150mm

6″

1

IMAGE EVALUATION TEST TARGET (MT-3)

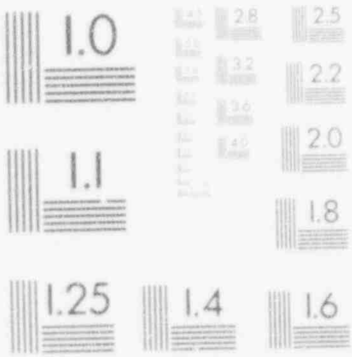


150mm

6"

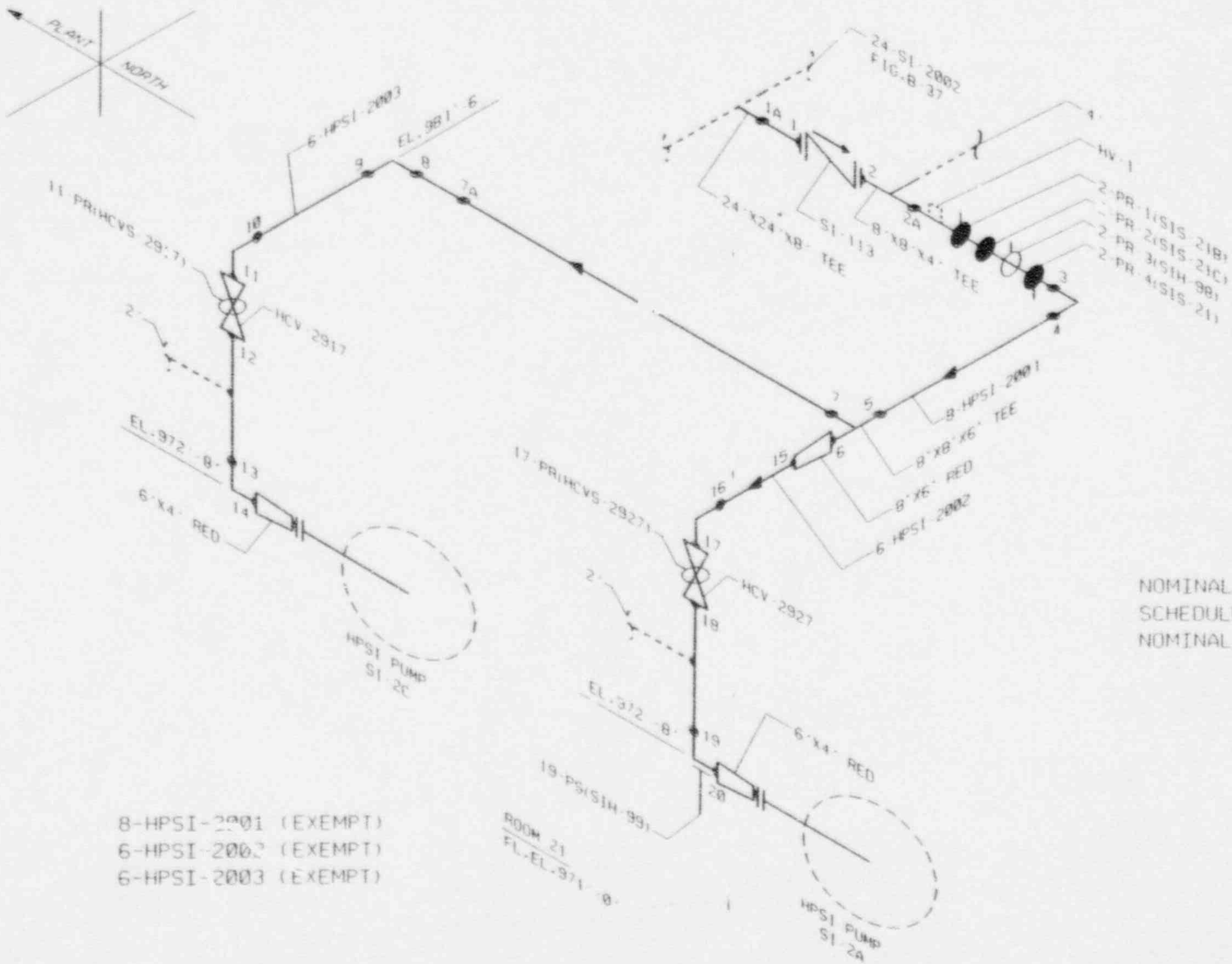
1

IMAGE EVALUATION TEST TARGET (MT-3)



150mm

6″



8-HPSI-2001 (EXEMPT)
6-HPSI-2002 (EXEMPT)
6-HPSI-2003 (EXEMPT)

NOMINAL DIA	6"	8"
SCHEDULE	40S	40S
NOMINAL THICKNESS	0.280	0.322

AUX.BLDG.
ROOM 21 EL.971'-0"

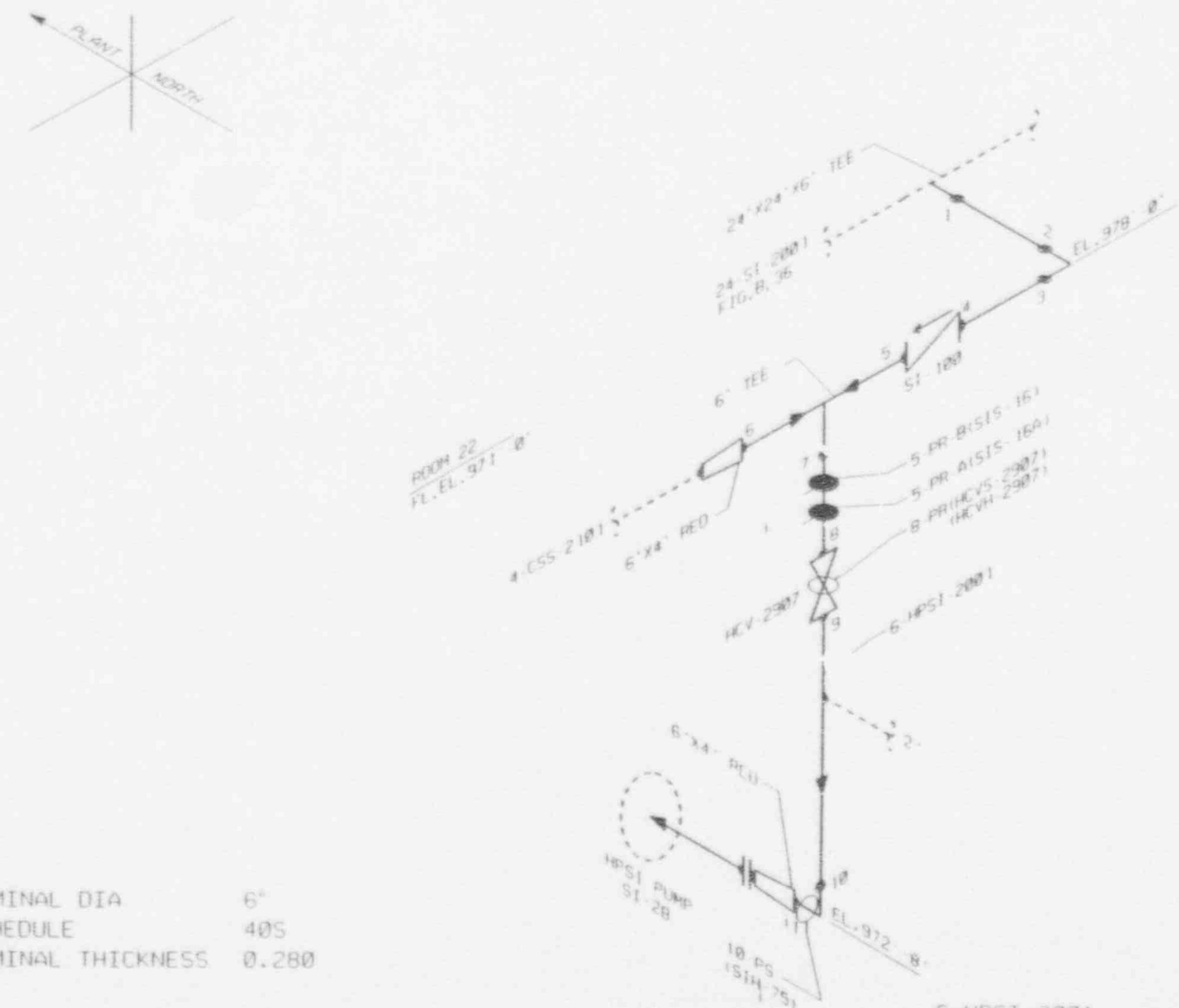
REF.DWGS.
P&ID E-23866-210-130
ISO IC 199 III. IC 205 V.
D-4268 II

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-40

DWG. FIGURE B-40, SH. 1



NOMINAL DIA 6"
SCHEDULE 40S
NOMINAL THICKNESS 0.280

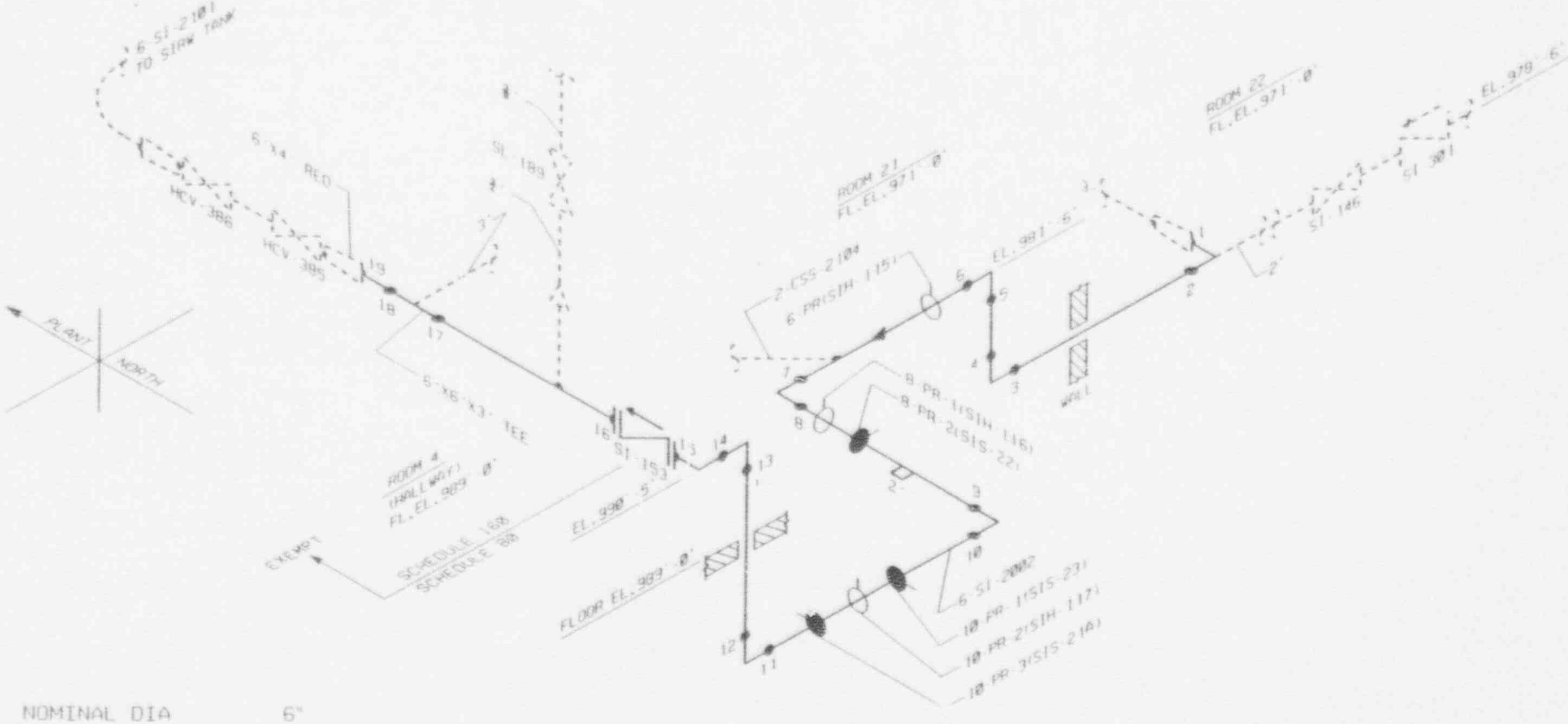
6-HPSI-2001
EXEMPT

AUX.BLDG.
ROOM 22 EL.971'-0"

REF.DWGS.
P&ID E-23866-210-130
ISO IC 197 IV, D-4267 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-41



NOMINAL DIA 6"
SCHEDULE 80
NOMINAL THICKNESS 0.432"

6-SI-2002

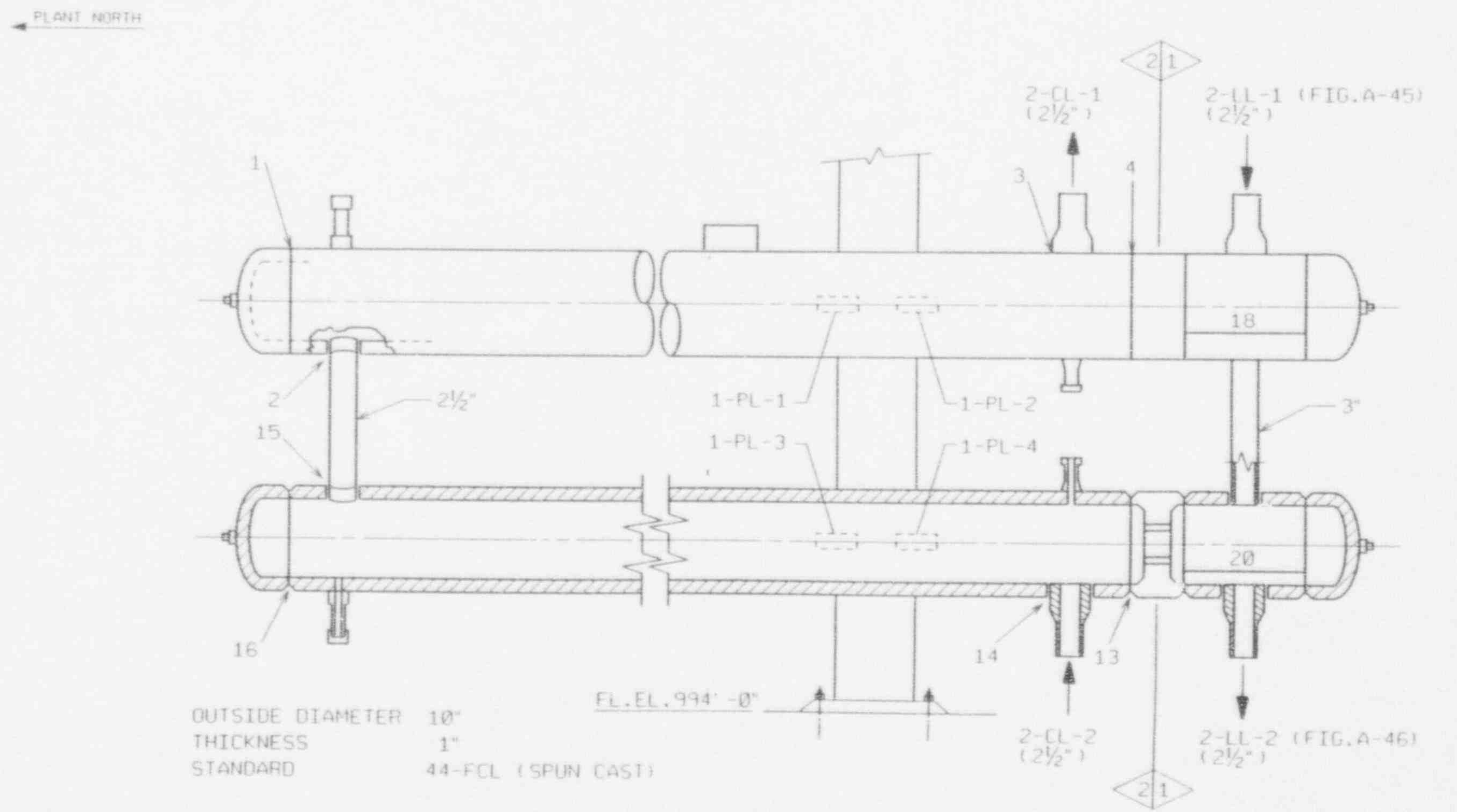
AUX.BLDG.
ROOM 21 EL.971'-0"
ROOM 22 EL.971'-0"

NOTE:
ENTIRE LINE EXEMPT.
FED BY PIPING ≤4".
HPSI FEEDS THIS THRU
1" LINES WITH FLOW
LIMITING ORIFICES.

REF.DWGS.
P&ID E-23866-210-130
ISO IC-200 II, IC-212 V,
D-4269 I, D-4274 I

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-42
DWG. FIGURE B-42, SH. 1



OUTSIDE DIAMETER 10"
THICKNESS 1"
STANDARD 44-FCL (SPUN CAST)

REGENERATIVE HEAT EXCHANGER
CH-6

CONTAINMENT
RHEX ROOM EL.994'-0"

REF.DWGS.
B-1853-5

FORT CALHOUN STATION

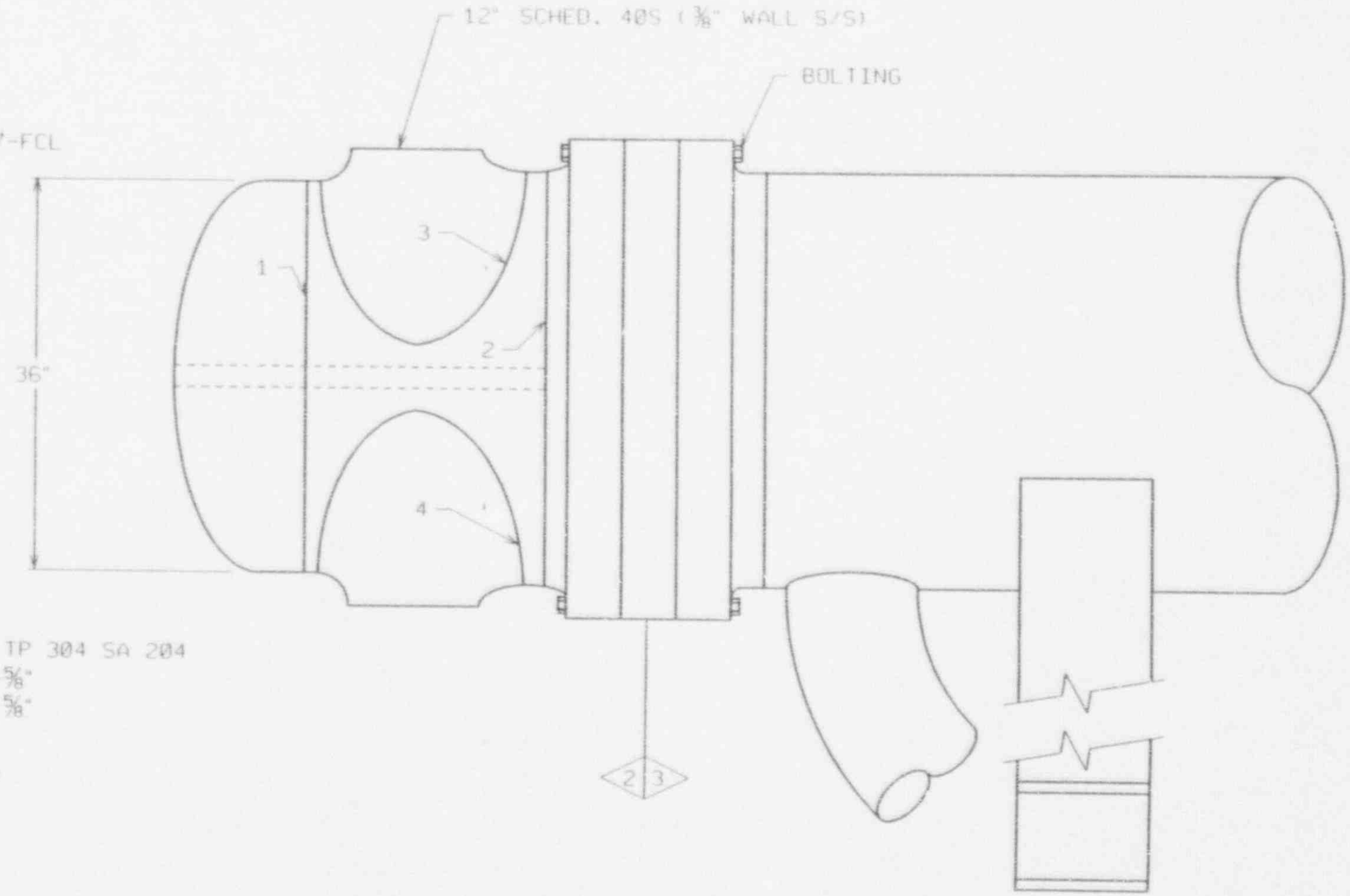
I.S.I. ISOMETRIC
B-43

PLANT NORTH

CALIBRATION BLOCKS: 37-FCL

NØ.AC-4A - ROOM 14

No.AC-4B - ROOM 15



CHANNEL MATERIAL: S/S TP 304 SA 204
SHELL THICKNESS - 5/8"
HEAD THICKNESS - 5/8"

BOLTING: ALLOY STEEL
STUDS - SA-193-B7
NUTS - SA-194-2H

AC-4A & AC-4B
SHUTDOWN HEAT EXCHANGERS
FL.EL.989'-0"

AUX.BLDG.
ROOM 14 EL.989'-0"
ROOM 15 EL.989'-0"

REF.DWGS.
L-26133-6

FORT CALHOUN STATION

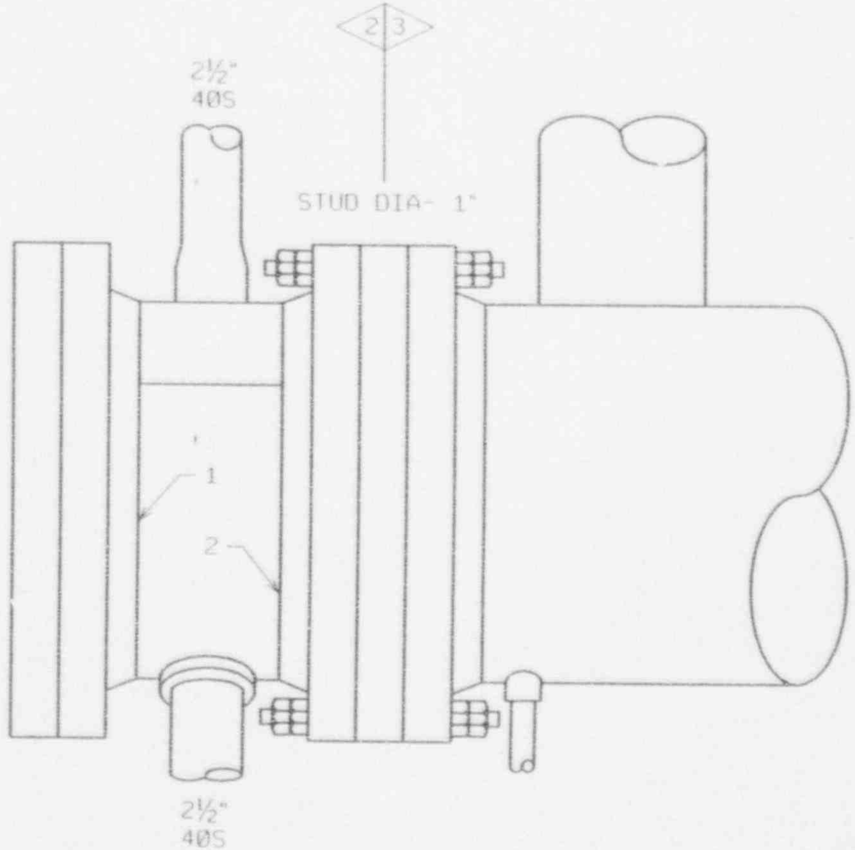
I.S.I. ISOMETRIC

B-44

FOR INFORMATION ONLY

PLANT NORTH

OUTSIDE DIA 20"
NOM THK ½"
MATERIAL SS-304
CALIBRATION BLOCK: 29-FCL



LET DOWN HEAT EXCHANGER
CH-7
ROOM 12
FL.EL.989'-0"
EXEMPT

AUX.BLDG.
ROOM 12 EL.989'-0"

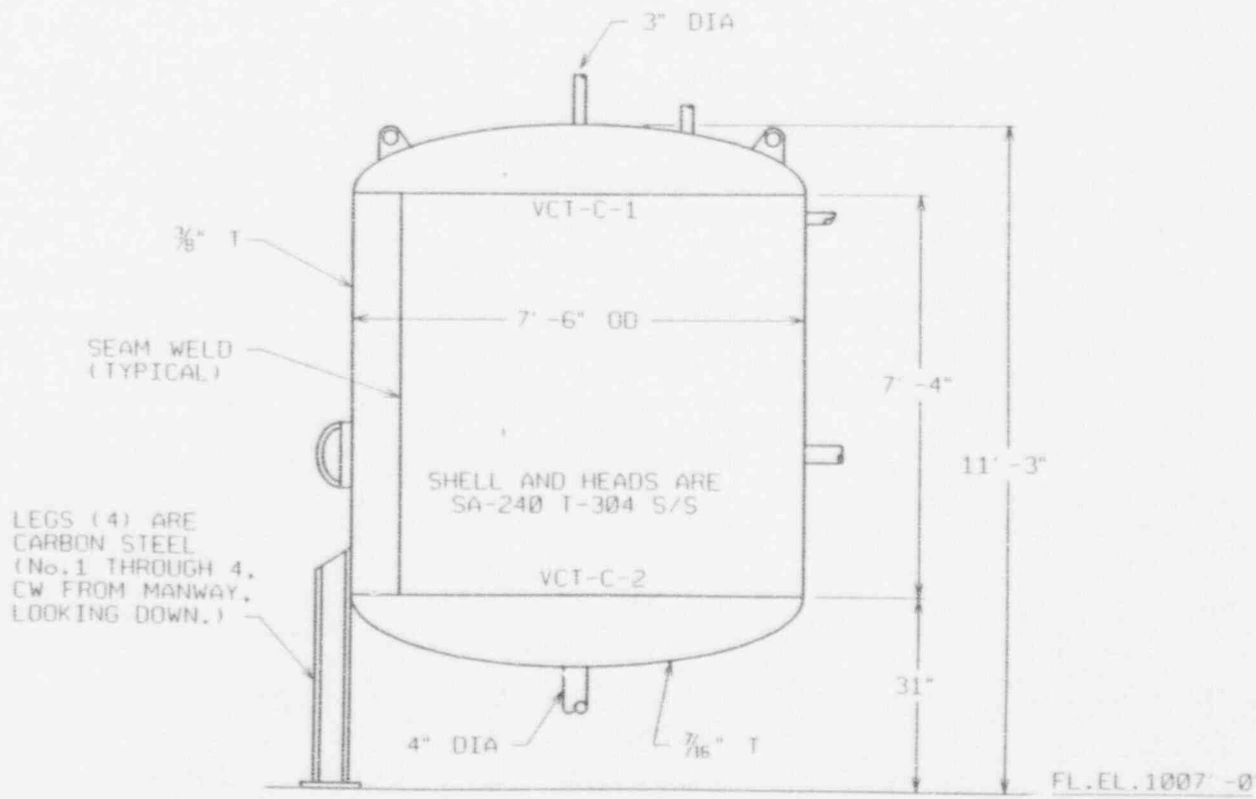
REF.DWGS.
P&ID 11405-M-10
D-184-3

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-45
DWG. FIGURE B-45, SH. 1

FOR INFORMATION ONLY

CALIBRATION BLOCK: 30-FCL



VOLUME CONTROL TANK
ROOM 29
EXEMPT

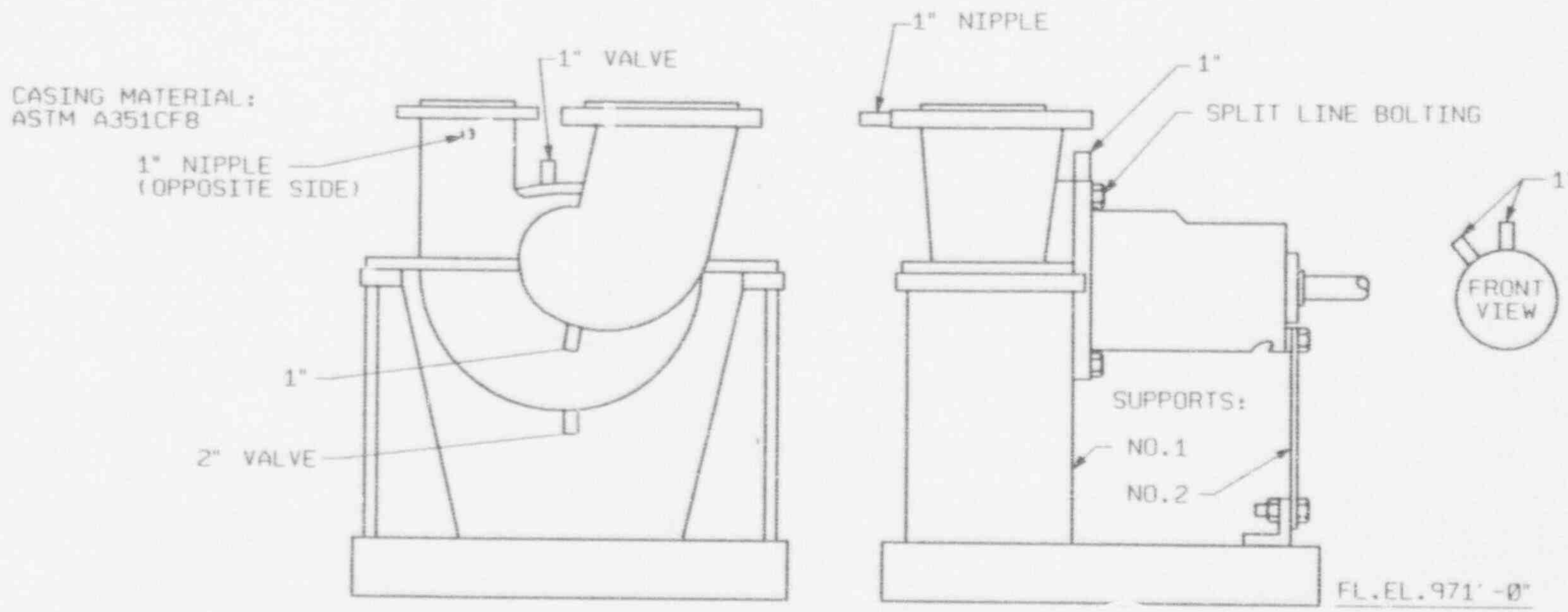
AUX.BLDG.
ROOM 29 EL.1007'-0"

REF.DWGS.
D-2494-5

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-46



CONTAINMENT SPRAY PUMPS SI-3A, -3B & -3C (AVERAGE CASING THICKNESS - .94" Ø

LOW PRESSURE SAFETY INJECTION PUMPS SI-1A & SI-1B (AVERAGE CASING THICKNESS - .99")

DATE	TASK/MR #

AUX.BLDG.
ROOM 21 EL.971'-0"
ROOM 22 EL.971'-0"

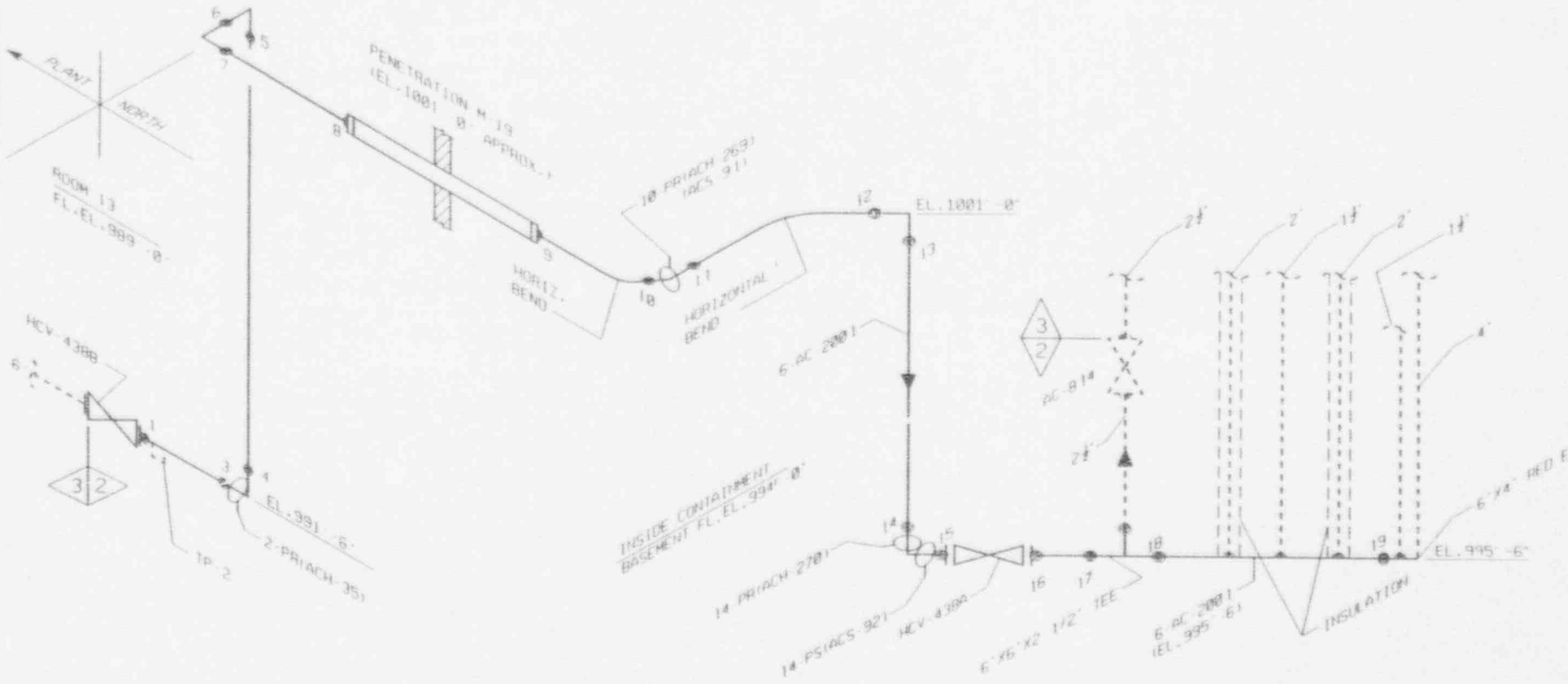
REF.DWGS.
X-6UCL86X19

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-47

DWG. FIGURE B-47, SH.1 OF 1



CARBON STEEL PIPE

NOMINAL DIA	6"
SCHEDULE	40
NOMINAL THICKNESS	0.280"

NOTE: ALL PIPE PAINTED BLUE

6-AC-2001
EXEMPT

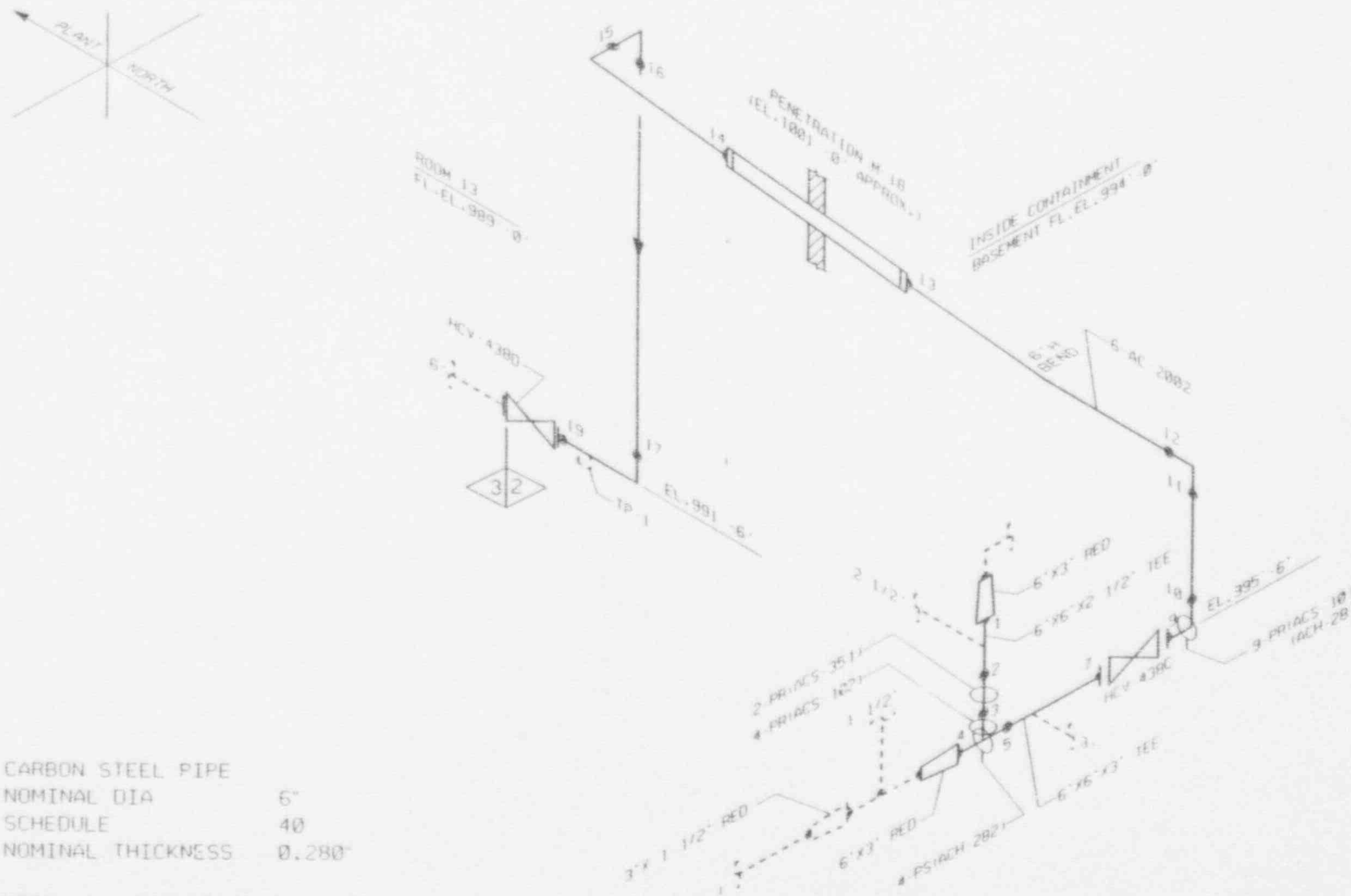
AUX.BLDG.
ROOM 13 EL.989'-0"

CONTAINMENT
NORTH SIDE EL.994'-0"

REF.DWGS.
P&ID 11405-M-40
ISO IC 93 V, IC 217 V, D-4206 I,
D-4210 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-48



CARBON STEEL PIPE
NOMINAL DIA 6"
SCHEDULE 40
NOMINAL THICKNESS 0.280"

NOTE: ALL PIPE PAINTED BLUE

REF.DWGS.
P&ID 11405-M-40
ISO IC 94 III, IC 217 V, D-4207 I, D-4209 I

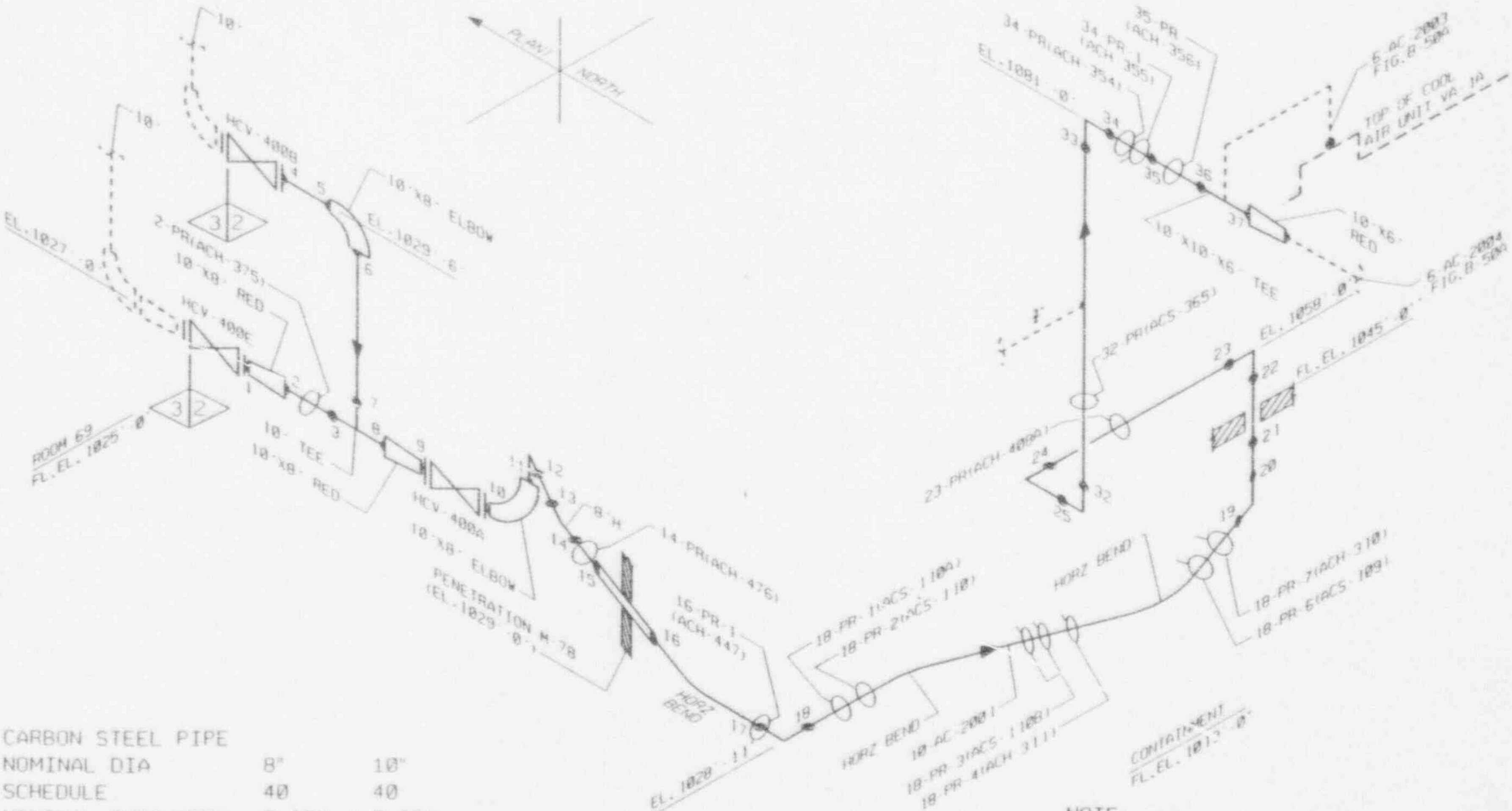
AUX.BLDG.
ROOM 13 EL.989'-0"

CONTAINMENT
NORTH SIDE EL.994'-0"

6-AC-2002
EXEMPT

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-49



CARBON STEEL PIPE

NOMINAL DIA	8"	10"
SCHEDULE	40	40
NOMINAL THICKNESS	0.322	0.365

NOTE: ALL PIPE PAINTED BLUE

AUX.BLDG.
ROOM 69 EL.1025'-0"

CONTAINMENT
NORTH SIDE EL.1013'-0"
EAST SIDE EL.1045'-0"

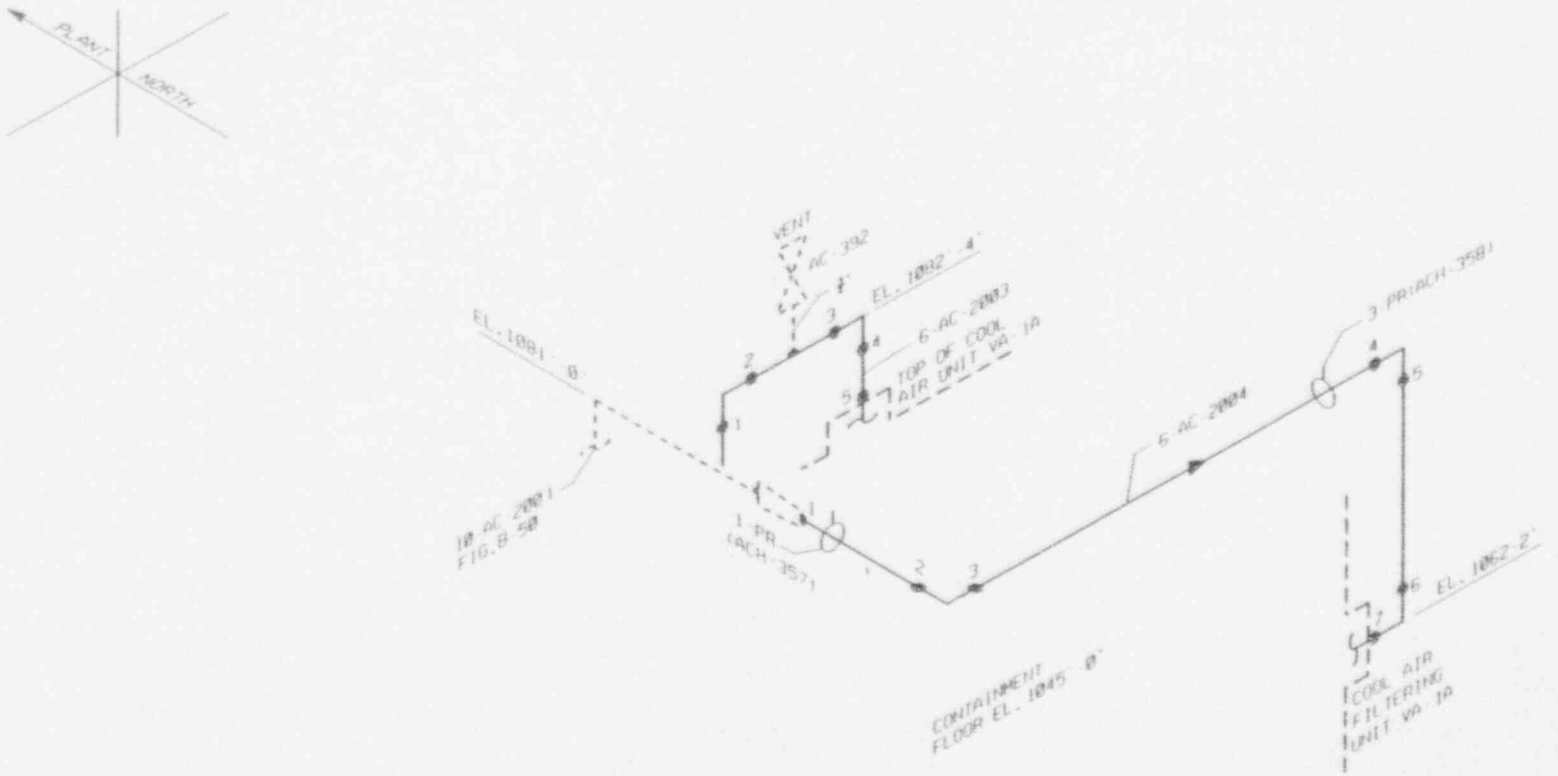
10-AC-2001
EXEMPT

NOTE:
AREA 16 THRU 21 REQUIRES SCAFFOLDING
& RUNS PARALLEL WITH 14 THRU 20 ISO.B-52.
SUPPORT CLAMPS NEAR WELDS: 14,17 AND 19
WELDS 16 THRU 34 NEED SCAFFOLDING FOR ISI

REF.DWGS.
P&ID 11405-M-40
ISO IC-83 II, IC 83A I,
IC 325 II, IC 328 IV
D-4218 I & II, D-4305 I

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-50



CARBON STEEL PIPE

NOMINAL DIA	6"
SCHEDULE	40
NOMINAL THICKNESS	0.280

NOTE: ALL PIPE PAINTED BLUE

6-AC-2003 (EXEMPT)
6-AC-2004 (EXEMPT)

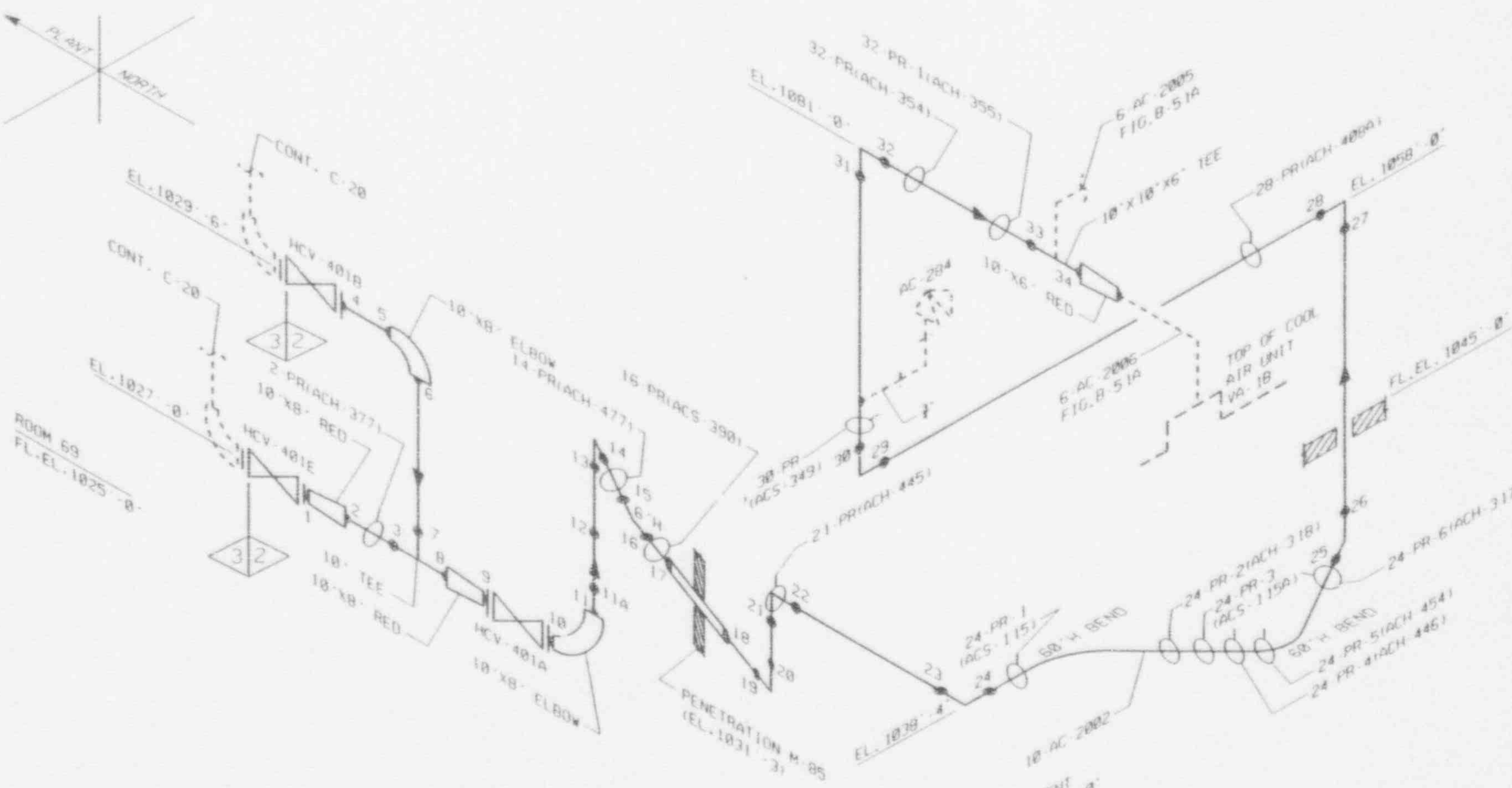
CONTAINMENT
EAST SIDE EL.1045'-0"

REF.DWGS.
P&ID 11405-M-40
ISO IC 83 II. IC 83A I.
D-4305

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-50A



CARBON STEEL PIPE		
NOMINAL DIA	8"	10"
SCHEDULE	40	40
NOMINAL THICKNESS	0.322	0.365

NOTE: ALL PIPE PAINTED BLUE

10-AC-2002
EXEMPT

NOTE:
WELDS 18 THRU 32 NEED SCAFFOLDING FOR ISI
SUPPORT CLAMPS NEAR WELDS 14,16,17 22,24,25,28 AND 30

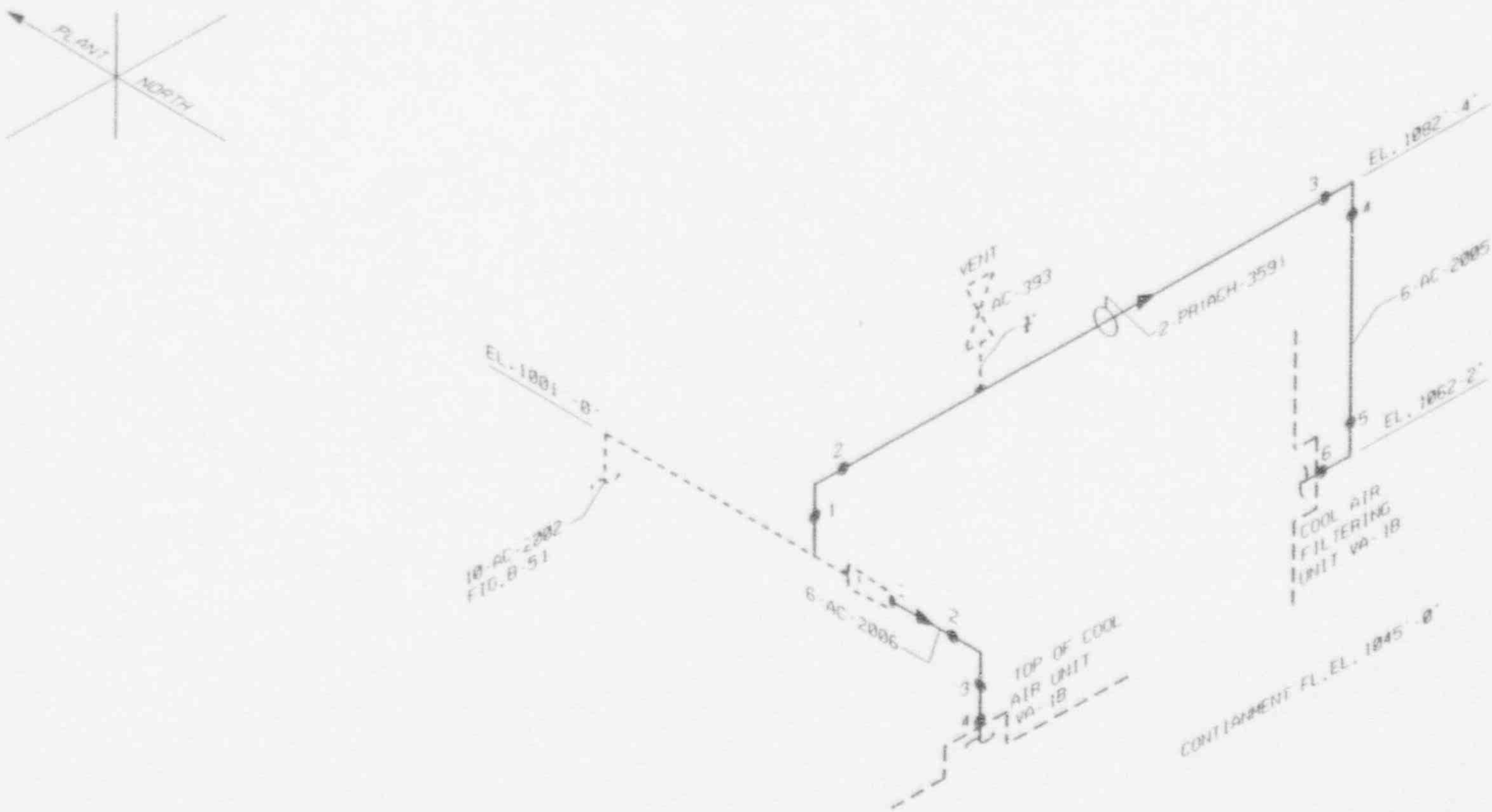
FOR INFORMATION ONLY

CONTAINMENT
EAST SIDE EL.1045'-0"
NORTH SIDE EL.1013'-0"

AUX.BLDG.
ROOM 69 EL.1025'-0"

REF.DWGS.
P&ID 11405-M-40
ISO IC 85 II. IC 85A I. D-4306
IC 325 II. IC 328 IV. D-4312 I & II

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-51
DWG. FIGURE B-51, SH. 1



CARBON STEEL PIPE
NOMINAL DIA 6"
SCHEDULE 40
NOMINAL THICKNESS 0.280

NOTE: ALL PIPE PAINTED BLUE

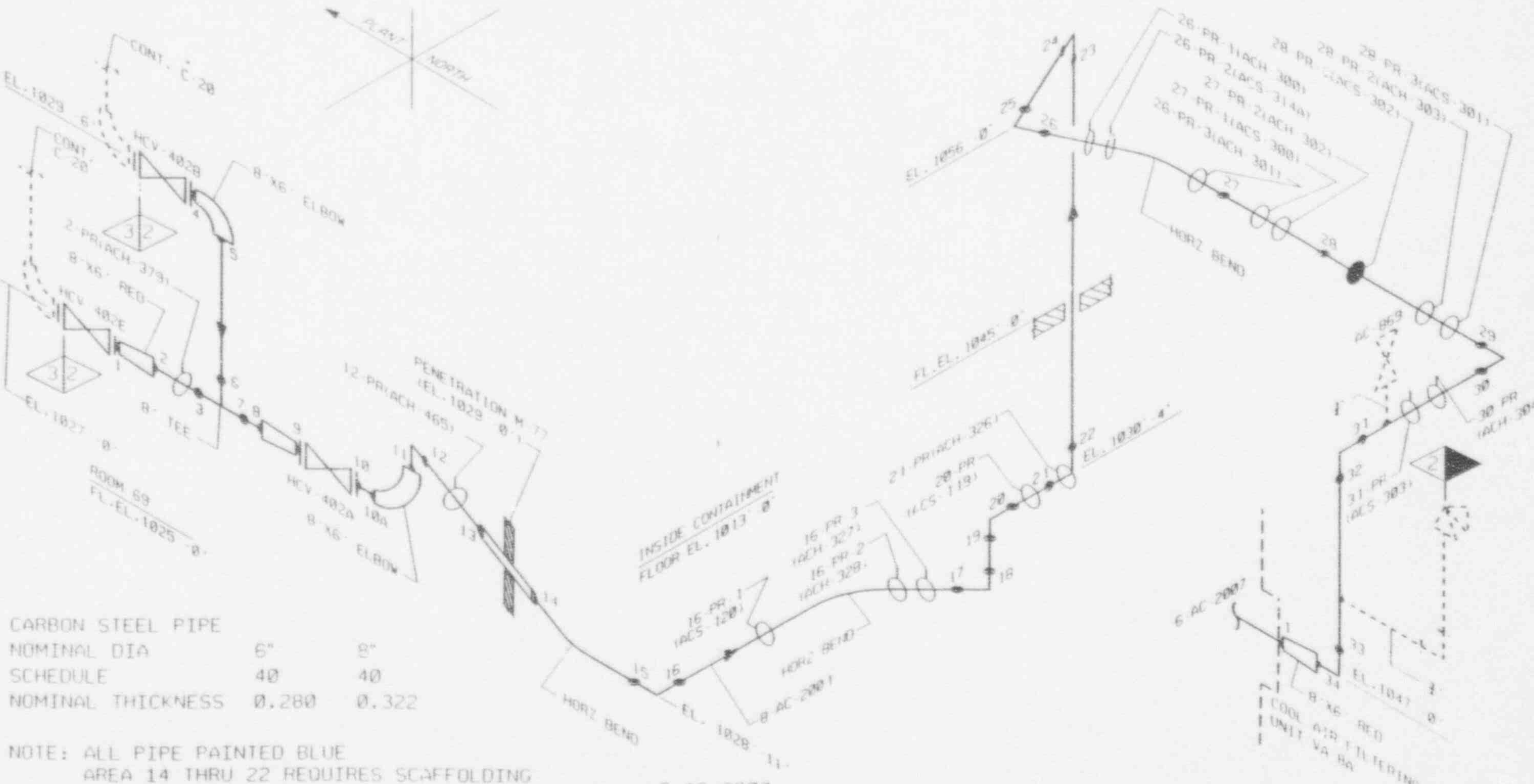
6-AC-2005 (EXEMPT)
6-AC-2006 (EXEMPT)

CONTAINMENT
EAST SIDE EL.1045'-0"

REF.DWGS.
P&ID 11405-M-40
ISO IC-85 II, IC-85A I,
D-4306

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-51A
DWG. FIGURE B-51A, SH. 1



CARBON STEEL PIPE		
NOMINAL DIA	6"	8"
SCHEDULE	40	40
NOMINAL THICKNESS	0.280	0.322

NOTE: ALL PIPE PAINTED BLUE
AREA 14 THRU 22 REQUIRES SCAFFOLDING & RUN PARALLEL WITH AREA 16 THRU 21 FIG.B-50
WELDS 14 THRU 32 NEED SCAFFOLDING FOR ISI
SUPPORT CLAMPS NEAR WELDS: 12 AND 20
INSTRUMENT TRAY NEAR WELD: 29
I-BEAM NEAR WELD:24

6-AC-2007
8-AC-2001
EXEMPT

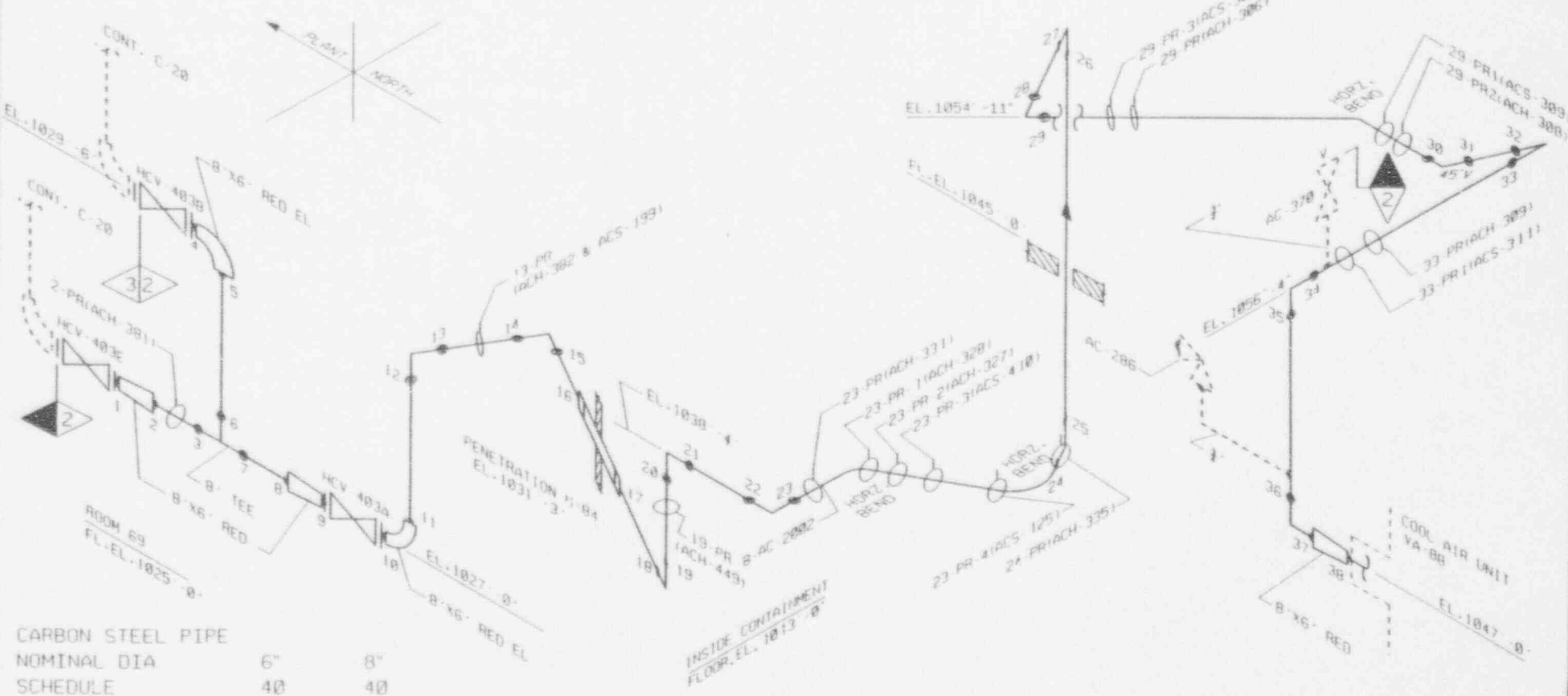
CONTAINMENT
EAST SIDE EL.1045' -0"
NORTH SIDE EL.1013' -0"

AUX.BLDG.
ROOM 69 EL.1025' -0"

FOR INFORMATION ONLY

REF.DWGS.
P&ID 11405-M-40
ISO IC-328 IV, IC-325 II, D-4307
IC-87A I, IC-87 II, D-4218 I & II

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-52



CARBON STEEL PIPE

	6"	8"
NOMINAL DIA	6"	8"
SCHEDULE	40	40
NOMINAL THICKNESS	0.280	0.322

8-AC-2002
EXEMPT

NOTE: ALL PIPE PAINTED BLUE
WELDS 17 THRU 25 NEED SCAFFOLDING FOR ISI
SUPPORT CLAMPS AREA NEAR WELDS: 13.14.24 & 30
CONDUIT NEAR WELD: 28

FOR INFORMATION ONLY

CONTAINMENT
EAST SIDE EL.1045'-0"
NORTH SIDE EL.1013'-0"

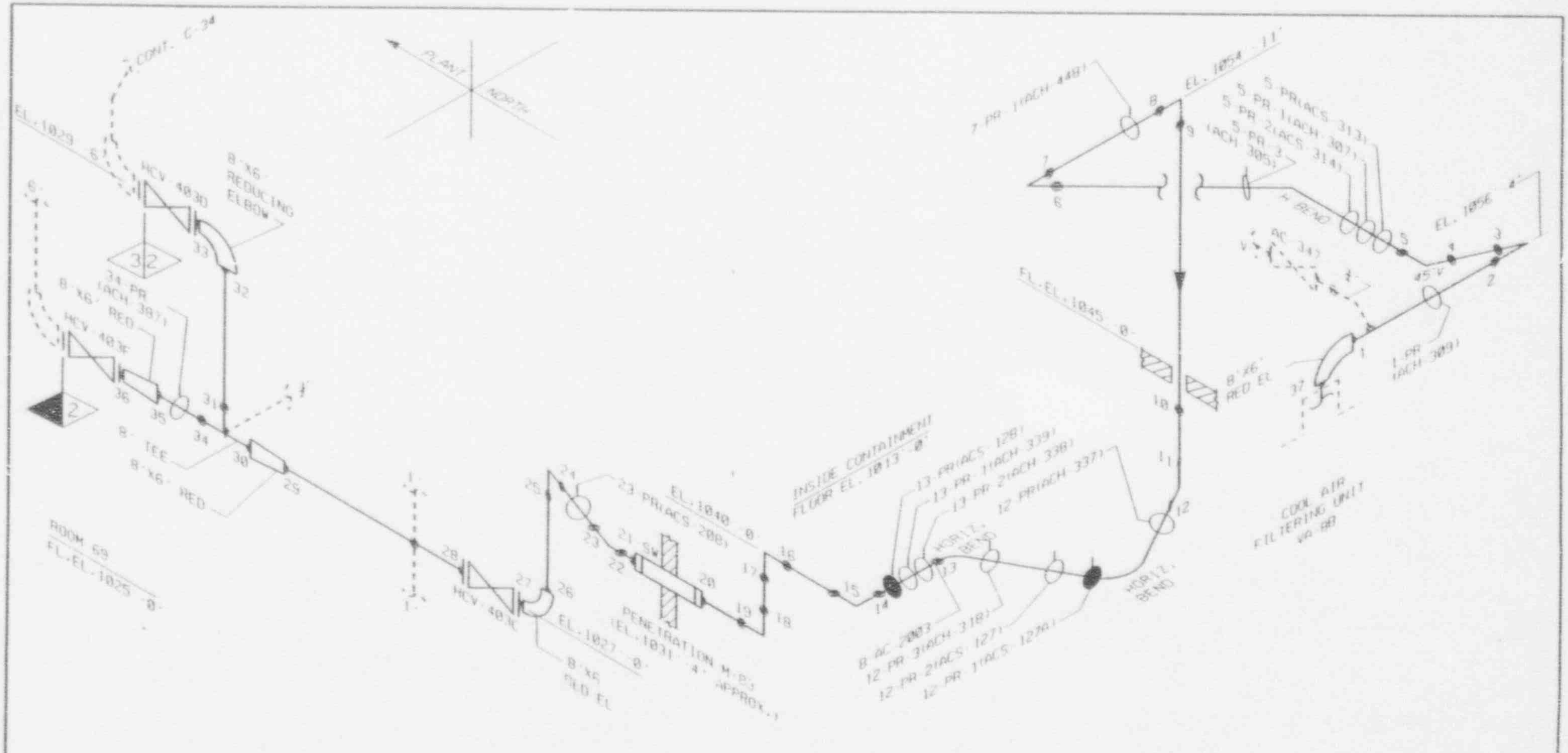
AUX.BLDG.
ROOM 69 EL.1025'-0"

REF.DWGS.
P&ID 11405-M-40
ISO IC-89 II. IC-8919 I. D-4202
IC-325 II. IC-328 IV. D4218 I & II

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-53

DWG. FIGURE B-53, SH. 1



8-AC-2003
EXEMPT

CARBON STEEL PIPE

NOMINAL DIA	6"	8"
SCHEDULE	40	40
NOMINAL THICKNESS	0.280	0.322

NOTE: ALL PIPE PAINTED BLUE
WELDS 2 THRU 20 REQUIRE SCAFFOLDING FOR ISI
SUPPORT CLAMP NEAR WELDS: 24 & 25
CONDUIT NEAR WELD:8

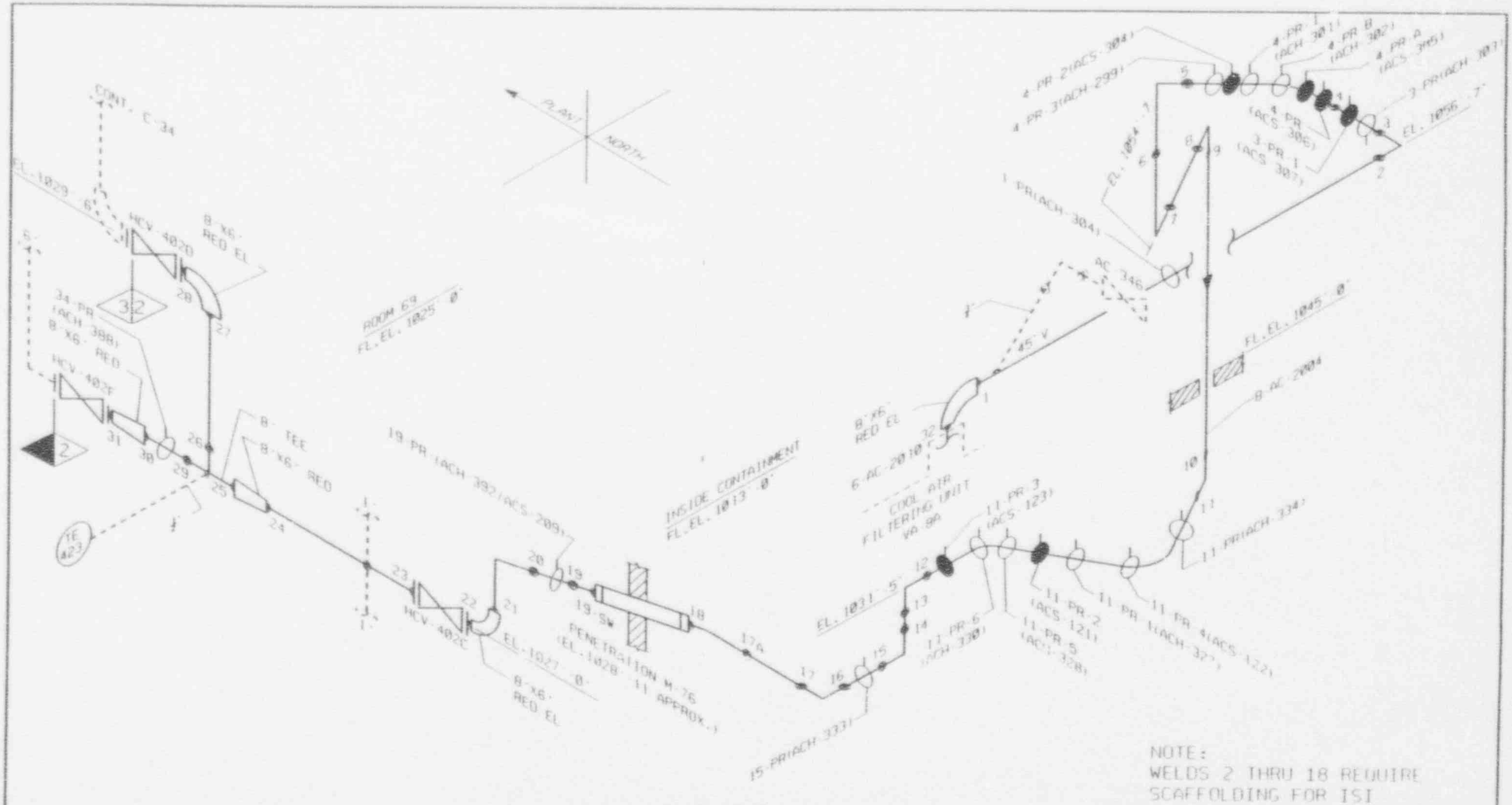
FOR INFORMATION ONLY

CONTAINMENT
EAST SIDE EL.1045' -0"
NORTH SIDE EL.1013' -0"

AUX.BLDG.
ROOM 69 EL.1025' -0"

REF.DWGS.
P&ID 11405-M-40
ISO IC-90 II, IC-90A I, IC-324 II, IC-331 III
D-4208 I, D-4203

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-54



NOTE:
WELDS 2 THRU 18 REQUIRE
SCAFFOLDING FOR ISI
SUPPORT CLAMP NEAR WELDS:
3, 11 & 16

6-AC-2010
8-AC-2004
EXEMPT

FOR INFORMATION ONLY

CARBON STEEL PIPE		
NOMINAL DIA	6"	8"
SCHEDULE	40	40
NOMINAL THICKNESS	0.280	0.322

NOTE: ALL PIPE PAINTED BLUE

CONTAINMENT
EAST SIDE EL.1045'-0"
NORTH SIDE EL.1013'-0"

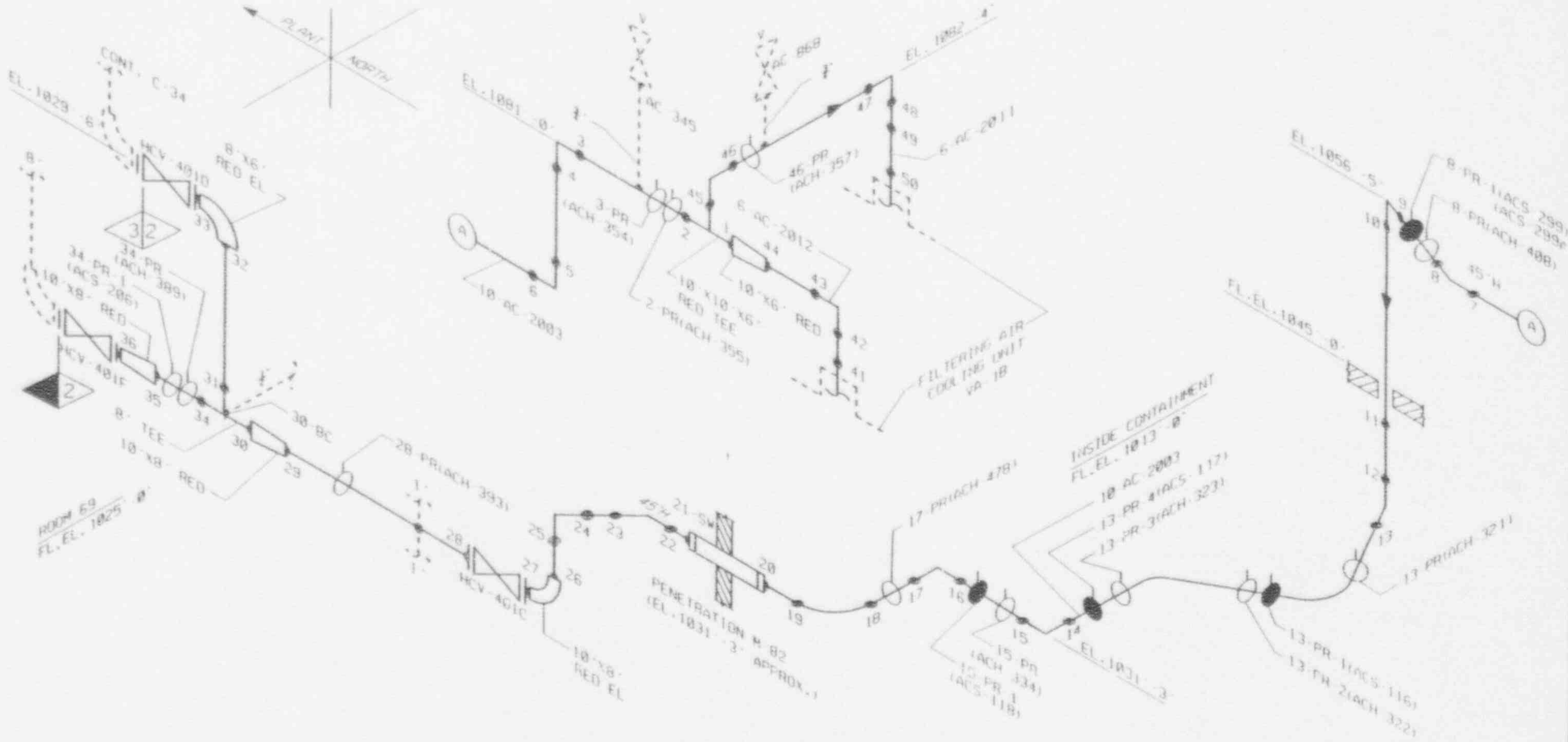
AUX.BLDG.
ROOM 69 EL.1025'-0"

REF.DWGS.
P&ID 11405-M-40
ISO IC-88 II, IC-88A I,
IC-324 II, IC-331 III,

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-55



10-AC-2003 (EXEMPT)
6-AC-2011 (EXEMPT)
6-AC-2012 (EXEMPT)

CARBON STEEL PIPE			
NOMINAL DIA	6"	8"	10"
SCHEDULE	40	40	40
NOMINAL THICKNESS	0.280	0.322	0.365

NOTE: ALL PIPE PAINTED BLUE
WELDS 3 THRU 20 REQUIRE SCAFFOLDING FOR ISI
SUPPORT CLAMP NEAR WELDS: 8.13.15 & 16
I-BEAM NEAR WELD: 9

REF.DWGS.
P&ID 11405-M-40
ISO IC-86 II, IC-86A I, D-4208 I
IC-324 II, IC-331 III, D-4304

FOR INFORMATION ONLY

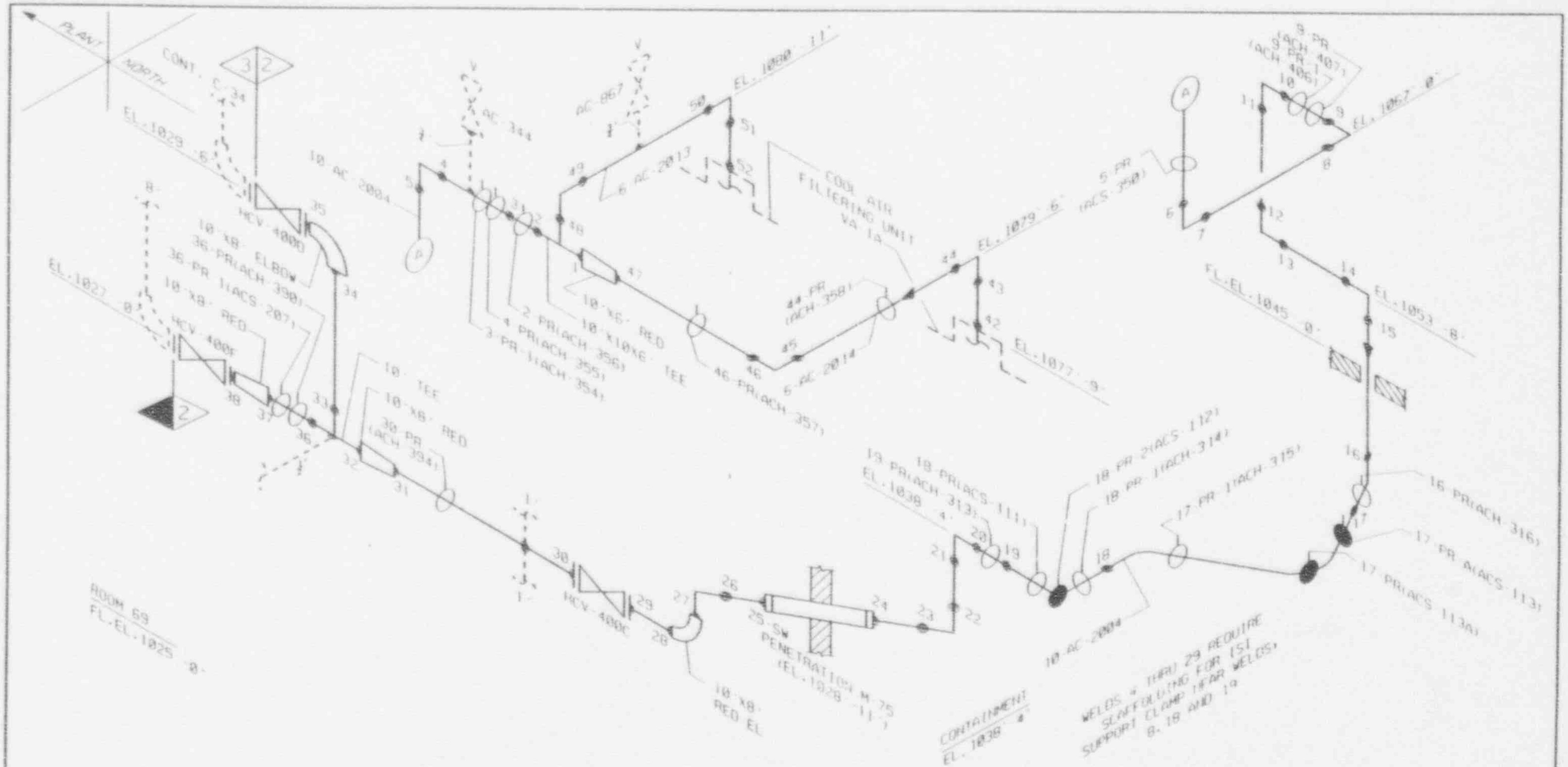
CONTAINMENT
EAST SIDE EL.1045'-0"
NORTH SIDE EL.1013'-0"

AUX.BLDG.
ROOM 69 EL.1025'-0"

FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-56



REF.DWGS.
P&ID 11405-M-40
ISO IC-84 II, IC-84A I, IC-324 II, IC-331 III, D-4200 I, D-4208 I & II

CARBON STEEL PIPE

NOMINAL DIA	6"	8"	10"
SCHEDULE	40	40	40
NOMINAL THICKNESS	0.280"	0.322"	0.365"

10-AC-2004 (EXEMPT)
6-AC-2013 (EXEMPT)
6-AC-2014 (EXEMPT)

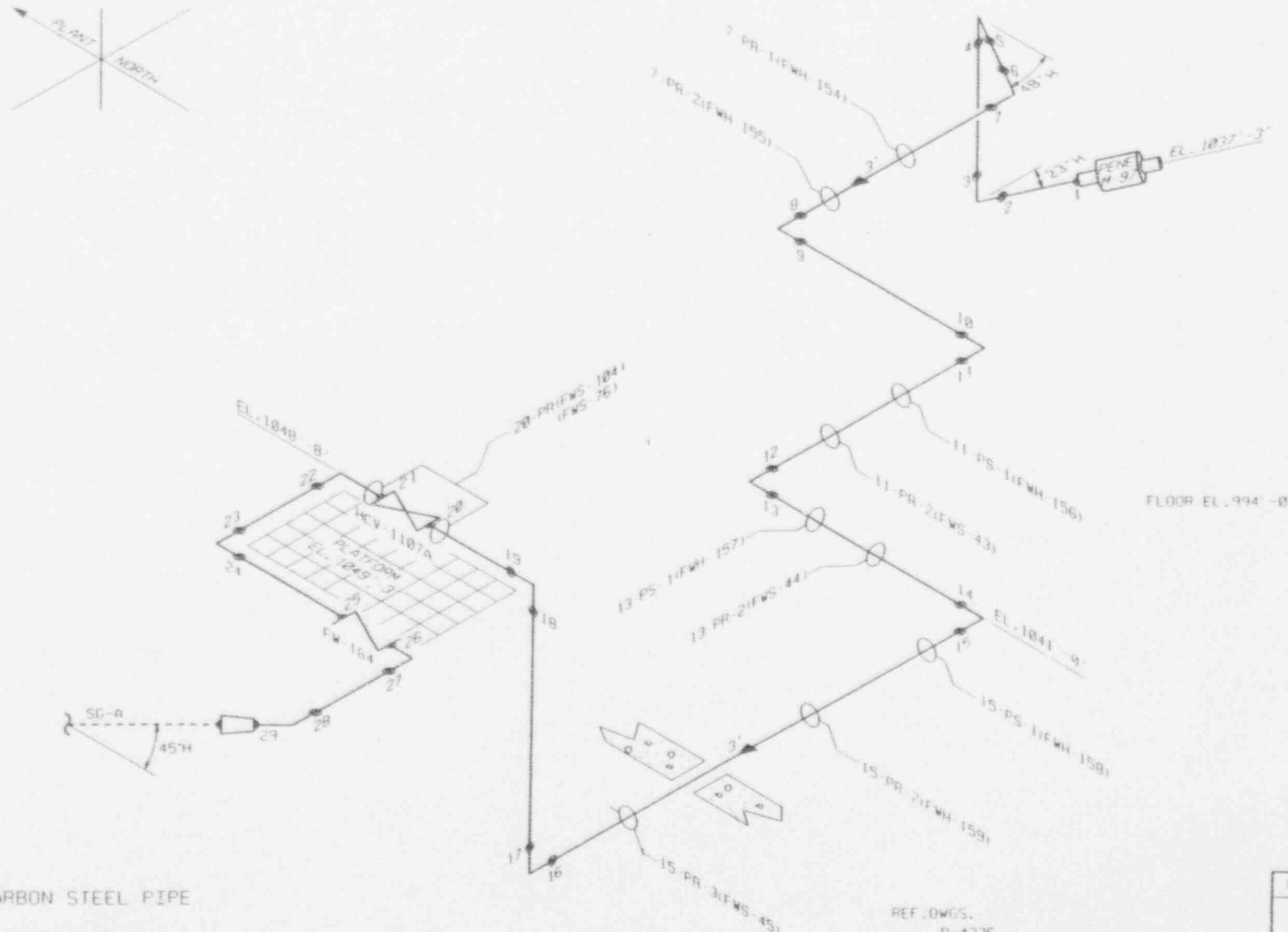
NOTE: ALL PIPE PAINTED BLUE

FOR INFORMATION ONLY

CONTAINMENT
EAST SIDE EL.1045'-0"
NORTH SIDE EL.1013'-0"

AUX.BLDG.
ROOM 69 EL.1025'-0"

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-57



CARBON STEEL PIPE

CONTAINMENT
LOOP A AREA

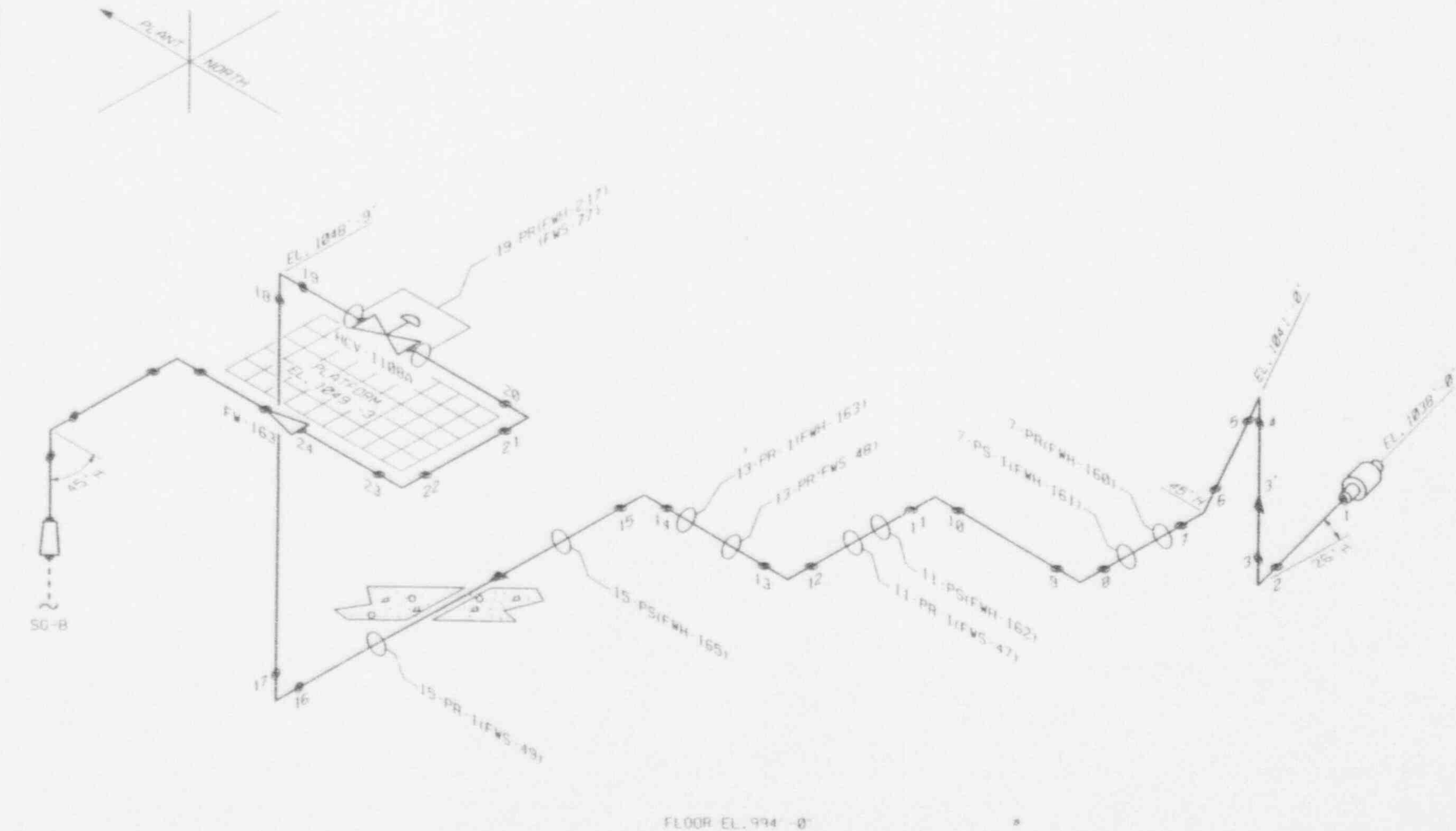
3-AFW-3001
EXEMPT

REF. DWGS.
D-4236

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-58

FOR INFORMATION ONLY



CARBON STEEL PIPE

CONTAINMENT
LOOP B AREA

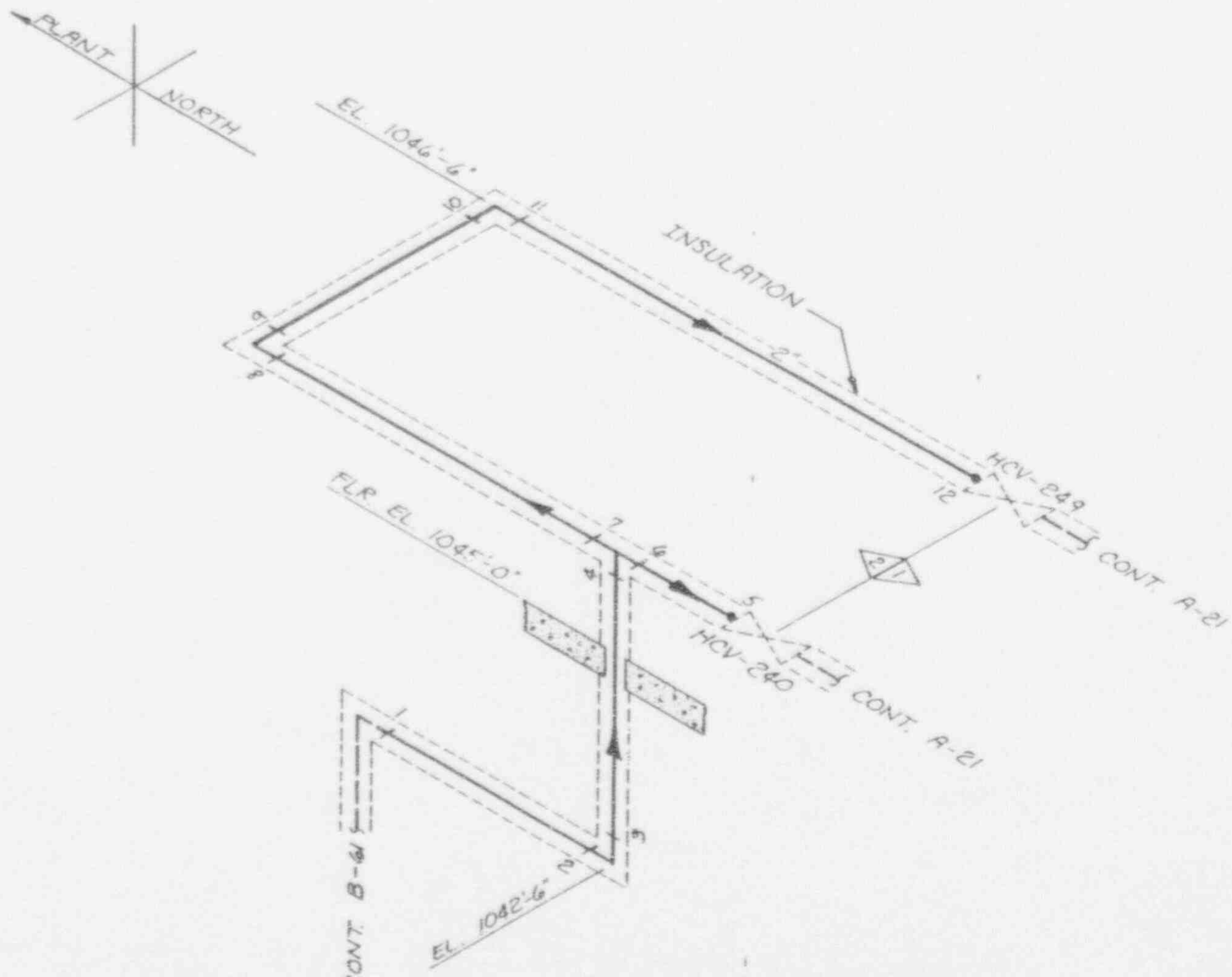
3-AFW-3002
EXEMPT

REF.DWGS.
D-4236

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-59

FOR INFORMATION ONLY



CONTAINMENT
ELEV. 1042'-6"

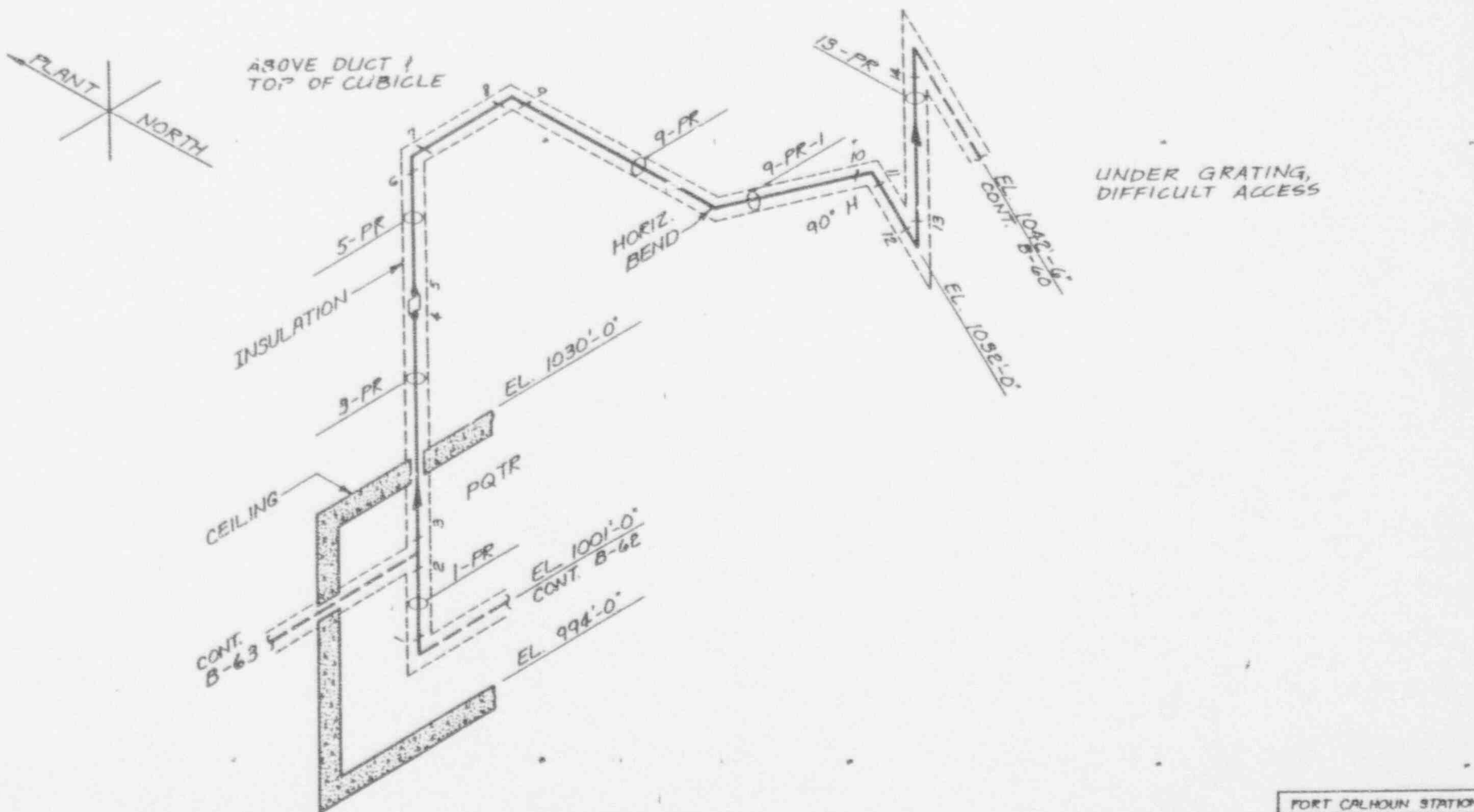
2-CH-10

REF. DWG.
CH-2014 SH. 1

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-60

DWG. FIGURE B-60 SH. 1
36476
44180



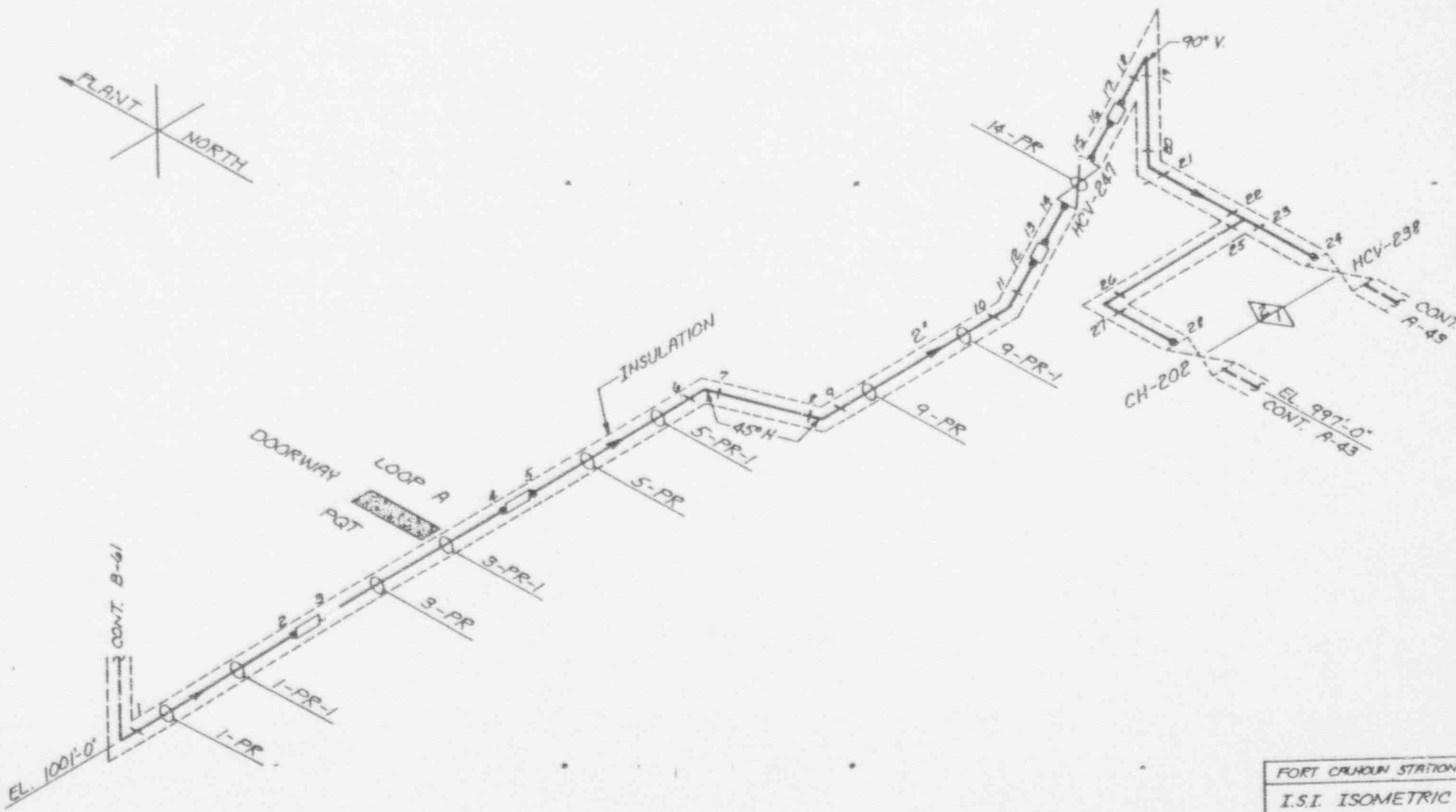
CONTAINMENT
ELEV. 994'-0"

2-CH-11

REF. DWG.
CH-2014 SH. 2

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC B-61
DWG FIGURE B-61 SH. 1
36477 · 0



CONTAINMENT
ELEV. 994'-0"

2-CH-12

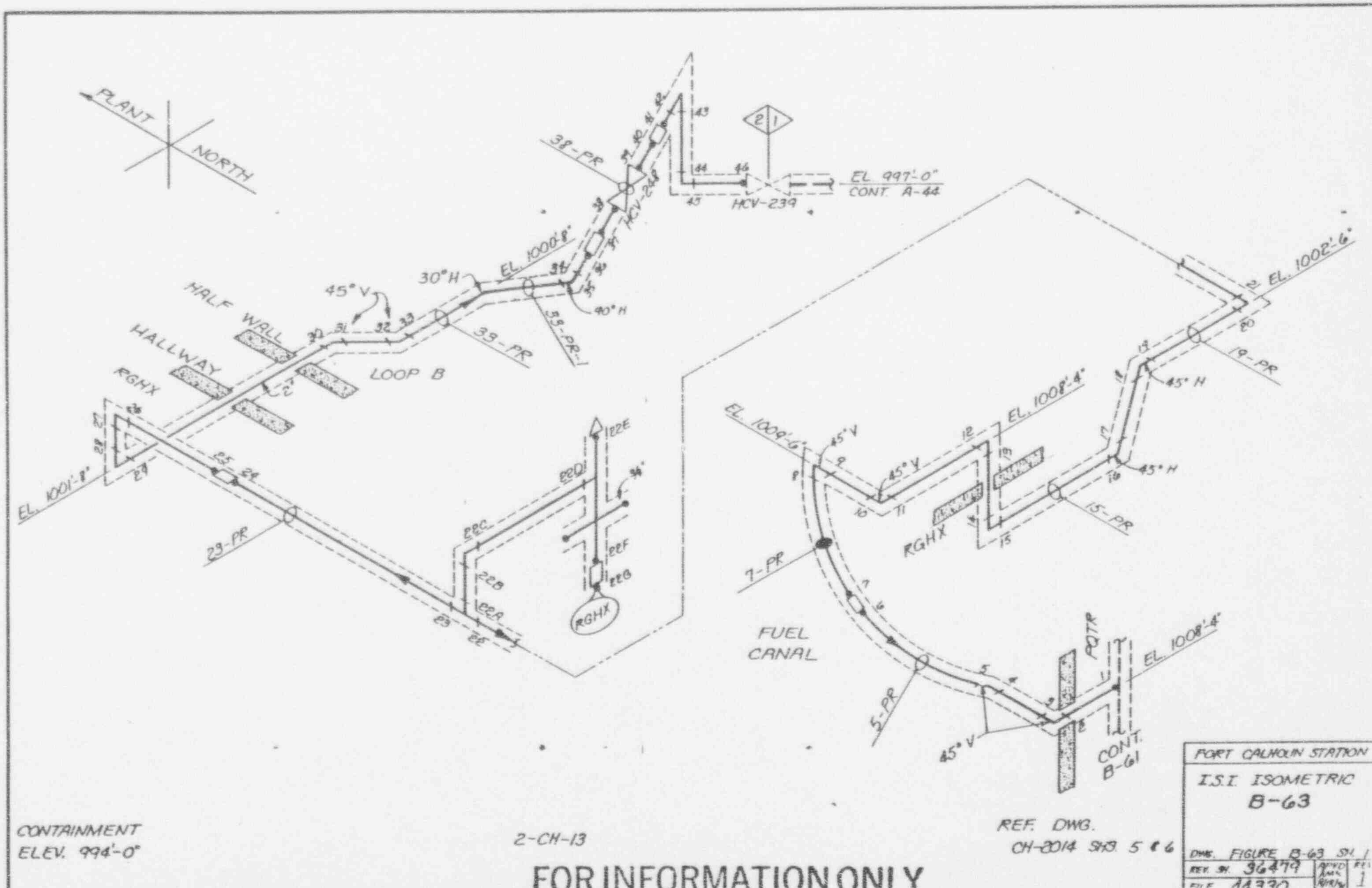
REF. DWG.
CH-2014 SH. 3

FORT CALHOUN STATION

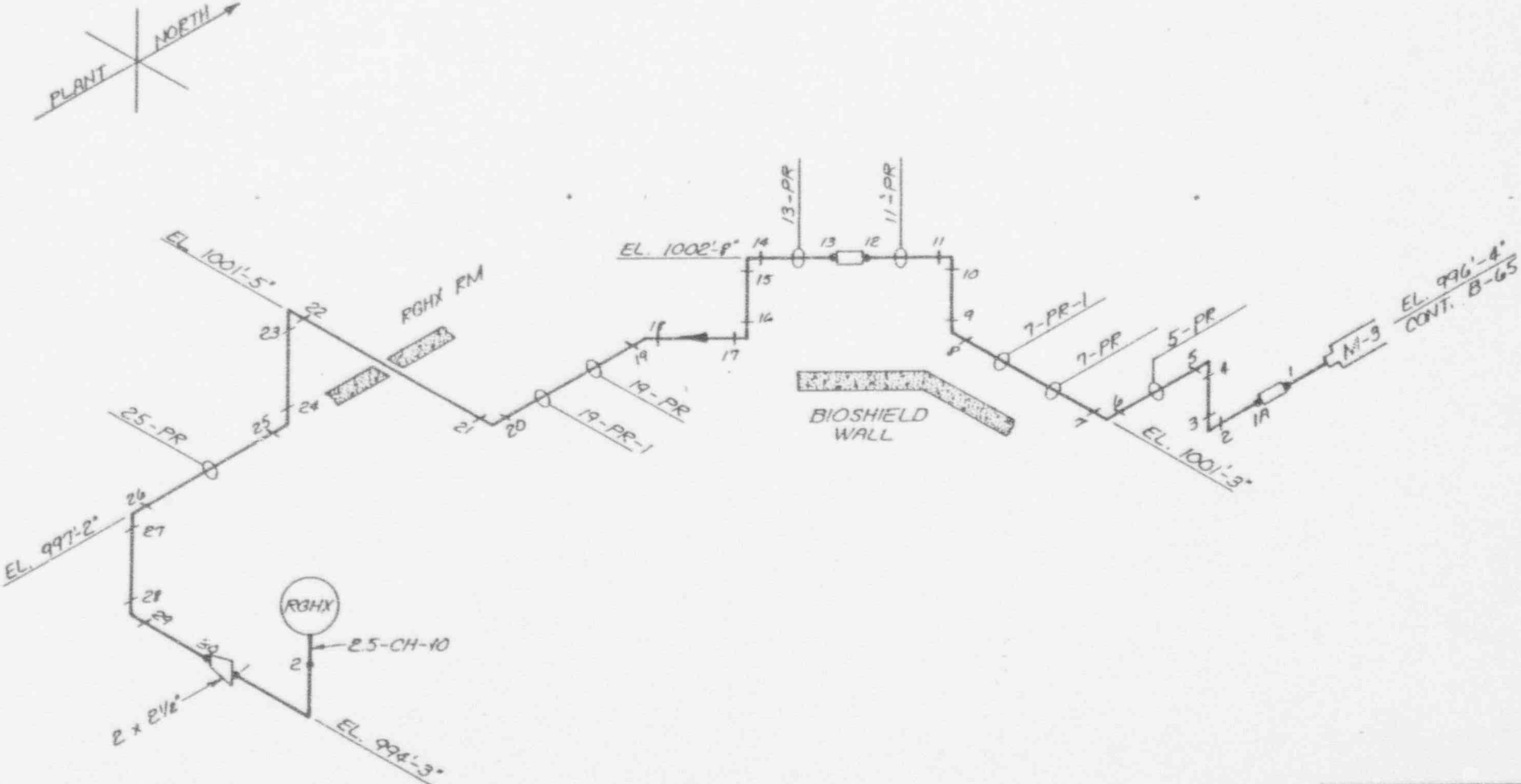
I.S.I. ISOMETRIC
B-62

DWG FIGURE B-62 SH. 1
REV SH 36478
FILE 44312

FOR INFORMATION ONLY



FOR INFORMATION ONLY



CONTAINMENT
ELEV. 994'-0"

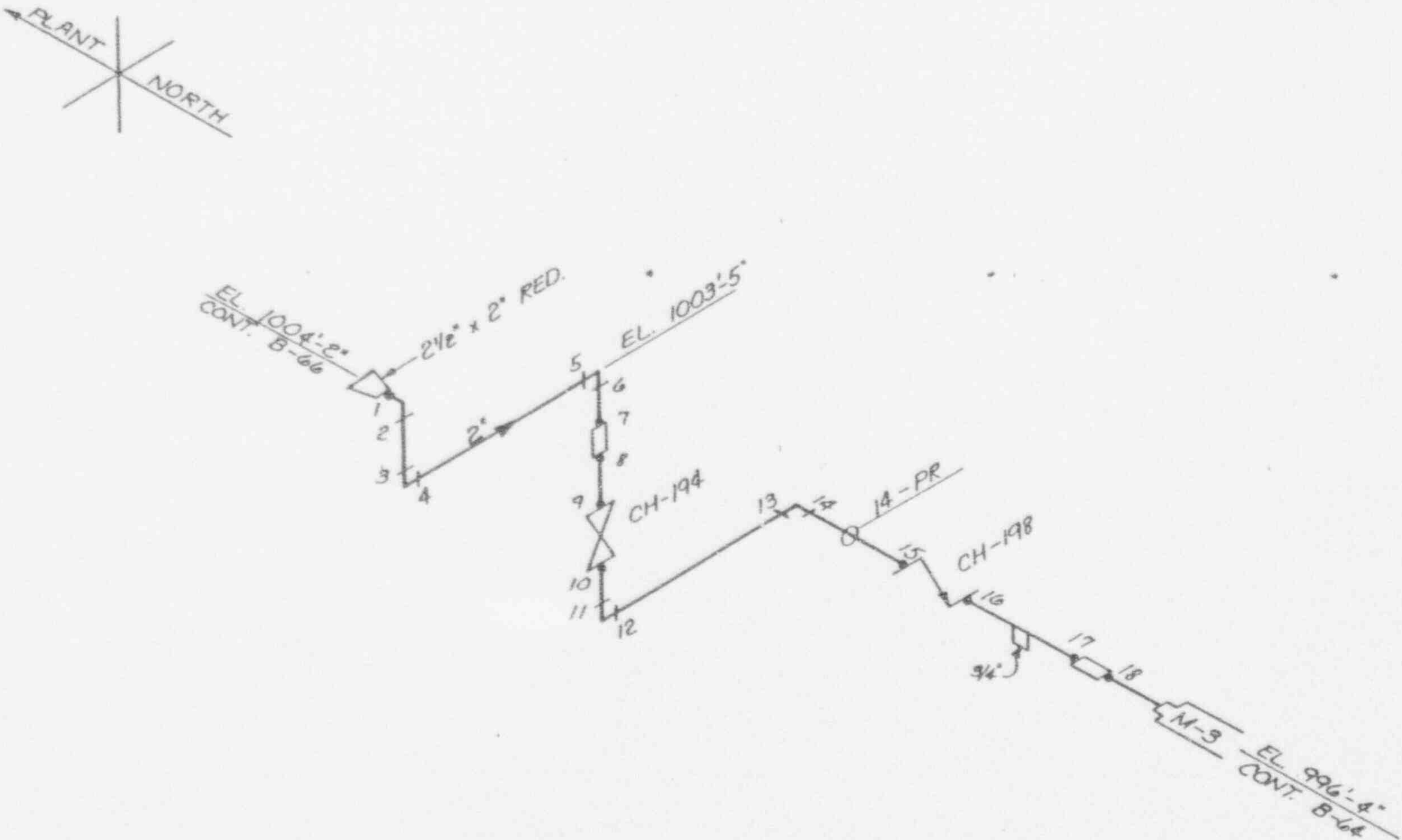
2-CH-14
2.5-CH-10

REF. DWG.
CH-2051 SH. 1

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-64

DWG. FIGURE B-64 SH. 1
REF. SK. 36480



AUXILIARY BUILDING
ROOM 13 EL. 989'-0"

2-CH-15

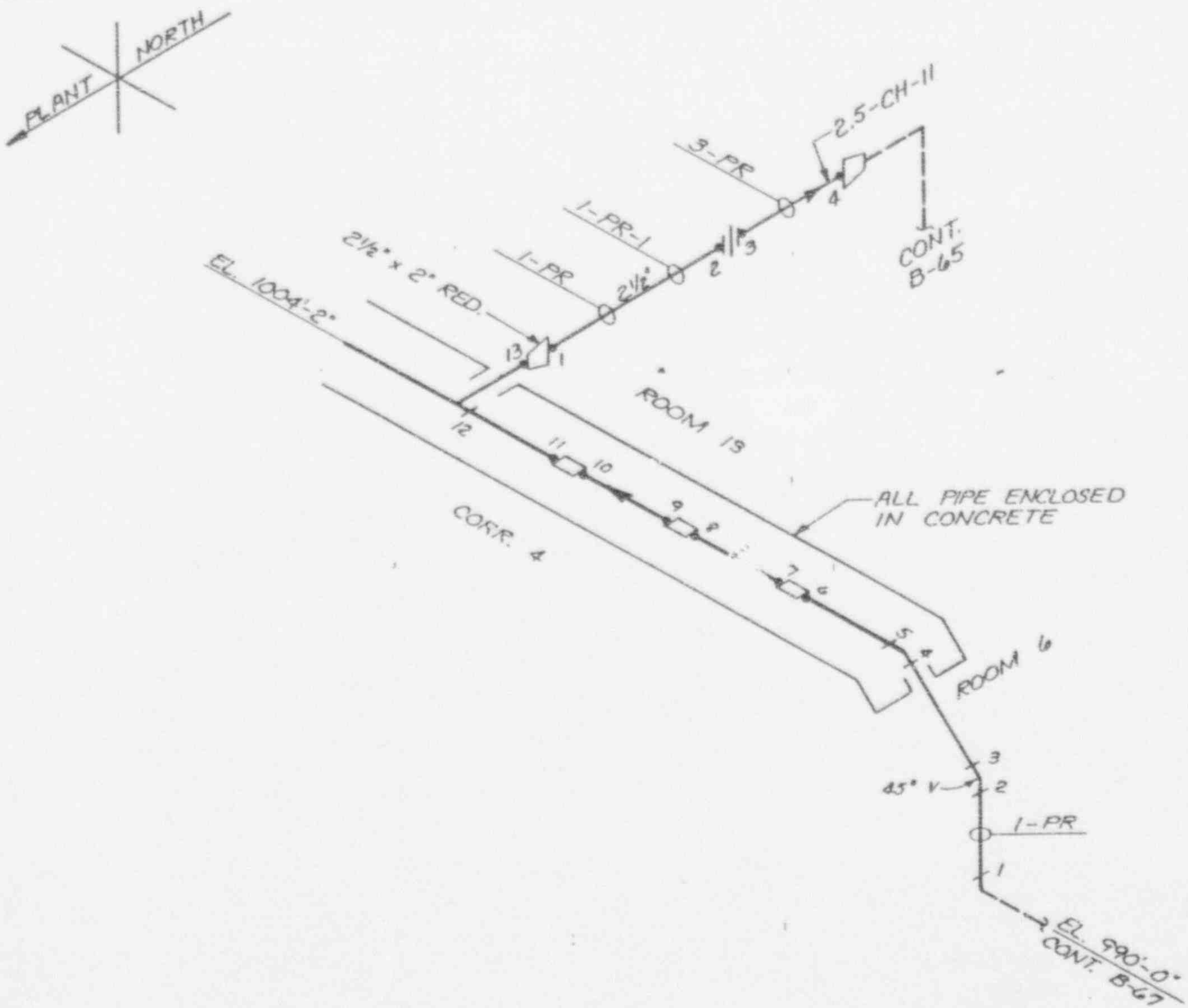
REF. DWG.
CH-4256 SH. 1

FORT CALHOUN STATION

I.S.I ISOMETRIC
B-65

DWG. FIGURE B-65 SH. 1
REV. SH. 36481
FILE 44361

FOR INFORMATION ONLY



AUXILIARY BUILDING
ROOM 13 EL. 989'-0"
ROOM 6 EL. 989'-0"

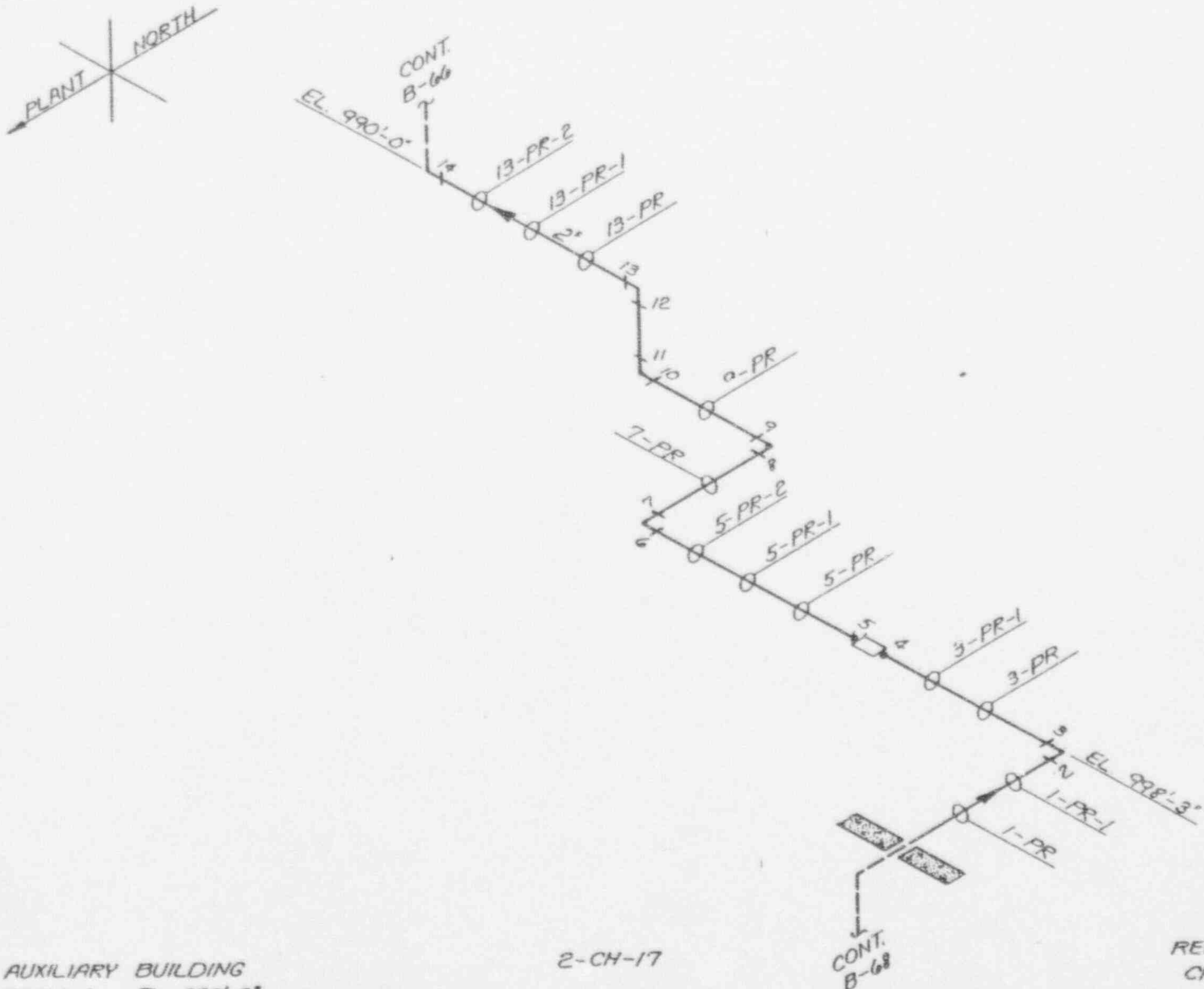
2-CH-16
2.5-CH-11

FOR INFORMATION ONLY

REF. DWGS.
CH-4139 SH. 3
IC-410

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-66

DWG FIGURE B-66 SH 1
REV. SH. 36482
FILE 44362
REV 0



AUXILIARY BUILDING
ROOM 6 EL. 989'-0"

2-CH-17

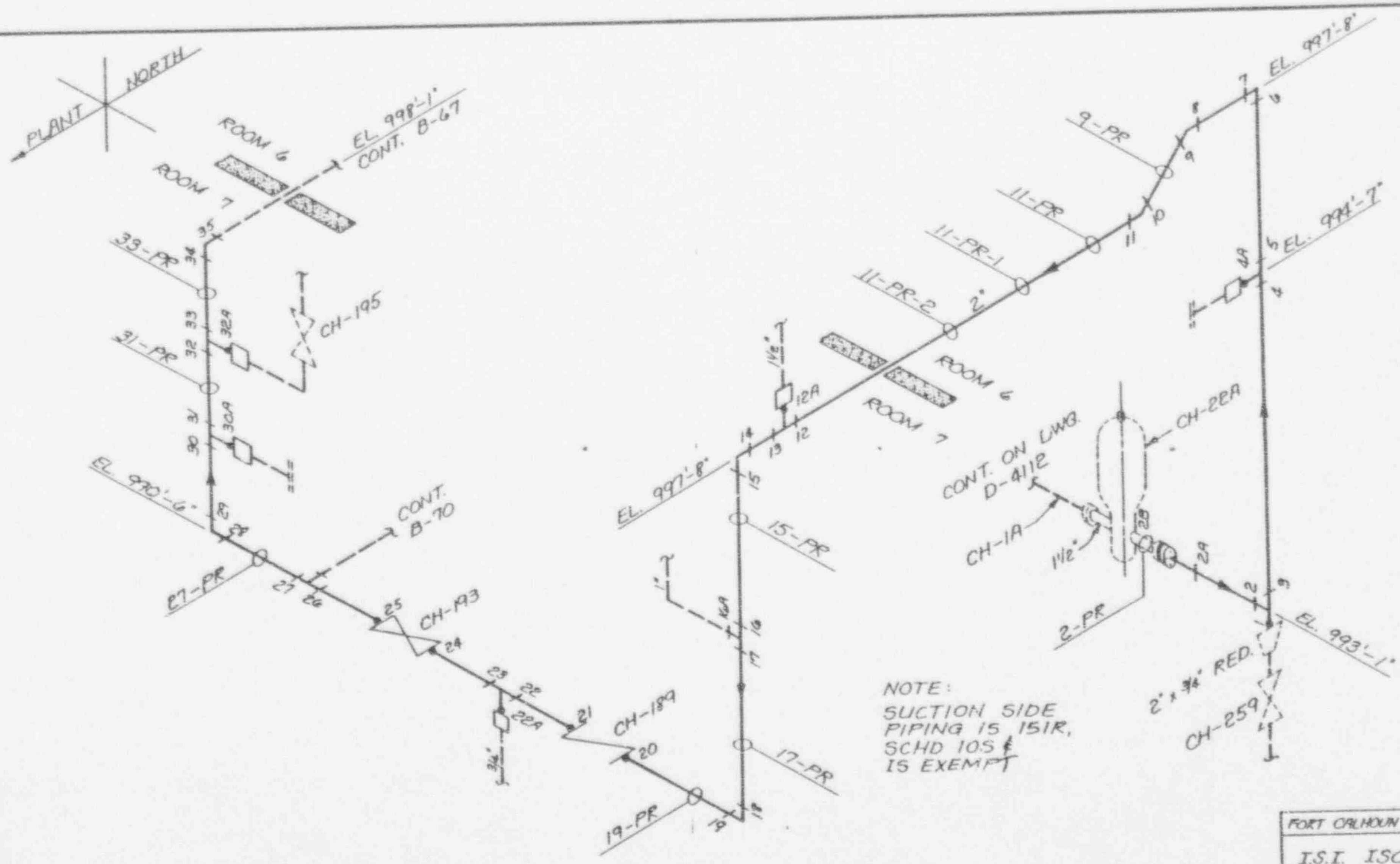
REF. DWG.
CH-4139 SH. 2

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-67

DWG. FIGURE B-67 SH. 1			
REV. SH.	36483	APVD	REV
FILE	44363		0

FOR INFORMATION ONLY



AUXILIARY BUILDING
ROOM 6 EL. 989'-0"

2-CH-18

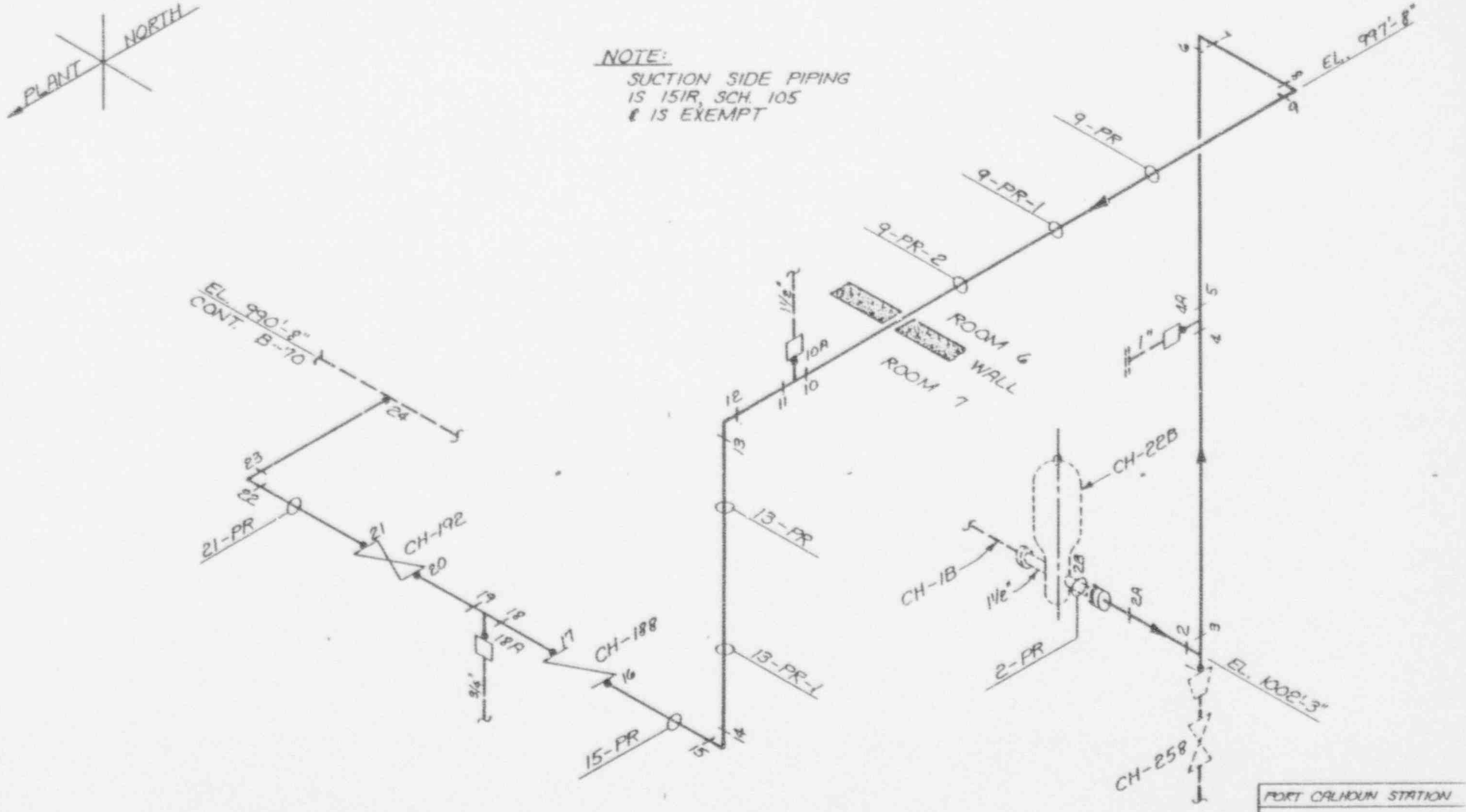
REF. DWG.
CH-4139 SH. 1

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-68

DWG FIGURE B-68 SH 1
REV. SH. 36484
FILE 44341 REV 0

FOR INFORMATION ONLY



AUXILIARY BUILDING
ROOM 6 & 7 EL. 989'-0"

2-CH-19

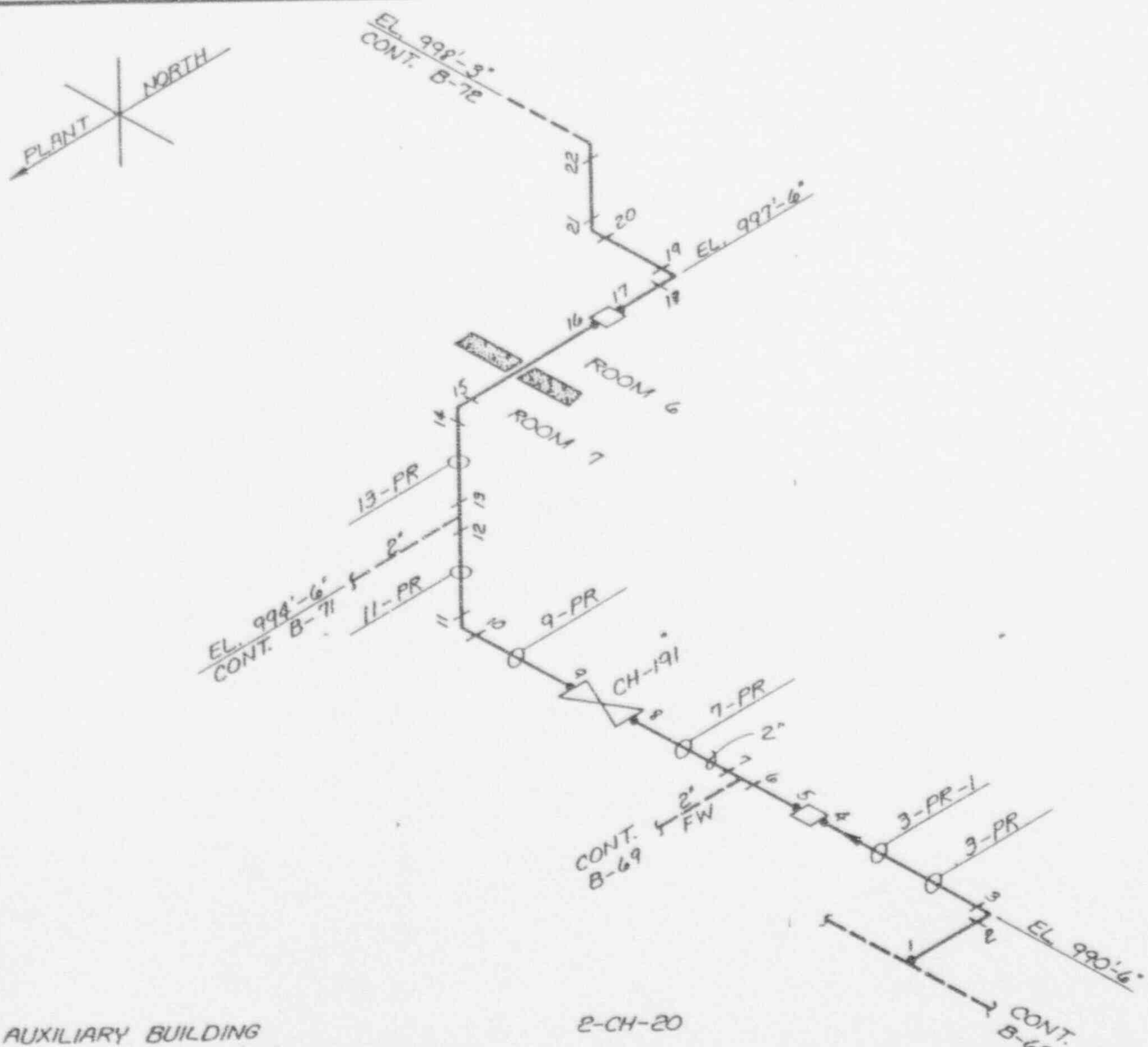
REF. DWG
CH-4140 SH. 1

PORT CALHOUN STATION

I.S.I. ISOMETRIC
B-69

DWG FIGURE B-69 SH. 1
REV. SN. 36485

FOR INFORMATION ONLY



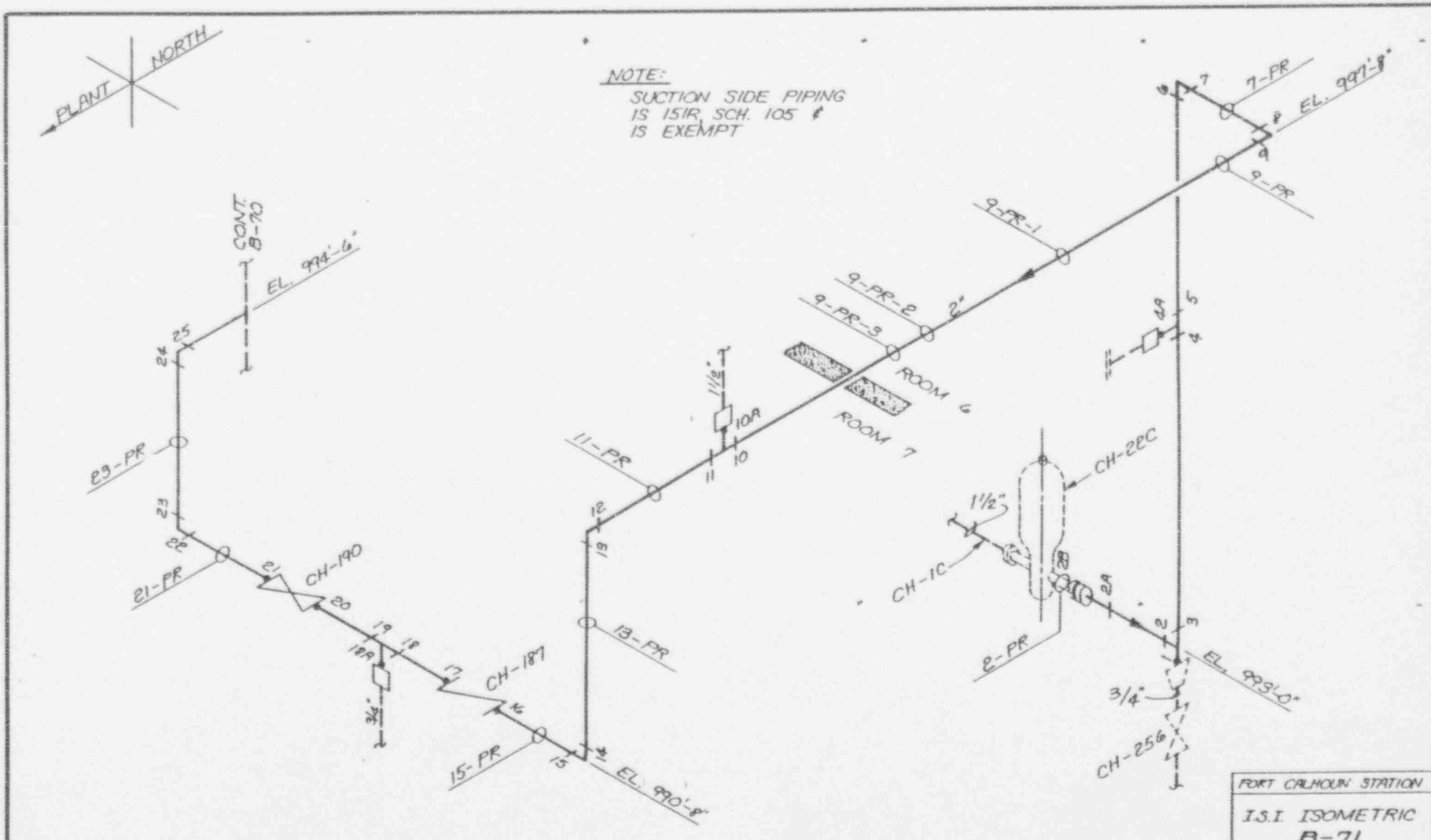
AUXILIARY BUILDING
ROOM 7 EL. 989'-0"

2-CH-20

REF. DWG.
CH-4141 SH. 1

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC B-70
DWG. FIGURE B-70 SH. 1
REV. SN. 36486
FILE 48966



AUXILIARY BUILDING
ROOM 6 EL. 989'-0"
ROOM 7 EL. 989'-0"

2-CH-21

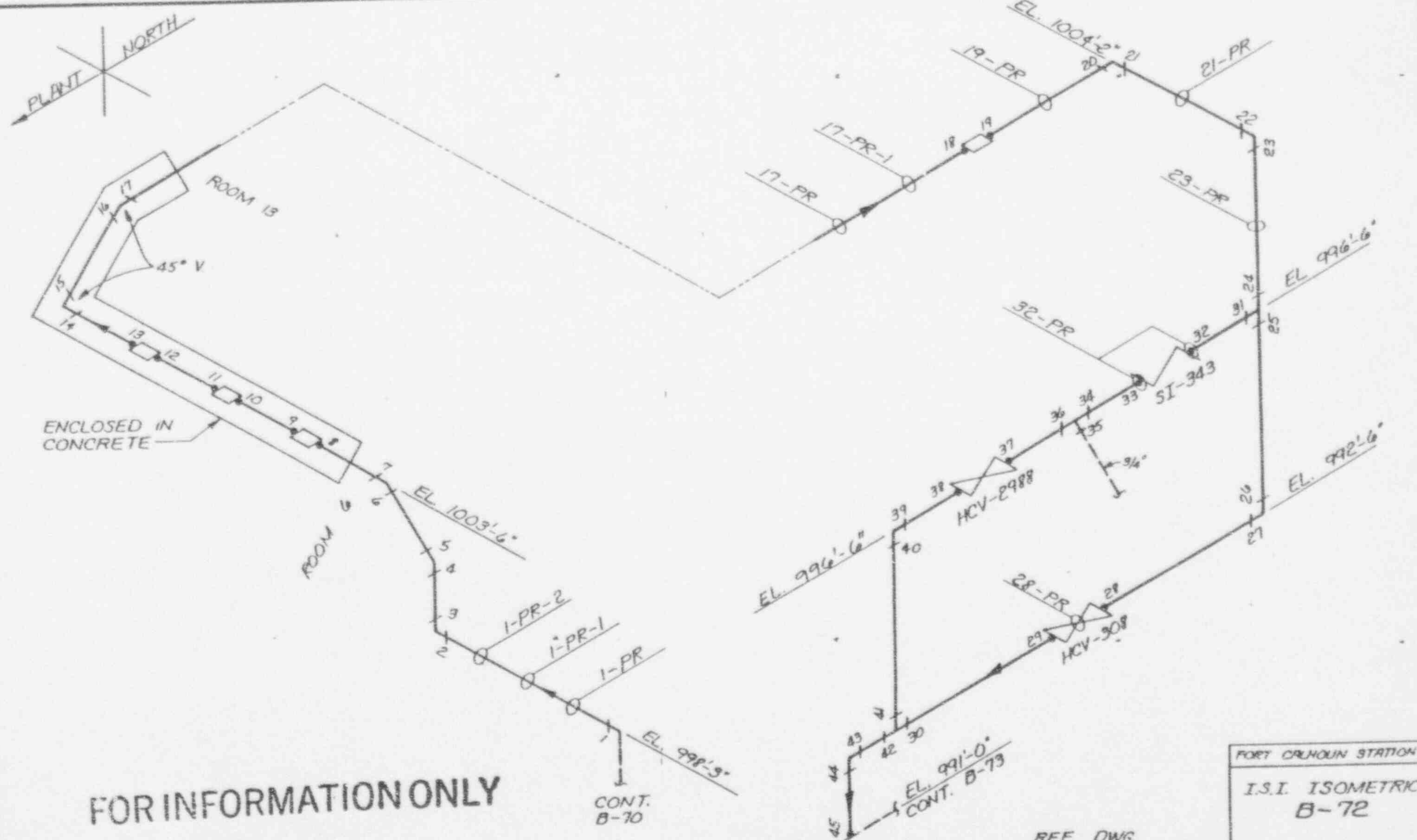
REF. DWG.
CH-4143 SH. 1

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-71

DWG. FIGURE B-71 SH. 1
REV. SH. 36487

FOR INFORMATION ONLY



FOR INFORMATION ONLY

AUXILIARY BUILDING
ROOM 6 EL. 989'-0"
ROOM 13 EL. 989'-0"

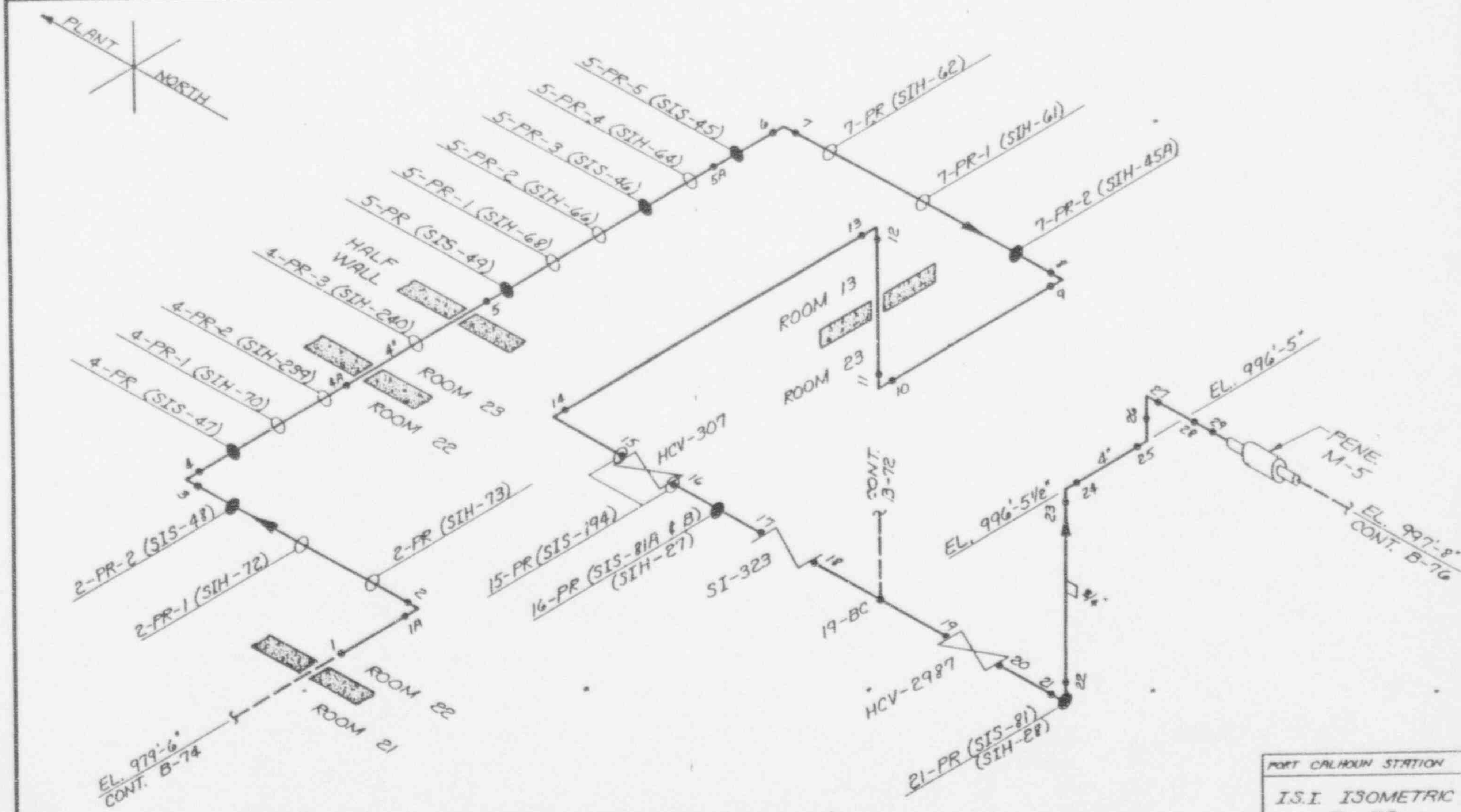
2-CH-22

REF. DWG.
CH-4141 SH. 3

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-72

DWG. FIGURE B-72 SH. 1
REV. SH. 36488
FILE 44368
REV. 1



FOR INFORMATION ONLY

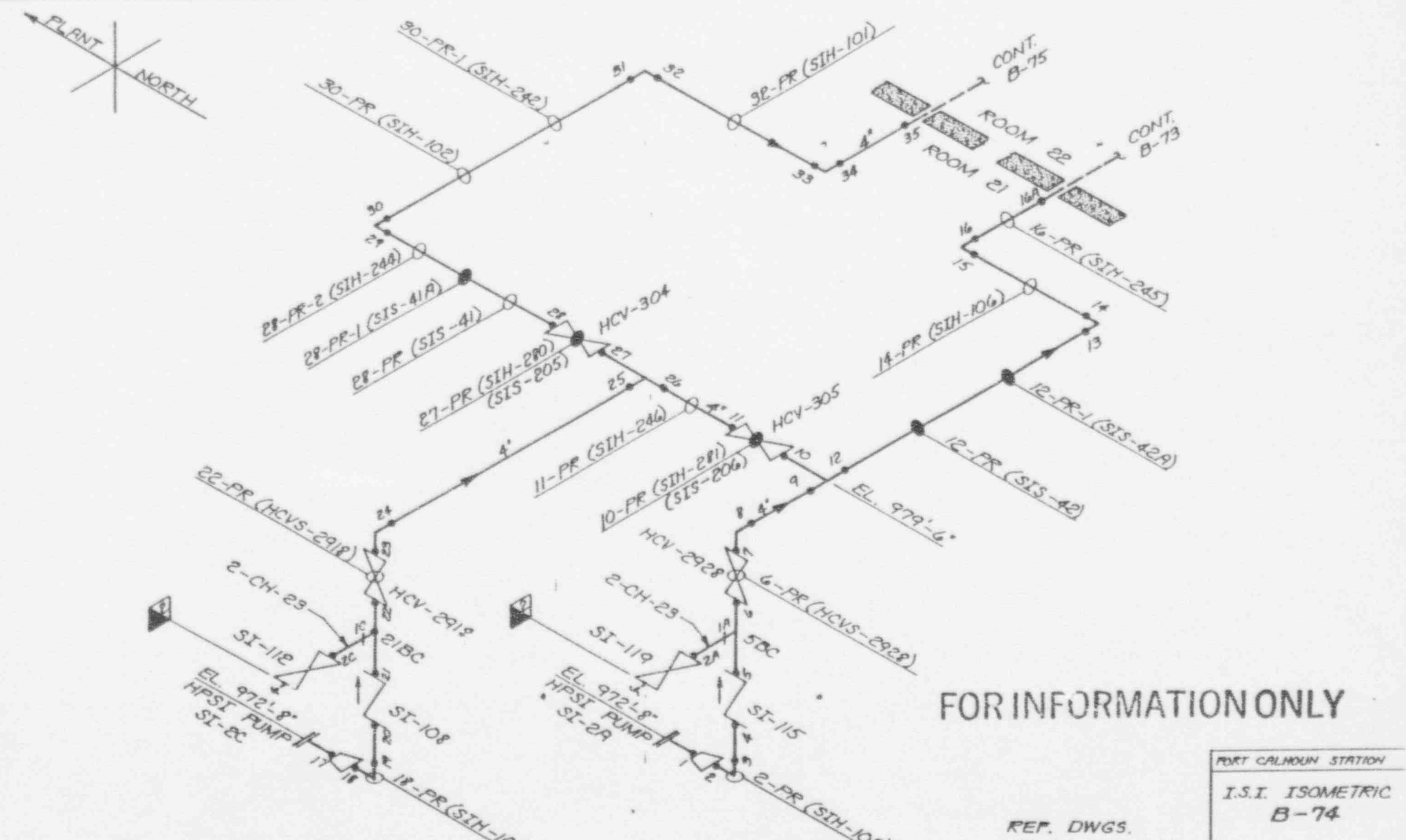
AUXILIARY BUILDING
ROOM 13 EL. 989'-0"
ROOM 21, 22 & 23 EL. 971'-0"

4-CH-10

REF. DWG.
D-4277 SH. 1

PORT CALHOUN STATION
I.S.I. ISOMETRIC
B-73

DWG. FIGURE B-73 SH. 1
REV. SH. 36489 REV. 1



AUXILIARY BUILDING
ROOM 21 EL. 971'-0"

4-CH-11
2-CH-23

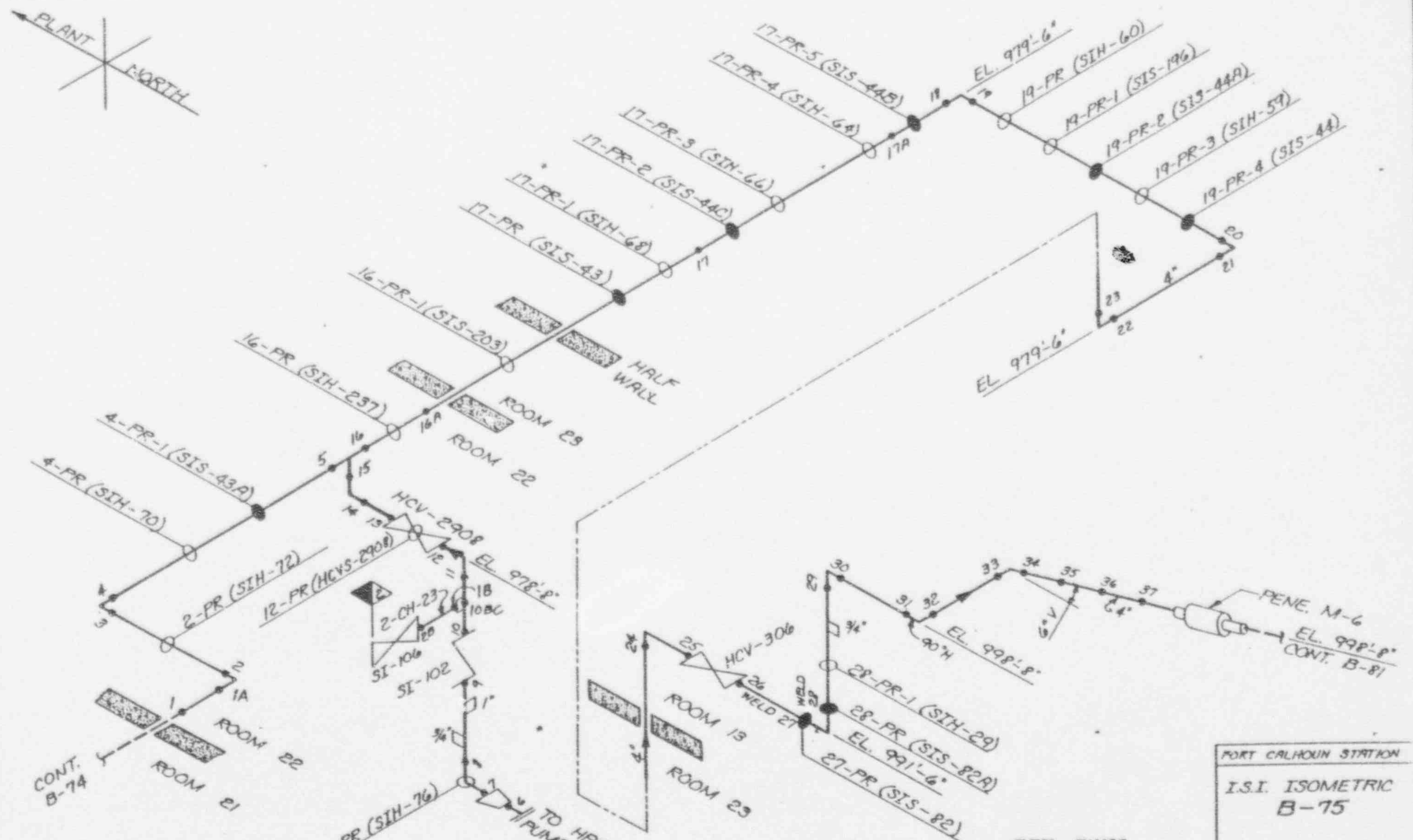
REF. DWGS.
D-4275
SI-4311 SH. 1
SI-4313 SH. 7

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC
B-74

DWG. FIGURE B-74 SH. 1
REV. SH. 32490



AUXILIARY BUILDING
ROOM 13 EL. 989'-0"
ROOM 21, 22 & 23 EL. 971'-0"

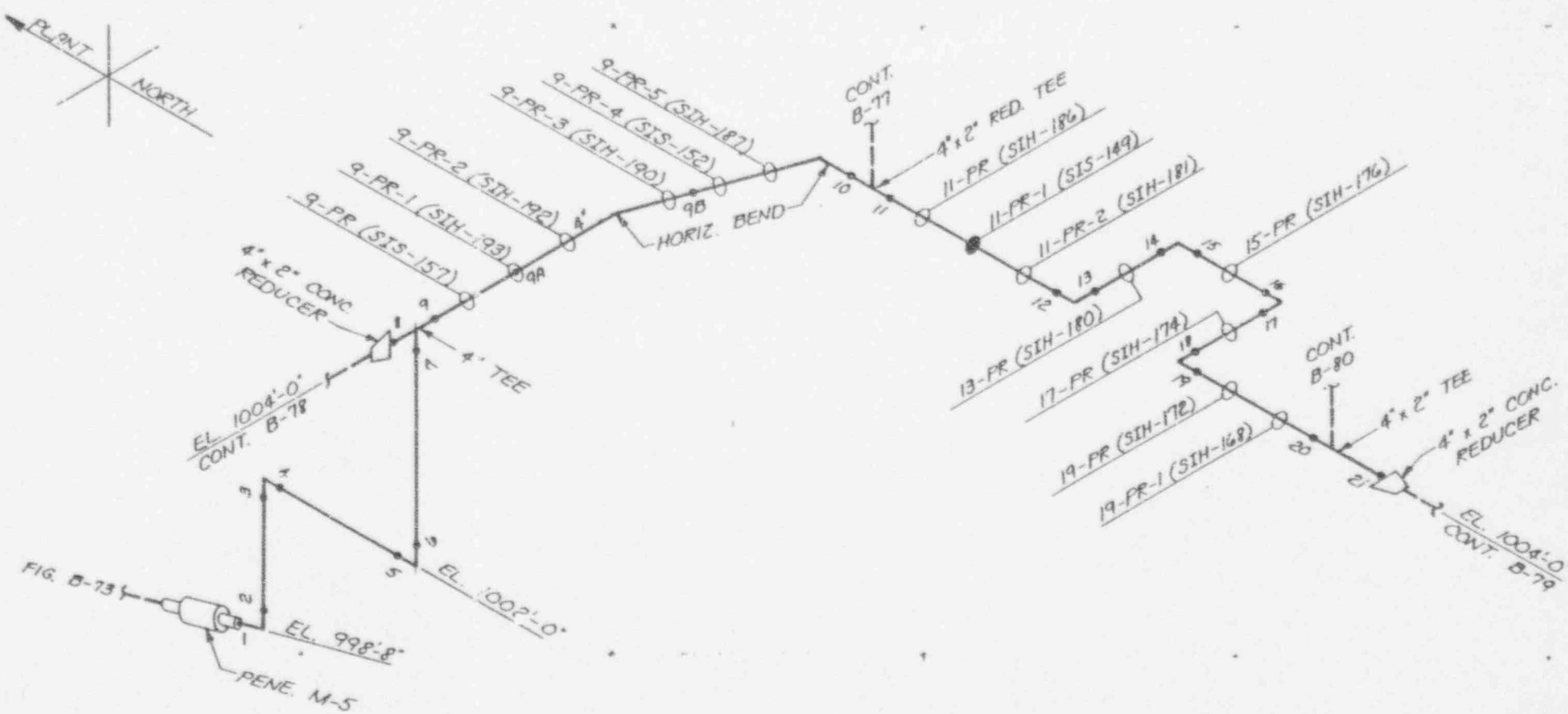
4-CH-12
2-CH-23

FOR INFORMATION ONLY

REF. DWGS.
D-4276 SH. 1
SI-4327 SH. 1

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-75

DWG.	FIGURE B-75 SH. 1	
REV. SH.	36491	1
FILE	44384	



PORT CALHOUN STATION

I.S.I. ISOMETRIC
B-76

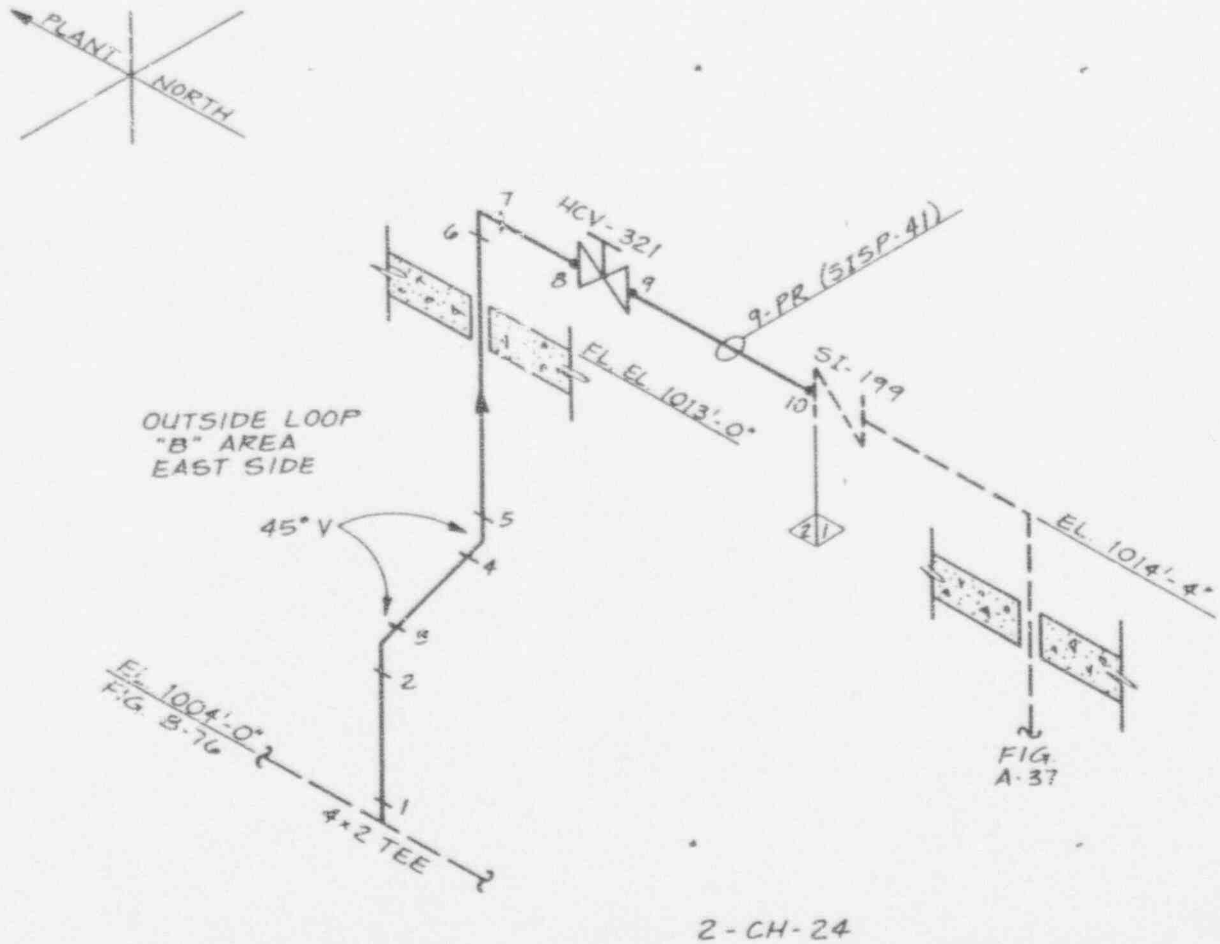
DWG. FIGURE B-76 SH. 1
REV. SH. 36492

CONTAINMENT
EL. 994'-0"

4-CH-13

REF. DWG.
D-4257 SH. 1

FOR INFORMATION ONLY

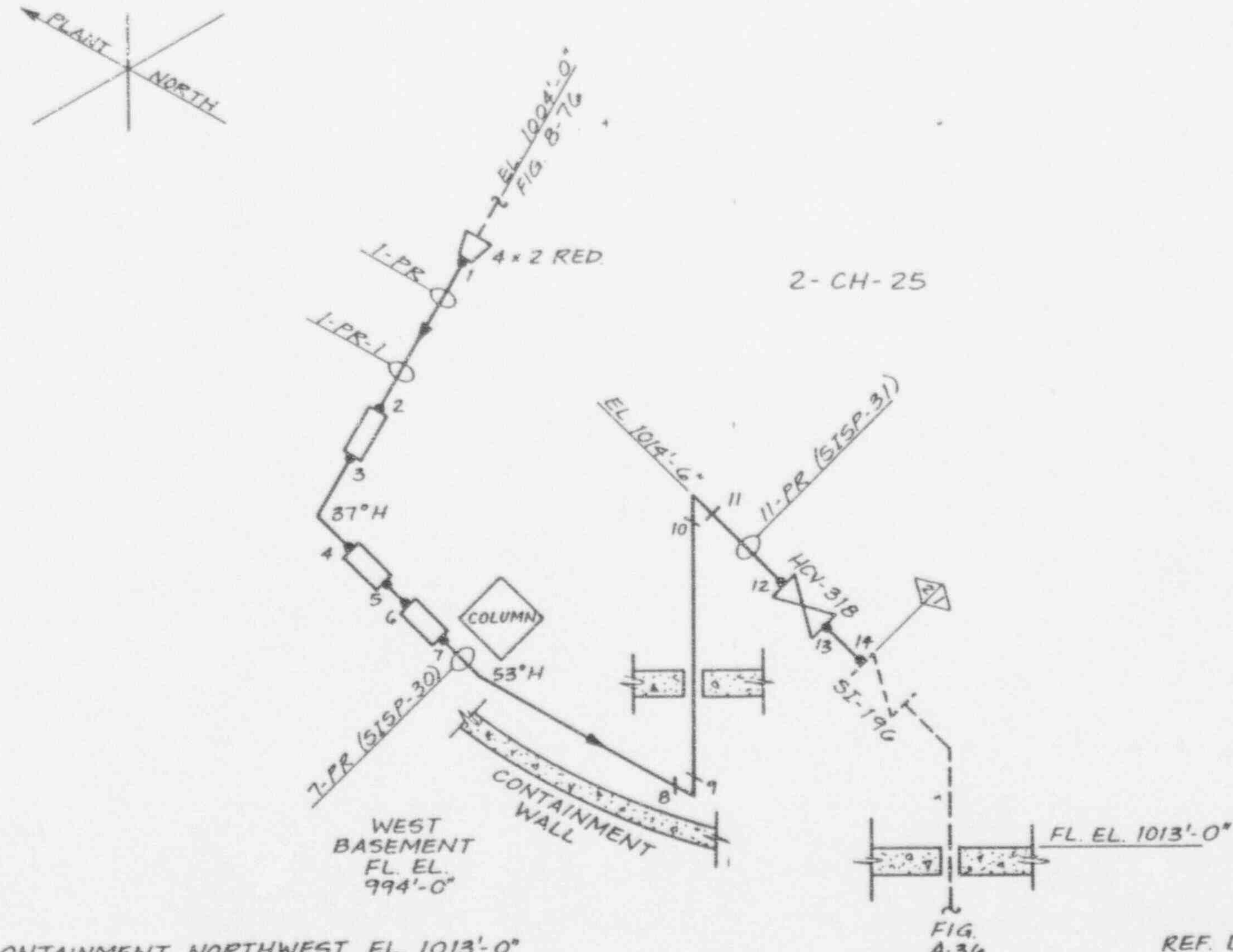


REF. DWG.
6I-2040, SH. 1

CONTAINMENT
ELEV. 994'-0"

FOR INFORMATION ONLY

FORT CALHOUN STATION		
I.S.I. ISOMETRIC B-77		
DWG. FIGURE B-77, SH. 1		
REV. SH. 36499		REV.
FILE 44682		0

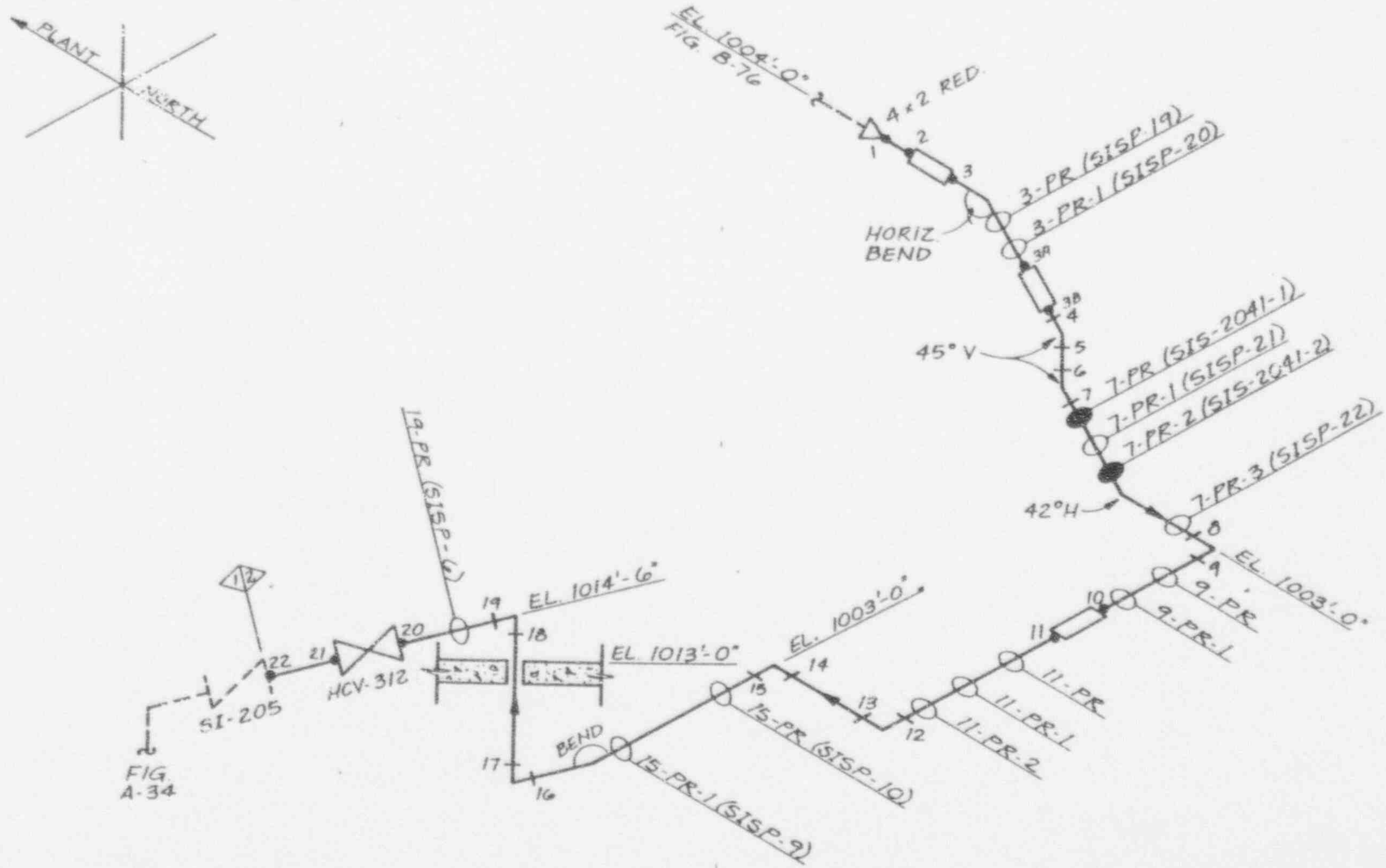


CONTAINMENT NORTHWEST EL. 1013'-0"
BASEMENT EL. 994'-0"

REF. DWG.
SI-2044, SH. 1

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-78
DWG. FIGURE B-78, SH. 1

FOR INFORMATION ONLY



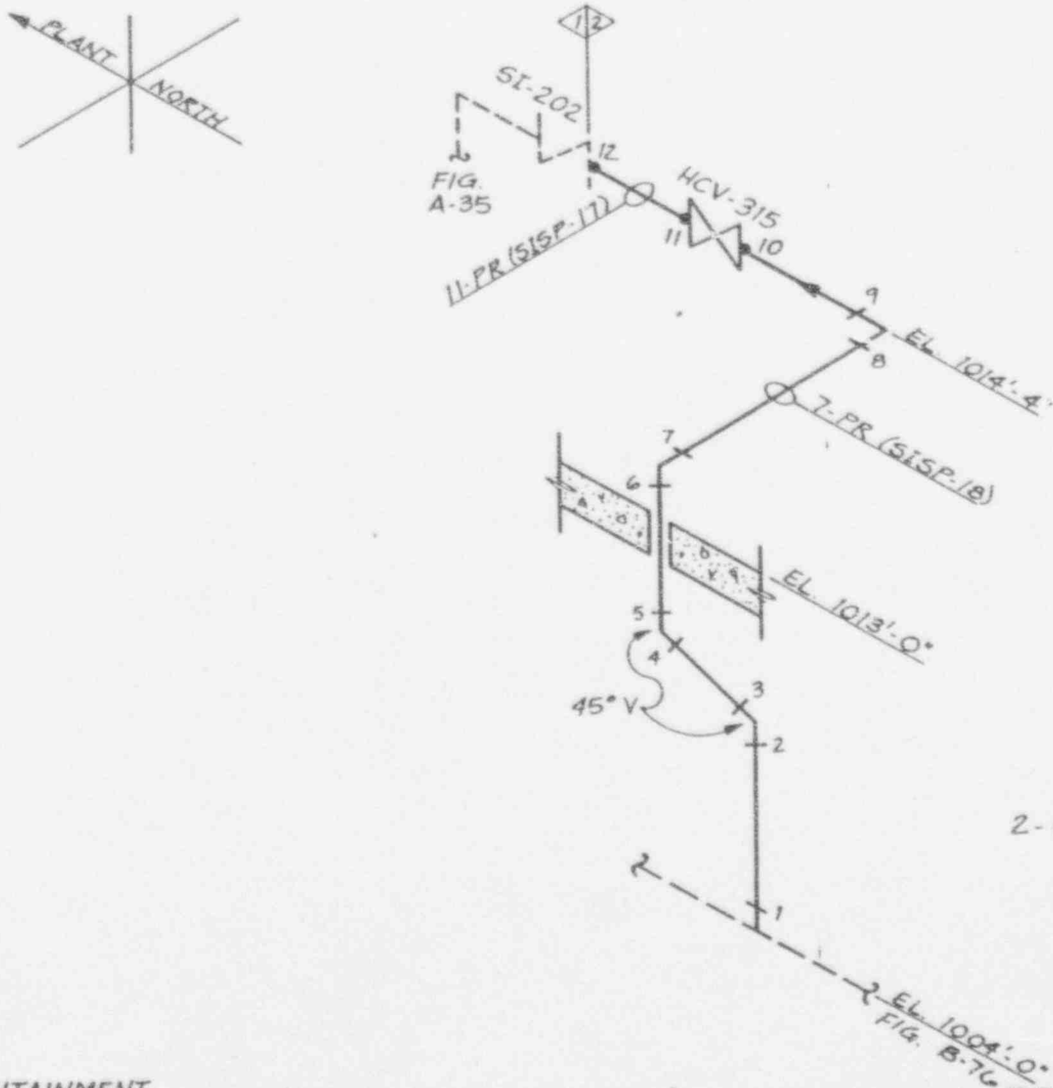
CONTAINMENT
ELEV. 994'-0"
ELEV. 1013'-0"

2-CH-26

REF. DWG.
SI-2041, SH. 1

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-79
DWG. FIGURE B-79, SH. 1
REV. SH. 36495

FOR INFORMATION ONLY

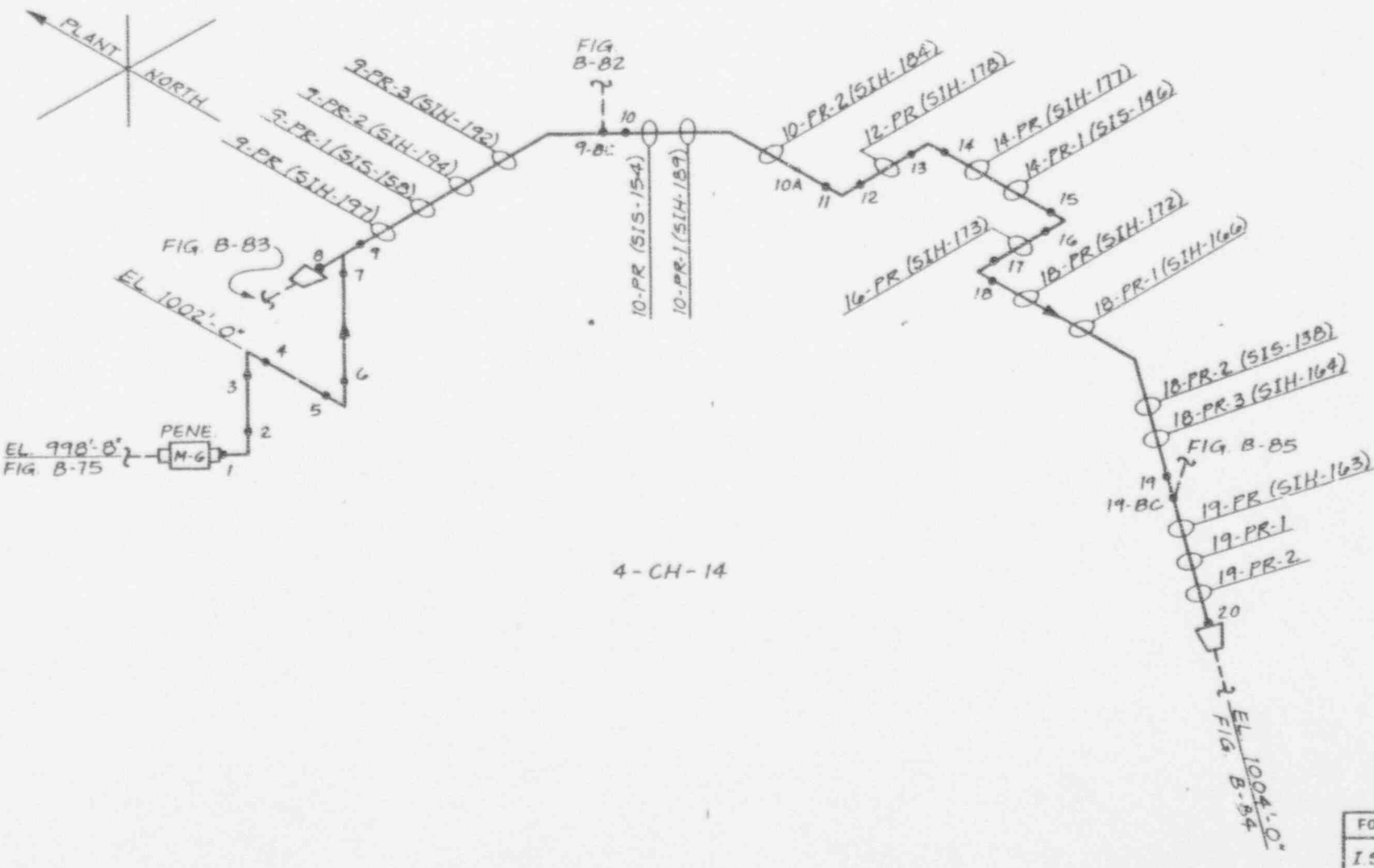


REF. DWG.
SI-2042, SH. 1

CONTAINMENT
ELEV. 994'-0"

FOR INFORMATION ONLY

FORT CALHOUN STATION		
I.S.I. ISOMETRIC B-80		
DWG. FIGURE B-80, SH. 1		
REV. BH. 36496	APVD	REV
FILE 44686		0

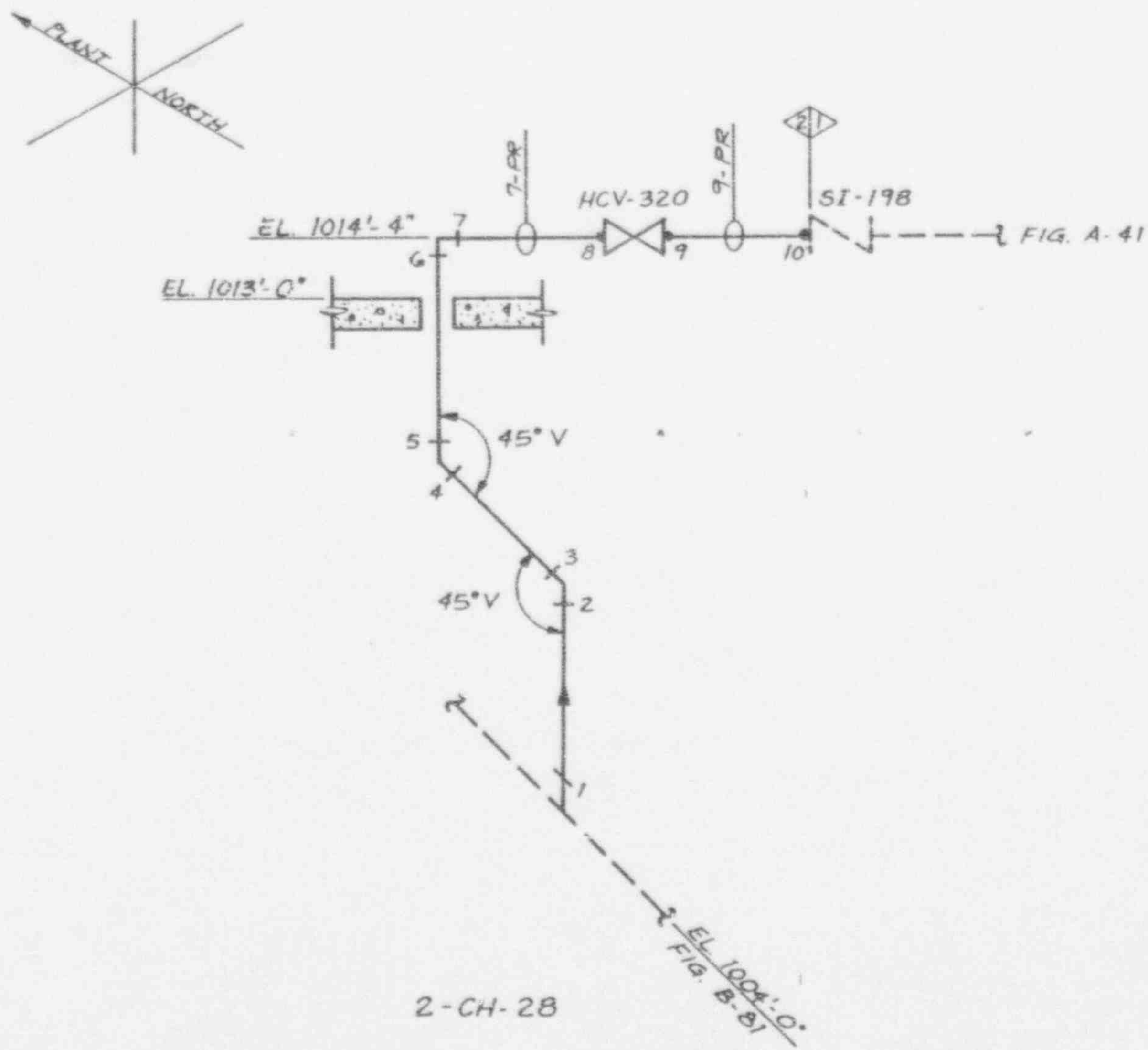


REF. DWG.
D-4261, SH. 1

CONTAINMENT
ELEV. 994'-0"

FOR INFORMATION ONLY

FORT CALHOUN STATION		
I.S.I. ISOMETRIC B-81		
DWG. FIGURE B-81, SH. 1		
REV. SH. 36497		REV 0
FILE 44627		

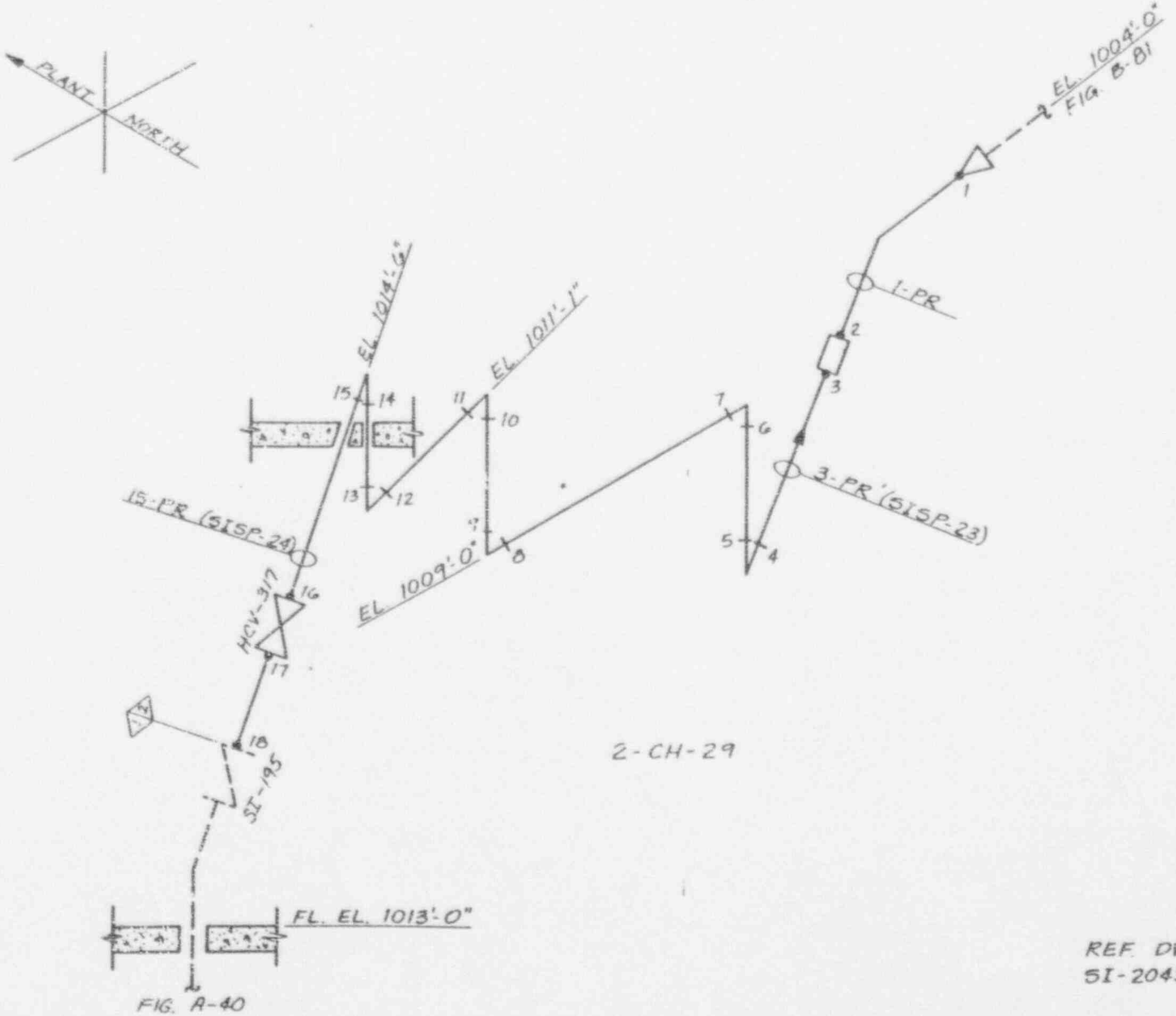


2-CH-28

CONTAINMENT
ELEV. 994'-0"
ELEV. 1013'-0"

REF. DWG.
SI-2039, SH. 1

FORT CALHOUN STATION
I.S.I. ISOMETRIC B-82
DWG. FIGURE B-82, SH. 1



CONTAINMENT WEST SIDE
ELEV. 994'-0"

REF. DWG.
SI-2043, SH. 1

FORT CALHOUN STATION

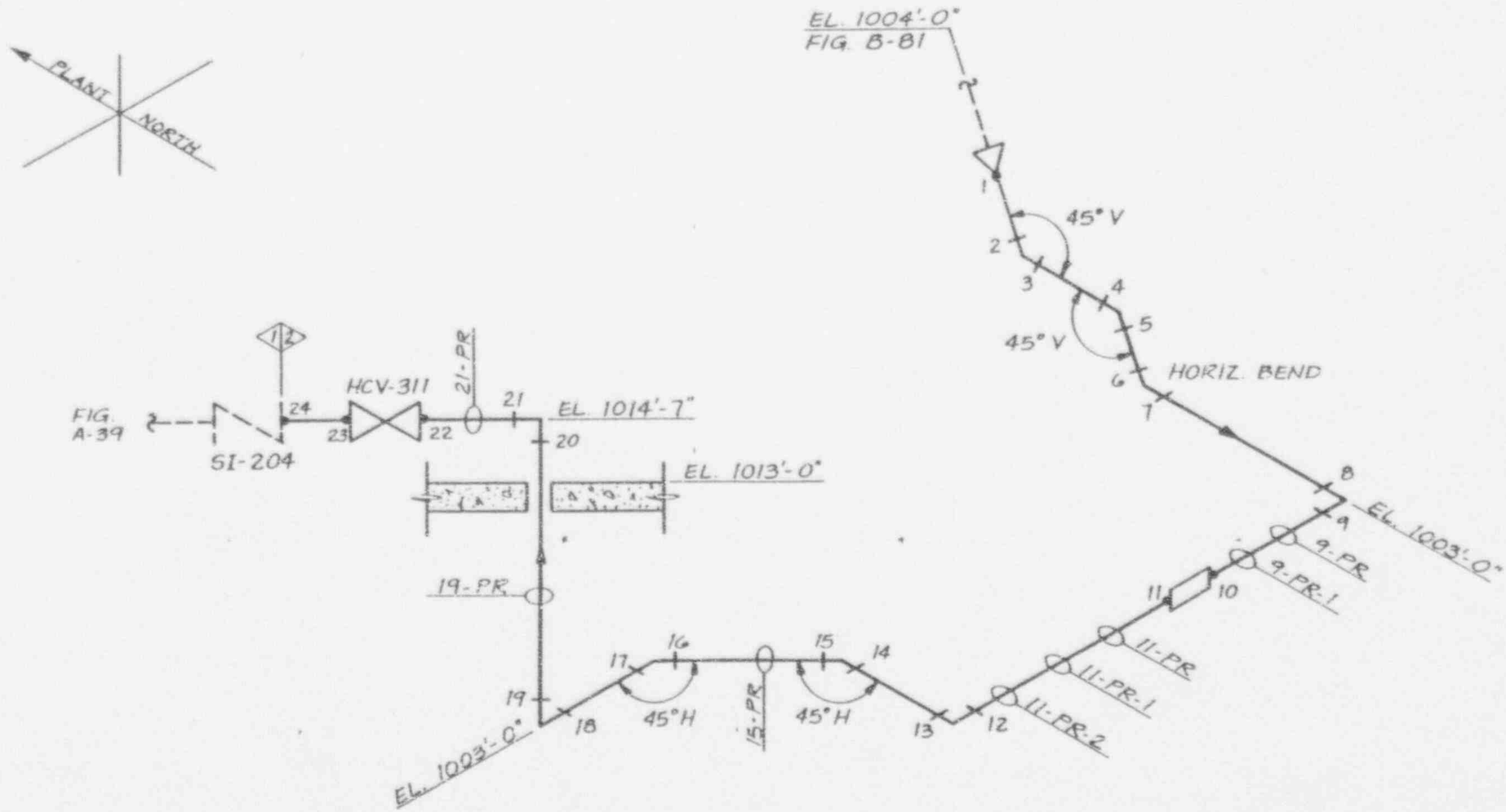
I.S.I. ISOMETRIC

B-83

DWG. FIGURE B-83, SH. 1

REV. SH. 36499

FOR INFORMATION ONLY



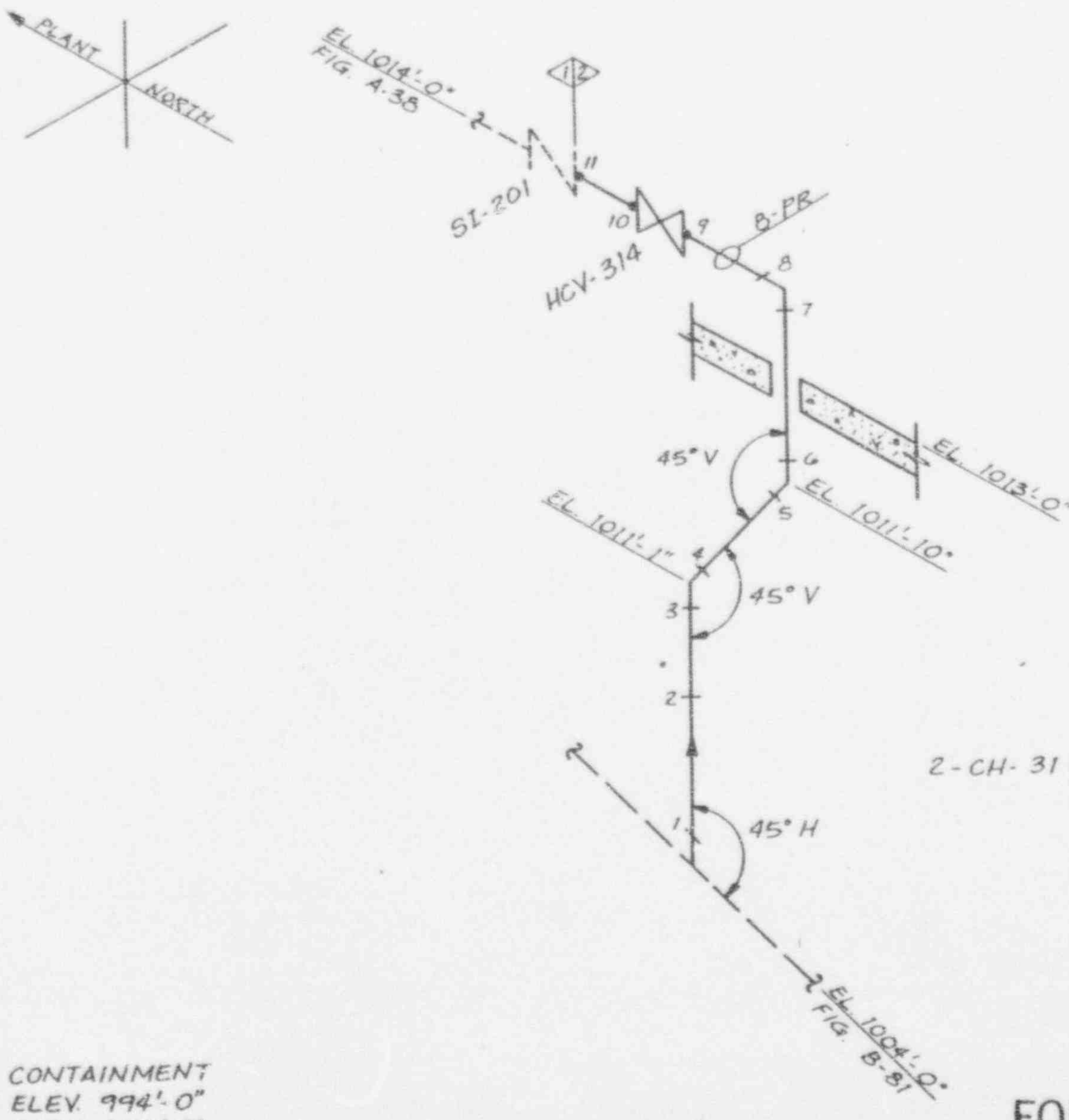
2-CH-30

CONTAINMENT
ELEV. 994'-0"

REF. DWG.
SI-2037, SH. 1 & 2

FORT CALHOUN STATION
I.S.I. ISOMETRIC
B-84
DWG. FIGURE B-84, SH.
REV. SH. 36500
0

FOR INFORMATION ONLY



CONTAINMENT
ELEV. 994'-0"
ELEV. 1013'-0"

REF. DWG.
SI-2038, SH. 1

FOR INFORMATION ONLY

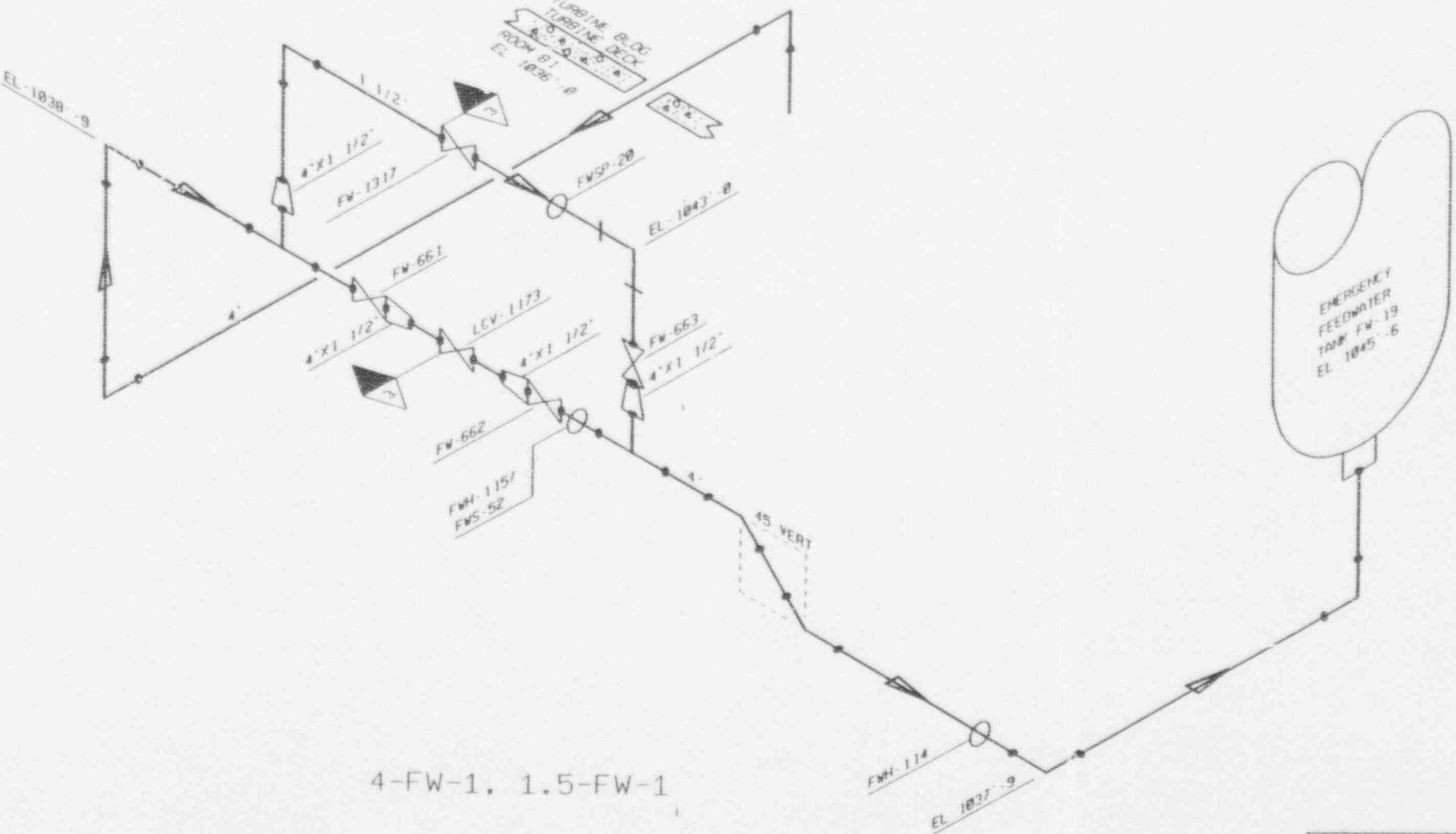
FORT CALHOUN STATION

I.S.I. ISOMETRIC

B-85

DWG. FIGURE B-85 SH.

REV. SH. 36501



4-FW-1, 1.5-FW-1

AUXILIARY BLDG
ROOM 81

REF.DWGS.
FW-4397,SH.1 OF 1 R-6
D-4103 SH.1 OF 1

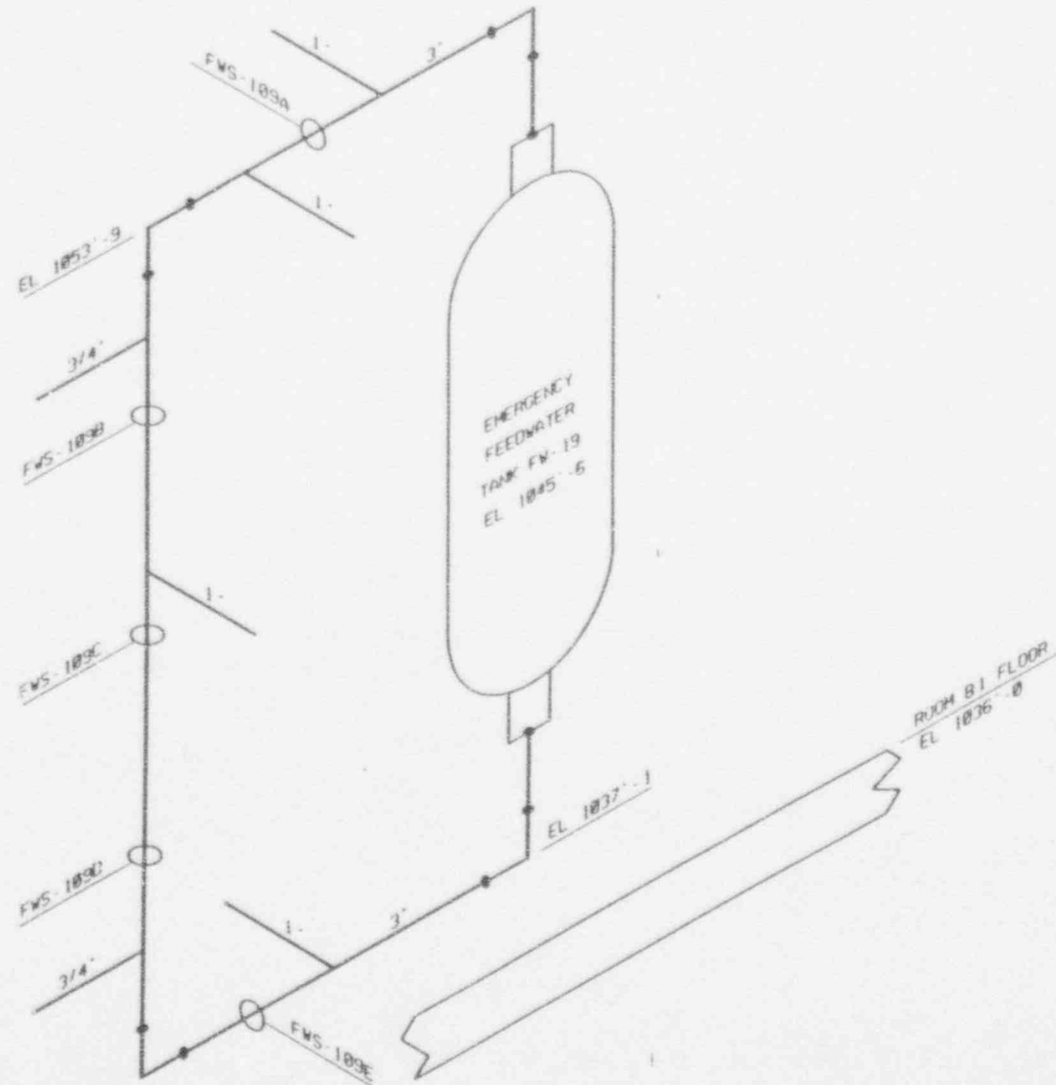
FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-1

DWG. FIGURE C-1, SH. 1

FOR INFORMATION ONLY



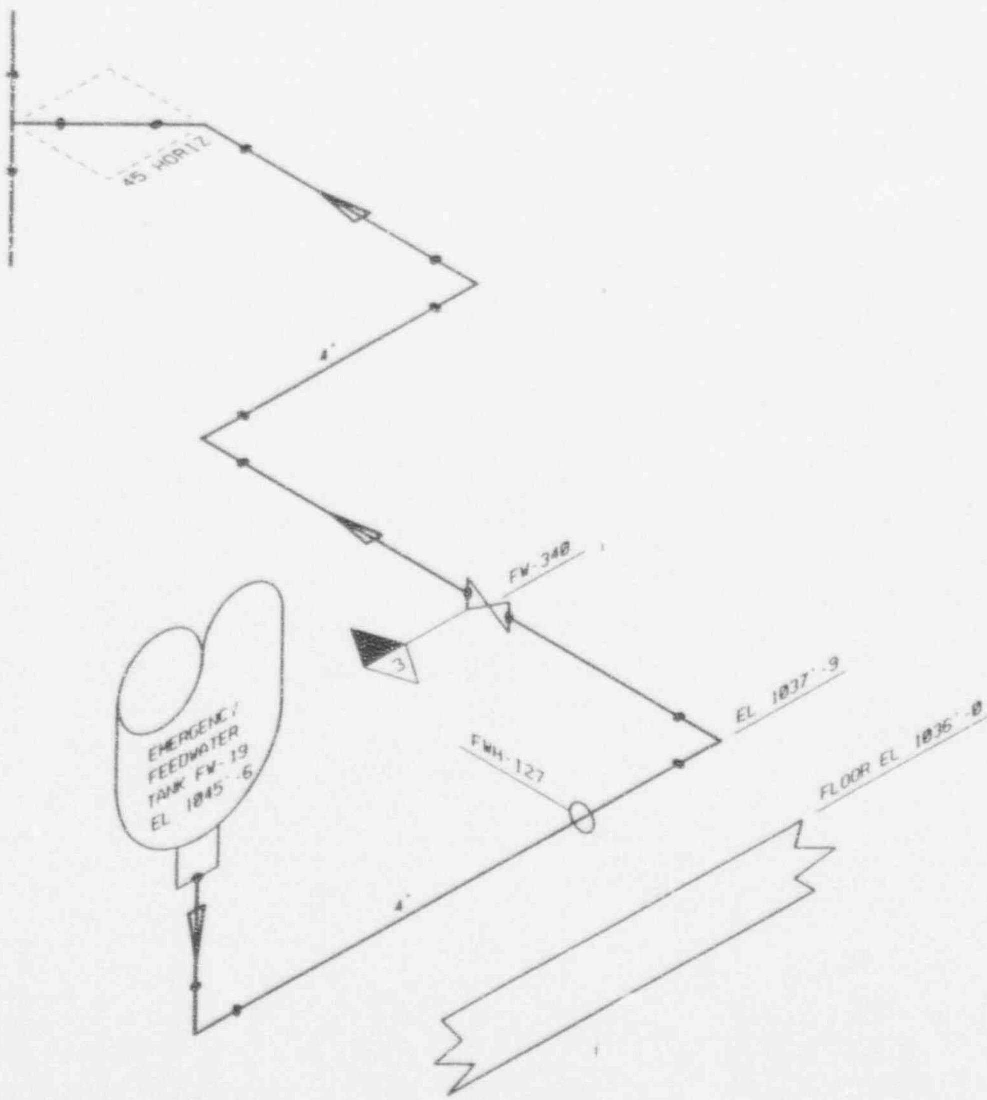
3-FW-1A

AUXILIARY BLDG
ROOM 81

REF.DWGS.
D-4241,R-1
M-254,R-63

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC C-2
DWG. FIGURE C-2, SH. 1



4-FW-10

AUXILIARY BLDG
ROOM 81

REF. DWGS
D-4239, SH. 1 OF 1 R-1
M-259, R-63

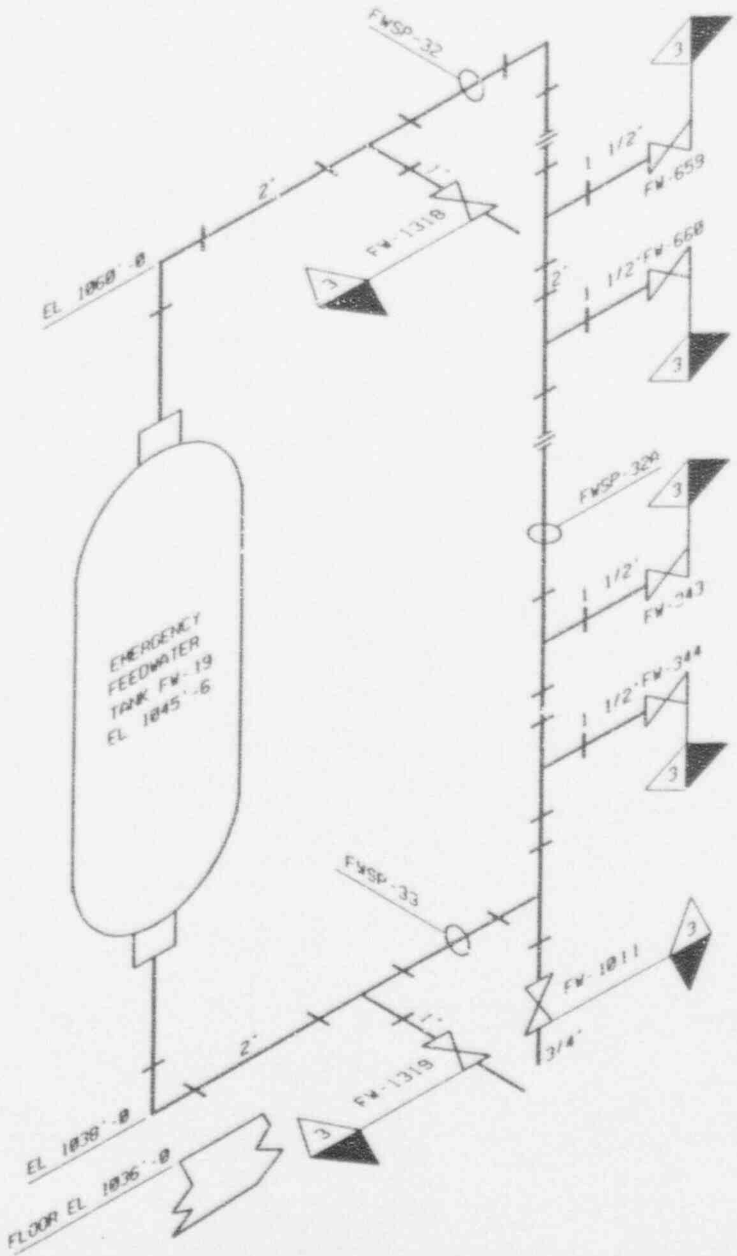
FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-3

DWG. FIGURE C-3, SH. 1

FOR INFORMATION ONLY

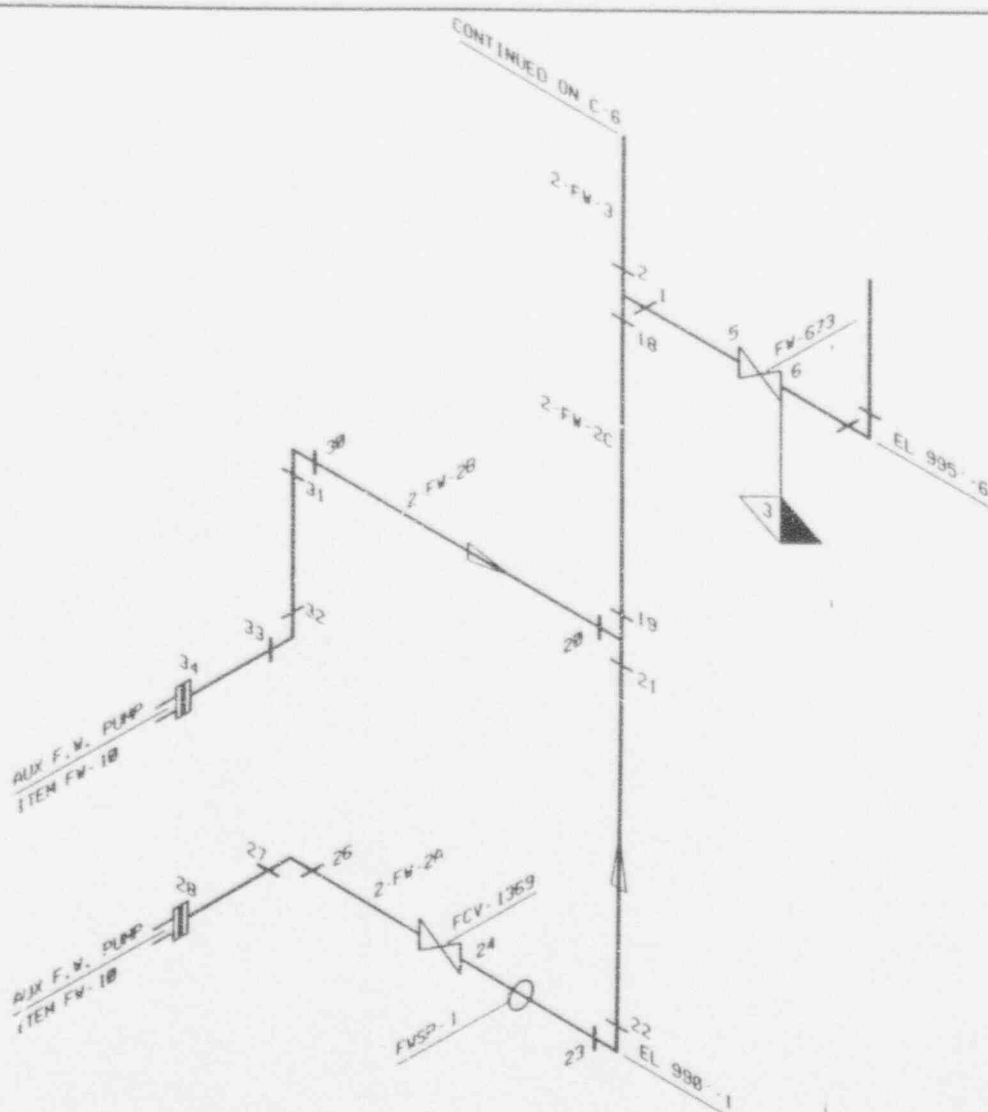


2-FW-1

AUXILIARY BLDG
ROOM 81

REF. DWGS.
FW-4463, SH. 1 OF 1 R-8
M-254, R-63

FORT CALHOUN STATION
I.S.I. ISOMETRIC C-4
DWG. FIGURE C.4, SH. 1



2-FW-2A, 2-FW-2B, 2-FW-2C

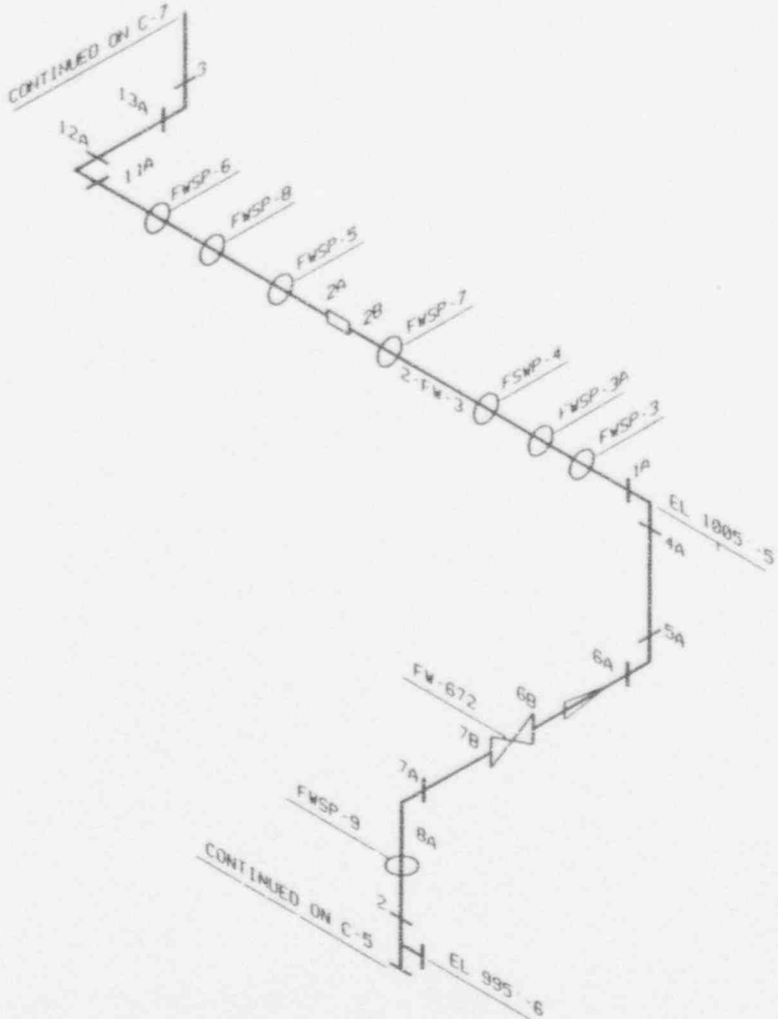
AUXILIARY BLDG
ROOM 19

REF.DWGS.
FW-4097,SH.1 OF 1 R-5
M-253,R-59

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-5



2-FW-3

AUXILIARY BLDG
ROOM 19

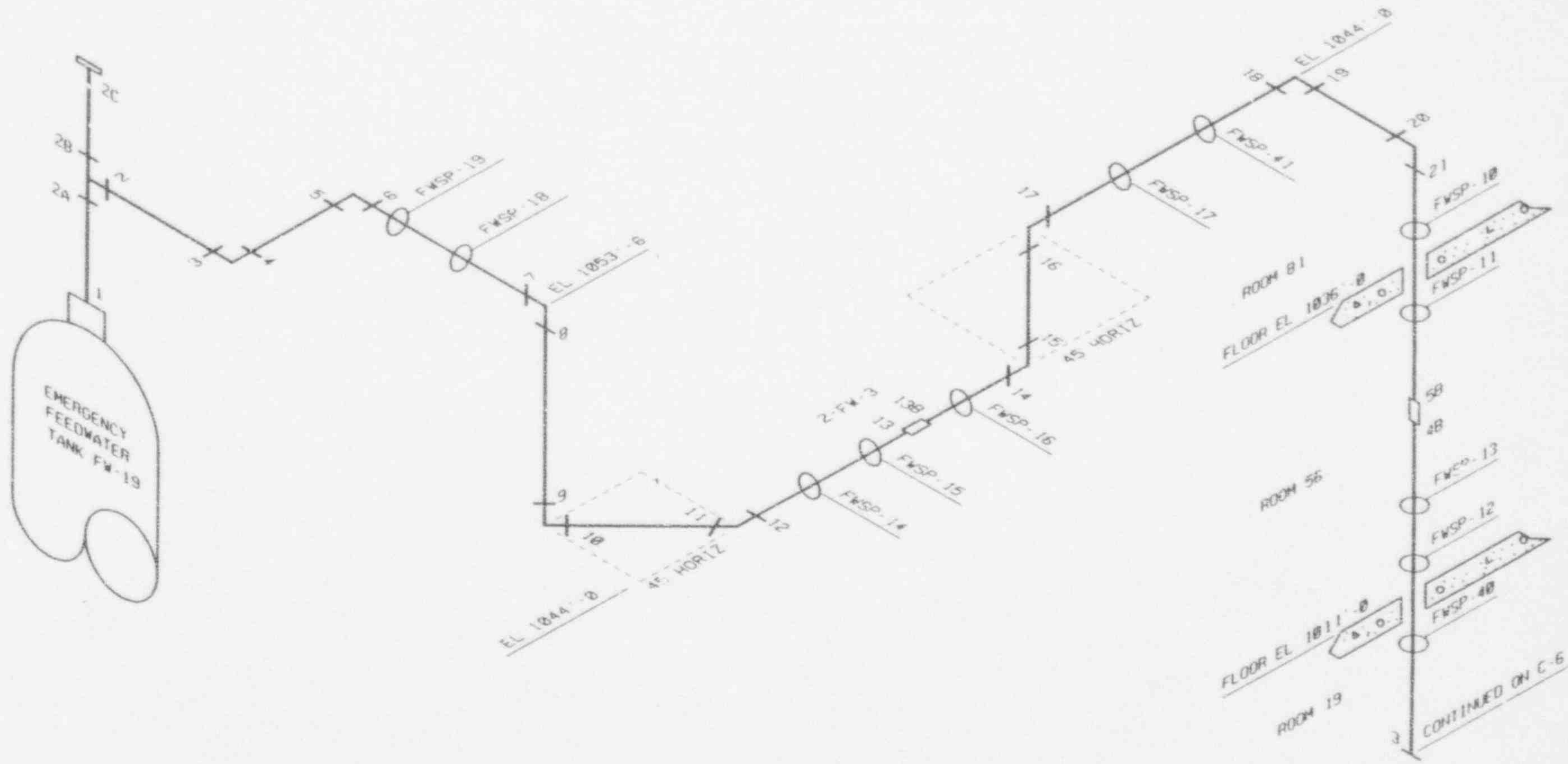
REF.DWGS.
FW-4098,SH.1 OF 2
M-253,R-59

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-6

DWG. FIGURE C-6, SH. 1



2-FW-3

AUXILIARY BLDG
ROOM 19,56,81

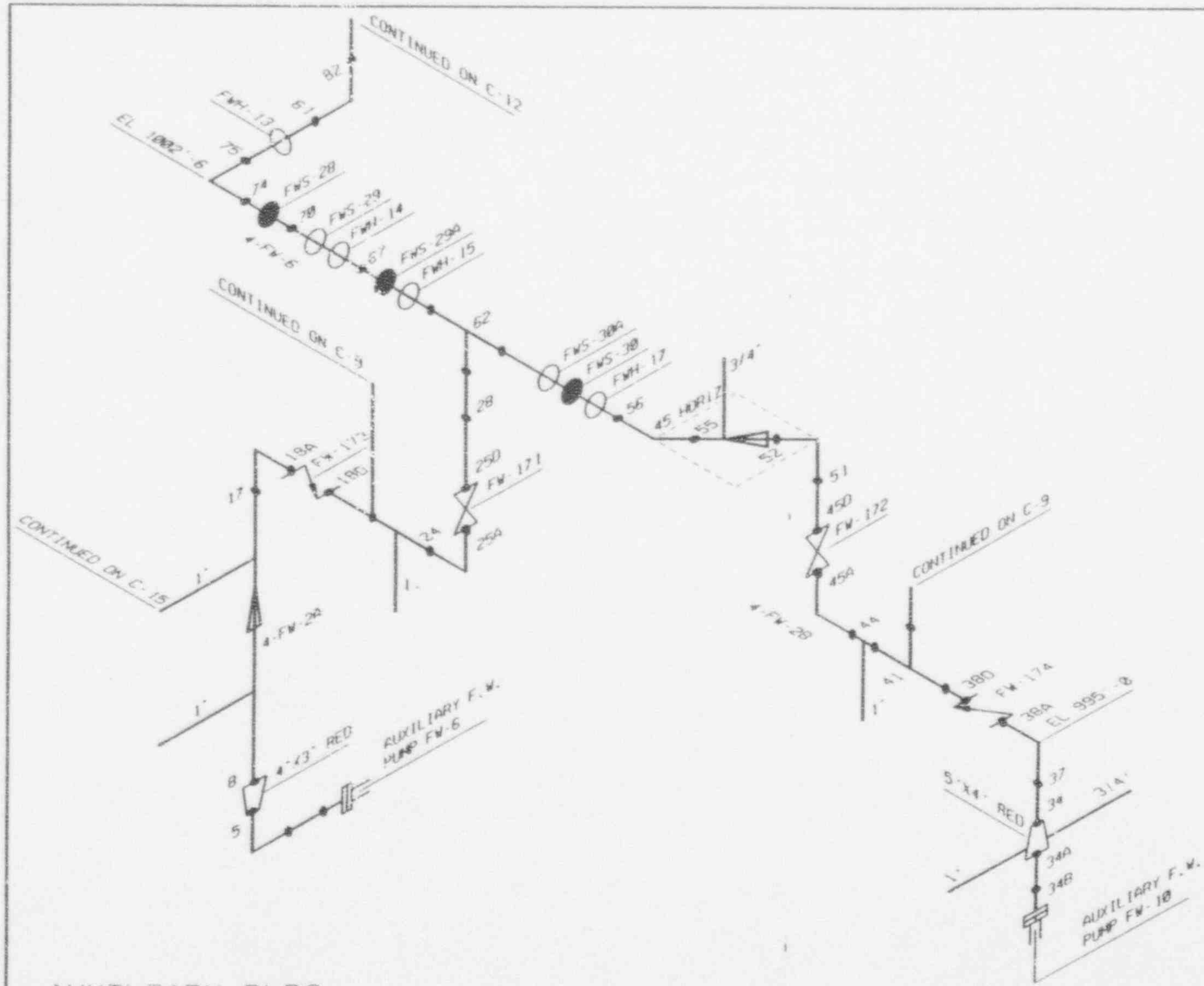
REF.DWGS.
FW-4098,SH.2 OF 2
M-253,R-59

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-7

DWG. FIGURE C-7, SH. 1



4-FW-2A, 4-FW-2B,
4-FW-6

AUXILIARY BLDG
ROOM 19

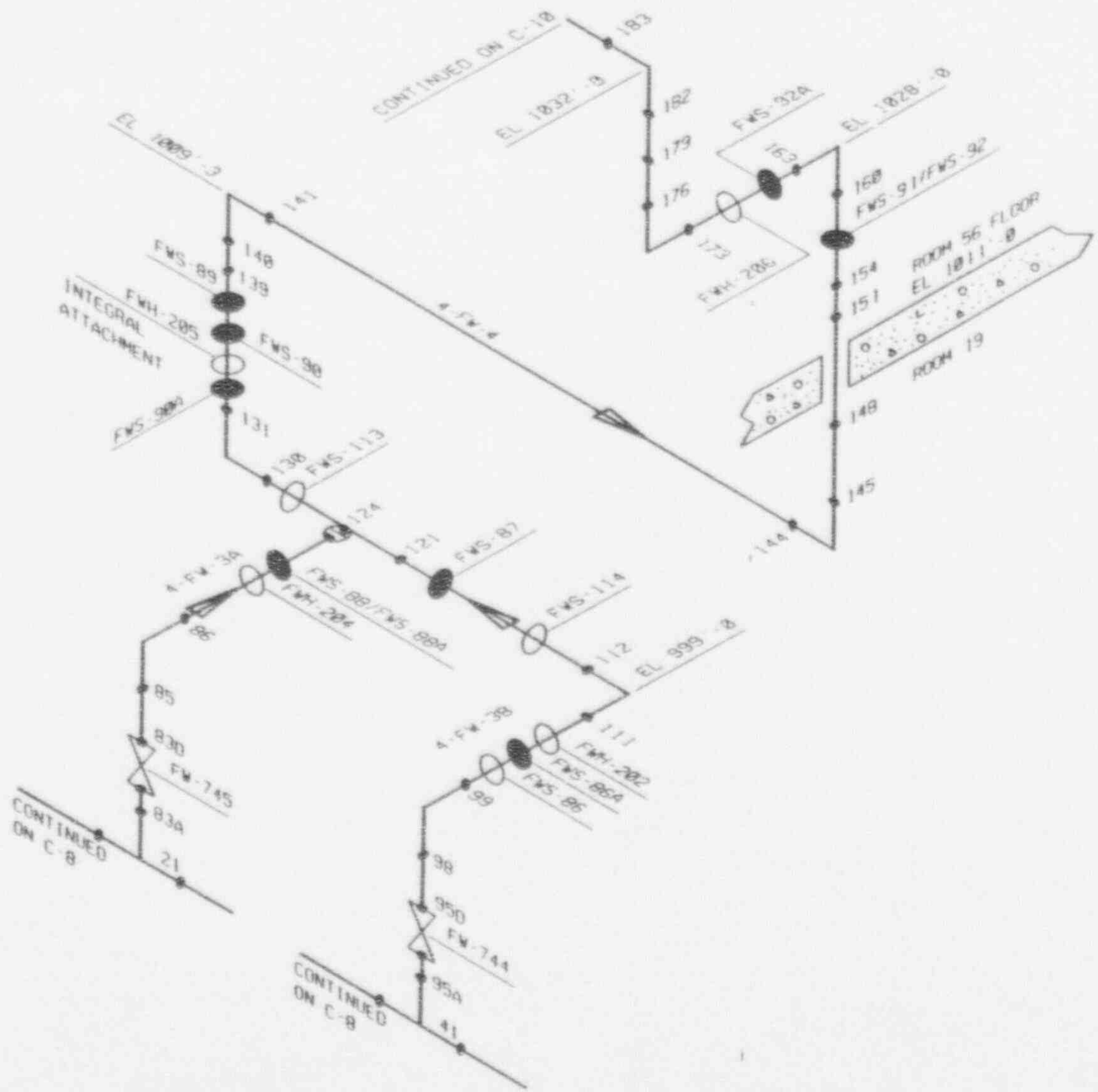
REF.DWGS.
D-4238,SH.1 OF 7 R-3
M-253,R-59

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-8



4-FW-3A, 4-FW-3B
4-FW-4

AUXILIARY BLDG
ROOM 19, ROOM 56

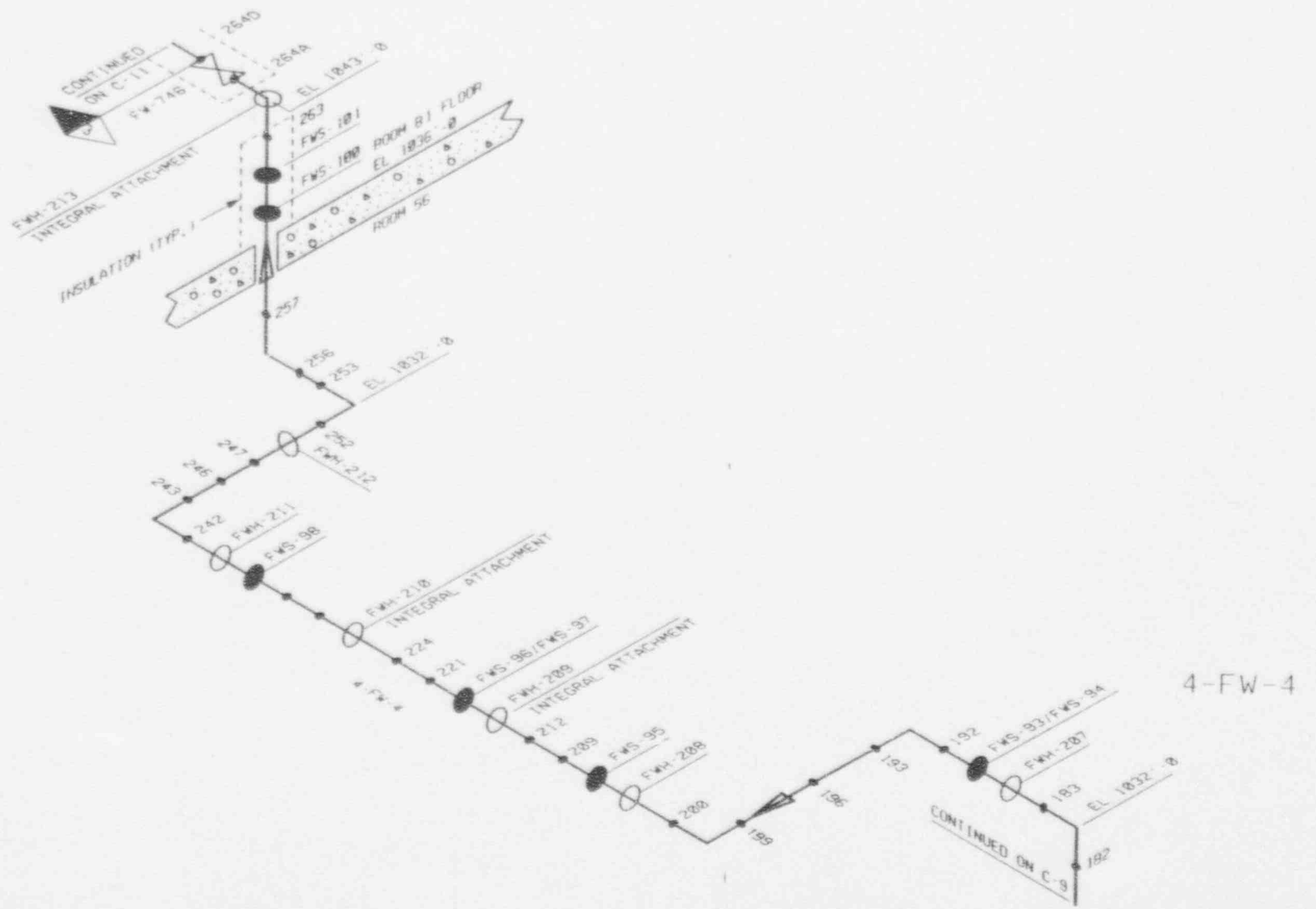
REF.DWGS.
D-4238,SH.2 OF 7 R-2
M-253,R-59

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-9



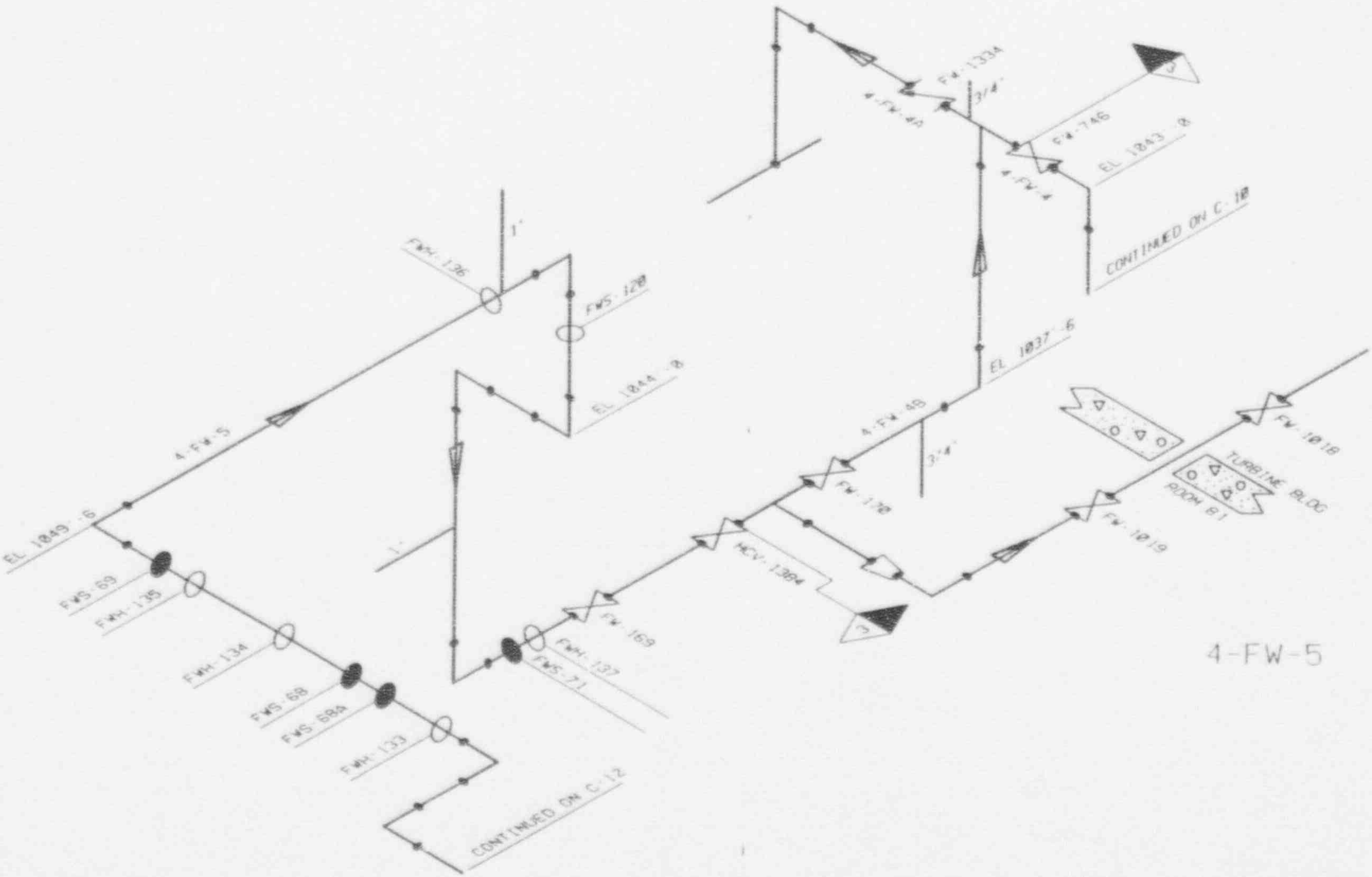
AUXILIARY BLDG
ROOM 56, ROOM 81

REF. DWGS.
D-4238, SH. 3 OF 7 R-1
M-253, R-53

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-10



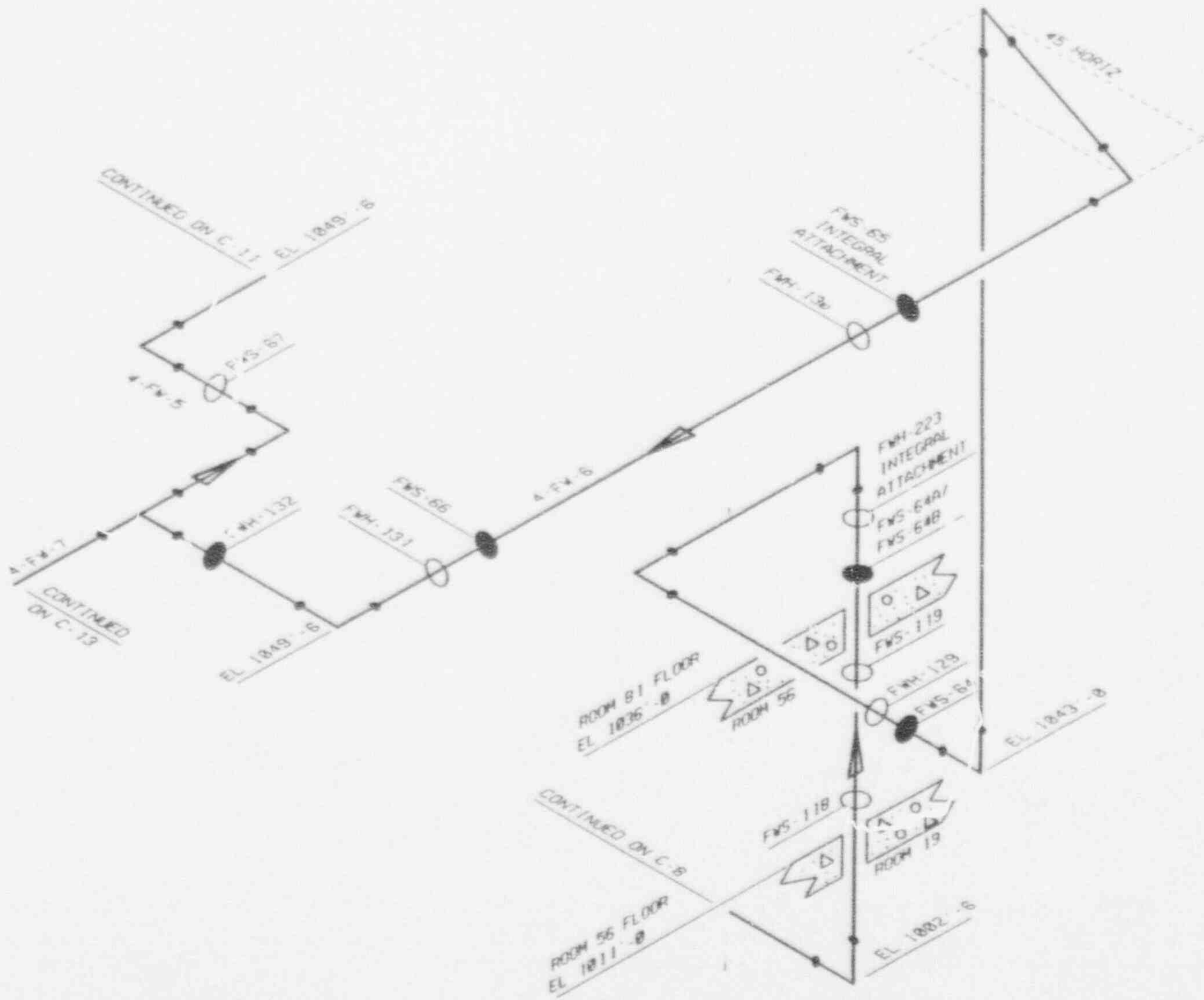
AUXILIARY BLDG
ROOM 81

REF.DWGS
D-4238,SH.4 OF 7, R-5
M-253, R-59

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-11

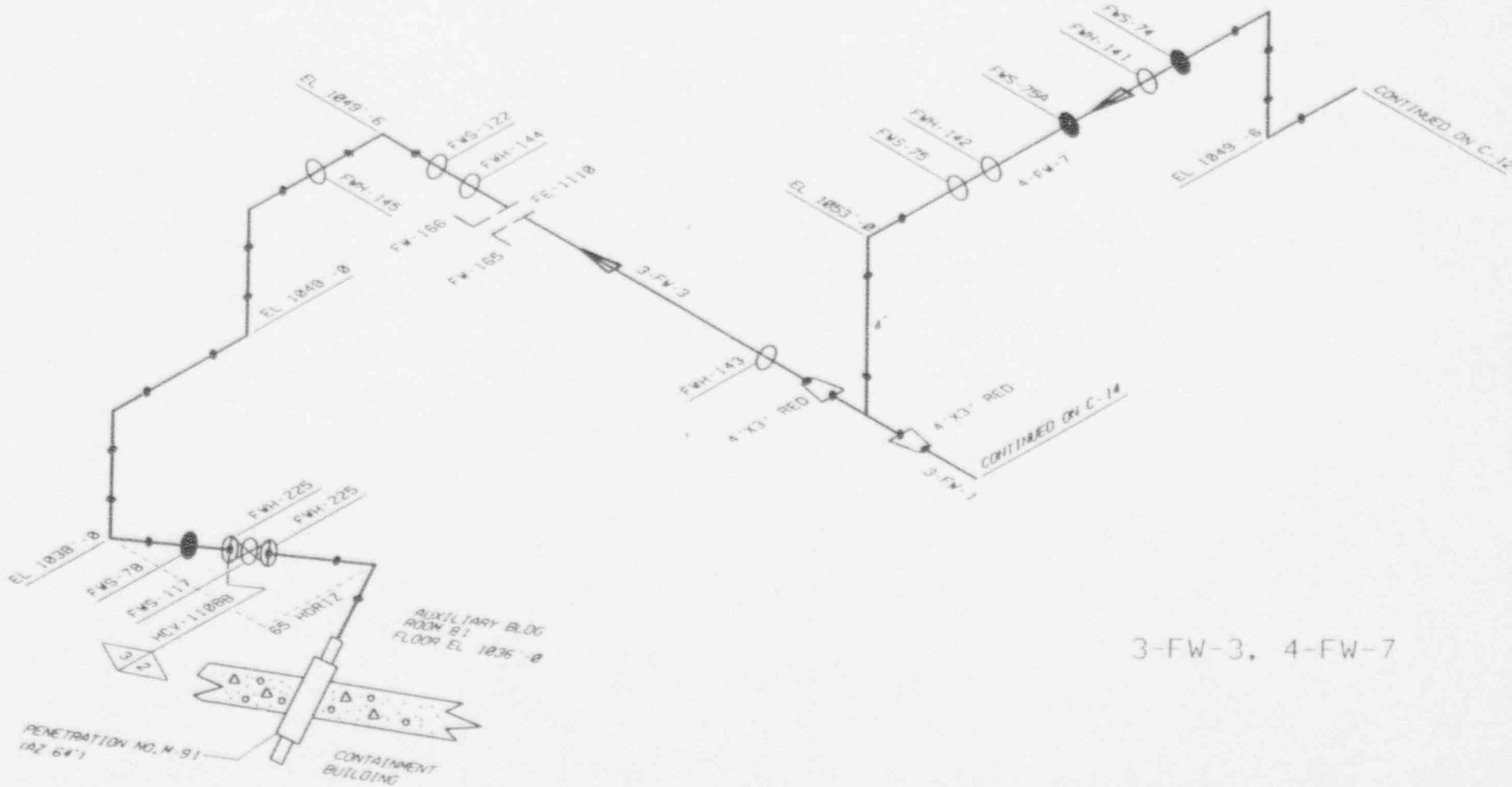


4-FW-5, 4-FW-6

AUXILIARY BLDG
ROOM 19, ROOM 56,
ROOM 81

REF.DWGS.
D-4238.SH.5 OF 7 R-2
M-253, R-59

FORT CALHOUN STATION
I.S.I. ISOMETRIC C-12



3-FW-3, 4-FW-7

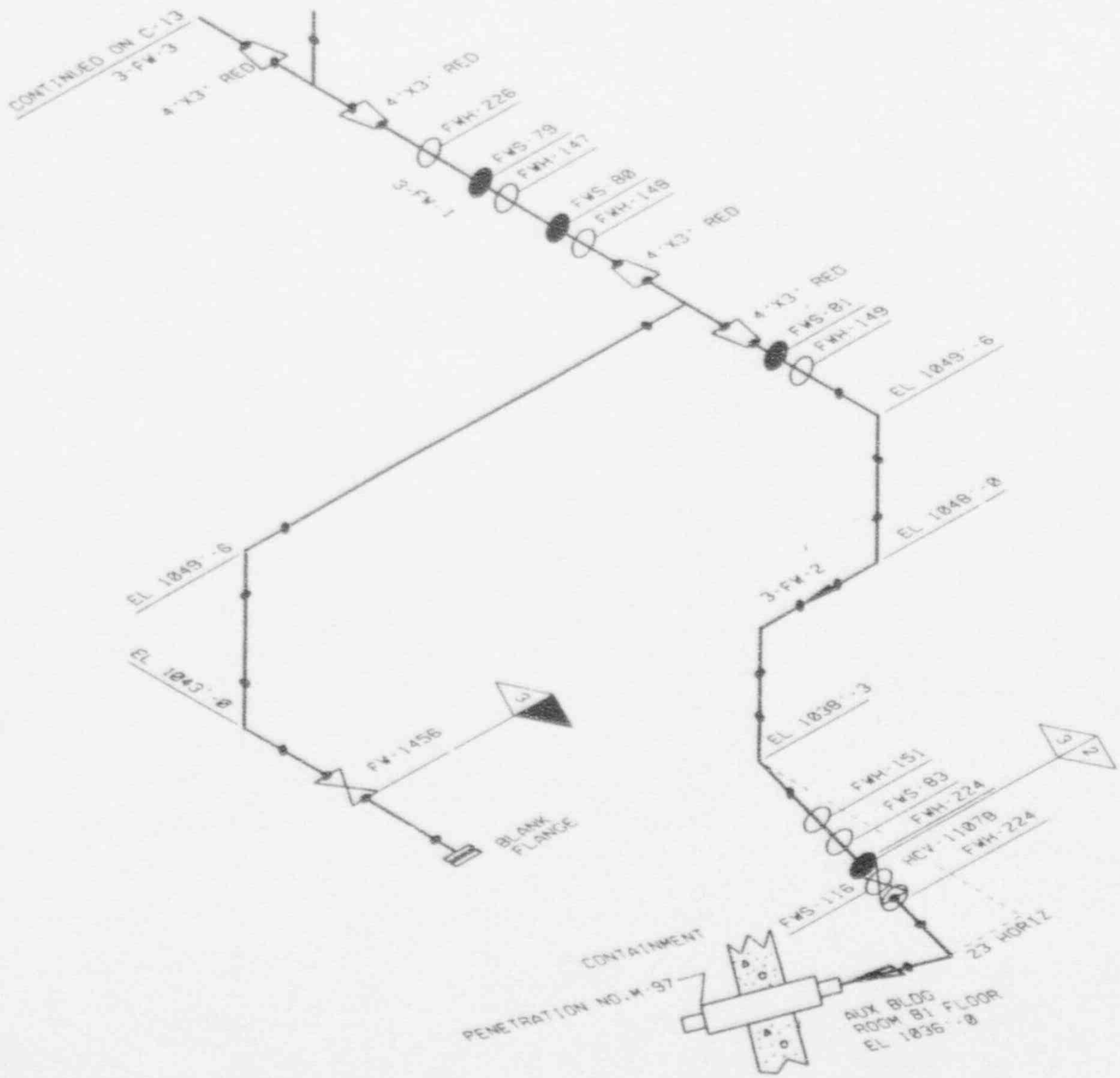
AUXILIARY BLDG
ROOM 81

REF. DWGS.
D-4238, SH.6 OF 7 R-1
M-253, R-59

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-13



3-FW-1, 3-FW-2

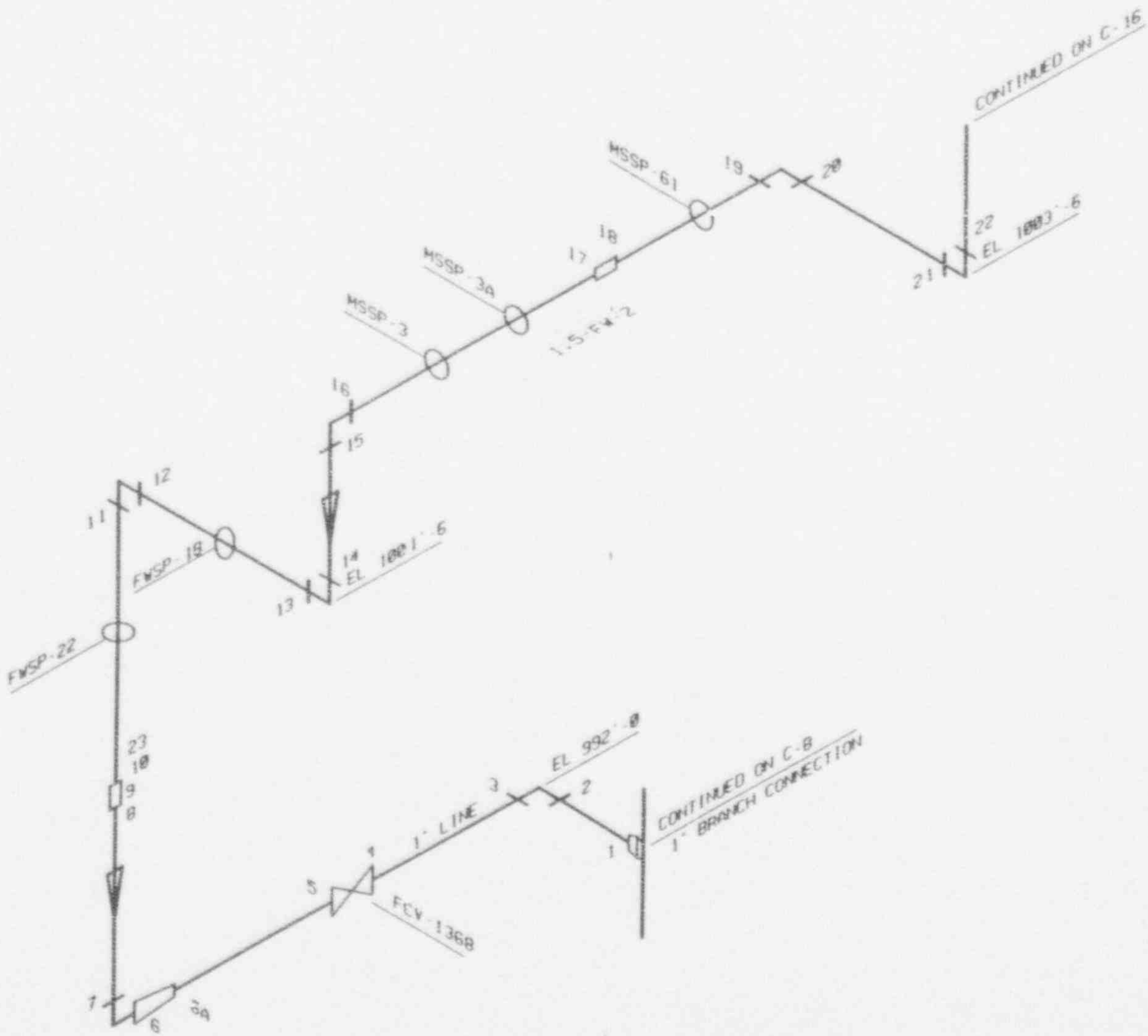
AUXILIARY BLDG
ROOM 81

REF. DWGS.
D-4238, SH. 7 OF 7 R-2
M-253, R-59

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-14



1.5-FW-2

AUXILIARY BLDG
ROOM 19

REF.DWGS.
FW-4387,SH.1 OF 2 R-5
M-253, R-59

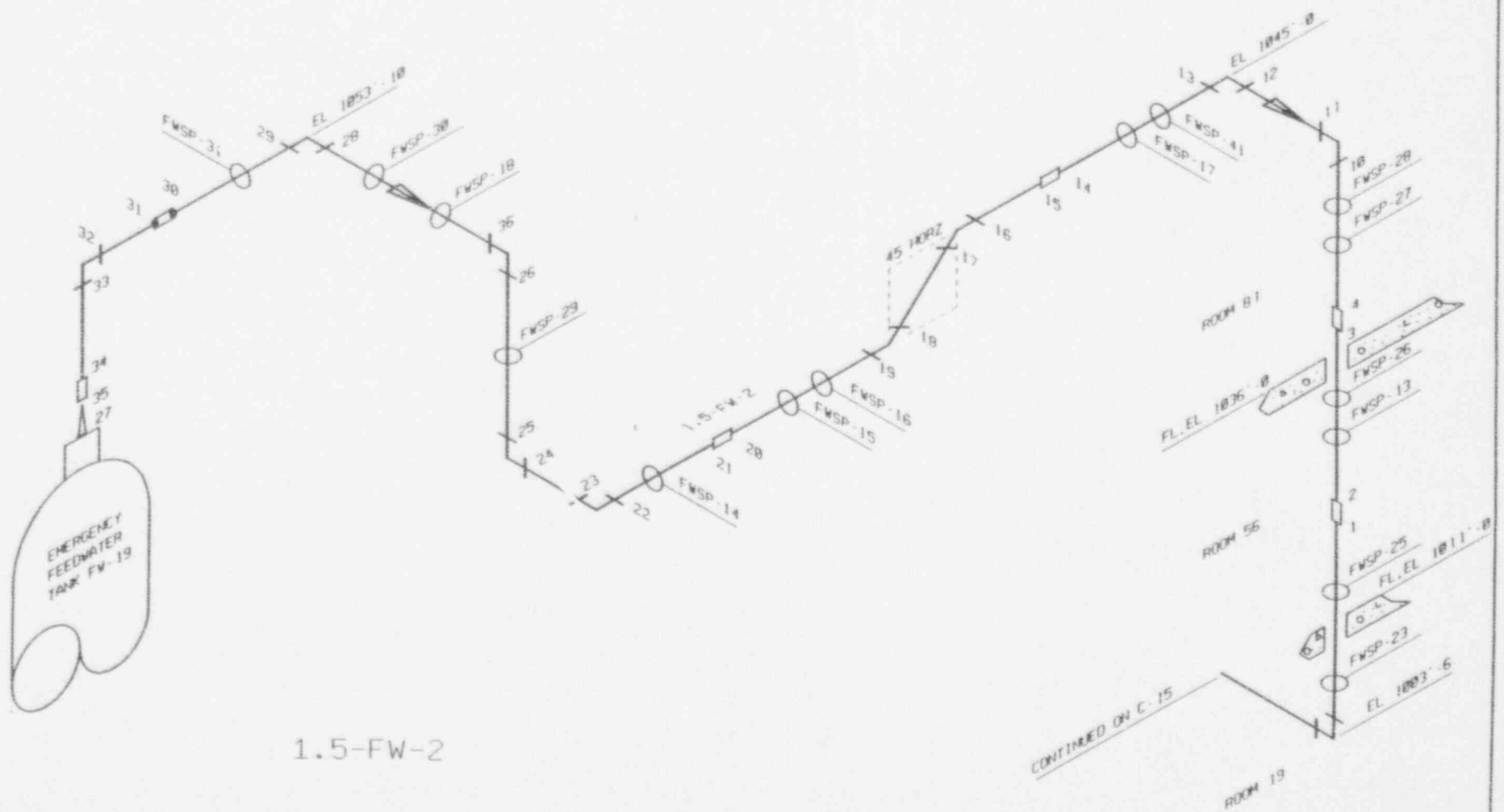
FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-15

DWG. FIGURE C-15, SH. 1

FOR INFORMATION ONLY



1.5-FW-2

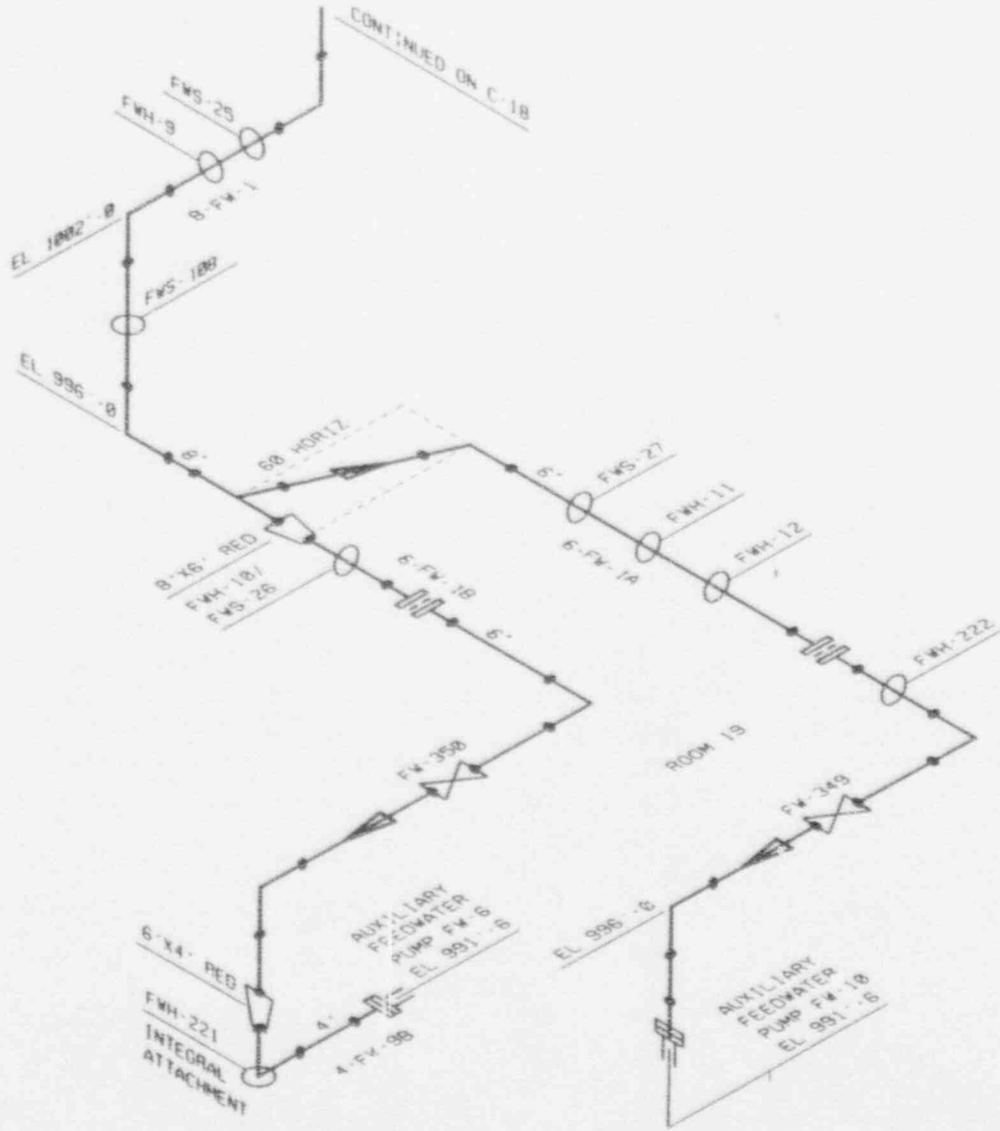
AUXILIARY BLDG
ROOM 19,56,81

REF.DWGS.
FW-4387,SH.2 OF 2 R-6
M-253, R-59

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-16



4-FW-9B, 6-FW-1A,
6-FW-1B, 8-FW-1

AUXILIARY BLDG
ROOM 19

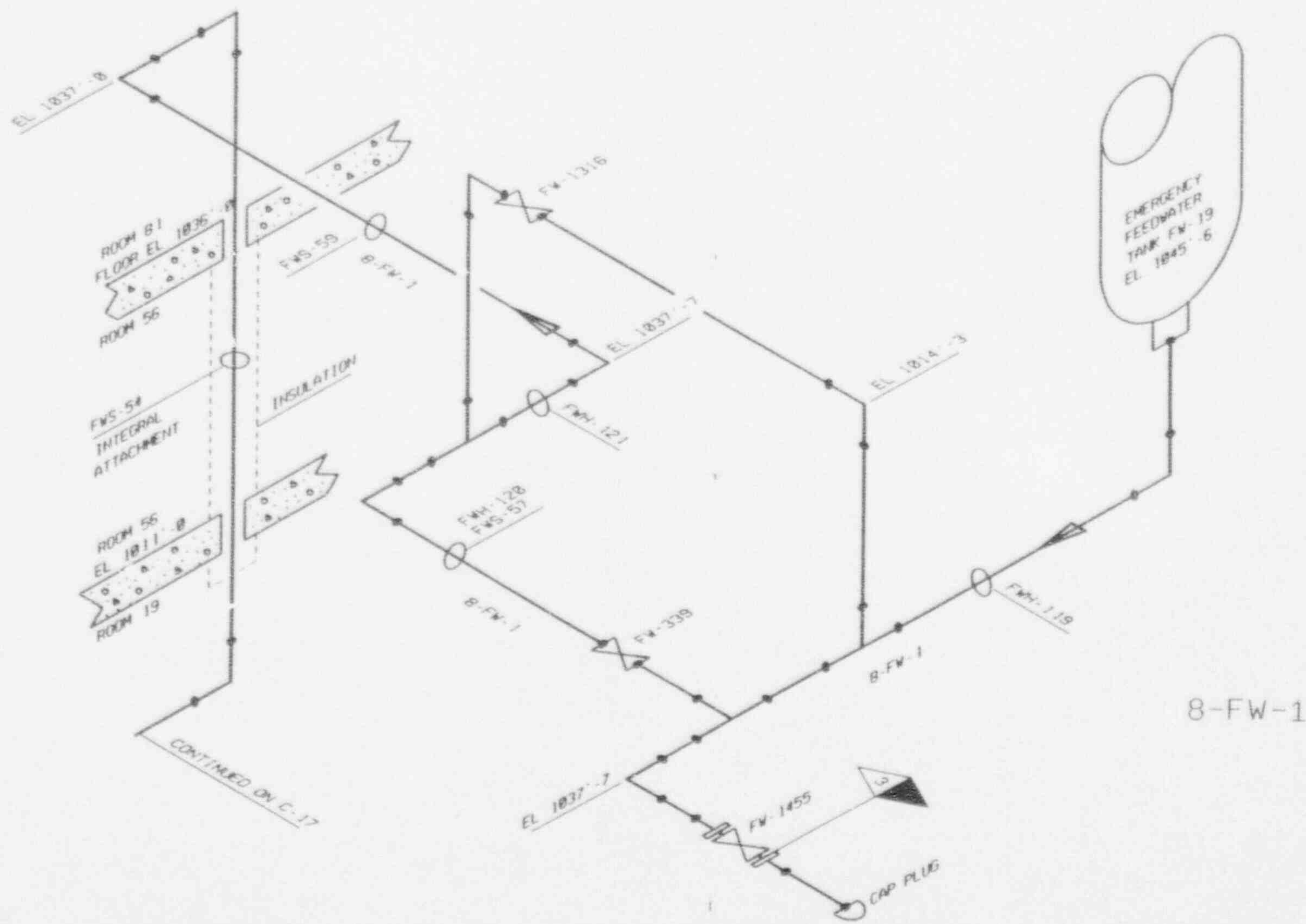
REF.DWGS.
D-4240,SH.1 OF 2 R-2
M-254, R-63

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-17

FOR INFORMATION ONLY



AUXILIARY BLDG
ROOM 19, ROOM 56
ROOM 81

REF.DWGS.
D-4240,SH.2 OF 2 R-5
M-254, R-63

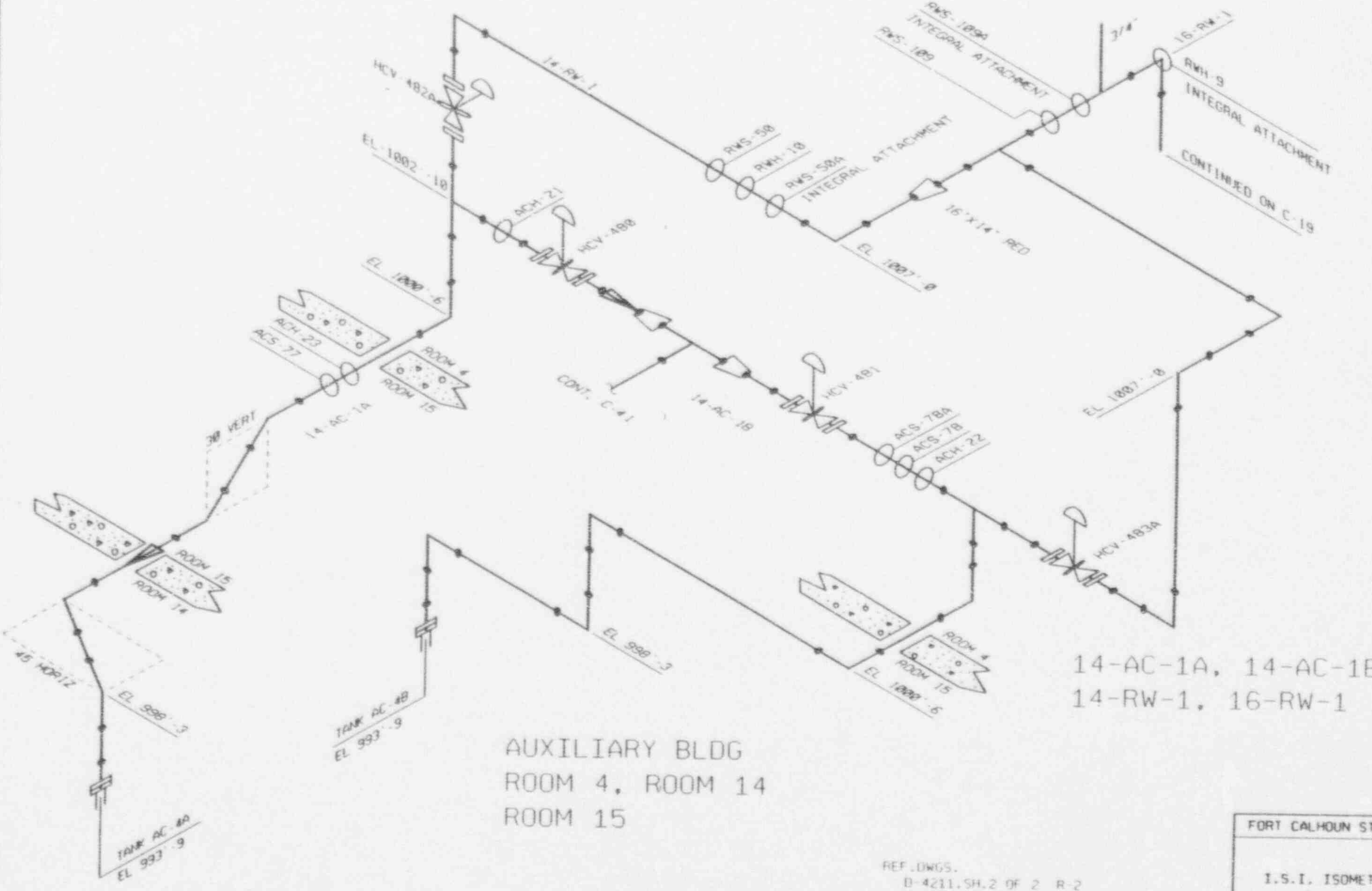
FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-18

DWG. FIGURE C-18, SH. 1

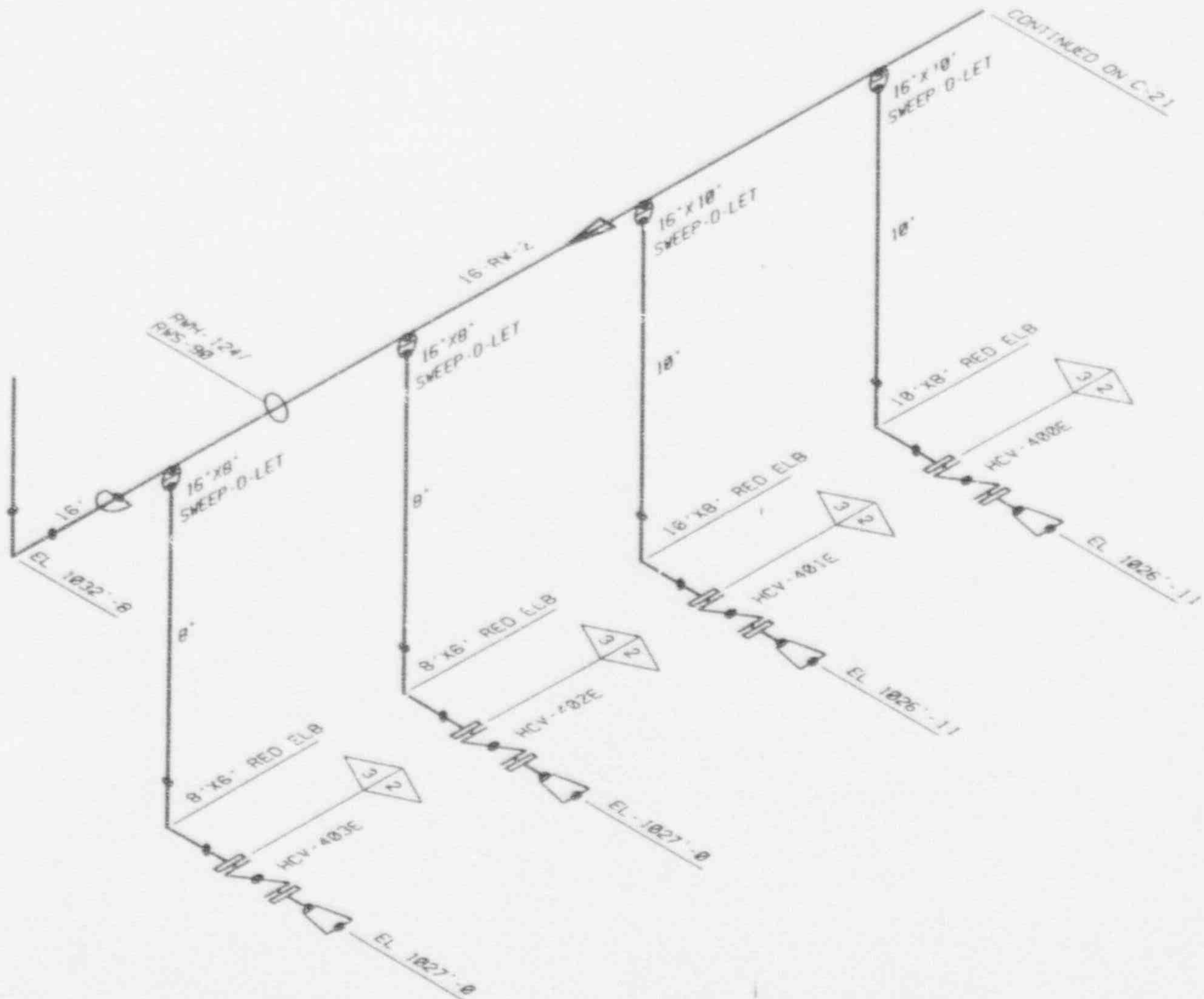


REF.DWGS.
D-4211.SH.2 OF 2 R-2
M-100, R-32, M-11

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-19



16-RW-2

AUXILIARY BLDG
ROOM 61

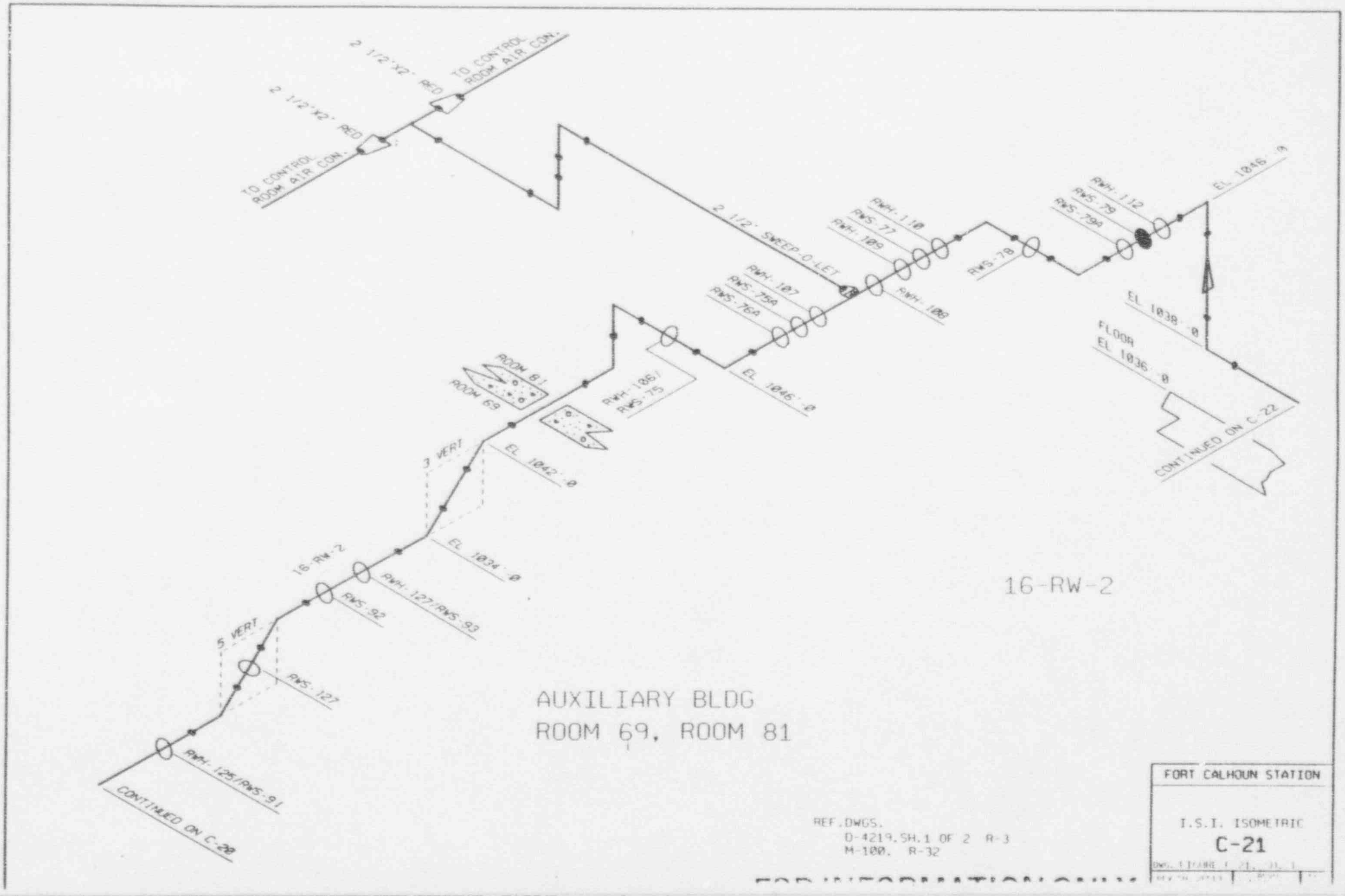
REF.DWGS.
D-4218,SH.1 OF 6 R-3
M-100, R-32

FOR INFORMATION ONLY

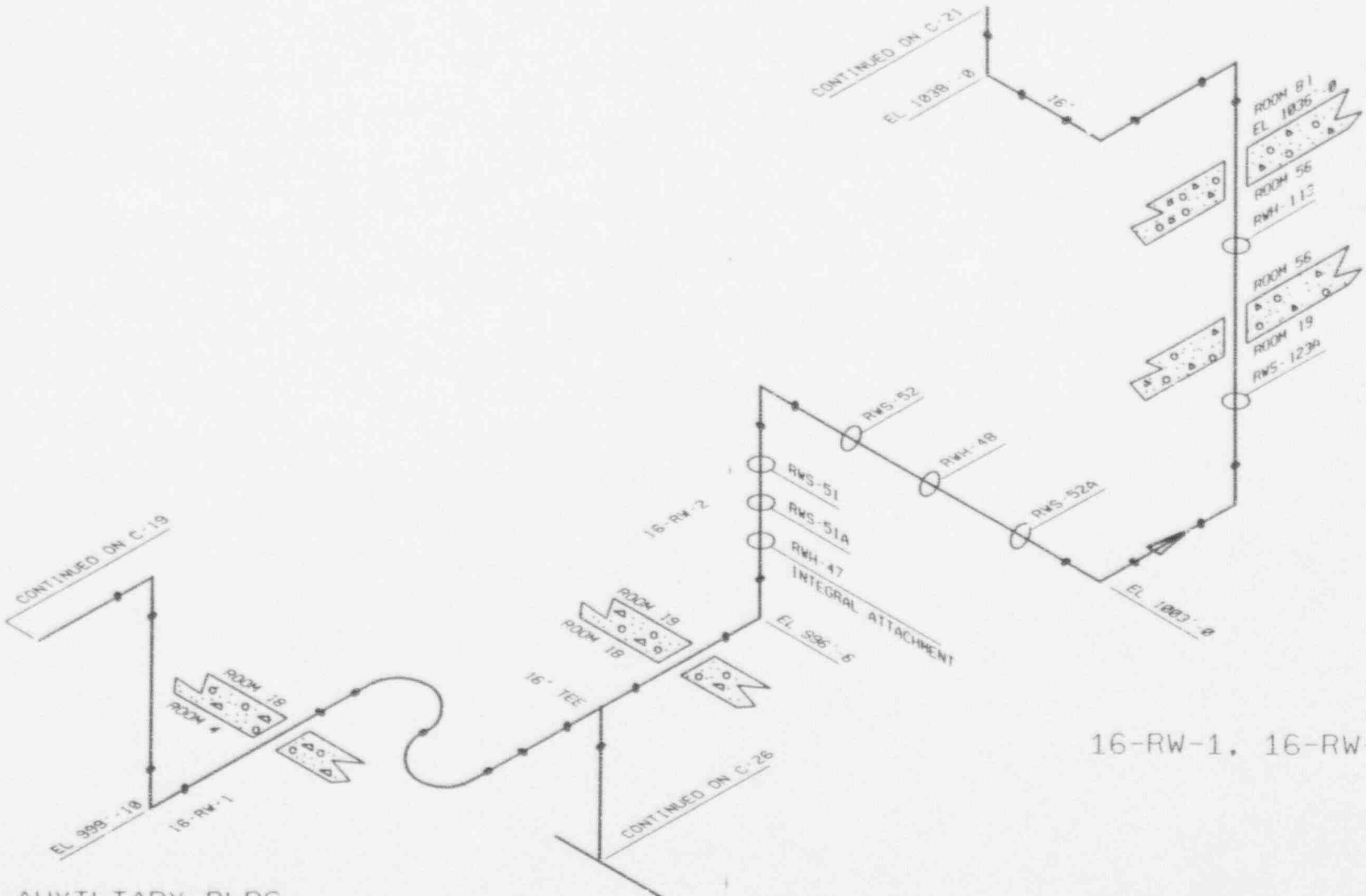
FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-20

DWG. FIGURE C-20, SH. 1



2 1/2"X2" RED
TO CONTROL ROOM AIR CON.
2 1/2"X2" RED
TO CONTROL ROOM AIR CON.
2 1/2" SWEEP-O-LET
RWH-110
RWS-77
RWH-109
RWH-108
RWS-78
RWH-112
RWS-79
RWS-79A
EL 1046'-0
EL 1038'-0
FLOOR EL 1036'-0
CONTINUED ON C-22
RWH-107
RWS-75A
RWS-76A
EL 1046'-0
RWH-106/RWS-75
ROOM 81
ROOM 69
3' VERT
EL 1042'-0
EL 1034'-0
16-RW-2
RWS-92
RWH-127/RWS-93
5' VERT
RWS-127
RWH-125/RWS-91
CONTINUED ON C-20
16-RW-2
AUXILIARY BLDG
ROOM 69, ROOM 81
REF. DWGS.
D-4219, SH.1 OF 2 R-3
M-100, R-32
FORT CALHOUN STATION
I.S.I. ISOMETRIC
C-21



16-RW-1, 16-RW-2

AUXILIARY BLDG
ROOM 4, ROOM 18
ROOM 19, ROOM 56
ROOM 81

REF.DWGS.
D-4251,SH.4 OF 5 R-2
D-4219,SH.2 OF 2 R-2
M-100, R-32

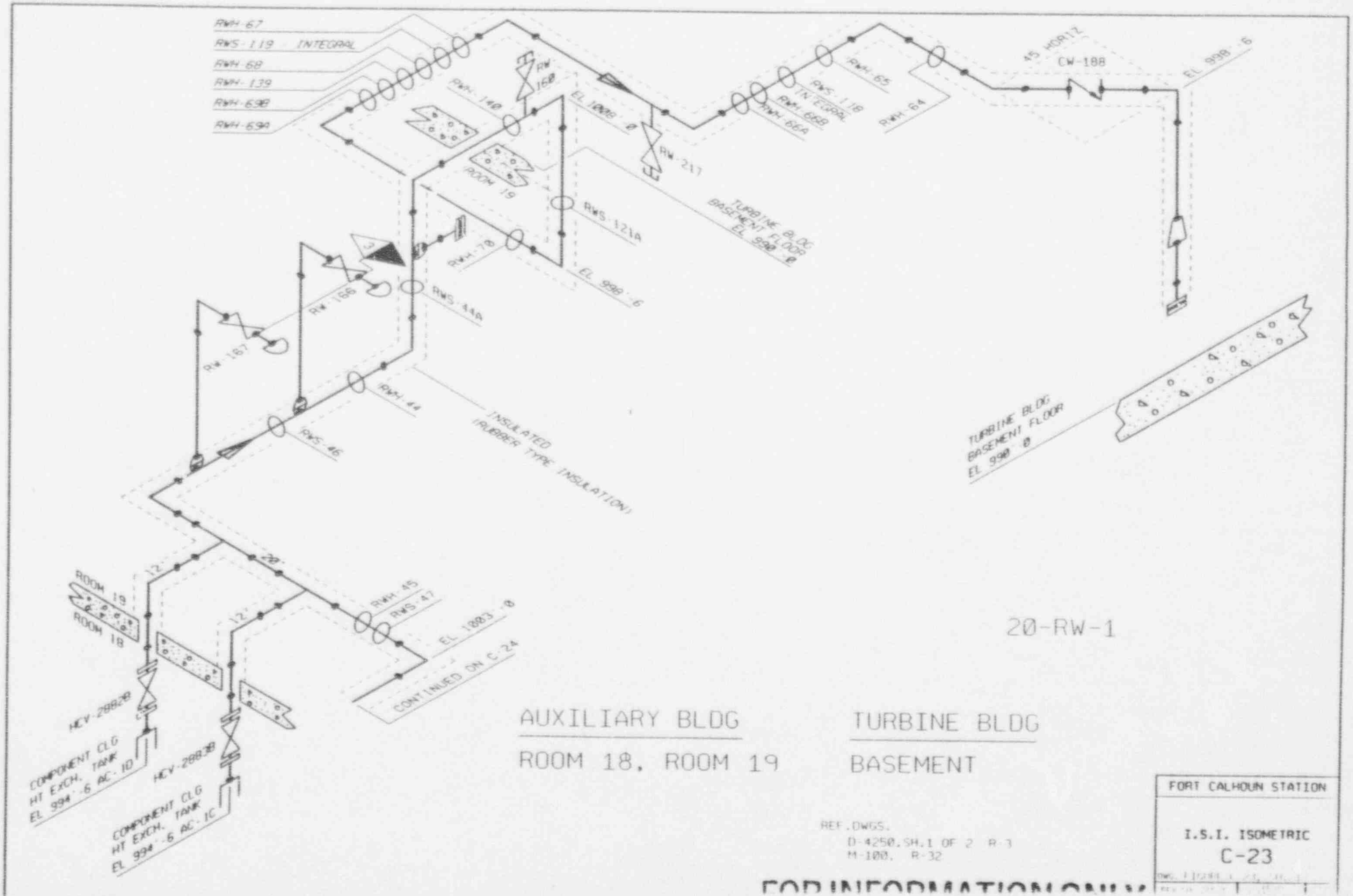
FORT CALHOUN STATION

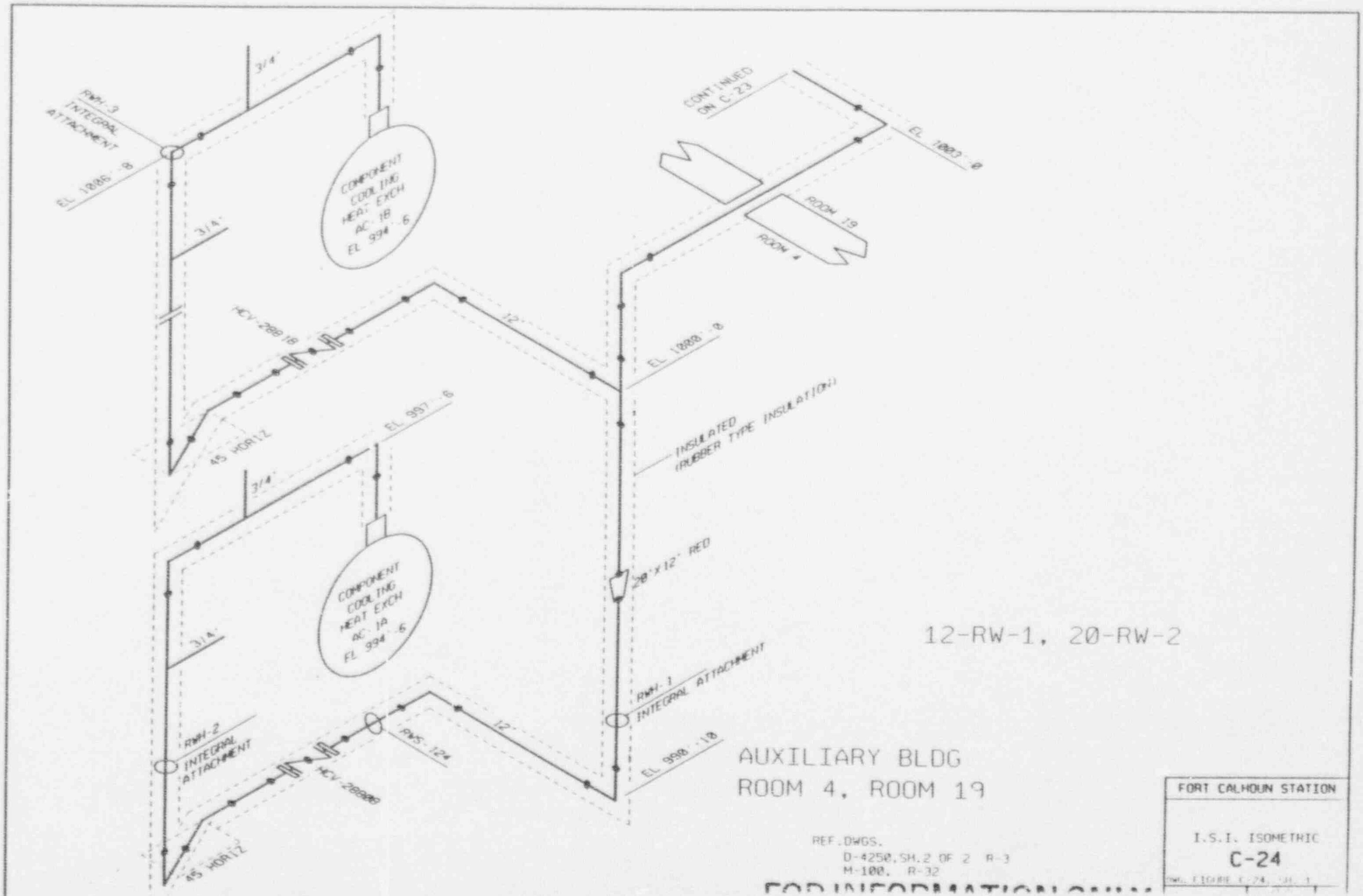
I.S.I. ISOMETRIC

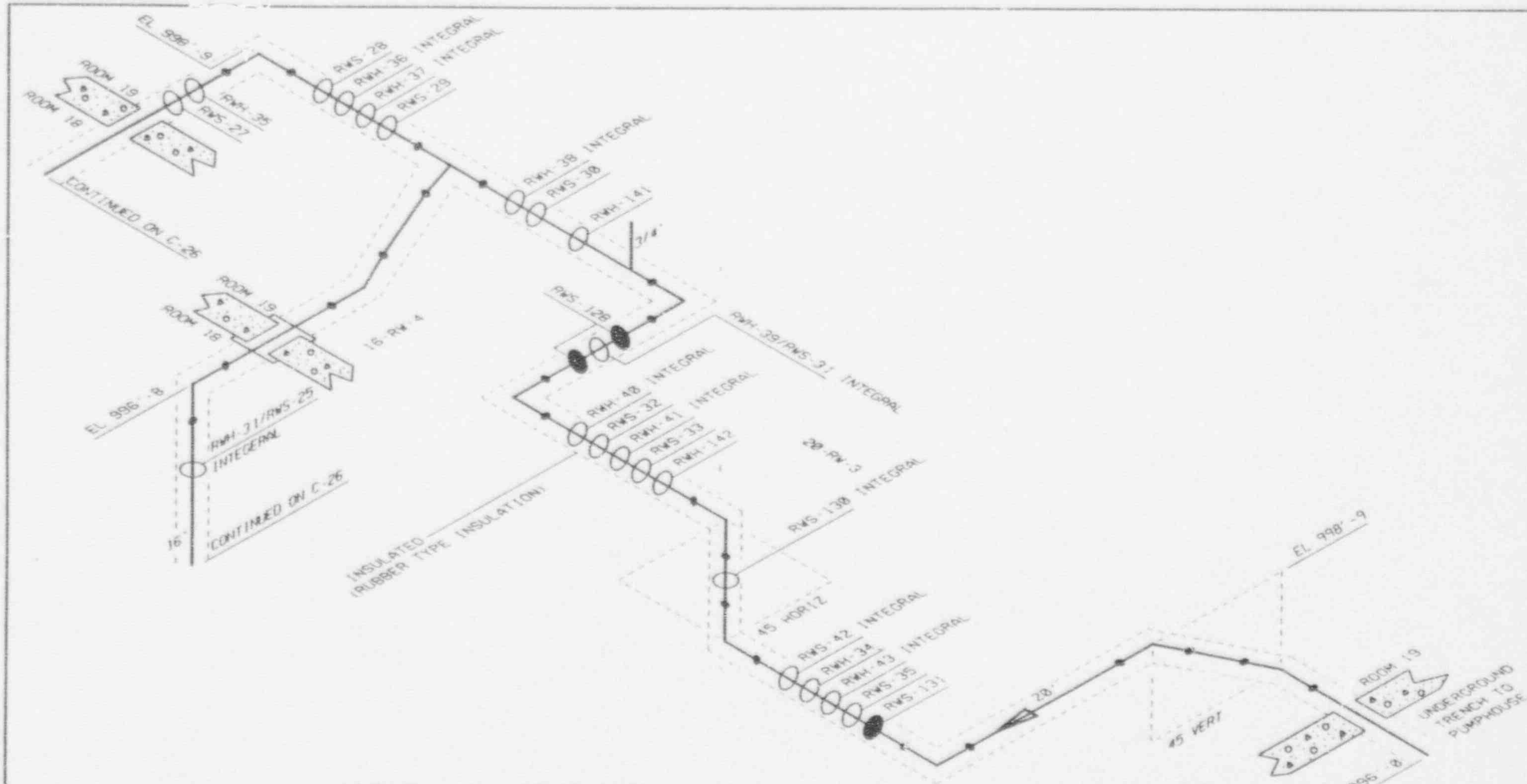
C-22

DWG. FIGURE C-22, SH. 1

FOR INFORMATION ONLY


RWH-67
RWS-119 INTEGRAL
RWH-68
RWH-139
RWH-69B
RWH-69A
RW-160
RWH-140
EL 1008'-0
RW-217
RWS-118 INTEGRAL
RWH-65
RWH-66B
RWH-66A
RWH-64
45 HORIZ
CW-188
EL 998'-6
ROOM 19
RWS-121A
TURBINE BLDG BASEMENT FLOOR EL 990'-0
RWH-70
RW-166
RWS-44A
EL 998'-6
RW-167
RWH-44
INSULATED (RUBBER TYPE INSULATION)
RWS-46
TURBINE BLDG BASEMENT FLOOR EL 990'-0
20"
12"
12"
ROOM 19
ROOM 18
RWH-45
RWS-47
EL 1003'-0
CONTINUED ON C-24
HCV-2882B
COMPONENT CLG HT EXCH. TANK EL 994'-6 AC-1D
HCV-2883B
COMPONENT CLG HT EXCH. TANK EL 994'-6 AC-1C
20-RW-1
AUXILIARY BLDG
ROOM 18, ROOM 19
TURBINE BLDG
BASEMENT
REF. DWGS.
D-4250, SH.1 OF 2 R-3
M-100, R-32
FORT CALHOUN STATION
I.S.I. ISOMETRIC
C-23
FOR INFORMATION ONLY


RWH-3
INTEGRAL
ATTACHMENT
EL 1006'-0"
3/4"
3/4"
COMPONENT
COOLING
HEAT EXCH
AC-1B
EL 994'-6"
CONTINUED
ON C-23
EL 1003'-0"
ROOM 19
ROOM 4
HCV-2881B
12"
EL 1000'-0"
45° HORIZ
EL 997'-6"
INSULATED
(RUBBER TYPE INSULATION)
3/4"
3/4"
20"X12" RED
COMPONENT
COOLING
HEAT EXCH
AC-1A
EL 994'-6"
12-RW-1, 20-RW-2
RWH-1
INTEGRAL ATTACHMENT
RWH-2
INTEGRAL
ATTACHMENT
PWS-124
12"
HCV-2880B
EL 990'-10"
45° HORIZ
AUXILIARY BLDG
ROOM 4, ROOM 19
REF.DWGS.
D-4250,SH.2 OF 2 R-3
M-100, R-32
FORT CALHOUN STATION
I.S.I. ISOMETRIC
C-24



16-RW-4, 20-RW-3

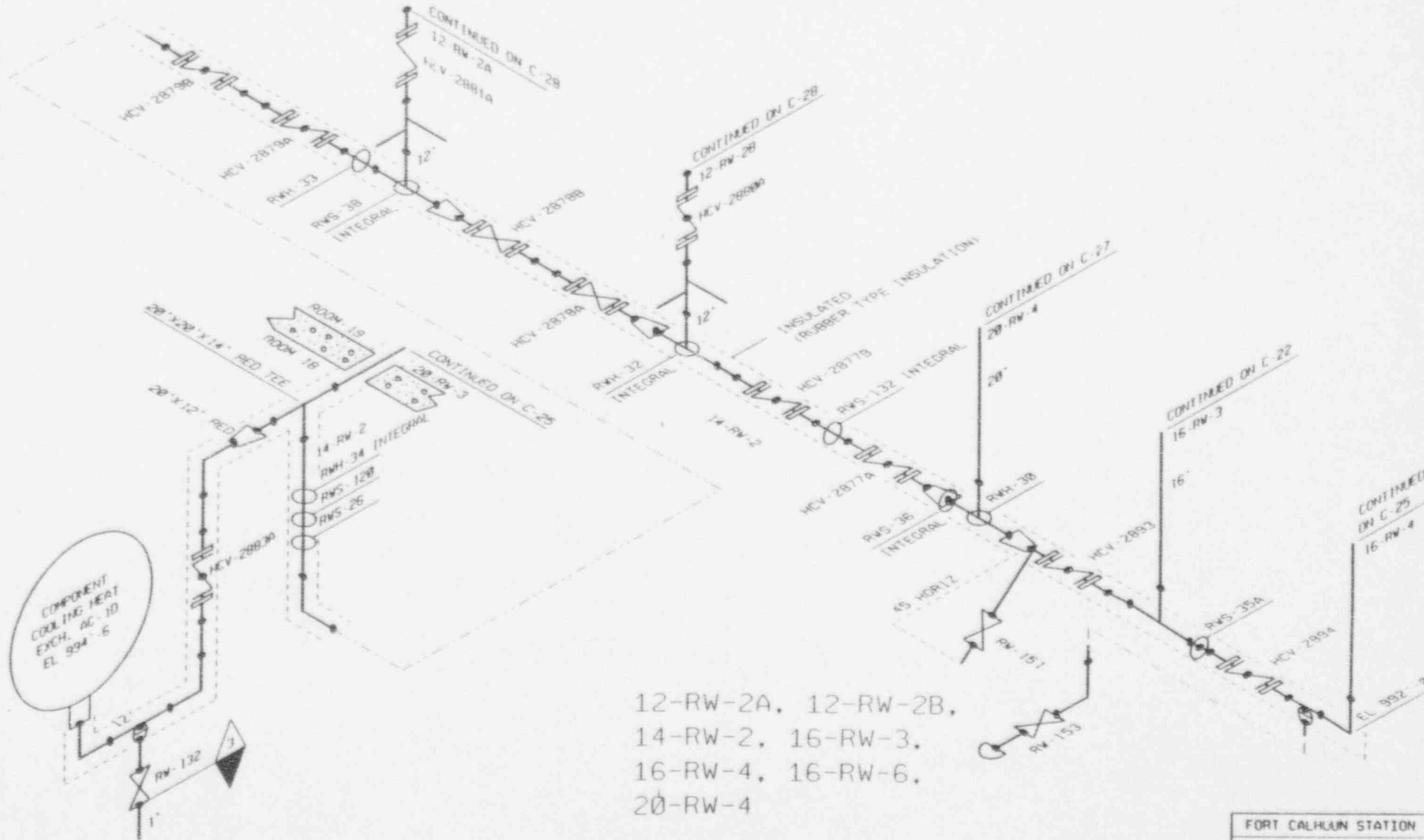
AUXILIARY BLDG
ROOM 18.19

REF.DWGS.
D-4251,SH.1 OF 3 R-3
M-100, R-32

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-25

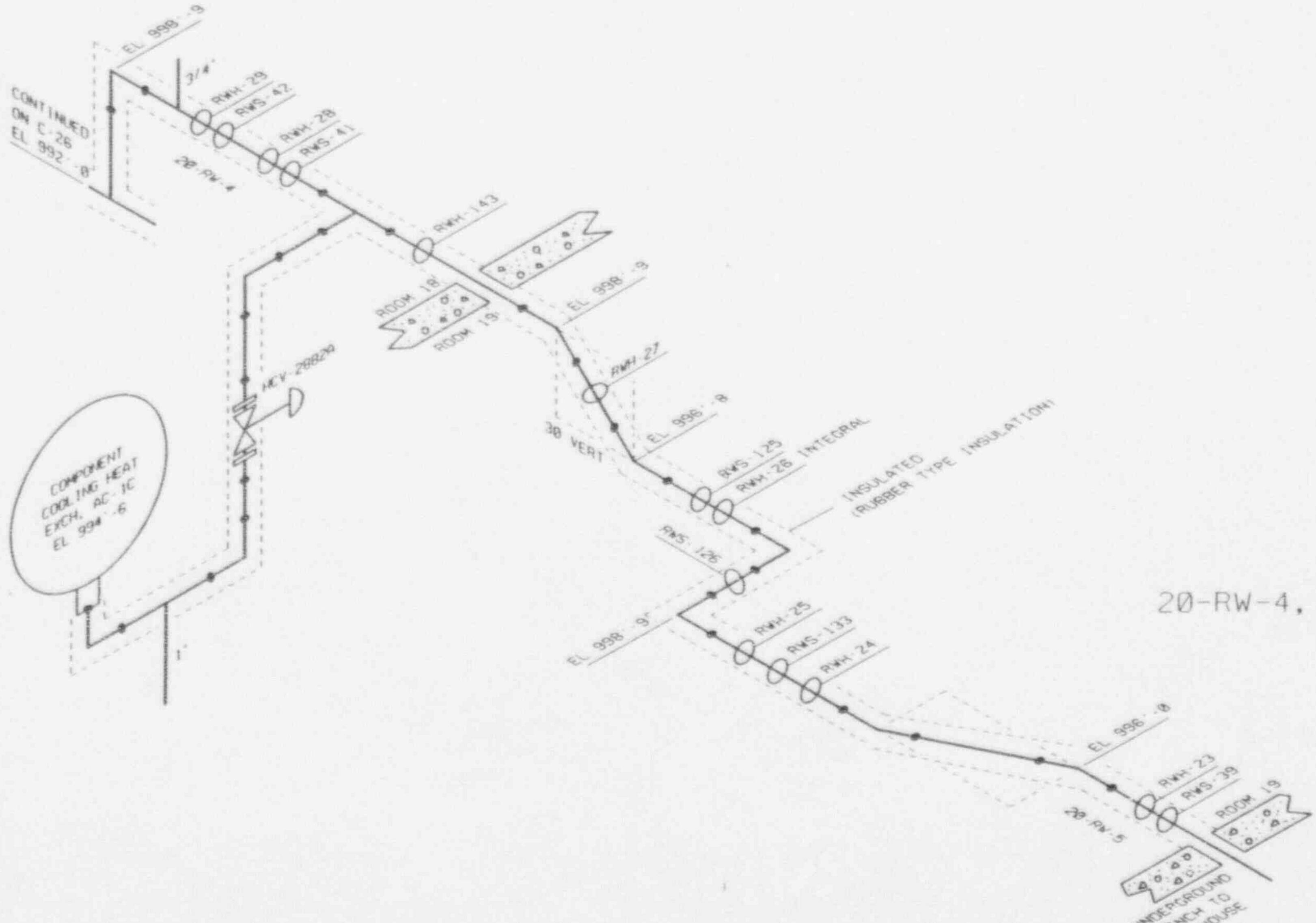


12-RW-2A, 12-RW-2B,
14-RW-2, 16-RW-3,
16-RW-4, 16-RW-6,
20-RW-4

AUXILIARY BLDG
ROOM 18

REF.DWGS.
D-4251,SH.2 OF 5 R-5
M-100, R-32

FORT CALHOUN STATION
I.S.I. ISOMETRIC C-26



20-RW-4, 20-RW-5

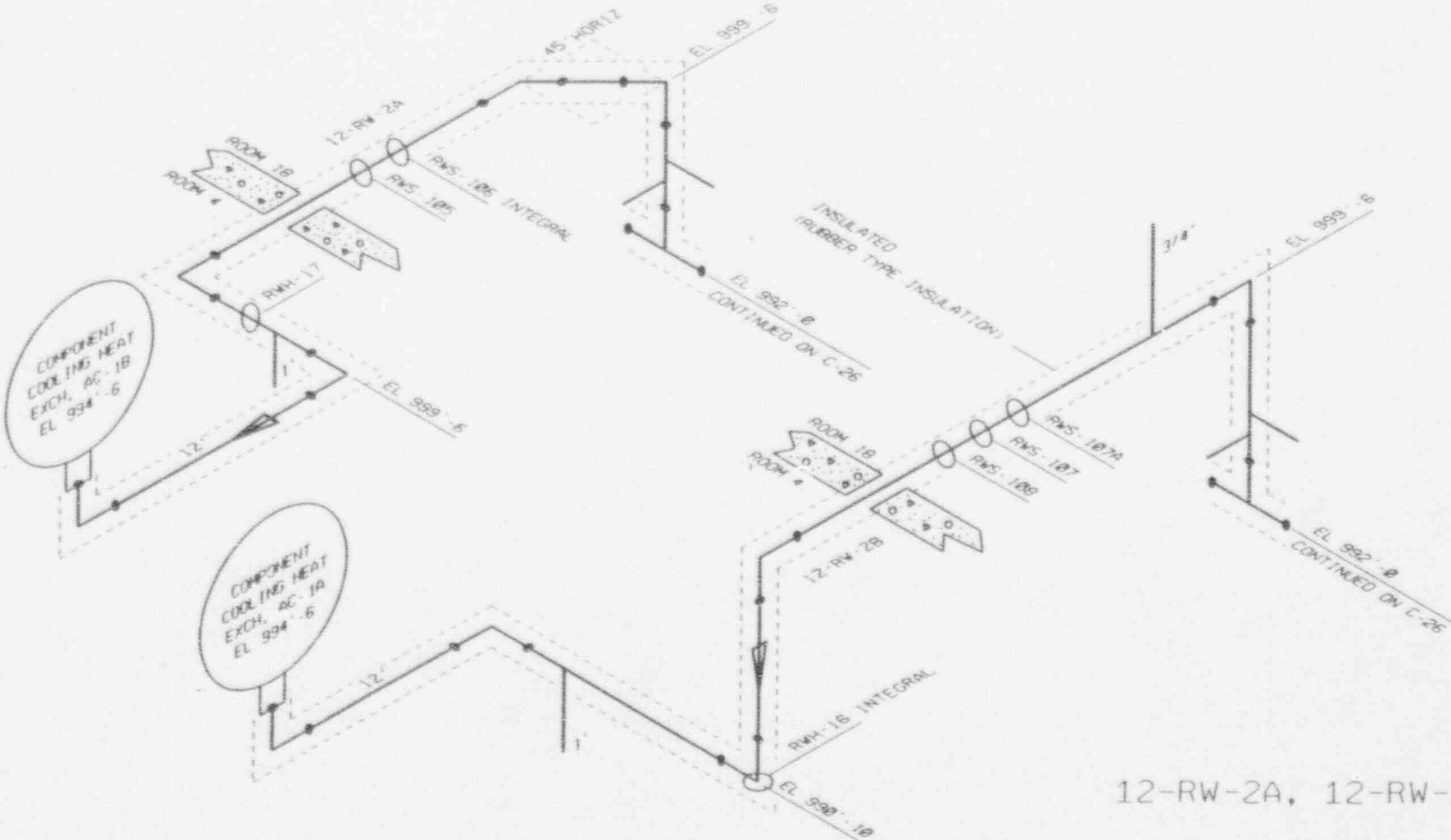
AUXILIARY BLDG
ROOM 18, ROOM 19

FOR INFORMATION ONLY

REF. DWGS.
D-4251, SH.3 OF 5 R-2
M-100, R-32

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-27



12-RW-2A, 12-RW-2B

AUXILIARY BLDG

ROOM 4, ROOM 18

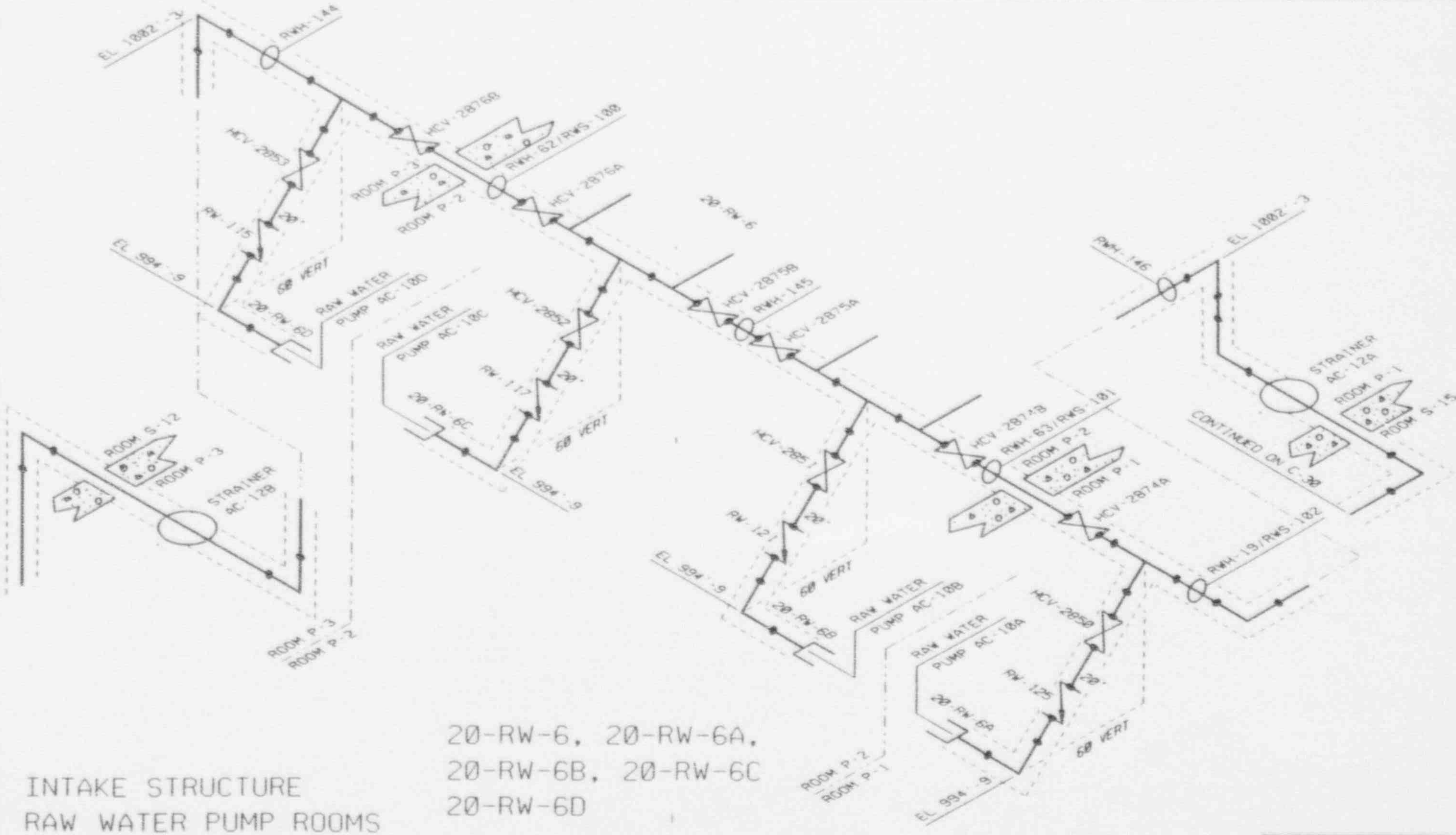
REF.DWGS.
D-4251.SH.5 OF 5 R-2
M-100, R-32

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-28

FOR INFORMATION ONLY



20-RW-6, 20-RW-6A,
20-RW-6B, 20-RW-6C
20-RW-6D

INTAKE STRUCTURE
RAW WATER PUMP ROOMS
ROOM P-1, ROOM P-2
ROOM P-3, ROOM S-12
ROOM S-15

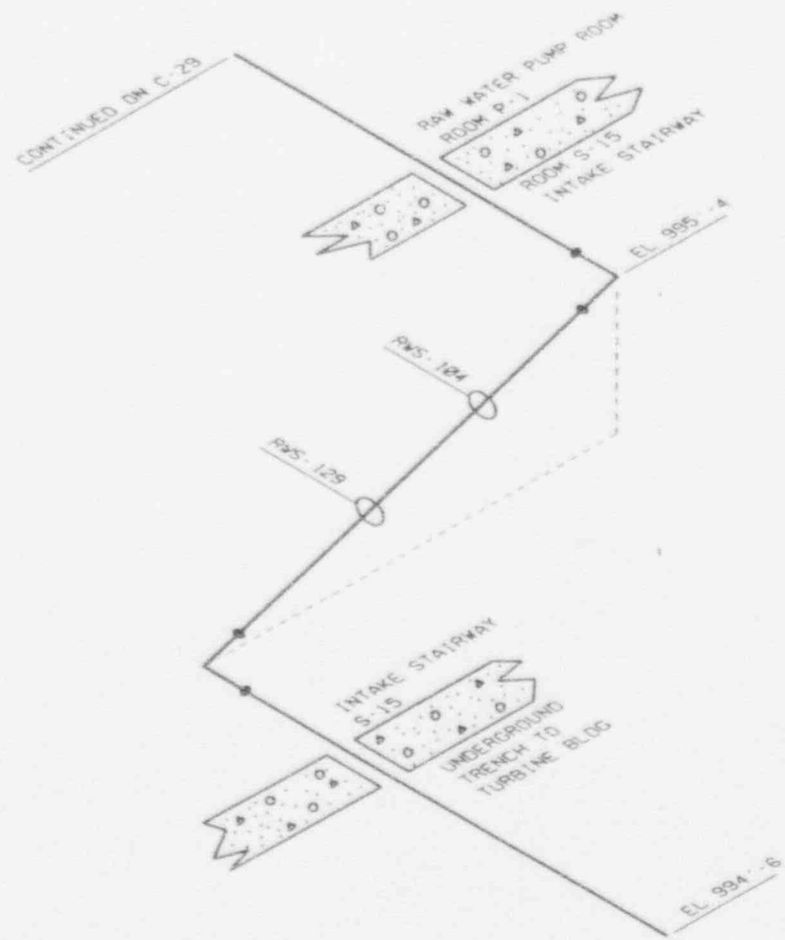
REF. DWGS.
D-4252, SH. 1 OF 1 R-1
M-100.

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-29



20-RW-7

INTAKE STRUCTURE

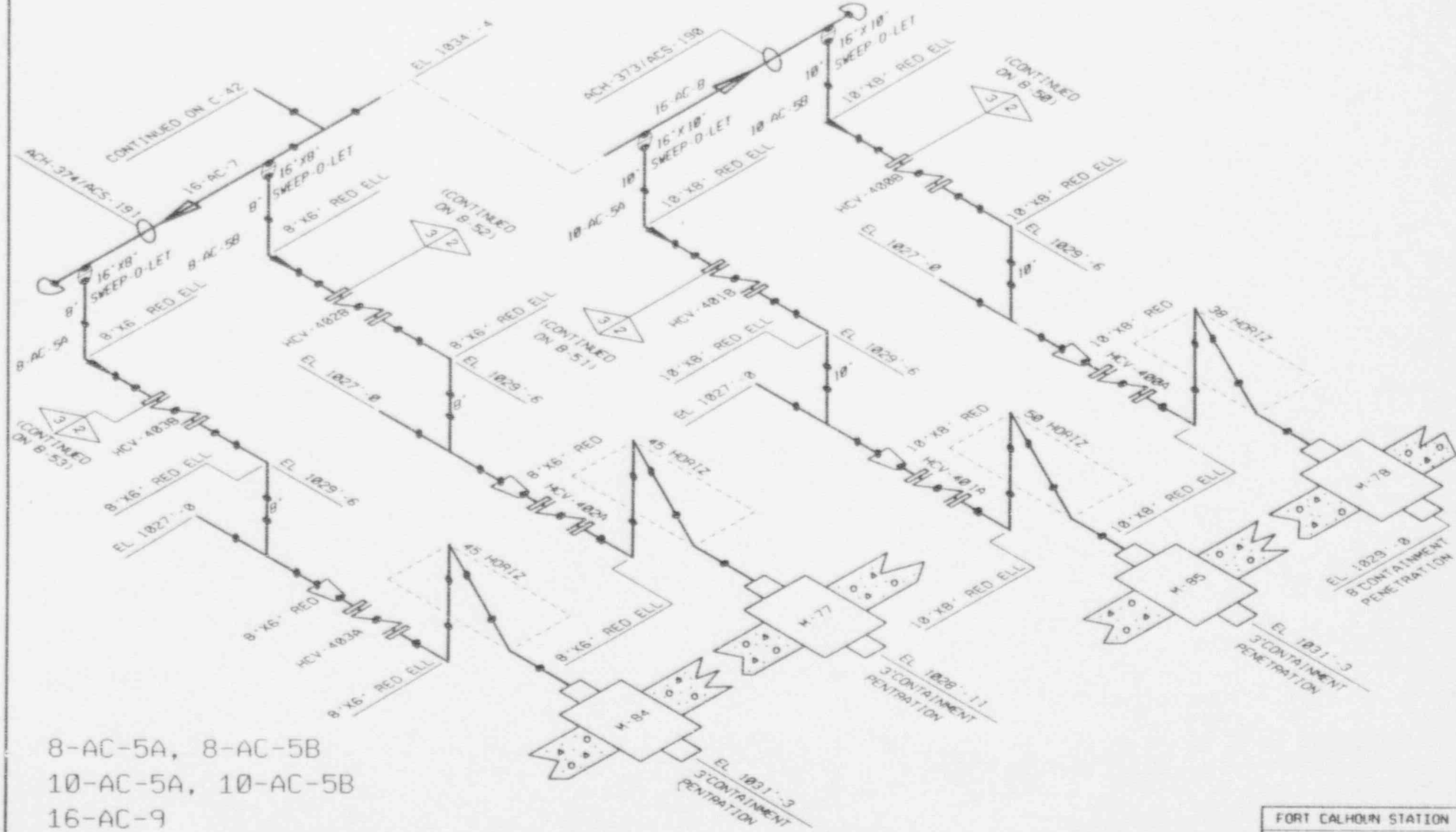
REF.DWGS.
D-4253,SH.1 OF 1 R-2
M-100.

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-30



8-AC-5A, 8-AC-5B
10-AC-5A, 10-AC-5B
16-AC-9

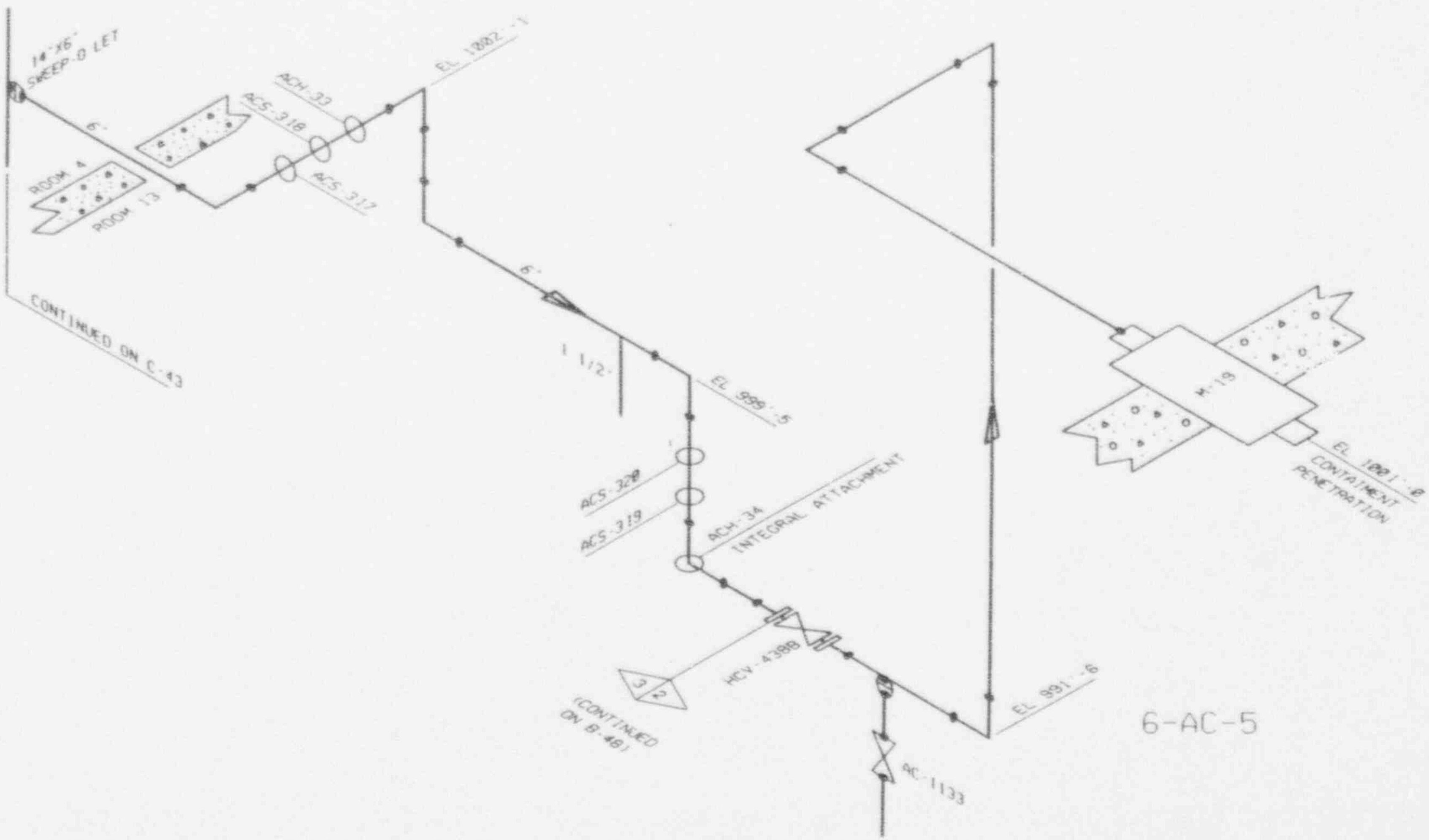
AUXILIARY BLDG
ROOM 69

REF. DWGS.
D-4218, SH.2 OF 6 R-2
M-40

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-31

FOR INFORMATION ONLY

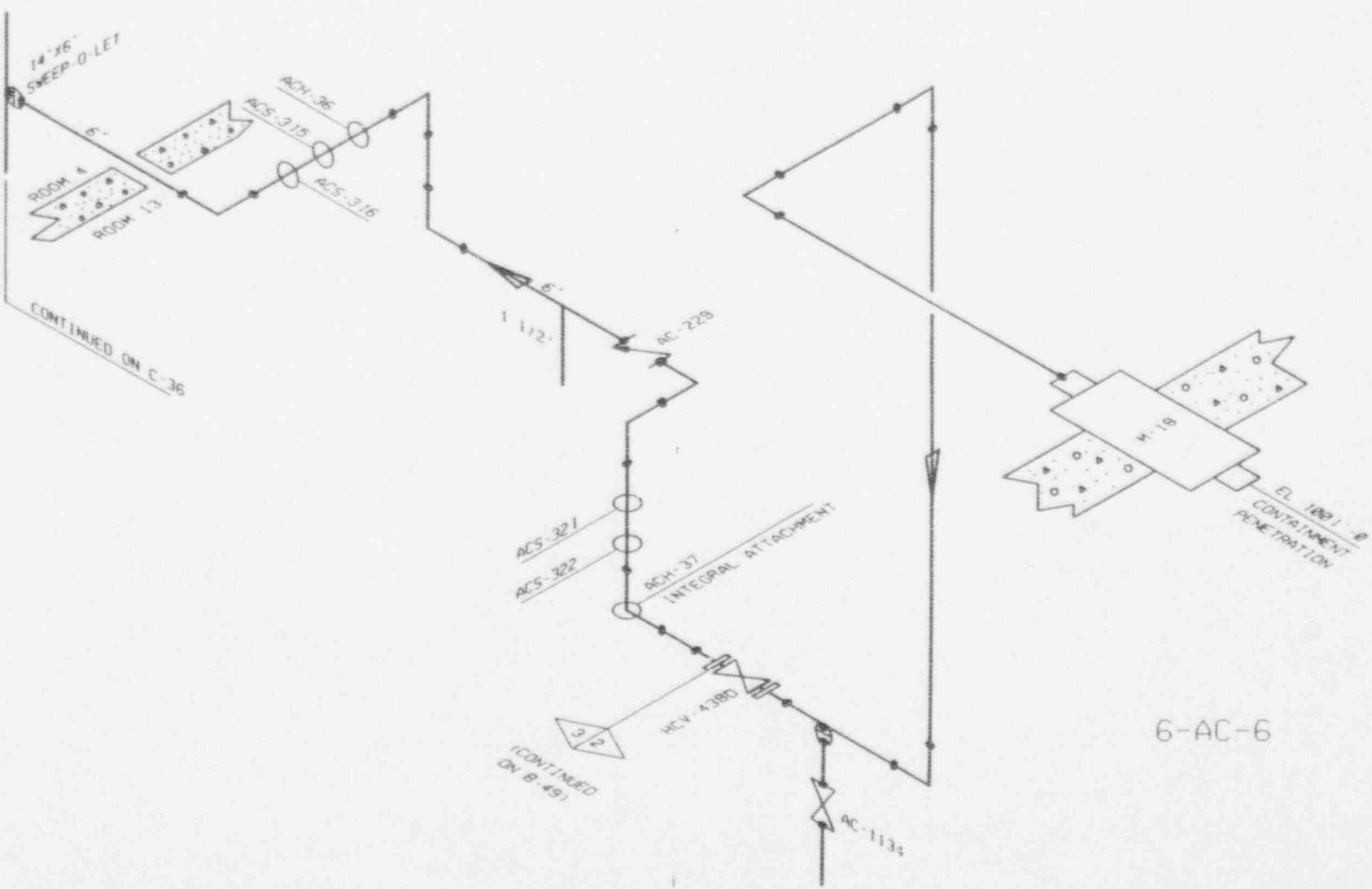


AUXILIARY BLDG
ROOM 4, ROOM 13

REF.DWGS.
D-4210 R-3
M-40

FORT CALHOUN STATION
I.S.I. ISOMETRIC C-32

FOR INFORMATION ONLY



6-AC-6

AUXILIARY BLDG
ROOM 4, ROOM 13

REF.DWGS.
D-4209 R-4
M-40

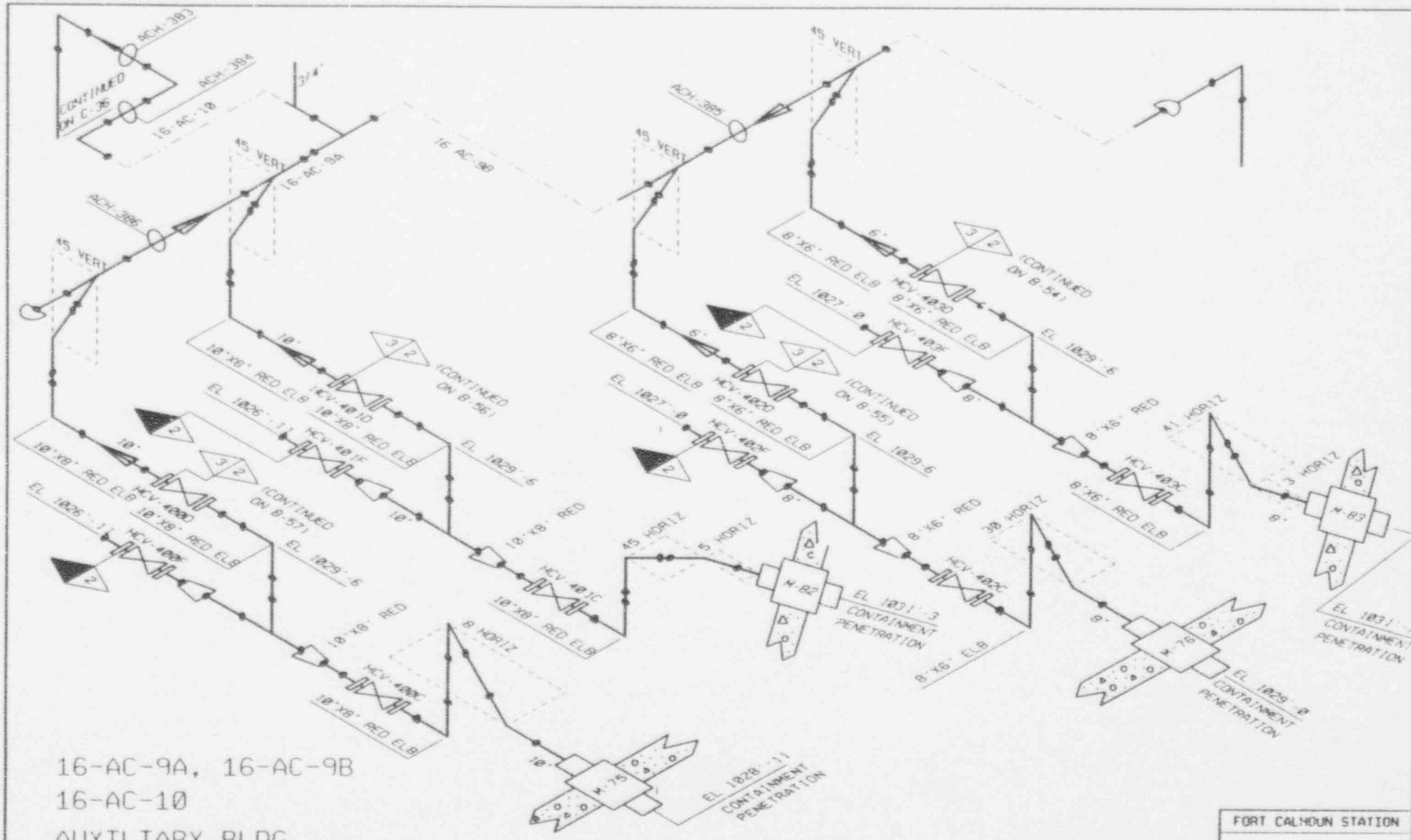
FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-33

DWG. FIGURE C-33, SH. 1

FOR INFORMATION ONLY

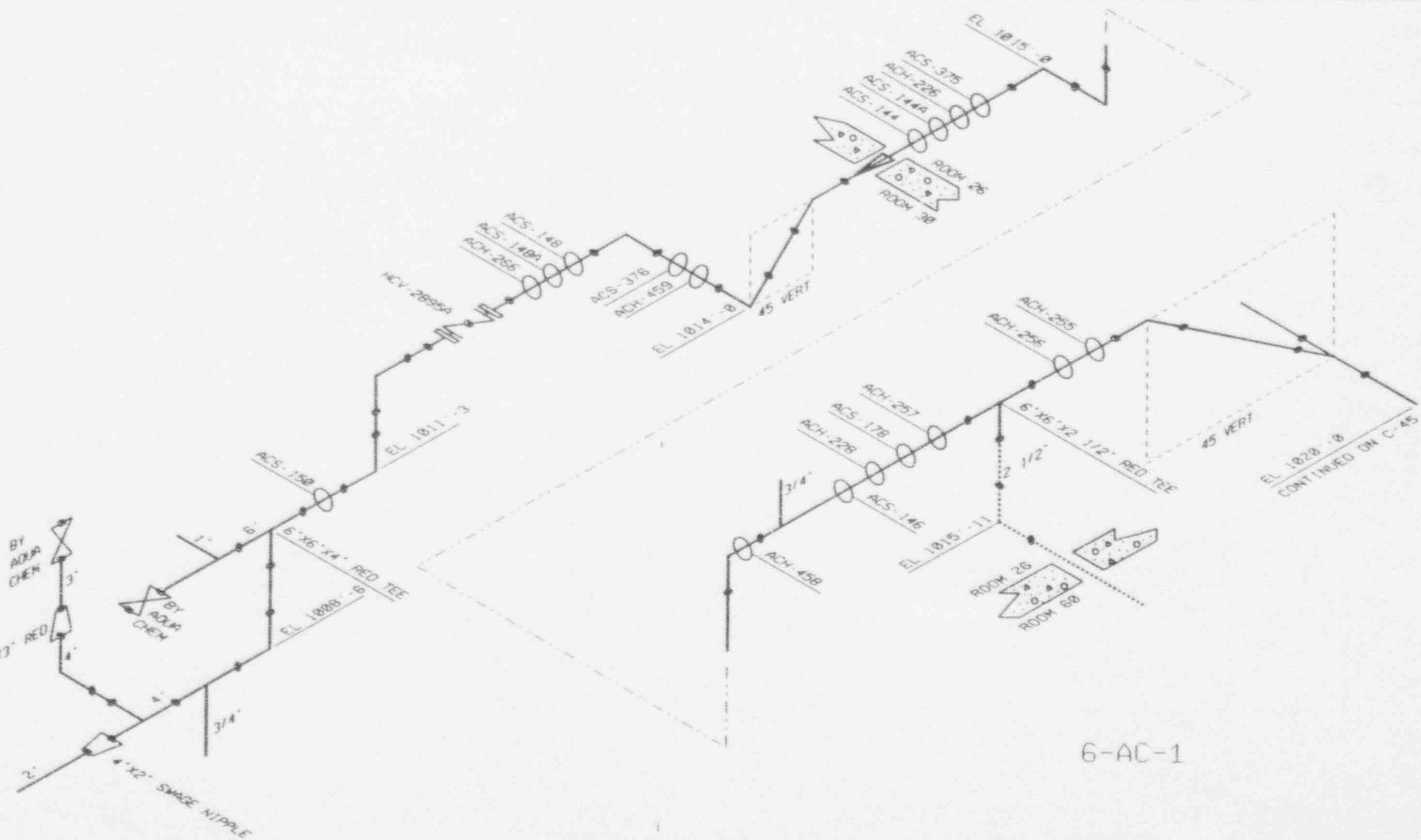


16-AC-9A, 16-AC-9B
16-AC-10
AUXILIARY BLDG
ROOM 69
FL EL 1007'-0

REF.DWGS.
D-4208.SH.1 OF 9 R-2
M-40

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-34



6-AC-1

AUXILIARY BLDG
ROOM 26, ROOM 30

REF.DWGS.
D-4110 R-2
M-10

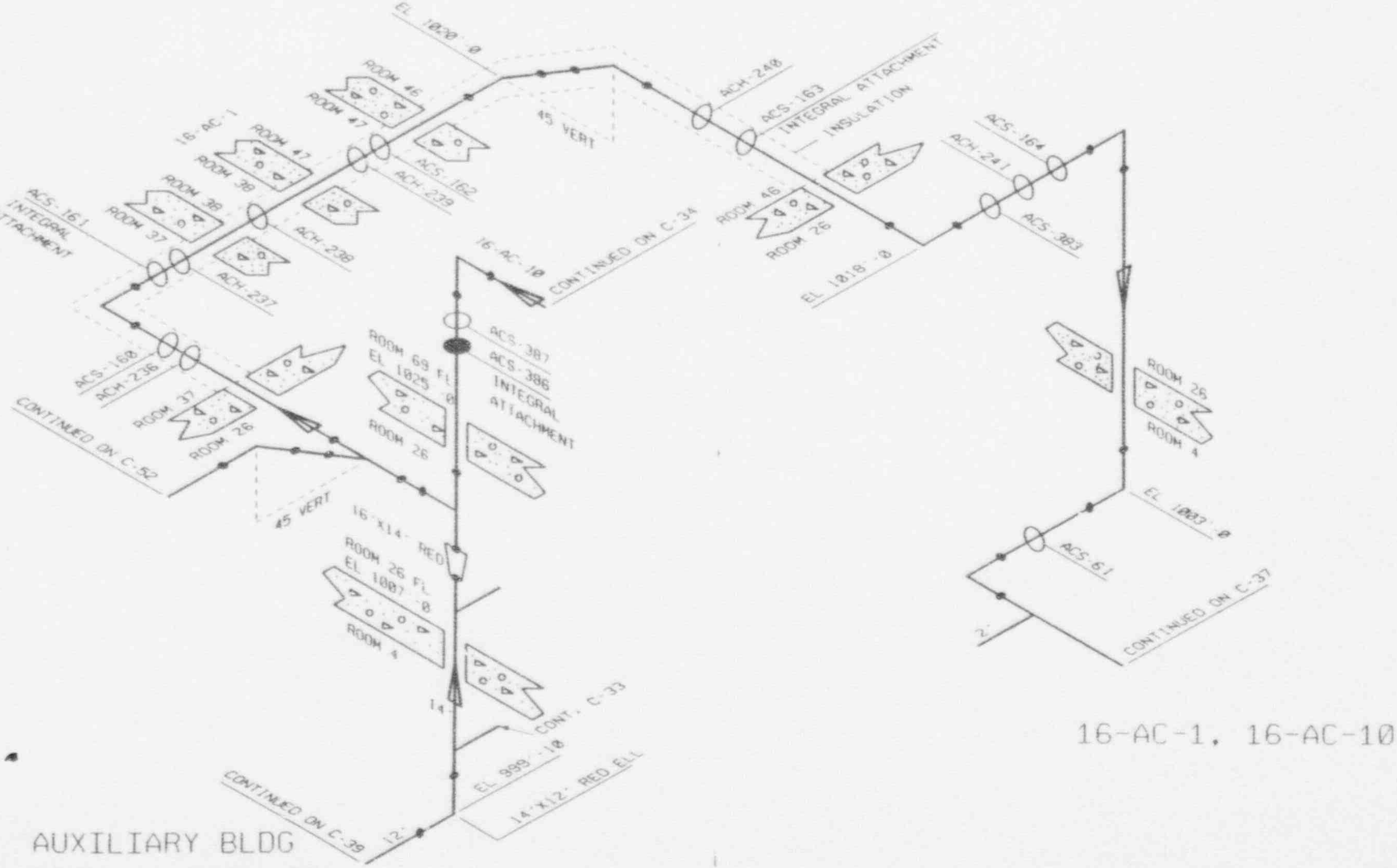
FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-35

DWG. FIGURE C-35, SH. 1

FOR INFORMATION ONLY



16-AC-1, 16-AC-10

AUXILIARY BLDG
ROOM 4, ROOM 26
ROOM 37, ROOM 38
ROOM 46, ROOM 47
ROOM 69

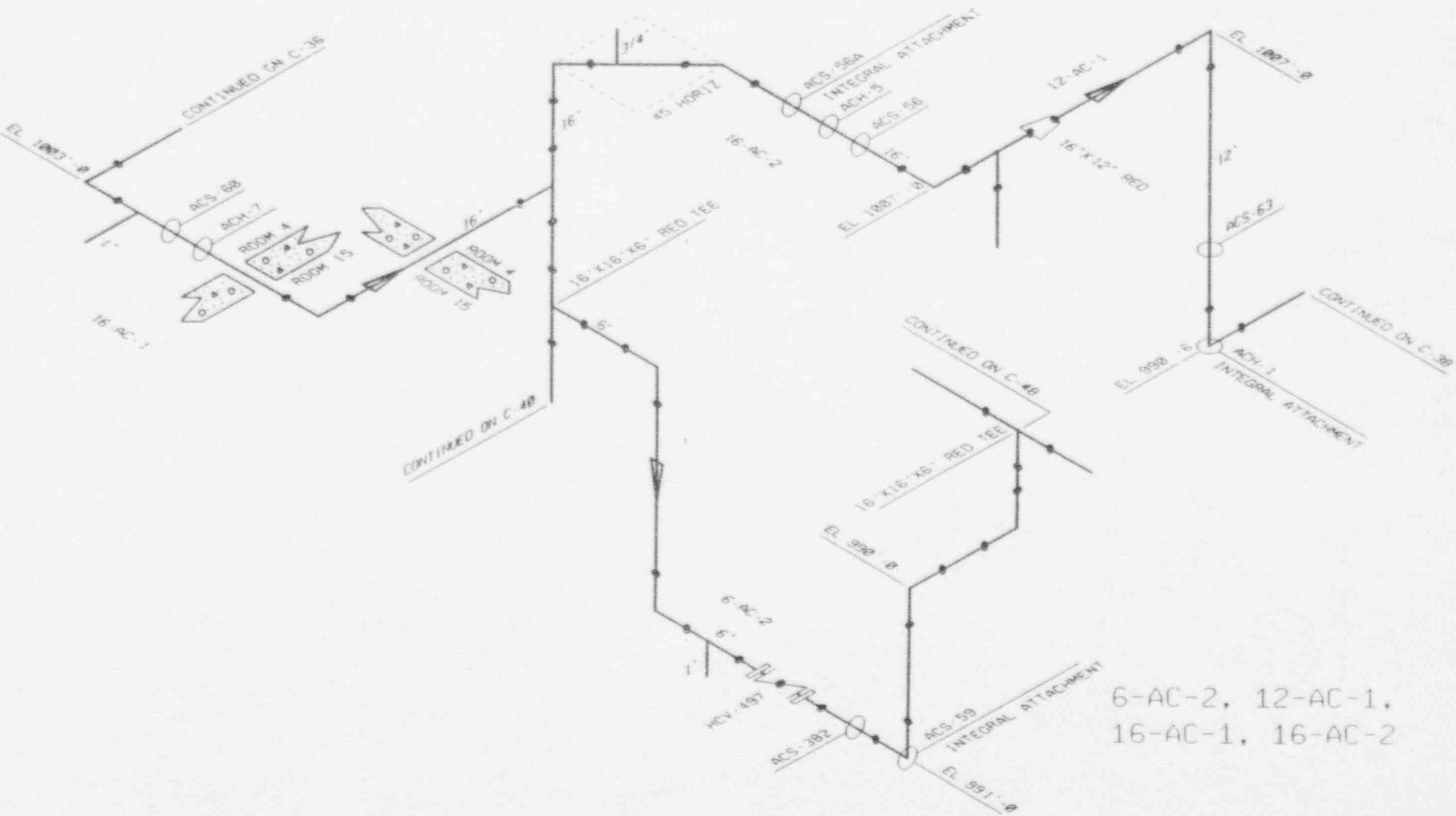
FOR INFORMATION ONLY

REF. DWGS.
D-4208, SH.2 OF 9 A-2
M-10

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-36



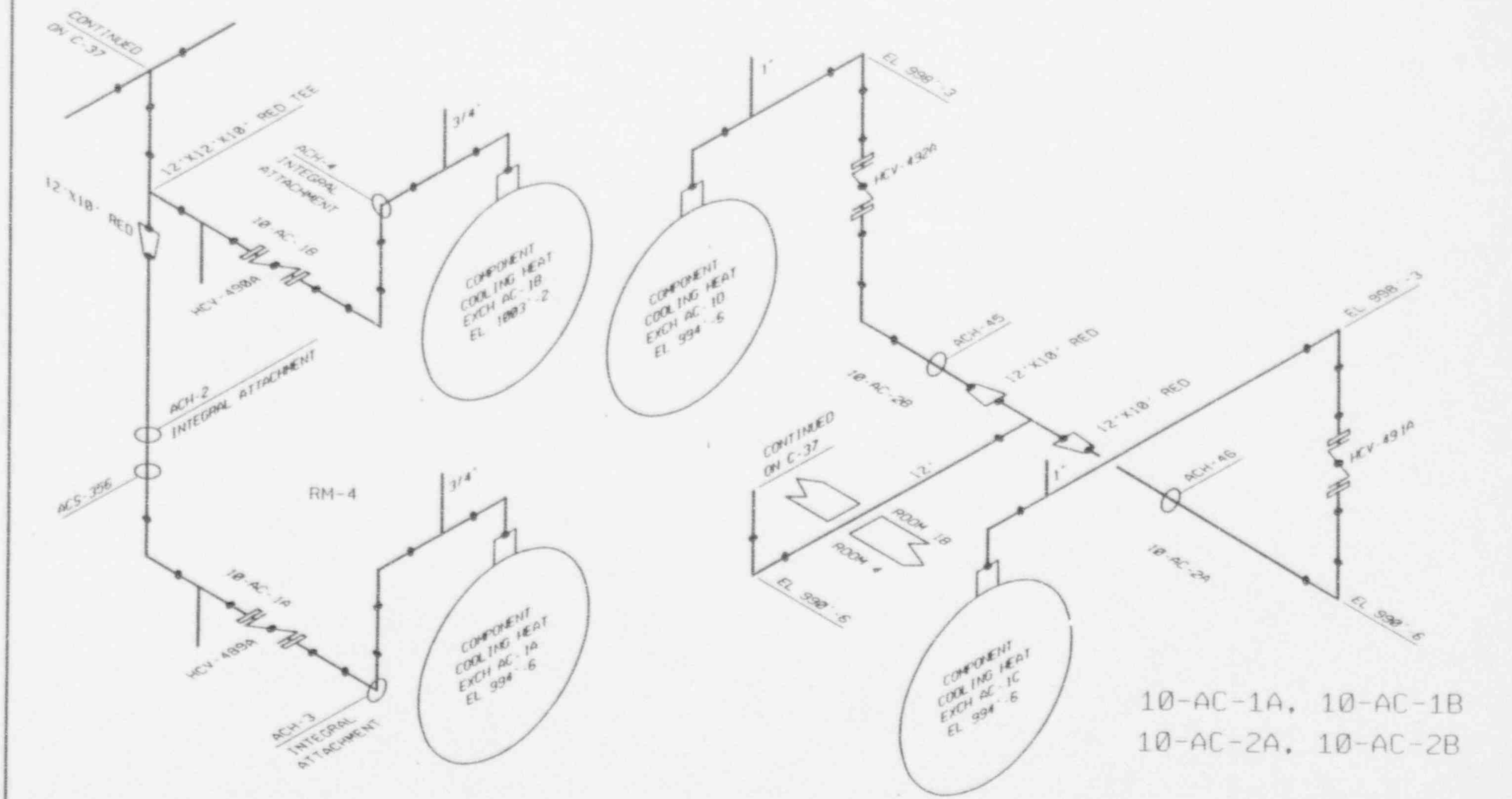
6-AC-2, 12-AC-1,
16-AC-1, 16-AC-2

AUXILIARY BLDG
ROOM 4, ROOM 15

FOR INFORMATION ONLY

REF. DWGS.
D-4208, SH.3 OF 9 R-2
M 10

FORT CALHOUN STATION
I.S.I. ISOMETRIC C-37



AUXILIARY BLDG
ROOM 4,18

REF.DWGS.
D-4208,SH.4 OF 9 R-2
M-10

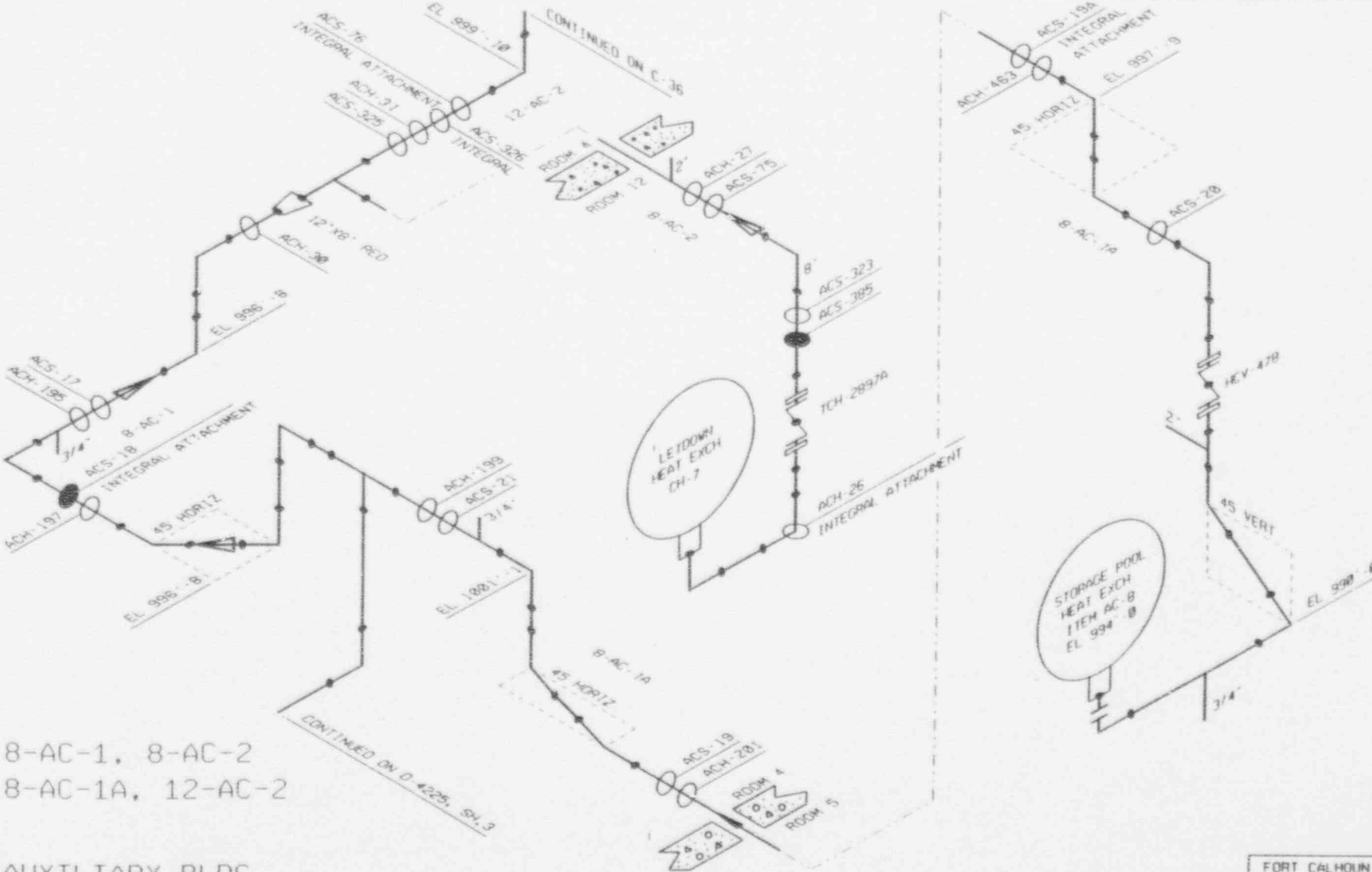
FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-38

DWG. FIGURE C-38, SH. 1

FOR INFORMATION ONLY



8-AC-1, 8-AC-2
8-AC-1A, 12-AC-2

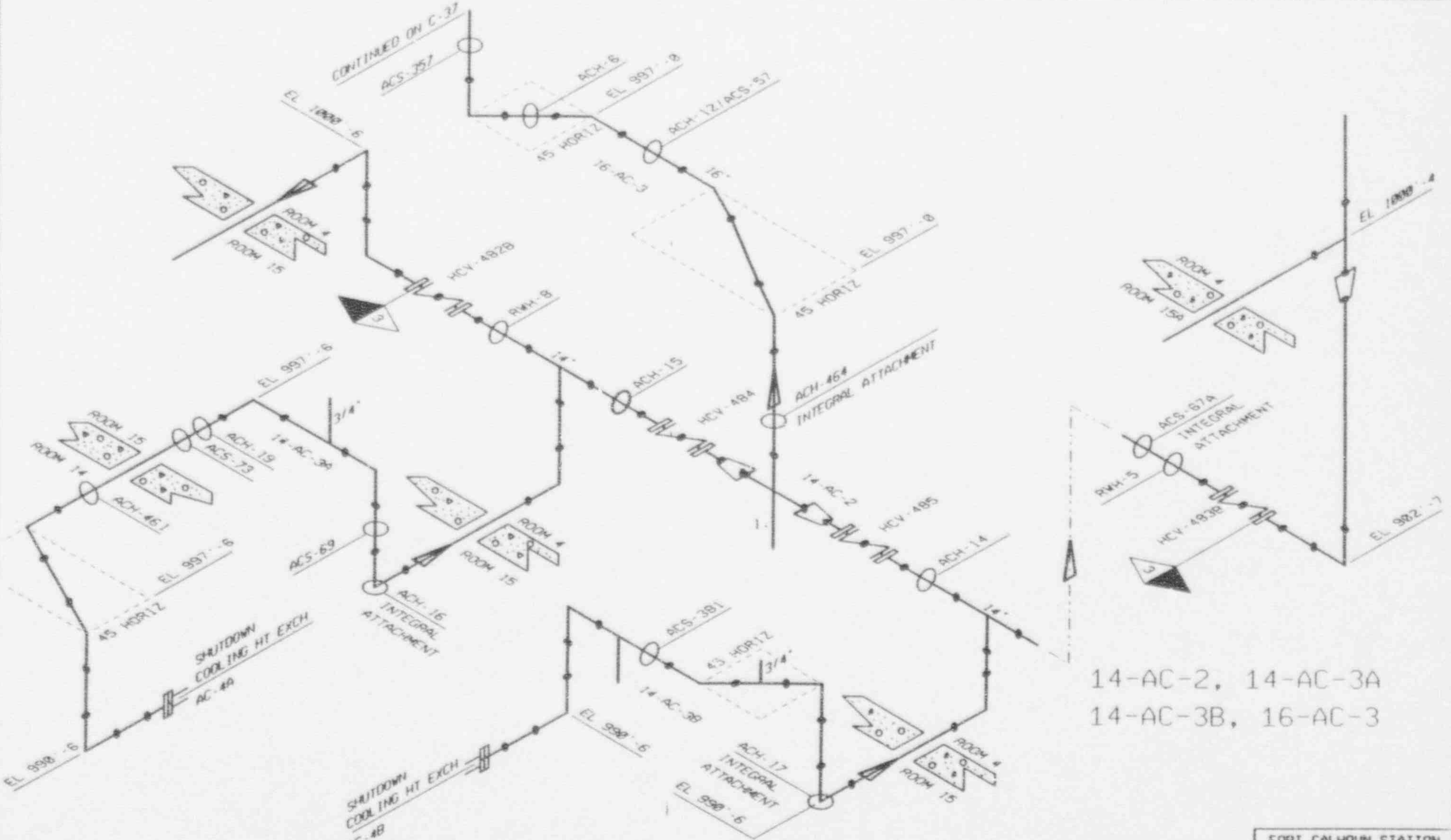
AUXILIARY BLDG
ROOM 4, ROOM 5
ROOM 12

REF.DWGS.
D-4208.SH.5 OF 9 R-2
D-4208.SH.6 OF 9 R-2
M-10

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-39



14-AC-2, 14-AC-3A
14-AC-3B, 16-AC-3

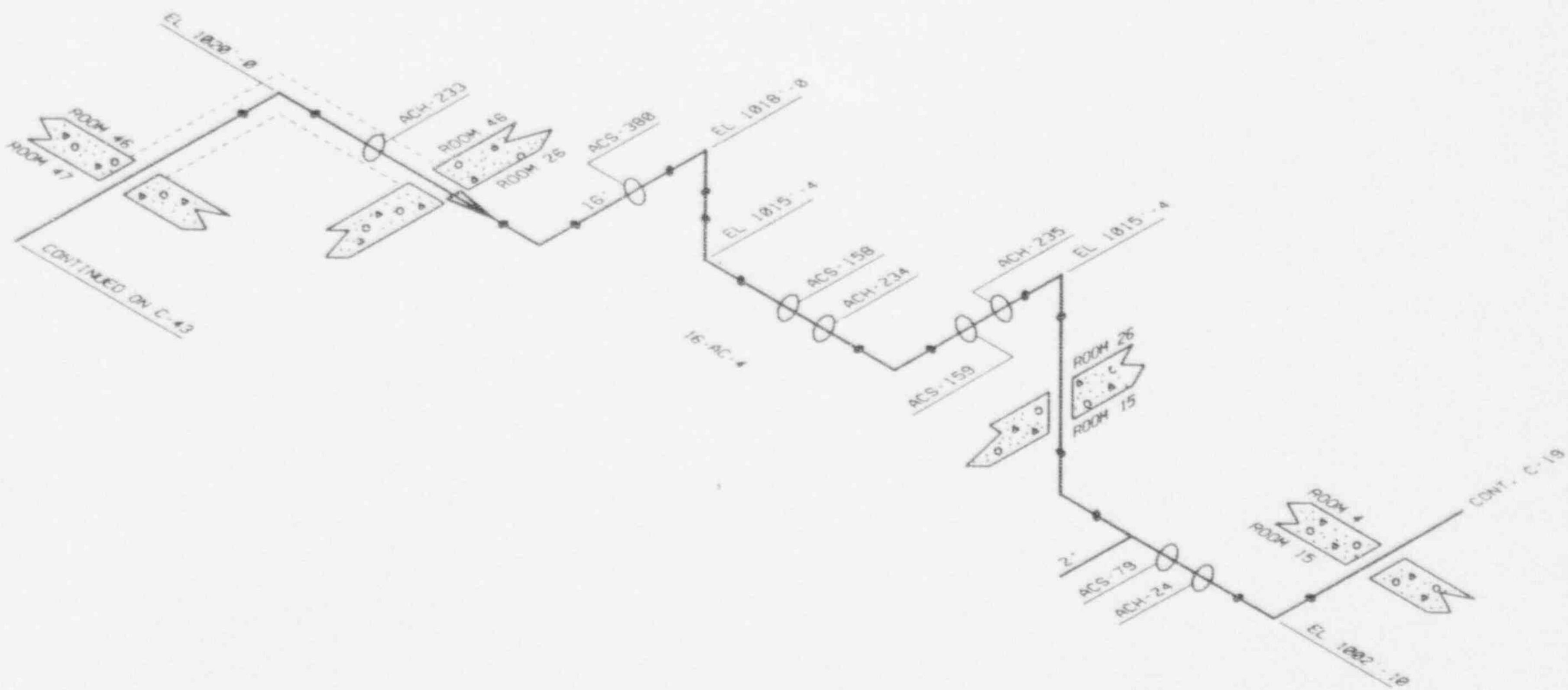
AUXILIARY BLDG
ROOM 4, ROOM 15

REF. DWGS.
D-4208, SH.7 OF 9 R-4
D-4208, SH.9 OF 9 R-3
M-10 M-100

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-40

FOR INFORMATION ONLY



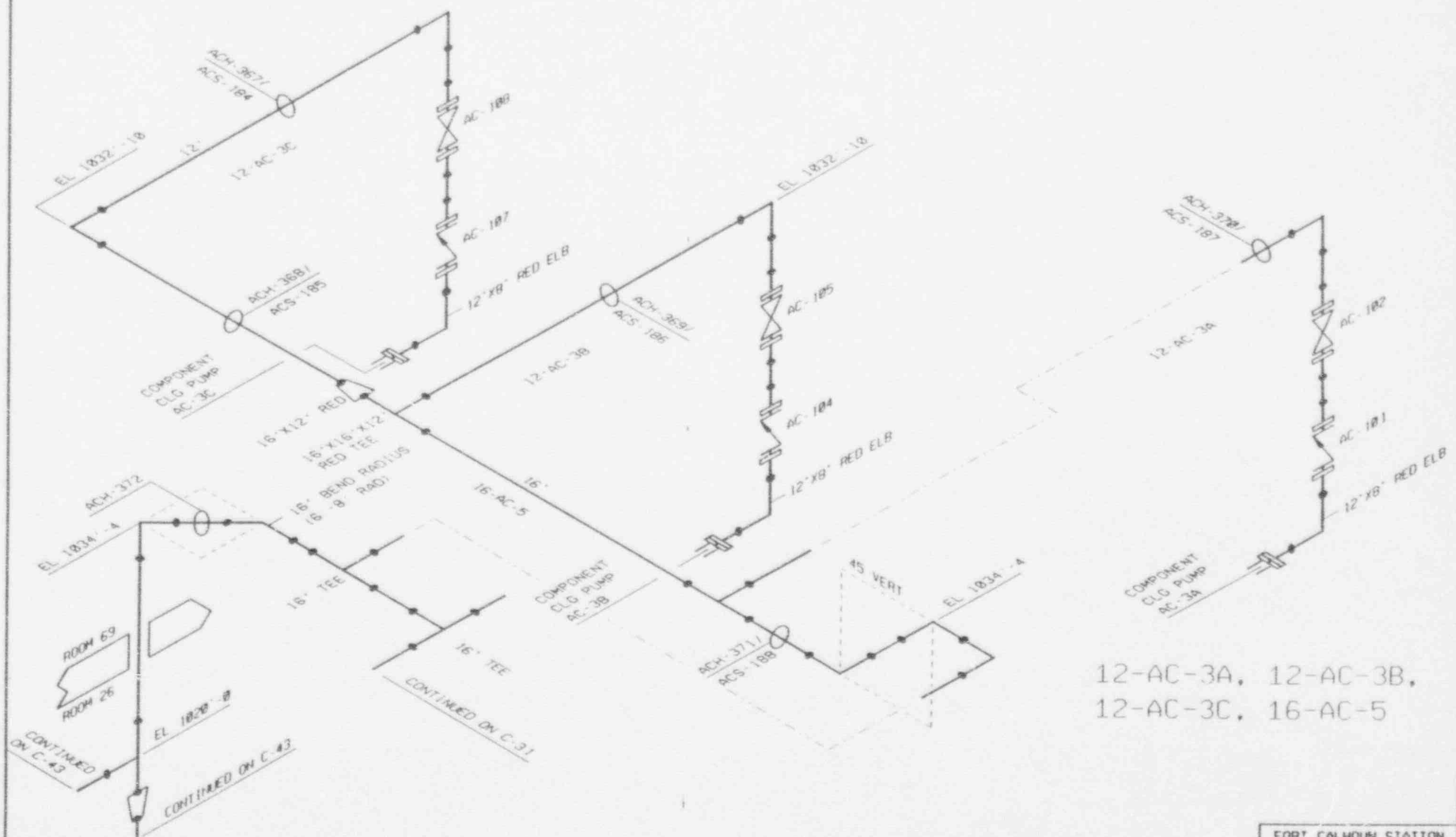
AUXILIARY BLDG
ROOM 46, ROOM 26
ROOM 15

REF.DWGS.
D-4211,SH.1 OF 2 R-2
M-10

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-41



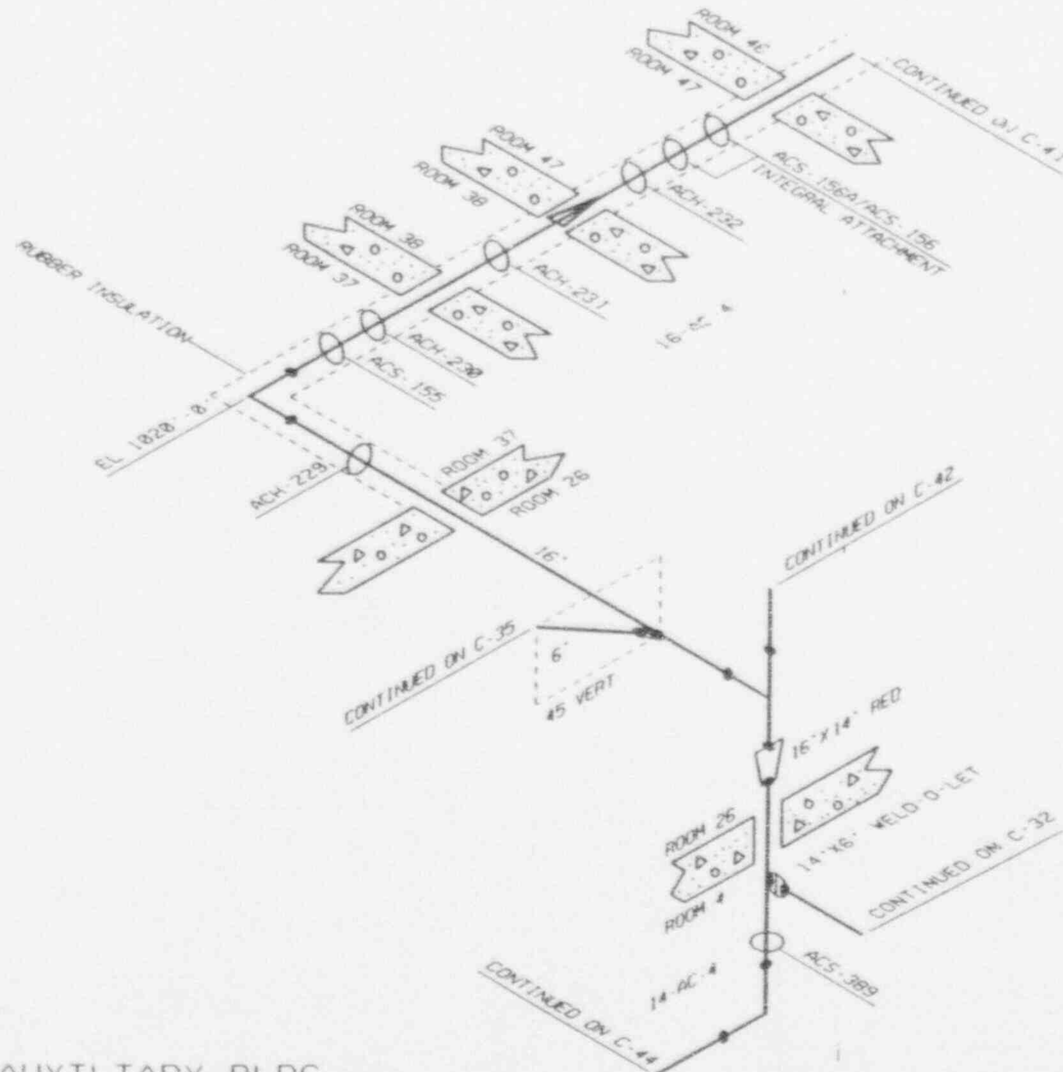
AUXILIARY BLDG
ROOM 69

REF.DWGS.
D-4218,SH.3 OF 6 R-4
M-10

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-42

FOR INFORMATION ONLY



14-AC-4, 16-AC-4

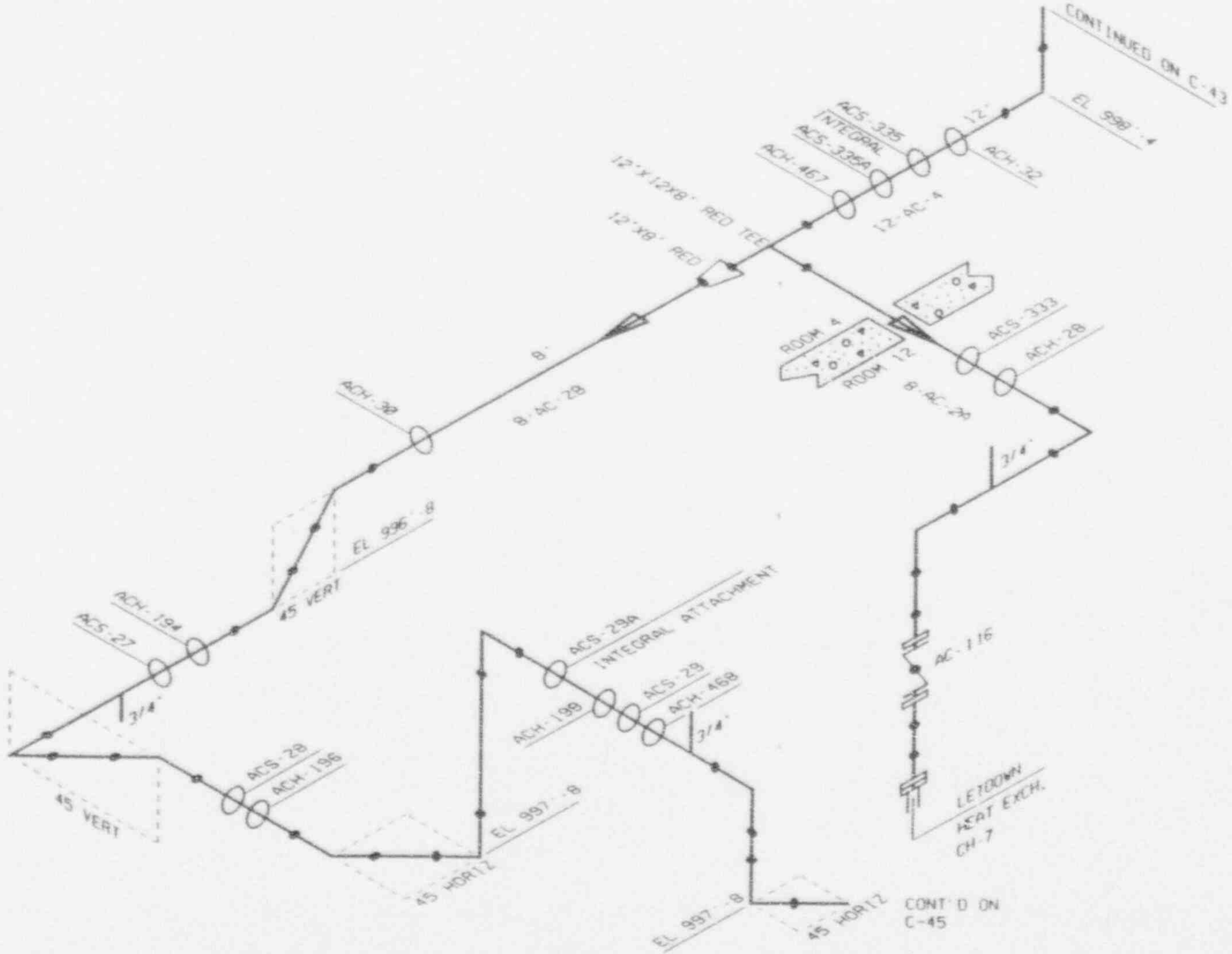
AUXILIARY BLDG
ROOM 4, ROOM 26,
ROOM 37, ROOM 38,
ROOM 47

REF.DWGS.
D-4218,SH.4 OF 6 R-2
M-10

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-43



8-AC-2A, 8-AC-2B,
12-AC-4

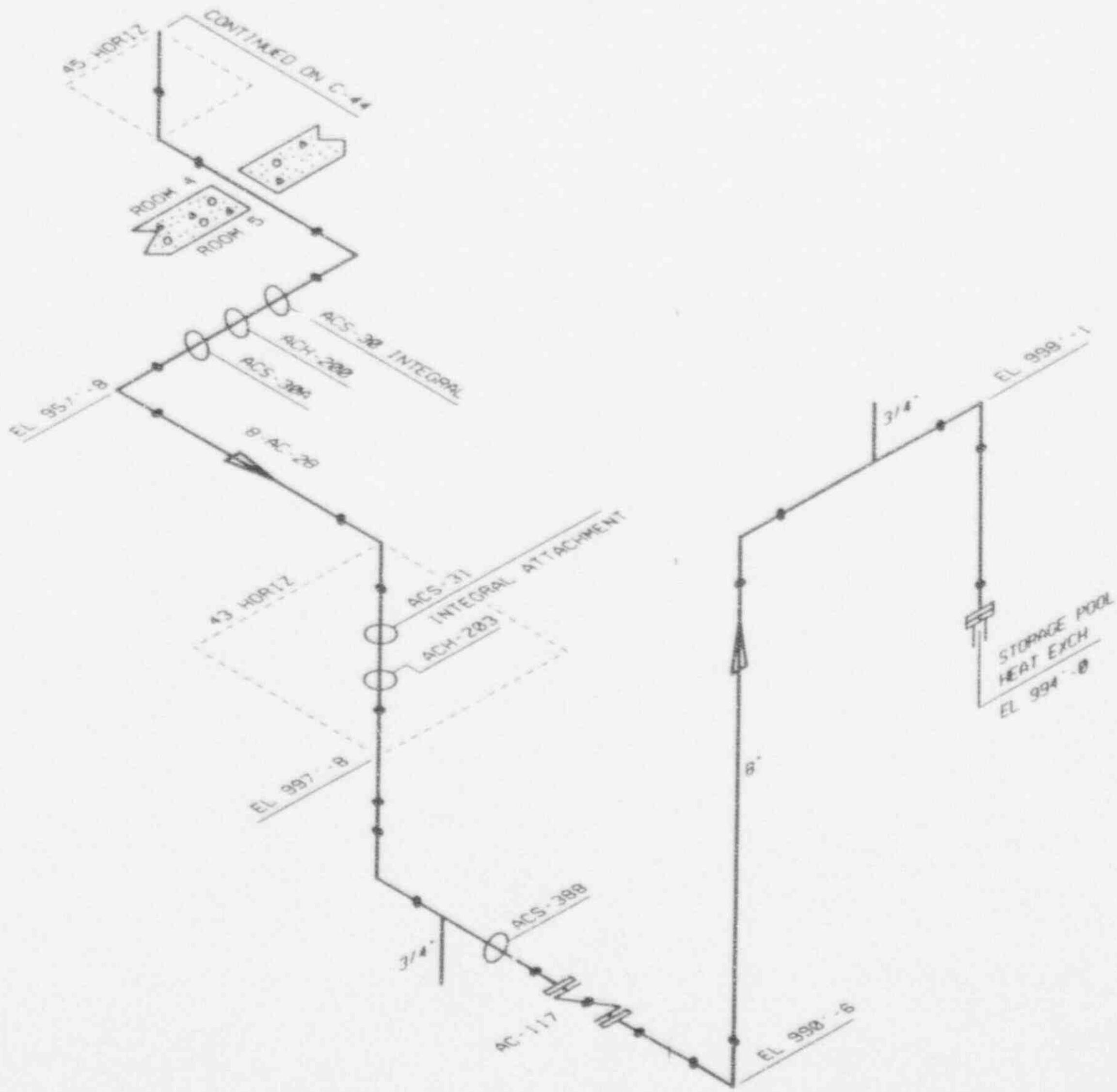
AUXILIARY BLDG
ROOM 4, ROOM 12

REF.DWGS.
D-4218,SH.5 OF 6 R-2
M-10

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-44

FOR INFORMATION ONLY



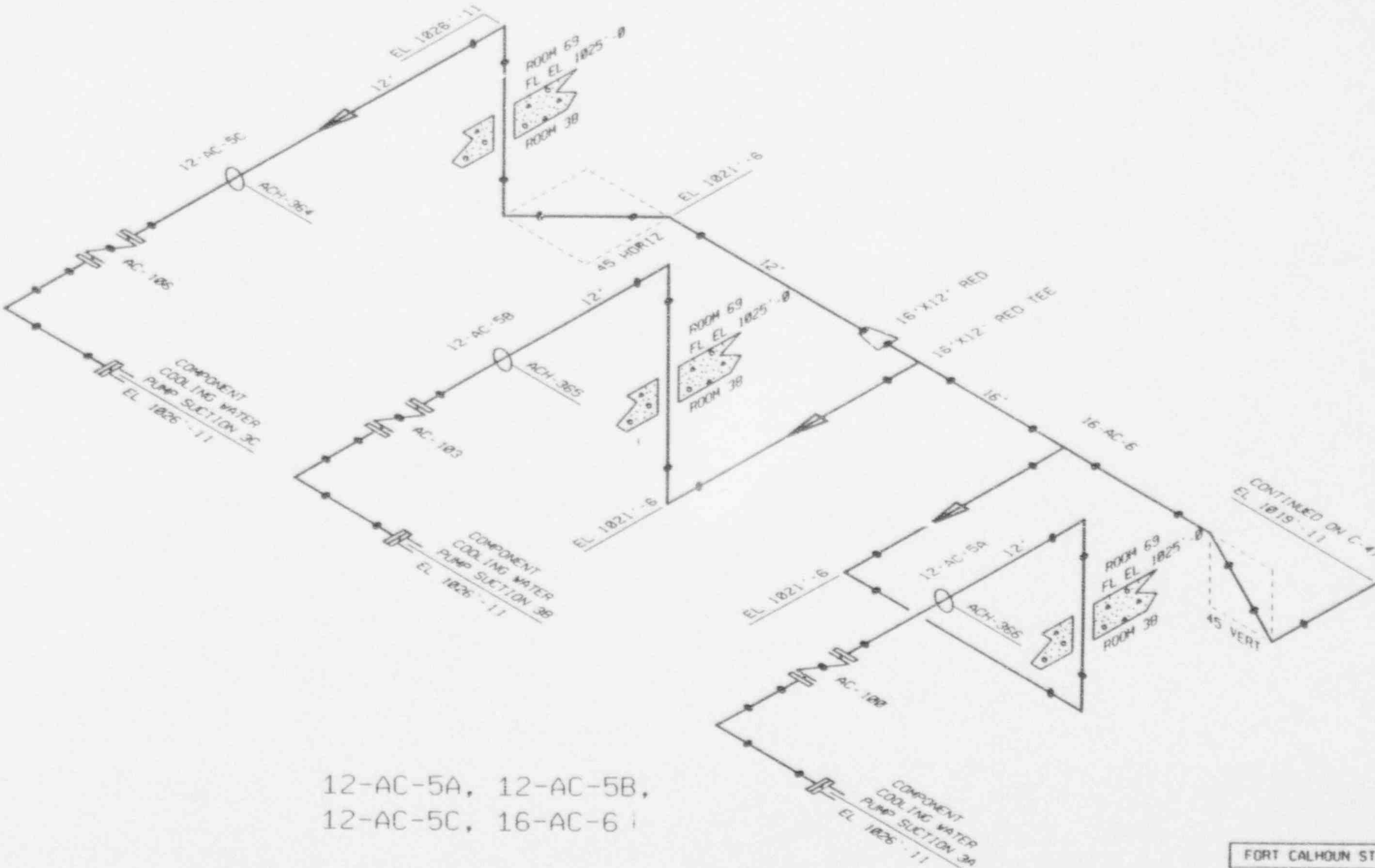
8-AC-2B

AUXILIARY BLDG
ROOM 5

REF. DWGS.
D-4218, SH.6 OF 6 R-2
M-10

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-45



12-AC-5A, 12-AC-5B,
12-AC-5C, 16-AC-6

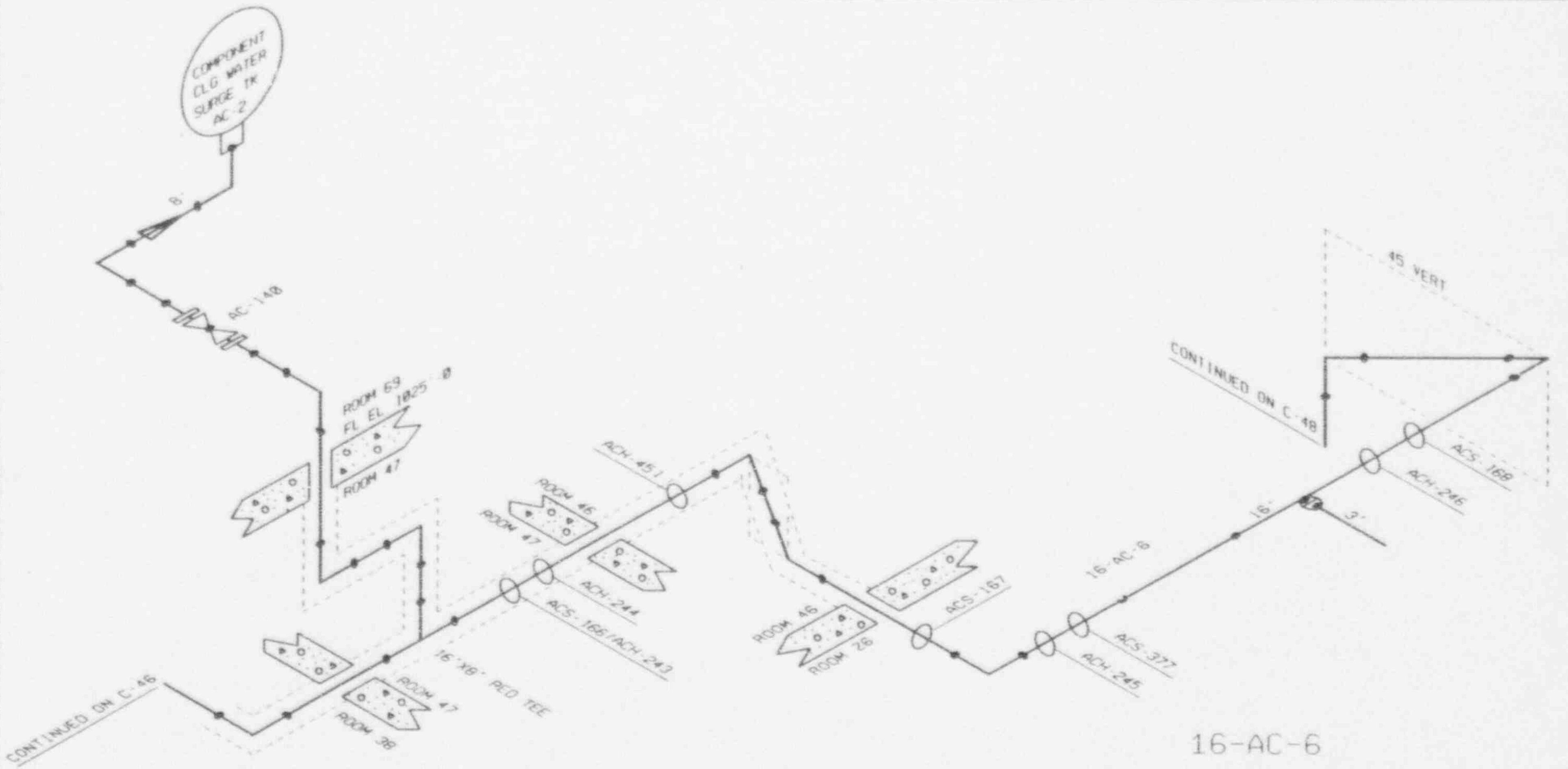
AUXILIARY BLDG
ROOM 38, ROOM 69

REF.DWGS.
D-4220,SH.2 OF 6 R-0
D-4220,SH.1 OF 6 R-0
M-10

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-46

FOR INFORMATION ONLY



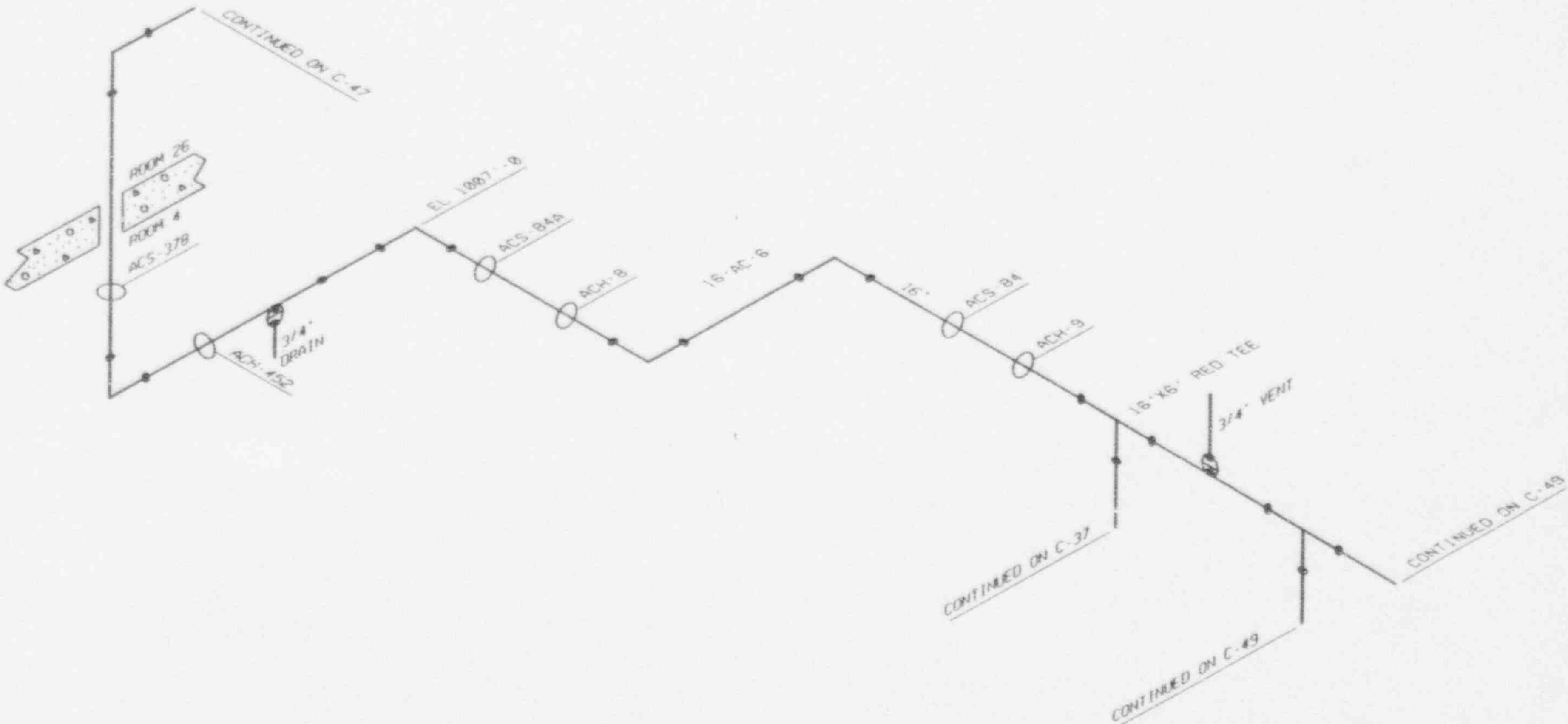
AUXILIARY BLDG
ROOM 26, ROOM 38,
ROOM 46, ROOM 47,
ROOM 69

REF. DWGS.
D-4220, SH. 3 OF 6 R-2
M-10

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-47

FOR INFORMATION ONLY



16-AC-6

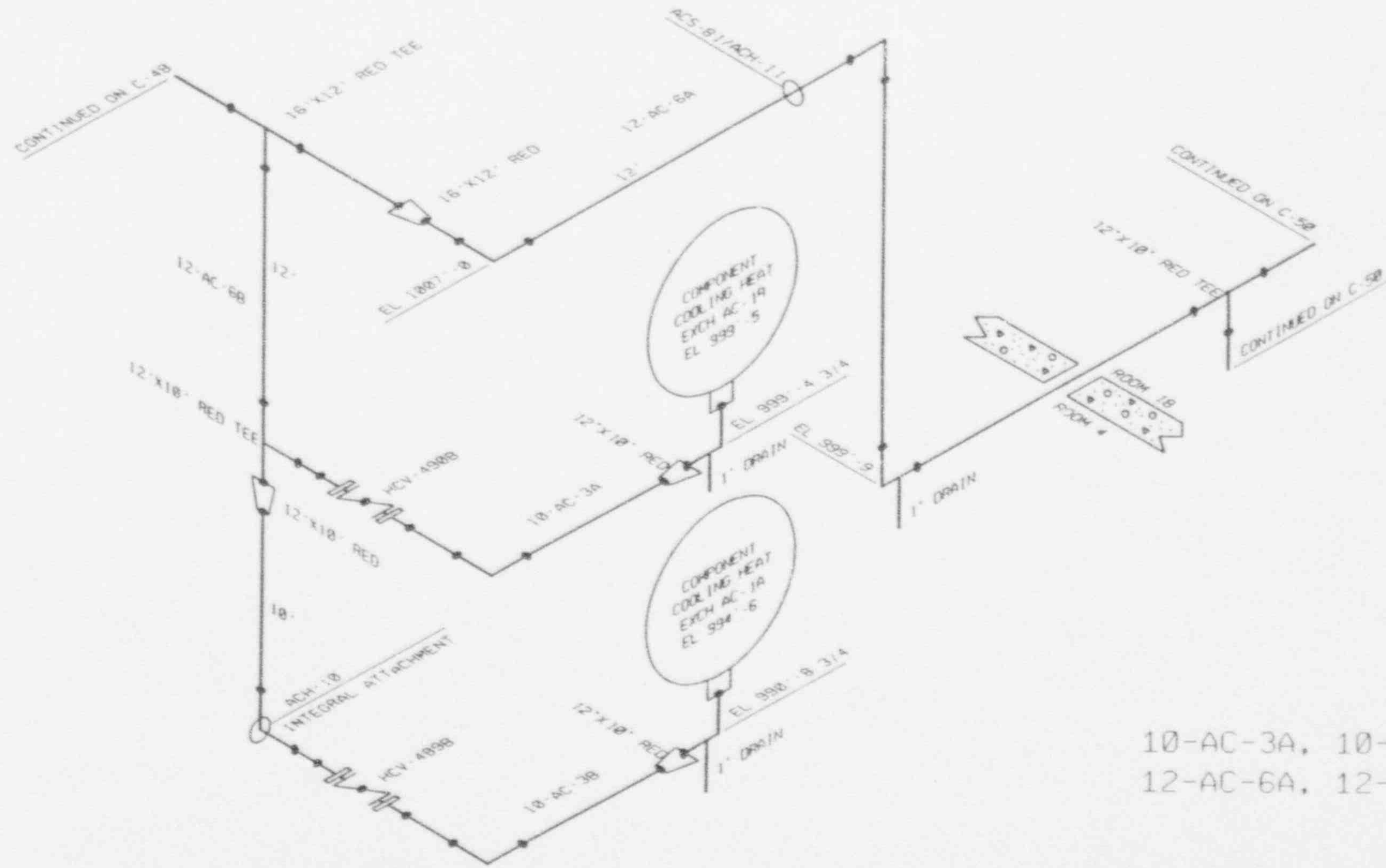
AUXILIARY BLDG
ROOM 4, ROOM 26

REF.DWGS.
D-4220,SH.4 OF 6 R-2
M-10

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-48



10-AC-3A, 10-AC-3B,
12-AC-6A, 12-AC-6B

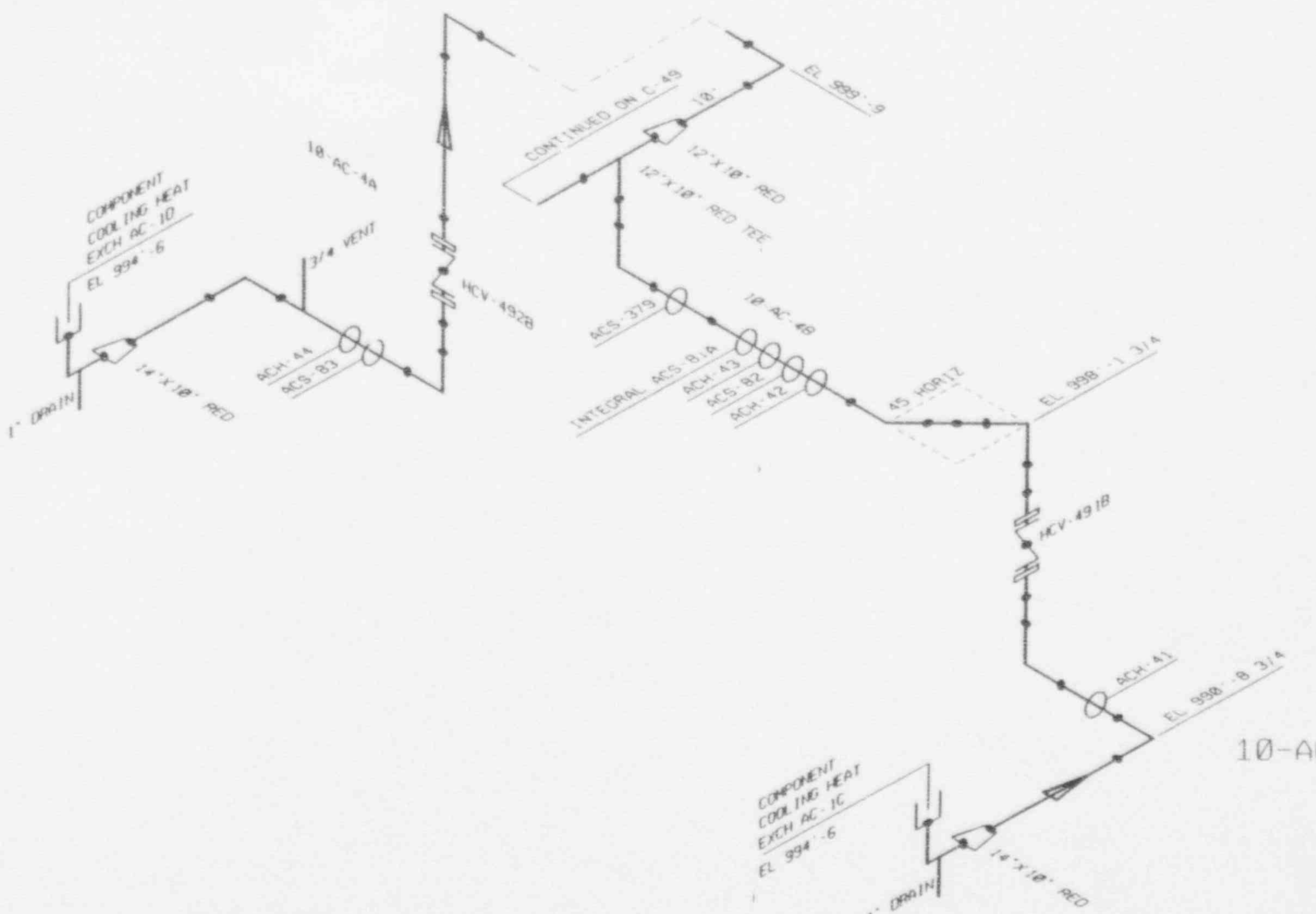
AUXILIARY BLDG
ROOM 4, ROOM 18

REF.DWGS.
D-4220,SH.5 OF 6 R-3

FOR INFORMATION ONLY

FORT CALHOUN STATION

I.S.I. ISOMETRIC
C-49



10-AC-4A, 10-AC-4B

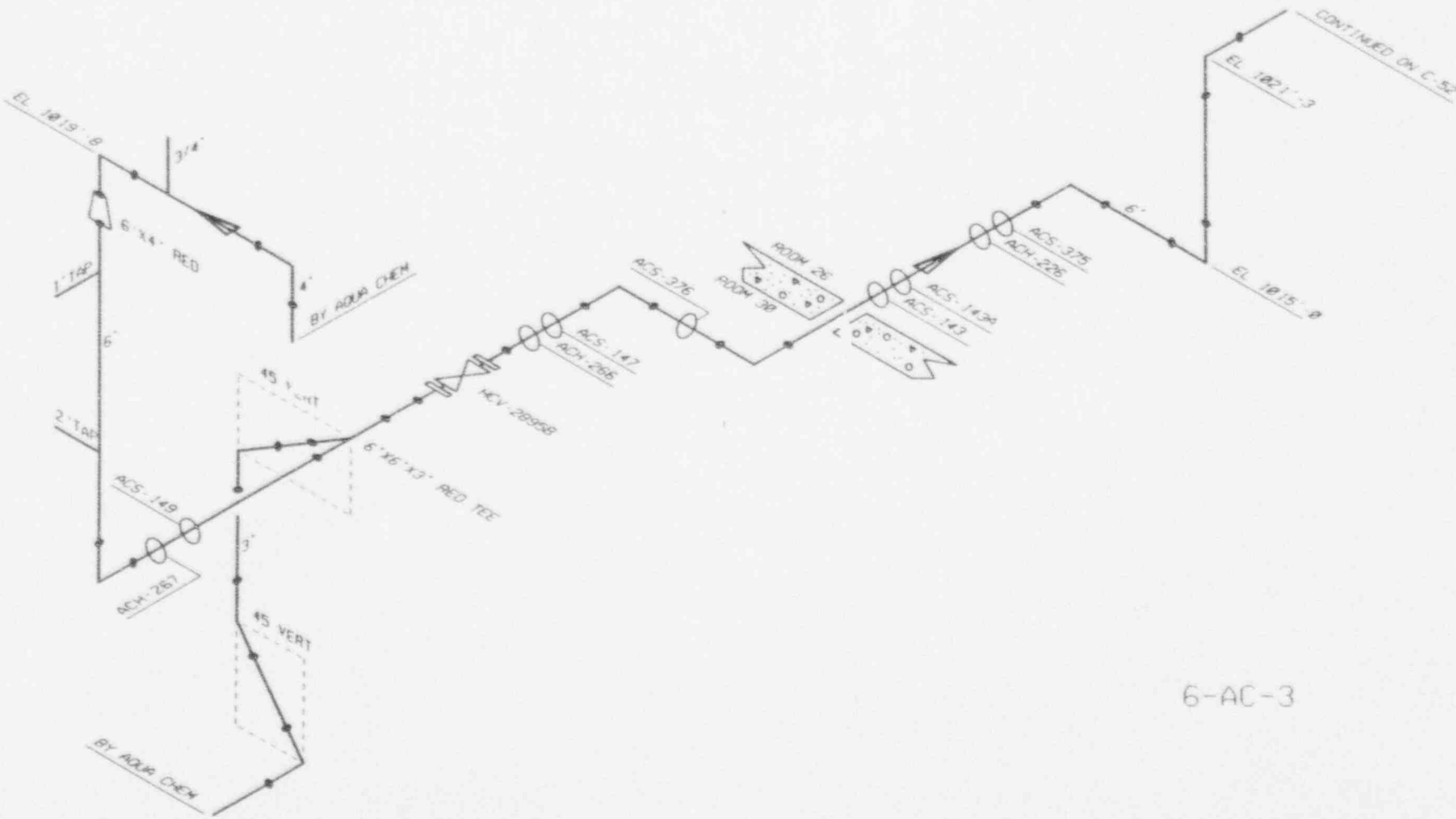
AUXILIARY BLDG
ROOM 18

REF. DWGS.
D-4220, SH.6 OF 6 R-1
M-10

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-50



AUXILIARY BLDG
ROOM 26, ROOM 30

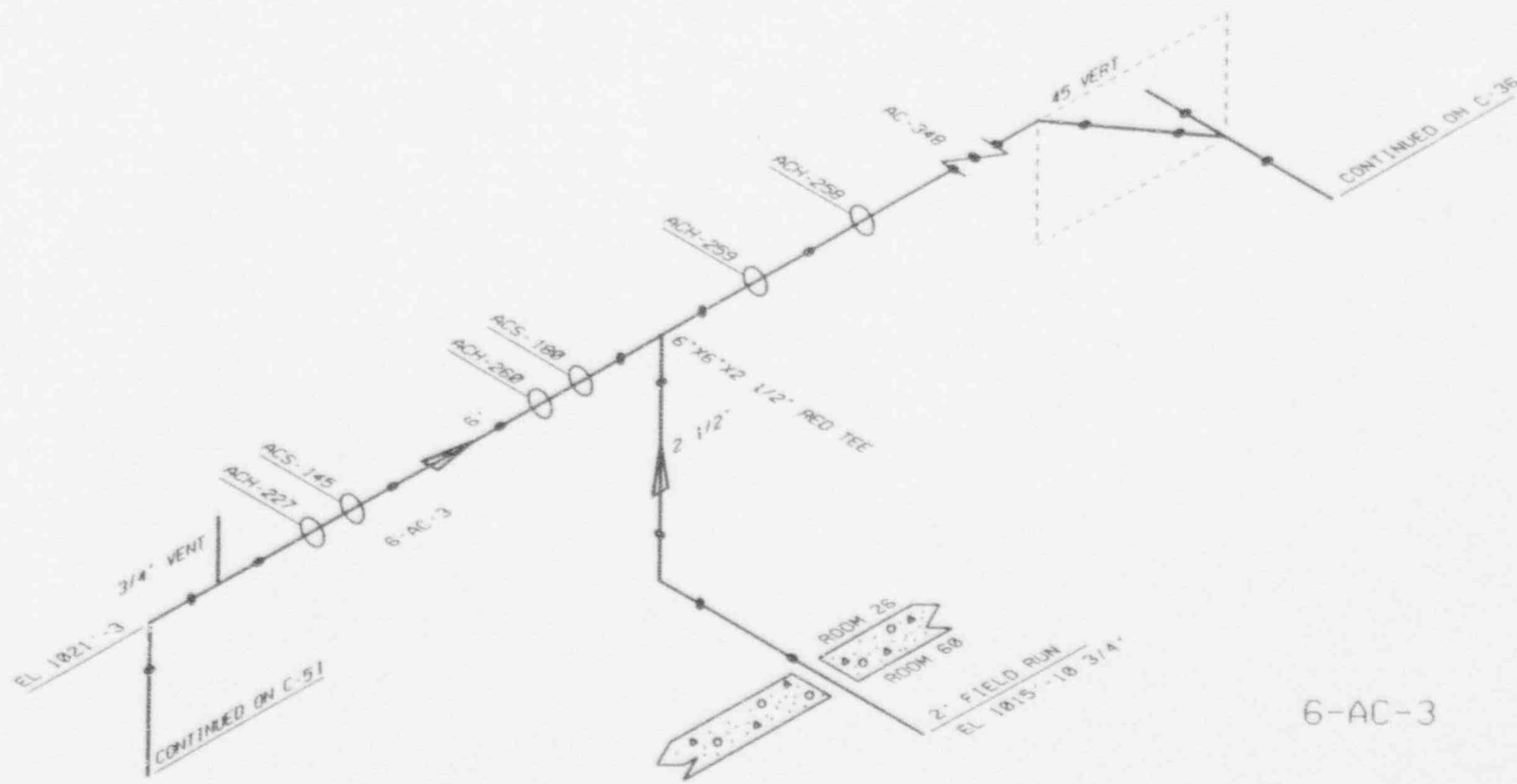
REF.DWGS.
D-4226,SH.1 OF 2 R-2
M-10

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-51

FOR INFORMATION ONLY

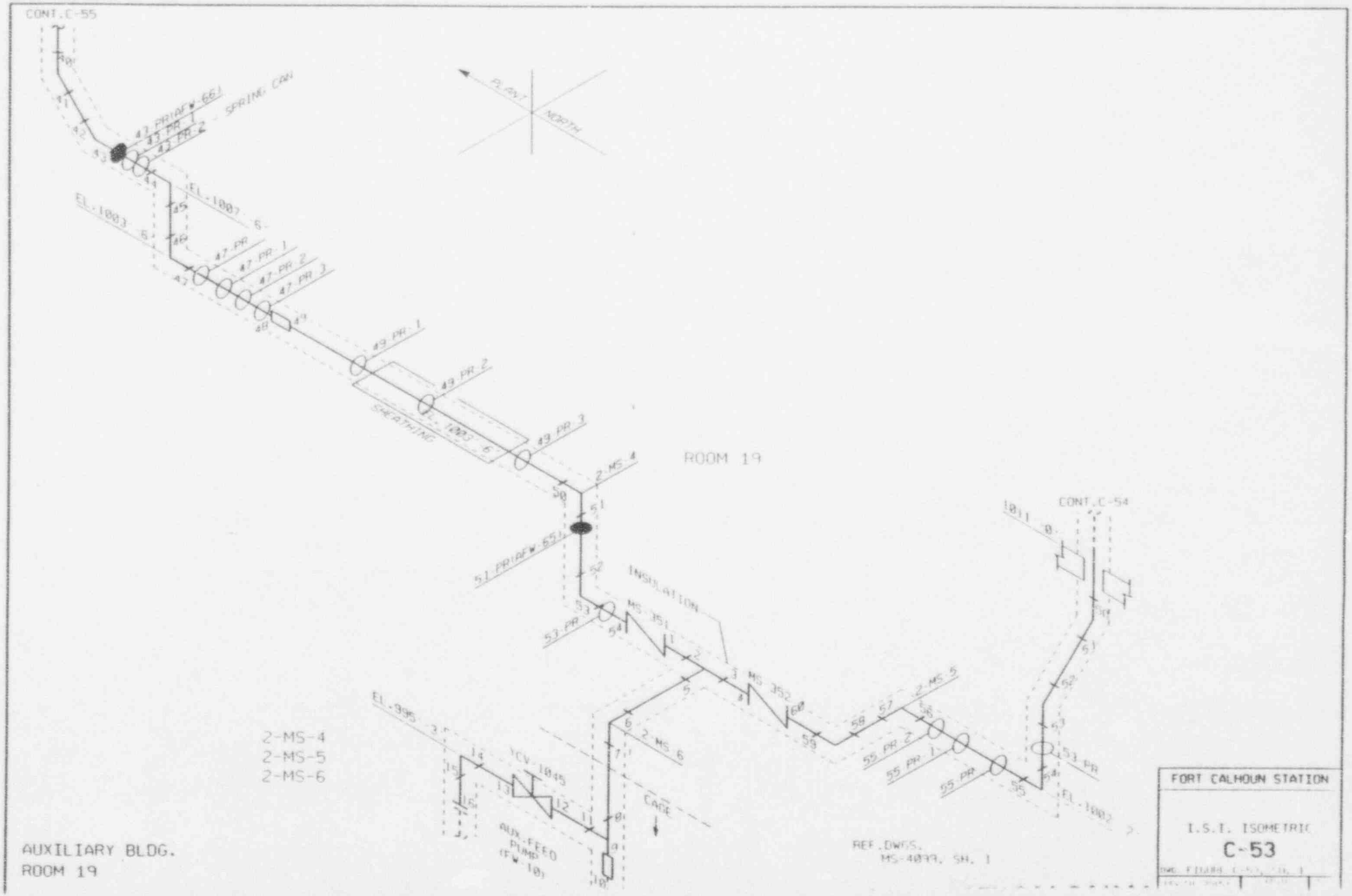


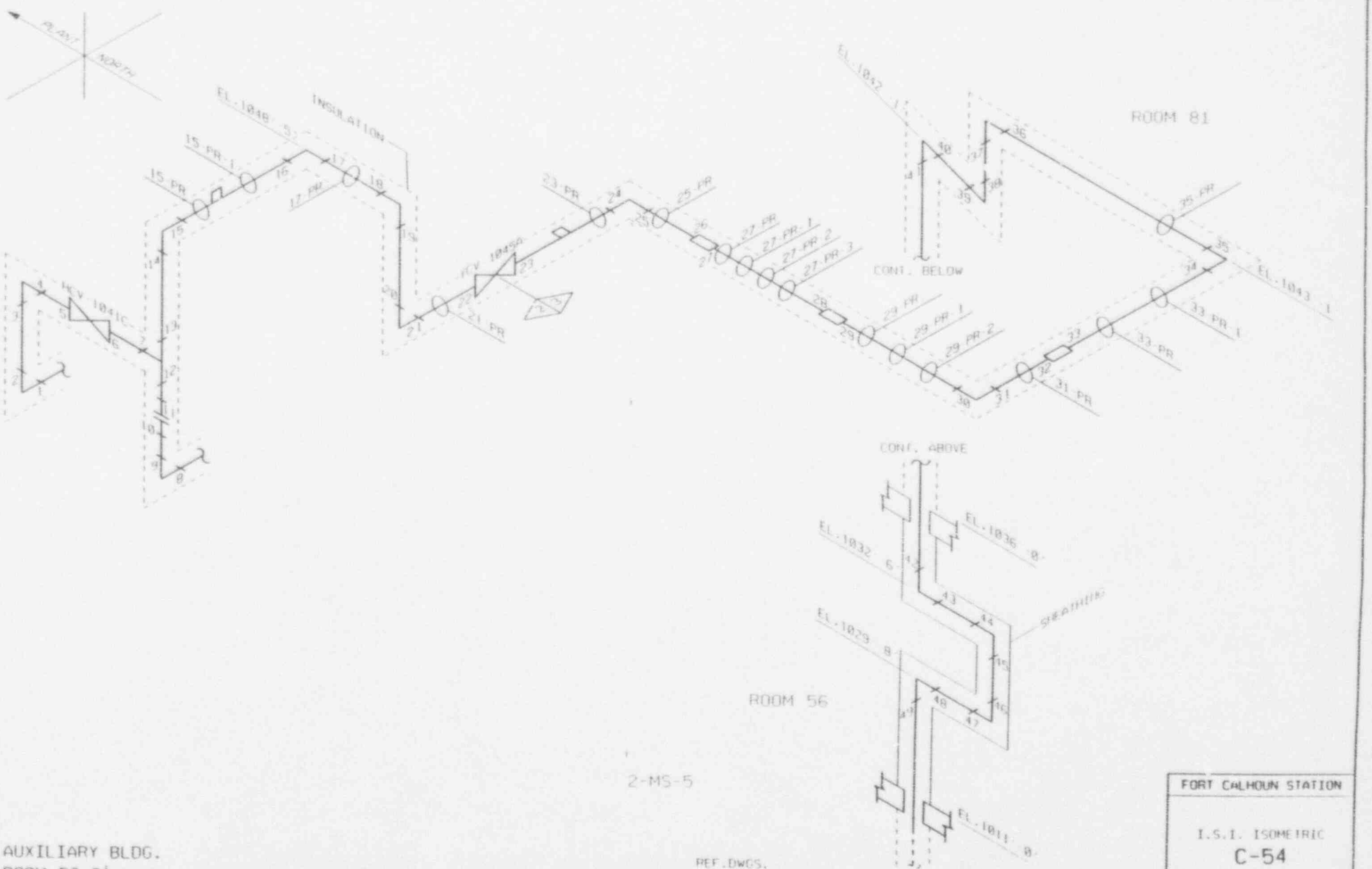
6-AC-3

AUXILIARY BLDG
ROOM 26, ROOM 60

REF.DWGS.
D-4226,SH.2 OF 2 R-2
M-10

FORT CALHOUN STATION
I.S.I. ISOMETRIC
C-52


CONT. C-55
PLANT NORTH
42 PR(AFW-66)
43 PR-1
43 PR-2
SPRING CAN
EL. 1007 -6
EL. 1003 -6
47-PR
47-PR-1
47-PR-2
47-PR-3
49-PR-1
49-PR-2
49-PR-3
SHEATHING
EL. 1003 -6
ROOM 19
2-MS-4
51 PR(AFW-65)
INSULATION
53-PR
MS-351
MS-352
2-MS-5
2-MS-6
CONT. C-54
55-PR-2
55-PR-1
55-PR
53-PR
EL. 1002
EL. 995 -3
YCV-1045
AUX. FEED PUMP (FW-10)
CAGE
2-MS-4
2-MS-5
2-MS-6
AUXILIARY BLDG.
ROOM 19
REF. DWGS.
MS-4099, SH. 1
FORT CALHOUN STATION
I.S.I. ISOMETRIC
C-53



AUXILIARY BLDG.
ROOM 56,81

FOR INFORMATION ONLY

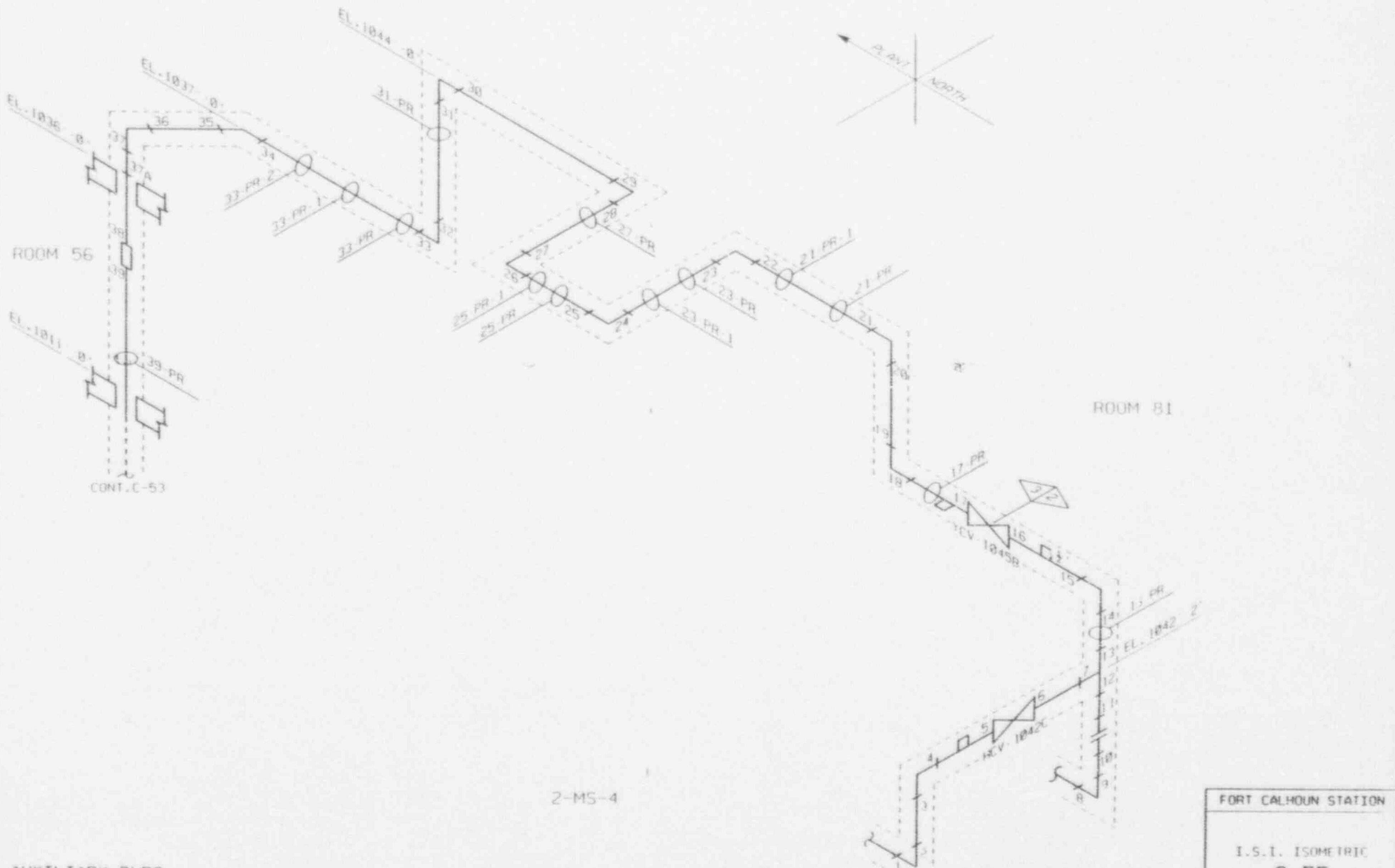
REF.DWGS.
MS-4099,SH.2

CONT. I-53

FORT CALHOUN STATION

I.S.I. ISOMETRIC

C-54



FORT CALHOUN STATION

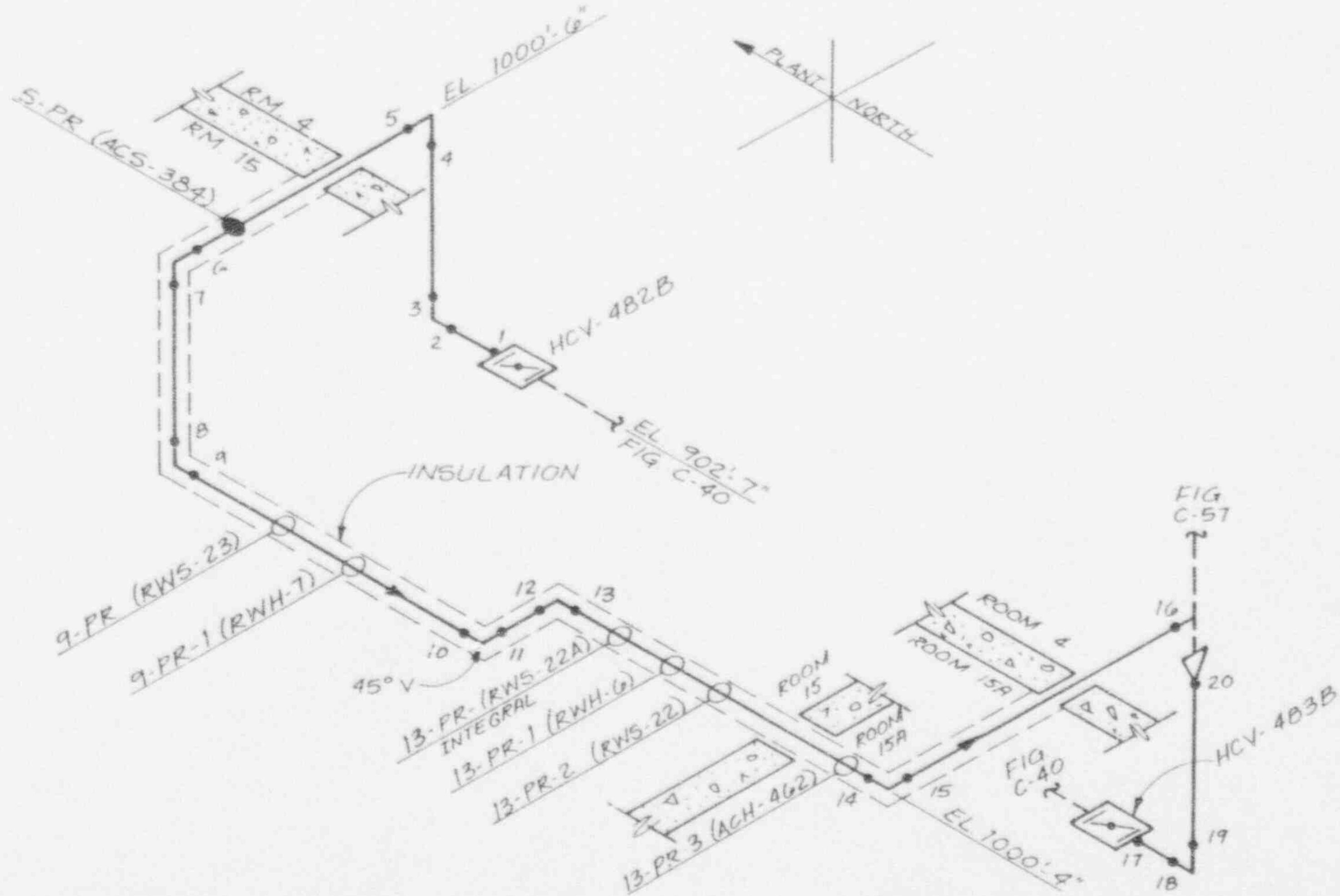
I.S.I. ISOMETRIC

C-55

AUXILIARY BLDG.
ROOM 56,81

FOR INFORMATION ONLY

REF. DWGS.
MS-4043, SH.1



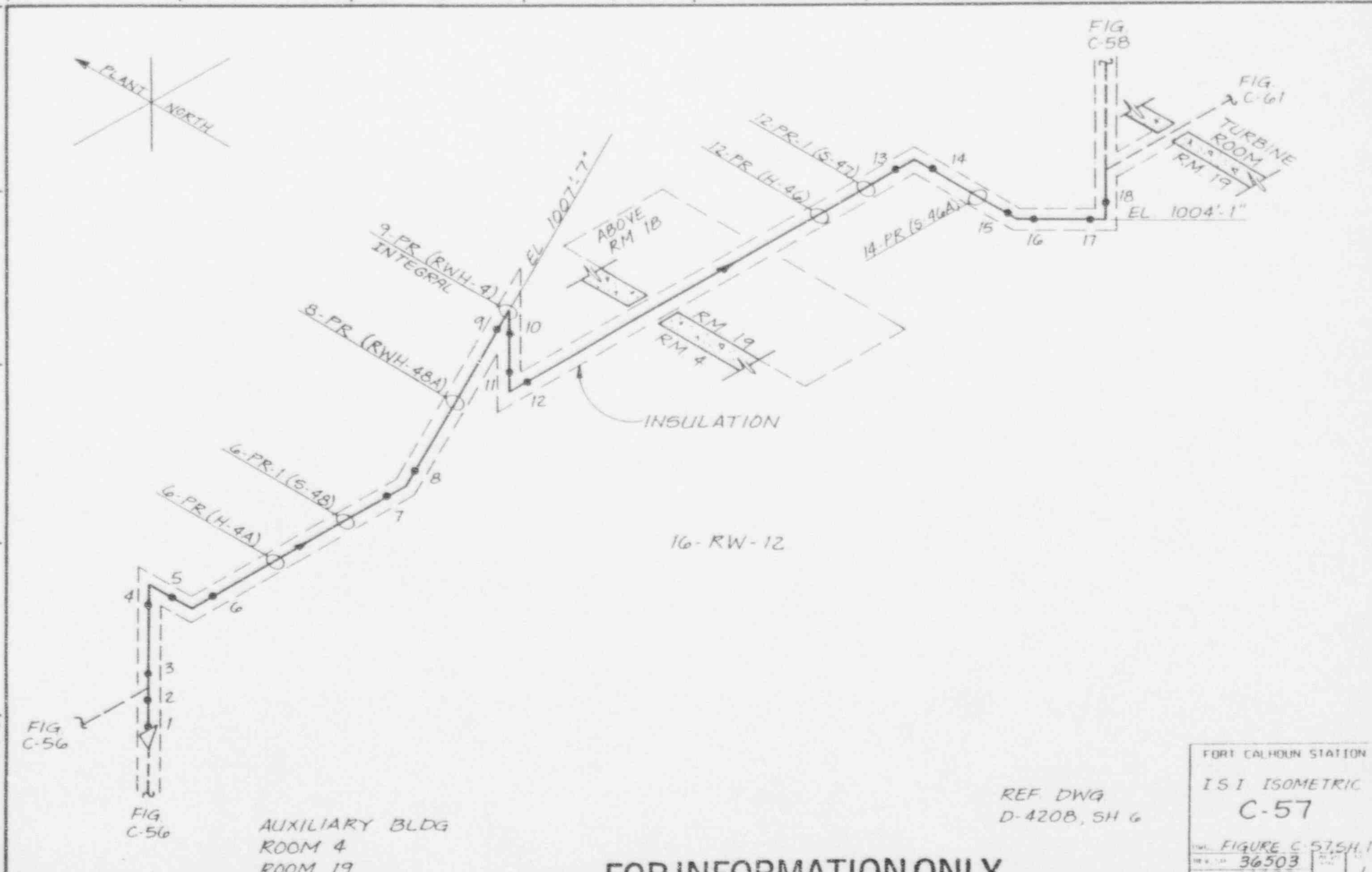
14-RW-10

AUXILIARY BLDG.
ROOM 4
ROOM 15
ROOM 15A

REF. DWG.
D-4208, SH. 7

FORT CALHOUN STATION
ISI ISOMETRIC
C-56
FIGURE C-56, SH 1
36502
44632

FOR INFORMATION ONLY

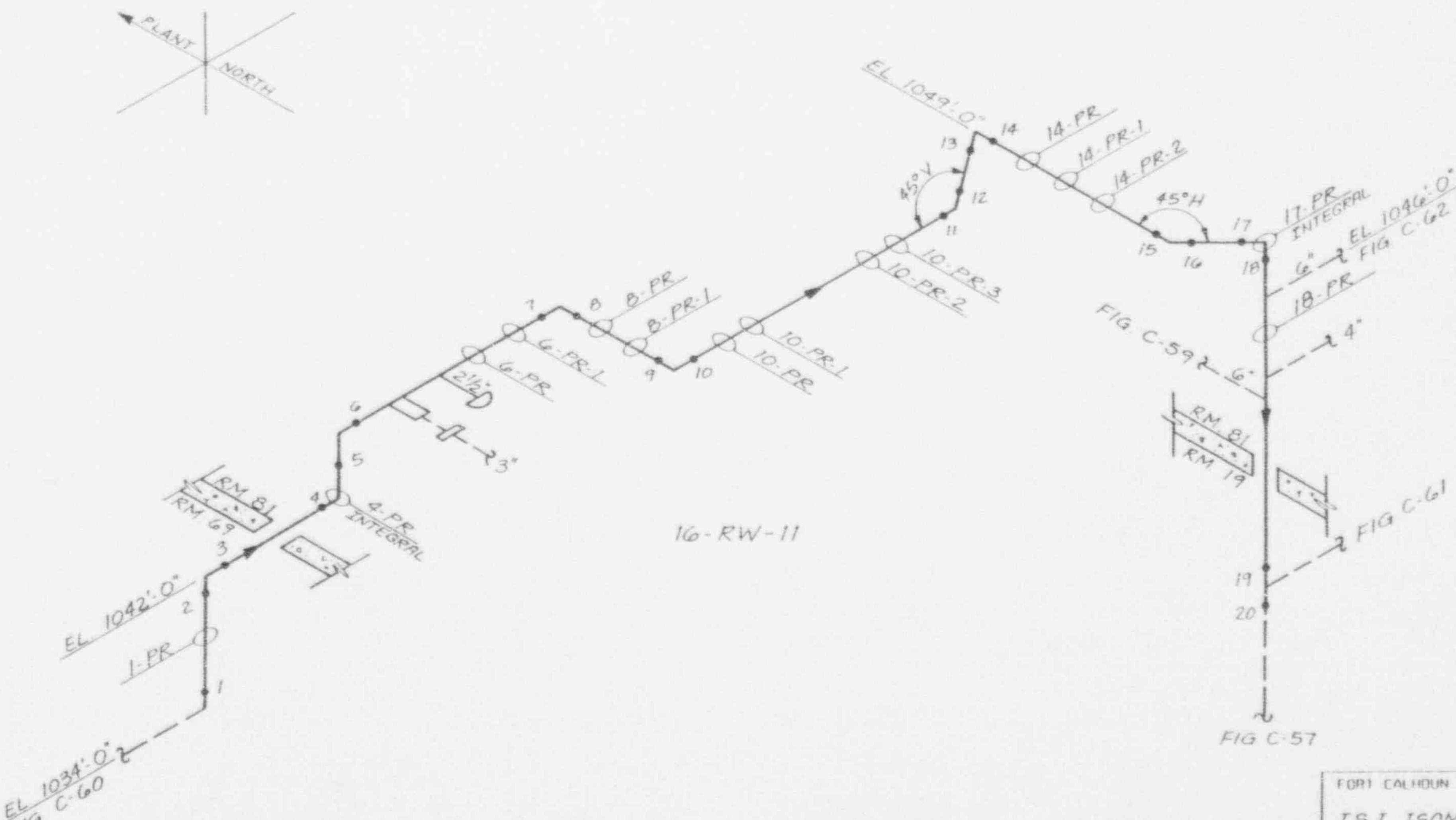


AUXILIARY BLDG
ROOM 4
ROOM 19

REF. DWG
D-4208, SH 6

FORT CALHOUN STATION
ISI ISOMETRIC
C-57
FIGURE C-57, SH. 1
36503
44633

FOR INFORMATION ONLY

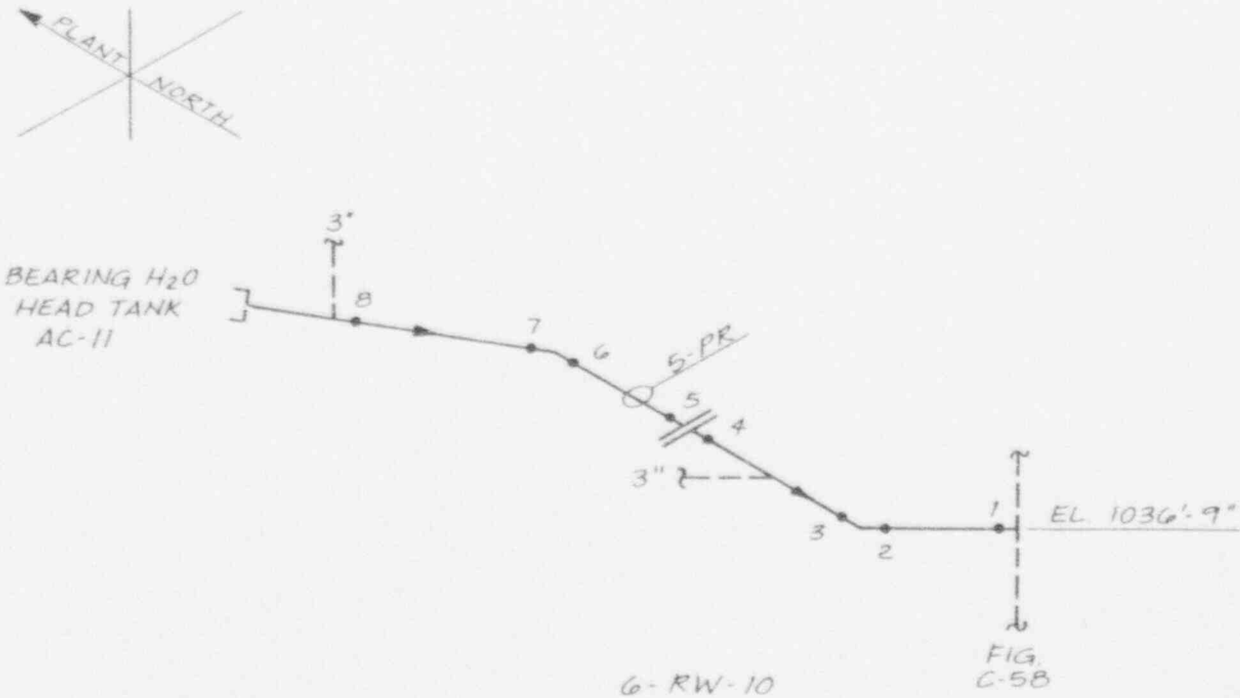


AUXILIARY BLDG.
RM. 69 EL. 1025'-0"
RM. 81 EL. 1036'-0"

REF DWG
IC-340

FOR INFORMATION ONLY

FORT CALHOUN STATION
ISI ISOMETRIC
C-58
FIGURE C-58, SH 1
36504
44694
1



AUXILIARY BLDG
ROOM 81

REF. DWG.
IC-333

FOR INFORMATION ONLY

FORT CALHOUN STATION

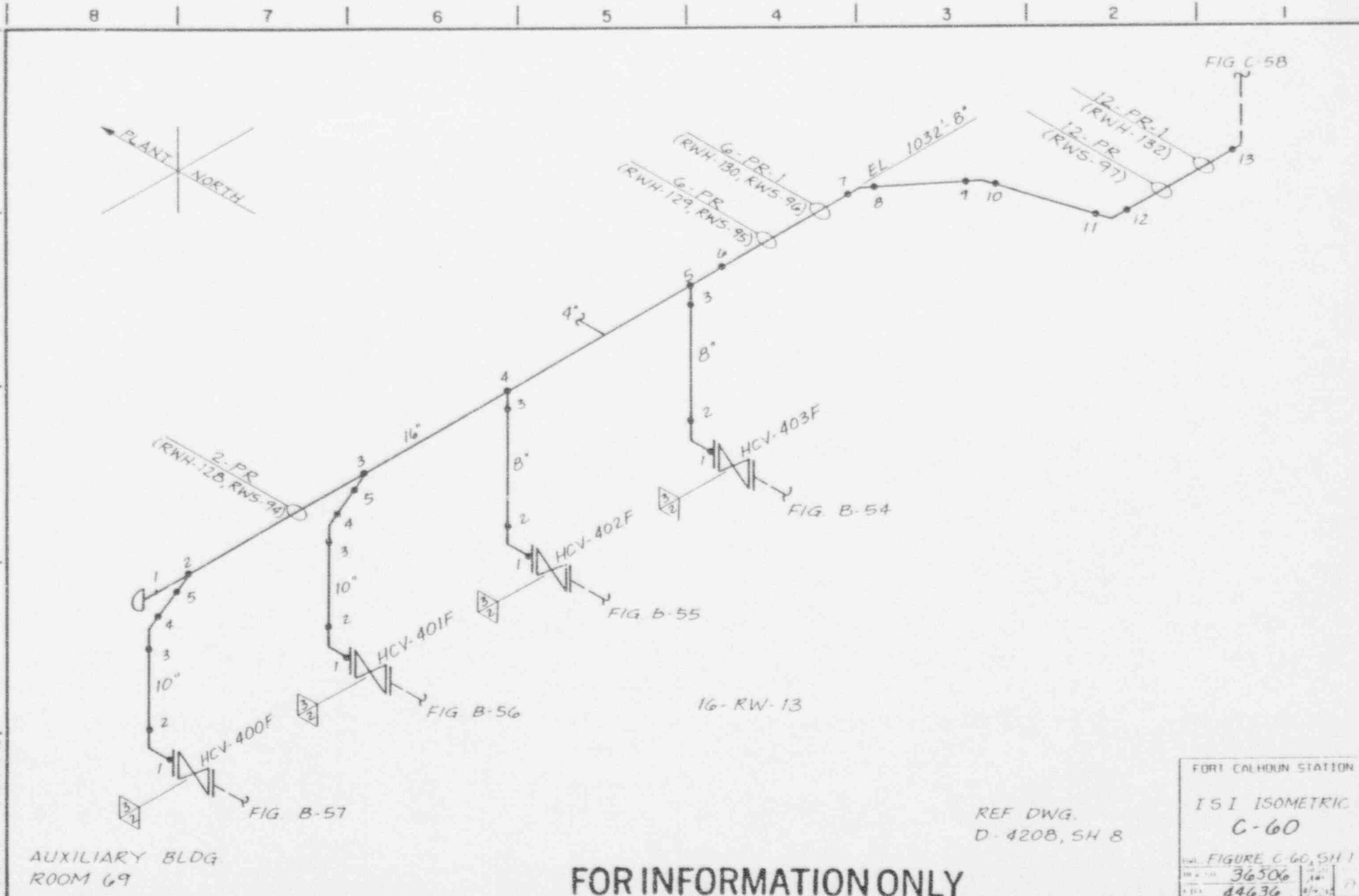
I.S.I ISOMETRIC

C-59

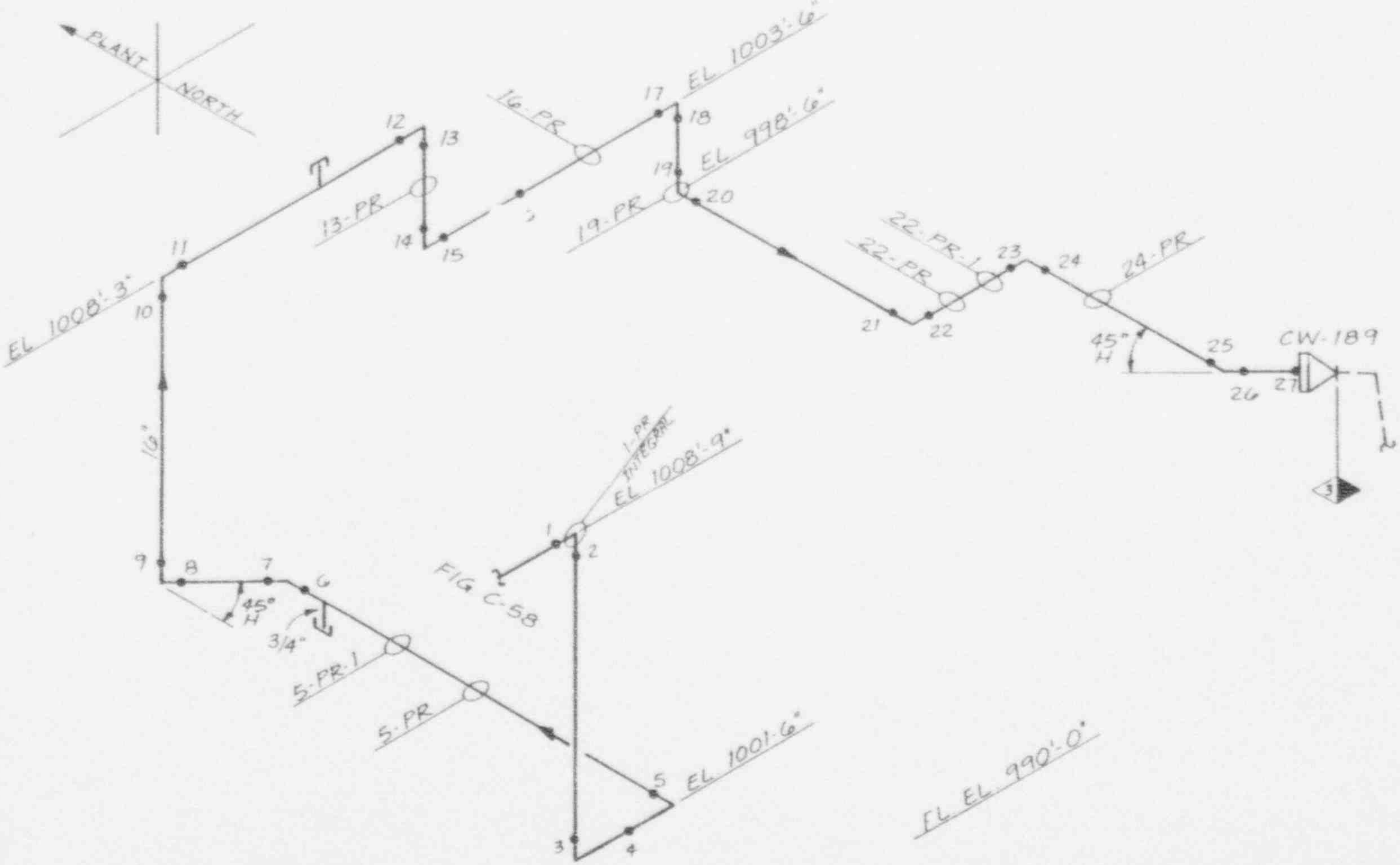
FIGURE C-59, SH 1

36505

44635



FOR INFORMATION ONLY



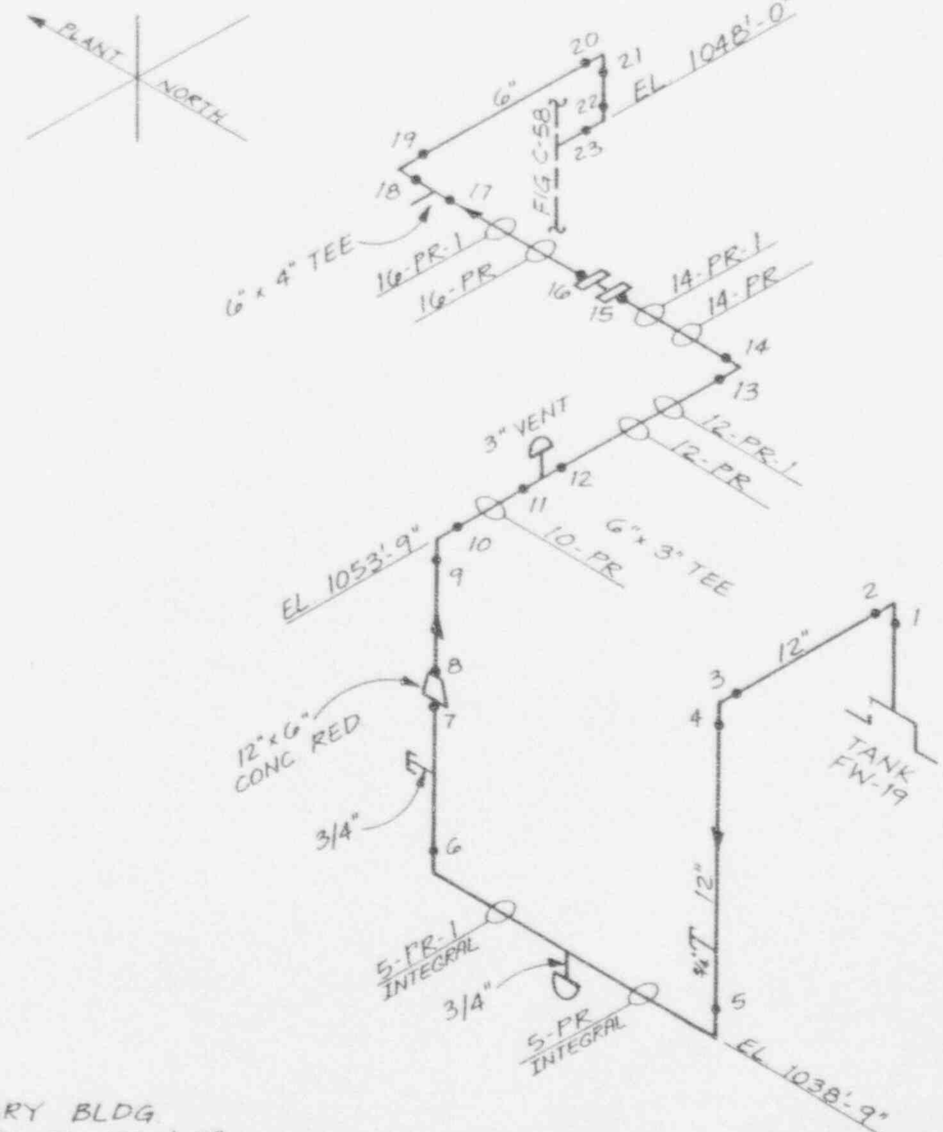
16-RW-10

REF DWGS
IC-112
IC-234

TURBINE BLDG
TURBINE BASEMENT - EL 990'-0"

FORT CALHOUN STATION
ISI ISOMETRIC
C-61
FIGURE C-61 SH 1
96507
44637

FOR INFORMATION ONLY



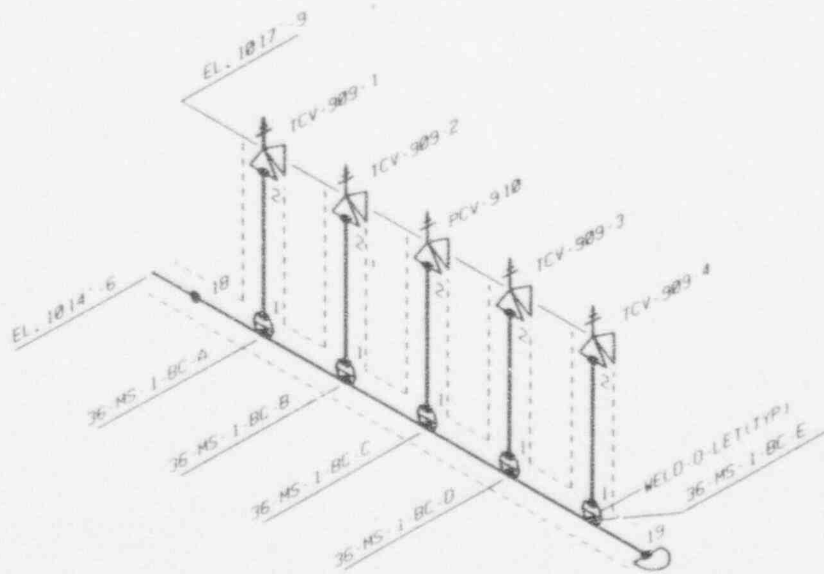
6-RW-11
12-RW-10

AUXILIARY BLDG
ROOM 81 · EL. 1036'-0"

REF DWG
IC-386

FOR INFORMATION ONLY

FORT CALHOUN STATION
ISI ISOMETRIC
C-62
FIGURE C-62, SH. 1
36508
44638



36-MS-1

TURBINE BLDG. EL. 1011'-0"
(NON-ASME
CLASSIFIED SYSTEM)

FOR INFORMATION ONLY

FORT CALHOUN STATION
I.S.I. ISOMETRIC D-1

ATTACHMENT 5

LIST OF ULTRASONIC CALIBRATION BLOCKS CURRENTLY AT FORT CALHOUN STATION

The following is a list of current ultrasonic calibration blocks on site at Fort Calhoun Station. The ISI Administrator and the current ISI vendor (Raytheon) are currently reviewing the requirements of the ASME Section XI code, 1989 Edition with no Addenda to determine any modifications or additions that may now be required. All blocks will be reviewed and accepted by the Authorized Nuclear Inservice Inspector prior to use.

2-FCL	24-FCL
3-FCL	25-FCL
4-FCL	26-FCL
5-FCL	27-FCL
5A-FCL	28-FCL
5B-FCL	29-FCL
6-FCL	30-FCL
7-FCL	31-FCL
8-FCL	32-FCL
9-FCL	33-FCL
10-FCL	34-FCL
11-FCL	35-FCL
12-FCL	36-FCL
13-FCL	37-FCL
14-FCL	38-FCL
15-FCL	39-FCL
16-FCL	40-FCL
17-FCL	41-FCL
18-FCL	42-FCL
19-FCL	43-FCL
20-FCL	44-FCL
21-FCL	45-FCL
22-FCL	64-FCL
23-FCL	66-FCL

CALIBRATION BLOCK 2 -FCL

ID IR-CSCL-2-FCL

THICKNESS VARIES [✓] CLAD - THICKNESS .25"

MATERIAL C/S MAT'L SPEC SA 533

HEAT # C0462 APPROX. DIMENSIONS 23 × 8½ × 24½

[ ] Axial Cut ID Notch

[ ] Circular Cut ID Notch

[ ] Axial Cut OD Notch

[ ] Circular Cut OD Notch

SEE COMMENT & PHOTOS

LENGTH	WIDTH	DEPTH

Other: - NUMEROUS SAW-CUT NOTCHES - SEE PHOTOS

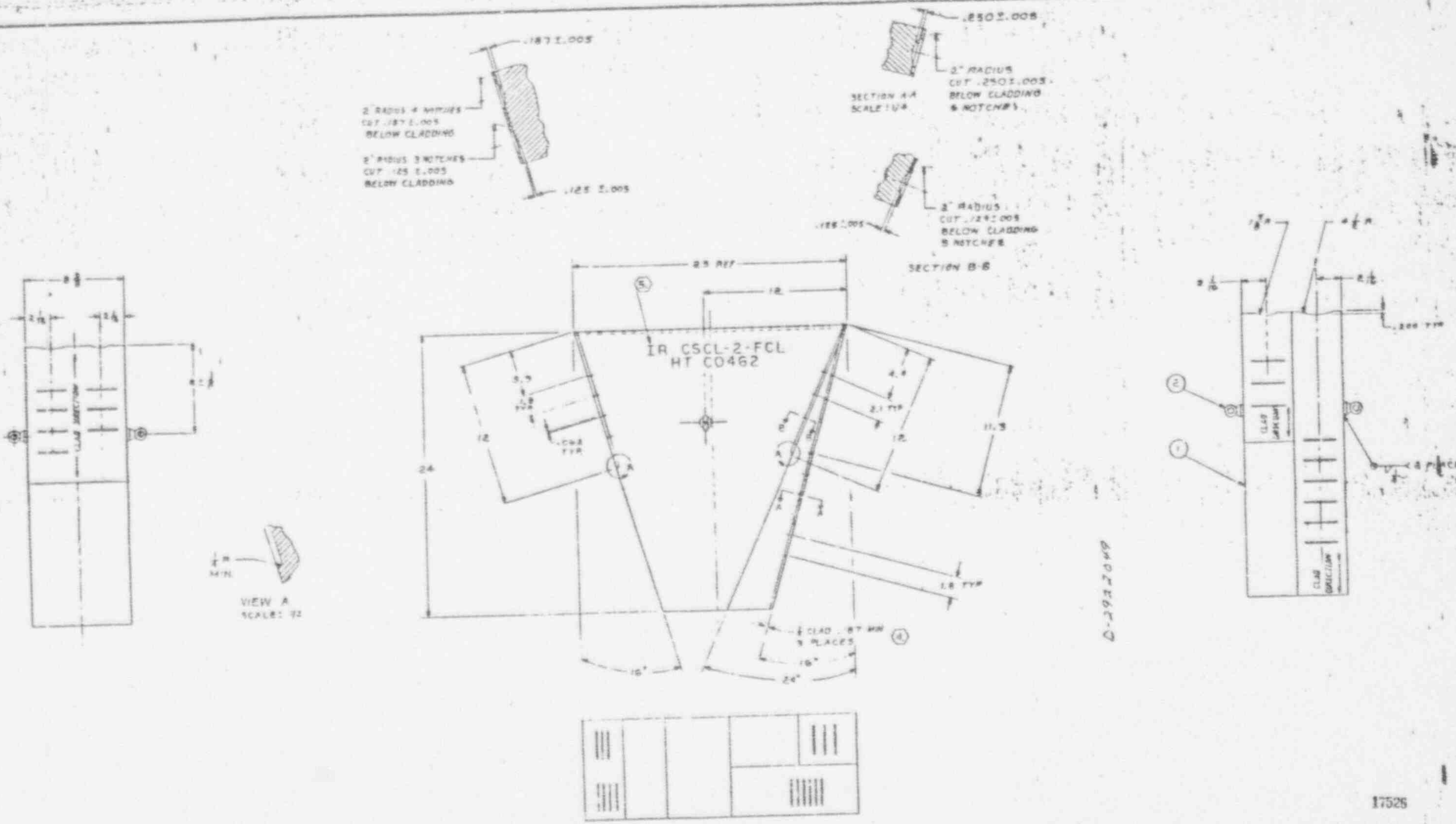
- TRIANGULAR SHAPED BLOCK

- NO SDH

P-# 3 GROUP 3

HT C0462

* Approximate Weight: 868



(5) MADE FROM SA533 GR B, HEAT NO. C0462, SWRI NO. C560A

(3) STEEL STAMP ID NO. AND HEAT NO. AS SHOWN ON SURFACE INDICATED, IN CHARACTERS 3/16 MINIMUM HEIGHT.

(4) CLAD OVERLAY IN ACCORDANCE WITH SWRI WP-500-2 REV. 7

3 ULTRASONIC EXAMINATION TO BE PERFORMED IN ACCORDANCE WITH ASME SECTION III, 1971, ARTICLE 23, SA 578 INCLUDING ACCEPTANCE STANDARD LEVEL 1 AND SUPPLEMENTARY REQUIREMENTS S1 PRIOR TO MACHINING.

2 BREAK ALL SHARP EDGES 1/32 AND REMOVE BURRS.

1 DIMENSIONS ARE IN INCHES.

NOTES:

2	2	LIFTING EYE	MASTER-CARR
1	1	BLOCK	CARBON STEEL
		PART NAME	MATERIAL

PARTS LIST

SOUTHWEST RESEARCH INSTITUTE
QUALITY ASSURANCE SYSTEMS AND ENGINEERING DIVISION
SAN ANTONIO, TEXAS

O.D. INNER RADIUS U.T.
CAL BLOCK R.P.V. S.G. PZR
FORT CALHOUN

SCALE 1/4 — C — D-2922049 — A

B	1856	
A	1852	
LTR	E.C.N. NO.	

REVISIONS

CALIBRATION BLOCK 3 -FCL

ID PL-CS-5.0-3-FCL

THICKNESS 5.0 [ ] CLAD - THICKNESS N/A

MATERIAL C/S MAT'L SPEC SA533

HEAT # C0462 APPROX. DIMENSIONS 22×6×5

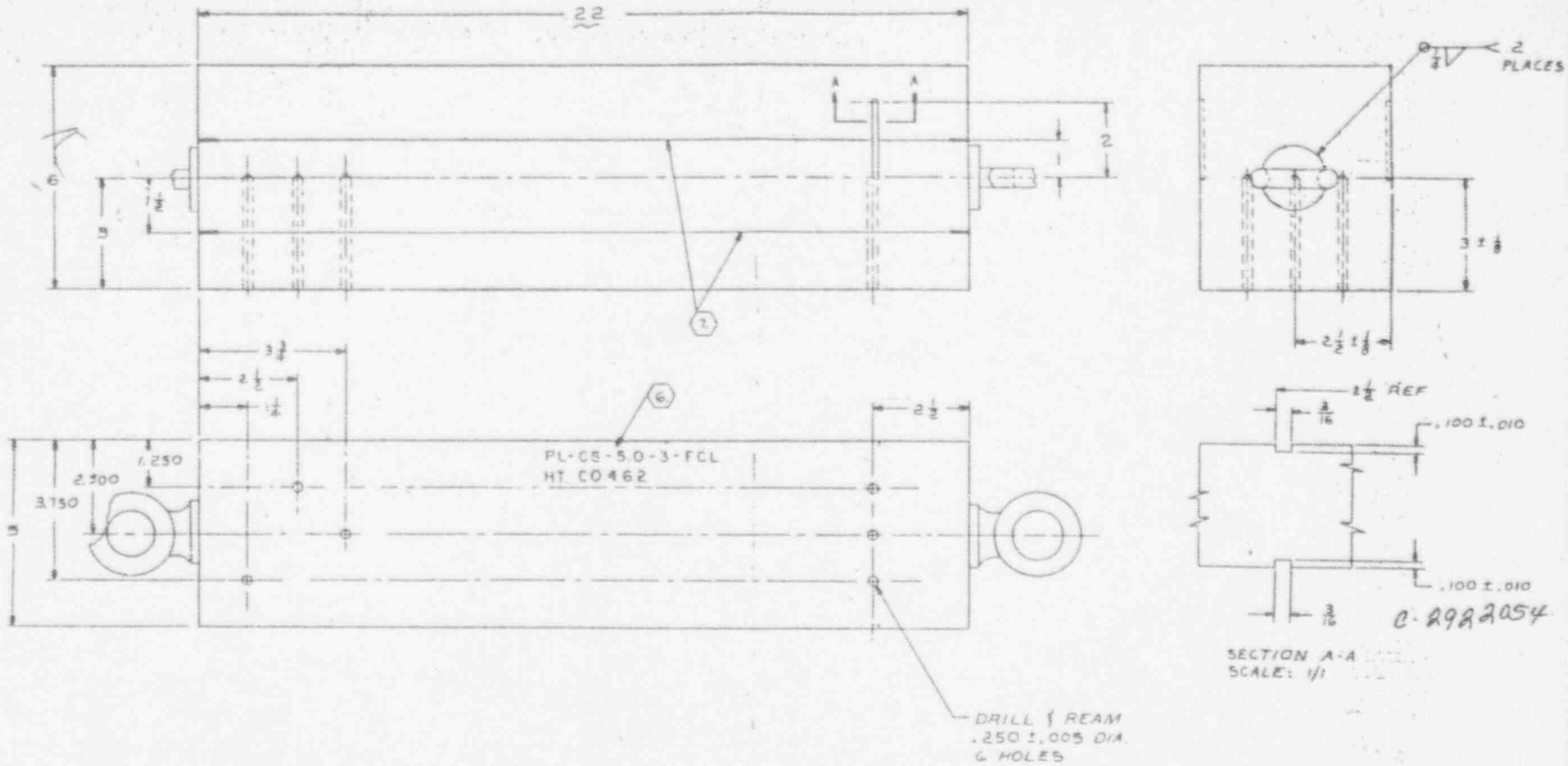
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.0	.2	.1
[N/A] Circular Cut ID Notch			
[✓] Axial Cut OD Notch	2.0	.2	.1
[N/A] Circular Cut OD Notch			

Other: SDH .25 Ø

P# 3 GROUP 3

HT C0462

* Approximate Weight: 197



8. MAKE FROM SA533,GRB, HEAT No. CO462
SwRI RIR No. 0560A.

7. SCRIBE CENTERLINE .003 TO .005 WIDE & DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT, AN INDEX MARK AT EACH END OF CENTERLINE AS SHOWN 1/32 X 1/32 X 1/4 LONG.

6. STEEL STAMP ID. No. AND HEAT No. ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.

5. ULTRASONIC EXAMINATION TO BE PERFORMED IN ACCORDANCE WITH ASME SECTION V, 1971 ARTICLE 23, SA 578 INCLUDING ACCEPTANCE STANDARD LEVEL I AND SUPPLEMENTARY REQUIREMENTS S1 PRIOR TO MACHINING.

4. TOP AND BOTTOM SURFACES TO BE FREE OF TOOL MARKS.

3.

2. BREAK SHARP EDGES AND REMOVE BURRS.

1. DIMENSIONS ARE IN INCHES.

NOTES:

PL-CS-5.0-3-FCL

17523

2	2	LIFTING EYE	3024 T 26 McMASTER-CARR
1	1	BLOCK	⟨8⟩
DASH No.	No. REQD	PART NAME	MATERIAL

PARTS LIST

TOLERANCES UNLESS NOTED
DECIMALS ±.020
FRACTIONS ± 1/16
ANGLES
FINISH 125

APPROVED	DATE
DESIGNED	6-77
	7-1-77
	7-1-77

F.S.R. DATE: 6-28-77

DRAWN BY RAMOS — DATE 6-9-77
CHECKED BY — DATE 6/21/77

NEXT ASSEMBLIES

LET	ECN No.	DATE	CHK	DSGN OR SUPVR	PROJ. MGR	Q.A. MGR

REVISIONS

SOUTHWEST RESEARCH INSTITUTE
QUALITY ASSURANCE SYSTEMS AND ENGINEERING DIVISION
SAN ANTONIO, TEXAS

5" PLATE ULTRASONIC CALIBRATION BLOCK
FORT CALHOUN

SCALE 1/2 — C A — C-2922054

CALIBRATION BLOCK 4 -FCL

ID PL-CS-3.0-4-FCL

THICKNESS 3.0 [ ] CLAD - THICKNESS

MATERIAL C/S MAT'L SPEC SA 533

HEAT # C0462 APPROX. DIMENSIONS 6 x 14 x 3

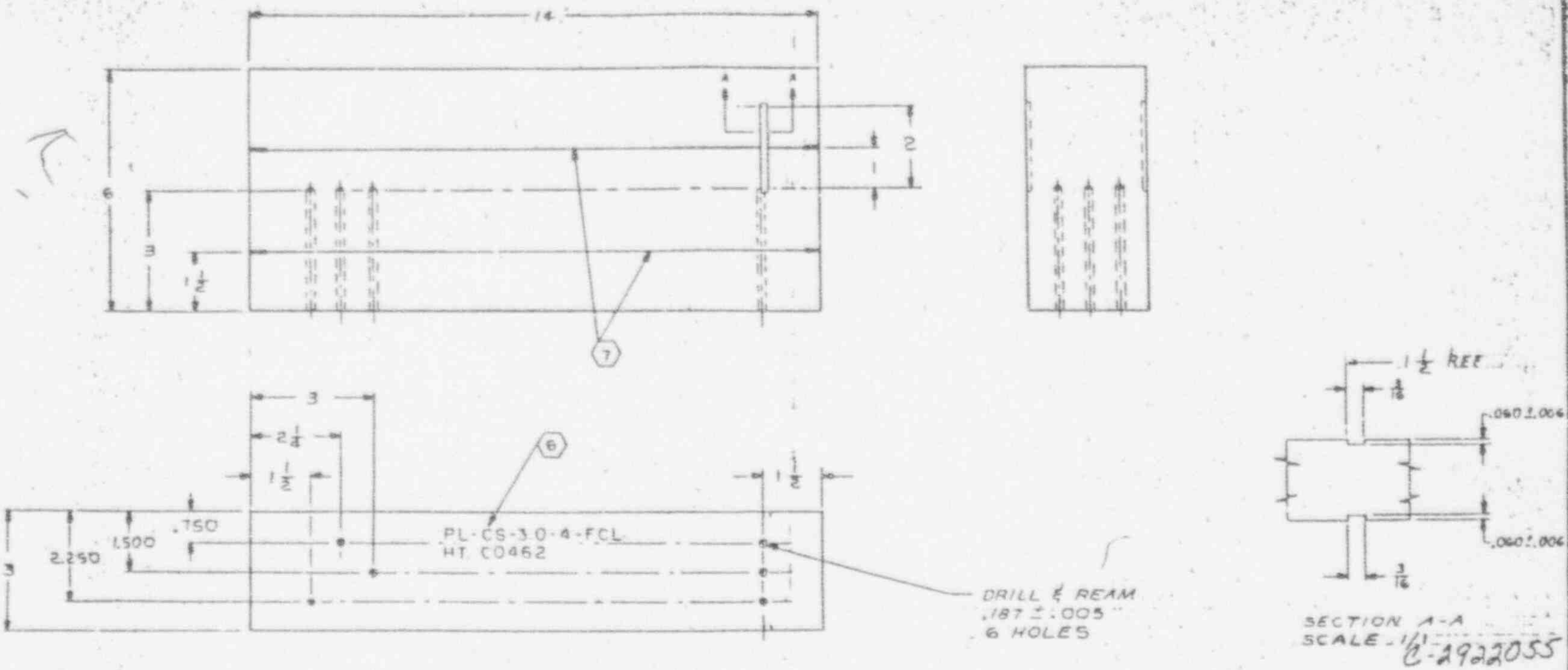
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.1	.2	.05
[N/A] Circular Cut ID Notch			
[✓] Axial Cut OD Notch	2.1	.2	.05
[N/A] Circular Cut OD Notch			

Other: SDH .2" Ø

P-3 GRP 3

HT C0462

* Approximate Weight: 70



8. MAKE FROM SA 533, GR B, HEAT No. C0462, SwRI RIR No. 0560A.

7. SCRIBE CENTERLINE .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT, AN INDEX MARK AT EACH END OF CENTERLINE AS SHOWN, 1/32 X 1/32 X 1/4 LONG.

6. STEEL STAMP ID. No. AND HEAT No. ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.

5. ULTRASONIC EXAMINATION TO BE PERFORMED IN ACCORDANCE WITH ASME SECTION V, 1971 ARTICLE 23, SA 578 INCLUDING ACCEPTANCE STANDARD LEVEL I AND SUPPLEMENTARY REQUIREMENTS S1 PRIOR TO MACHINING.

4. TOP AND BOTTOM SURFACES TO BE FREE OF TOOL MARKS.

2. BREAK SHARP EDGES AND REMOVE BURRS.

1. DIMENSIONS ARE IN INCHES :

NOTES:

17524

PL-CS-3.0-4-FCL

LET	DCN NO	DATE	CHK	DSGN OF SUPVR	PROJ MGR	QA MGR
REVISIONS						

TOLERANCES UNLESS NOTED
DECIMALS ±.020
FRACTIONS ±1/16
ANGLES
FINISH 125

APPROVED	DATE
DSGN OF SUPVR	6-30-77
PROJ MGR	7-1-77
QA MGR	7-1-77

DASH NO	NO REQD	PART NAME	MATERIAL

PARTS LIST

NEXT ASSEMBLIES

F.O.R. DATE: 6-28-77

DRAWN BY: RAMOS — DATE: 6-16-77

CHECKED BY — DATE

SOUTHWEST RESEARCH INSTITUTE
QUALITY ASSURANCE SYSTEMS AND ENGINEERING DIVISION
SAN ANTONIO, TEXAS

3" PLATE ULTRASONIC CALIBRATION BLOCK
FORT CALHOUN

SHEET OF

SCALE 1/2 C I C-2922055 REV

CALIBRATION BLOCK 5 -FCL

ID 11-CSCL-5-FCL

THICKNESS 11 [✓] CLAD - THICKNESS 1/4

MATERIAL C/S MAT'L SPEC SA 508

HEAT # 3P-2870 APPROX. DIMENSIONS 35 × 11½ × 12

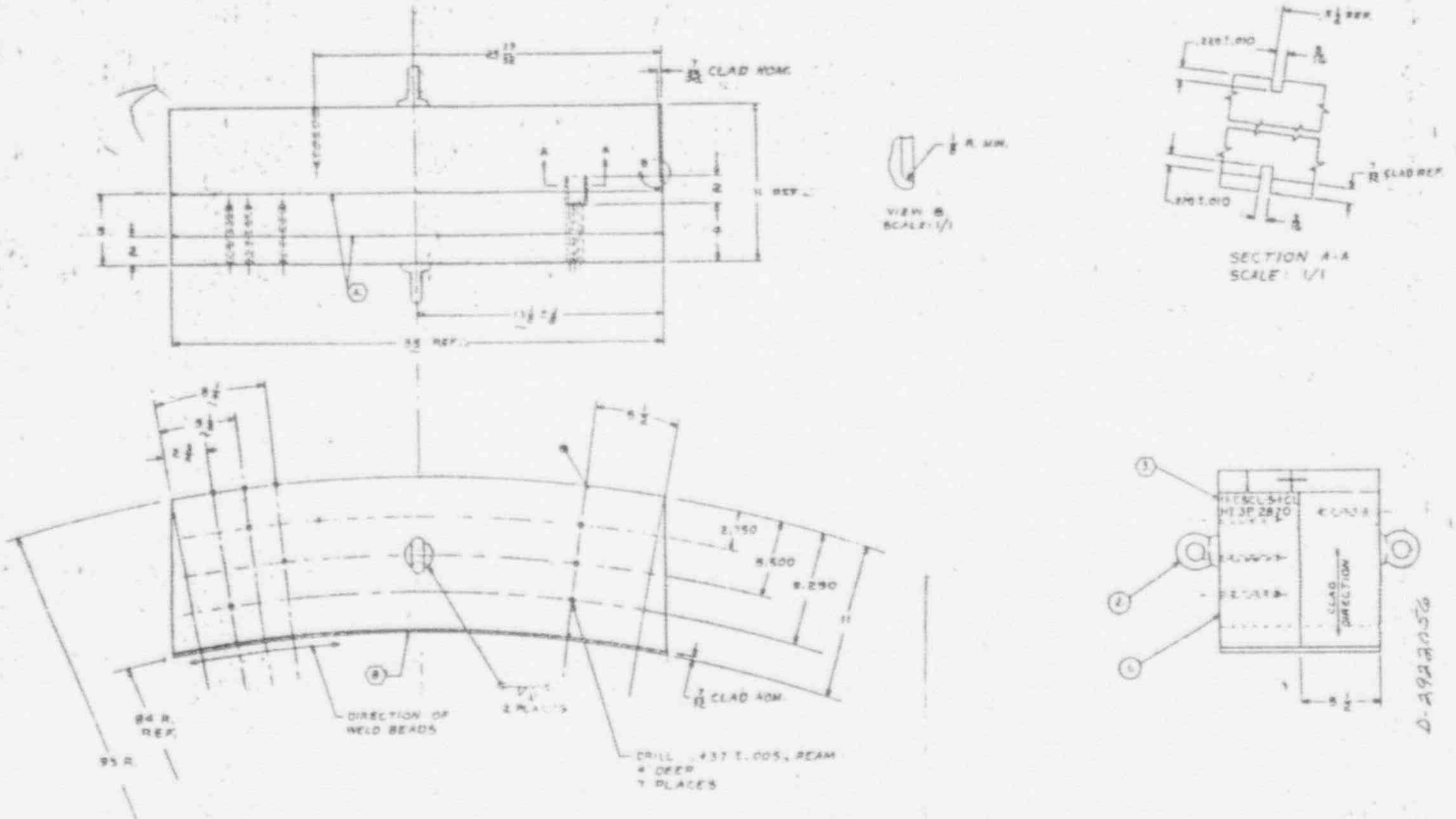
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.0	.2	.2
[N/A] Circular Cut ID Notch			
[✓] Axial Cut OD Notch	2.0	.2	.2
[N/A] Circular Cut OD Notch			

Other: P# 3 GRP 3

SDH 3/8" Ø

HT 3P-2870

* Approximate Weight: 1286



(8) CLAD OVERLAY MAY BE HAND GROUND OR MACHINED TO DUPLICATE VESSEL ID. SURFACE.

7. OVERLAY CLADDING IN ACCORDANCE WITH SwRI NP-300-2, REV.0

6. ULTRASONIC EXAMINATION TO BE PERFORMED IN ACCORDANCE WITH ASME SECTION V, 1971 ARTICLE 23, SA 578 INCLUDING ACCEPTANCE STANDARD LEVEL I AND SUPPLEMENTARY REQUIREMENTS S1 PRIOR TO MACHINING.

(5) MAKE FROM SA508 CL II HEAT No. 3P-2870 SwRI RIR No. 0856A.

(4) SCRIBE CENTERLINES AS SHOWN .003 TO .005 WIDE X .003 TO .005 DEEP. STEEL STAMP OR MILL CUT AN INDEX MARK AT EACH END OF CENTERLINE, AS SHOWN, 1/32 X 1/32 X 1/8 LG.

(3) STEEL STAMP STANDARD ID. NO. AND HEAT NO., AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN HEIGHT.

2. MATERIAL FOR STANDARD TO BE FREE OF FABRICATION OR REPAIR WELDS AND LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

1. BREAK SHARP EDGES AND REMOVE BURRS.

11-CSCL-5-FCL

17529

2	2	LIFTING EYE	MASTER-CARR NO. 3024T26
1	1	BLOCK	(5)

PARTS LIST

SOUTHWEST RESEARCH INSTITUTE

SAN ANTONIO, TEXAS

11 CLAD VESSEL U.T. CALIBRATION BLOCK

FORT CALHOUN

RAMOS

SCALE 1/4

D-2922056 A

A	1907		

REVISIONS

CALIBRATION BLOCK 5A -FCL

ID 9125-6-8-CS-5A-FCL

THICKNESS 1.6 [ ] CLAD - THICKNESS ____

MATERIAL C/S MAT'L SPEC ____

HEAT # ____ APPROX. DIMENSIONS 9.2 x 3 x 1.6

[✓] Axial Cut ID Notch

[N/A] Circular Cut ID Notch

[N/A] Axial Cut OD Notch

[N/A] Circular Cut OD Notch

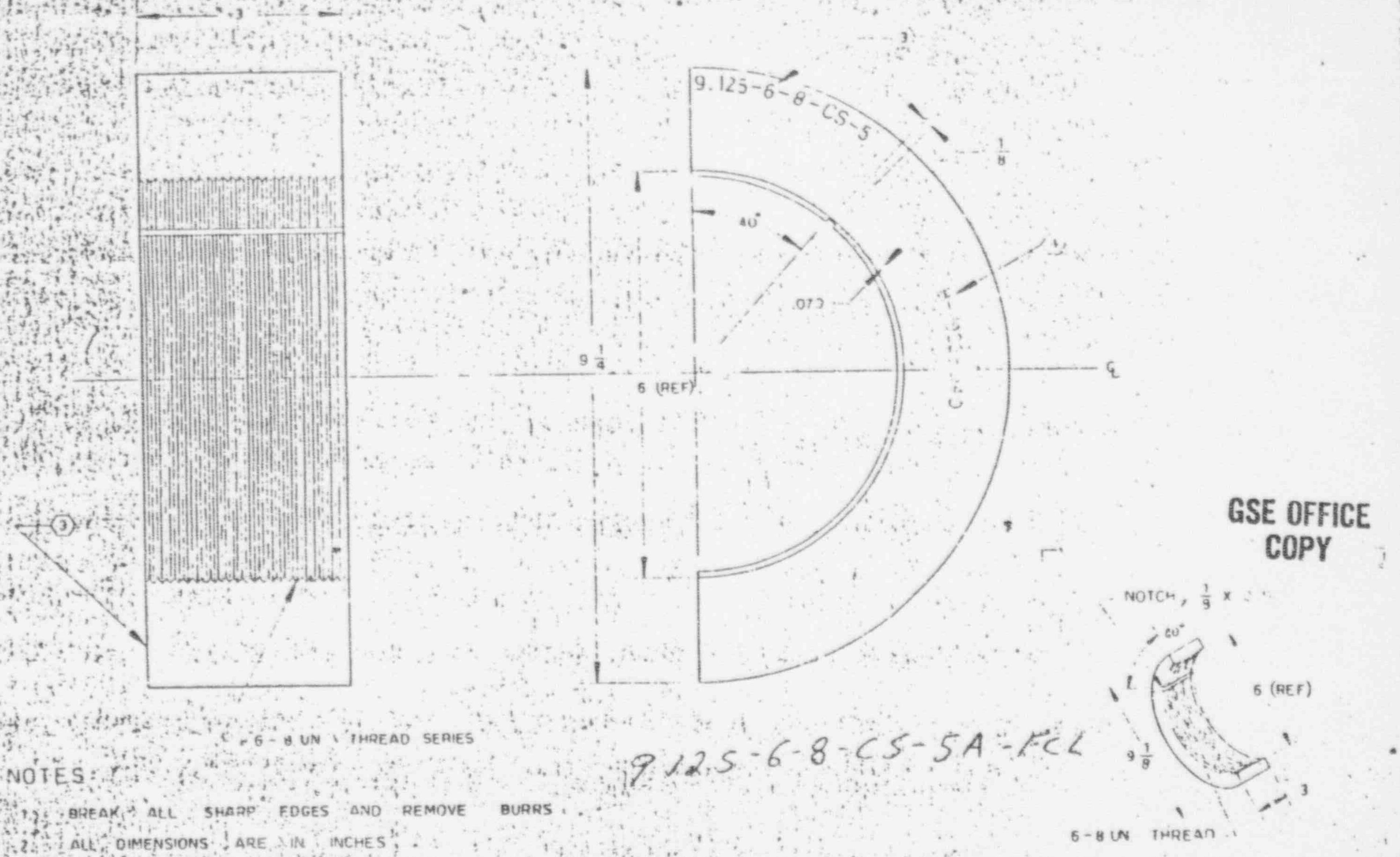
LENGTH	WIDTH	DEPTH
3.0	.1	.1

Other: No SDH

GRADE B BOLTING MATERIAL

B2922040

* Approximate Weight: 18



NOTES:

1. BREAK ALL SHARP EDGES AND REMOVE BURRS.
2. ALL DIMENSIONS ARE IN INCHES.
3. STEEL STAMP STANDARD ID. NO. AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 1/8 MINIMUM HEIGHT.
4. STEEL STAMP REFERENCE NO. AS SHOWN ON SURFACE INDICATED IN CHARACTERS 1/8 MINIMUM HEIGHT.

LET	CHANGE	DATE	BY	APP
REVISIONS				

PART NO.	NO. REQD	PART NAME	MATERIAL
PARTS LIST			
DRAWN BY: F. CASTRO	MATERIAL: CARBON STEEL	DECIMALS ±.010; FRACTIONS ± 1/16	9.125" CS NUT STANDARD 9.125-6-8-CS-5
	125	SOUTHWEST RESEARCH INSTITUTE, SAN ANTONIO, TEXAS	DATE 12 AUG 7?; SCALE 1/1; DRAWING NUMBER C-70130

2248

CALIBRATION BLOCK 5B -FCL

ID 6.125-1.125-8-CS-5B-FCL

THICKNESS 6.125 Ø [ ] CLAD - THICKNESS

MATERIAL C/S MAT'L SPEC

HEAT # APPROX. DIMENSIONS 16 1/2 x 6 1/8

[ ] Axial Cut ID Notch

[ ] Circular Cut ID Notch *SEE NOTE

[ ] Axial Cut OD Notch

[ ] Circular Cut OD Notch

LENGTH	WIDTH	DEPTH

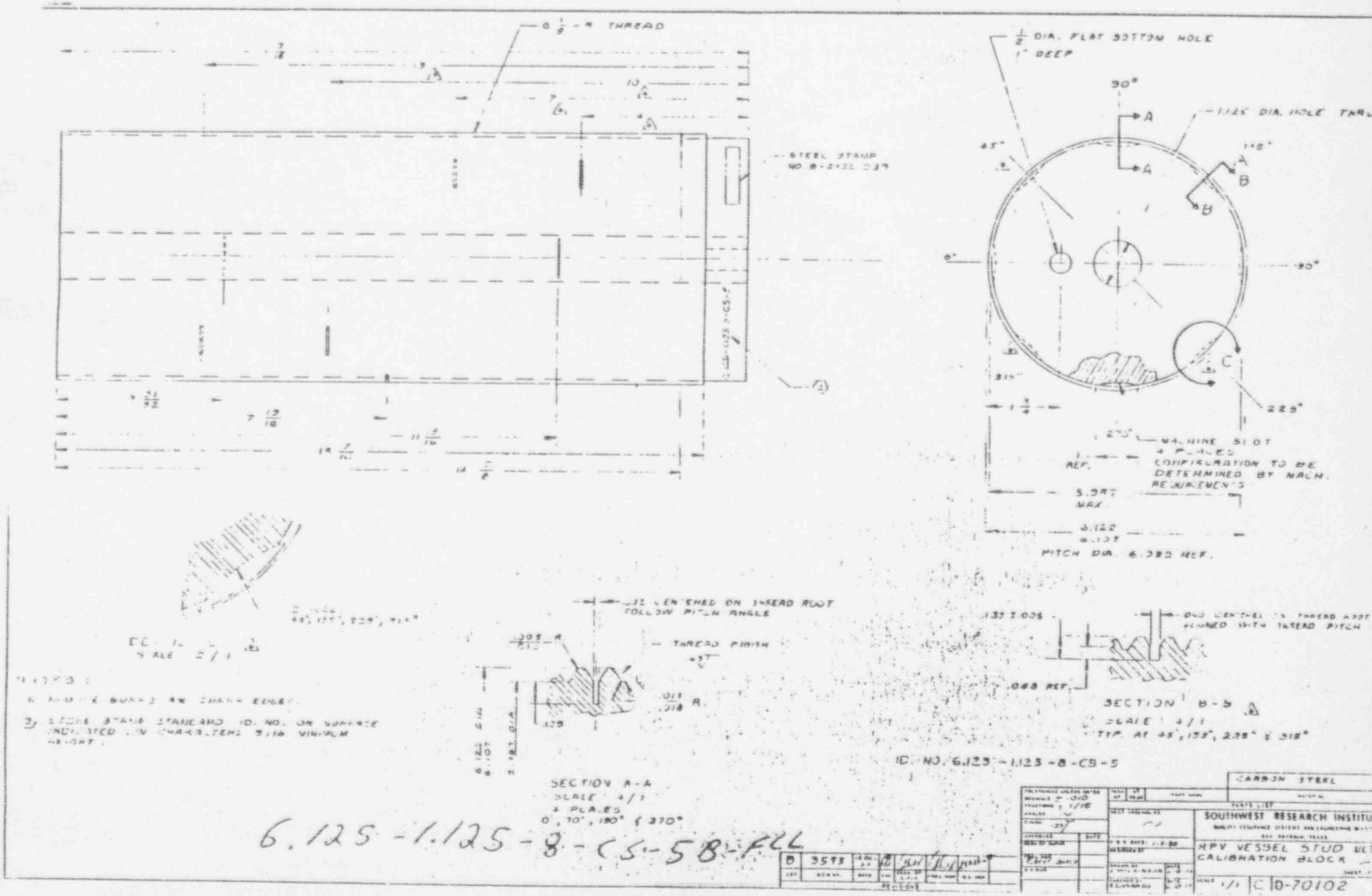
Other: NO HOLES

*MISC SAW CUT NOTCHES

BOLTING MATERIAL, GRADE B

B2922039

* Approximate Weight: 100



6 1/8 - 8 THREAD
STEEL STAMP
1/2 DIA. FLAT BOTTOM HOLE
1" DEEP
1.125 DIA. HOLE THRU
MACHINE SLOT
4 PLACES
CONFIGURATION TO BE
DETERMINED BY MACH.
REQUIREMENTS
5.987
MAX.
PITCH DIA. 6.082 REF.
.032 CENTERED ON THREAD ROOT
FOLLOW PITCH ANGLE
THREAD FINISH
SECTION A-A
SCALE 4/1
4 PLACES
0°, 90°, 180° & 270°
SECTION B-B
SCALE 4/1
TYP. AT 45°, 135°, 225° & 315°
.048 REF.
NOTES:
ID. NO. 6.125 - 1.125 - 8 - CS - 5
6.125 - 1.125 - 8 - CS - 5B - FLL
CARBON STEEL
SOUTHWEST RESEARCH INSTITUTE
RPV VESSEL STUD ULTRASONIC
CALIBRATION BLOCK
D-70102

CALIBRATION BLOCK 6 -FCL

ID 5-CSCL-6-FCL

THICKNESS 5.0 [ ] CLAD - THICKNESS 1/4

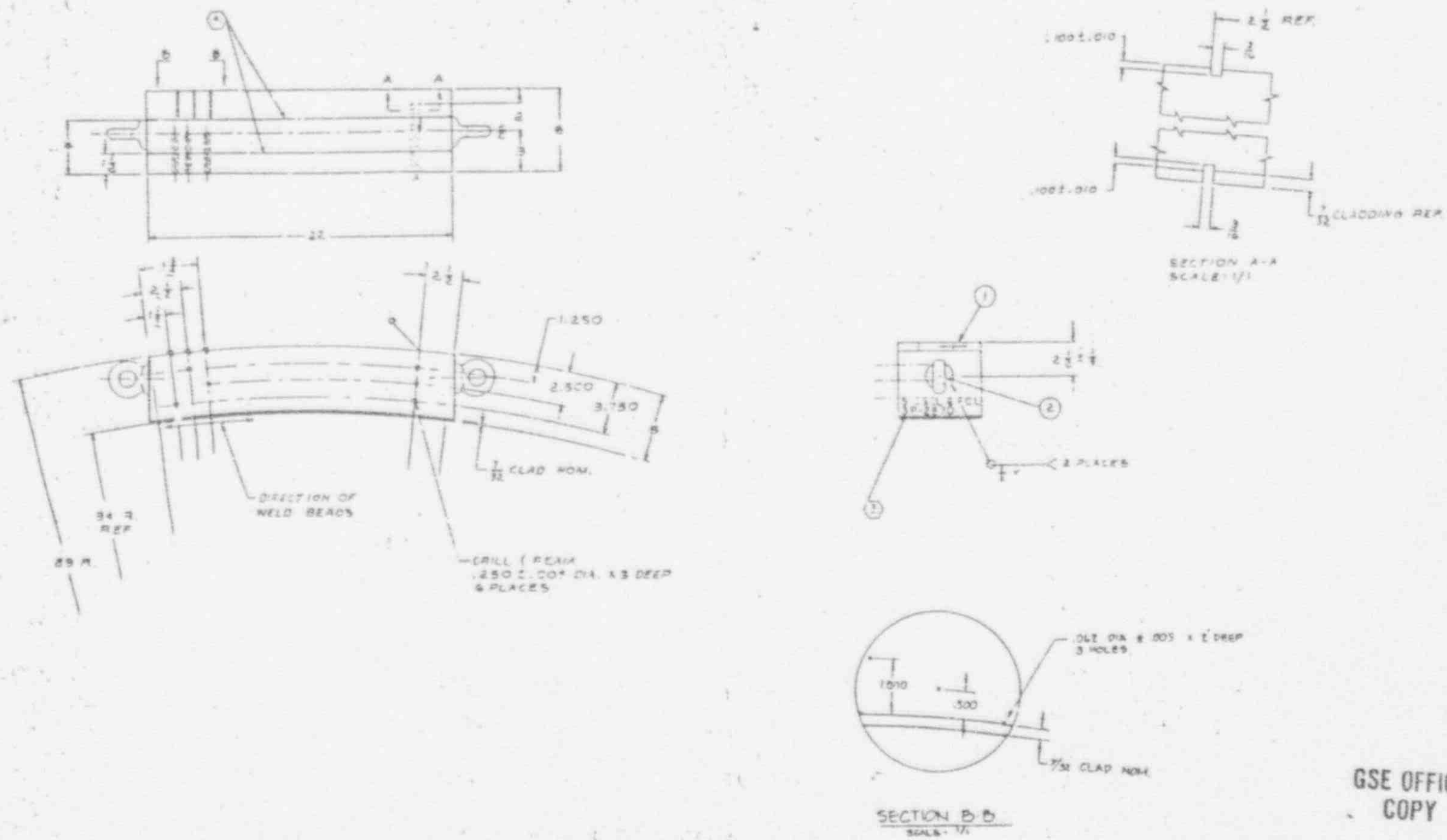
MATERIAL C/S MAT'L SPEC SA508

HEAT # 3P 2870 APPROX. DIMENSIONS 22×5×6 1/4

	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.0	.2	.3
[N/A] Circular Cut ID Notch			
[✓] Axial Cut OD Notch	2.0	.2	.1
[N/A] Circular Cut OD Notch			

Other: SDH .2"Ø (6)
.1"Ø (3)
P-3 GRP 3
HT 3P-2870

* Approximate Weight: 75



GSE OFFICE COPY

5-CSCL-6-FCL

17530

7. OVERLAY CLADDING IN ACCORDANCE WITH SwRI WP-90C-2 REV-C.

6. ULTRASONIC EXAMINATION TO BE PERFORMED IN ACCORDANCE WITH ASME SECTION V, 1977 ARTICLE 23, SA 578 INCLUDING ACCEPTANCE STANDARD LEVEL I AND SUPPLEMENTARY REQUIREMENTS S1 PRIOR TO MACHINING.

(5) MAKE FROM SA508 CL II, HEAT No 3P-2870, SwRI RIR No 0298A.

(4) SCRIBE CENTERLINES, AS SHOWN, .003 TO .005 WIDE X .003 TO .005 DEEP. STEEL STAMP OR MILL CUT AN INDEX MARK AT EACH END OF CENTERLINE, AS SHOWN, 1/32 X 1/32 X 1/4 LONG.

(3) STEEL STAMP STANDARD ID No AND HEAT No, AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.

2. MATERIAL FOR STANDARD TO BE FREE OF FABRICATION OR REPAIR WELDS AND LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

1. BREAK SHARP EDGES AND REMOVE BURRS.

NOTES:

2	2	LIFTING EYE	McMASTER-CARR No 3027T26
1	1	BLOCK	(5)
		PART NAME	MATERIAL

SOUTHWEST RESEARCH INSTITUTE

SAN ANTONIO, TEXAS

5" CLAD VESSEL UT CALIBRATION BLOCK

FORT CALHOUN

RAMOS

SCALE 1/4

D-292205

CALIBRATION BLOCK 7 -FCL

ID 7-CSCL-7-FCL

THICKNESS 7" [✓] CLAD - THICKNESS .33"

MATERIAL C/S MAT'L SPEC SA 508

HEAT # 3P-2870 APPROX. DIMENSIONS 24" x 7" x 7"

[✓] Axial Cut ID Notch

[N/A] Circular Cut ID Notch

[✓] Axial Cut OD Notch

[N/A] Circular Cut OD Notch

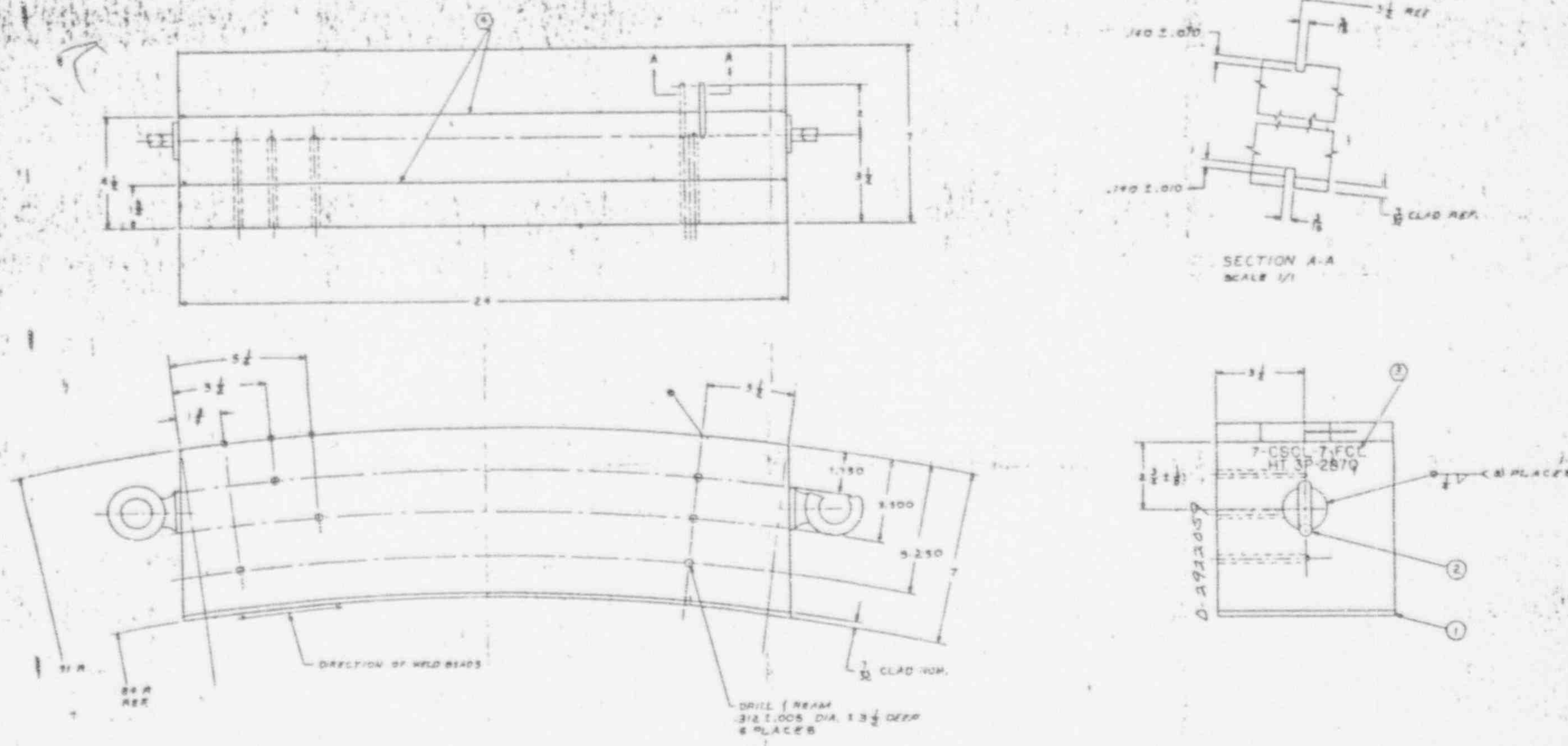
LENGTH	WIDTH	DEPTH
2.0	.18	.46
2.0	.18	.14

Other: SDH Ø = .31

P#3 GRP 3

HT 3P-2870

* Approximate Weight: 220



7-CSCL-7-FCL

17532

1. OVERLAY CLADDING IN ACCORDANCE WITH S.W.R.I. WP-300-2 REV.-0.

ULTRASONIC EXAMINATION TO BE PERFORMED IN ACCORDANCE WITH ASME SECTION III, 1971 ARTICLE 23, SA 578 INCLUDING ACCEPTANCE STANDARD LEVEL I & SUPPLEMENTARY REQUIREMENTS S1 PRIOR TO MACHINING.

MAKE FROM SA508 CL II, HEAT NO. 3P-2870 S.W.R.I. RIR NO. 0356A.

SCRIBE CENTERLINES AS SHOWN .003 TO .005 WIDE & .003 TO .005 DEEP. STEEL STAMP OR BALL CUT AN INDEX MARK AT EACH END OF CENTER LINE, AS SHOWN, 1/32 × 1/32 × 1/8 LONG.

STEEL STAMP STANDARD ID NO. AND HEAT NO., AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 APPR. HEIGHT.

MATERIAL FOR STANDARD TO BE FREE OF FABRICATION OR REPAIR WELDS AND LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

DEBURR AND BREAK SHARP EDGES.

NOTES:

2	2	LIFTING EYE	McMASTER-CARR #3024T28
1	1	BLOCK	(3)
		PART NAME	MATERIAL

PARTS LIST

SOUTHWEST RESEARCH INSTITUTE

1" CLAD VESSEL U.T. CALIB. BLOCK

FORT CALHOUN

RAMOS

SCALE 1/8

D-2922059

REVISIONS

CALIBRATION BLOCK 8 -FCL

ID 3-CSCL-8-FCL

THICKNESS 3.0 [✓] CLAD - THICKNESS 1/4

MATERIAL C/S MAT'L SPEC SA 508

HEAT # 3P-2870 APPROX. DIMENSIONS 18×3×6

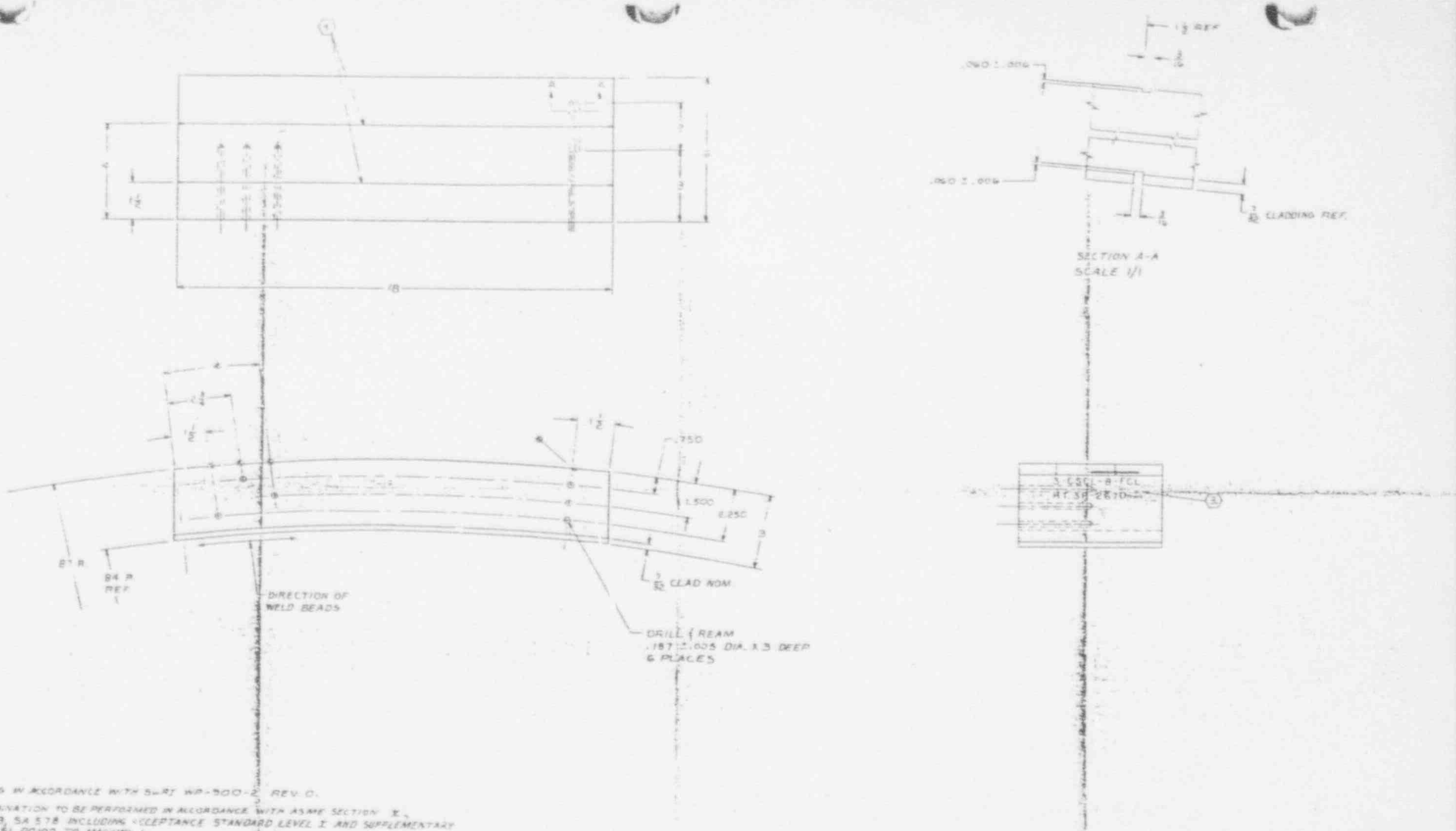
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.0	.2	.3
[N/A] Circular Cut ID Notch			
[✓] Axial Cut OD Notch	2.0	.2	.1
[N/A] Circular Cut OD Notch			

Other: P#3 GRP 3

SDH .2" Ø

HT. 3P-2870

* Approximate Weight: 45



NOTES:

1. BREAK SHARP EDGES AND REMOVE BURRS.
2. MATERIAL FOR STANDARD TO BE FREE OF FABRICATION OR REPAIR WELDS AND LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
3. STEEL STAMP STANDARD ID No. AND HEAT No., AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.
4. SCRIBE CENTERLINES, AS SHOWN, .003 TO .005 WIDE X .003 TO .005 DEEP, STEEL STAMP OR MILL CUT AN INDEX MARK AT EACH END OF CENTERLINE, AS SHOWN, 1/32 X 1/32 X 1/8 LONG.
5. MAKE FROM SA508 CL II, HEAT No. 3P-2870 SwRI RIR No. 0556A.
6. ULTRASONIC EXAMINATION TO BE PERFORMED IN ACCORDANCE WITH ASME SECTION XI, 1971 ARTICLE 23, SA 578 INCLUDING ACCEPTANCE STANDARD LEVEL I AND SUPPLEMENTARY REQUIREMENTS S1 PRIOR TO MACHINING.
7. OVERLAY CLADDING IN ACCORDANCE WITH SwRI WP-500-2 REV. 0.

3-CSCL-8-FCL

SOUTHWEST RESEARCH INSTITUTE
QUALITY ASSURANCE SYSTEMS AND ENGINEERING DIVISION
SAN ANTONIO, TEXAS

3" CLAD VESSEL UT CALIBRATION BLOCK
FORT CALHOUN

DRAWN BY: RAMOS
SCALE: 1/2
D-2922058

REVISIONS

I

NOZZLE SAFE-END

CALIBRATION BLOCK 9 -FCL

ID 32-SSCL-3.125-9-FCL

THICKNESS 3.12 [✓] CLAD - THICKNESS .22

MATERIAL SS MAT'L SPEC SA 182

HEAT # 16125 APPROX. DIMENSIONS 10 x 3¼ x 12

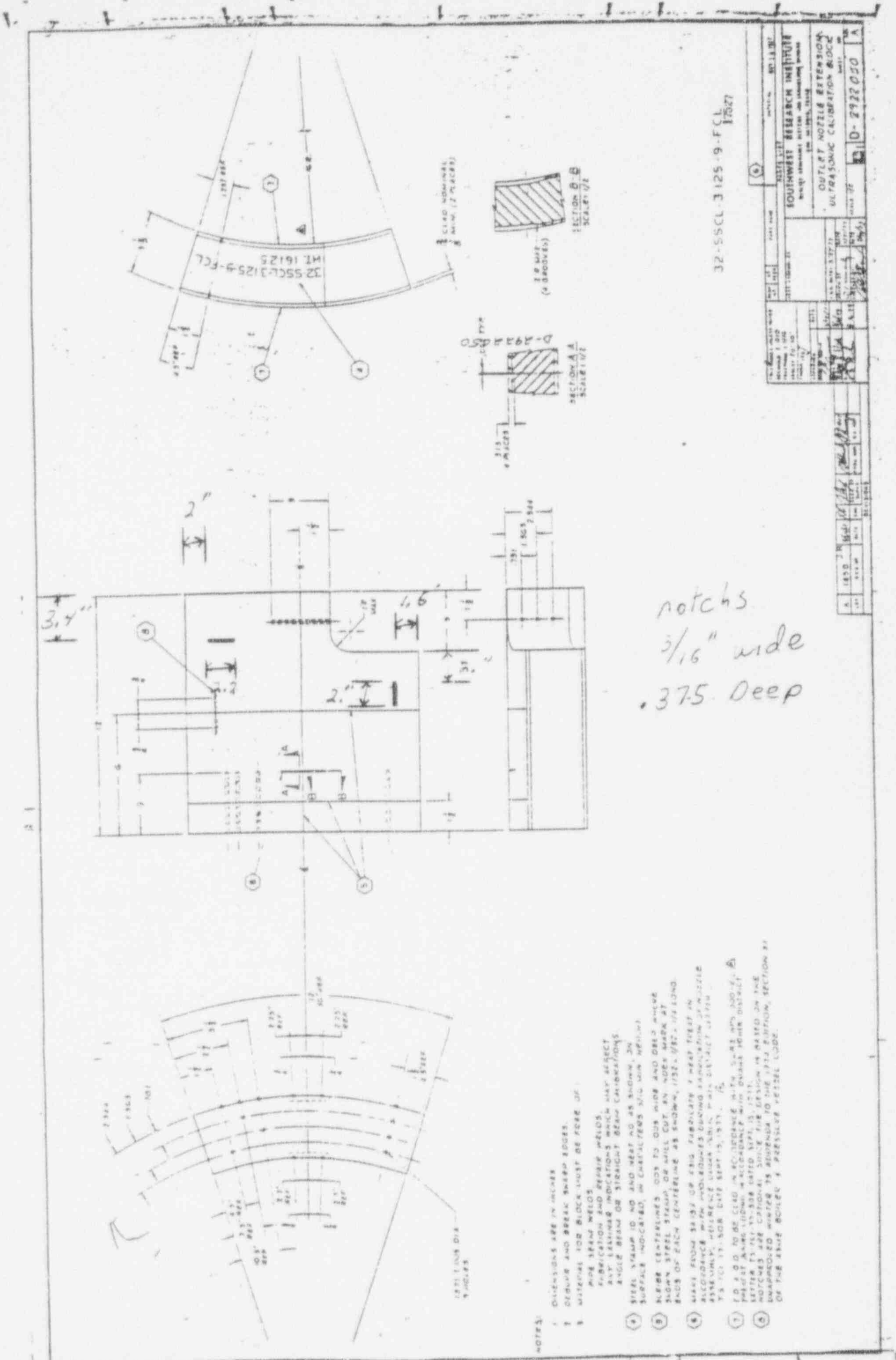
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.0	5/c ; .2	.3
[✓] Circular Cut ID Notch	2.0	5/c ; .2	.3
[✓] Axial Cut OD Notch	2.0	5/c	.3
[✓] Circular Cut OD Notch	2.0	5/c	.3

Other: SDH .2"Ø

P#8 GRP 1

HT. 16125

* Approximate Weight: 108



32-SSCL-3125-9-FCL
SOUTHWEST RESEARCH INSTITUTE
OUTLET NOZZLE EXTENSION ULTRASONIC CALIBRATION BLOCK
D-2922050
SECTION A-A
SECTION B-B
NOTES:
2"
3.4"
1.6"
2."
notchs
3/16" wide
.375 Deep

NOZZLE SAFE-END

CALIBRATION BLOCK 10 -FCL

ID 24-SSCL-2406-10-FCL

THICKNESS 2½" [✓] CLAD - THICKNESS .22

MATERIAL SS MAT'L SPEC SA 182

HEAT # 16125 APPROX. DIMENSIONS 12×9½×2½

[✓] Axial Cut ID Notch

[✓] Circular Cut ID Notch

[N/A] Axial Cut OD Notch

[N/A] Circular Cut OD Notch

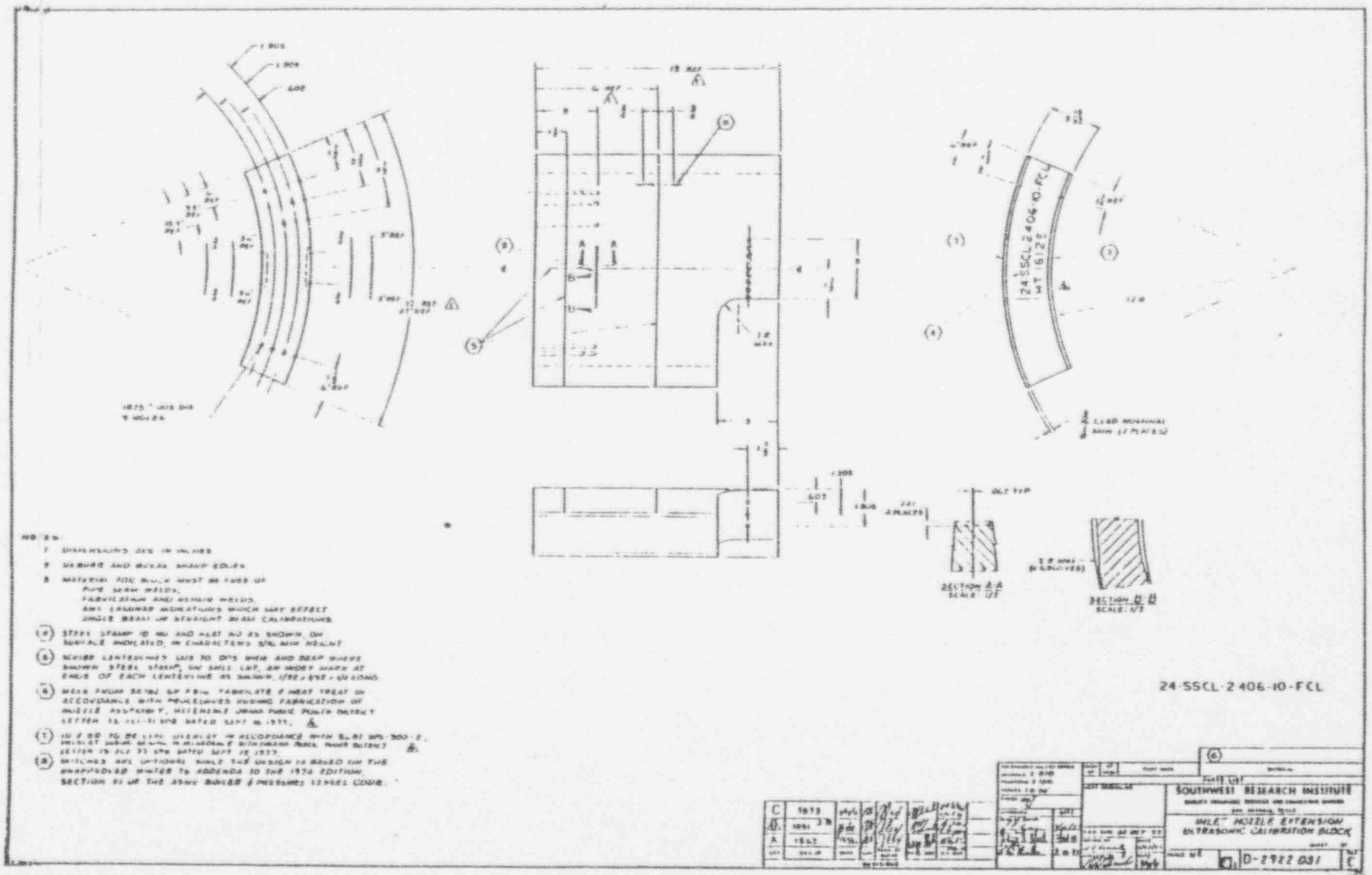
LENGTH	WIDTH	DEPTH
2.0	.2	.4
2.0	.2	.4

Other: P#8 GRP1

SDH .2" Ø

HT. 16125

* Approximate Weight: 81


24 SSCL 2406-10-FCL
MT 16125
SECTION A-A
SECTION B-B
24-SSCL-2406-10-FCL
SOUTHWEST RESEARCH INSTITUTE
INLET NOZZLE EXTENSION
ULTRASONIC CALIBRATION BLOCK
D-2922 031

CALIBRATION BLOCK 11 -FCL

ID 10-SSCL-X-1.125-11-FCL

THICKNESS 1.125 [✓] CLAD - THICKNESS .22

MATERIAL SS MAT'L SPEC SA182

HEAT # 16125 APPROX. DIMENSIONS 12×9×1.4

[✓] Axial Cut ID Notch

[✓] Circular Cut ID Notch

[N/A] Axial Cut OD Notch

[N/A] Circular Cut OD Notch

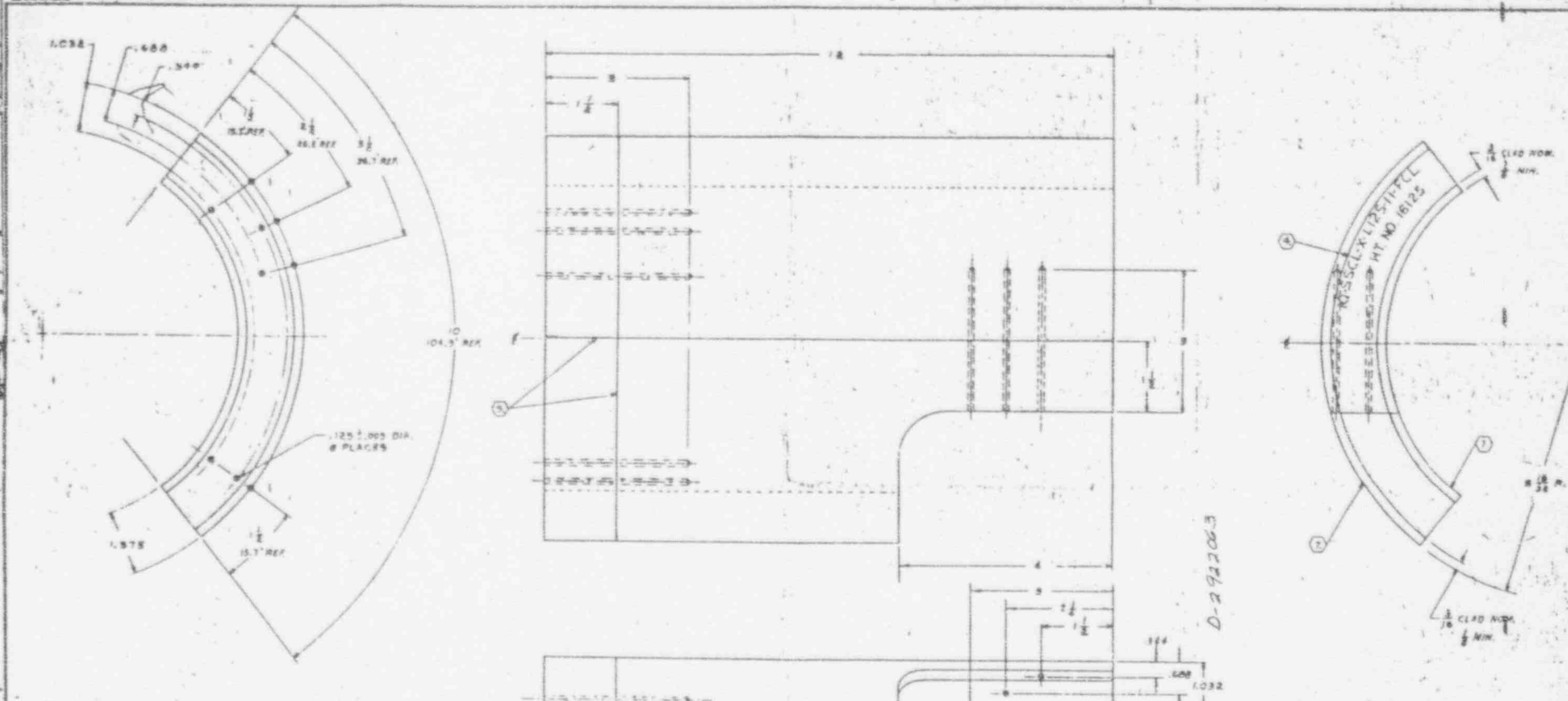
LENGTH	WIDTH	DEPTH
1.5	.2	.3
1.0	.2	.3

Other: P#8 GR. 1

SDH .1" Ø

HT. 16125

* Approximate Weight: 36



5 PREHEAT DURING WELDING AND HEAT TREATMENT AFTER WELDING IN ACCORDANCE WITH OMAHA PUBLIC POWER DISTRICT LETTER TS-FCI-77-508, DATED SEPT. 15, 1977 △A

7 CLAD OVERLAY IN ACCORDANCE WITH SWRI WPS 900-E.

6 MAKE FROM FORGING SA 182, F316, HEAT NO. 16125 SWRI RIN NO. 0695C

5 SCRIB. CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CST AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN, 1/32 X 1/32 X 1/4 LONG.

4 STEEL STAMP ID. NO. AND HEAT NO. AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.

3. MATERIAL FOR BLOCK MUST BE FREE OF: FABRICATION OR REPAIR WELDS. ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

2. DEBURR AND BREAK SHARP EDGES.

1. DIMENSIONS ARE IN INCHES.

NOTES:

10-SSCL-X-1.125-11-FCL

17536

SOUTHWEST RESEARCH INSTITUTE

NOZZLE EXTENSION, UT, CALIBRATION BLOCK

FORT CALHOUN

RAMOS

SCALE 1/1

D-2922063 A

REVISIONS: A 1895

CALIBRATION BLOCK 12 -FCL

ID 6.5-CSCL-X-1.75-12-FCL

THICKNESS 1.50 [ ] CLAD - THICKNESS .25

MATERIAL CS MAT'L SPEC SA 508

HEAT # 3P 2870 APPROX. DIMENSIONS 12 × 6½ × 3½

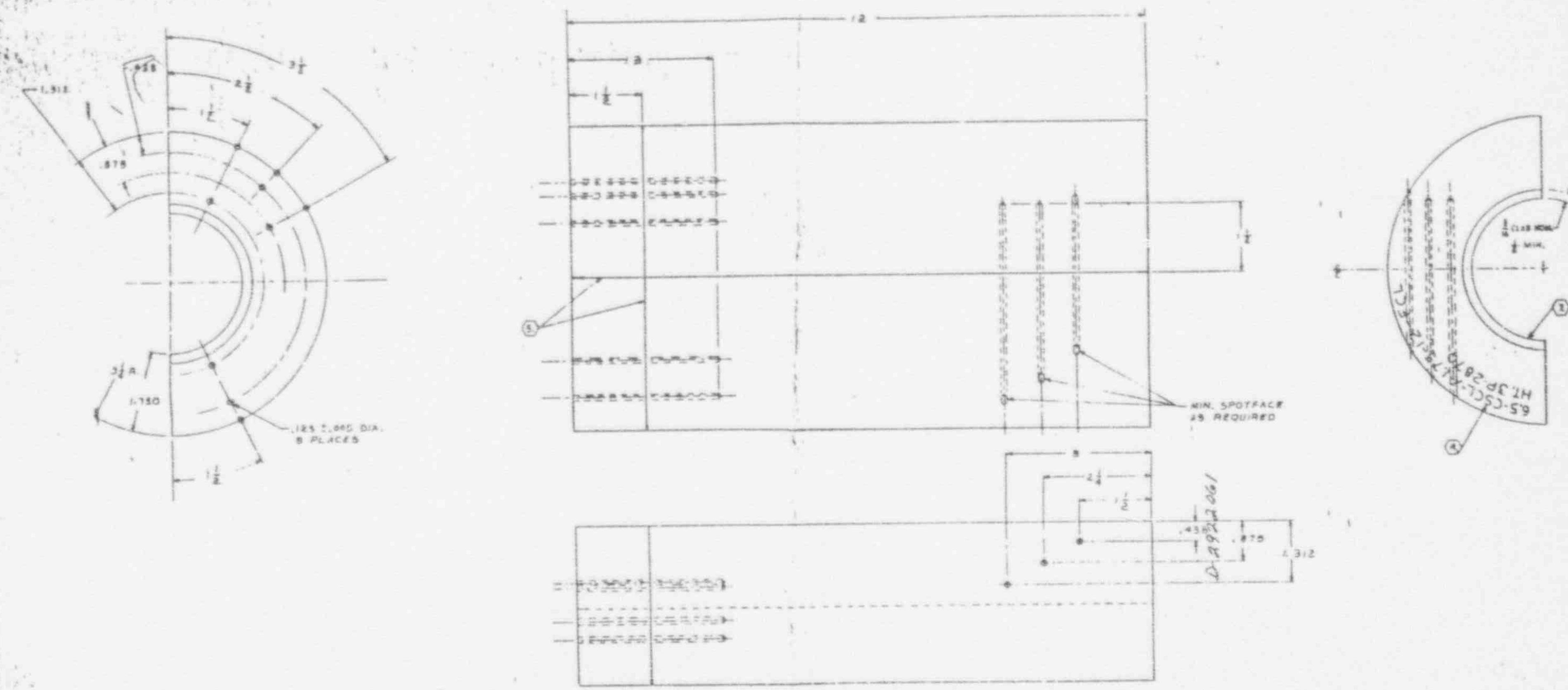
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.0	.19	.32
[✓] Circular Cut ID Notch	1.0	.19	.32
[✓] Axial Cut OD Notch	1.0	.19	.14
[✓] Circular Cut OD Notch	1.0	.19	.14

Other: P-3 GRP 3

SDH 1/8" Ø

HT. 3P-2870

* Approximate Weight: 28



NOTES:

1. DIMENSIONS ARE IN INCHES.
2. DEBURR AND BREAK SHARP EDGES.
3. MATERIAL FOR BLOCK MUST BE FREE OF:
   PIPE SEAM WELDS, FABRICATION OR REPAIR WELDS,
   ANY LAMINAR INDICATIONS WHICH MAY AFFECT
   ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
4. STEEL STAMP ID. NO. AND HEAT NO. AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.
5. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN, 1/32 x 1/32 x 1/4 LONG.
6. MAKE FROM SA 508 CL II, HEAT NO. 3P-2870, SwRI RIR NO. 0558A.
7. CLAD OVERLAY IN ACCORDANCE WITH SwRI WPS 300-2.

6.5-CSCL-X-1.75-12-FCL

17534

SOUTHWEST RESEARCH INSTITUTE

NOZZLE-TO-FLANGE UT.
CALIBRATION BLOCK
FORT CALHOUN

RAMOS

SCALE 1/1

D-2922061

CALIBRATION BLOCK 13 -FCL

ID 6-X-1.5-13-FCL

THICKNESS 1.5 [ ] CLAD - THICKNESS ____

MATERIAL SS MAT'L SPEC SB 166

HEAT # NX8229 APPROX. DIMENSIONS 12"x6"x3"

	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.0	.18	.10
[✓] Circular Cut ID Notch	1.0	.18	.10
[✓] Axial Cut OD Notch	1.0	.18	.10
[✓] Circular Cut OD Notch	1.0	.18	.10

Other: SDH .12 Ø

P # 43

HT. NX8229

* Approximate Weight: 35

6-IN-X-1.5-13-FCL

NOTES:

1. DIMENSIONS ARE IN INCHES.
2. DEBURR AND BREAK SHARP EDGES.
3. MATERIAL FOR BLOCK TO BE FREE OF:
   PIPE SEAM WELDS, FABRICATION OR REPAIR WELDS,
   ANY LAMINAR INDICATIONS WHICH MAY AFFECT
   ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
4. STEEL STAMP I.D. No. AND HEAT No. AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.
5. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT, AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN, 1/32 X 1/32 X 1/4 LONG.
6. MAKE FROM SB-166 HEAT No. NX8229
   SwRI RIR No. 0634 A

SOUTHWEST RESEARCH INSTITUTE
QUALITY ASSURANCE SYSTEMS AND ENGINEERING DIVISION
SAN ANTONIO, TEXAS

FLANGE-TO-NOZZLE UT
CALIBRATION BLOCK
FORT CALHOUN

DRAWN BY RAMOS
SCALE 1/1
D-2922 062

REVISIONS

CALIBRATION BLOCK 14 -FCL

ID 2.5-SS-1160-.375-14-FCL

THICKNESS .375 [ ] CLAD - THICKNESS

MATERIAL SS MAT'L SPEC SA 376

HEAT # NVE16B APPROX. DIMENSIONS 3×10×1½

	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.25	S/C	.03
[✓] Circular Cut ID Notch	2.25	S/C	.03
[✓] Axial Cut OD Notch	2.25	S/C	.03
[✓] Circular Cut OD Notch	2.25	S/C	.03

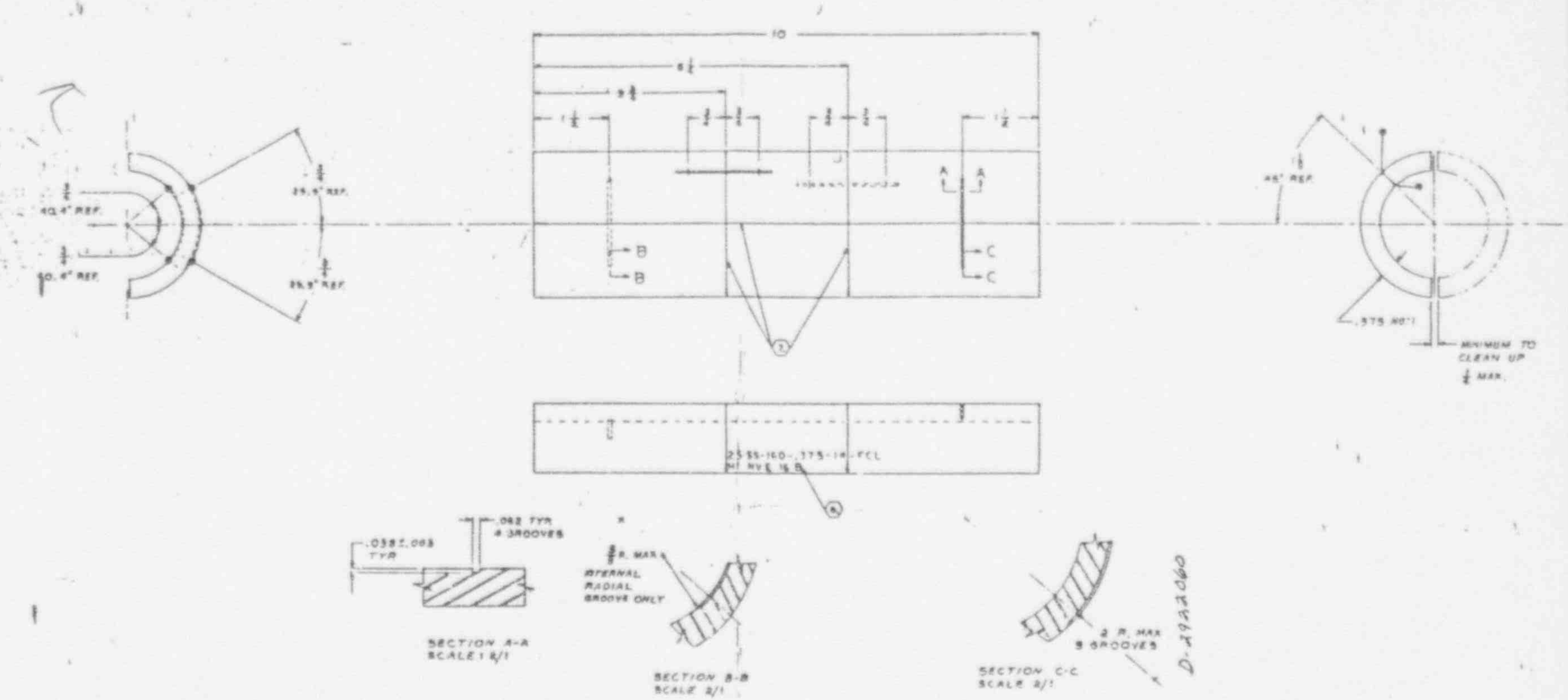
Other: P#8 GRP 1

316 SS

No SDH

NVE 16 B

* Approximate Weight: 12



6) MAKE FROM 2½" PIPE, SCHEDULE 160, HEAT NR. NYE 16.B SwRI RIR NR. 06694, A376 TYPE 316.

7) SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN, 1/32 X 1/32 X 1/4 LONG.

6) STEEL STAMP ID. NR. AND HEAT NR. AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.

5. MATERIAL FOR BLOCK MUST BE FREE OF:
   PIPE SEAM WELDS, FABRICATION OR REPAIR WELDS, ANY LAMINAR INDICATIONS WHICH WOULD AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

4. ID. AND OD. SURFACES TO BE FREE OF TOOL MARKS.

3. DO NOT MACHINE OR ALTER ID. OR OD. SURFACES.

2. DEBURR AND BREAK SHARP EDGES.

1. DIMENSIONS ARE IN INCHES.

NOTES:

2.5-SS-160-.375-14-FCL

17533

SOUTHWEST RESEARCH INSTITUTE

2½ PIPE ULTRASONIC CALIBRATION BLOCK

FORT CALHOUN

RAMOS

D-2922060

CALIBRATION BLOCK 15 -FCL

ID 28-CS-X-1.0-15-FCL

THICKNESS 1.0 [ ] CLAD - THICKNESS ____

MATERIAL C/S MAT'L SPEC SA155

HEAT # 801522760 APPROX. DIMENSIONS 1×7¾×12

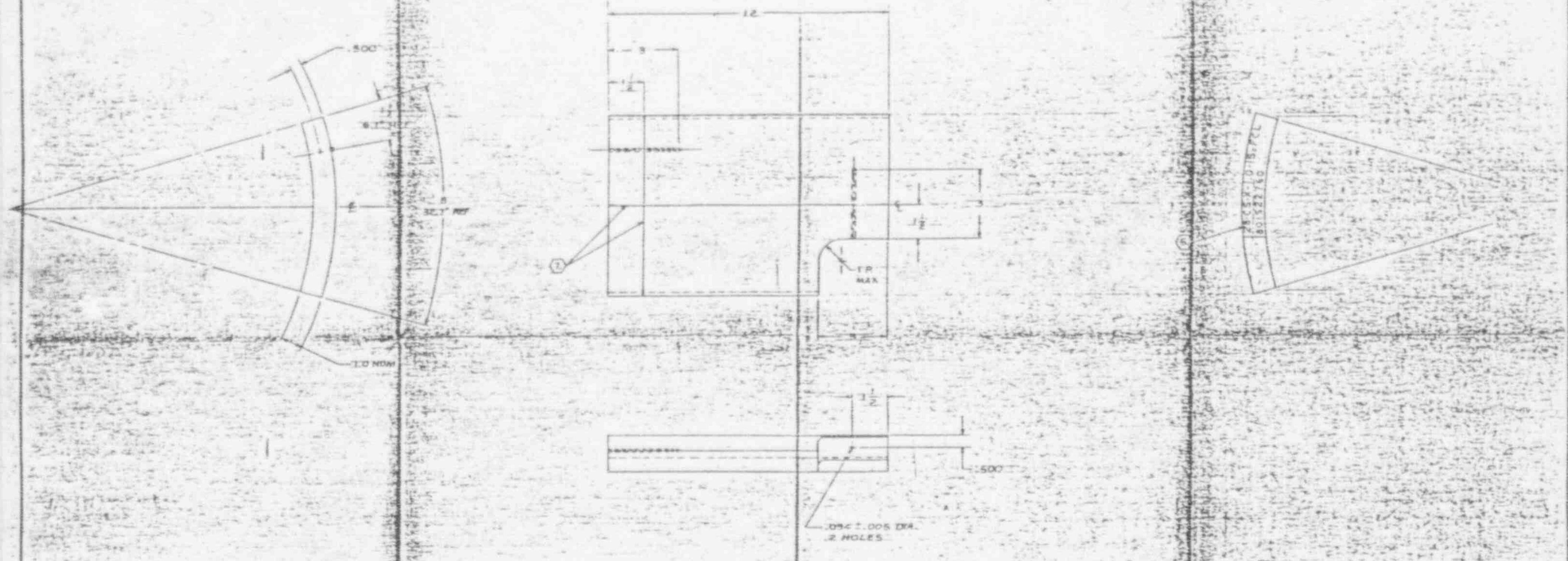
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	<2"	.2	.1
[✓] Circular Cut ID Notch	<2'	.2	.1
[✓] Axial Cut OD Notch	<2"	.2	.1
[✓] Circular Cut OD Notch	<2"	.2	.1

Other: P# 1 GRP 1

SCH. 10 Ø

HT. 801522760

* Approximate Weight: 15



28-CS-X-1.0-15-FCL

NOTES:

1. DIMENSIONS ARE IN INCHES.
2. DEBURR AND BREAK SHARP EDGES.
3. DO NOT MACHINE OR ALTER ID. OR OD. SURFACES.
4. ID. AND OD. SURFACES TO BE FREE OF TOOL MARKS.
5. MATERIAL FOR BLOCK MUST BE FREE OF:
   PIPE SEAM WELDS, FABRICATION OR REPAIR WELDS, ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
6. STEEL STAMP ID. Nº AND HEAT Nº AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.
7. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT, AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN, 1/32 X 1/32 X 1/4 LONG.
8. MAKE FROM 28" PIPE, A155 CL1, C55, HEAT Nº 8015[illegible] S.RI. RIR Nº UT61

SOUTHWEST RESEARCH INSTITUTE
QUALITY ASSURANCE SYSTEMS AND ENGINEERING DIVISION
SAN ANTONIO, TEXAS

28" PIPE ULTRASONIC CALIBRATION BLOCK
FORT CALHOUN

SCALE 1/2 | C | D-2922070

DRAWN: RAMOS

CALIBRATION BLOCK 16 -FCL

ID 16-CS-80-.884-16-FCL

THICKNESS .884 [ ] CLAD - THICKNESS ______

MATERIAL CS MAT'L SPEC SA106

HEAT # L05127 APPROX. DIMENSIONS 12×8×2

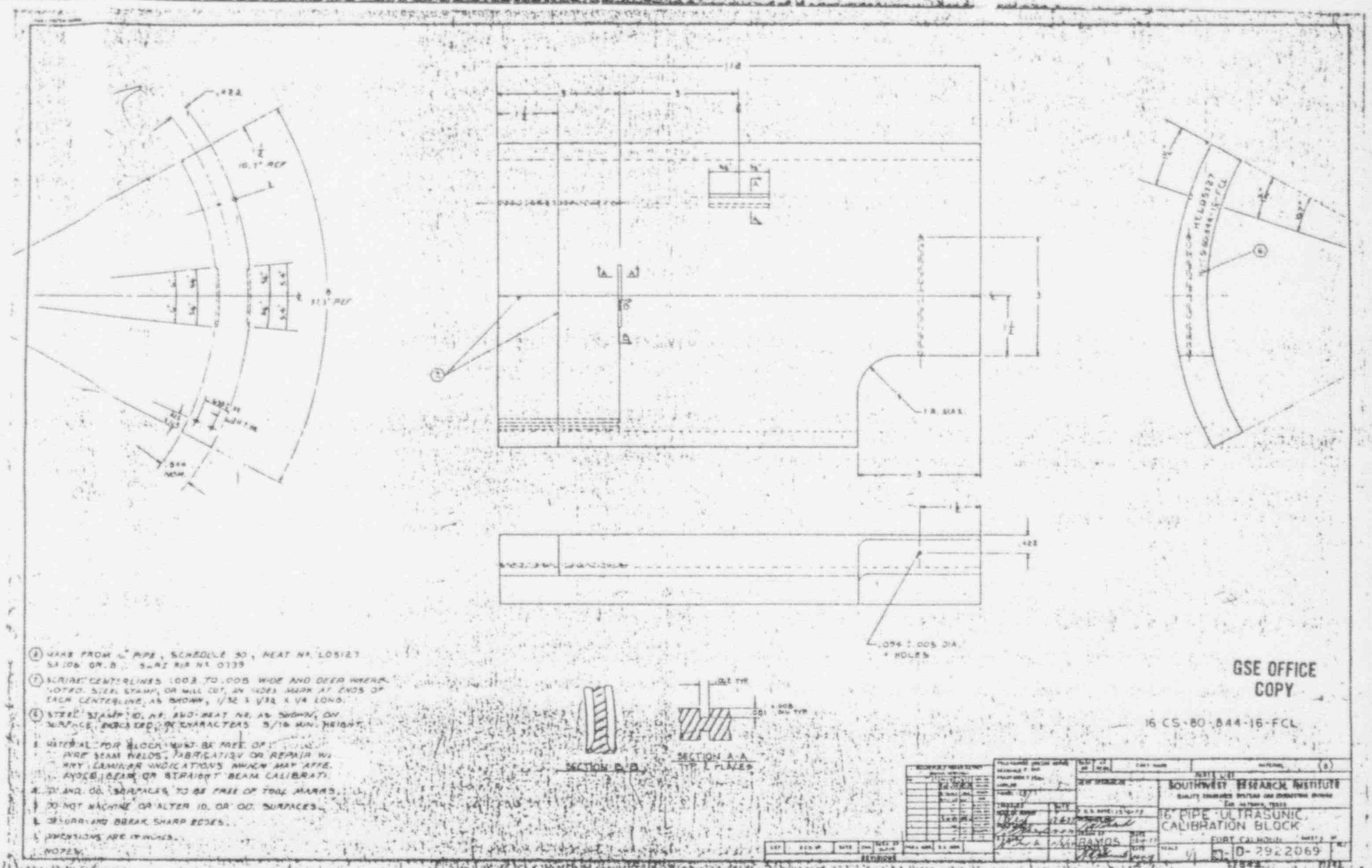
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.5	S/C	.08
[✓] Circular Cut ID Notch	1.5	S/C	.08
[✓] Axial Cut OD Notch	1.5	S/C	.08
[✓] Circular Cut OD Notch	1.5	S/C	.08

Other: P# 1 GROUP 1

SDH .1" Ø

HT. L05127

* Approximate Weight: 20


GSE OFFICE
COPY
16 CS-80-844-16-FCL
(8) MAKE FROM 16" PIPE, SCHEDULE 80, HEAT NO. L05127
SA 106 GR. B SwRI RIR NO. 0139
(7) SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT, AN INDEX MARK AT ENDS OF EACH CENTERLINE, AS SHOWN, 1/32 x 1/32 x 1/4 LONG.
(6) STEEL STAMP ID. NO. AND HEAT NO. AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.
MATERIAL FOR BLOCK MUST BE FREE OF:
PIPE SEAM WELDS, FABRICATION OR REPAIR W
ANY LAMINAR INDICATIONS WHICH MAY AFFE
ANGLE BEAM OR STRAIGHT BEAM CALIBRATI
ID. AND OD. SURFACES TO BE FREE OF TOOL MARKS.
DO NOT MACHINE OR ALTER ID. OR OD. SURFACES.
DEBURR AND BREAK SHARP EDGES.
DIMENSIONS ARE IN INCHES.
NOTES:
SECTION B-B
SECTION A-A
.094 ± .005 DIA.
4 HOLES
1 R. MAX.
SOUTHWEST RESEARCH INSTITUTE
16" PIPE ULTRASONIC CALIBRATION BLOCK
FORT CALHOUN
D-2922069
RAMOS
16 FCL

CALIBRATION BLOCK 17 -FCL

ID 14-SS-20-.312-17-FCL

THICKNESS .312 [ ] CLAD - THICKNESS

MATERIAL SS MAT'L SPEC SA 358/304

HEAT # F50820 APPROX. DIMENSIONS 10x6x1

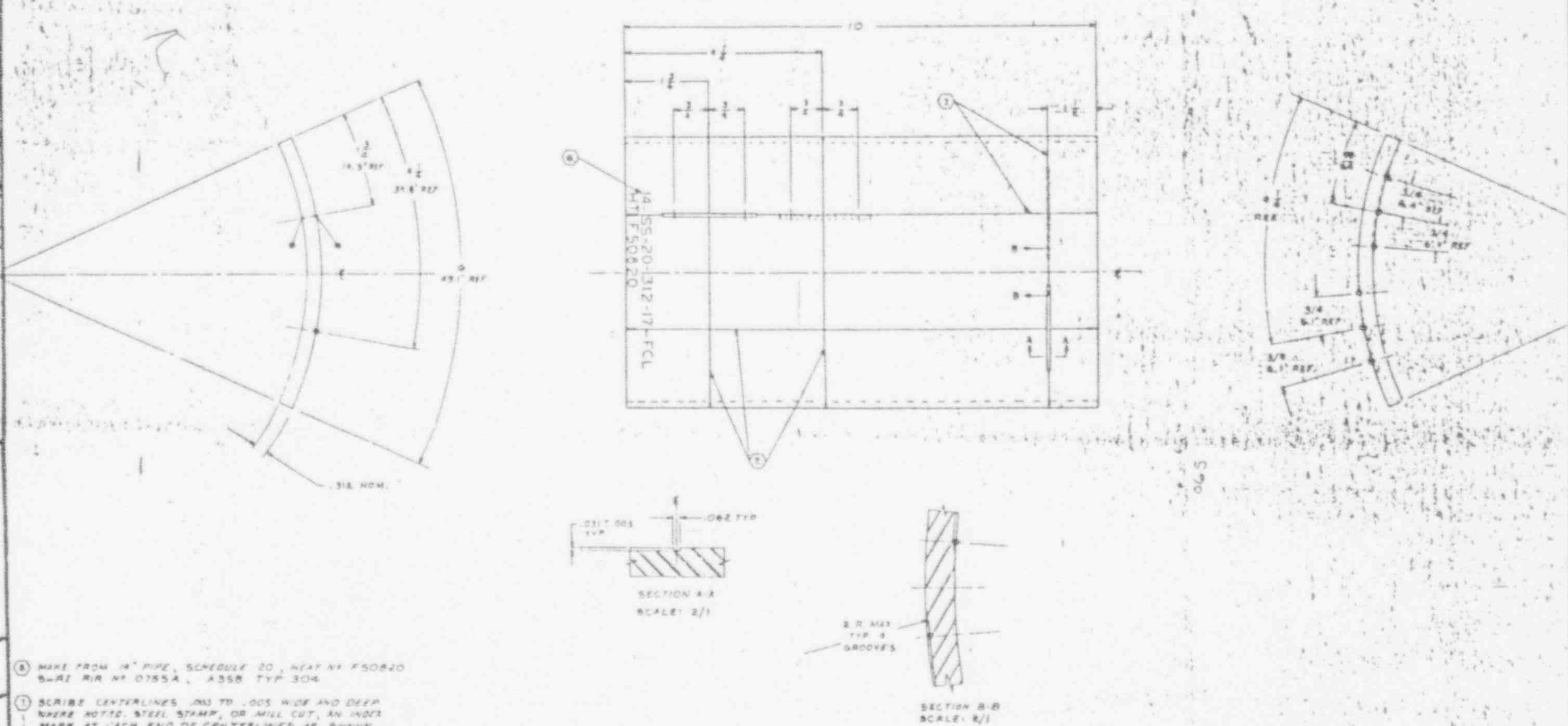
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.7	S/C	.03
[✓] Circular Cut ID Notch	1.7	S/C	.03
[✓] Axial Cut OD Notch	1.7	S/C	.03
[✓] Circular Cut OD Notch	1.7	S/C	.03

Other: No SDH

P# 8 GRP 2

HT. 50820

* Approximate Weight: 8



8. MAKE FROM 14" PIPE, SCHEDULE 20, HEAT Nº F50820 SwRI RIR Nº 0755A, A358 TYP 304

7. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT, AN INDEX MARK AT EACH END OF CENTERLINES AS SHOWN, 1/32 X 1/32 X 1/4 LONG.

6. STEEL STAMP ID Nº AND HEAT Nº, AS SHOWN, ON SURFACE INDICATED AND WITHIN LIMITS OF AREA NOTED, IN CHARACTERS 3/16 MIN. HEIGHT.

5. MATERIAL FOR BLOCK TO BE FREE OF:
   FABRICATION OR REPAIR WELDS, PIPE SEAM WELDS, ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

4. ID. AND OD. SURFACES TO BE FREE OF TOOL MARKS.

3. DO NOT MACHINE OR ALTER ID. OR OD. SURFACES.

2. DEBURR AND BREAK SHARP EDGES

1. DIMENSIONS ARE IN INCHES.

NOTES:

14-SS-20-.312-17-FCL

17538

SOUTHWEST RESEARCH INSTITUTE

14" PIPE UT CALIB. BLOCK

FORT CALHOUN

RAMOS

D-2922065

CALIBRATION BLOCK 18 -FCL

ID 12-SS-40S-.375-18-FCL

THICKNESS .375 [ ] CLAD - THICKNESS

MATERIAL SS MAT'L SPEC SA 312 /304

HEAT # 73314 APPROX. DIMENSIONS 10 x 6 x 1

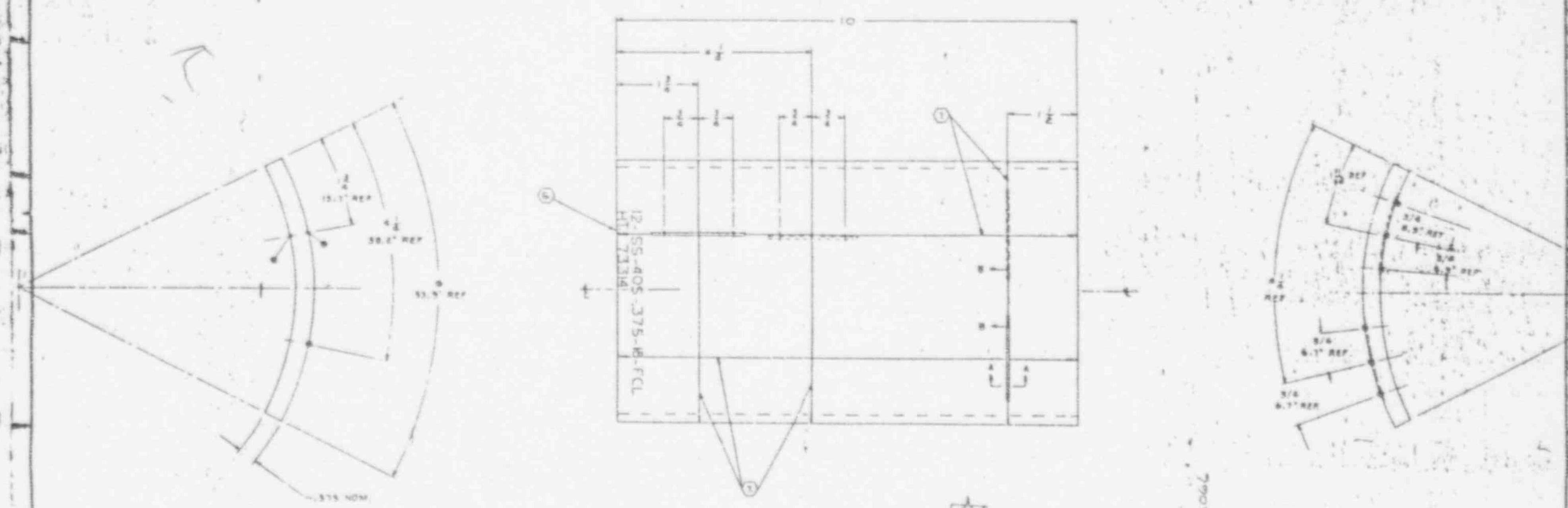
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.75	S/C	.03
[✓] Circular Cut ID Notch	1.75	S/C	.03
[✓] Axial Cut OD Notch	1.75	S/C	.03
[✓] Circular Cut OD Notch	1.75	S/C	.03

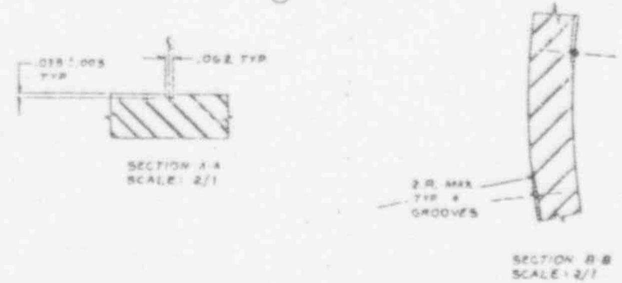
Other: NO SDH

P#8 GRP 1

HT. 73314

* Approximate Weight: 8





(8) MAKE FROM 12" PIPE, SCHEDULE 40S, HEAT NO. 73314
SwRI RIR No. 07658 A 312, TYP 304

(7) SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT, AN INDEX MARK AT EACH END OF CENTERLINES AS SHOWN, 1/16 × 1/32 × 1/4 LONG.

(6) STEEL STAMP ID NO AND HEAT NO. AS SHOWN, ON SURFACE INDICATED AND WITHIN LIMITS OF AREA NOTED, IN CHARACTERS 3/16 MIN HEIGHT.

5. MATERIAL FOR BLOCK TO BE FREE OF:
FABRICATION OR REPAIR WELD, PIPE SEAM WELDS, ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

4. ID AND OD SURFACES TO BE FREE OF TOOL MARKS.

3. DO NOT MACHINE OR ALTER ID OR OD SURFACES.

2. DEBURR AND BREAK SHARP EDGES.

1. DIMENSIONS ARE IN INCHES.

NOTES:

12-SS-40S-375-18-FCL

17530

SOUTHWEST RESEARCH INSTITUTE

12" PIPE UT CALIB BLOCK

RAMOS

D-2922066

CALIBRATION BLOCK 19 -FCL

ID 10-SS-40S-.365-19-FCL

THICKNESS .365 [ ] CLAD - THICKNESS

MATERIAL SS MAT'L SPEC SA 312/304

HEAT # A29600 APPROX. DIMENSIONS 10×6×1½

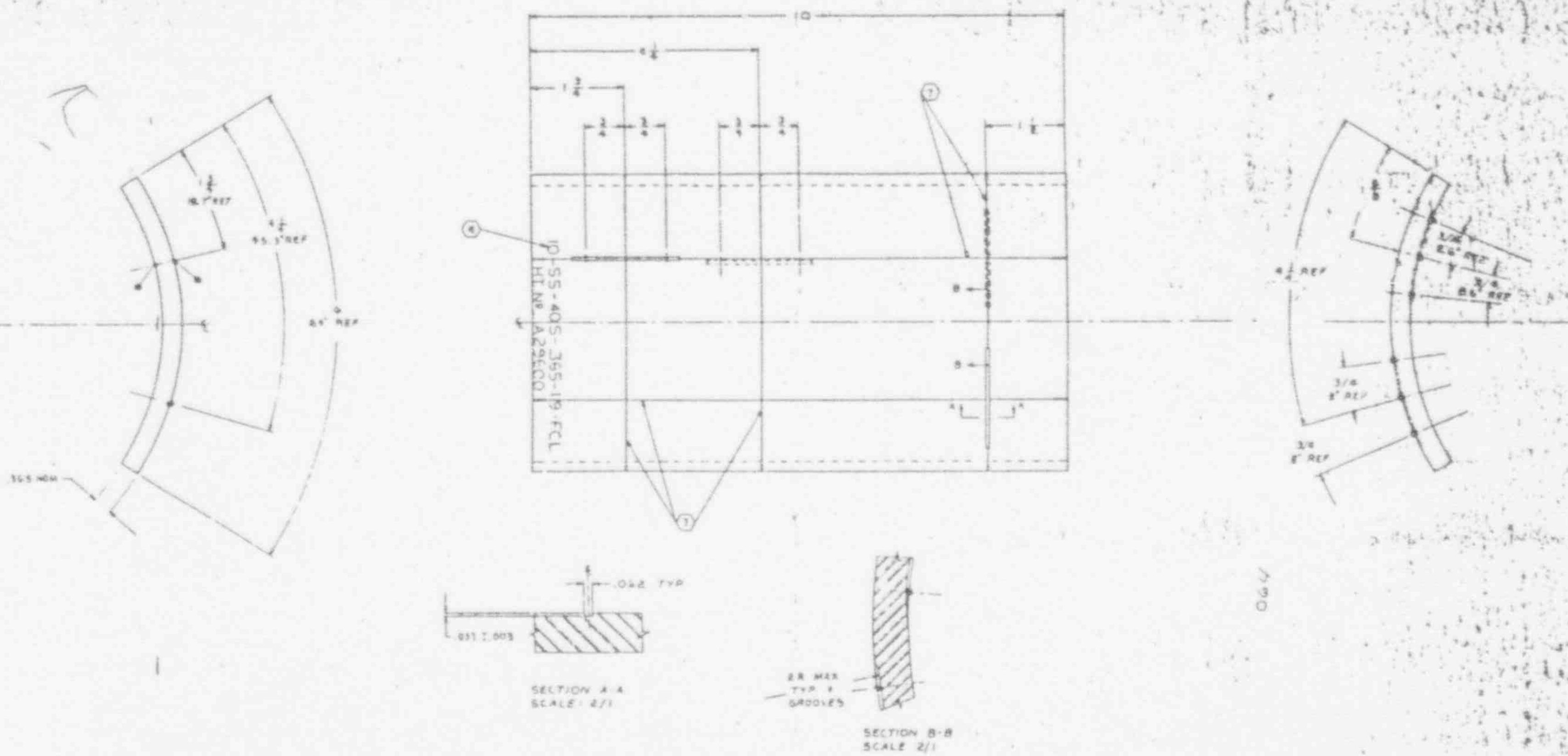
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.75	S/C	.03
[✓] Circular Cut ID Notch	1.75	S/C	.03
[✓] Axial Cut OD Notch	1.75	S/C	.03
[✓] Circular Cut OD Notch	1.75	S/C	.03

Other: No SDH

P8/GR 1

HT. A29600

* Approximate Weight: 10



8. MAKE FROM 10" PIPE, SCHEDULE 40, HEAT Nº A29600
SwRI RIR Nº 0740 A312, TYP 304.

7. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT, AN INDEX MARK AT EACH END OF CENTERLINES AS SHOWN, 1/32 X 1/32 X 1/4 LONG.

6. STEEL STAMP ID Nº AND HEAT Nº, AS SHOWN, ON SURFACE INDICATED AND WITHIN LIMITS OF AREA NOTED, IN CHARACTERS 3/16 MIN. HEIGHT.

5. MATERIAL FOR BLOCK TO BE FREE OF:
FABRICATION OR REPAIR WELDS, PIPE SEAM WELDS, ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

4. ID. AND OD. SURFACES TO BE FREE OF TOOL MARKS.

3. DO NOT MACHINE OR ALTER ID OR OD SURFACES.

2. DEBURR AND BREAK SHARP EDGES.

1. DIMENSIONS ARE IN INCHES.

NOTES:

10-SS-40S-.365-19-FCL

17537

SOUTHWEST RESEARCH INSTITUTE

10" PIPE UT CALIB. BLOCK

FORT CALHOUN

RAMOS

SCALE 1/1

D-2922064

CALIBRATION BLOCK 20 -FCL

ID 8-SS-40S-.322-20-FCL

THICKNESS .322 [ ] CLAD - THICKNESS ____

MATERIAL SS MAT'L SPEC SA312/304

HEAT # A29715 APPROX. DIMENSIONS 10×6×1½

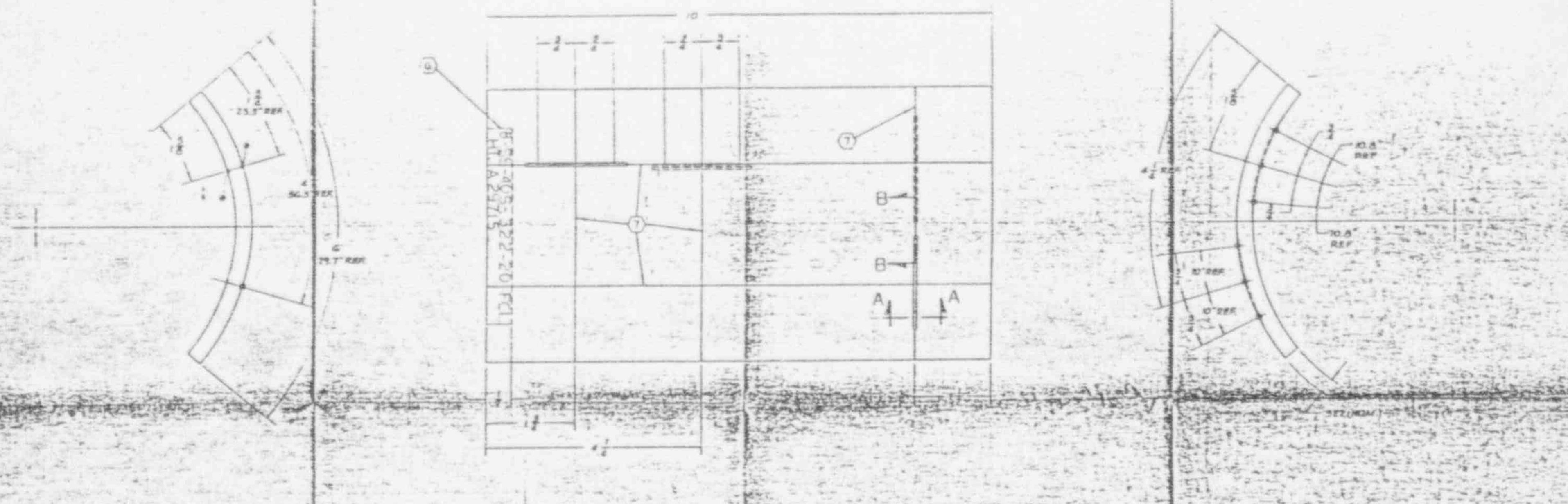
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.75	S/C	.03
[✓] Circular Cut ID Notch	1.75	S/C	.03
[✓] Axial Cut OD Notch	1.75	S/C	.03
[✓] Circular Cut OD Notch	1.75	S/C	.03

Other: No SDH

P8/GRP 1

HT. A29715

* Approximate Weight: 8



SECTION A-A
SECTION: 2/1

SECTION B-B
SCALE: 2/1

NOTES:

1. DIMENSION ARE IN INCHES.
2. DEBURR & BREAK SHARP EDGES.
3. DO NOT MACHINE OR ALTER I.D. OR O.D. SURFACES.
4. I.D. & O.D. SURFACES TO BE FREE OF TOOL MARKS.
5. MATERIAL FOR BLOCK TO BE FREE OF: FABRICATION OR REPAIR WELDS, PIPE SEAM WELDS, ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

(6) STEEL STAMP I.D. NO & HEAT NO., AS SHOWN, ON SURFACE INDICATED AND WITHIN LIMITS OF AREA NOTED, IN CHARACTERS 3/16 MIN. HEIGHT.

(7) SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT, AN INDEX MARK AT EACH END OF CENTERLINES AS SHOWN, 1/32 x 1/32 x 1/4 LONG.

(8) MAKE FROM 8" PIPE, SCHEDULE 40S, HEAT NO. A29715, SWRI R/R NO. 2740B.

8-SS-40S-322-20-FCL

(8)

PARTS LIST

SOUTHWEST RESEARCH INSTITUTE

SAN ANTONIO, TEXAS

8" DIA. PIPE ULTRASONIC CALIBRATION BLOCK
FORT CALHOUN

SCALE 1/1

D-2922-068

REVISIONS

CALIBRATION BLOCK 21 -FCL

ID 6-SS-40S-.280-21-FCL

THICKNESS .280 [ ] CLAD - THICKNESS ____

MATERIAL SS MAT'L SPEC SA 312/304

HEAT # SX 1025 APPROX. DIMENSIONS 10×6×1½

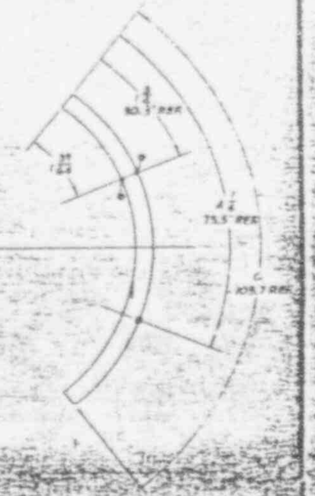
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.6	S/C	.025
[✓] Circular Cut ID Notch	1.6	S/C	.025
[✓] Axial Cut OD Notch	1.6	S/C	.025
[✓] Circular Cut OD Notch	1.6	S/C	.025

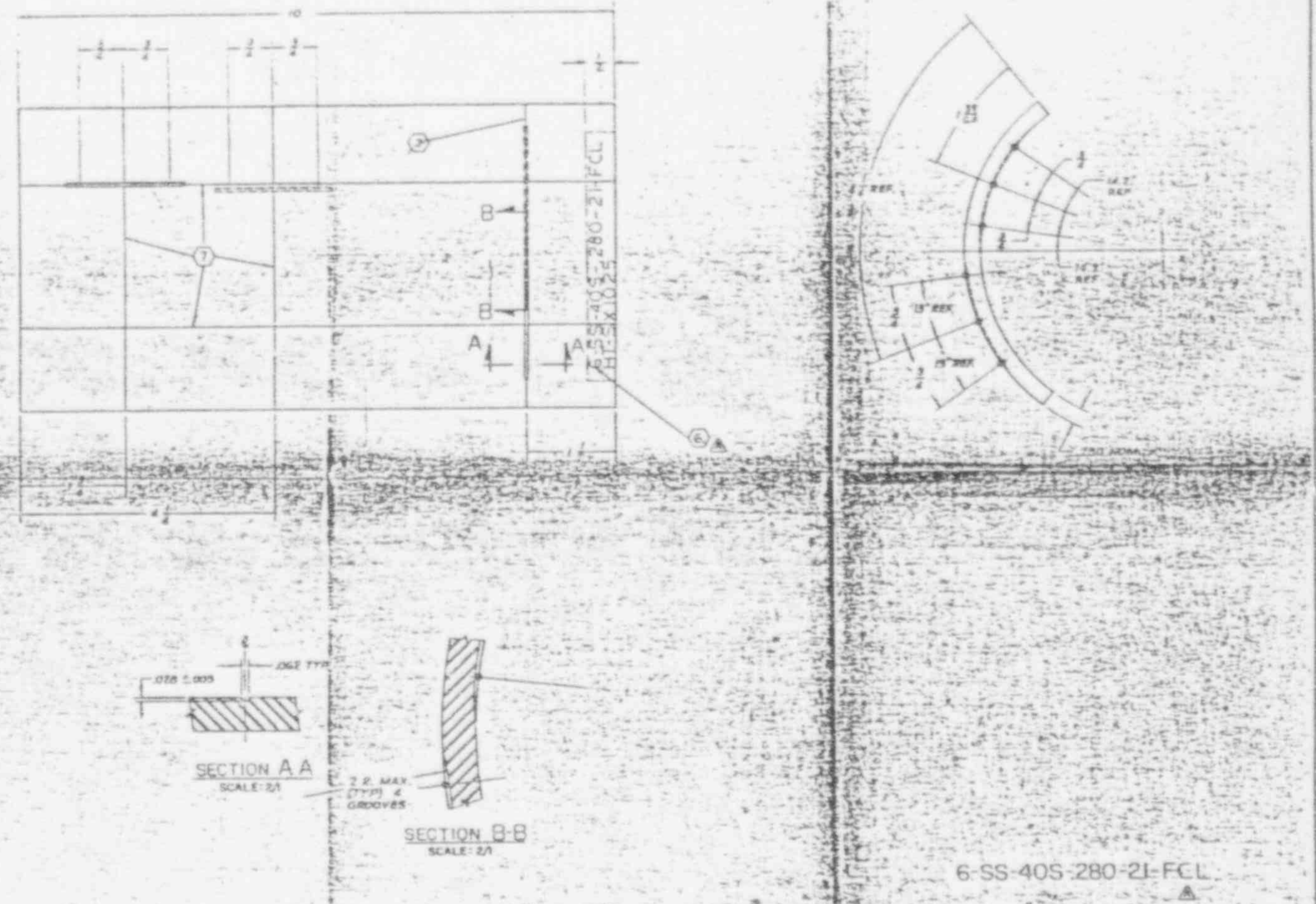
Other: NO SDH

PB/GRP 1

HT. SX1025

* Approximate Weight: 6





NOTES:

1. DIMENSIONS ARE IN INCHES.
2. DEBURR & BREAK SHARP EDGES.
3. DO NOT MACHINE OR ALTER ID. OR O.D. SURFACES.
4. I.D. & O.D. SURFACES TO BE FREE OF TOOL MARKS.
5. MATERIAL FOR BLOCK TO BE FREE OF: FABRICATION OR REPAIR WELDS, PIPE SEAM WELDS, ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

(6) STEEL STAMP I.D. NO. & HEAT NO., AS SHOWN, ON SURFACE INDICATED AND WITHIN LIMITS OF AREA NOTED, IN CHARACTERS 3/16 MIN. HEIGHT.

(7) SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CUT, AN INDEX MARK AT EACH END OF CENTERLINES AS SHOWN, 1/32 × 1/32 × 1/4 LONG.

(8) MAKE FROM 6" PIPE, SCHEDULE 40, HEAT NO. 381025 SWRI RIR NO. 0740-

A	2077	REVISIONS

PARTS LIST

SOUTHWEST RESEARCH INSTITUTE

QUALITY ASSURANCE SYSTEMS AND ENGINEERING DIVISION

SAN ANTONIO, TEXAS

6" DIA. PIPE ULTRASONIC CALIBRATION BLOCK

FORT CALHOUN

SCALE 1/1

D-2922-067 A

CALIBRATION BLOCK 22 -FCL

ID 6-CS-80-.432-22-FCL

THICKNESS .432 [ ] CLAD - THICKNESS

MATERIAL C/S MAT'L SPEC SA106/B

HEAT # N53299 APPROX. DIMENSIONS 10 x 5½ x 1¾

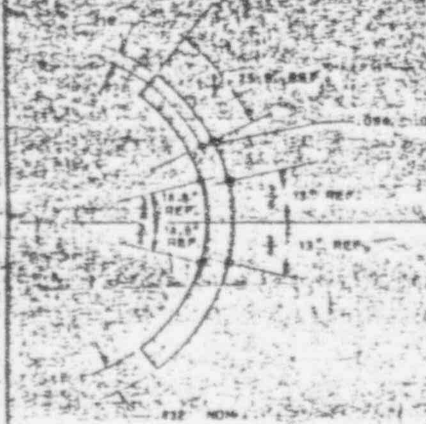
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.5	5/C	.04
[✓] Circular Cut ID Notch	1.5	5/C	.04
[✓] Axial Cut OD Notch	1.5	5/C	.04
[✓] Circular Cut OD Notch	1.5	5/C	.04

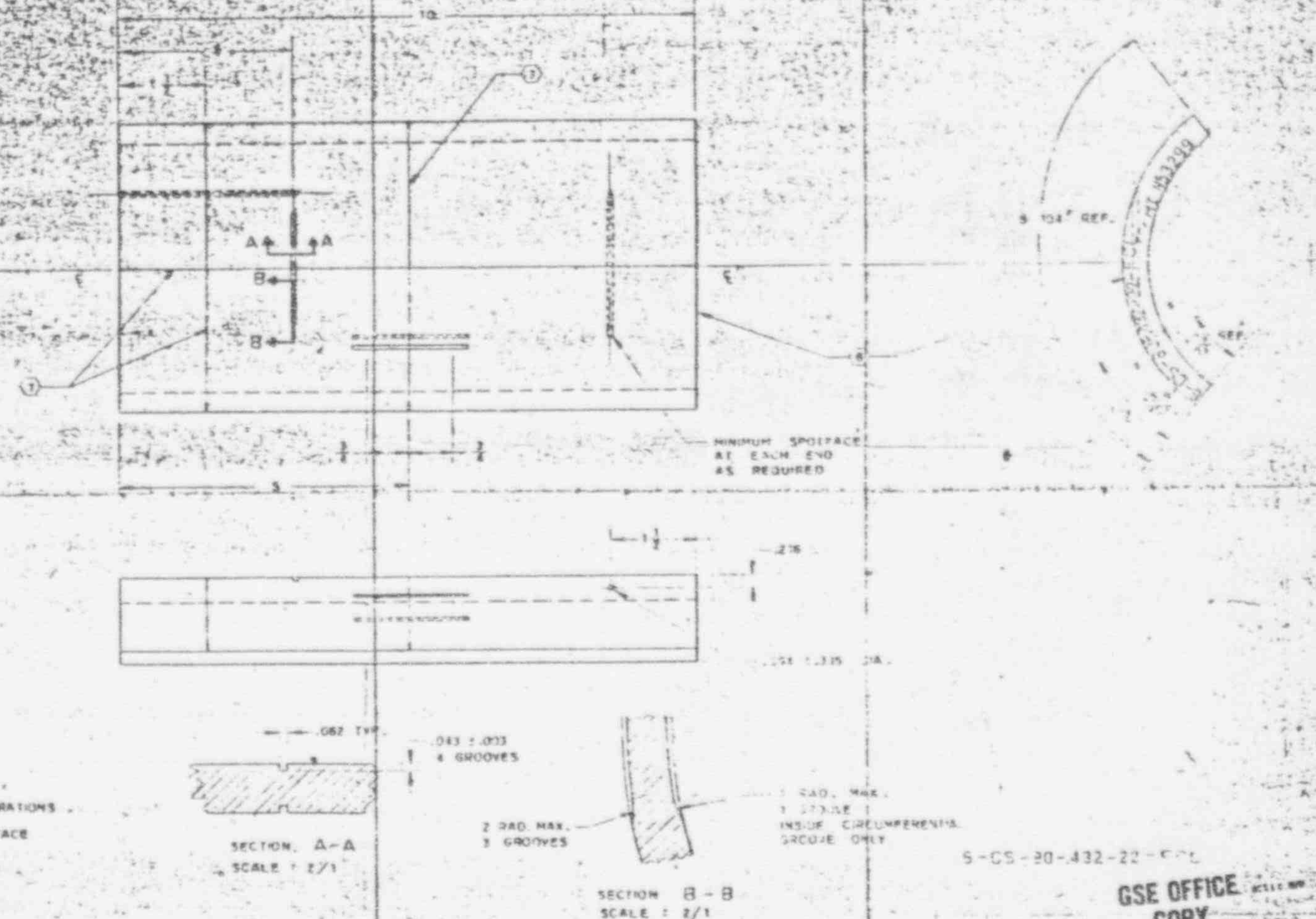
Other: Pi/bre l

SDH .10 Ø

HT. N53299

* Approximate Weight: 8





NOTES :

1. DIMENSIONS ARE IN INCHES .
2. BREAK ALL SHARP EDGES AND REMOVE BURRS .
3. DO NOT MACHINE OR ALTER ID. OR OD. SURFACES .
4. ID. AND OD. SURFACES TO BE FREE OF TOOL MARKS .
5. MATERIAL FOR BLOCK TO BE FREE OF : PIPE SEAM WELDS , FABRICATION OR REPAIR WELDS , ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS .
6. STEEL STAMP ID. NO. AND HEAT NO. AS SHOWN , ON SURFACE INDICATED , IN CHARACTERS 3/16 MINIMUM HEIGHT .
7. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP AS NOTED . STEEL STAMP OR MILL CUT , AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN 1/32 X 1/32 X 1/4 LONG .
8. MAKE FROM 8" PIPE , SCHEDULE 80 , ASTM A 106 , GR B . HEAT NO. H53299 . SWRI LOG NO. 0931 R .

S-CS-80-.432-22-

GSE OFFICE COPY

TOLERANCES UNLESS NOTED	.010 1/16
	SOUTHWEST RESEARCH INSTITUTE
	6" PIPE ULTRASONIC CALIBRATION BLOCK
DRAWN BY	E. CASTRO
SCALE	2/1
SIZE	C
DWG. NO.	D-2

CALIBRATION BLOCK 23 -FCL

ID 20-SS-STD-.375-23-FCL

THICKNESS .375 [ ] CLAD - THICKNESS ______

MATERIAL SS MAT'L SPEC SA 358/304

HEAT # 32780 APPROX. DIMENSIONS 12 × 8 × 1½

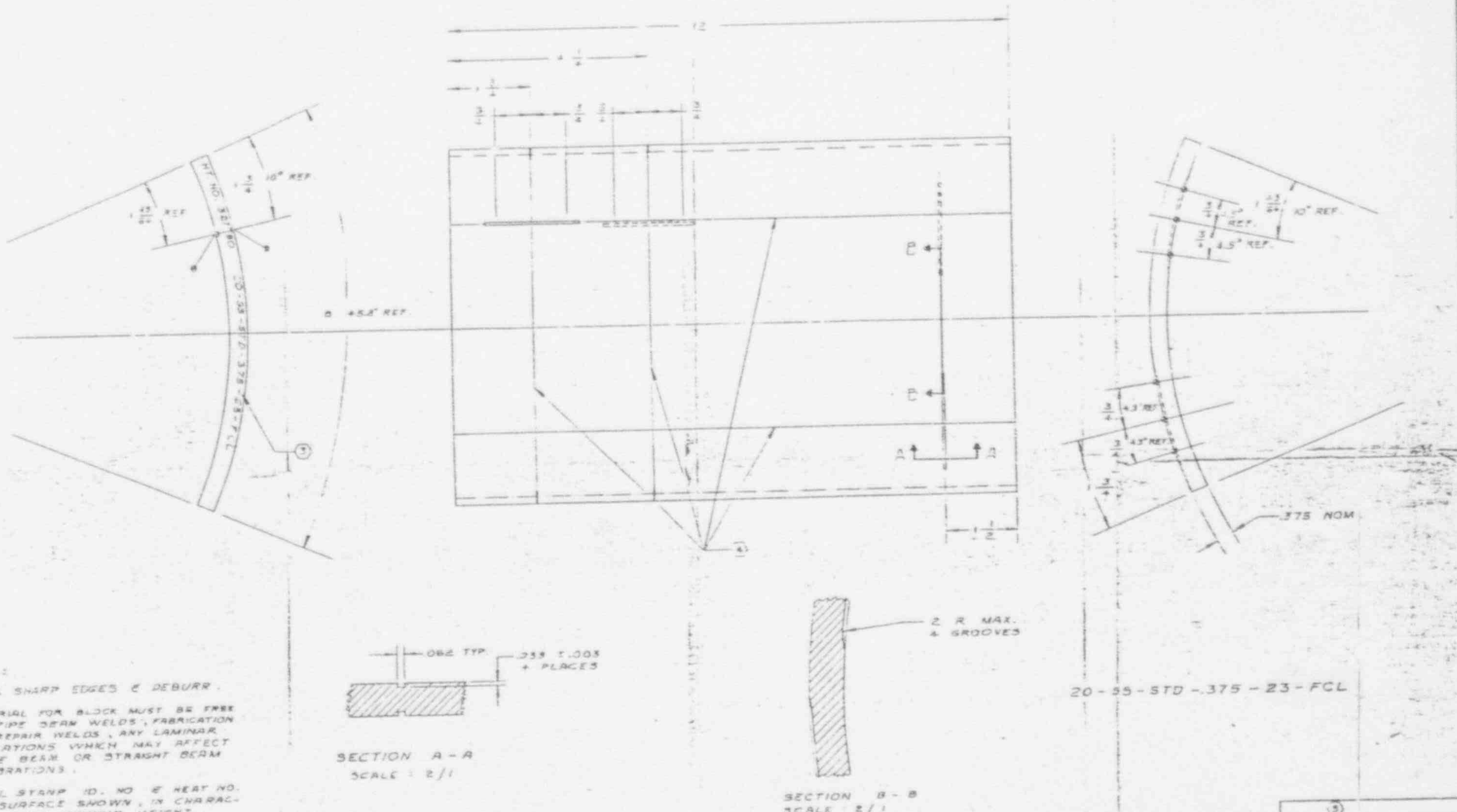
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.6	S/C	.03
[✓] Circular Cut ID Notch	1.6	S/C	.03
[✓] Axial Cut OD Notch	1.6	S/C	.03
[✓] Circular Cut OD Notch	1.6	S/C	.03

Other: No SDH

P8/GRP 1

HT. 327 80

* Approximate Weight: 16



NOTES:

1. BREAK SHARP EDGES & DEBURR.
2. MATERIAL FOR BLOCK MUST BE FREE OF: PIPE SEAM WELDS, FABRICATION OR REPAIR WELDS, ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
3. STEEL STAMP ID. NO & HEAT NO. ON SURFACE SHOWN, IN CHARACTERS 3/16 MINIMUM HEIGHT.
4. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE 1/32 X 1/32 X 1/4 LONG.
5. MAKE FROM 20" PIPE, ASTM A 312 OR A 358 TYPE 304, HEAT NO. 32780 MATERIAL TO BE PROVIDED BY OMAHA PUBLIC POWER.

SOUTHWEST RESEARCH INSTITUTE
QUALITY ASSURANCE SYSTEMS AND ENGINEERING DIVISION
SAN ANTONIO, TEXAS

20" PIPE ULTRASONIC CALIBRATION BLOCK FORT CALHOUN.

SCALE 1/1 C D-2922 072 SHEET 1 OF 1

CALIBRATION BLOCK 24 -FCL

ID 35-X-8-CS-24-FCL

THICKNESS 3½" Ø [ ] CLAD - THICKNESS ______

MATERIAL C/S MAT'L SPEC *

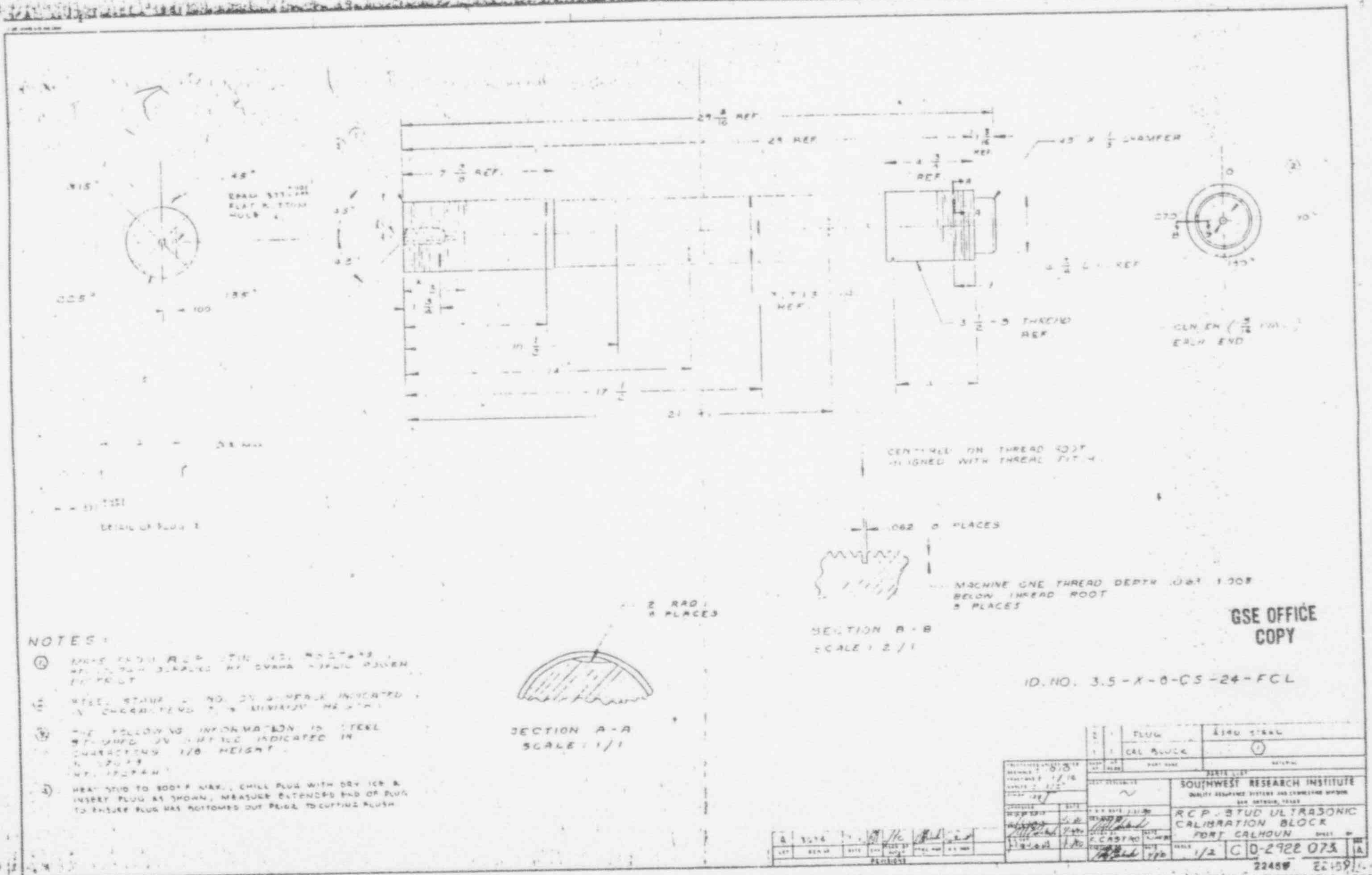
HEAT # 17274H APPROX. DIMENSIONS 29 x 3½

	LENGTH	WIDTH	DEPTH
[N/A] Axial Cut ID Notch			
[N/A] Circular Cut ID Notch			
[N/A] Axial Cut OD Notch			
[✓] Circular Cut OD Notch (4 PL)	.71	S/C	.078

Other: STUD IS 29" l

*BOLTING MATERIAL

* Approximate Weight: 70


29 9/16 REF
29 REF
7 3/8 REF
17 1/2
21
45° x 1/8 CHAMFER
3 1/2 - 8 THREAD REF
CENTERED ON THREAD ROOT ALIGNED WITH THREAD PITCH
.062 8 PLACES
MACHINE ONE THREAD DEPTH BELOW THREAD ROOT 8 PLACES
SECTION B-B
SCALE 2/1
2 RAD 8 PLACES
SECTION A-A
SCALE 1/1
NOTES:
HEAT STUD TO 300°F MAX., CHILL PLUG WITH DRY ICE & INSERT PLUG AS SHOWN, MEASURE EXTENDED END OF PLUG TO ENSURE PLUG HAS BOTTOMED OUT PRIOR TO CUTTING FLUSH.
GSE OFFICE
COPY
ID. NO. 3.5-X-0-CS-24-FCL
PLUG
CAL BLOCK
4340 STEEL
SOUTHWEST RESEARCH INSTITUTE
RCP STUD ULTRASONIC
CALIBRATION BLOCK
FORT CALHOUN
F. CASTRO
1/2
C
D-2922 073
A
2245
22159

CALIBRATION BLOCK 25 -FCL

ID 10-SS-X-1.0-25-FCL

THICKNESS 1.0 [ ] CLAD - THICKNESS

MATERIAL SS MAT'L SPEC SA240/316

HEAT # 737021 APPROX. DIMENSIONS 12 1/4 x 8 1/2 x 1

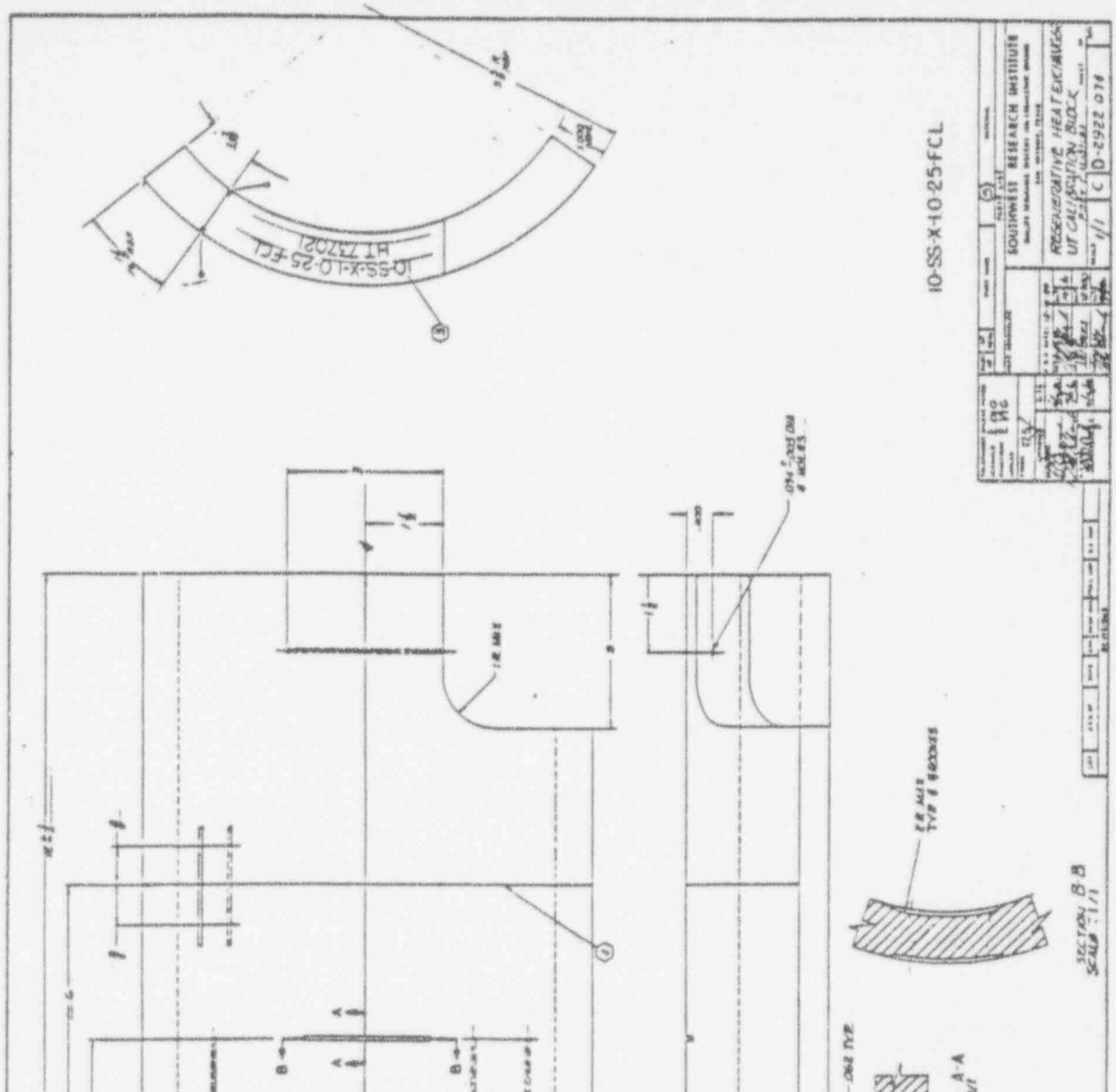
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch		S/C	0.115"
[✓] Circular Cut ID Notch		S/C	0.115"
[✓] Axial Cut OD Notch		S/C	0.115"
[✓] Circular Cut OD Notch		S/C	0.115"

Other: SDH .1 Ø

P8/Grp 1

HT. 737021

* Approximate Weight: 25


10-SS-X-1.0-25-FCL
SOUTHWEST RESEARCH INSTITUTE
REGENERATIVE HEAT EXCHANGER
UT CALIBRATION BLOCK
D-2922 078
SECTION A-A
SECTION B-B
NOTES

CALIBRATION BLOCK 26 -FCL

ID 6-CS-40-.280-26-FCL

THICKNESS .280 [ ] CLAD - THICKNESS ____

MATERIAL C/S MAT'L SPEC SA 106

HEAT # L20432 APPROX. DIMENSIONS 12 x 6½ x 2¼

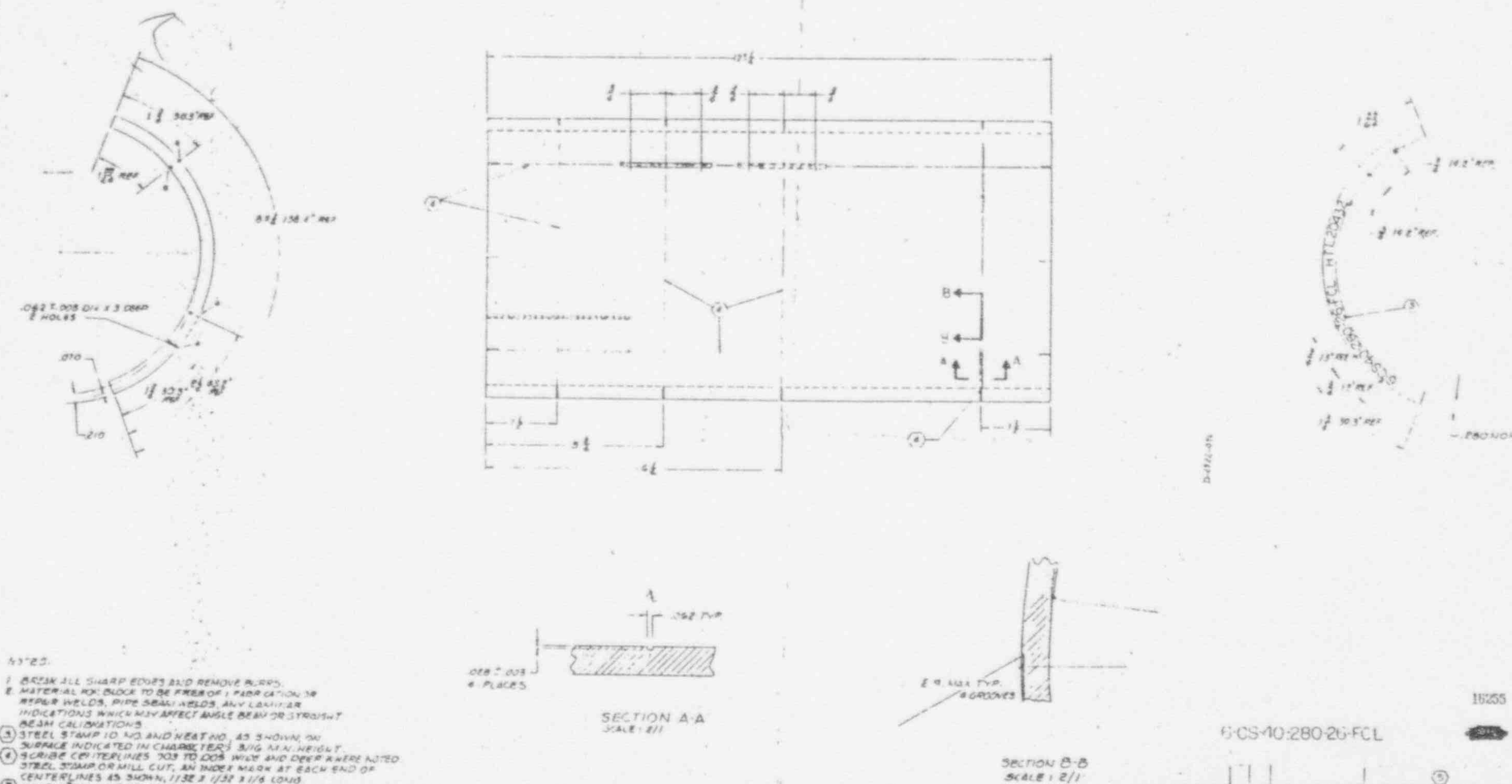
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.5	S/C	.02
[✓] Circular Cut ID Notch	2.2	S/C	.02
[✓] Axial Cut OD Notch	1.5	S/C	.02
[✓] Circular Cut OD Notch	1.5	S/C	.02

Other: SDH .05 Ø

Pl/Greel

HT. 20432

* Approximate Weight: 8



NOTES:

1. BREAK ALL SHARP EDGES AND REMOVE BURRS.
2. MATERIAL FOR BLOCK TO BE FREE OF FABRICATION OR REPAIR WELDS, PIPE SEAM WELDS, ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
3. STEEL STAMP ID NO. AND HEAT NO. AS SHOWN, ON SURFACE INDICATED IN CHARACTERS 3/16 MIN. HEIGHT.
4. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CUT, AN INDEX MARK AT EACH END OF CENTERLINES AS SHOWN, 1/32 X 1/32 X 1/16 LONG.
5. MAKE FROM 6" PIPE, SCHEDULE 40, ASTM A 106 GR B HEAT NO. L20332 SWRI RIC NO. 101A
MATERIAL SUPPLIED BY OMAHA PUBLIC POWER DISTRICT

SOUTHWEST RESEARCH INSTITUTE

6" SCH 40 ULTRASONIC CALIBRATION BLOCK
FORT CALHOUN

SCALE 1/1 | C | D-2922-076

CALIBRATION BLOCK 27 -FCL

ID 8-CS-40-.322-27-FCL

THICKNESS .322 [ ] CLAD - THICKNESS

MATERIAL C/S MAT'L SPEC SA 106/B

HEAT # N16578 APPROX. DIMENSIONS 9½ x 7 x 2

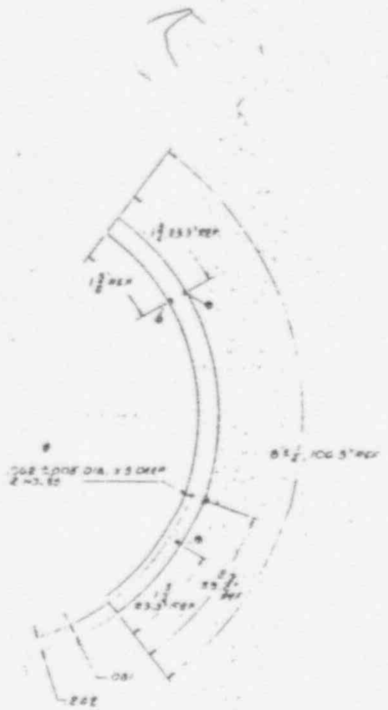
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.5	S/C	.03
[✓] Circular Cut ID Notch	1.5	S/C	.03
[✓] Axial Cut OD Notch	1.5	S/C	.03
[✓] Circular Cut OD Notch	1.5	S/C	.03

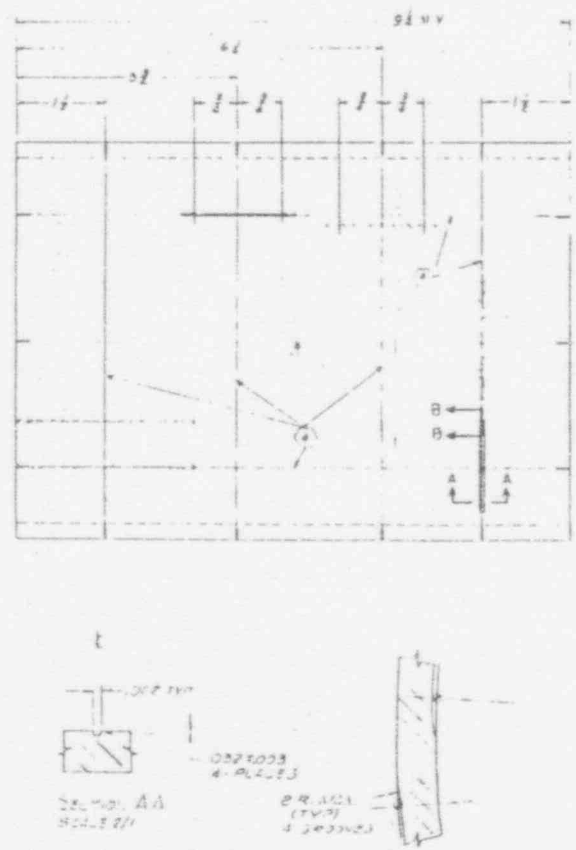
Other: SDH .05 Ø

P1/GROUP 1

HT. N16578

* Approximate Weight: 12





Section A-A
Scale 2/1

Section B-B
Scale 2/1

NOTES

BREAK SHARP EDGES AND REMOVE BURRS

MATERIAL FOR BLOCK TO BE FREE OF:
FABRICATION OR REPAIR WELDS, PIPE SEAM WELDS,
ANY LAMINAR INDICATIONS WHICH MAY AFFECT
ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

STEEL STAMP ID Nº AND HEAT Nº, AS SHOWN ON
SURFACE INDICATED IN CHARACTERS 3/16 MIN. HEIGHT.

SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE
NOTED. STEEL STAMP OR MILL CUT, AND INDEX MARK AT EACH
END OF CENTERLINES AS SHOWN, 1/32 x 1/32 x 1/4 LONG.

MAKE FROM 8" PIPE, SCHEDULE 40 ASTM A106 GR B
HEAT NO NH 378, SWRI RIC Nº 101 B
MATERIAL SUPPLIED BY OMAHA PUBLIC POWER DISTRICT.

BCS 4C-322-27-FCL

1656

SOUTHWEST RESEARCH INSTITUTE
QUALITY ASSURANCE SYSTEMS AND ENGINEERING DIVISION
SAN ANTONIO, TEXAS

8" ... PIPE ULTRASONIC CALIBRATION BLOCK

C | D-2922 077

CALIBRATION BLOCK 28 -FCL

ID 10 CS-40-.365-28-FCL

THICKNESS .365 [ ] CLAD - THICKNESS

MATERIAL C/S MAT'L SPEC SA106/B

HEAT # L84206 APPROX. DIMENSIONS 12 x 7½ x 2

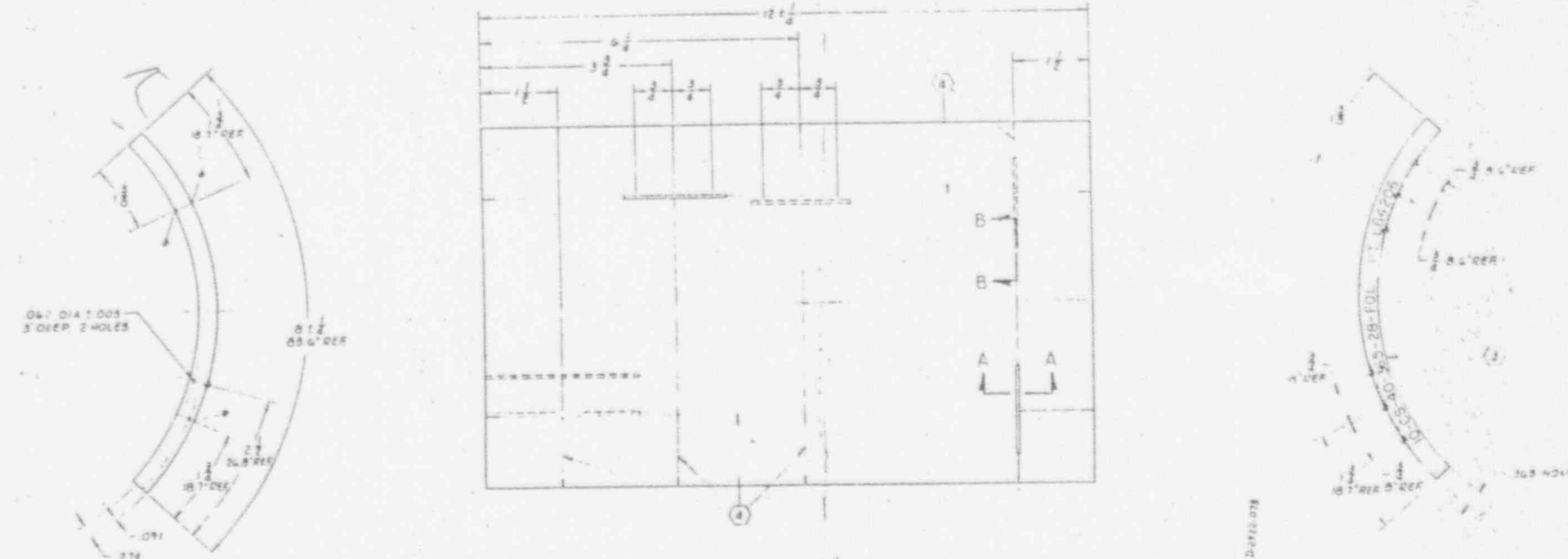
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.5	5/C	.035
[✓] Circular Cut ID Notch	1.5	5/C	.035
[✓] Axial Cut OD Notch	1.5	5/C	.035
[✓] Circular Cut OD Notch	1.5	5/C	.035

Other: SDH .05 Ø

P1/GRP1

HT. L84206

* Approximate Weight: 14



SECTION A-A
SCALE: 2/1

SECTION B-B
SCALE: 2/1

NOTES:

1. DEBURR AND BREAK SHARP EDGES.
2. I.D. AND O.D. SURFACE TO BE FREE OF: FABRICATION OR REPAIR WELDS, PIPE SEAM WELDS, ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
4) STEEL STAMP ID. N° AND HEAT N° AS SHOWN, ON SURFACE INDICATED IN CHARACTERS 3/16 MIN. HEIGHT.
1) SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT AN INDEX MARK AT EACH END OF CENTERLINES AS SHOWN, 1/32 x 1/32 LG.
5) MAKE FROM 10" PIPE, SCHEDULE 40, ASTM A-106, GR B SWRI RIC N° 37K, HEAT N° L54200

10-CS-40-365-28-FCL

1R57

SOUTHWEST RESEARCH INSTITUTE
SAN ANTONIO, TEXAS

10" SCH 40 PIPE ULTRASONIC CALIBRATION BLOCK

FORT CALHOUN

C D-2922-078 A

A 2532

CALIBRATION BLOCK 29 -FCL

ID 20-30-.50-SS-29-FCL

THICKNESS .50 [ ] CLAD - THICKNESS ____

MATERIAL SS MAT'L SPEC SA 358/304

HEAT # 855315 APPROX. DIMENSIONS 12 x 8 x 1½

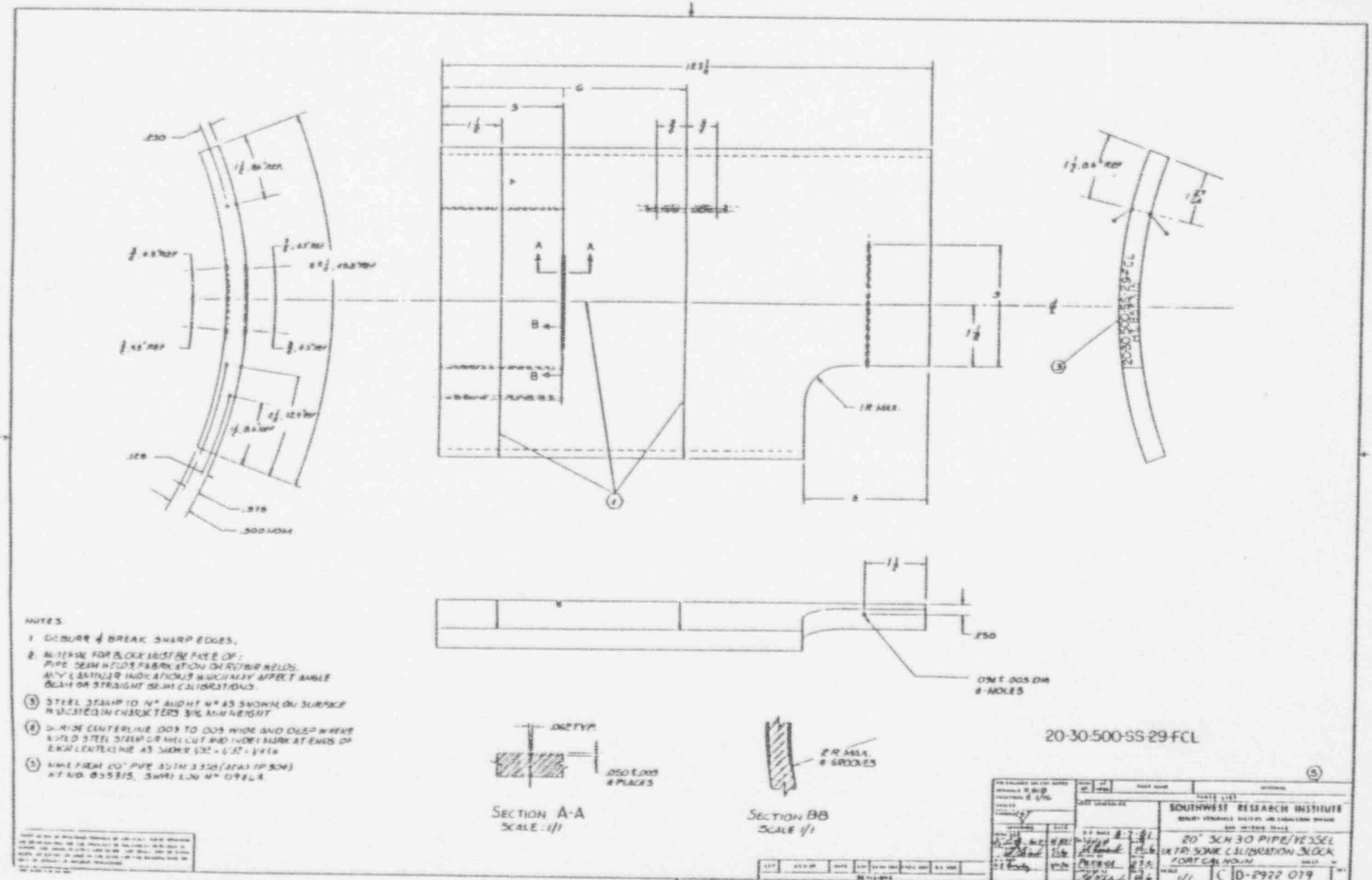
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.75	S/C	.05
[✓] Circular Cut ID Notch	1.75	S/C	.05
[✓] Axial Cut OD Notch	1.75	S/C	.05
[✓] Circular Cut OD Notch	1.75	S/C	.05

Other: SDH .10" Ø

P1/GRP 1

HT. 855315

* Approximate Weight: 20


NOTES:
1 DEBURR & BREAK SHARP EDGES.
SECTION A-A
SCALE: 1/1
SECTION BB
SCALE 1/1
1R MAX.
2R MAX.
.250
20-30-500-SS-29-FCL
SOUTHWEST RESEARCH INSTITUTE
20" SCH 30 PIPE/VESSEL
ULTRASONIC CALIBRATION BLOCK
FORT CALHOUN
D-2922 019

CALIBRATION BLOCK 30 -FCL

ID PL-SS-.375-30-FCL

THICKNESS .375 [ ] CLAD - THICKNESS

MATERIAL SS MAT'L SPEC SA 240/304

HEAT # A10592 APPROX. DIMENSIONS 10½ x 6 x .375

	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.0	S/C	.035
[N/A] Circular Cut ID Notch			
[N/A] Axial Cut OD Notch			
[N/A] Circular Cut OD Notch			

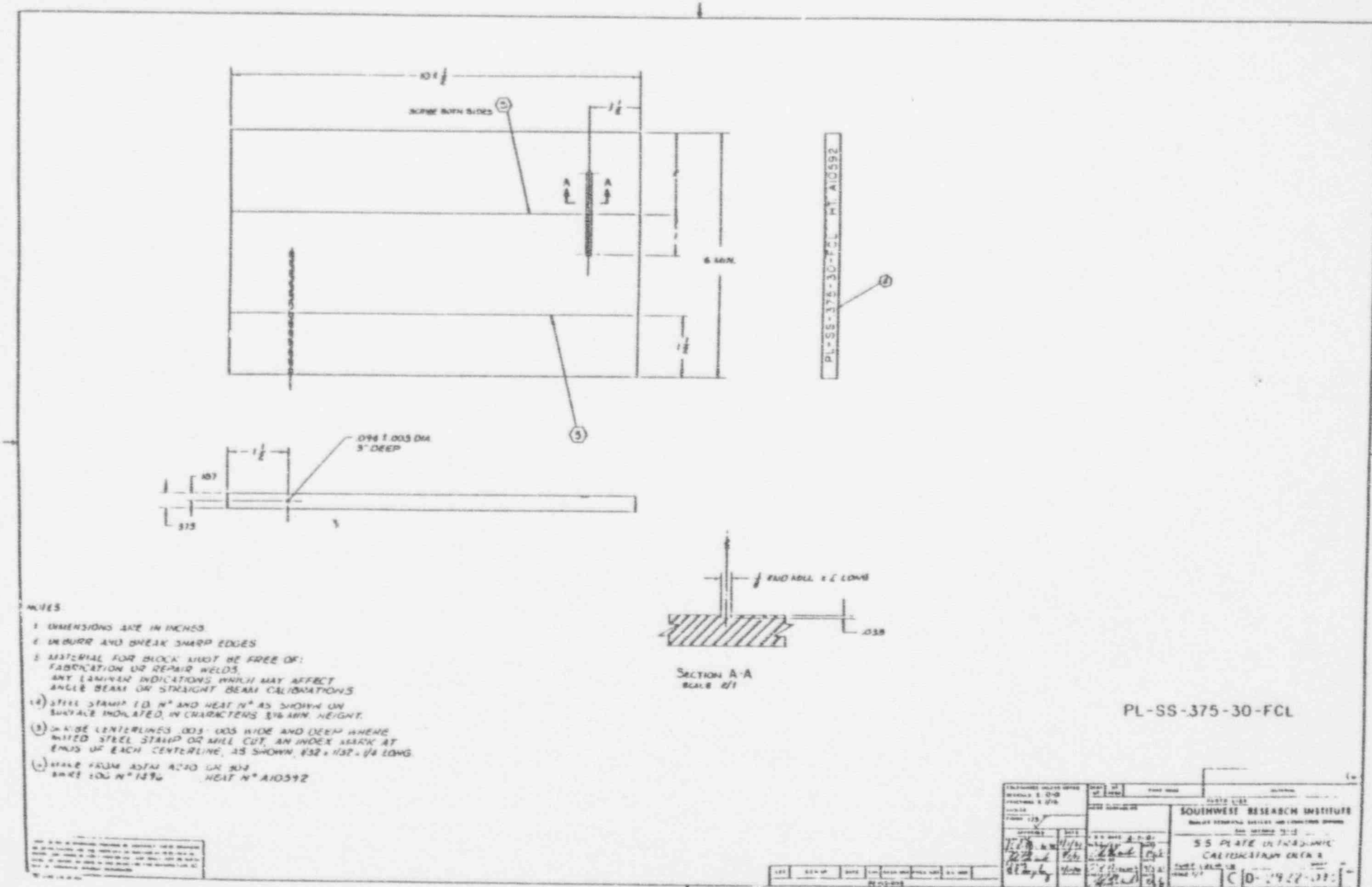
Other: PLATE

SDH, 10" Ø

P1/GRP1

HT. A10592

* Approximate Weight: 8



PL-SS-375-30-FCL

CALIBRATION BLOCK 31 -FCL

ID IR-CSCL-31-FCL

THICKNESS N/A [✓] CLAD - THICKNESS 1/4

MATERIAL C/S MAT'L SPEC SA 508

HEAT # 218993 APPROX. DIMENSIONS 14½ × 9¼ × 6½

[ ] Axial Cut ID Notch

[ ] Circular Cut ID Notch * SEE NOTE

[ ] Axial Cut OD Notch

[ ] Circular Cut OD Notch

LENGTH	WIDTH	DEPTH

Other: SDH .3" Ø

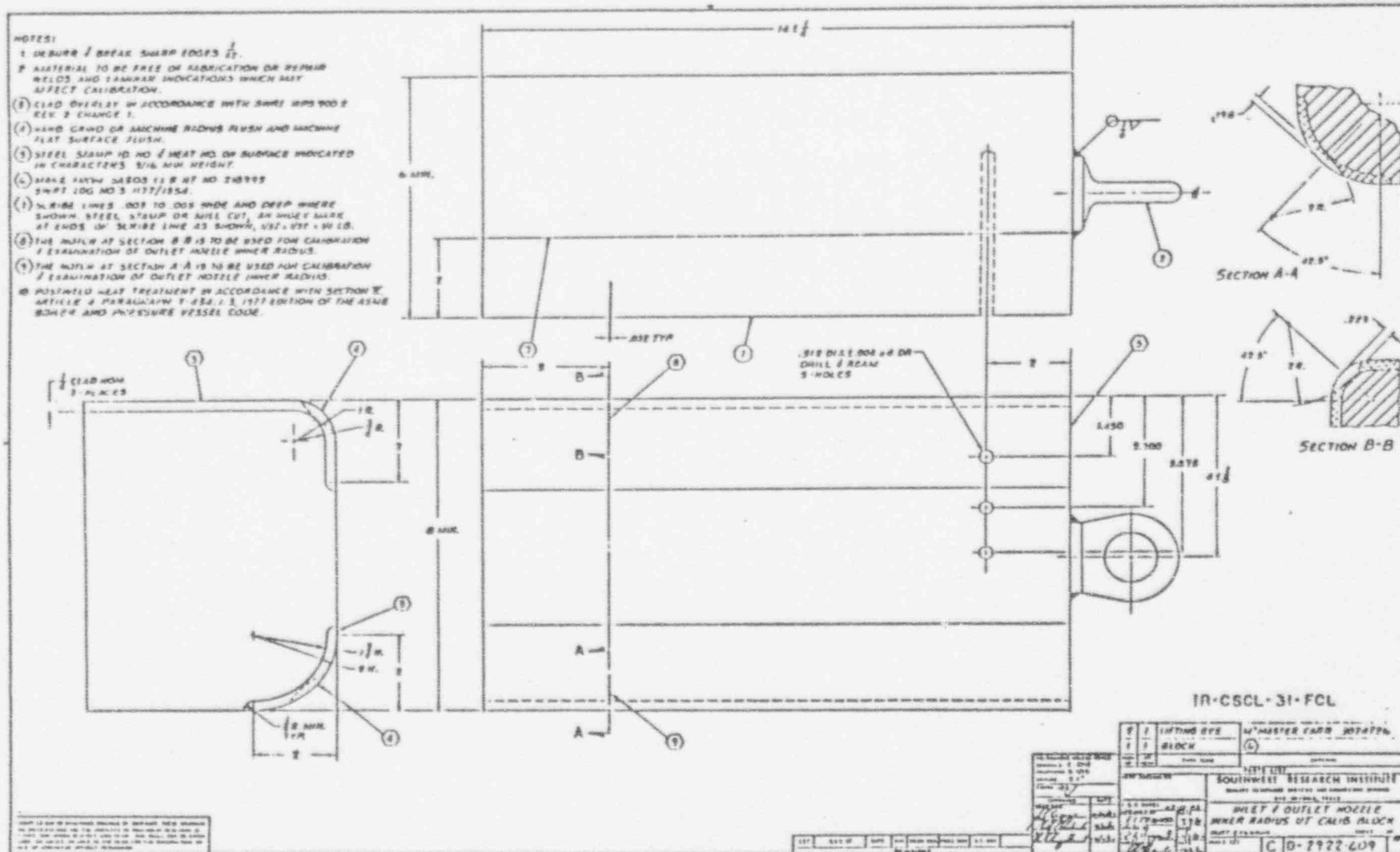
NOTCHES SAW CUT ON 1" & 2" RADIUS (.15 WIDE)

. P3/GRP 3

CLAD ON RADIUS ONLY

HT. 218993

* Approximate Weight: 260


NOTES:
SECTION A-A
SECTION B-B
1R-CSCL-31-FCL
LIFTING EYE
BLOCK
SOUTHWEST RESEARCH INSTITUTE
INLET & OUTLET NOZZLE
INNER RADIUS UT CALIB BLOCK
C
D-2922-609

3 of 9
rev 2

CALIBRATION BLOCK 32 -FCL

ID N/S-CSCL-32-FCL

THICKNESS 9½ [✓] CLAD - THICKNESS ¼

MATERIAL CS MAT'L SPEC SA 508

HEAT # C2011INQT APPROX. DIMENSIONS 23×20½×9½

	LENGTH	WIDTH	DEPTH
[N/A] Axial Cut ID Notch			
[N/A] Circular Cut ID Notch			
[N/A] Axial Cut OD Notch			
[N/A] Circular Cut OD Notch			

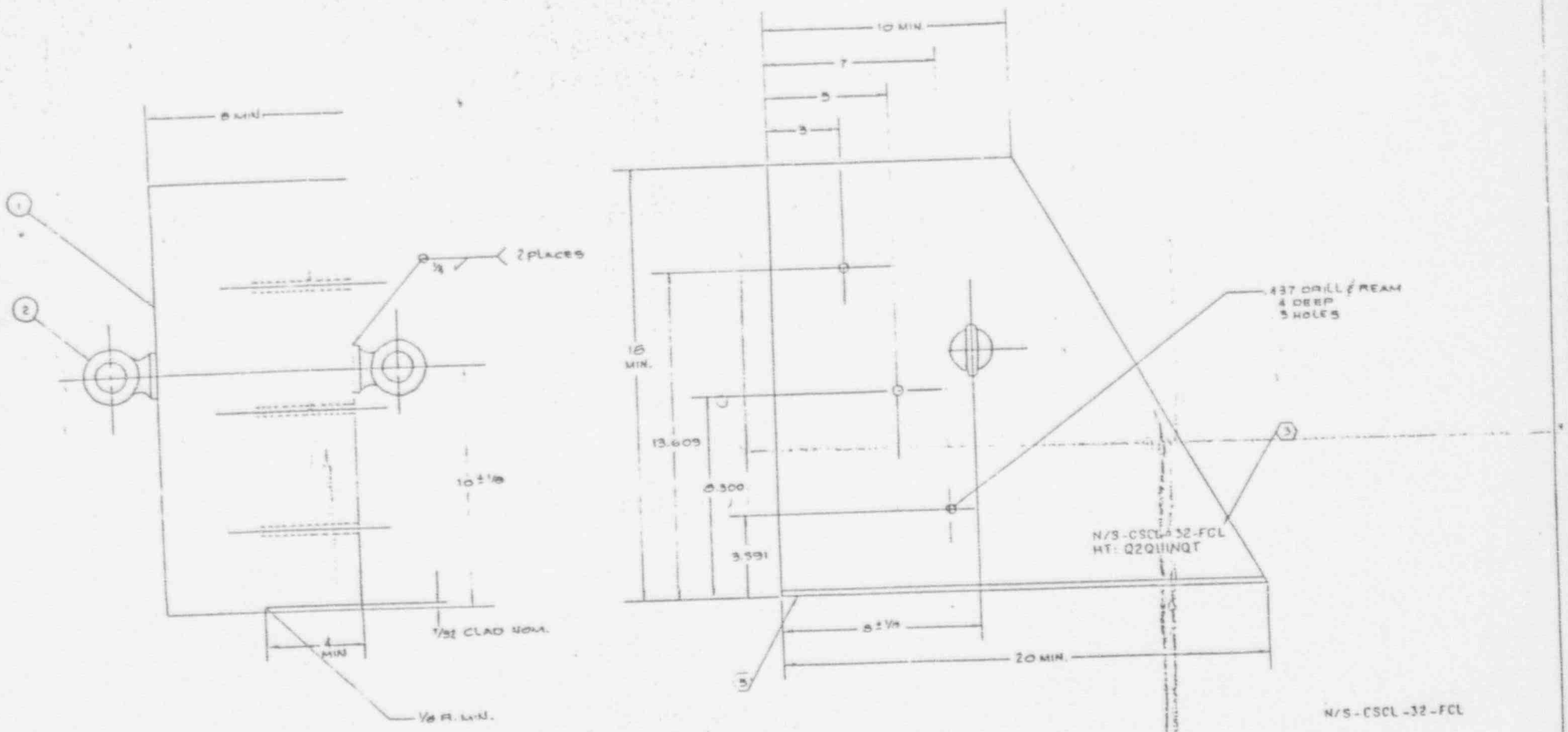
Other: P3 / GRP 3

SDH Ø = .4"

No NOTCHES

HT. Q2Q11ØNQT

* Approximate Weight: 936



NOTES:

1. REMOVE BURRS AND BREAK SHARP EDGES
2. MATERIAL FOR BLOCK TO BE FREE OF FABRICATION OR REPAIR WELDS AND LAMINAR INDICATIONS WHICH MAY EFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
3. STEEL STAMP BLOCK I.D. N° AND HEAT N° AS SHOWN ON SURFACE INDICATED IN CHARACTERS 3/16 MIN HEIGHT.
4. MAKE FROM SA508 CII HEAT N° Q2Q1INQT SwRI LOG N° 1697
5. CLAD OVERLAY IN ACCORDANCE WITH SwRI WPS-900-2 REVISION 1, CHANGE 1.
6. POSTWELD HEAT TREATMENT IN ACCORDANCE WITH SECTION V, ARTICLE 4 PARAGRAPH T-434.1.3, 1977 EDITION OF THE ASME BOILER AND PRESSURE VESSEL CODE.

2	2	LIFTING EYE	MC MASTER CARR 3024T 26
1	1	BLOCK	④

SOUTHWEST RESEARCH INSTITUTE

NOZZLE TO SHELL UT CALIBRATION BLOCK FORT CALHOUN

Scale 1/2 | C | D-2922-606 | A

30958

CALIBRATION BLOCK 33 -FCL

ID 24-ID-CSCL-2.594-33-FCL

THICKNESS 2.59 [✓] CLAD - THICKNESS 1/4

MATERIAL CS MAT'L SPEC SA508

HEAT # 218993 APPROX. DIMENSIONS 10×12×2½

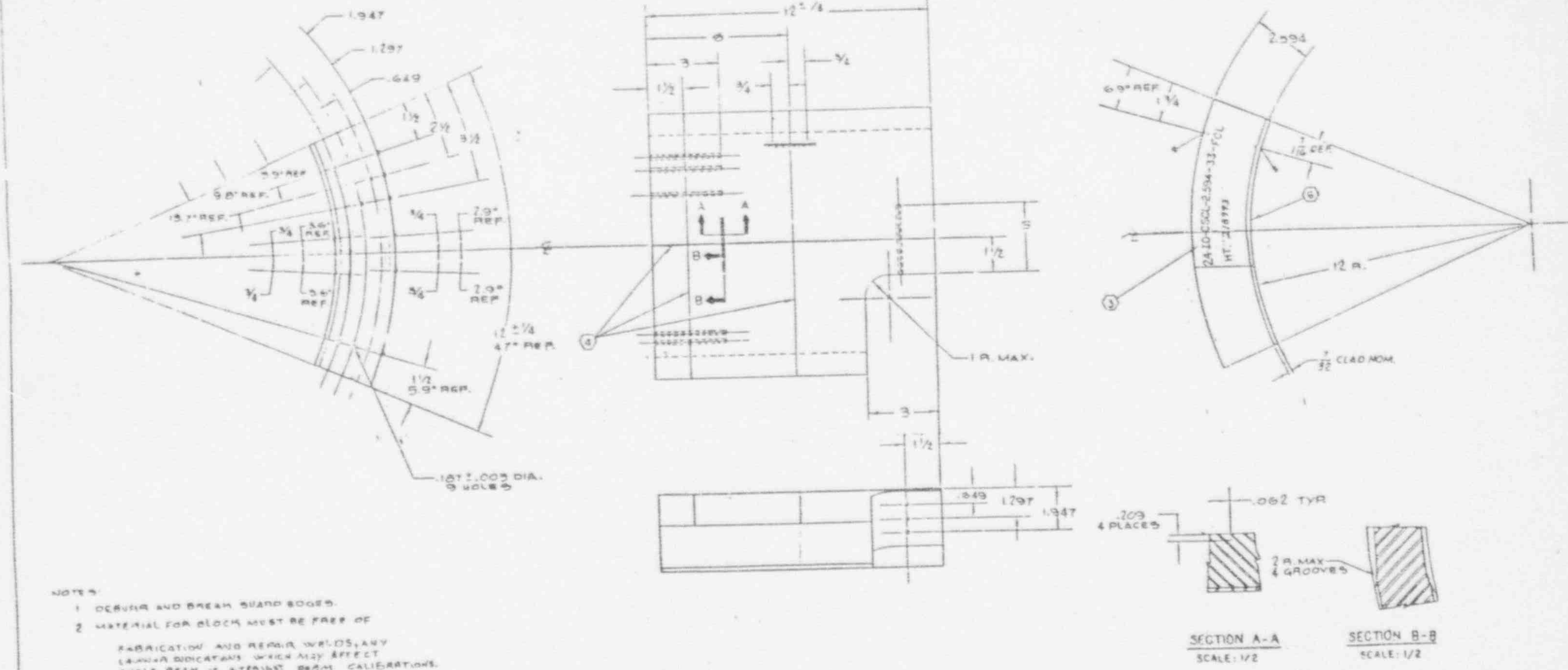
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.0	S/C ⁝ .2	.25
[✓] Circular Cut ID Notch	2.0	S/C ⁝ .2	.25
[✓] Axial Cut OD Notch	2.0	S/C	NOT USED
[✓] Circular Cut OD Notch	2.0	S/C	NOT USED

Other: P3 GRP 3

SDH .2" Ø

HT. 218993

* Approximate Weight: 40



24 I.D.-CSCL-2.594-33-FCL

NOTES:

1. DEBURR AND BREAK SHARP EDGES.
2. MATERIAL FOR BLOCK MUST BE FREE OF FABRICATION AND REPAIR WELDS, ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM or STRAIGHT BEAM CALIBRATIONS.
3. STEEL STAMP I.D. Nº AND HEAT Nº AS SHOWN ON SURFACE INDICATED, 1/8 CHARACTER 1/16 MIN. HEIGHT.
4. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE SHOWN, STEEL STAMP, OR MILL CUT, AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN 1/32 x 1/16 x 1/4 LONG
5. MAKE FROM SA 516 CL2 HEAT Nº 218993 LOG Nº 1554/1177
6. SS CLAD OVERLAY IN ACCORDANCE WITH SWRI WPS-900-2 REV 2 CHANGE 1.
7. POSTWELD HEAT TREATMENT IN ACCORDANCE WITH SECTION V, ARTICLE 4 PARAGRAPH T-434.1.3, 1977 EDITION OF THE ASME BOILER AND PRESSURE VESSEL CODE.

SOUTHWEST RESEARCH INSTITUTE

INLET NOZZLE TO EXTENSION ULTRASONIC CALIBRATION BLOCK

FORT CALHOUN

SCALE 1/2 | C | D-2922-607

30957

CALIBRATION BLOCK 34 -FCL

ID 32-CSCL-3.344-34-FCL

THICKNESS 3.35 [✓] CLAD - THICKNESS 1/4

MATERIAL C/S MAT'L SPEC SA 508

HEAT # 218993 APPROX. DIMENSIONS 12 × 9 × 3 1/4

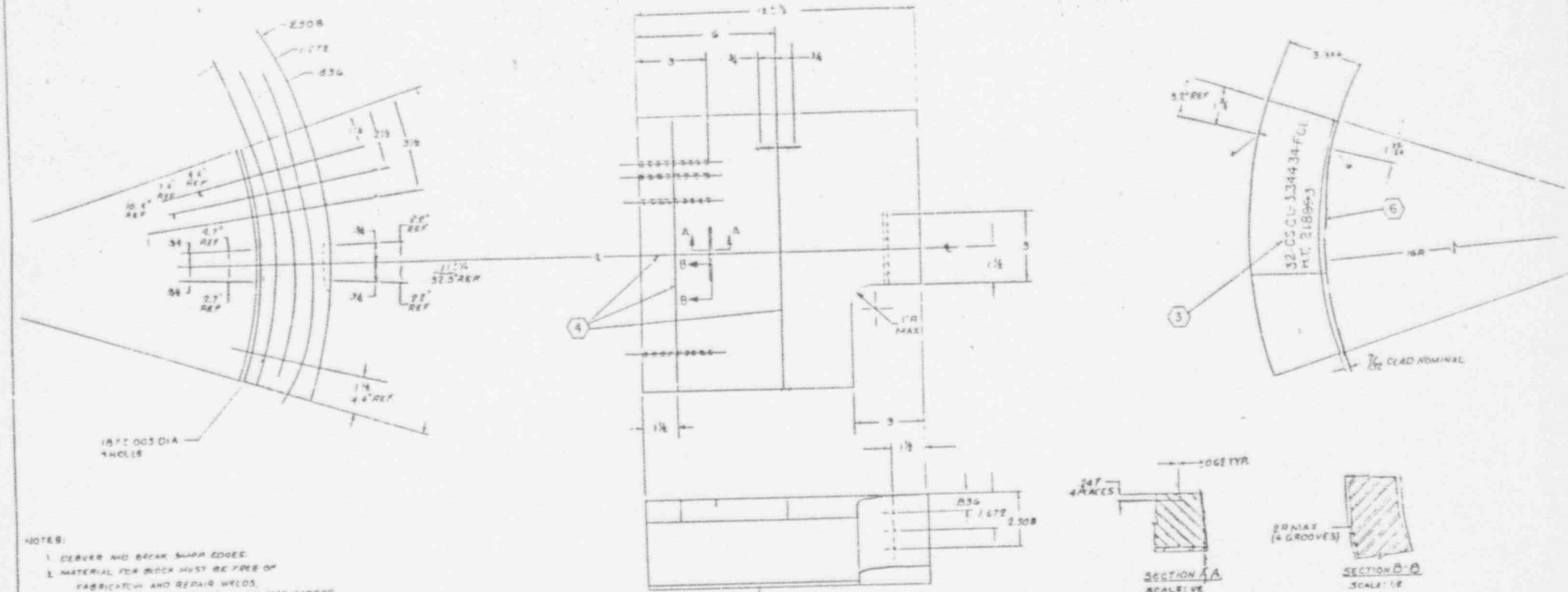
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.0	.2	.25
[✓] Circular Cut ID Notch	2.0	.2	.25
[✓]-Axial Cut OD Notch	NOT USED		
[✓] Circular Cut OD Notch	NOT USED		

Other: P3/GRP3

SDH .2" Ø

HT. 218993

* Approximate Weight: 103



NOTES:

1. DEBURR AND BREAK SHARP EDGES.
2. MATERIAL FOR BLOCK MUST BE FREE OF FABRICATION AND REPAIR WELDS. ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

3. STEEL STAMP ID NO. AND HEAT NO. AS SHOWN, ON SURFACE INDICATED. # CHARACTERS 3/16 MIN. HEIGHT.

4. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE SHOWN. STEEL STAMP, OR NULL CUT, AN INDEX MARK AT END OF EACH CENTERLINE AS SHOWN 1/32 X 1/32 X 1/4 LONG.

5. MAKE FROM SA508 CL2 HEAT NO. 218993 SWRI LOG NO. 16148

6. SS CLAD OVERLAY IN ACCORDANCE WITH SWRI WPS 800-E REV 2 CHANGE 1

7. POSTWELD HEAT TREATMENT IN ACCORDANCE WITH SECTION V, ARTICLE 4 PARAGRAPH T-434.1.3, 1977 EDITION OF THE ASME BOILER AND PRESSURE VESSEL CODE.

32 ID-CSCL-3344-34-FCL

SOUTHWEST RESEARCH INSTITUTE

OUTLET NOZZLE TO EXTENSION ULTRASONIC CALIBRATION BLOCK

C | D-2922-605 | A

30955

CALIBRATION BLOCK 35 -FCL

ID FS/L-CSCL-35-FCL

THICKNESS 1 in. Block [ ] CLAD - THICKNESS

MATERIAL C/S MAT'L SPEC SA 508

HEAT # Q2Q110NQT APPROX. DIMENSIONS 30 x 14½ x 9

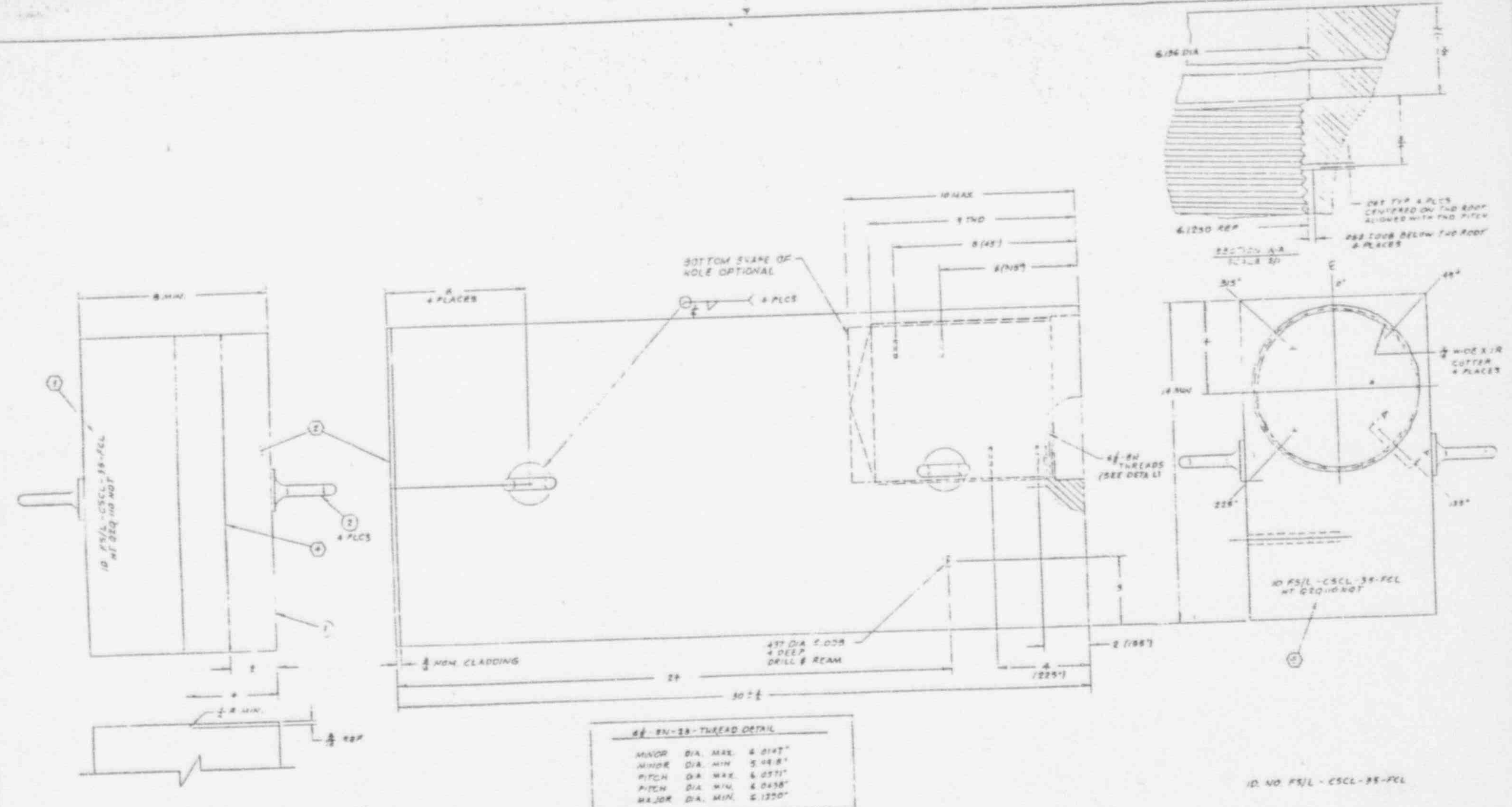
	LENGTH	WIDTH	DEPTH
[N/A] Axial Cut ID Notch			
[N/A] Circular Cut ID Notch			
[N/A] Axial Cut OD Notch			
[N/A] Circular Cut OD Notch			

Other: P3 / GRP 3

SDH 3/8" Ø

HT. Q2Q 110 NQT

* Approximate Weight: 966



6 1/4 - 8N - 2A - THREAD DETAIL			
MINOR	DIA.	MAX.	6.0147"
MINOR	DIA.	MIN.	5.9918"
PITCH	DIA.	MAX.	6.0371"
PITCH	DIA.	MIN.	6.0438"
MAJOR	DIA.	MIN.	6.1250"

1. REMOVE BURRS AND BREAK SHARP EDGES.
2. [illegible]
3. [illegible]
4. [illegible]
5. POSTWELD HEAT TREATMENT IN ACCORDANCE WITH SECTION II, ARTICLE 4 PARAGRAPH T-434.1.3, 1977 EDITION OF THE ASME BOILER AND PRESSURE VESSEL CODE.
6. [illegible]

MCMASTER-CARR NO 90947A

SOUTHWEST RESEARCH INSTITUTE
SAN ANTONIO, TEXAS

D-2922-604

30954

CALIBRATION BLOCK 36 -FCL

ID CRD-I/V-.386-36-FCL

THICKNESS .386 [ ] CLAD - THICKNESS ______

MATERIAL SS MAT'L SPEC SB166

HEAT # 2155-0-3443 APPROX. DIMENSIONS 11x.4x3.5

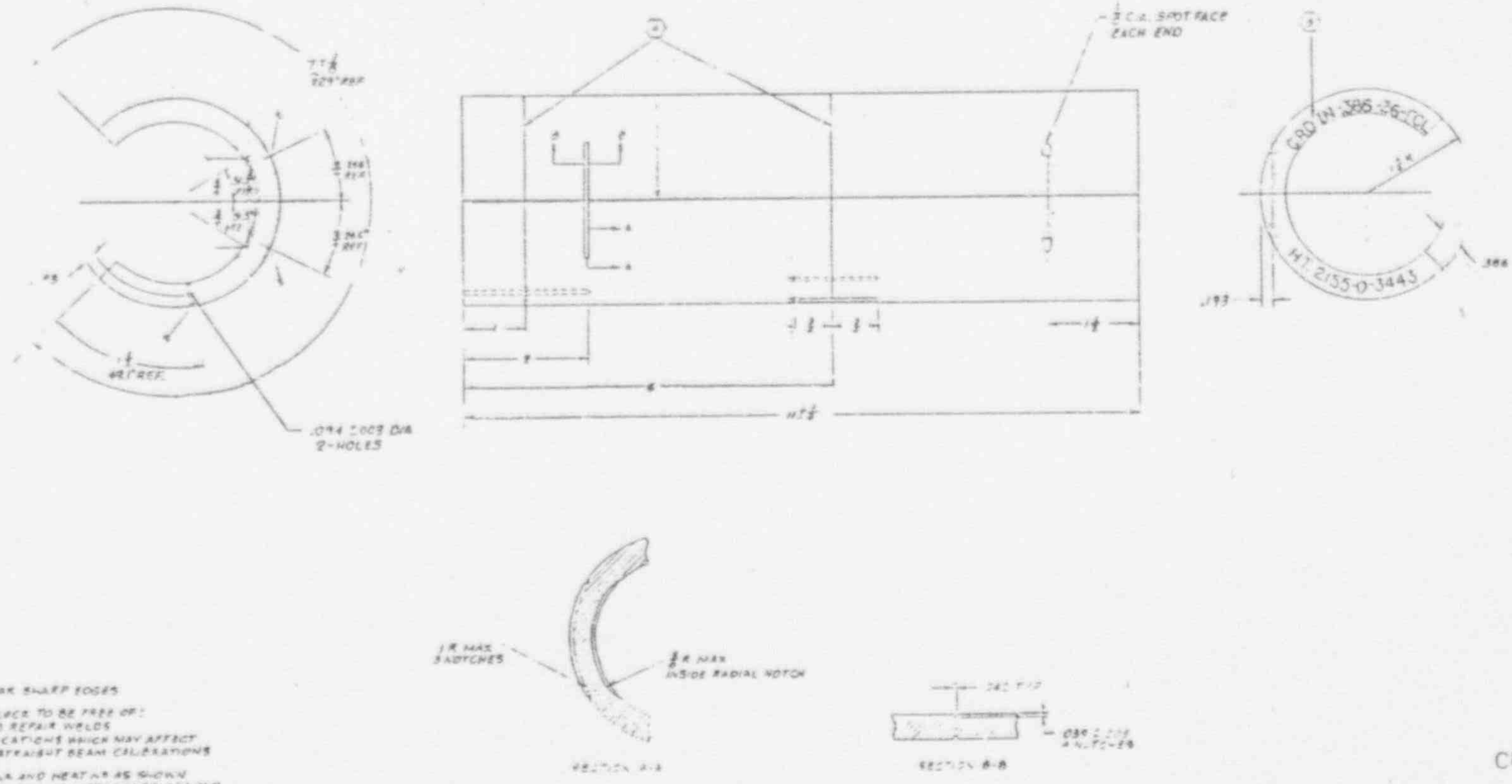
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.0	S/C	.1
[✓] Circular Cut ID Notch	2.0	S/C	.1
[✓] Axial Cut OD Notch	2.0	S/C	.1
[✓] Circular Cut OD Notch	2.0	S/C	.1

Other: SDH .1 Ø

P# 43

HT. 2155-0-3443

* Approximate Weight: 15



NOTES:

1. DEBURR AND BREAK SHARP EDGES
2. MATERIAL FOR BLOCK TO BE FREE OF:
   FABRICATION AND REPAIR WELDS
   ALL LAMINAR INDICATIONS WHICH MAY AFFECT
   ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS
3. STEEL STAMP ID NO. AND HEAT NO. AS SHOWN
   ON SURFACE INDICATED, IN CHARACTERS 3/16 (.19)
   MIN HEIGHT
4. SCRIBE CENTERLINES AS SHOWN .005 (.08) TO .007 (.13)
   WIDE AND DEEP WHERE NOTED. STEEL STAMP OR
   MILL CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE
   AS SHOWN, 1/32 (.8) X 1/32 (.8) X 1/4 (6.4) LONG
5. MAKE FROM ASME SB-166 HT. NO. 2155-0-3443
   EPRI LOG NR 1526

CRD-IN-386-36-FCL

SOUTHWEST RESEARCH INSTITUTE

SAN ANTONIO, TEXAS

CONTROL ROD HOUSING
UT CALIBRATION BLOCK

SCALE 1/1 | C | D-2922-608

30958

CALIBRATION BLOCK 37 -FCL

ID PL-SS-.750-37-FCL

THICKNESS .750 [ ] CLAD - THICKNESS ______

MATERIAL SS MAT'L SPEC SA240/304

HEAT # 34691 APPROX. DIMENSIONS 10½ × ¾ × 6¼

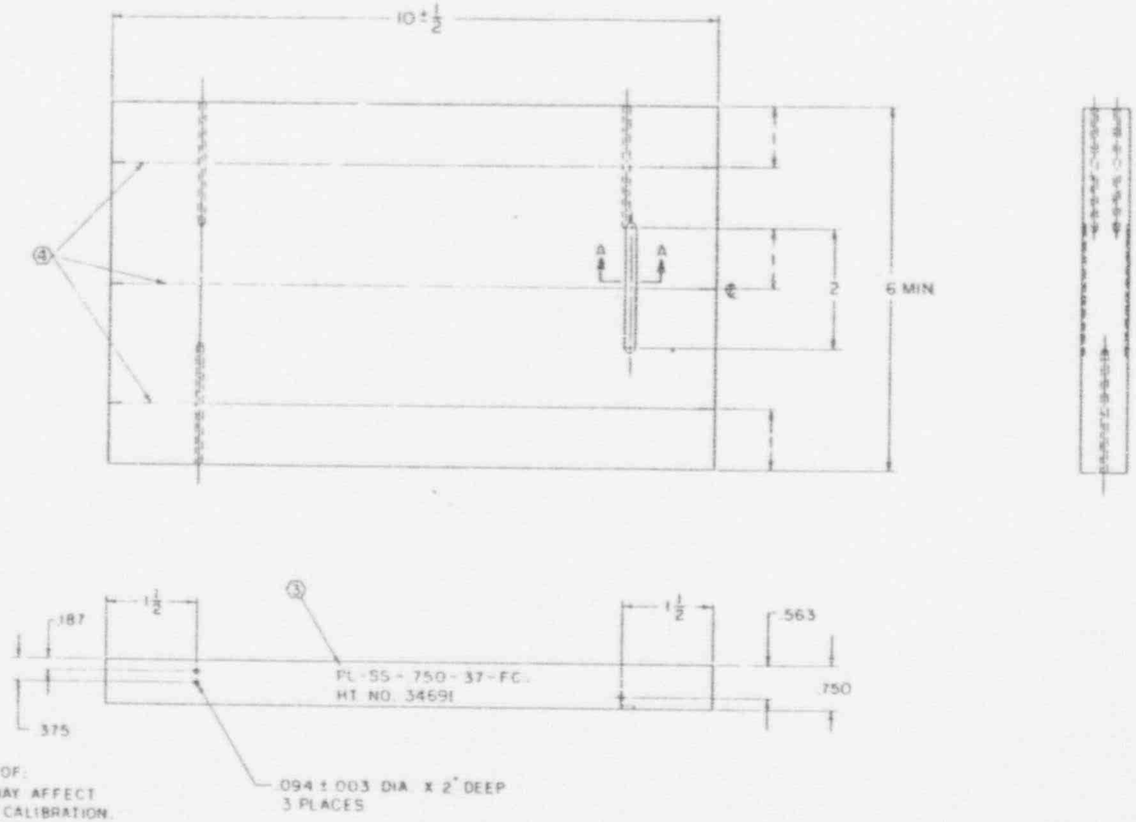
	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	2.0	.2	.05
[N/A] Circular Cut ID Notch			
[N/A] Axial Cut OD Notch			
[N/A] Circular Cut OD Notch			

Other: SDH, 1" Ø

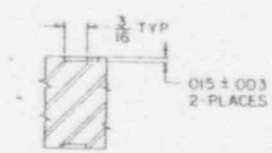
P 8/ GRP 1

HT. 34691

* Approximate Weight: 8



1. DEBURR AND BREAK SHARP EDGES.
2. MATERIAL FOR BLOCK MUST BE FREE OF:
   ANY LAMINAR INDICATION WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATION.
③ STEEL STAMP ID NO. AND HEAT NO. AS SHOWN ON SURFACE INDICATED IN CHARACTERS 3/16 MIN HEIGHT.
④ SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN 1/32 X 1/32 X 1/4 LONG.
⑤ MAKE FROM ASTM A240 GR 304, HEAT NO. 34691 SWRI LOG NO. 20340



SECTION A-A
SCALE: 2/1

PL-SS-750-37-FCL

PARTS LIST	⑤
SOUTHWEST RESEARCH INSTITUTE	
3/4" PLATE UT CALIB BLOCK SHUTDOWN HEAT EXCHANGER	
FORT CALHOUN	
SCALE 1/1	C D-2922-610

REVISIONS

CALIBRATION BLOCK 38 -FCL

ID 10-2507-1-S160-38-FCL

THICKNESS 1.3 [ ] CLAD - THICKNESS ____

MATERIAL SS MAT'L SPEC A376/316

HEAT # E1469 APPROX. DIMENSIONS 4½ x 9 x 1.3

	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.2	.2	.15
[✓] Circular Cut ID Notch	1.2	.2	.15
[✓] Axial Cut OD Notch	1.2	.2	.15
[✓] Circular Cut OD Notch	1.2	.2	.15

Other: SCH. 160
P#8/GRP1

* Approximate Weight: 28

Vol. I

17300241

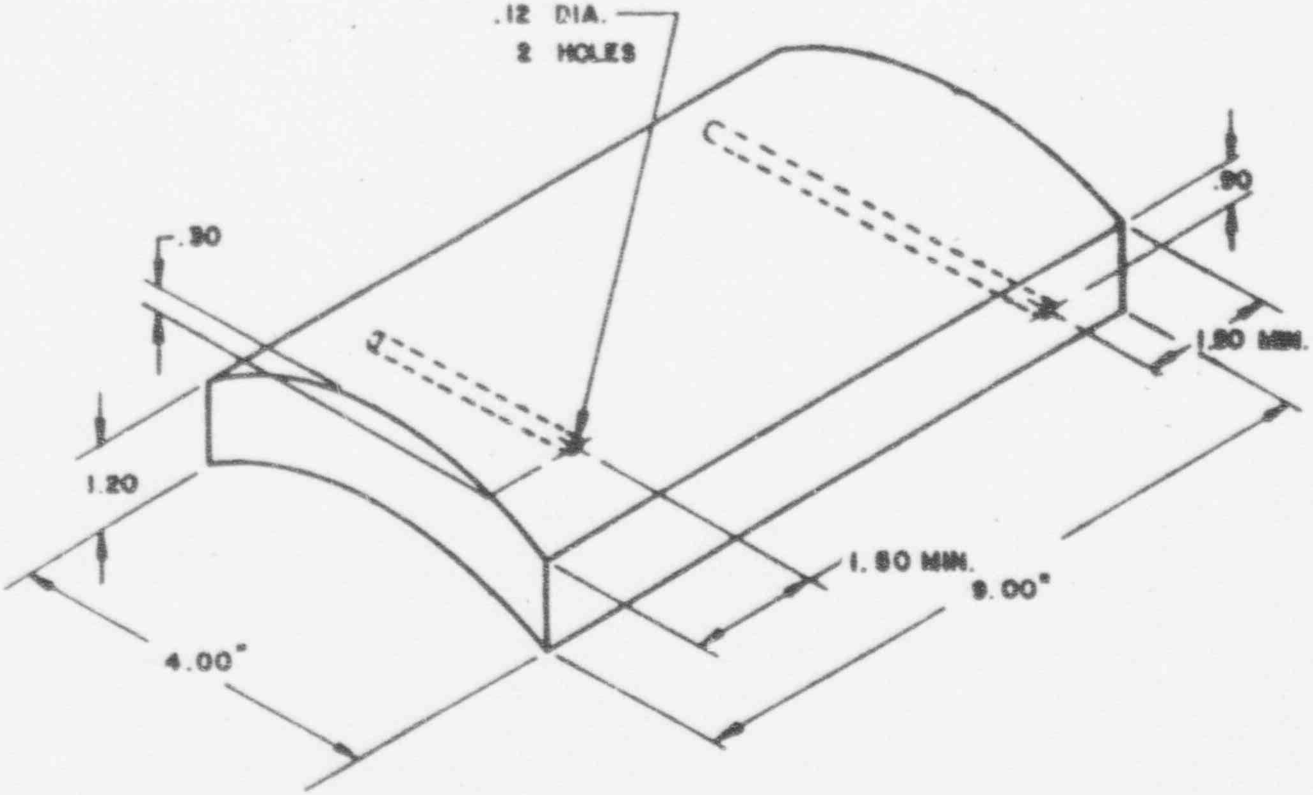


FIGURE 4

STD. NO. 10"-2507-1-3.160 - 38-FCL

CALIBRATION BLOCK 39 -FCL

ID 12-2501-1-S.160-39-FCL

THICKNESS 1.3 [ ] CLAD - THICKNESS ________

MATERIAL SS MAT'L SPEC A376/316

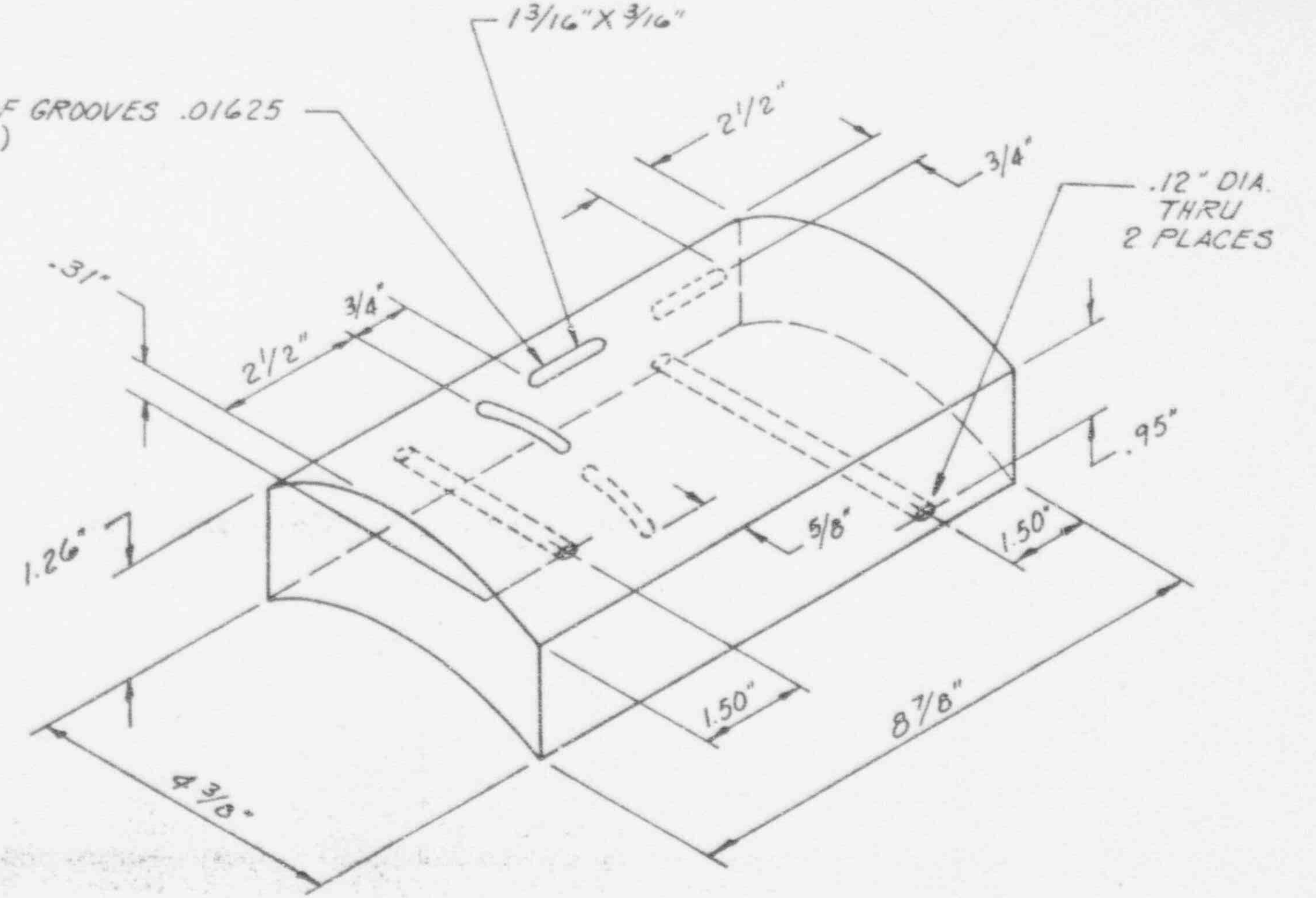
HEAT # ________ APPROX. DIMENSIONS 9x4½x1.3

	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.2	.2	.15
[✓] Circular Cut ID Notch	1.2	.2	.15
[✓] Axial Cut OD Notch	1.2	.2	.15
[✓] Circular Cut OD Notch	1.2	.2	.15

Other: SDH .1 Ø

P#8/GRP 1

* Approximate Weight: 26



STD. NO. 12"-2501-1-S.160-39-FCL

37872

REV SHEET	18099	
7-10-83	VES	DRAWN
7-15-85	HSK	CHECKED
2-15-85	JGM	ENGINEER
—	—	CIVIL
—	—	ELECTRICAL
JKS	MEE	MECHANICAL
—	—	NUCLEAR

FORT CALHOUN STATION

UT CALIBRATION BLOCKS

A-4873

REV

CALIBRATION BLOCK 40 -FCL

ID 12-601-1-S.40-FCL

THICKNESS .37 [ ] CLAD - THICKNESS ____

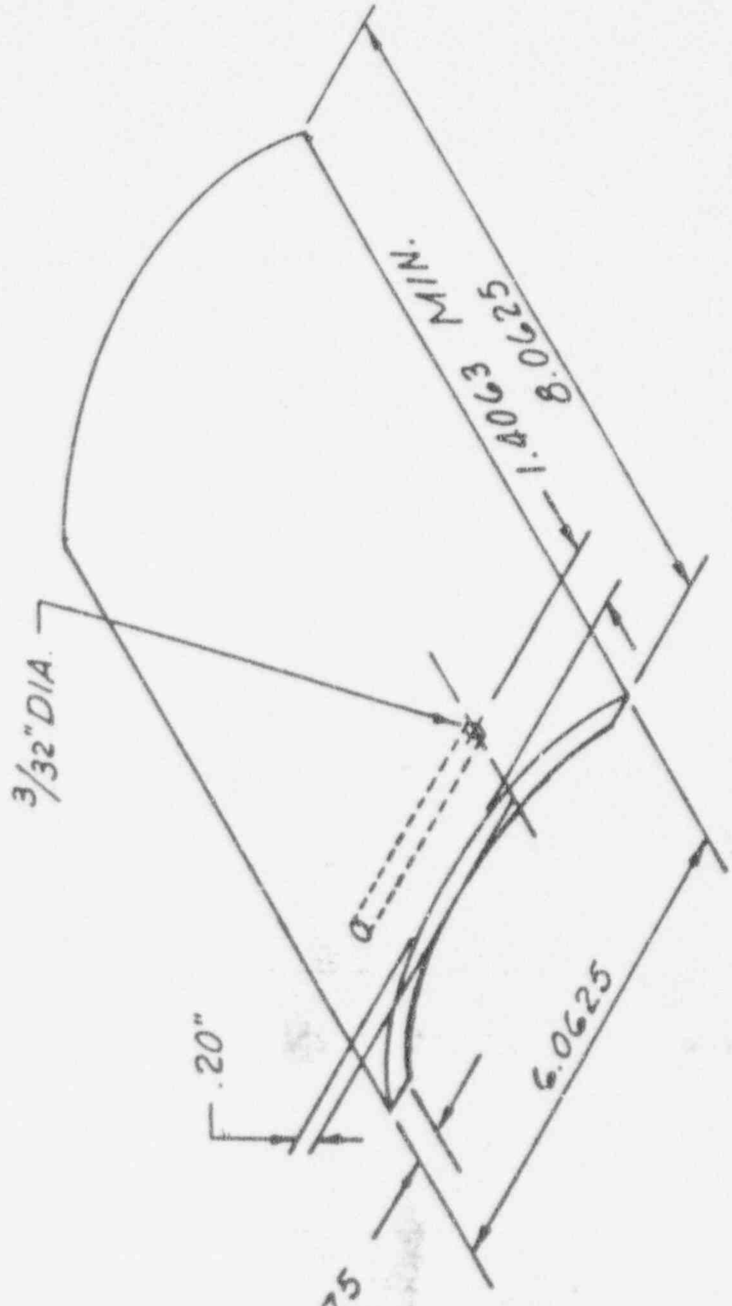
MATERIAL SS MAT'L SPEC A376/1

HEAT # ____ APPROX. DIMENSIONS 8×6×1

	LENGTH	WIDTH	DEPTH
[N/A] Axial Cut ID Notch			
[N/A] Circular Cut ID Notch			
[N/A] Axial Cut OD Notch			
[N/A] Circular Cut OD Notch			

Other: SDH .1 Ø
P#8/GRP 1

* Approximate Weight: 12



STD. NO. 12" 601-1-5 40-FCL

9048

RS 3497	1	REV NO.	FORT CALHOUN STATION	
12-14-81	YES	DRAWN		
12-15-81	WWP	CHECK	UT	
12-15-81	JGK	ENG.	CALIBRATION	
—	—	CIVIL DPT.	BLOCKS	
—	—	ELEC DPT		
12-15-81	MFE	MECH. DPT		
—	—	Q. CONTROL		
—	—	P.E.	SCALE	
OMAHA PUBLIC POWER DISTRICT OMAHA, NEBRASKA			A-4100	REV.

CALIBRATION BLOCK 41 -FCL

ID 6-2501-2-S160-41-FCL

THICKNESS .730 [ ] CLAD - THICKNESS ______

MATERIAL SS MAT'L SPEC A376/316

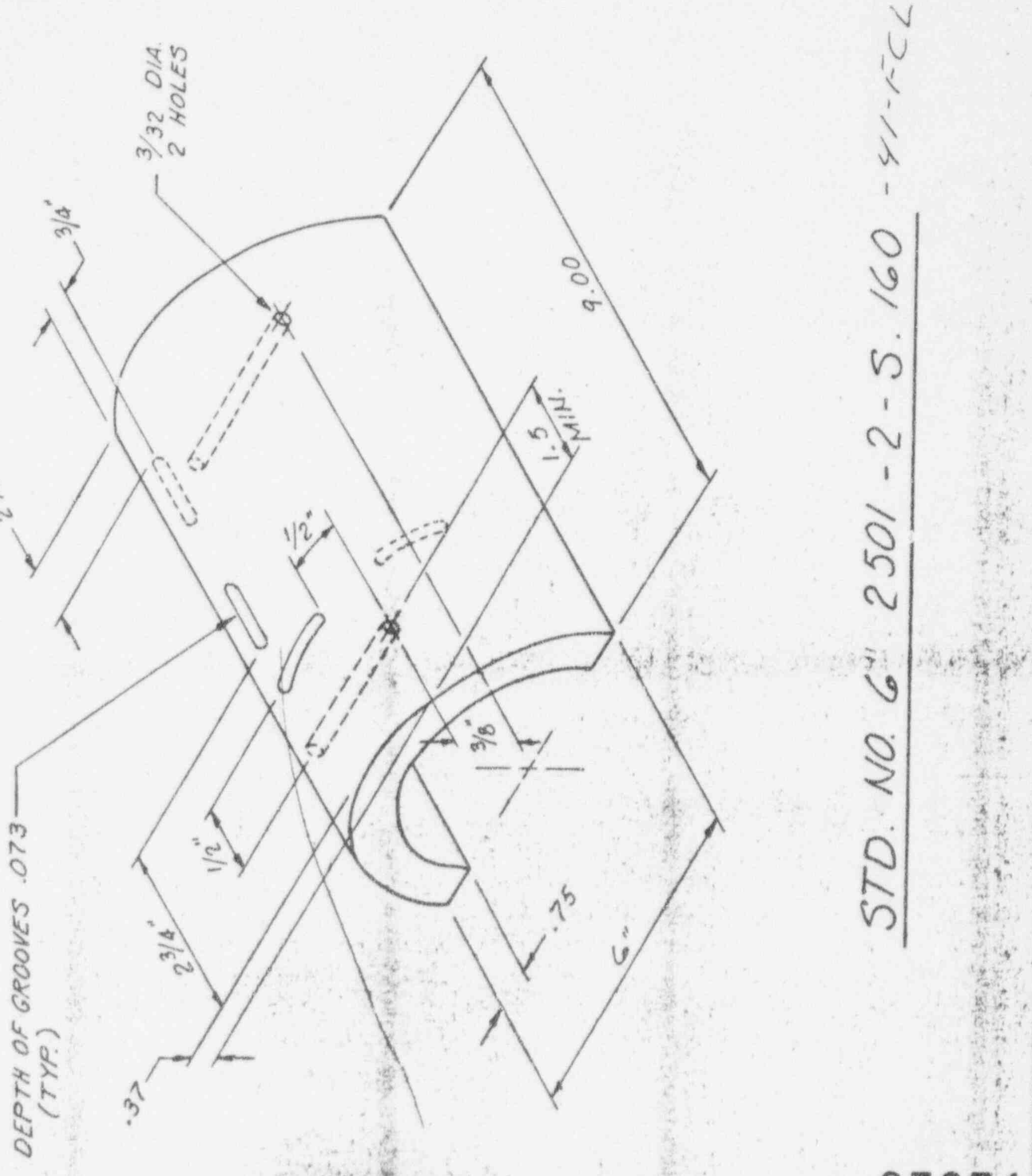
HEAT # ______ APPROX. DIMENSIONS 6 x 8¼ x 2

	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.2	.18	.075
[✓] Circular Cut ID Notch	1.2	.18	.075
[✓] Axial Cut OD Notch	1.2	.18	.075
[✓] Circular Cut OD Notch	1.2	.18	.075

Other: SDH .1 Ø

P#8/GRP 1

* Approximate Weight: 28



37871

OMAHA PUBLIC POWER DISTRICT
OMAHA, NEBRASKA

18098	1	[illegible]		
8-30-85	VES	[illegible]		
9-18-85	[illegible]	[illegible]		
9-18-85	[illegible]	[illegible]		

REV SHEET 18098		
7-10-85	VES	DRAWN
7-15-86	[illegible]	CHECKED
7-15-86	[illegible]	ENGINEER
—	—	CIVIL
—	—	ELECTRICAL
7-85	MEF	MECHANICAL
—	—	NUCLEAR

FORT CALHOUN STATION

UT CALIBRATION BLOCKS

A-4872

REV

CALIBRATION BLOCK 42 -FCL

ID 4-1503-1-5.80-42-FCL

THICKNESS .32 [ ] CLAD - THICKNESS ______

MATERIAL SS MAT'L SPEC A312/316

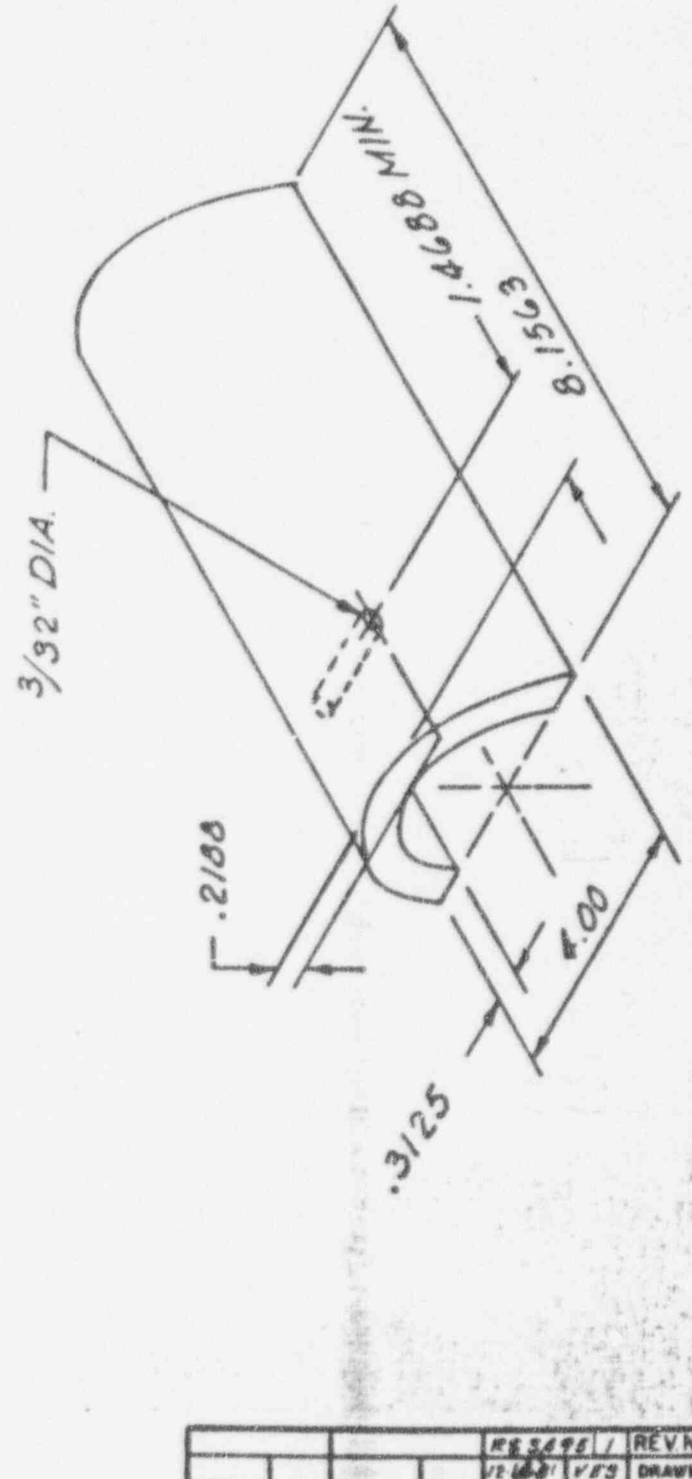
HEAT # ______ APPROX. DIMENSIONS 8¼ x 4 x 1½

	LENGTH	WIDTH	DEPTH
[N/A] Axial Cut ID Notch			
[N/A] Circular Cut ID Notch			
[N/A] Axial Cut OD Notch			
[N/A] Circular Cut OD Notch			

Other: .08 Ø SDH

P# 8/GRP 1

* Approximate Weight: 14



STD. NO. 4" 1503-1-5. 80 -42-FCL

9203

FC 3496	/	REV. NO.	PORT CALHOUN STATION
12-[illegible]-81	VES	DRAWN	
12-15-81	WVP	CHECK	
12-15-81	JGK	ENG.	UT CALIBRATION BLOCKS
–	–	CIVIL DPT.	
–	–	ELEC. DPT.	
12-15-81	MES	MECH. DPT.	
–	–	Q. CONTROL	
–	–	P.E.	SCALE

OMAHA PUBLIC POWER DISTRICT
OMAHA, NEBRASKA

A-4103 | REV.

CALIBRATION BLOCK 43 -FCL

ID 3-2507-3-5.160-43-FCL

THICKNESS .41 [ ] CLAD - THICKNESS ______

MATERIAL SS MAT'L SPEC A312/316

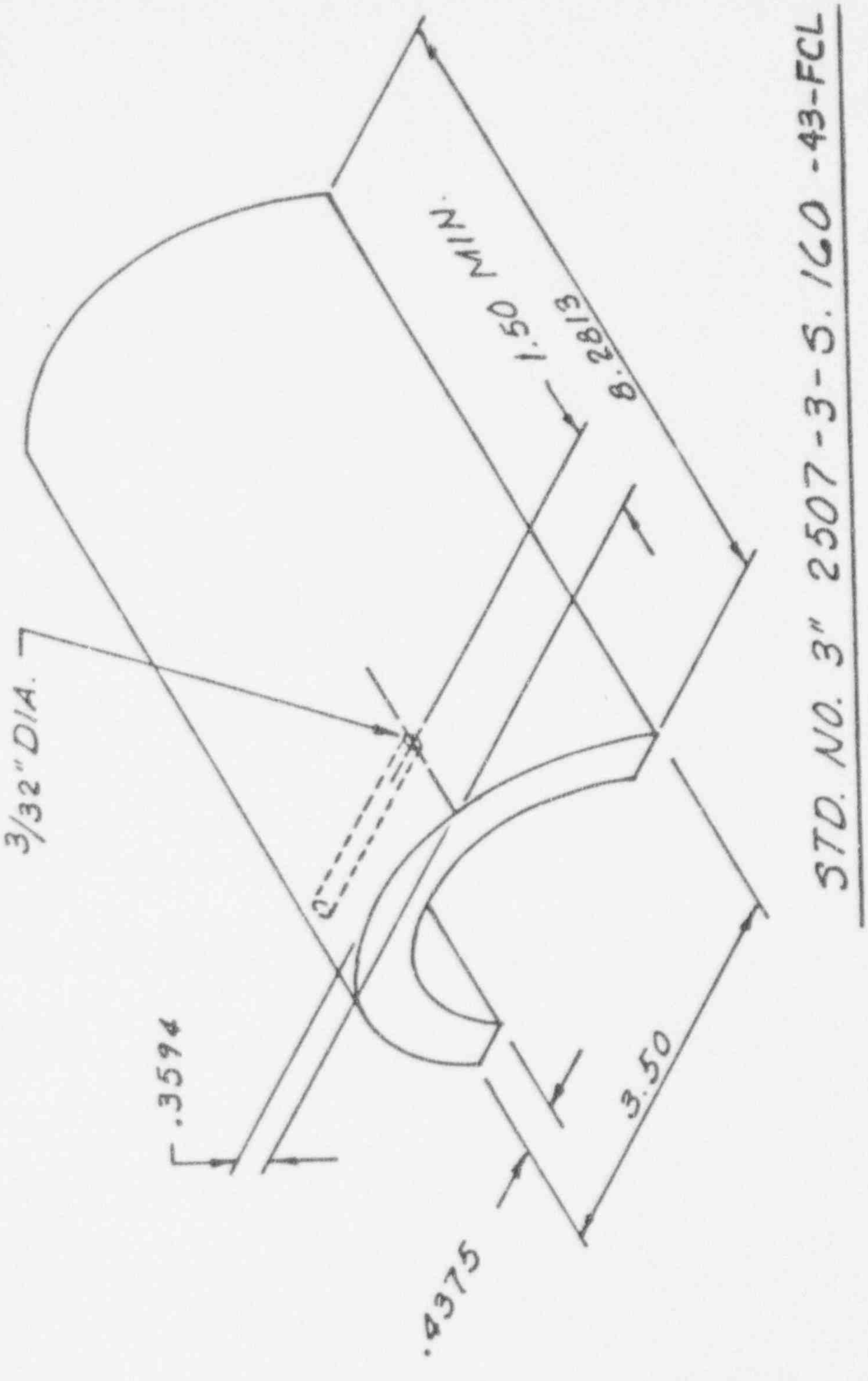
HEAT # ______ APPROX. DIMENSIONS 8½ x 3½ x 2

	LENGTH	WIDTH	DEPTH
[N/A] Axial Cut ID Notch			
[N/A] Circular Cut ID Notch			
[N/A] Axial Cut OD Notch			
[N/A] Circular Cut OD Notch			

Other: .10 Ø SDH

P#8 / GRP 1

* Approximate Weight: 12



REV.SH. 3496	APVD GHE 10/9/90	REV 2
FILE 9049		

9049

REV NO.	FORT CALHOUN STATION
DRAWN	
CHECK	UT
ENG.	CALIBRATION
CIVIL DPT	BLOCKS
ELEC DPT	
MECH DPT	
Q CONTROL	
P.E.	SCALE

OMAHA PUBLIC POWER DISTRICT
OMAHA, NEBRASKA

A-4101

REV.

0904(

CALIBRATION BLOCK 44 -FCL

ID B-2922-001-44-FCL

THICKNESS 1.0 [ ] CLAD - THICKNESS

MATERIAL SS MAT'L SPEC SA 351

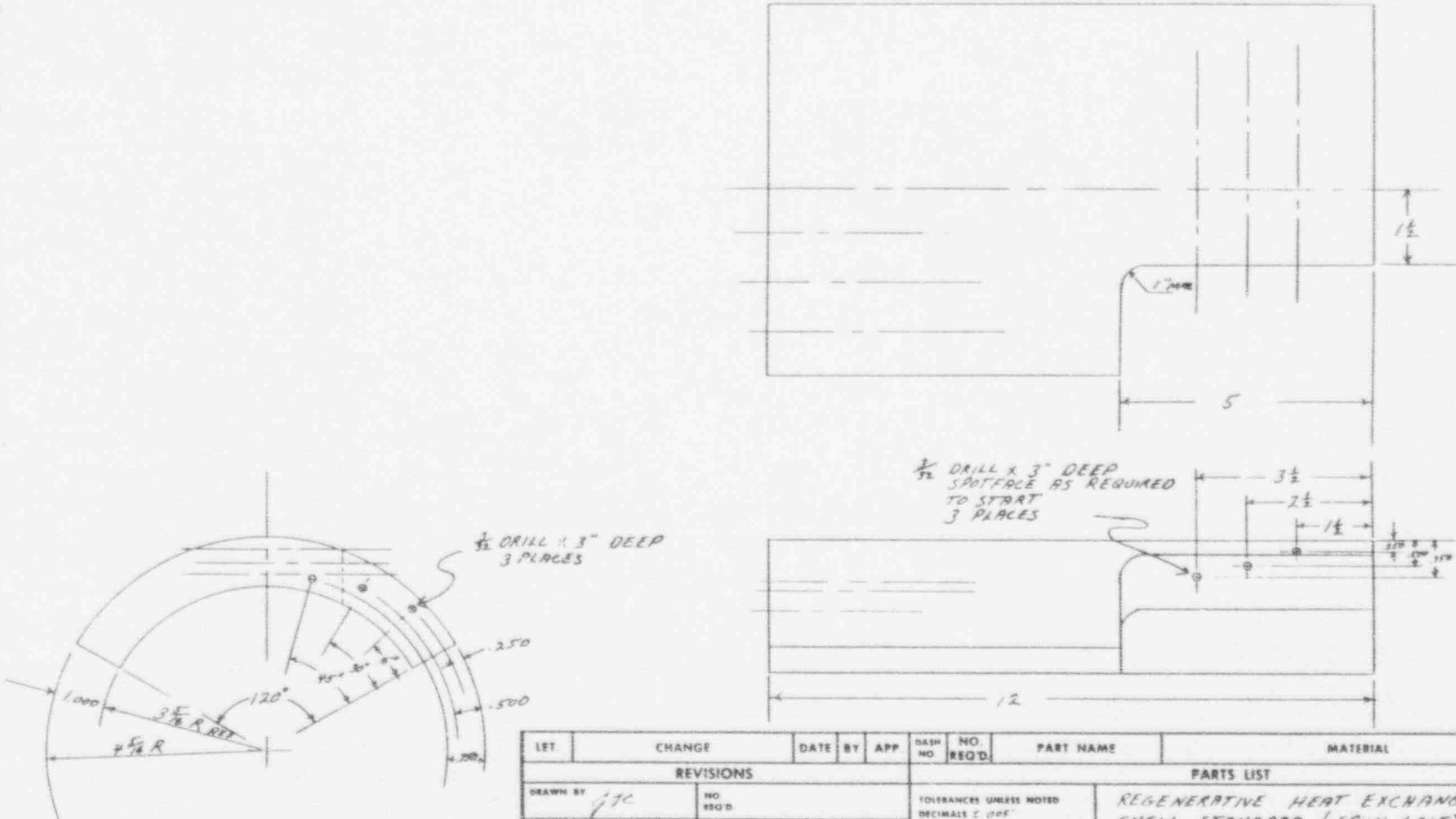
HEAT # APPROX. DIMENSIONS 12 x 8 3/4 x 2 3/4

	LENGTH	WIDTH	DEPTH
[N/A] Axial Cut ID Notch			
[N/A] Circular Cut ID Notch			
[N/A] Axial Cut OD Notch			
[N/A] Circular Cut OD Notch			

Other: SDH = .088" Ø

P# 8 / GRP 1

* Approximate Weight: 22



LET.	CHANGE	DATE	BY	APP.	DASH NO.	NO. REQ'D.	PART NAME	MATERIAL

REVISIONS — PARTS LIST

DRAWN BY JTC	NO. REQ'D.	TOLERANCES UNLESS NOTED DECIMALS ± .005" FRACTIONS ± 1/32 ANGLES ± ½°	REGENERATIVE HEAT EXCHANGER SHELL STANDARD (SPUN CAST)
DESIGNED BY JTC	MATERIAL CF8M - SA351 (1)		
CHECKED BY J. Wilkinson 2-14-75	HEAT TREAT	SOUTHWEST RESEARCH INSTITUTE	DATE 2/13/75 SCALE ½
APPROVED BY	FINISH √63	SAN ANTONIO, TEXAS	DRAWING NUMBER B-2922-001

(1) MAKE FROM SPECIAL ORDER CASTING
9½ OD x 4 5/8 ID x 15" LONG
2. SUPPLY TEST COUPON FOR CHEMICAL ANALYSIS

B-2922-001-44FCL

CALIBRATION BLOCK 45 -FCL

ID 4-2507-2-S160-45-FCL

THICKNESS .5 [ ] CLAD - THICKNESS ____

MATERIAL SS MAT'L SPEC A376/316

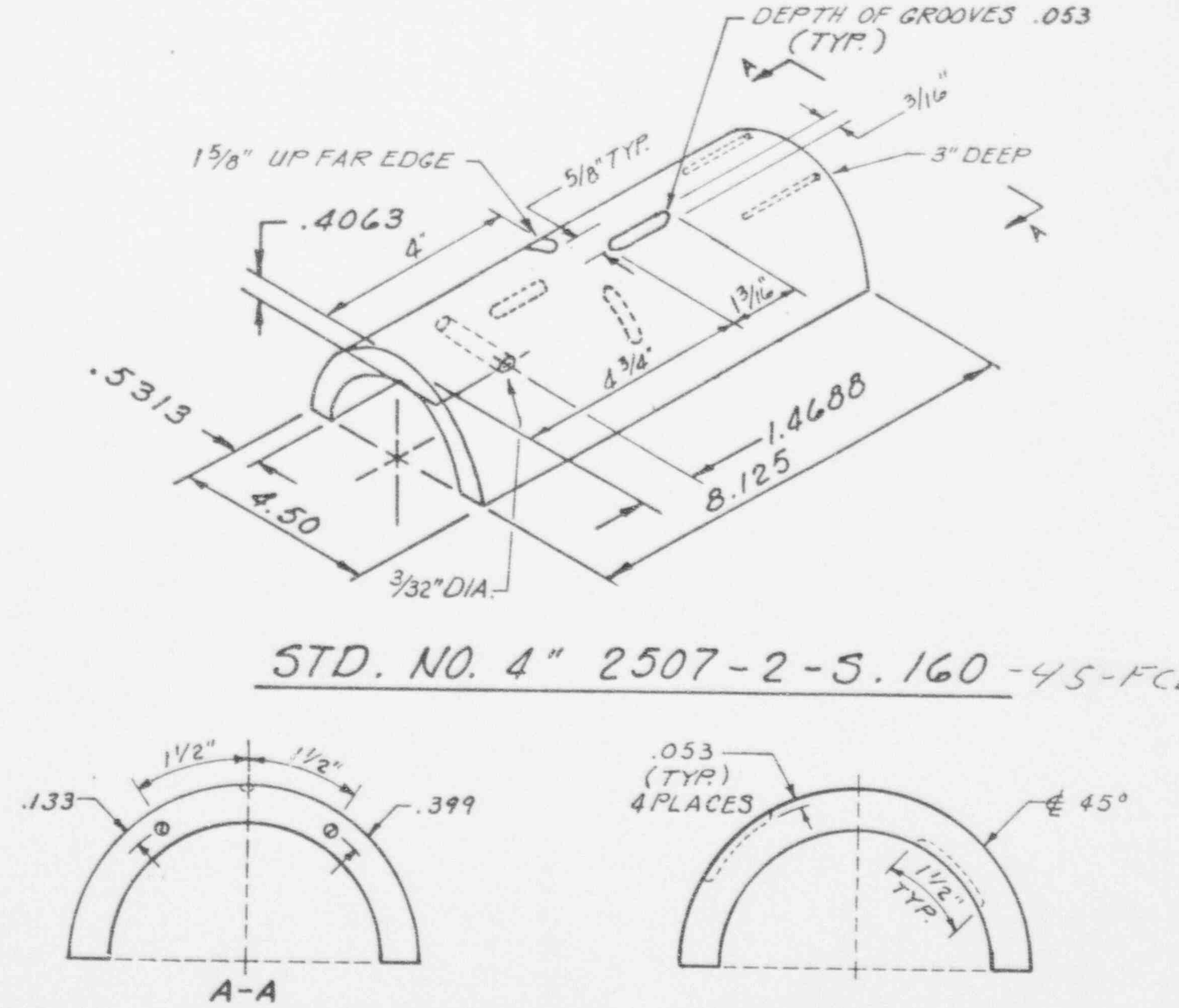
HEAT # ____ APPROX. DIMENSIONS 8 1/4 x 4 1/2 x .5

	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.2	.2	.05
[✓] Circular Cut ID Notch	1.2	.2	.05
[✓] Axial Cut OD Notch	1.2	.2	.05
[✓] Circular Cut OD Notch	1.2	.2	.05

Other: SDH .1 Ø

P# 8/ GRP 1

* Approximate Weight: 12



REV. NO.	1	2	3
	RR-3472	RR-3492	RR-3492
DRAWN	VES 12-14-81	VES 7-8-84	VES 9-6-85
CHECK	WP 12-15-81	7-16-85	KLK 9-18-85
ENG.	JGK 12-15-81	JGK 7-16-85	JGK 9-18-85
CIVIL DPT.	-	-	-
ELEC. DPT.	-	-	-
MECH. DPT.	-	-	-
Q. CONTROL	NEF 12-18-81	NEF 7-18-85	NEF 10-17-85
P.E.	-	-	-

OMAHA PUBLIC POWER DISTRICT
OMAHA, NEBRASKA

SCALE

FORT CALHOUN STATION

UT
CALIBRATION
BLOCKS

9204

A-41104

REV.

CALIBRATION BLOCK 64 -FCL

ID 36-CCSS-XX-3.25-64-FCL

THICKNESS 3.25 [ ] CLAD - THICKNESS NONE

MATERIAL SS MAT'L SPEC SA 351

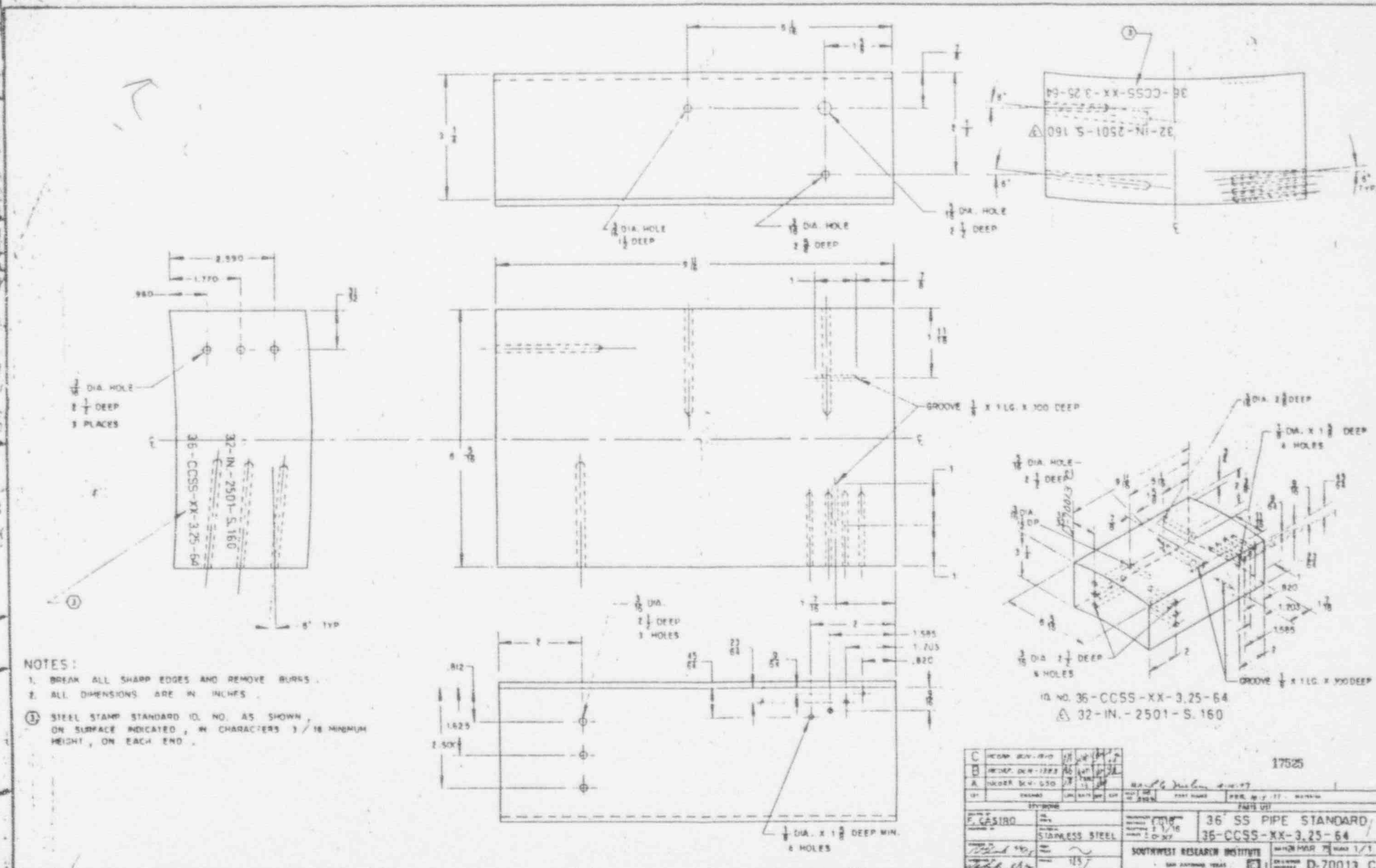
HEAT # ______ APPROX. DIMENSIONS 10 x 3¼ x 6½

	LENGTH	WIDTH	DEPTH
[✓] Axial Cut ID Notch	1.5	.2	.3
[✓] Circular Cut ID Notch	1.5	.2	.3
[N/A] Axial Cut OD Notch			
[N/A] Circular Cut OD Notch			

Other: P#8/GRP 1

SDH 3/16" Ø

* Approximate Weight: 30



36-CCSS-XX-3.25-64-FCL

CALIBRATION BLOCK 66 -FCL

24-IN-2501-S.160-66-FCL

ID 24-CCSS-XX-2.5-66-FCL

THICKNESS 2.5 [ ] CLAD - THICKNESS NONE

MATERIAL SS MAT'L SPEC SA351

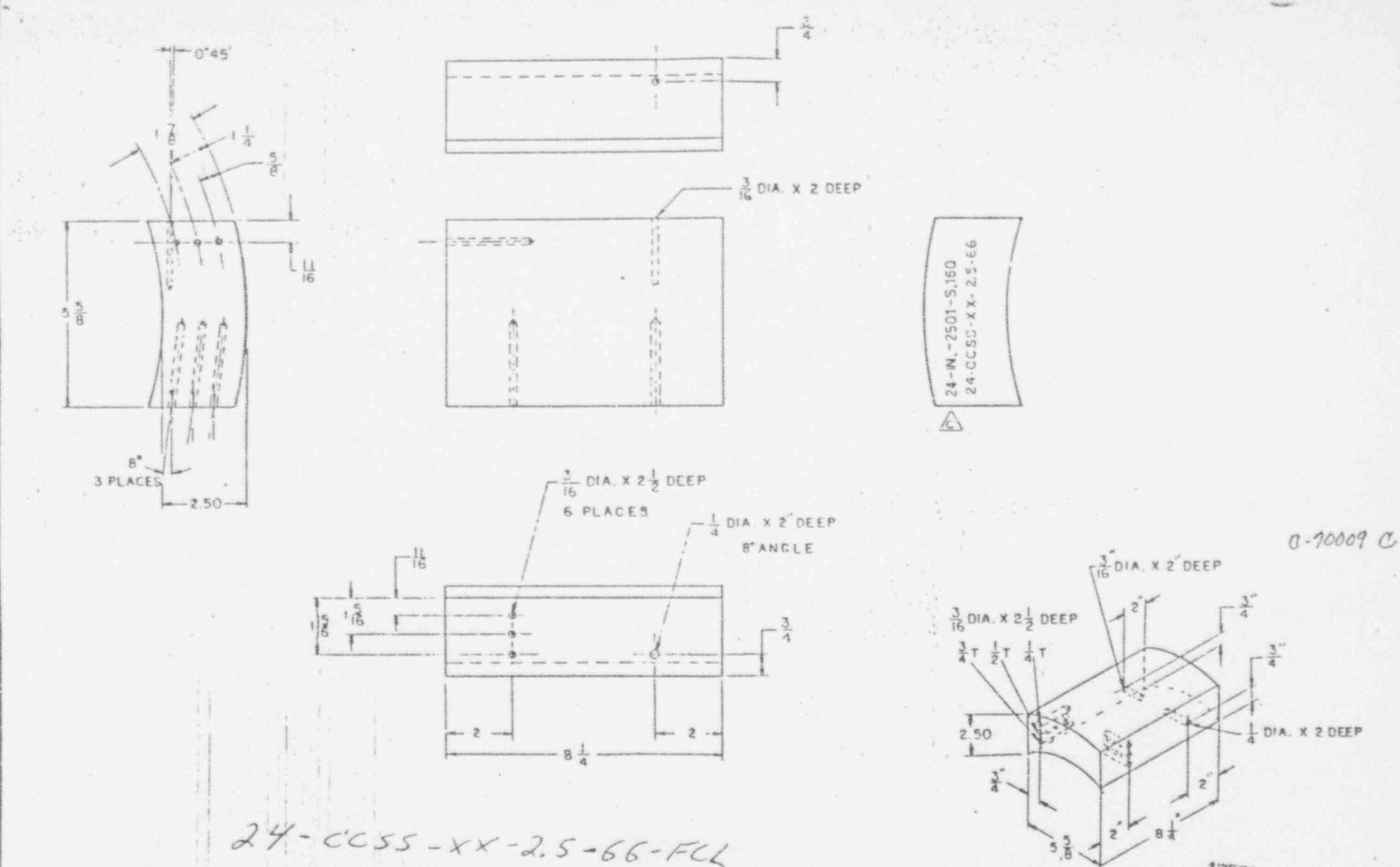
HEAT # ______ APPROX. DIMENSIONS 8 1/4 x 6 x 2.6

	LENGTH	WIDTH	DEPTH
[√] Axial Cut ID Notch	1.5	.2	.25
[√] Circular Cut ID Notch	1.5	.2	.25
[N/A] Axial Cut OD Notch			
[N/A] Circular Cut OD Notch			

Other: SDH .2" Ø

P#8 / GRP 1

* Approximate Weight: 30



17522

LET.	CHANGE	CHK.	DATE	APP.	APP.
C	INCORP. DCN-1911				
B	INCORP. DCN-1382				
A	INCORP. DCN-649				

REVISIONS

ID. NO. 24-CCSS-XX-2.5-66-FCL C

24-IN.-2501-S.160

PART NAME | P.O.R. 10-6-77 | MATERIAL

PARTS LIST

DRAWN BY JESSE RAMOS

MATERIAL CCSS

FINISH 125

24" CCSS PIPE STANDARD
24-CCSS-XX-2.5-66

SOUTHWEST RESEARCH INSTITUTE
SAN ANTONIO, TEXAS

DATE 5-21-75 SCALE 1/2

DRAWING NUMBER C-70009 C

3. STEEL STAMP STANDARD ID No. AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 1/8 MIN. HEIGHT, EACH END.
2. DEBURR AND BREAK SHARP EDGES 1/32.
1. DIMENSIONS ARE IN INCHES.

NOTES

ATTACHMENT 6

CLASS 2 COMPONENTS CATEGORY C-F-1 AND C-F-2

CLASS 2 C-F-1 CATEGORY EXAM SELECTION
(AUSTENITIC PIPING WELDS)

										FIRST PERIOD EXAMS				SECOND PERIOD EXAMS				THIRD PERIOD EXAMS			
LINE NUMBER	ISO	TOTAL C-F	≥ 3/8" T C5.11	C5.12	> 1/5" T C5.21	C5.22	SOCKET C5.30	BRANCH C5.41	NOT REQUIRED	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40
14-LPSI-2001	B-9	13							13												
0.250" NOMINAL THICKNESS (2 TERMINAL ENDS)																					
14-LPSI-2002	B-10	11							11												
0.250" NOMINAL THICKNESS (2 TERMINAL ENDS)																					
12-SDC-2020	B-11	21	21	20																	
0.375" NOMINAL THICKNESS																					
12-LPSI-2001/8"	B-16	2							2												
0.322" NOMINAL THICKNESS																					
12-LPSI-2001	B-16	24	24	10																	
12-LPSI-2002	B-17	25	25	31																	
0.375" NOMINAL THICKNESS																					
12-LPSI-2003	B-18	42	42	24																	
0.375" NOMINAL THICKNESS (1 TERMINAL END)																					
12-CSS-2001	B-19	36	33	40				3													
0.375" NOMINAL THICKNESS (1 TERMINAL END)																					
12-CSS-2002	B-20	9	9	4																	
0.375" NOMINAL THICKNESS																					
12-SDC-2001	B-21	27	27	2																	
0.375" NOMINAL THICKNESS (1 TERMINAL END)																					
12-SDC-2002	B-22	28	28	20																	
0.375" NOMINAL THICKNESS (1 TERMINAL END)																					
12-SDC-2003	B-22A	22	22	14																	
0.375" NOMINAL THICKNESS																					
10-LPH-2001	B-23	13							13												
0.365" NOMINAL THICKNESS																					
10-LPSI-2001	B-24	12							12												
0.365" NOMINAL THICKNESS (2 TERMINAL ENDS)																					

CLASS 2 C-F-1 CATEGORY EXAM SELECTION
(AUSTENITIC PIPING WELDS)

										FIRST PERIOD EXAMS				SECOND PERIOD EXAMS				THIRD PERIOD EXAMS			
LINE NUMBER	ISO	TOTAL C-F	≥ 3/8" T C5.11	C5.12	>1/5" T C5.21	C5.22	SOCKET C5.30	BRANCH C5.41	NOT REQUIRED	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40
10-LPSI-2002	B-25	35							35												
0.365" NOMINAL THICKNESS (1 TERMINAL END)																					
8-CSS-2001	B-26	13							13												
0.322" NOMINAL THICKNESS (2 TERMINAL ENDS)																					
8-CSS-2002	B-27	12							12												
0.322" NOMINAL THICKNESS (2 TERMINAL ENDS)																					
8-CSS-2003	B-28	20							20												
0.322" NOMINAL THICKNESS (2 TERMINAL ENDS)																					
8-LPSI-2001	B-29	22							22												
0.322" NOMINAL THICKNESS (1 TERMINAL END)																					
8-LPSI-2002	B-30	11							11												
0.322" NOMINAL THICKNESS (1 TERMINAL END)																					
6-LPH-2022	B-31	11							11												
0.280" NOMINAL THICKNESS																					
6-SI-2022	B-31	2	2																		
0.719" NOMINAL THICKNESS																					
6-LPH-2024	B-32	7							7												
0.280" NOMINAL THICKNESS																					
6-SI-2024	B-32	3	3																		
0.719" NOMINAL THICKNESS																					
6-LPH-2012	B-33	7							7												
0.280" NOMINAL THICKNESS																					
6-SI-2012	B-33	2	2																		
0.719" NOMINAL THICKNESS																					
6-LPH-2014	B-34	17							17												
0.280" NOMINAL THICKNESS																					

CLASS 2 C-F-1 CATEGORY EXAM SELECTION
(AUSTENITIC PIPING WELDS)

										FIRST PERIOD EXAMS				SECOND PERIOD EXAMS				THIRD PERIOD EXAMS			
LINE NUMBER	ISO	TOTAL C-F	≥ 3/8" T C5.11	C5.12	> 1/5" T C5.21	C5.22	SOCKET C5.30	BRANCH C5.41	NOT REQUIRED	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40
6-SI-2014	B-34	3	3																		
0.719" NOMINAL THICKNESS																					
6-CSS-2001	B-35	16							16												
0.280" NOMINAL THICKNESS																					
20-SI-2001	B-36	10	10	18																	
24-SI-2001	B-36	17	17	34																	
0.375" NOMINAL THICKNESS																					
20-SI-2002	B-37	3	3	6																	
24-SI-2002	B-37	24	24	40																	
0.375" NOMINAL THICKNESS																					
12-CSS-2004	B-38	24	24	10																	
12-CSS-2005	B-38	12	12	11																	
0.375" NOMINAL THICKNESS																					
12-CSS-2011	B-39	7							7												
12-CSS-2012	B-39	5							5												
12-CSS-2013	B-39	5							5												
0.180" NOMINAL THICKNESS (3 TERMINAL ENDS, 1 EACH)																					
12-CSS-2011	B-39	3	3	2																	
12-CSS-2012	B-39	5	5	4																	
12-CSS-2013	B-39	5	5	0																	
0.375" NOMINAL THICKNESS (3 TERMINAL ENDS, 1 EACH)																					
6-HPSI-2002	B-40	6							6												
8-HPSI-2003	B-40	9							9												
0.280" NOMINAL THICKNESS (2 TERMINAL ENDS, 1 EACH)																					
8-HPSI-2001	B-40	8							8												
0.322" NOMINAL THICKNESS (1 TERMINAL END)																					

CLASS 2 C-F-1 CATEGORY EXAM SELECTION
(AUSTENITIC PIPING WELDS)

										FIRST PERIOD EXAMS				SECOND PERIOD EXAMS				THIRD PERIOD EXAMS			
LINE NUMBER	ISO	TOTAL C-F	≥ 3/8" T C5.11	C5.12	> 1/5" T C5.21	C5.22	SOCKET C5.30	BRANCH C5.41	NOT REQUIRED	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40
6-HPSI-2001	B-41	11							11												
0.280" NOMINAL THICKNESS (2 TERMINAL ENDS)																					
6-SI-2002	B-42	15	15	18																	
0.432" NOMINAL THICKNESS																					
2-CH-10	B-60	12					12														
0.344" NOMINAL THICKNESS (2 TERMINAL ENDS)																					
2-CH-11	B-61	14					14														
0.344" NOMINAL THICKNESS																					
2-CH-12	B-62	28					28														
0.344" NOMINAL THICKNESS (1 TERMINAL END)																					
2-CH-13	B-63	53					53														
0.344" NOMINAL THICKNESS (2 TERMINAL ENDS)																					
2-CH-14	B-64	31					31														
0.344" NOMINAL THICKNESS (1 TERMINAL END)																					
2.5-CH-10	B-64	2			2																
0.375" NOMINAL THICKNESS (1 TERMINAL END)																					
2-CH-15	B-65	18					18														
0.344" NOMINAL THICKNESS (1 TERMINAL END)																					
2-CH-16	B-66	13					13														
0.344" NOMINAL THICKNESS																					
2.5-CH-11	B-66	4			4																
0.375" NOMINAL THICKNESS																					
2-CH-17	B-67	13					13														
0.344" NOMINAL THICKNESS																					
2-CH-18	B-68	43					43														
0.344" NOMINAL THICKNESS (1 TERMINAL END)																					

CLASS 2 C-F-1 CATEGORY EXAM SELECTION
(AUSTENITIC PIPING WELDS)

										FIRST PERIOD EXAMS				SECOND PERIOD EXAMS				THIRD PERIOD EXAMS			
LINE NUMBER	ISO	TOTAL C-F	≥ 3/8" T C5.11	C5.12	> 1/5" T C5.21	C5.22	SOCKET C5.30	BRANCH C5.41	NOT REQUIRED	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40
2-CH-19	B-69	29					29														
0.344" NOMINAL THICKNESS (1 TERMINAL END)																					
2-CH-20	B-70	22					22														
0.344" NOMINAL THICKNESS																					
2-CH-21	B-71	30					30														
0.344" NOMINAL THICKNESS (1 TERMINAL END)																					
2-CH-22	B-72	45					45														
0.344" NOMINAL THICKNESS (1 TERMINAL END)																					
4-CH-10	B-73	33			32			1													
0.531" NOMINAL THICKNESS																					
2-CH-23	B-74	4					4														
0.344" NOMINAL THICKNESS																					
4-CH-11	B-74	38			36			2													
0.531" NOMINAL THICKNESS (2 TERMINAL ENDS)																					
2-CH-23	B-75	2					2														
0.344" NOMINAL THICKNESS (2 TERMINAL ENDS)																					
4-CH-12	B-75	41			40			1													
0.531" NOMINAL THICKNESS																					
4-CH-13	B-76	23			23																
0.531" NOMINAL THICKNESS (1 TERMINAL END)																					
2-CH-24	B-77	10					10														
0.344" NOMINAL THICKNESS (1 TERMINAL END)																					
2-CH-25	B-78	14					14														
0.344" NOMINAL THICKNESS																					
2-CH-26	B-79	24					24														
0.344" NOMINAL THICKNESS																					

CLASS 2 C-F-1 CATEGORY EXAM SELECTION
(AUSTENITIC PIPING WELDS)

										FIRST PERIOD EXAMS				SECOND PERIOD EXAMS				THIRD PERIOD EXAMS			
LINE NUMBER	ISO	TOTAL C-F	≥ 3/8" T C5.11	C5.12	> 1/5" T C5.21	C5.22	SOCKET C5.30	BRANCH C5.41	NOT REQUIRED	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40	C5.10	C5.20	SOCKET C5.30	BRANCH C5.40
2-CH-27	B-80	12					12														
0.344" NOMINAL THICKNESS (1 TERMINAL END)																					
4-CH-14	B-81	23			21			2													
0.531" NOMINAL THICKNESS (1 TERMINAL END)																					
2-CH-28	B-82	10					10														
0.344" NOMINAL THICKNESS (1 TERMINAL END)																					
2-CH-29	B-83	18					18														
0.344" NOMINAL THICKNESS																					
2-CH-30	B-84	24					24														
0.344" NOMINAL THICKNESS																					
2-CH-31	B-85	11					11														
0.344" NOMINAL THICKNESS (1 TERMINAL END)																					
TOTAL		1279	359	306	158	0	480	9	273												
REQUIRED TOTALS FOR THIRD INTERVAL		96	45	*	13	0	36	2	0	16 - 32				48 - 64				96			
CUMULATIVE TOTALS OF EXAMS EACH PERIOD																					

* LONGSEAMS ARE EXAMINED WITH SELECTED INTERSECTING CIRCUMFERENTIAL WELDS

CLASS 2 C-F-1 CATEGORY EXAM SELECTION
(AUSTENITIC PIPING WELDS)

WELD SELECTION PER ASME SECTION XI 1989 EDITION

SYSTEM	SIZE	ITEM #	THICKNESS	TOTAL WELDS	TERMINAL ENDS	STRUCTURAL DISCONTINUITIES	% REQUIRED	REQ. TOTAL PER SYSTEM/SIZE
LPSI	14	N/A	0.250"	24	3	21	0	0
LPSI	12	C5.11	0.375"	91	2	89	19.70	19
LPSI	10	N/A	0.365"	47	3	44	0	0
LPSI	8	N/A	0.322"	35	2	33	0	0
LPH	10	N/A	0.365"	13	0	13	0	0
LPH	6	N/A	0.280"	42	0	42	0	0
LPSI SUB-TOTAL				252	10	242	19.70	19 (1 TERMINAL END)
CSS	12	N/A	0.180"	17	3	14	0	0
CSS	12	C5.11	0.375"	91	3	88	13.45	12
CSS	12	C5.41	0.375"	3	0	3		1
CSS	8	N/A	0.322"	45	6	39	0	0
CSS	6	N/A	0.280"	16	0	16	0	0
CSS SUB-TOTAL				172	12	160	13.45	13 (1 TERMINAL END)
SDC	12	C5.11	0.375"	98	2	96	7.86	7
SDC SUB-TOTAL				98	2	96	7.86	7
SI	24	C5.11	0.375"	41	0	41	36.25	3
SI	20	C5.11	0.375"	13	0	13	11.50	1
SI	6	C5.11	0.719"	10	0	10	8.84	1
SI	6	C5.11	0.432"	15	0	15	43.36	4
HPSI (ADD TO 6" SI)	8	N/A	0.322"	8	1	7	0	0
HPSI (ADD TO 6" SI)	6	N/C	0.280"	26	4	22	0	0
HPSI SUB-TOTAL				113	5	108	8.83	9

CLASS 2 C-F-1 CATEGORY EXAM SELECTION
(AUSTENITIC PIPING WELDS)

SYSTEM	SIZE	ITEM #	THICKNESS	TOTAL WELDS	TERMINAL ENDS	STRUCTURAL DISCONTINUITIES	% REQUIRED	REQ. TOTAL PER SYSTEM/SIZE
CH	4	C5.21	0.531"	152	4	148	23.80	11
CH	4	C5.41	0.531"	6	0	6	0.93	1
CH	2.5	C5.21	0.375"	6	1	5	0.93	1
CH	2	C5.30	0.344"	480	17	463	74.53	36 (2 TERMINAL ENDS)
CH SUB-TOTAL				644	22	622	50.36	48 (2 TERMINAL ENDS)
COLUMN TOTALS				1279	51	1218	4.02% TERMINAL ENDS 95.98% STRUCTURAL DISC.	4 TERMINAL ENDS 92 STRUCTURAL DISC.

THE SUB-TOTAL OF EACH SYSTEM DIVIDED BY GRAND TOTAL (1279) OF WELDS EQUALS REQUIRED PERCENTAGE PER SYSTEM.

WITHIN A SYSTEM, THE TOTAL WELDS PER SIZE DIVIDED BY SYSTEM SUB-TOTAL EQUALS REQUIRED PERCENTAGE PER SYSTEM PER SIZE.

CLASS 2 C-F-2 CATEGORY EXAM SELECTION
(CARBON PIPING WELDS)

										FIRST PERIOD EXAMS				SECOND PERIOD EXAMS				THIRD PERIOD EXAMS			
LINE NUMBER	ISO	TOTAL C-F	≥ 3/8" T C5.51	C5.52	> 1/5" T C5.61	C5.62	SOCKET C5.70	BRANCH C5.81	NOT REQUIRED	C5.50	C5.60	SOCKET C5.70	BRANCH C5.80	C5.50	C5.60	SOCKET C5.70	BRANCH C5.80	C5.50	C5.60	SOCKET C5.70	BRANCH C5.80
28-MS-2001	B-3	12	12																		
1.000" NOMINAL THICKNESS (1 TERMINAL END)																					
*28-MS-2001	B-4	9	5					4													
1.000" NOMINAL THICKNESS (ALL ARE CABLE WRAPPED)																					
6-MS-2001	B-4	2	2																		
6-MS-2002	B-4	2	2																		
6-MS-2003	B-4	2	2																		
6-MS-2004	B-4	2	2																		
0.432" NOMINAL THICKNESS																					
28-MS-2002	B-5	12	12																		
1.000" NOMINAL THICKNESS (1 TERMINAL END)																					
6-MS-2005	B-6	2	2																		
6-MS-2006	B-6	2	2																		
6-MS-2007	B-6	2	2																		
6-MS-2008	B-6	2	2																		
0.432" NOMINAL THICKNESS																					
*28-MS-2002	B-6	9	5					4													
1.000" NOMINAL THICKNESS (ALL ARE CABLE WRAPPED)																					
16-FW-2001	B-7	12	12																		
0.844" NOMINAL THICKNESS (2 ARE CABLE WRAPPED) (1 TERMINAL END)																					
16-FW-2002	B-8	16	16																		
0.344" NOMINAL THICKNESS (4 ARE CABLE WRAPPED) (1 TERMINAL END)																					
6-AC-2001	B-48	18							18												
0.280" NOMINAL THICKNESS																					
6-AC-2002	B-49	16							16												
0.280" NOMINAL THICKNESS																					

CLASS 2 C-F-2 CATEGORY EXAM SELECTION
(CARBON PIPING WELDS)

										FIRST PERIOD EXAMS				SECOND PERIOD EXAMS				THIRD PERIOD EXAMS			
LINE NUMBER	ISO	TOTAL C-F	≥ 3/8" T C5.81	C5.52	> 1/8" T C5.81	C5.82	SOCKET C5.70	BRANCH C5.81	NOT REQUIRED	C5.50	C5.80	SOCKET C5.70	BRANCH C5.80	C5.50	C5.80	SOCKET C5.70	BRANCH C5.80	C5.50	C5.80	SOCKET C5.70	BRANCH C5.80
10-AC-2001	B-50	26							26												
0.365" NOMINAL THICKNESS																					
10-AC-2001 (8")	B-50	5							5												
0.322" NOMINAL THICKNESS																					
6-AC-2003	B-50A	5							5												
6-AC-2004	B-50A	7							7												
0.280" NOMINAL THICKNESS (2 TERMINAL ENDS, 1 EACH)																					
10-AC-2002	B-51	30							30												
0.365" NOMINAL THICKNESS																					
10-AC-2002 (8")	B-51	5							5												
0.322" NOMINAL THICKNESS																					
6-AC-2005	B-51A	6							6												
6-AC-2006	B-51A	4							4												
6-AC-2007	B-52	1							1												
0.280" NOMINAL THICKNESS (3 TERMINAL ENDS, 1 EACH)																					
8-AC-2001	B-52	35							35												
0.322" NOMINAL THICKNESS																					
6-AC-2008	B-53	1							1												
0.280" NOMINAL THICKNESS (1 TERMINAL END)																					
8-AC-2002	B-53	37							37												
0.322" NOMINAL THICKNESS																					
6-AC-2009	B-54	1							1												
0.280" NOMINAL THICKNESS (1 TERMINAL END)																					
8-AC-2003	B-54	35							35												
0.322" NOMINAL THICKNESS																					
6-AC-2010	B-55	1							1												
0.280" NOMINAL THICKNESS (1 TERMINAL END)																					

CLASS 2 C-F-2 CATEGORY EXAM SELECTION
(CARBON PIPING WELDS)

										FIRST PERIOD EXAMS				SECOND PERIOD EXAMS				THIRD PERIOD EXAMS			
LINE NUMBER	ISO	TOTAL C-F	≥ ½" T C5.51	C5.52	> 1/8" T C5.81	C5.82	SOCKET C5.70	BRANCH C5.81	NOT REQUIRED	C5.50	C5.80	SOCKET C5.70	BRANCH C5.80	C5.50	C5.80	SOCKET C5.70	BRANCH C5.80	C5.50	C5.80	SOCKET C5.70	BRANCH C5.80
8-AC-2004	B-55	32							32												
0.322" THICKNESS																					
10-AC-2003	B-56	30							30												
0.365" NOMINAL THICKNESS																					
10-AC-2003 (8")	B-56	5							5												
0.322" NOMINAL THICKNESS																					
6-AC-2011	B-56	6							6												
6-AC-2012	B-56	4							4												
0.230" NOMINAL THICKNESS (2 TERMINAL ENDS, 1 EACH)																					
10-AC-2004	B-57	31							31												
0.365" NOMINAL THICKNESS																					
10-AC-2004 (8")	B-57	6							6												
0.322" NOMINAL THICKNESS																					
6-AC-2013	B-57	5							5												
6-AC-2014	B-57	6							6												
0.280" NOMINAL THICKNESS (2 TERMINAL ENDS, 2 EACH)																					
TOTAL		444	78	0	0	0	0	8	358												
REQUIRED TOTALS FOR THIRD INTERVAL		34	33	0	0	0	0	1*	0	6 - 11				17 - 22				34			
CUMULATIVE TOTALS OF EXAMS EACH PERIOD																					

* THE BRANCH CONNECTION WELDS LOCATED ON ISO. # B-4 OR B-6 ARE BURIED IN CABLE WRAPPED PIPING, THEREFORE THE REQUIRED BRANCH CONNECTION WELD EXAM WILL BE PERFORMED ON A WELD LOCATED ON A SIMILAR CONFIGURATION ON ISO. # D-01.

CLASS 2 C-F-2 CATEGORY EXAM SELECTION
(CARBON PIPING WELDS)

WELD SELECTION PER ASME SECTION XI 1989 EDITION

SYSTEM	SIZE	THICKNESS	TOTAL WELDS	NOT ACCESSIBLE	ACCESSIBLE	TERMINAL ENDS	STRUCTURAL DISCONTINUITIES	% REQUIRED	TOTAL PER SYSTEM/SIZE
MAIN STEAM	6"	0.432"	16	0	16	0	16	18.6	6
MAIN STEAM	28"	1.000"	42	18	24	2	40	48.8	17 (1 TERMINAL END)
FEED WATER	16"	0.844"	28	6	22	2	26	32.6	11 (1 TERMINAL END)
COLUMN TOTALS	-	-	86	24	62	4	82	100	34 (2 TERMINAL ENDS)

OPPD PROPOSED WELD SELECTION

SYSTEM	SIZE	THICKNESS	TOTAL WELDS	NOT ACCESSIBLE	ACCESSIBLE	TERMINAL ENDS	STRUCTURAL DISCONTINUITIES	% PROPOSED	TOTAL PER SYSTEM/SIZE PROPOSED
MAIN STEAM	6"	0.432"	16	0	16	0	16	11.7	4
MAIN STEAM	28"	1.000"	42	18	24	2	40	35.3	12 (1 TERMINAL END)
FEEDWATER	16"	0.844"	28	6	22	2	26	26.5	9 (1 TERMINAL END)
COLUMN SUB-TOTALS	-	-	66	24	62	4	82	73.5	25
AUXILIARY COOLING	10"	0.365"	117	-	117	12	105	26.5	9
COLUMN TOTALS	-	-	203	24	179	16	187	100	34 (2 TERMINAL ENDS)