

ATTACHMENT

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MAINTENANCE INSTRUCTION

MI-6.22

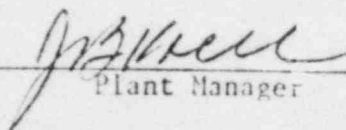
CONTROL OF HEAVY LOADS IN CRITICAL  
LIFTING ZONES - NUREG 0612

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PORC Review: MAY 21 1984  
Date

Approved By:   
Plant Manager

Date Approved: MAY 21 1984

The current revision level of this instruction is: 3

Reason for current revision (include all temporary change numbers) Revised in accordance with Temporary Change 84-0447, PORC approved 5/17/84.

The last page of this instruction is number 21

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CONTROL OF HEAVY LOADS IN CRITICAL LIFTING ZONES - NUREG 0612

1.0 SCOPE

This instruction provides requirements for the control of lifts greater than 2,000 pounds (1 ton), made in the auxiliary building (elevations 653, 690, and 734), in the upper compartment of units 1 and 2 reactor buildings, or at the ERCW pumping station in the areas designated as the critical lifting zones (CLZ). The CLZ's are defined in this instruction as the following areas:

1. The region, defined as the reactor building CLZ, inside the polar crane wall of the upper compartment when at least one of the horizontal reactor well missile shields has been removed (see Attachment A). CLZ applies only when the reactor or cavity pool has fuel in it. The jib crane shall not be used for lifts greater than 2,000 pounds above elevation 734 inside the crane wall when spent fuel assemblies are in the RCC change fixture, the upender, or in the transfer canal.
2. The region, defined as the spent fuel pit CLZ, within 15 feet of the spent fuel pit when spent fuel is in the pit (see Attachment B).
3. The region, defined as the auxiliary building CLZ, within 15 feet of the RHR and containment spray heat exchanger hatches when the hatch plugs have been removed and the heat exchangers are in service (see Attachment C).

NOTE: This instruction does not apply to lifting of new or spent fuel assemblies using the manipulator crane or spent fuel bridge.

4. The region, defined as the ERCW Pumping station CLZ, over safety related equipment (see Attachment D).
5. The region, defined as the waste evaporator feed filter CLZ, in the auxiliary building at elevation 653 between A8 and A10 lines and V and W lines (see Attachment E).
6. The region, defined as the component cooling pump CLZ, in the auxiliary building at elevation 690 between A1 and A3 lines and T and U lines (see Attachment F).
7. Any area in which temporary hoists and rigging must be used for lifts greater than 2000 pounds over operable CSSC equipment. For temporary hoists and rigging the area is not limited to areas described in 1.1., 1.2, 1.3, 1.4, 1.5 and 1.6 above. Prior to any of these lifts, a safety evaluation must be processed to determine potential risks to plant safety and to verify proper handling equipment will be used in making these lifts. The plant Compliance Section will co-ordinate necessary safety evaluations with the Reactor Engineering Branch who will secure assistance, when needed, from the Mechanical Branch. The involved plant section will furnish the details of the lift and equipment to be used to the plant Compliance Section, the Reactor Engineering Branch or the Mechanical Branch as applicable.

## 2.0 REFERENCES

2.1 NUREG-0612.

\* 2.2 DPM No. N74M15. (MI-2.2, 2.3, 7.2, 7.3, 8.12, 9.1, 9.2; MSL-A37, A50; OTGL-A3; SQM31)

## 3.0 PREREQUISITIES

NOTE: The following prerequisites shall be verified by review of appropriate documentation of required inspections, etc., before any lift in a CLZ greater than 2,000 pounds.

- \* 3.1 The reactor building polar crane must meet the requirements given in MI-9.1 prior to any lifts in the reactor building CLZ.
- \* 3.2 The auxiliary building crane must meet the requirements given in MI-9.2 prior to any lifts in the spent fuel pit or auxiliary building CLZs. The auxiliary building crane (10- and 125-ton hooks) is the only handling device approved for lifts greater than 2,000 pounds in any active CLZ in the auxiliary building (elevation 734).
- \* 3.3 All sling(s), special lifting device(s), or monorail hoists (electric or manual) to be used for lifting in the CLZ's must satisfy the requirements given in SQM-31.
- \* 3.4 The ERCW hydraulic pedestal crane must meet the requirements given in SQM-31 prior to any lifts over the ERCW pumping station CLZ.
- \* 3.5 The reactor building, auxiliary building, and ERCW pedestal crane operators must meet the training and qualification requirements given in SQM-31.
- \* 3.6 The crane flagman must use the signals provided in SQM-31.

## 4.0 PRECAUTIONS

- 4.1 Maintain a minimum safe clearance between the load and the floor or object over which the load must pass.
- 4.2 Clearance over the steam generators from the No. 1 and No. 2 RCP area will not be sufficient in some control lifts. These lifts can only be performed over an open reactor head when shield head blocks are in place.

## 5.0 ALARA CONSIDERATIONS

- 5.1 Work closely with Health Physics to identify lifts which require special consideration to minimize personnel exposure.

## 6.0 WORK INSTRUCTIONS

- 6.1 Prior to performing a lift in a given CLZ, a cognizant person shall be designated to supervise the lift. Where possible, this person shall walk the designated route of the safe load path for the benefit of the crane operator and the crane flagman. If it is not possible to walk the route, the designated person shall discuss in detail with the flagman the safe load path to be taken. For overhead or mobile cranes, the crane operator shall have a copy of the appropriate attachment to this instruction posted in the cab which designates safe load paths to be taken.
- 6.2 Verify that the lift to be made is an approved lift by locating the appropriate entry in Tables 1, 2, 3, 4, 5, and 6. Note the referenced procedures, safe load path, and special restrictions specified in Tables 1, 2, 3, 4, 5, and 6.
- 6.3 Complete the prelift requirements on Data Sheet A or appropriate maintenance instruction.
- \* 6.4 Raise and transfer the load to its destination, following the safe load path given. Note the precautions in Section 4.0. Any deviation from a given safe load path shall require prior PORC approval.
- 6.5 Indicate satisfactory completion of the lift in a safe manner consistent with the given precautions, restrictions, and safe load path by initialing the appropriate column on Data Sheet A.
- 6.6 If this instruction is performed in conjunction with another approved instruction (i.e., MI-1.2), submit the completed Data Sheet A at the completion of that instruction as part of the data package. Otherwise, the completed data sheet must be submitted no more than one week after completion of the lift.

NOTE: Several unrelated lifts may be documented on a single Data Sheet A.



REACTOR BUILDING CLZ LIFTS

LIFT NO.	R. B. POLAR	LIFTING DEVICE OR RIGGING	LIFT	WEIGHT (TONS)	REF. DRAWINGS	REFERENCE PROCEDURES	SAFE LOAD PATH
RB-1	Main	2 Slings MK44N267-2	Missile Shields PC-1	92	44N265	MI-1.2	Attachment A
			PC-2	73	44N266 44N267		
RB-2	Main and Aux.	2 Slings MK44N267-1 and 1 Sling MK44N267-2	Canal Gates PC-3	41	44N265	MI-1.2	"
			PC-4	41	266		
			PC-5	41	267		
RB-3	Main	2 Slings MK44N267-3	Canal Gates PC-3	41	44N265	MI-1.2	"
			PC-4	41	266		
			PC-5	41	267		
			Missile Shield PC-6	56			
RB-4	Main	Closure Head Lifting Rig	KV Head	171.15		MI-1.2	"
RB-5	Main	Internals Lifting Rig	Upper Internals	102.3		MI-1.2	"
RB-6	Aux.	4 Part Sling MK44N267-4	Reactor Coolant Pump Plug	13.3	44N267	MI-2.3	"
RB-7	Aux.	4 Part Sling MK44N267-4	Hatch Plug	10	44N267		"
RB-8	Main	Lifting Assembly MK44N260-1, 2, 3, 4, 5, 6	R.C. Pump Motor	41.15	44N260 261	MI-2.3	"
RB-9	Main		R.C. Pump			MI-2.2	

SQNP

MI-6.22

Table I

Page 2 of 2

Rev. 2

## REACTOR BUILDING CLZ LIFTS (Continued)

LIFT NO.	R. B. POLAR	LIFTING DEVICE OR RIGGING	LIFT	WEIGHT (TONS)	REF. DRAWINGS	REFERENCE PROCEDURES	SAFE LOAD PATH
RB-10	Main or Aux	Approved Slings or Rigging	Miscellaneous Equipment in Reactor Bldg. CLZ (not otherwise listed)	1 ton to 87.5 tons, for main & 1-17.5 for Aux.			Attachment A
RB-11	Aux	Approved Slings or Rigging	1. Stud Tensioners 2. Stud Racks w/studs		MI-1.2		"
RB-12	Aux	Approved Slings or Rigging	A Frame	approx. 1 ton			"
RB-13	Aux	Approved Slings or Rigging	NDE equipment	3 ton			

SPENT FUEL PIT CLZ LIFTS

LIFT NO.	AUX BLDG CRANE	LIFTING DEVICE OR RIGGING	LIFT	WEIGHT (TONS)	REF. DRAWINGS	REFERENCE PROCEDURES	SAFE LOAD PATH
SF-1	Main	Lifting Beam MK44N357-5 Slings MK44N357-3 per Ref. Dwg.	R.B. Equipment Hatch Plugs A B C	50 50 50	44N356 44N357		Attachment B
SF-2		Approved slings and rigging	Pool Divider Gates		44N330		"
SF-3		Approved slings and rigging	Fuel Transfer Canal Door		44N330	series	"
SF-4		Approved slings and rigging	Irradiated Speciman Shipping Cask				"
SF-5		Approved slings and rigging	Spent Resin, Filter or other radioactive mat'l shipping casks				"
SF-6		Approved slings and rigging	New Fuel Shipping Containers w/fuel				"
SF-7		(To be completed when) Spent Fuel Shipping Cask Lift becomes applicable)					"
SF-8		(To be completed when) Failed Fuel Container lift becomes applicable)					"
SF-9		Approved slings and rigging	Fuel Transfer Carriage				"
SF-10	Aux. or Main	Approved Rigging	Misc. Equipment	5  60			"



\* SQNP  
\* MI-6.22  
Table 3  
\* Page 1 of 1  
\* Rev. 1

AUXILIARY BUILDING CLZ LIFTS

LIFT NO.	* AUX BLDG CRANE	LIFTING DEVICE OR RIGGING	LIFT	WEIGHT (TONS)	REF. DRAWINGS	REFERENCE PROCEDURES	SAFE LOAD PATH
AX-1			Containment Spray Shield Blocks		44N356		Attachment C
AX-2			RHR Shield Blocks		44N365		"

ERCW PUMPING STATION CLZ LIFTS

LIFT NO.	LIFTING DEVICE OR RIGGING	LIFT	WEIGHT (POUNDS)	REF. DRAWINGS	REF. PROCEDURES	SPECIAL RESTRICTIONS	SAFE LOAD PATH
PS-1	Misc. Slings	ERCW Pump JA Assy.	35,200 Total Wt.	34N230		Pump JA should not be lifted over pump KA, and both pumps QA and RA shall be operable.	See Attachment D
PS-2	Misc. Slings	ERCW Pump KA Assy.	35,200 Total Wt.	34N230		Pump KA should not be lifted over pump JA, and both pumps QA and RA shall be operable.	See Attachment D
PS-3	Misc. Slings	ERCW Pump LB Assy.	35,200 Total Wt.	34N230		Pump LB should not be lifted over pump MB, and both pumps NB and PB shall be operable.	See Attachment D
PS-4	Misc. Slings	ERCW Pump MB Assy.	35,200 Total Wt.	34N230		Pump MB should not be lifted over pump LB, and both pumps NB and PB shall be operable.	See Attachment
PS-5	Misc. Slings	ERCW Pump NB Assy.	35,200 Total Wt.	34N230		Pump NB should not be lifted over pump PB, and both pumps LB and MB shall be operable.	See Attachment D

**NOTE:** All lifts in the ERCW pumping station CLZ shall be performed only by using the permanently mounted pedestal crane unless otherwise noted.

ERCW PUMPING STATION CLZ LIFTS

LIFT NO.	LIFTING DEVICE OR RIGGING	LIFT	WEIGHT (POUNDS)	REF. DRAWINGS	REF. PROCEDURES	SPECIAL RESTRICTIONS	SAFE LOAD PATH
PS-6	Misc. Slings	ERCW Pump PB Assy.	35,200 Total Wt.	34N230		Pump PB should not be lifted over pump NB, and both pumps LB and NB shall be operable.	See Attachment D
PS-7	Misc. Slings	ERCW Pump QA Assy.	35,200 Total Wt.	34N230		Pump QA should not be lifted over pump RA, and both pumps JA and KA shall be operable.	See Attachment D
PS-8	Misc. Slings	ERCW Pump QA Assy.	35,200 Total Wt.	34N230		Pump RA should not be lifted over pump QA, and both pumps JA and KA shall be operable.	See Attachment D
PS-9	Misc. Slings	Traveling Water Screen AA	39,600 Total Wt.	34N210 34N230			See Attachment D
PS-10	Misc. Slings	Traveling Water Screen BB	39,600 Total Wt.	34N210 34N230			See Attachment D
PS-11	Misc. Slings	Traveling Water Screen CB	39,600 Total Wt.	34N210 34N230			See Attachment D
PS-12	Misc. Slings	Traveling Water Screen DA	39,600 Total Wt.	34N210 34N230			See Attachment D

NOTE: All lifts in the ERCW pumping station CLZ shall be performed only by using the permanently mounted pedestal crane unless otherwise POKC approved.

## ERCW PUMPING STATION CLZ LIFTS

LIFT NO.	LIFTING DEVICE OR RIGGING	LIFT	WEIGHT (POUNDS)	REF. DRAWINGS	REF. PROCEDURES	SPECIAL RESTRICTIONS	SAFE LOAD PATH
PS-13	Lifting Beam MK 34N215-4	Stop Log AA	13,200 Total Wt.	34N215-1 to -3 34N230			See Attachment D
PS-14	Lifting Beam MK 34N215-4	Stop Log BB	13,200 Total Wt.	34N215-1 to -3 34N230			See Attachment D
PS-15	Lifting Beam MK 34N215-4	Stop Log CB	13,200 Total Wt.	34N215-1 to -3 34N230			See Attachment D
PS-16	Lifting Beam MK 34N215-4	Stop Log DA	13,200 Total Wt.	34N215-1 to -3 34N230			See Attachment D
PS-17	Misc. Slings	Lifting of following equipment through equipment hatch AA:	1. ERCW Strainer 12,000 2. Transformer 8,800 3. Switch Gear 5,500 4. Circuit Breaker 4,950	34N230			See Attachment D
PS-18	Misc. Slings	Lifting of following equipment through equipment hatch BB:		34N230			See Attachment D

NOTE: All lifts in the ERCW pumping station CLZ shall be performed only by using the permanently mounted pedestal crane unless otherwise PIRC approved.

SQNP

NI-6.22

Table 4

Page 4 of 4

Rev. 0

## ERCW PUMPING STATION CLZ LIFTS

LIFT NO.	LIFTING DEVICE OR RIGGING	LIFT	WEIGHT (POUNDS)	REF. DRAWINGS	REF. PROCEDURES	SPECIAL RESTRICTIONS	SAFE LOAD PATH
PS-18 (cont'd)		1. ERCW Strainer 2. Transformer 3. Switch Gear 4. Circuit Breaker	12,000 8,800 5,500 4,950				
PS-19	Misc. Slings	Lifting of following equipment through equipment hatch DA:		34N230			See Attachment D
		1. ERCW Strainer 2. Transformer 3. Switch Gear 4. Circuit Breaker	12,000 8,800 5,500 4,950				

NOTE: All lifts in the ERCW pumping station CLZ shall be performed only by using the permanently mounted pedestal crane unless otherwise PORC approved.

SQNP

MI-6.22

Table 5

Page 1 of 1

Rev. 0

## WASTE EVAPORATOR FEED FILTER CLZ LIFTS

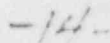
LIFT NO.	LIFTING DEVICE OR RIGGING	LIFT	WEIGHT (POUNDS)	REF. DRAWINGS	RFF. PROCEDURES	SPECIAL RESTRICTIONS	SAFE LOAD PATH
WE-1	Misc. Slings	Waste Evaporator Feed Filter Concrete Plug		44N387 48N1347	MI 8.12	Care shall be taken to avoid drifting these loads into the RHR pump room cooler supply control valve 2-FSV-67-188 and the RHR pump A-A minimum flow valve switch 2-L-5.	See Attachment E
WE-2	Misc. Slings	Waste Evaporator Feed Filter		44N387 48N1347			

NOTE: All lifts in the waste evaporator feed filter CLZ shall be performed only by using the permanently mounted electric monorail hoist at elevation 653 between A8 and A10 lines and V and W lines unless otherwise PORC approved.

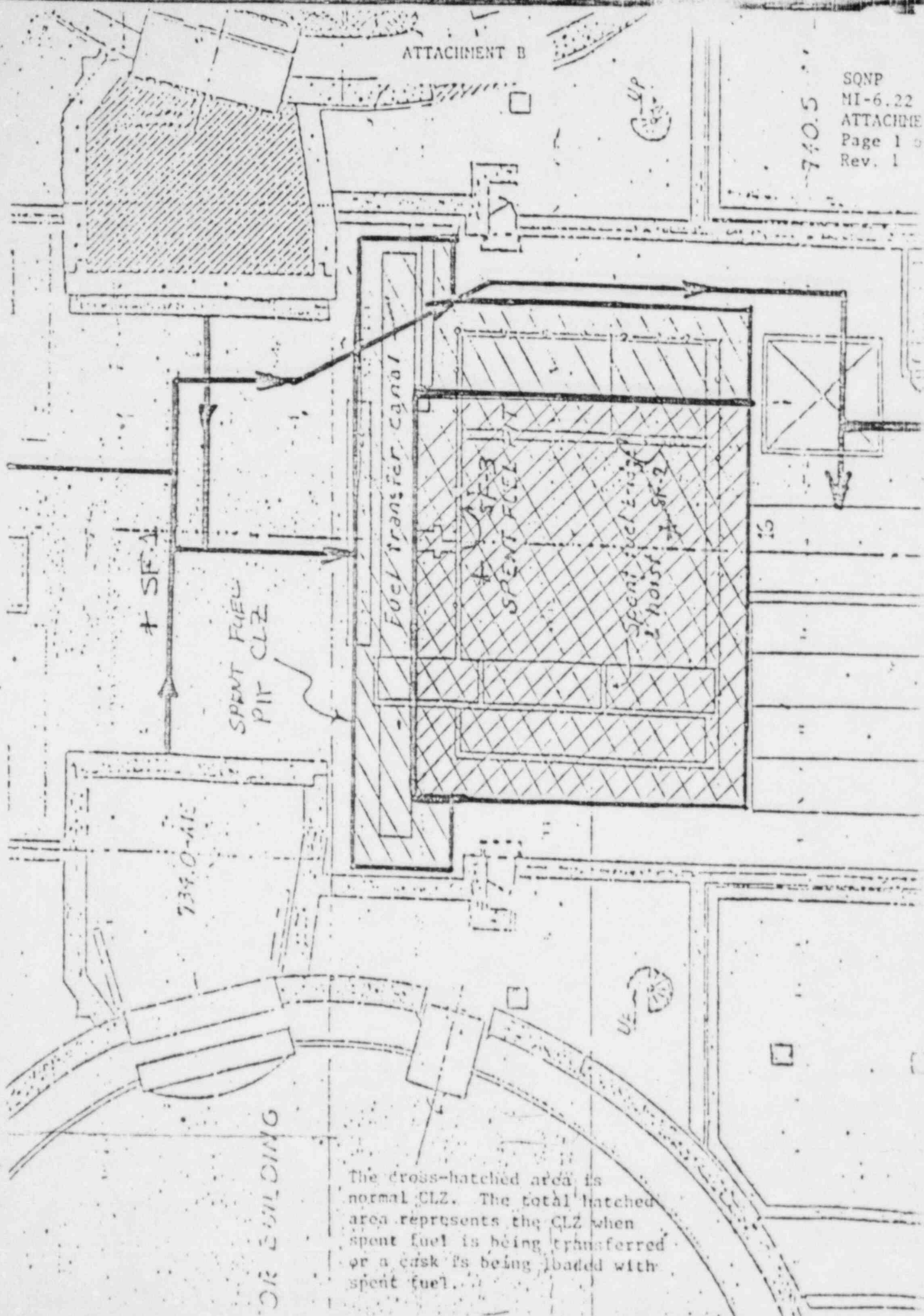


COMPONENT COOLING PUMP CLZ LIFTS

LIFT NO.	LIFTING DEVICE OR RIGGING	LIFT	WEIGHT (POUNDS)	REF. DRAWINGS	REF. PROCEDURES	SPECIAL RESTRICTIONS	SAFE LOAD PATH
CC-1	4 Ton Manual Chain Hoist w/Misc. Slings (4 ton vertical rated cap.)	Component Cooling Water Pump 1B	7,600 Total Assy.	44N389 48N1348	MI 7.2 MI 7.3	If possible, pump 1B should not be lifted over pump 2B. If pump 1B is lifted over 2B, then pumps 1A, 2A, and C-5 must be operable.	See Attachment F
CC-2	4 Ton Manual Chain Hoist w/Misc. Slings (minimum 2-1/2 ton vertical rated cap.)	Component Cooling Water Pump Motor 1B	4,700	44N389 48N1348			See Attachment F
CC-3	4 Ton Manual Chain Hoist w/Misc. Slings (4 ton vertical rated cap.)	Component Cooling Water Pump 2B	7,600 Total Assy.	44N389 48N1348	MI 7.2 MI 7.3	If possible, pump 2B should not be lifted over pump 1B. If pump 2B is lifted over 1B, then pumps 1A, 2A, and C-5 must be operable.	See Attachment F
CC-4	4 Ton Manual Chain Hoist w/Misc. Slings (minimum 2-1/2 ton vertical rated cap.)	Component Cooling Water Pump Motor 2B	4,700	44N389 48N1348			See Attachment F



740.5



The cross-hatched area is normal CLZ. The total hatched area represents the CLZ when spent fuel is being transferred or a cask is being loaded with spent fuel.

ATTACHMENT C

2. Auxiliary  
Building  
CLZS

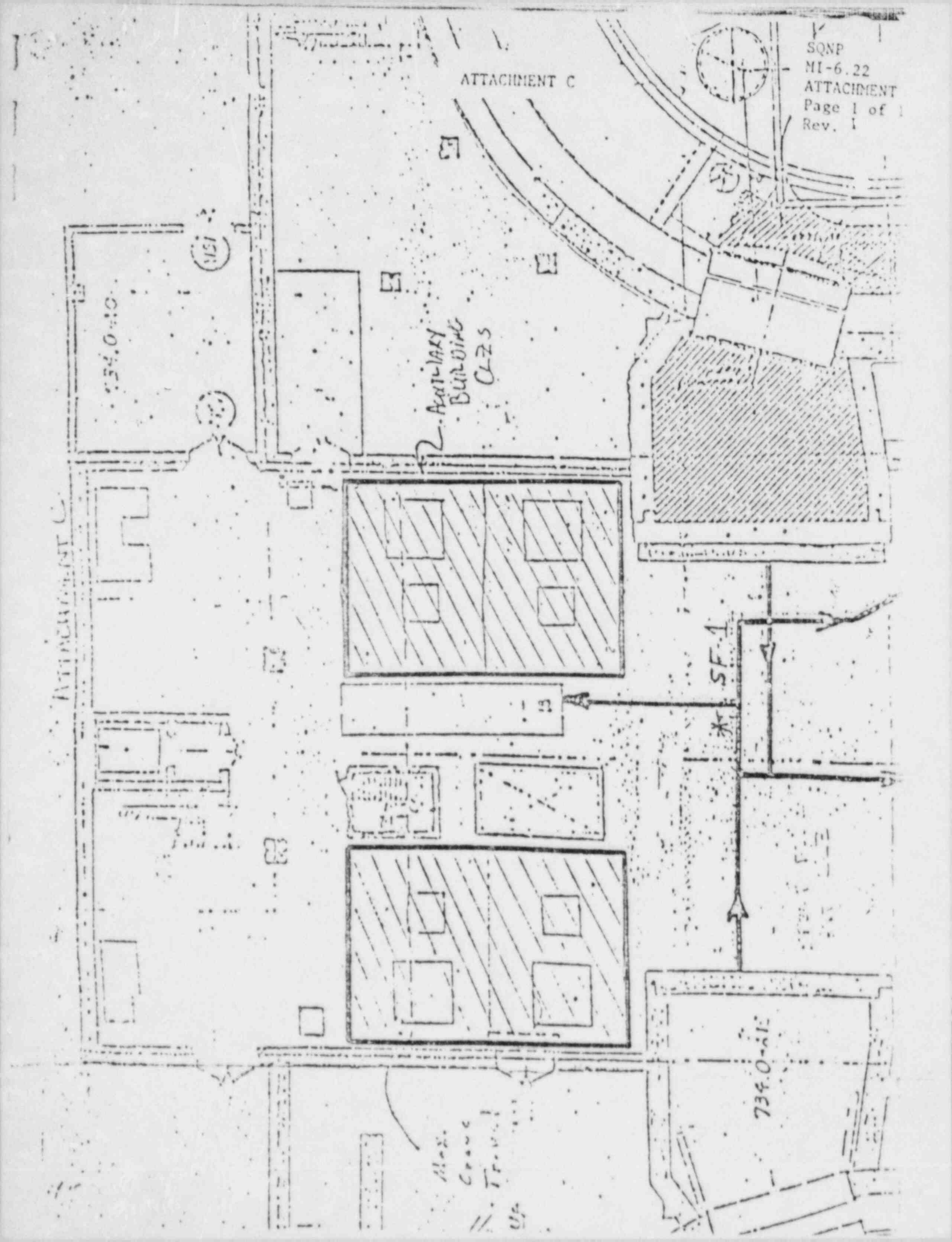
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SF-1

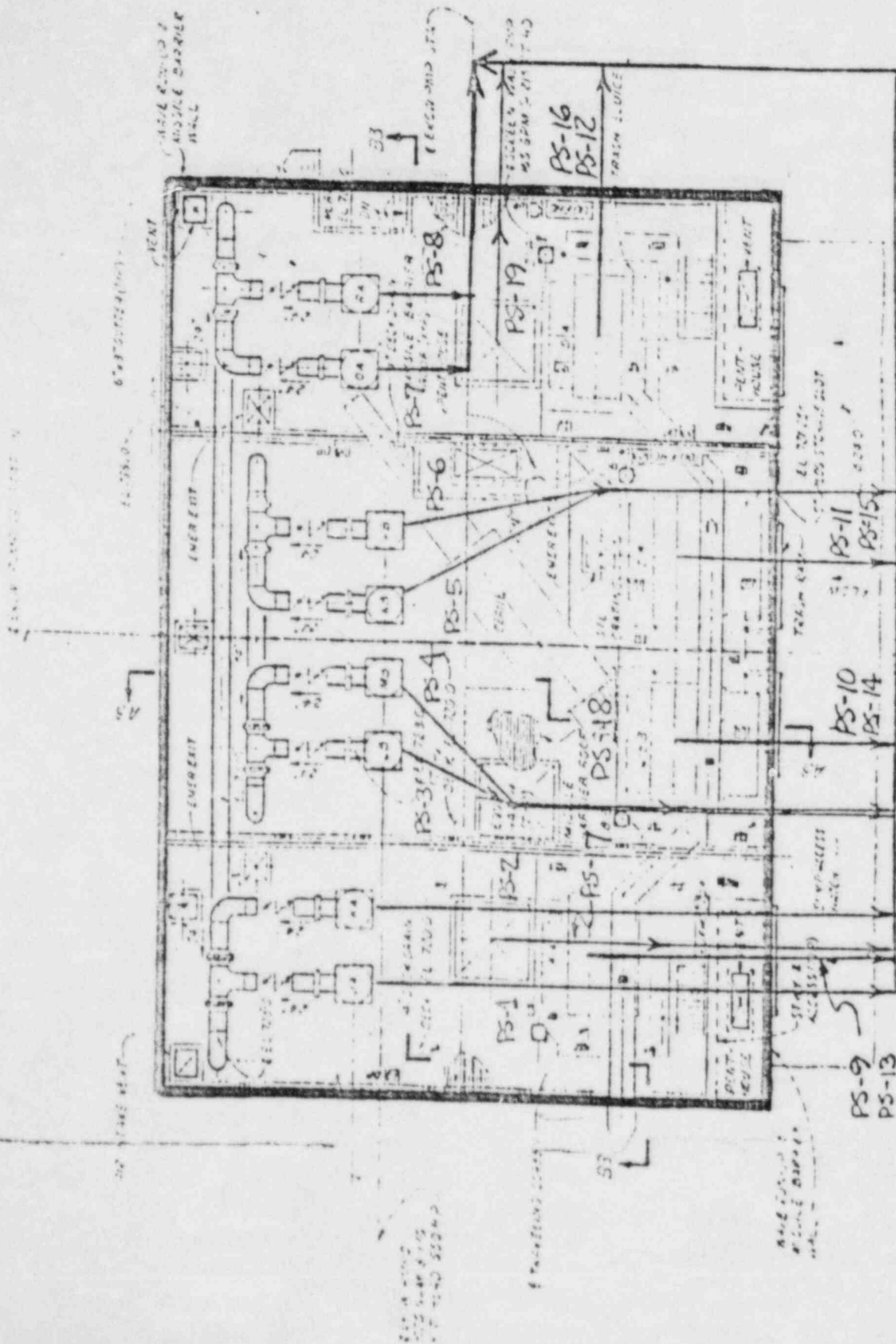
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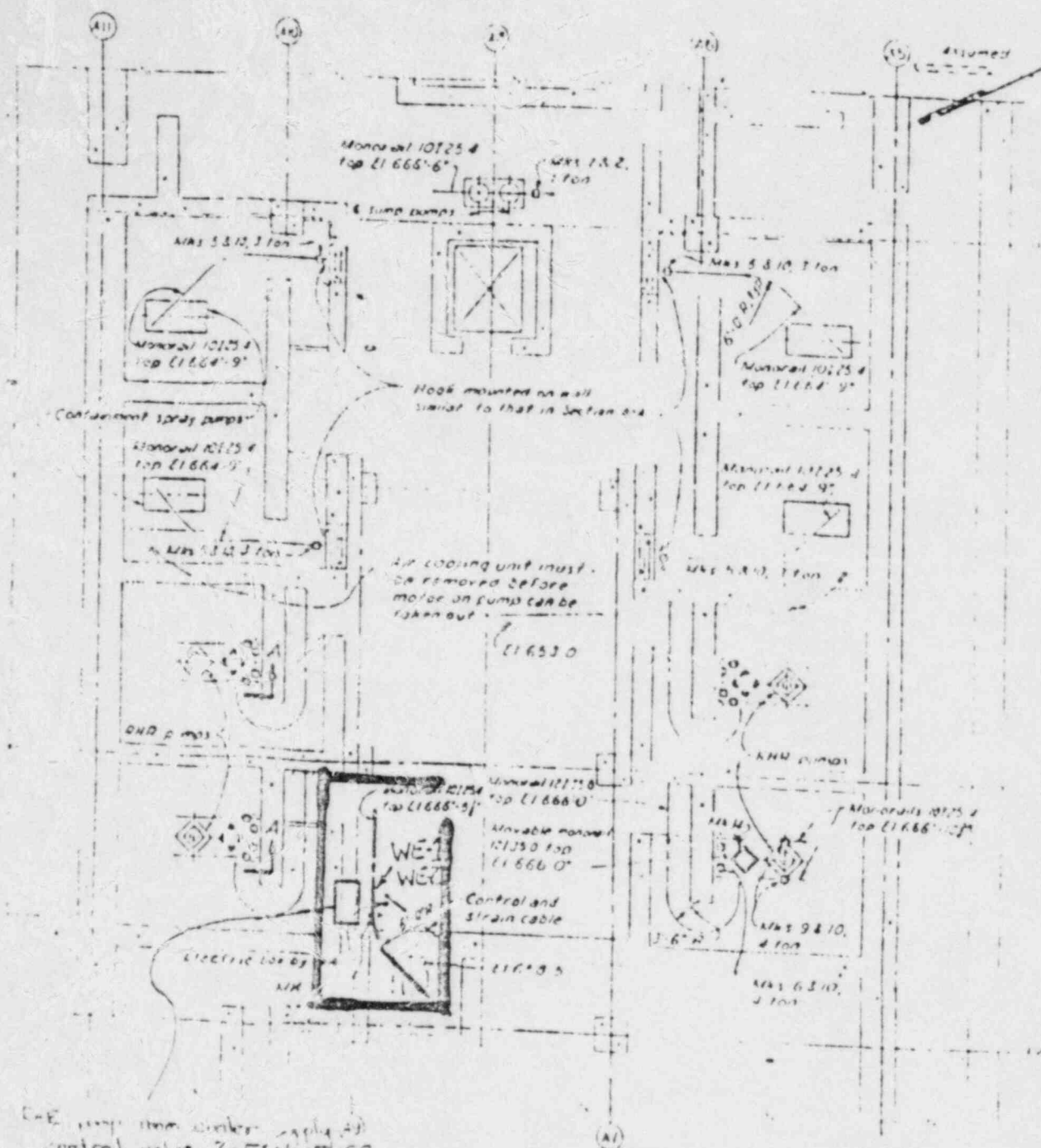
Along  
Crane  
Trail  
Up

ATTACHMENT C





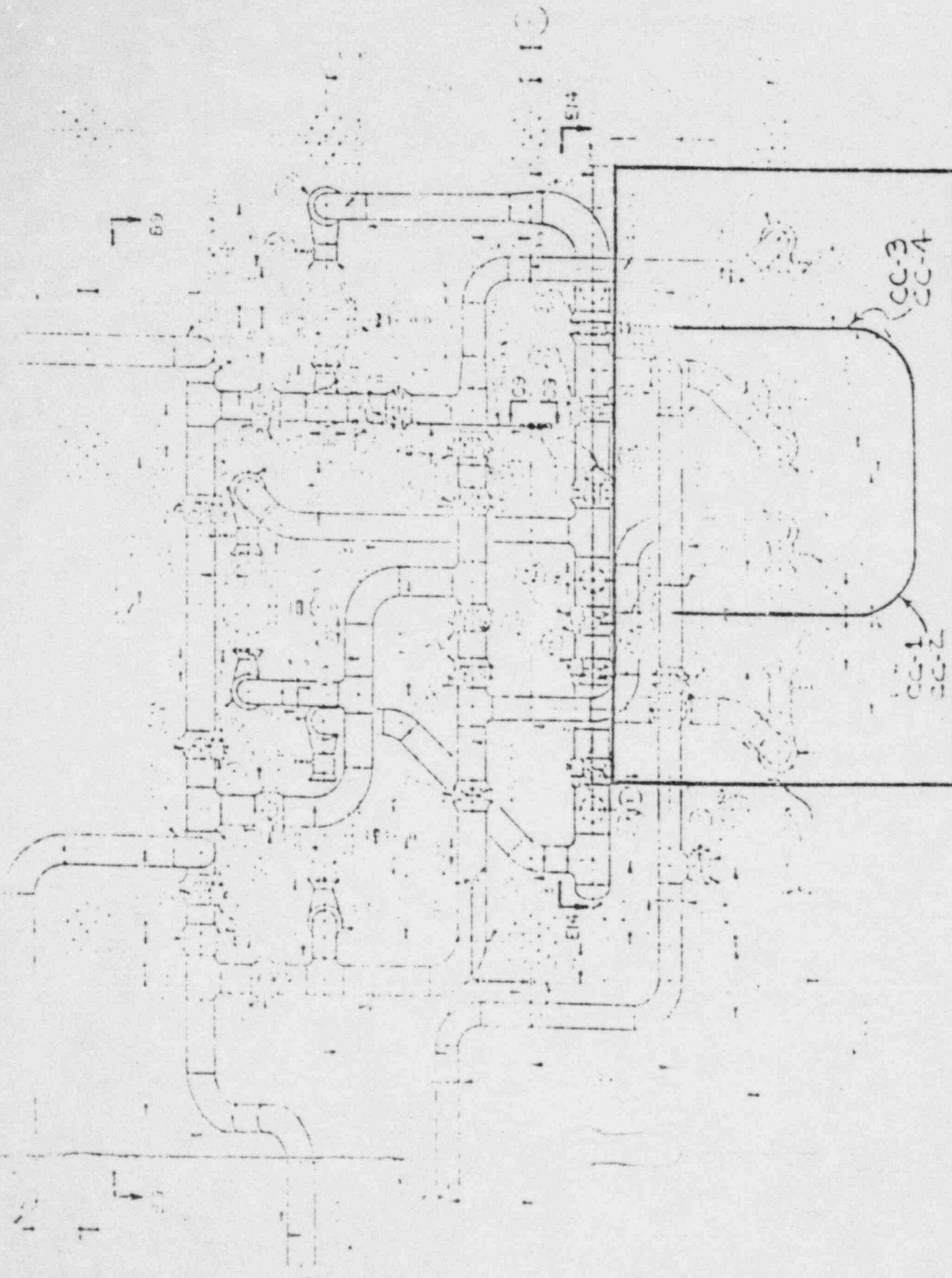




E-E pump and control valve Z-F-V-2T-58  
 & RHR pump A-A minimum  
 flow valve switch Z-L-5

PLAN EL 653.0





Plan Elev. 690

SQNP

MI-6.22

Data Sheet A

Page 1 of 2

Rev. 0

### CRITICAL ZONE LIFT CHECKLIST

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SQNP  
MI-6.22  
Data Sheet A  
Page 2 of 2  
Rev. 0

\*\*\* N/A for lifts using special lifting devices designed for the lift.

RIGGING, LIFTING DEVICE INSP. UP TO DATE ( )	CRANE OPERATOR CERTIFIED FOR RF FLOOR ( )	SLING** CAPACITY RATED FOR LOAD ( ) OR N/A	LIFT COMPLETED SATISFACTORY (INITIAL)	REMARKS
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