SNUPPS
Standardized Nuclear Unit
Power Plant System

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Nicholas A. Petrick
Executive Director

June 22, 1981

SLNRC 81- 48 FILE: 0278
SUBJ: Control of Heavy Loads

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Docket Nos: STN 50-482, STN 50-483, STN 50-486

Reference: NRC Generic Letter dated December 22, 1980: Same subject

Dear Mr. Denton:

Enclosed are 15 copies of the report that documents the results of the review of the SNUPPS load handling systems as requested by Section 2.1 of Enclosure 3 of the referenced letter.

This submittal satisfies the six-month action associated with item number 1 of the reference. Item number 2 of the reference requested confirmation within six months that implementation of changes and modifications identified by the evaluation will commence as soon as possible and that all modifications will be completed within two years of submittal of Section 2.4. The enclosed report on Section 2.1 does not identify a need for any hardware changes. If the report on the nine-month action items (i.e., Sections 2.2, 2.3, 2.4) identifies the need for any modifications, an appropriate confirmation of change implementation will be made. Item number 3 of the reference requested justification for any exceptions that are being taken. The enclosed report does not identify any specific exceptions.

Very truly yours,

Nicholas A. Petrick

RLS/mtk
Enclosure: 15 copies
cc: J. K. Bryan UE w/1
G. L. Koester KGE "
D. T. McPhee KCPL "
W. Hansen USNRC/CAL w/1
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2.1 GENERAL REQUIREMENTS FOR OVERHEAD HANDLING SYSTEMS

NUREG 0612, Section 5.1.1, identifies several general guidelines related to the design and operation of overhead load-handling systems in the areas where spent fuel is stored, in the vicinity of the reactor core, and in other areas of the plant where a load drop could result in damage to equipment required for safe shutdown or decay heat removal. Information provided in response to this section should identify the extent of potentially hazardous load-handling operations at a site and the extent of conformance to appropriate load-handling guidance.

1. Report the results of your review of plant arrangements to identify all overhead handling systems from which a load drop may result in damage to any system required for plant shutdown or decay heat removal (taking no credit for any interlocks, technical specification, operating procedures, or detailed structural analysis).

2. Justify the exclusion of any overhead handling system from the above category by verifying that there is sufficient physical separation from any load-impact point and any safety-related component to permit a determination by inspection that no heavy load drop can result in damage to any system or component required for plant shutdown or decay heat removal.

3. With respect to the design and operation of heavy-load-handling systems in the containment and the spent-fuel-pool area and those load-handling systems identified in 2.1-1, above, provide your evaluation concerning compliance with the guidelines of NUREG 0612, Section 5.1.1. The following specific information should be included in your reply:

   a. Drawings or sketches sufficient to clearly identify the location of safe load paths, spent fuel, and safety-related equipment.

   b. A discussion of measures taken to ensure that load-handling operations remain within safe load paths, including procedures, if any, for deviation from these paths.

   c. A tabulation of heavy loads to be handled by each crane which includes the load identification, load weight, its designated lifting device, and verification that the handling of such load is governed by a written procedure containing, as a minimum, the information identified in NUREG 0612, Section 5.1.1(2).

   d. Verification that lifting devices identified in 2.1 3-c, above, comply with the requirements of ANSI N14.6-1978, or ANSI B30.9-1971 as appropriate. For lifting devices where these standards, as supplemented by NUREG 0612, Seciton 5.1.1(4) or 5.1.1(5), are not

met, describe any proposed alternatives and demonstrate their equivalency in terms of load-handling reliability.

e. Verification that ANSI B30.2-1976, Chapter 2-2, has been invoked with respect to crane inspection, testing, and maintenance. Where any exception is taken to this standard, sufficient information should be provided to demonstrate the equivalency of proposed alternatives.

f. Verification that crane design complies with the guidelines of CMAA Specification 70 and Chapter 2-1 of ANSI B30.2-1976, including the demonstration of equivalency of actual design requirements for instances where specific compliance with these standards is not provided.

g. Exceptions, if any, taken to ANSI B30.2-1976 with respect to operator training, qualification, and conduct.

RESPONSE:

1. A review of the SNUPPS plant arrangements has been completed to identify the overhead handling systems from which a postulated load drop could damage spent fuel or safe shutdown systems or components. An evaluation of load-handling activities associated with fuel handling, including analyses of credible load drop accidents, is provided in Section 9.1.4 of the SNUPPS FSAR.

   The specific additional information required by section 2.1 of the NRC's generic letter on Contol of Heavy Loads, dated December 22, 1980, is provided in 3 below.

2. The review of the SNUPPS plant arrangement indicated that based on physical separation, no load drops in the radwaste and turbine buildings could result in damage to any system or component required for safe shutdwon or decay heat removal. Therefore, these buildings were excluded from further evaluation.

3.a. Attached Figures 1 through 19 identify the locations of all applicable overhead handling systems, their load paths, and major safety-related equipment. A detailed listing of all safety-related equipment is provided in FSAR Table 3.11(B)-3. This list identifies the location of the equipment by room number.

3.b. Heavy load handling operations fall into two general categories: (1) those associated with fuel handling operations and (2) those associated with maintenance and inservice inspection.

   The following discussion demonstrates the adequacy of the design and administrative measures to ensure that load-handling operations remain within safe load paths:

   Fuel Handling Operations

   The fuel handling system provides a safe means for handling fuel assemblies

and control components from the time of receipt of new fuel assemblies to shipment of spent fuel. This includes equipment necessary for reactor vessel servicing.

The fuel handling system is composed of cranes, equipment, special fuel handling devices, and a fuel transfer system that is designed to meet the seismic and safety classifications shown in FSAR Section 3.2.

The fuel handling system is designed and arranged so that there are no loads which, if dropped, could result in damage, leading to the release of radioactivity in excess of 10 CFR 100 guidelines, or impart the capability to safely shut down the plant. This meets the requirements of Regulatory Guide 1.13 and excludes the system from the requirements of Regulatory Guide 1.104.

Component Description

Containment Building Polar Crane

The containment building polar crane is a CMAA No. 70, Class C type, and is used in conjunction with the various lifting rigs, to remove the reactor vessel head, the reactor vessel upper internals, and the lower internals. The 260-ton capacity main hook is used for these services. The 25-ton capacity auxiliary hook on the polar crane, in conjunction with strategically located 3-ton capacity jib cranes, is used for routine maintenance and inservice inspection. The crane is controlled from its bridge-mounted cab, a portable cab, or a portable radio control unit. The containment building polar crane is designed to maintain its integrity with load during as SSE.

Figures 20 and 21 show equipment configurations and the areas of movement of the containment building polar crane. Specific data pertaining to the crane travel speed and lifting capacity are shown on Table I.

Fuel Building Cask Handling Crane

The fuel building cask handling crane is a CMAA No. 70, Class A type, indoor electrical overhead traveling bridge crane with a single trolley and all the necessary motors, controls, and brakes and a festooned pendant control station. The main hoist capacity is 150 tons. The crane and accessories are used to handle spent fuel shipping casks between the railroad cars or trucks, the loading pool, and the washdown pit.

The cask handling crane is equipped with a monorail and hoist which is used to transfer new fuel from the new fuel storage vault to the new fuel elevator. The monorail is also used for moving new fuel shipping containers. The monorail hoist is rated at 5 tons. The festooned pendant control station or radio control unit is utilized for controlling the cask handling crane and monorail hoist.

The handling tool of the cask handling crane is designed to prevent a shipping cask from dropping into the spent fuel pool. Limit switches and mechanical stops are located to prevent any crane (other than the spent fuel pool bridge crane) from traveling over the spent fuel pool. Refer to Figures 22 and 23 for arrangement and areas of movement of the fuel building cask handling crane and Table I for travel speed and lifting capacity data.

Spent Fuel Pool Bridge Crane

The spent fuel pool bridge crane is a CMAA No. 70, Class B type, designed to maintain its integrity during an SSE. The crane consists of a 5-ton-capacity wheeled bridge structure with steel deck walkway, a 2-ton motorized monorail trolley, and a 5-ton manual push-type trolley. The crane has interlocking capabilities with the new fuel elevator, fuel transfer canal gate, and cask loading gate. In addition, the crane also has a ½-inch bridge and trolley positioning capability.

The spent fuel pool bridge crane is used to transport new and spent fuel to and from various locations inside the fuel building. These locations include the new fuel elevator, spent fuel storage racks, spent fuel shipping cask, upending device of the fuel transfer car, and spent fuel pool gates. The handling tools for the new and spent fuel are different to prevent interchanging the fuel assemblies. The hoist travel and tool length are are designed to limit the maximum lift of a fuel assembly so that the minimum required depth of the water shielding is maintained. This is accomplished through the use of limit switches.

The spent fuel assembly handling tool, also referred to as the long handling tool, is manually actuated and located on the end of a long pole suspended from the spent fuel pool bridge crane. An operator on the spent fuel bridge guides and operates the tool. The tool is designed to maintain its integrity during an SSE.

The spent fuel assembly handling tool employs four cam actuated latching fingers which grip the underside of the fuel assembly top nozzle. The operating handle to actuate the fingers is located at the top of the tool. When the fingers are latched, a lock pin is inserted into the operating handle to prevent the fingers from being accidently unlatched during fuel handling operations.

The tool weighs approximately 400 pounds, and is preoperationally tested at 125 percent the weight of one fuel assemble (1,600 pounds).

The 2-ton electric hoist of the crane is used primarily to transfer spent fuel and new fuel assemblies. Control is from a pendant station supported from the trolley. The 5-ton manual chain hoist and trolley are used to move the spent fuel pool transfer gates to and from their normal storage positions. The hoists share the same monorail. While moving the transfer gates, the gates are secured by a redundant support to preclude the dropping of a gate on the spent fuel racks.

Figures 24 and 25 show equipment configurations and the areas for movement of the spent fuel pool bridge crane. Table I shows data pertaining to crane travel speed and lifting capacity.

Refueling Machine

The refueling machine is a rectilinear bridge and trolley crane with a vertical mast extending down into the refueling pool. The bridge spans the refueling pool and runs on rails set into the edges of the refueling pool. The bridge and trolley motions are used to position the vertical mast over a fuel assembly in the core. The bridge, trolley main hoist and

hoist controls are interlocked through the use of the same control panel such that only one drive is operable at a time. A long tube with a pneumatic gripper on the end is lowered down from the mast to grip the fuel assembly. The gripper tube is long enough so that the upper end is still contained in the mast when the gripper end contacts the fuel assembly. A winch mounted on the trolley raises the gripper tube and fuel assembly up into the mast tube. The fuel is transported to its new position while inside the mast tube.

All controls for the refueling machine are mounted on a console on the trolley. The bridge and trolley are positioned in relation to a grid pattern referenced to the core by an X-Y servo system. Bridge and trolley positions are indicated by an electric position relay system.

The outer mast is mounted on the trolley structure on a support bearing that allows rotation of the mast to allow a fuel assembly that is not properly oriented with the core position to be picked up and rotated into proper alignment. In the event a fuel assembly must be turned 90° or 180°, the stops can be disconnected and the mast turned manually. With the mast rotated from the normal operating position, the hoist will be run at slow speed under strict administrative control.

Fuel assemblies can be placed in the core in only one way relative to the core centerlines. Orientation of the fuel is maintained by keeping the gripper so it engages the fuel only when the relative orientation is correct.

Readout dials are read directly by the operator at the console. The drives for the bridge, trolley and winch are variable speed and include a separate inching control on the winch. The maximum speed for the bridge is 40 feet per minute. The trolley and hoist maximum speeds are both 20 feet per minute. The auxiliary monorail hoist on the refueling machine has a two step magnetic controller to give hoisting speeds of approximately 7 and 22 feet per minute.

Electrical interlocks and limit switches on the bridge and trolley drives prevent damage to the fuel assemblies. The winch is also provided with limit switches plus a mechanical stop to prevent a fuel assembly from being raised above a safe shielding depth should the limit switch fail. In an emergency, the bridge, trolley, and winch can be operated manually using a handwheel on the motor shaft. Suitable restraints are provided between the bridge and trolley structures and their respective rails to prevent derailing.

A conservative design approach is used for all load-bearing parts. The static design load for the crane structure and all lifting components is normal dead and live loads plus three times the fuel weight with a RCC assembly inserted. The design load on the wire rope hoisting cables does not exceed 0.20 times the average breaking strength. Where two cables are used, each is assumed to carry one-half the load.

All components critical to the operation of the equipment or located so that parts can fall into the reactor are assembled with the fasteners positively restrained from loosening under vibration.

The refueling machine design includes the following provisions to ensure safe handling of fuel assemblies:

a. Safety interlocks

Operations which could endanger the operator or damage the fuel are prohibited by mechanical or fail-safe electrical interlocks, or by redundant electrical interlocks. All other interlocks are intended to provide equipment protection and may be implemented either mechanically or by electrical interlock, not necessarily fail-safe. The following interlocks are provided on the refueling machine.

1. When the gripper is engaged, the machine cannot traverse unless the guide tube is in its full up position.

2. When the gripper is disengaged, the machine cannot traverse unless the gripper is withdrawn into the mast.

3. Vertical motion of the guide tube is permitted only in a controlled area over the reactor (avoiding the vessel guide studs), fuel transfer system, or rod cluster control change fixture.

4. Traverse of the trolley and bridge is limited to the areas of item 3 and a clear path connecting those areas.

5. A key-operated interlock bypass switch is provided to defeat interlock 1 through 4 to allow operation of an inspection camera on the gripper. That switch also operates a flashing red light to indicate that the interlocks are bypassed.

6. The gripper is monitored by limit switches to confirm operation to the fully engaged or fully disengaged position. An audible and visual alarm are actuated if both engaged and disengaged switches are actuated at the same time or if neither is actuated. A time delay may by used to allow for recycle time of normal operation.

7. The loaded fuel gripper will not release unless it is in its down position in the core, or in the fuel transfer system or rod cluster control change fixture, and the weight of the fuel is off the mast.

8. Raising of the guide tube is not permitted if the gripper is disengeged and the load monitor indicates that it is still attached to the fuel assembly.

9. Raising of the guide tube is not permitted if the hoist loading exceeds 115 percent of the total weight of guide tube plus fuel assembly plus rod cluster control assembly. A backup interlock limits this load to 135 percent.

10. Lowering of the guide tube is not permitted if the hoist loading is less than 85 percent of the weight of the guide tube.

11. The guide tube is prevented from rising to a height where there is less than 10 feet of nominal water coverage over the fuel.

12. The guide tube is prevented from lowering completely out of the mast.

13. The guide tube travels only at a controlled speed of about 2 fpm when: a) the bottom of the fuel begins to enter the core, and b) the gripper approaches the top of the core. In additon, just above those points, the the guide tube automatically stops lowering, and requires acknowledgement from the operator before proceeding.

14. The fuel transfer system container is prevented from moving unless the engaged gripper is in the full up position or the disengaged gripper is withdrawn into the mast, or unless the refueling machine is out of the fuel transfer zone. An interlock is provided from the refueling machine to the fuel transfer system to accomplish this.

b. Bridge and trolley holddown devices

The refueling machine bridge and trolley are both horizontally restrained on the rails by two pairs of guide rollers, one pair at each wheel location on one truck only. The rollers are attached to the bridge truck and contact the vertical faces on either side of the rail to prevent horizontal movement. Vertical restraint is accomplished by antirotation bars located at each of the four wheels for both the bridge and trolley. The antirotation bars are bolted to the trucks and extend under the rail flange. Horizontal and vertical restraints are both adequately designed to withstand the forces and overturning moments resulting from the SSE.

c. Main hoist braking system

The main hoists are equipped with two independent braking systems. A solenoid-release, spring-set electric brake is mounted on the motor shaft. This brake operates in the normal manner to release upon application of current to the motor and set when current is interrupted. The second brake is a mechanically actuated load brake internal to the hoist gear box that engages if the load starts to overload the hoist. It is necessary to apply torque from the motor to raise or lower the load. In raising, this motor cams the brake open; in lowering, the motor slips the brake, allowing the load to lower. This brake actuates upon loss of torque from the motor for any reason and is not dependent on any electrical circuits. Both brakes are rated at 125 percent of the hoist design load.

d. Fuel assembly support system

The main hoist system is supplied with redundant paths of loads

support so that failure of any component will not result in free-fall of the fuel assembly. Two wire ropes are anchored to the winch drum and carried to a load-equalizing mechanism on the top of the gripper tube. In addition, supports for the equalizing mechnism are backed up by passive restraints to pick up the load in the event of the failure of this primary support.

During each refueling outage and prior to removing fuel, the gripper and hoist system are load tested to 125 percent of the maximum setting on the secondary hoist load limit. Table I shows data pertaining to crane travel speed and lifting capacity.

Miscellaneous Hoists

Other load-handling operations, which are not part of the fuel handling system include miscellaneous hoists and monorails in the Reactor, Auxiliary, Fuel, Control, and Diesel Generators buildings. The hoists' travel paths are restricted to the monorail layout by mechanical stops.

Table II identifies primary loads lifted and hoist capacities for the miscellaneous hoists. No special lifting devices are used with the miscellaneous hoists. Lifting divices for these hoists will be in accordance with the guidance provided by ANSI B30.9-1971, as clarified by NUREG-0612, Section 5.1.1.(5).

3.c. Tables I and II provide a listing of each applicable crane or hoist and loads to be handled. Lifting devices are described in d., below.

Certain of the typical PWR heavy loads identified in NUREG-0612 Table 3.1-1 are not applicable to SNUPPS and are not covered by Tables I and II. The SNUPPS missile shield is mounted on a dedicated transfer cart that shares the refueling machine rails and is not normally handled by a crane.

The reactor head lifting rig is normally attached to the vessel head; the tripod for attaching the polar crane is the only part handled separately from the vessel head.

In addition, certain heavy loads such as the spent fuel cask have not been specifically designed for SNUPPS at this time; however load values that envelope the expected weight of these items are included in the evaluation.

Written procedures that reflect the results of this evaluation will be developed to govern the handling of all heavy loads whose drop could damage fuel or safe shutdown equipment. These procedures will incorporate the requirements provided in Section 5.1.1.(2) of NUREG-0612.

3.d. Specific spent fuel shipping casks and associated lifting devices have not been selected for the SNUPPS units. Compliance with ANSI N14.6-1978 for the lifting device will be a consideration in the selection and complicance or equivalency will be provided.

Lifting devices for the miscellaneous hoists and cranes will be in accordance with the guidance provided by ANSI B30.9-1971, as clarified in NUREG-0612 Section 5.1.1(5).

The reactor vessel head lifting rig weighs approximately 15,000 pounds and is designed to the requirements of ASME Section III, Subsection NF.

3.e. Plant procedures will be developed for inspection, testing and maintenance of those cranes identified in Table I. These procedures will include the guidance provided by Chapter 2-2 of ANSI B30.2-1976, as clarified in NUREG-0612 paragraph 5.1.1.(6) with regard to frequency of inspections, tests and maintenance.

Miscellaneous hoists identified in Table II will be inspected, tested and maintained in accordance with the manufacturers recommendations.

3.f. As described in 3.b, above, the containment polar crane, the cask handling crane, the spent fuel pool bridge crane and the refueling machine are designed to the standards of CMAA No. 70 (1975). The SNUPPS cranes were ordered in 1974 and their purchase specifications included reference to ANSI B30.2-1967, which was the applicable edition, for design requirements.

The miscellaneous hoists throughout the plant are designed in accordance with the requirements of ANSI B30.10-1975, Hooks, ANSI B30.11-1973, Monorail Systems and Underhung Cranes, and ANSI B30.16-1973, Safety Standards for Overhead Hoists.

3.g. Specific plant procedures will be developed that address crane operator training, qualification and conduct for those cranes identified in Table I. These procedures will incorporate the guidance provided by ANSI B30.2-1976, Chapter 2.3.

TABLE I

FUEL HANDLING CRANE DATA (1)

Parameters	Name of Crane			
	Polar Crane	Cask Handling Crane	Spent Fuel Pool Bridge Crane	Refueling Machine
Capacity of main hoist	260 tons	150 tons	2 tons	2.4 tons
Capacity of auxiliary monorail hoist (const)	25 tons	5 tons		
Capacity of auxiliary monorail hoist (normal)	25 tons	5 tons & 2 tons (2)		
Capacity of main trolley	260 tons	130 tons	2 tons	1.5 tons
Capacity of lift beam	500 tons			2.4 tons
Maximum main hoist speed (normal)	5 fpm	3.75 fpm	21 fpm	20 fpm
Minimum main hoist speed (normal)	3 ipm	2 ipm	7 fpm	
Maximum auxiliary monorail hoist speed (normal)	40 fpm			
Minimum auxiliary monorail hoist speed (normal)	3 fpm			
Maximum trolley speed (normal)	51.5 fpm	20 fpm	30 fpm	20 fpm
Minimum trolley speed (normal)	6 fpm	6 ipm	10 fpm	
Maximum bridge speed (normal)	51.5 fpm	20 fpm	30 fpm	40 fpm
Minimum bridge speed (normal)	6 fpm	6 ipm	10 fpm	
Maximum load during plant operation	167.5 tons	125 tons	1,870 lbs	
Normal expected load range	0-167.5 tons	0-125 tons	0-1,870 lbs	
Maximum construction load	475 tons			
Maximum main hoist speed (constr)	5 fpm			
Minimum main hoist speed (constr)	3 ipm			
Maximum trolley speed (constr)	51.5 fpm			
Minimum trolley speed (constr)	6 fpm			
Maximum bridge speed (constr)	51.5 fpm			
Minimum bridge speed (constr)	6 fpm			

TABLE 1 (Sheet 2)

Parameters	Name of Crane: Polar Crane	Cask Handling Crane	Spent Fuel Pool Bridge Crane	Refueling Machine
Normal load range (constr)	0-475 tons			
Maximum monorail hoist speed		20 fpm		22 fpm
Minimum monorail hoist speed		10 fpm		7 fpm
Maximum monorail trolley speed		32 fpm		
Minimum monorail trolley speed		16 fpm		
Lifting limitation	28.5 ft (above vessel flange)	Cask bottom 3 inches above fl El. 2047'-6"	24'-3" (Hook limit is 2066'-8")	
Seismic Class	(3)	(3)	(3)	(3)
Design Standards				
General	CMAA No. 70 (1975)	CMAA No. 70 (1975)	CMAA No. 70 (1975)	CMAA No. 70 (1975)
Structural	Covered by CMAA	Covered by CMAA	Covered by CMAA	ASME Sect. III, App. XVII, Subarticle XVII-2200
Electrical	NFPA Vol. 5 Art. 610 1974-1975	NFPA Vol. 5 Art. 610 1974-1975	NFPA Vol. 5 Art. 610 1974-1975	NFPA Vol. 5 Art. 610 1974-1975
Materials	ASTM Std's.	ASTM Std's.	ASTM Std's.	ASTM Std's.
Others	OSHA 29 CFR 1910 & 1926	OSHA 29 CFR 1910 & 1926	OSHA 29 CFR 1910 & 1926	OSHA 29 CFR 1910 & 1926

NOTES:

(1) Rated speeds given are within ±10 percent of the actual speeds.

(2) Refer to Figure 23 a 2-ton limit to the monorail hoist exists only over area B on Figure 23

(3) Seismic Category I

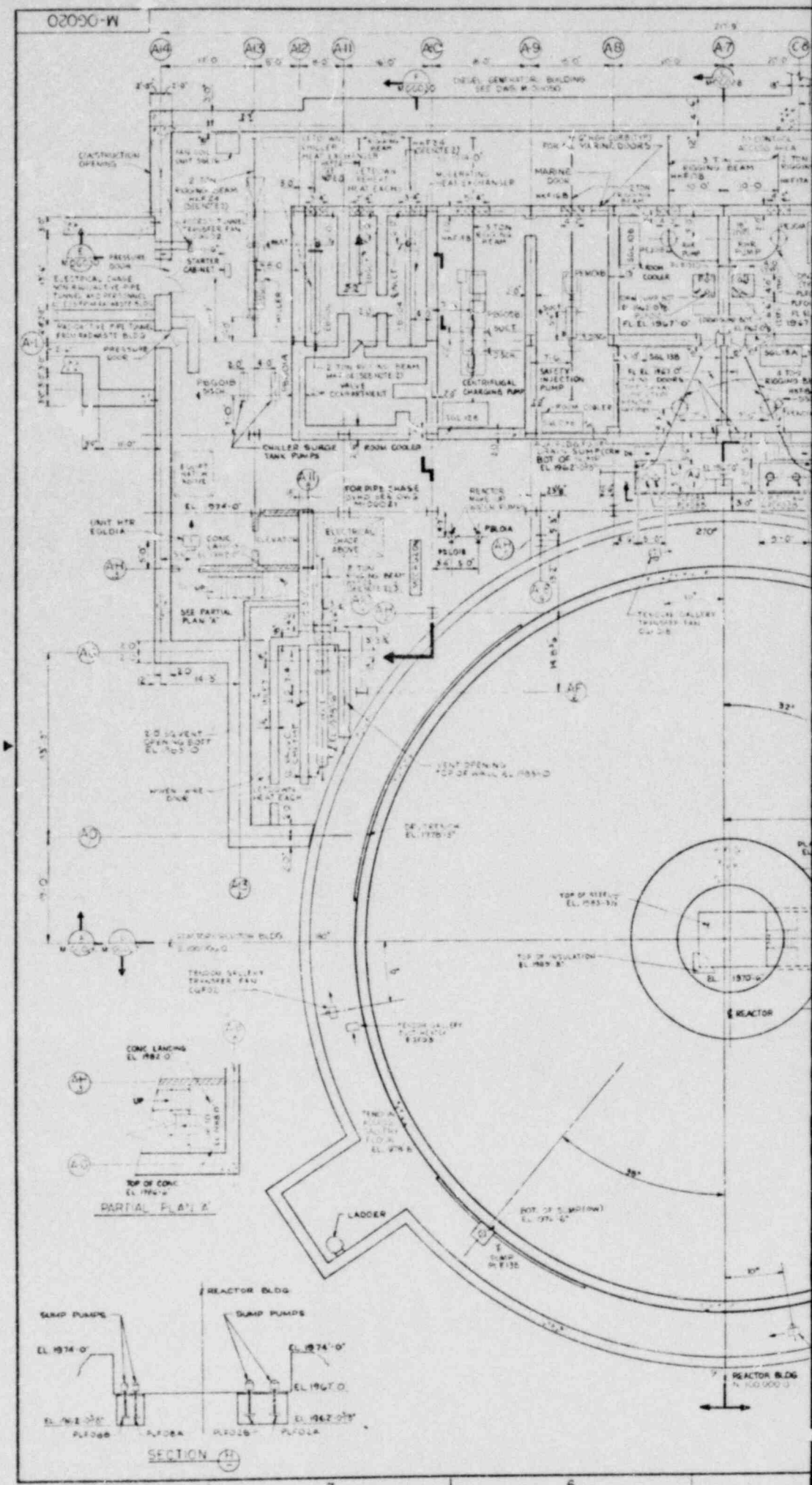
TABLE II

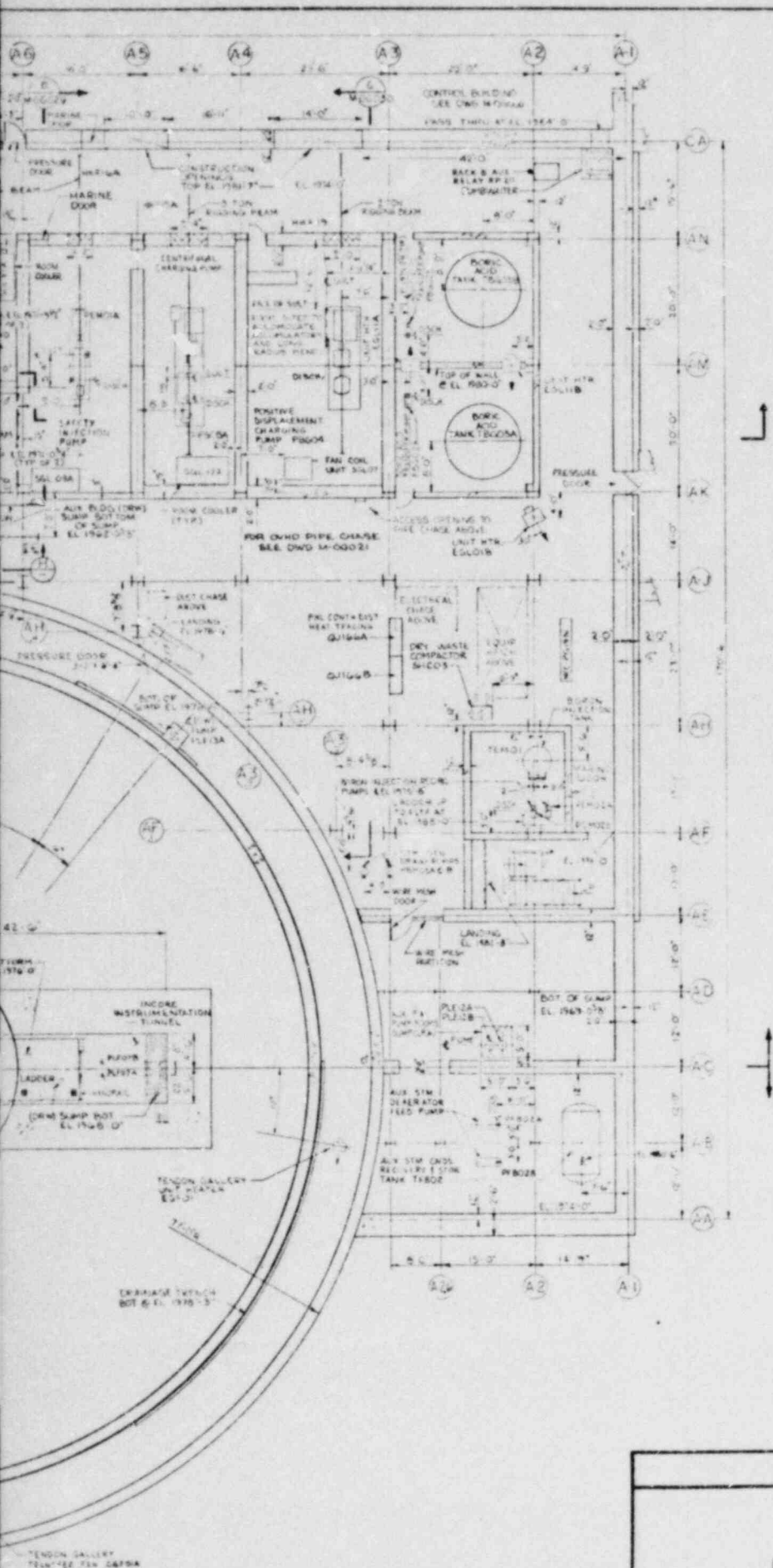
MISCELLANEOUS HOISTS DATA

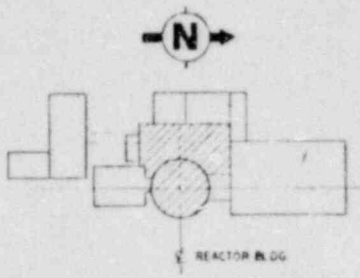
EQUIPMENT NO.	SERVICE DESCRIPTION	HOIST CAPACITY	PRIMARY LOADS LIFTED
HKF03A-D	CONTAINMENT JIB CRANE	3 TONS	HYDROGEN MIXING FANS
HKF05	SECONDARY SHIELD WALL AREA JIB CRANE	3 TONS	COOLING FAN
HKF06	HOT MACHINE SHOP BRIDGE CRANE	3 TONS	CHEMICAL TANKS
HKF08A & B	DIESEL GENERATOR UNDERHUNG MONORAIL AND BRIDGE CRANE	5 TONS	EMERGENCY FUEL OIL DAY TANK AND MISCELLANEOUS EQUIPMENT
HKF09A & B	FUEL POOL COOLING PUMP MONORAIL AND HOIST	2 TONS	FUEL POOL COOLING HEAT TRANSFER
HKF10	AUXILIARY BUILDING FILTER ROOM MONORAIL AND HOIST	5 TONS	REACTOR COOLANT FILTERS
HKF11A-C	AUXILIARY FEEDWATER PUMP MONORAIL AND HOIST	4 TONS	AUXILIARY FEEDWATER PUMPS
HKF12A-C	COMPONENT COOLING WATER PUMP MONORAIL AND HOIST	5 TONS	COMPONENT COOLING WATER HEAT EXCHANGERS
HKF13	COMPONENT COOLING WATER SURGE TANK AREA MONORAIL AND HOIST	10 TONS	COMPONENT COOLING WATER SURGE TANKS
HKF15A & B	CENTRIFUGAL CHARGING PUMP MONORAIL AND HOIST	5 TONS	CENTRIFUGAL CHARGING PUMPS
HKF16A & B	SAFETY INJECTION PUMP MONORAIL AND HOIST	5 TONS	SAFETY INJECTION PUMPS
HKF17A & B	RHR PUMP MONORAIL AND HOIST	5 TONS	RHR PUMPS
HKF18A & B	CONTAINMENT SPRAY PUMP MONORAIL AND HOIST	5 TONS	CONTAINMENT SPRAY PUMPS
HKF19	RECIPROCATING CHARGING PUMP MONORAIL AND HOIST	5 TONS	POSITIVE DISPLACEMENT CHARGING PUMPS

TABLE II (Sheet 2)

HKF23	AUXILIARY BUILDING HVAC MONORAIL AND HOIST	10 TONS	MISCELLANEOUS FANS AND EQUIPMENT
HKF24	MODERATION HEAT EXCHANGER MONORAIL AND HOIST	2 TONS	MISCELLANEOUS HEAT EXCHANGERS
HKF29A-D	MAIN STEAM RELIEF ISOLATION VALVE MONORAIL AND HOIST	10 TONS	MAIN STEAM RELIEF ISOLATION VALVE AND FEEDWATER PIPING
HKF30	RESIN CHARGING TANK AREA MONORAIL AND HOIST	1 TON	BORON RESIN THERMAL REGENERATIVE FILTER
HKF32	COMMUNICATION CORRIDOR HOT WATER PACKAGING AREA MONORAIL, HOIST AND SWITCH	5 TONS	MISCELLANEOUS EQUIPMENT
HKF33	BORIC ACID BATCH TANK MONORAIL AND HOIST	1 TON	BORIC ACID TANKS
HKF41	ESW PUMP HOUSE HOIST	10 TONS	ESW PUMPS


M-06020
A14
A13
A12
A11
A10
A9
A8
A7
DIESEL GENERATOR BUILDING
CONSTRUCTION OPENING
MARINE DOOR
PRESSURE DOOR
ELECTRICAL CHASE
CHILLER SURGE TANK PUMPS
ROOM COOLER
SAFETY INJECTION PUMP
CENTRIFUGAL CHARGING PUMP
FOR PIPE CHASE
UNIT HTR EQ#DIA
SEE PARTIAL PLAN 'A'
TENDON GALLERY TRANSFER FAN
REACTOR
LADDER
CONC LANDING
TOP OF CONC
PARTIAL PLAN 'A'
REACTOR BLDG
SUMP PUMPS
EL 1974'-0"
EL 1967'-0"
EL 1962'-0"
SECTION
8
7
6





KEY PLAN

NOTES

1. THIS DRAWING WAS MADE FROM SK M-80.
2. WEIGHT TO BE SHARED FOR LIFTING BEAMS LOCATED ABOVE THE FOLLOWING EQUIPMENTS: BORON METER, REACTANT COOLANT ACTIVITY MONITOR, SEAL WATER HEAT EXCHANGER, LETDOWN CHILLER HEAT EXCHANGER, LETDOWN REHEAT HEAT EXCHANGER, MIXED BED HEAT EXCHANGER, LETDOWN HEAT EXCHANGER, AND CHILLER.

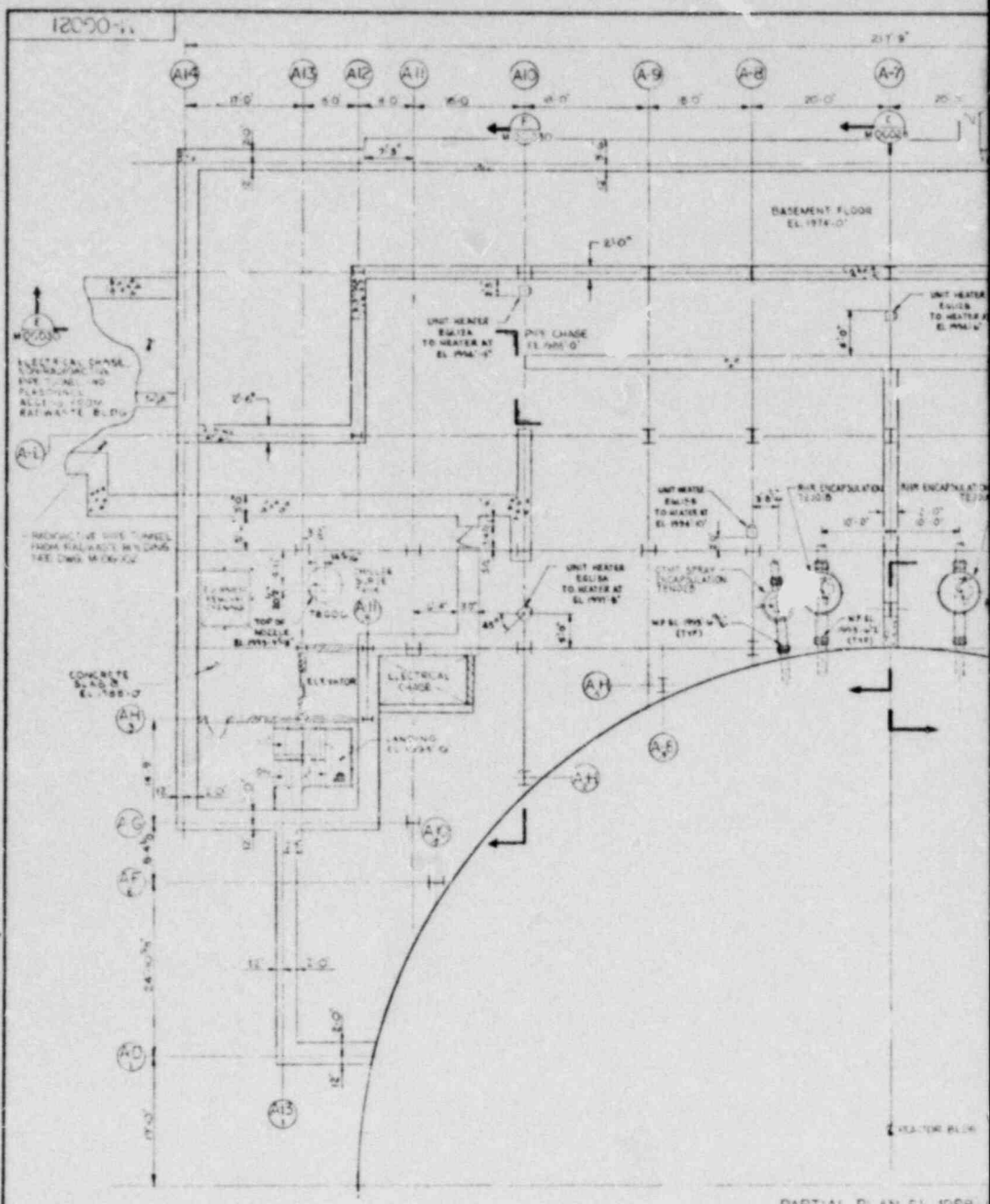
BLOCKOUT

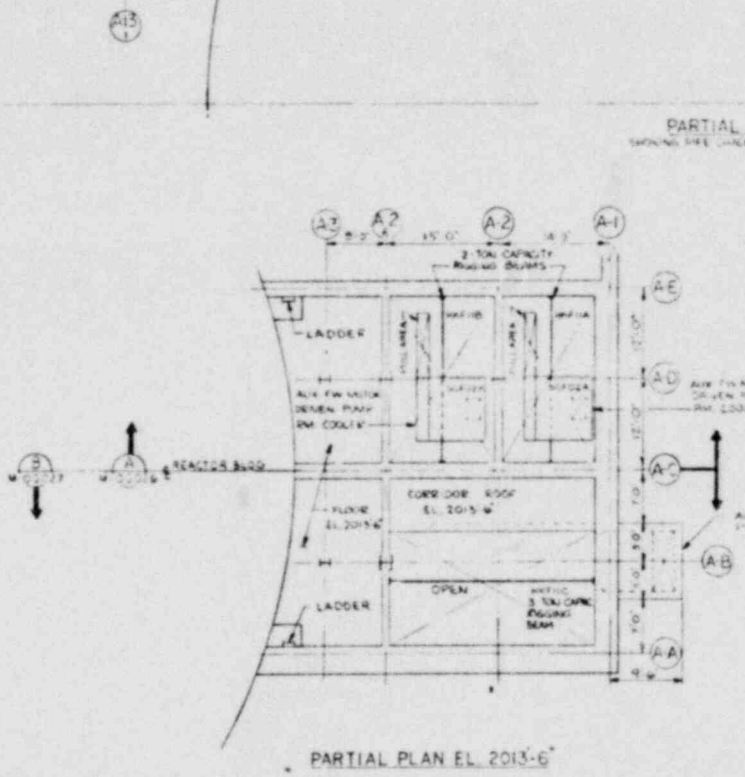
BLOCK WALL

3. WEIGHT 134,8 - CONT. CHG. PUMP MONORAIL & HOIST (G-4), (G-6).
4. WEIGHT 136,8 - SAFETY INJECTION PUMP MONORAIL & HOIST (G-5), (G-4).
5. WEIGHT 137A,8 - RHR PUMP MONORAIL & HOIST (G-5).
6. WEIGHT 186A,8 - CONTAINMENT SPRAY PUMP MONORAIL & HOIST (F-3), (F-4).
7. WEIGHT 324 - AUX. HEAT EXCHANGE MONORAIL & HOIST (E-7), (G-7)

SNUPPS

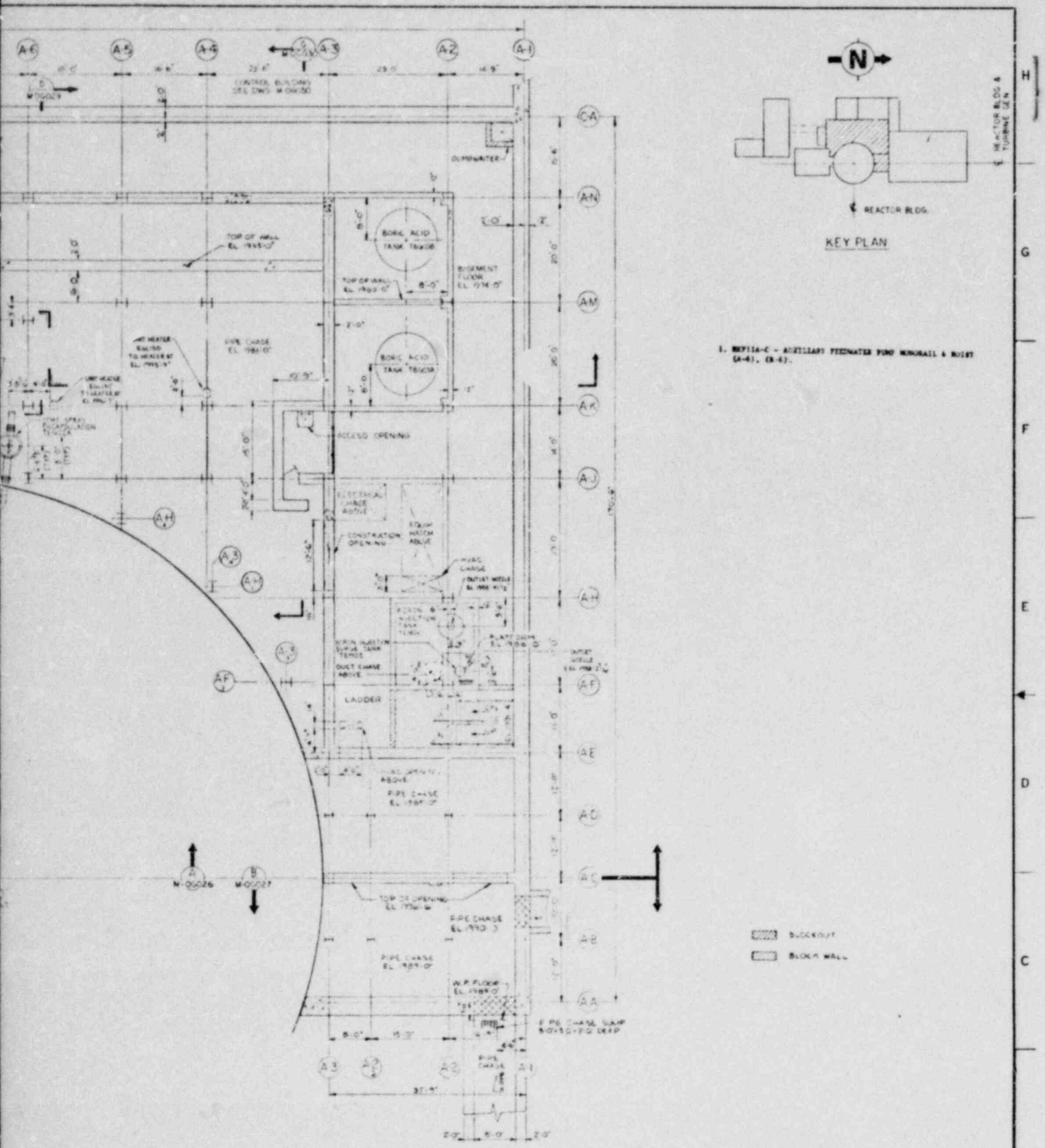
FIGURE 1
EQUIPMENT LOCATION
REACTOR AND AUXILIARY
BUILDING PLAN BASEMENT
ELEVATION 1974'-0"





PARTIAL PLAN EL 2013'-6"

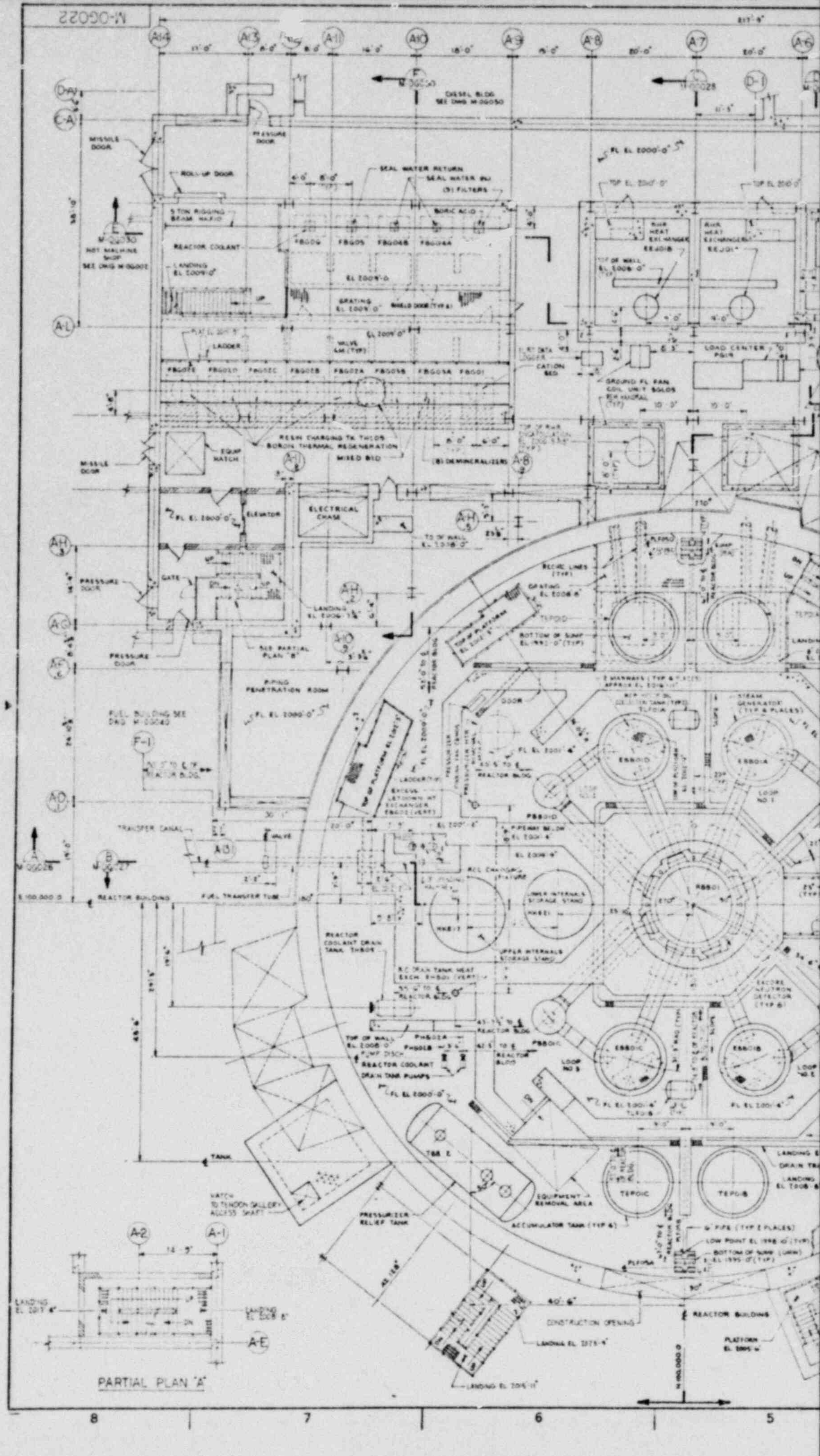
8 | 7 | 6



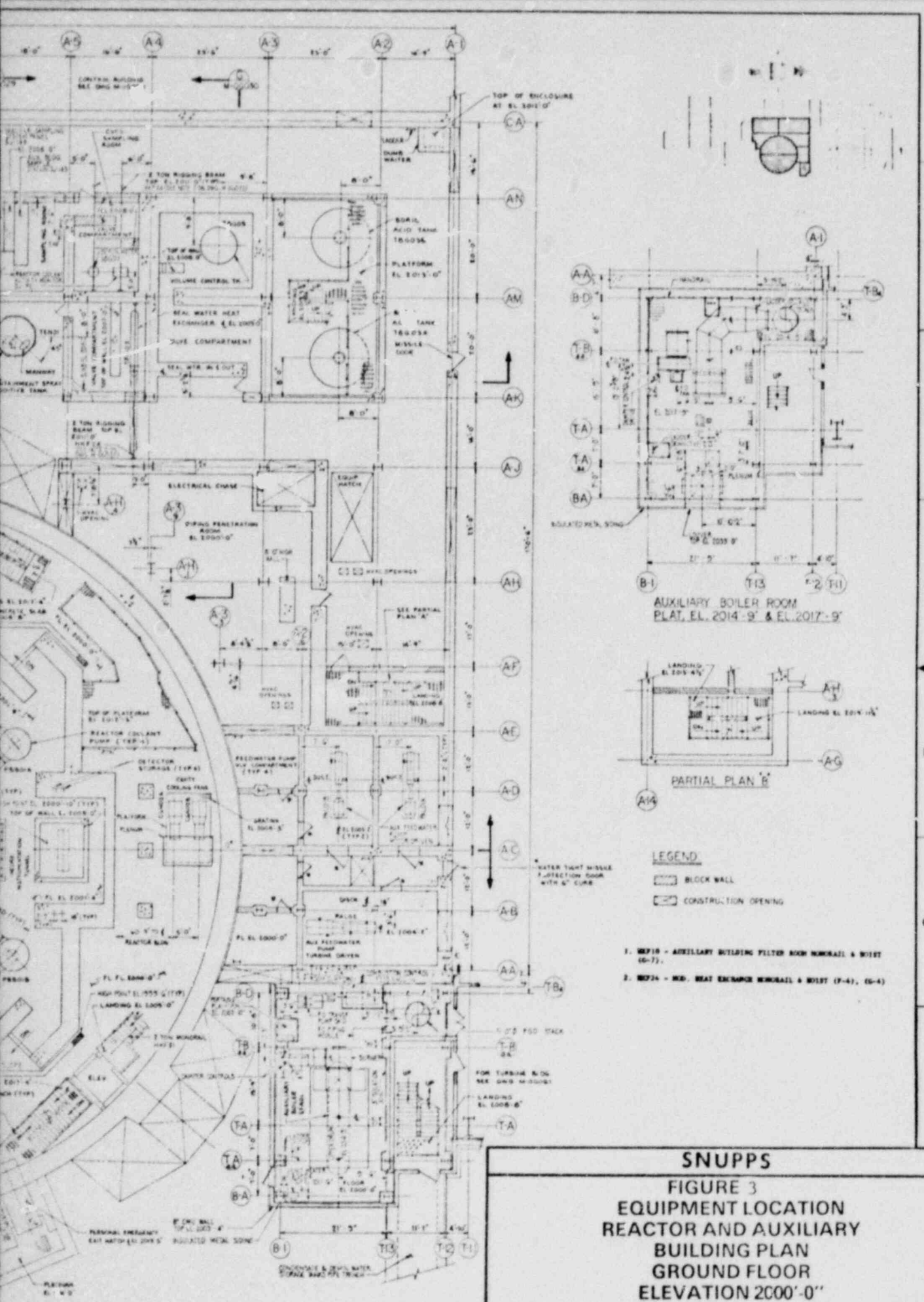
1. INSTALL C - AUXILIARY FEEDWATER PUMP MONORAIL & HOIST (A-6), (B-6).

SNUPPS

FIGURE 2
EQUIPMENT LOCATION
AUXILIARY BUILDING
PARTIAL PLAN
ELEVATION 1988'-0" & 2012'-0"



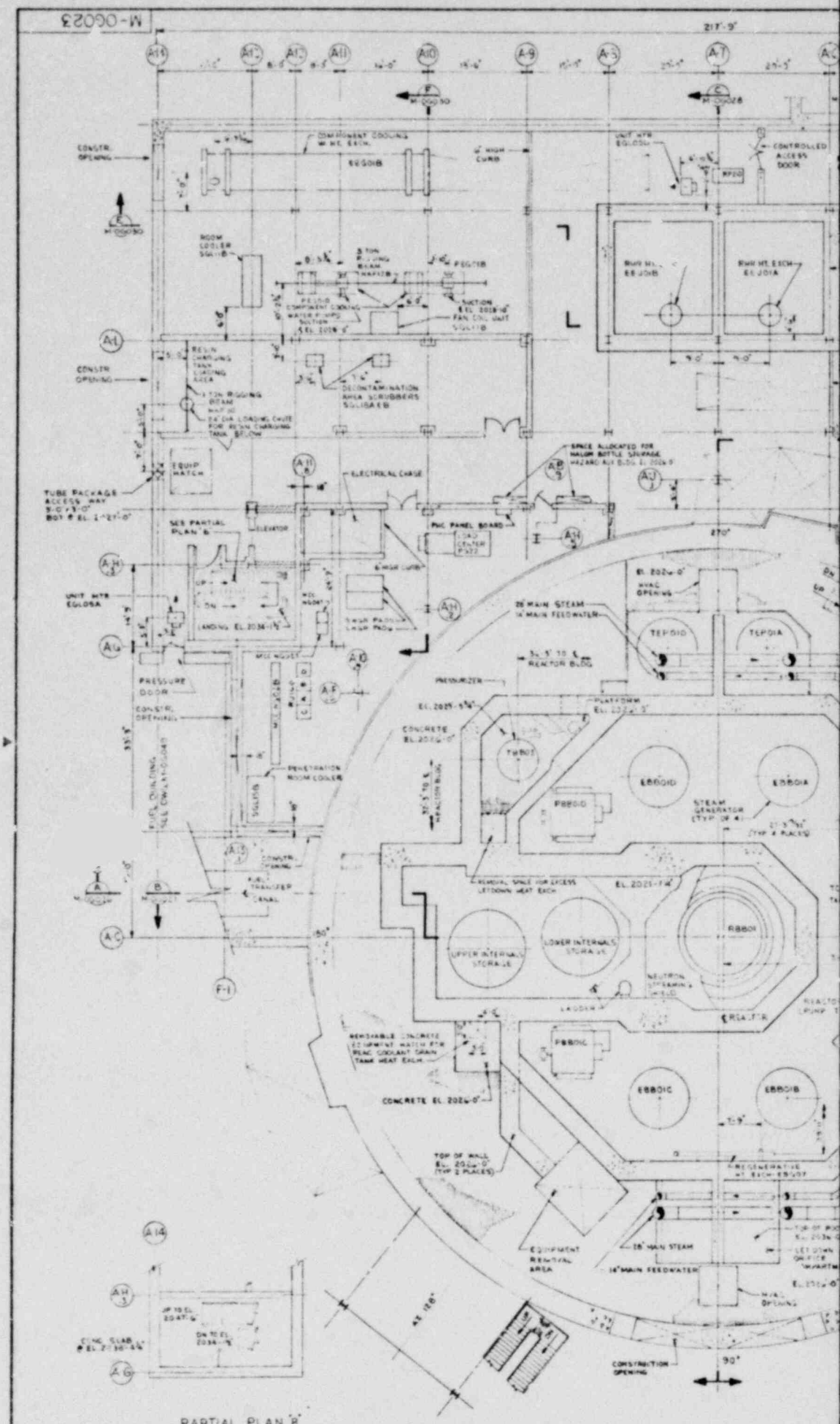
DIESEL BLDG SEE DWG M-0G050
MISSILE DOOR
PRESSURE DOOR
ROLL-UP DOOR
SEAL WATER RETURN
REACTOR COOLANT
LOAD CENTER
EQUIP HATCH
ELEVATOR
ELECTRICAL CHASE
PIPING PENETRATION ROOM
FUEL BUILDING SEE DWG M-0G040
TRANSFER CANAL
REACTOR BUILDING
FUEL TRANSFER TUBE
REACTOR COOLANT DRAIN TANK PUMPS
PRESSURIZER RELIEF TANK
EQUIPMENT REMOVAL AREA
CONSTRUCTION OPENING
PARTIAL PLAN 'A'
8
7
6
5



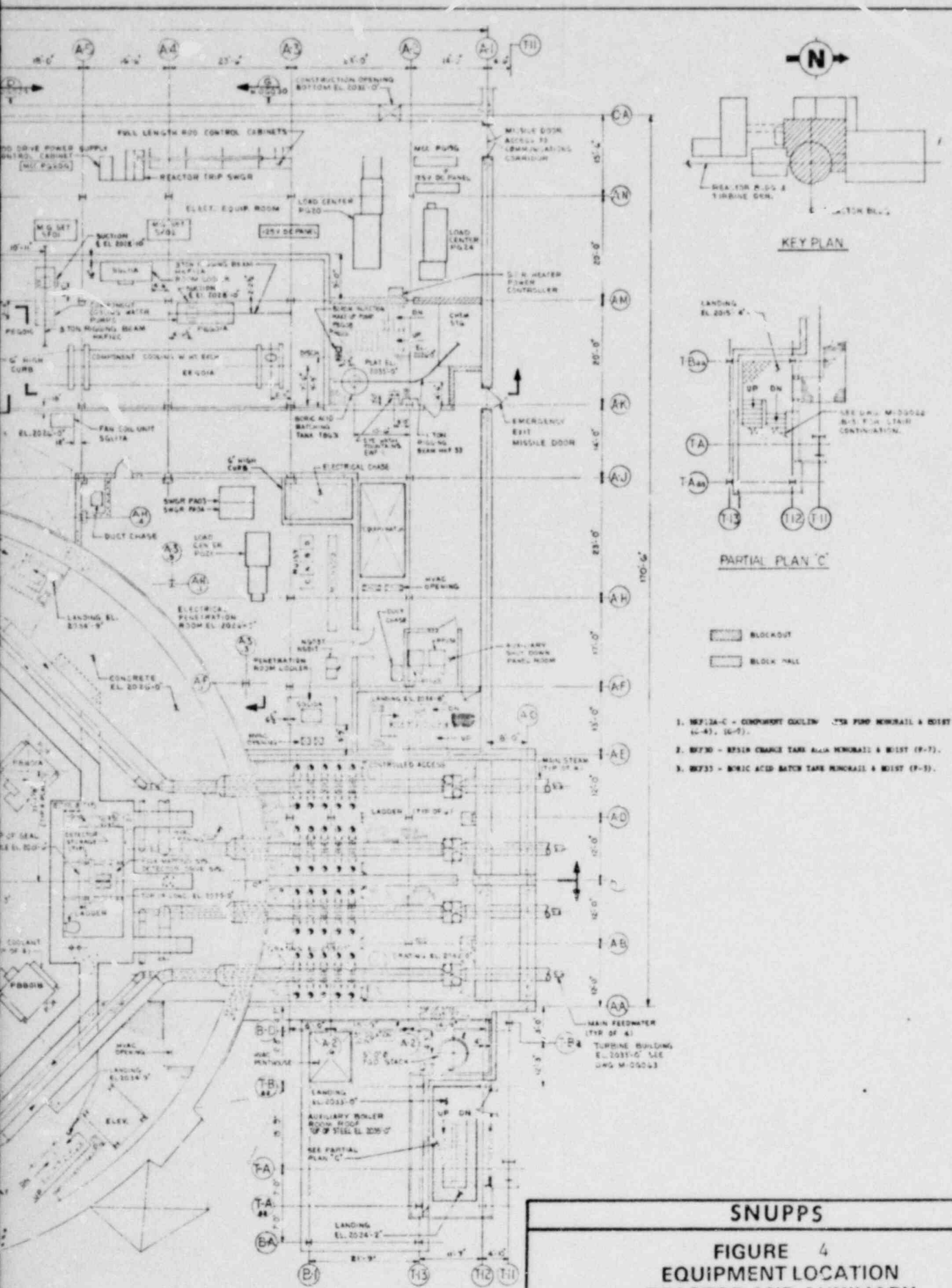
SNUPPS

FIGURE 3
EQUIPMENT LOCATION
REACTOR AND AUXILIARY
BUILDING PLAN
GROUND FLOOR
ELEVATION 2000'-0"

M-06023



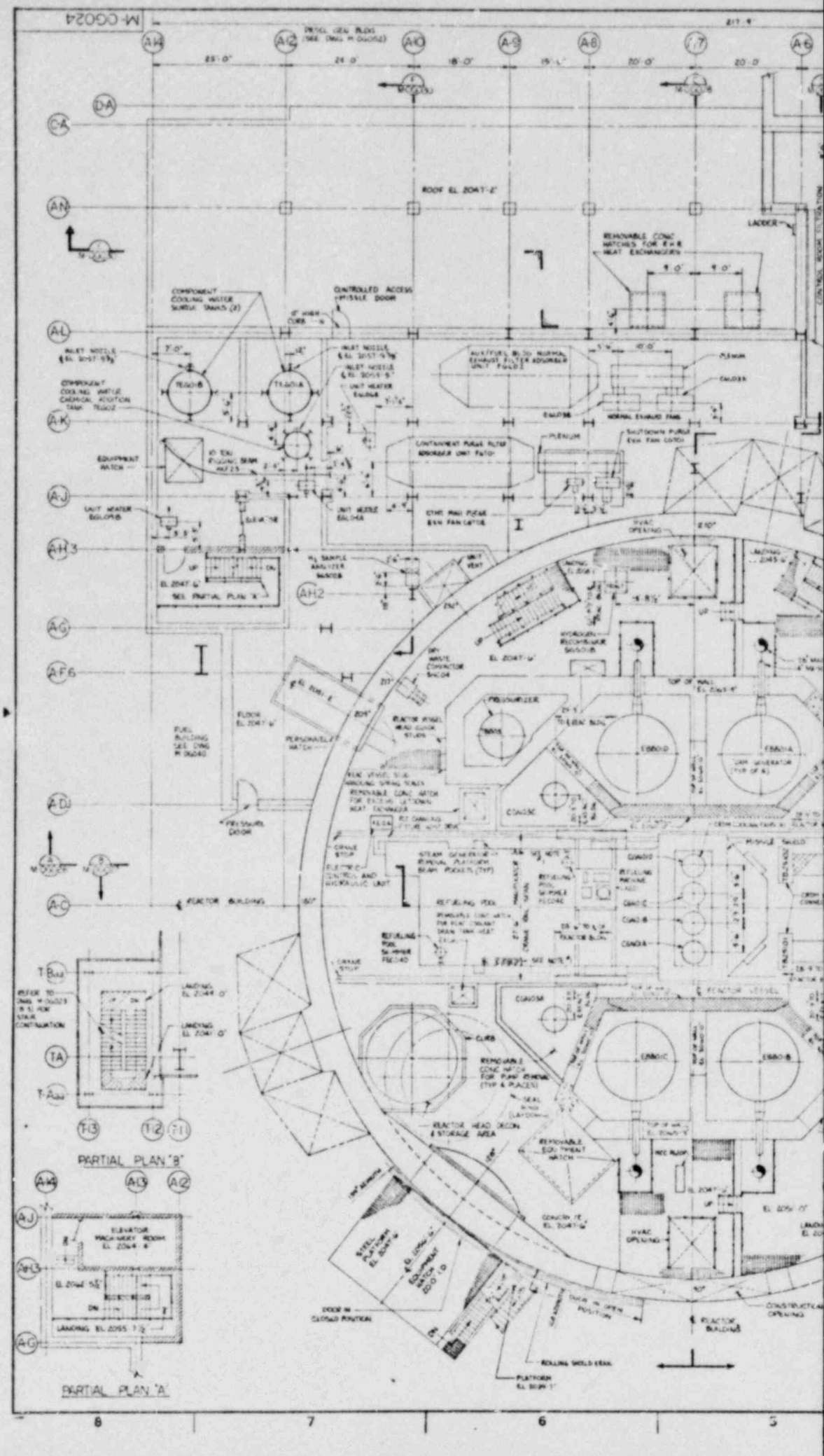
PARTIAL PLAN 'B'

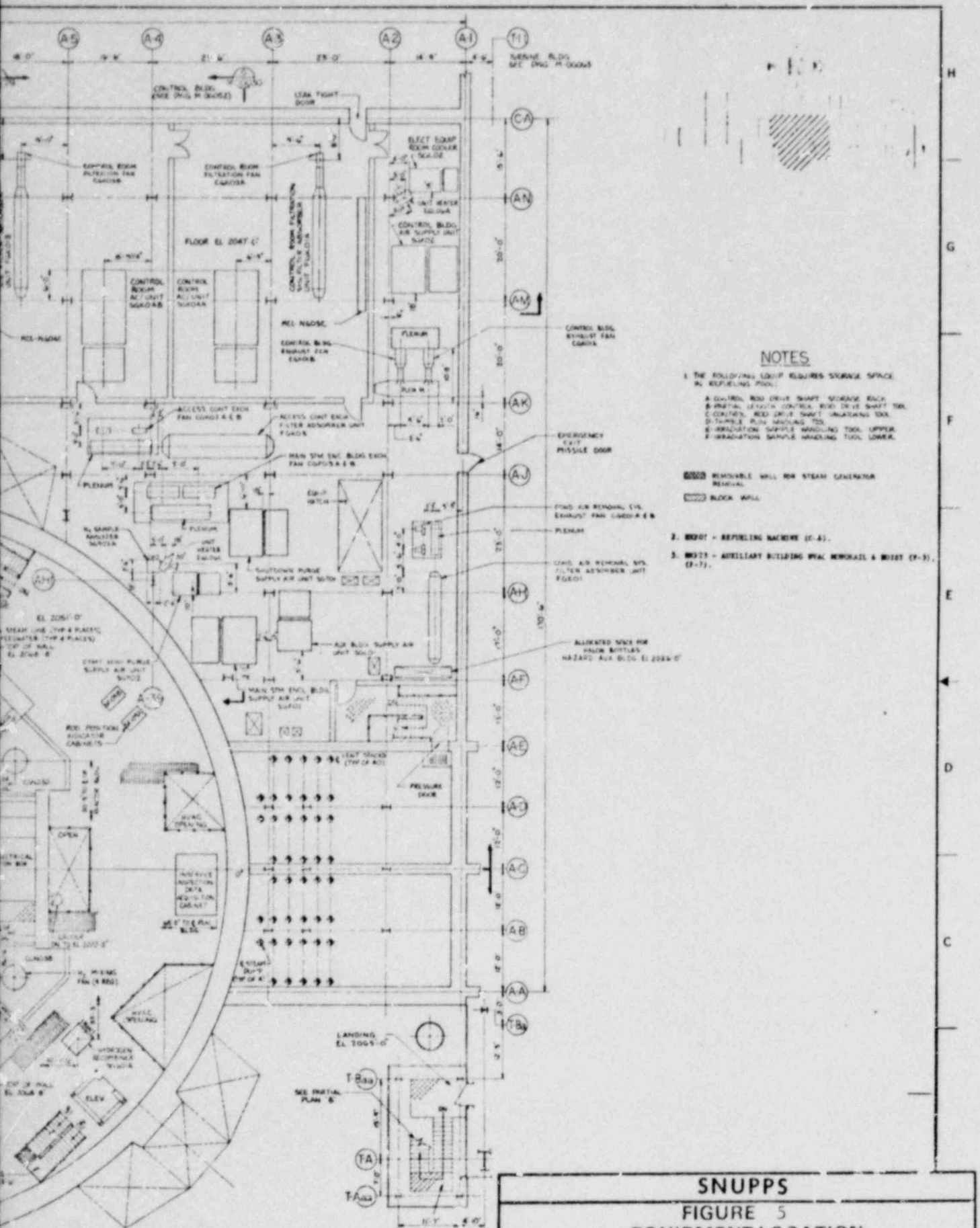


1. MKF12A-C - COMPONENT COOLING [illegible] PUMP MONORAIL & HOIST (C-4), (C-5).
2. MKF30 - RESIN CHANGE TANK [illegible] MONORAIL & HOIST (F-7).
3. MKF33 - BORIC ACID BATCH TANK MONORAIL & HOIST (F-5).

SNUPPS

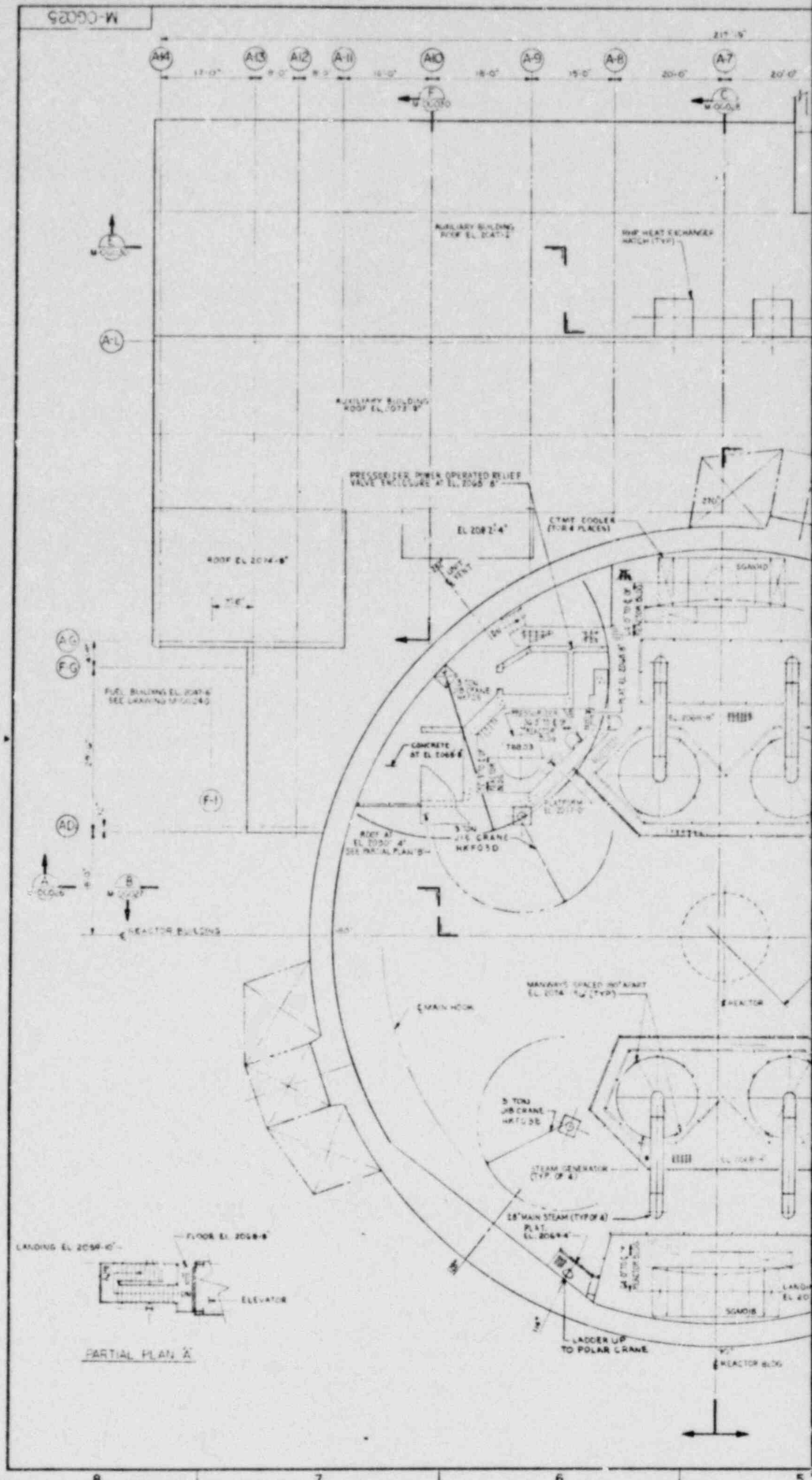
FIGURE 4
EQUIPMENT LOCATION
REACTOR AND AUXILIARY
BUILDING PLAN
ELEVATION 2026'-0"


M-06024
ROOF EL 2047'-6"
REMOVABLE CONC HATCHES FOR E.H.R. HEAT EXCHANGERS
LADDER
CONTROLLED ACCESS (MISSILE DOOR
EQUIPMENT HATCH
UNIT HEATER
PLENUM
HVAC OPENING
FUEL BUILDING
PRESSURIZER
REACTOR BUILDING
REFUELING POOL
REMOVABLE CONC HATCH FOR PIPE REMOVAL (TYP 4 PLACES)
REACTOR HEAD DECON & STORAGE AREA
REMOVABLE EQUIPMENT HATCH
PARTIAL PLAN "B"
PARTIAL PLAN "A"
ELEVATOR MACHINERY ROOM EL 2064'-6"
LANDING EL 2055'-7 1/2"
CONSTRUCTION OPENING
ROLLING SHIELD DOOR
PLATFORM EL 2039'-1"



SNUPPS

FIGURE 5
EQUIPMENT LOCATION REACTOR AND AUXILIARY BUILDING PLAN OPERATING FLOOR ELEVATION 2047'-6"


A-14
A-13
A-12
A-11
A-10
A-9
A-8
A-7
A-L
A-G
F-G
F-1
AD
AUXILIARY BUILDING ROOF EL. 2047'-2"
RHF HEAT EXCHANGER HATCH (TYP)
PRESSURIZER POWER OPERATED RELIEF VALVE ENCLOSURE AT EL. 2068'-8"
EL. 2082'-4"
CTMT. COOLER (TYP 4 PLACES)
ROOF EL. 2074'-8"
FUEL BUILDING EL. 2047'-6" SEE DRAWING M-OG24G
CONCRETE AT EL. 2066'-6"
3 TON JIB CRANE HKF05D
PLATFORM
REACTOR BUILDING
MANWAYS SPACED 90° APART
MAIN HOOK
REACTOR
3 TON JIB CRANE HKF05B
STEAM GENERATOR (TYP. OF 4)
28" MAIN STEAM (TYP OF 4)
LADDER UP TO POLAR CRANE
REACTOR BLDG
SGA01B
LANDING EL. 2058'-10"
FLOOR EL. 2068'-8"
ELEVATOR
PARTIAL PLAN 'A'
8
7
6
5

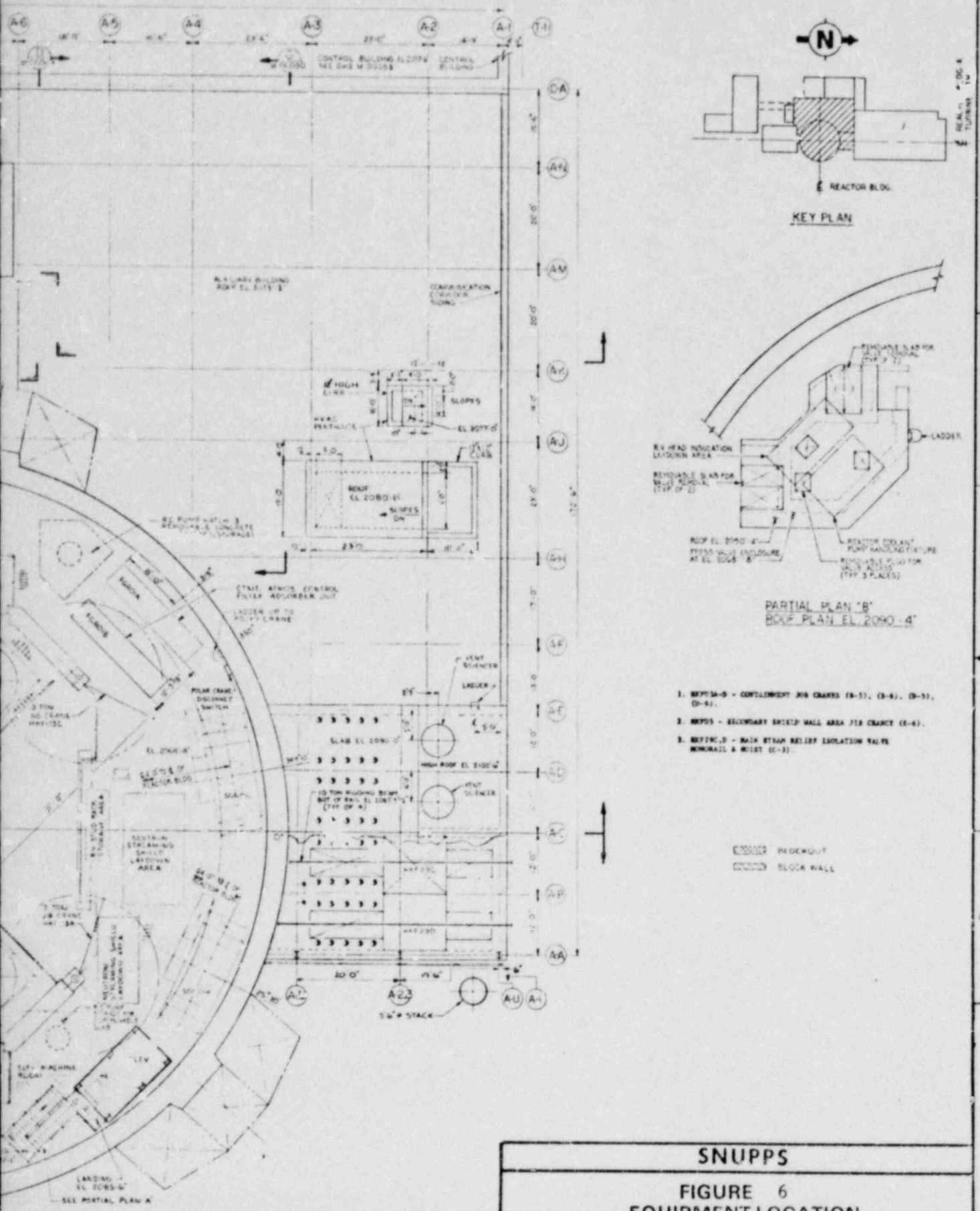
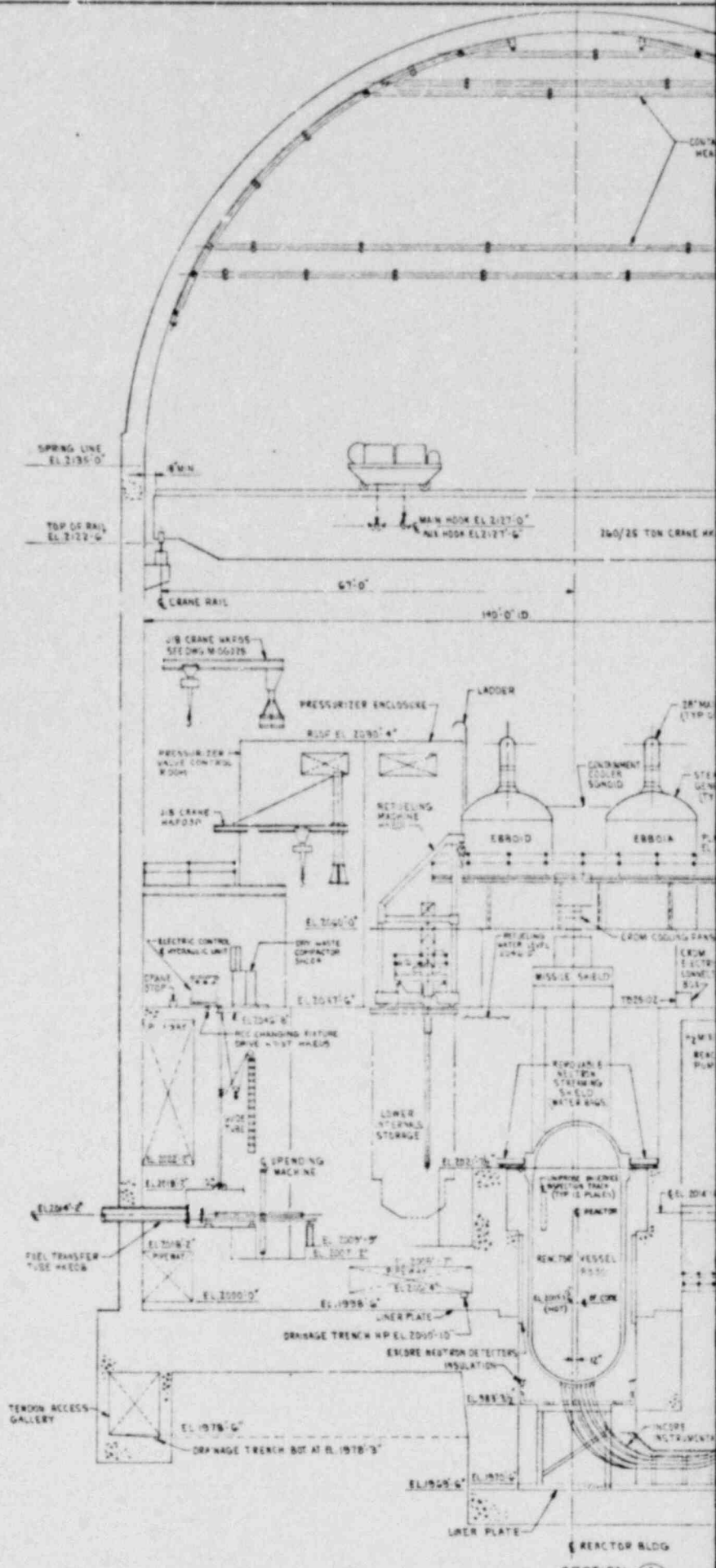


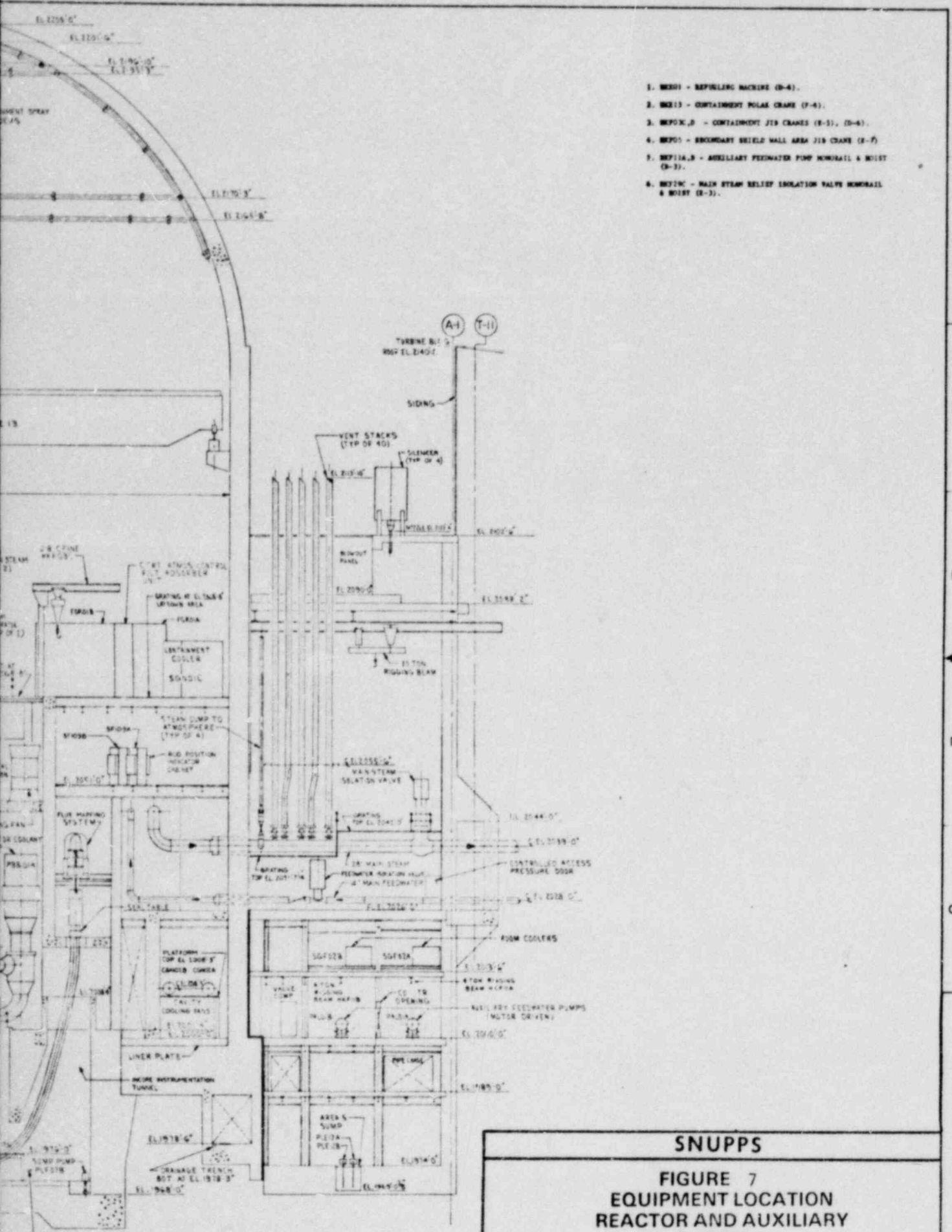
FIGURE 6
EQUIPMENT LOCATION
REACTOR AND AUXILIARY
BUILDING PLAN
ELEVATION 2068'-8"

M-06026



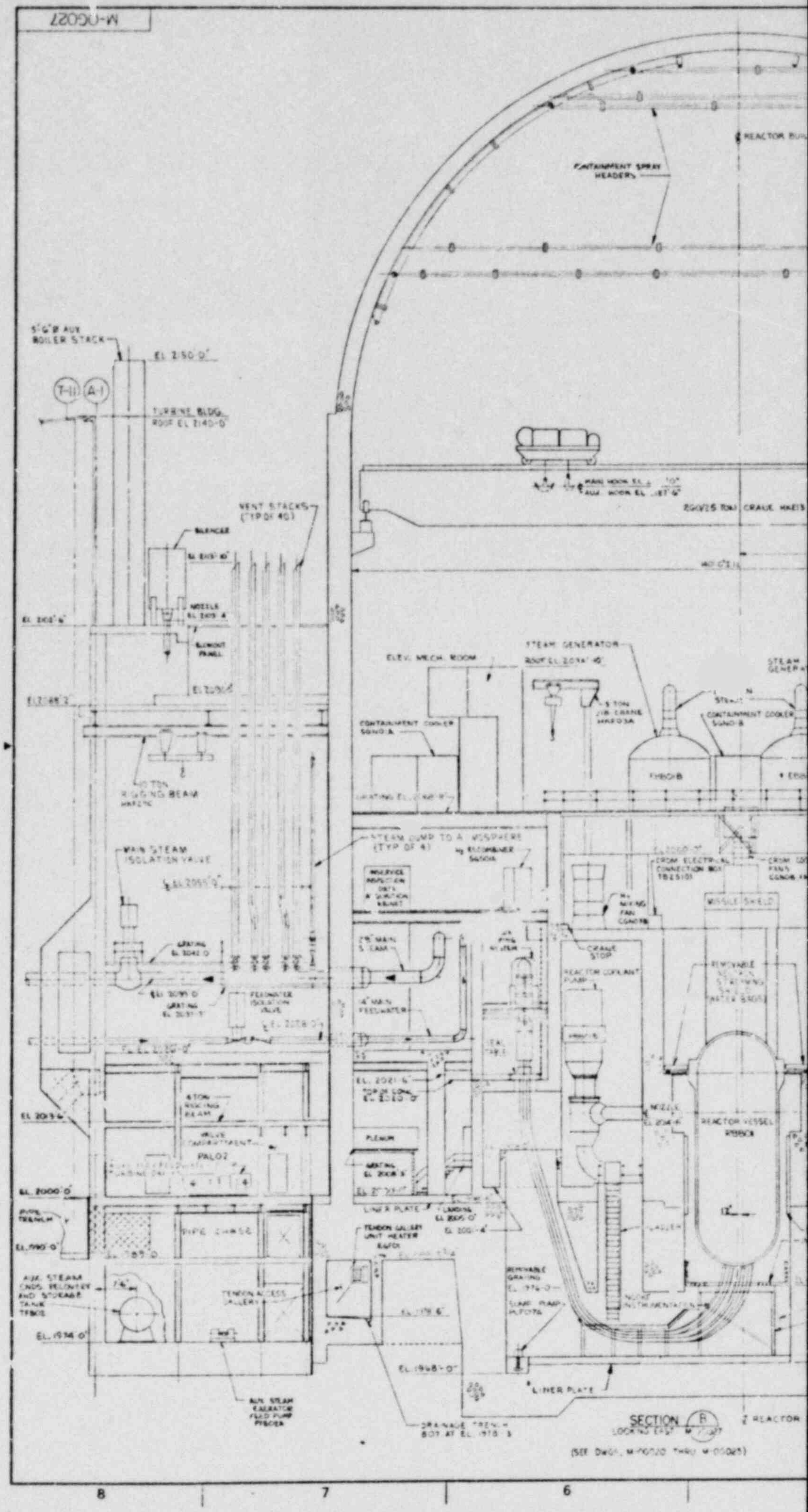
SECTION A
LOOKING WEST M-06026
(SEE DWG M06020 THRU M06025)

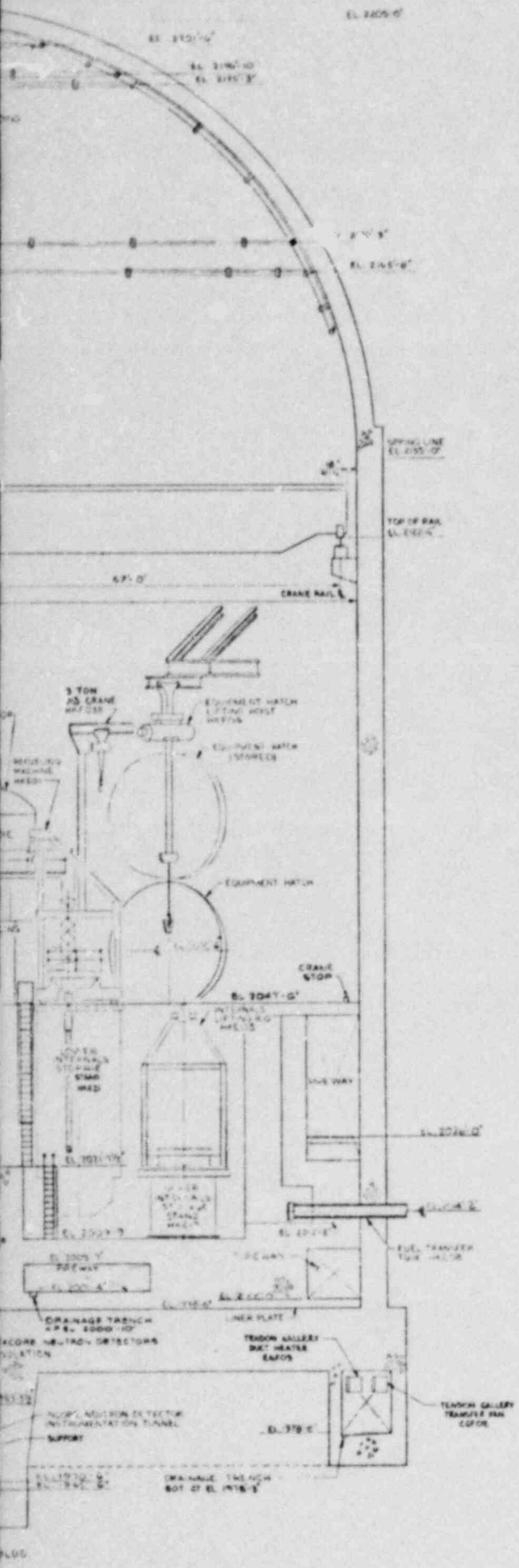
8 | 7 | 6 | 5



SNUPPS

FIGURE 7
EQUIPMENT LOCATION REACTOR AND AUXILIARY BUILDING SECTION A


CONTAINMENT SPRAY HEADERS
REACTOR BUI
5'-6" Ø AUX BOILER STACK
EL 2150'-0"
T-11
A-1
TURBINE BLDG. ROOF EL 2140'-0
VENT STACKS (TYP OF 4)
SILENCER
NOZZLE
ELEMENT PANEL
10 TON RIGGING BEAM
MAIN STEAM ISOLATION VALVE
ELEV. MECH. ROOM
STEAM GENERATOR
CONTAINMENT COOLER
GRATING
STEAM DUMP TO ATMOSPHERE (TYP OF 4)
28" MAIN STEAM
14" MAIN FEEDWATER
FEEDWATER ISOLATION VALVE
CRANE STOP
REACTOR COOLANT PUMP
MISSILE SHIELD
REACTOR VESSEL
PIPE CHASE
PIPE TRENCH
AUX. STEAM CNDS. RECOVERY AND STORAGE TANK
TENDON ACCESS GALLERY
TENDON GALLERY UNIT HEATER
LINER PLATE
REMOVABLE GRATING
SUMP PUMP
NUCLEAR INSTRUMENTATION
DRAINAGE TRENCH
EL 2000'-0"
EL 1974'-0"
EL 1968'-0"
SECTION B
LOOKING EAST
(SEE DWGS. M-05020 THRU M-05025)
8
7
6

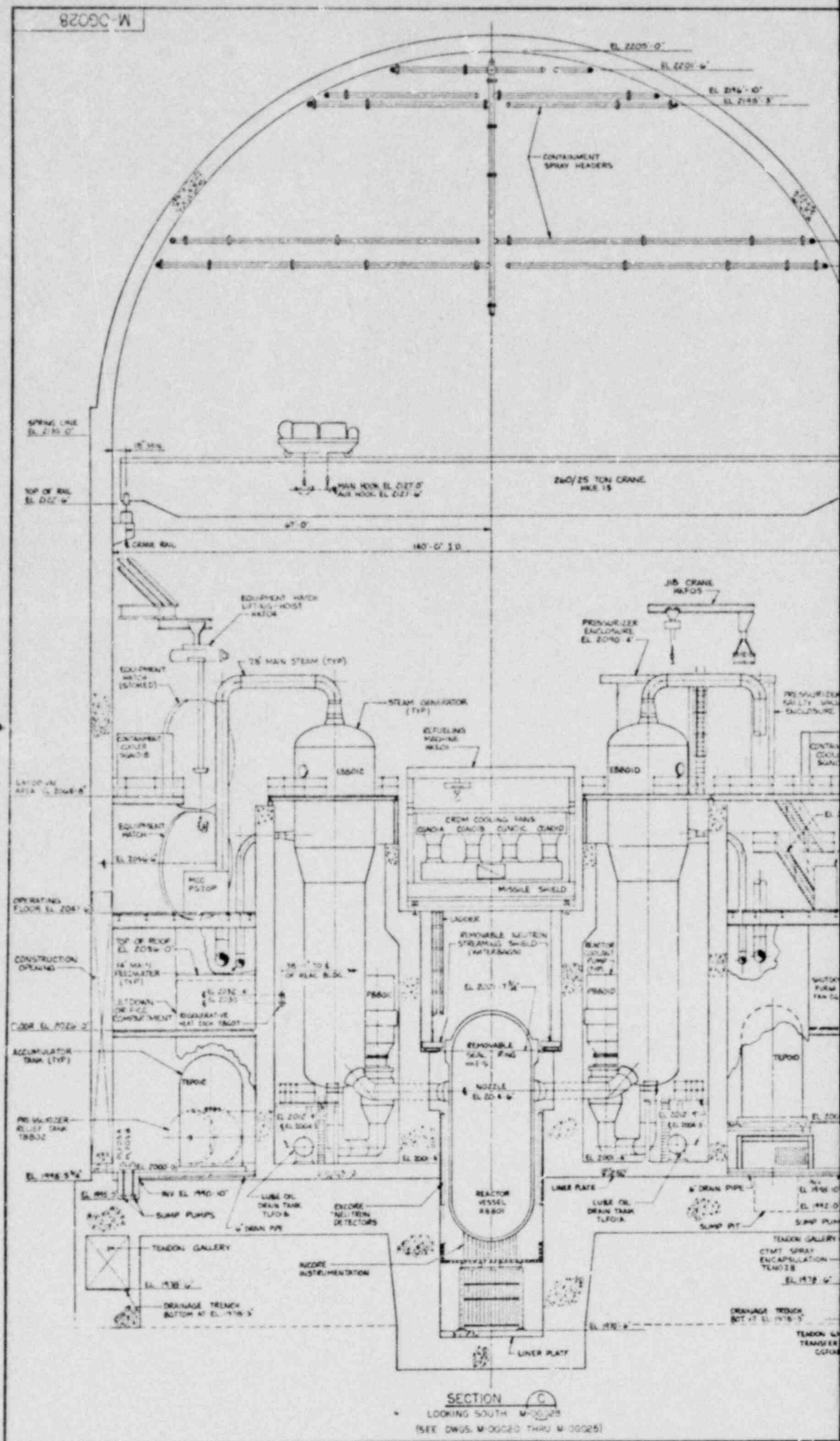


1. [illegible] - REFUELING MACHINE (D-5).
2. [illegible] - CONTAINMENT POLAR CRANE (F-4).
3. [illegible] - CONTAINMENT JIB CRANES (E-4), (B-3).
4. [illegible] - AUXILIARY FEEDWATER PUMP MONORAIL & HOIST (B-7).
5. [illegible] - MAIN STEAM RELIEF ISOLATION VALVE MONORAIL & HOIST (D-7).

SNUPPS

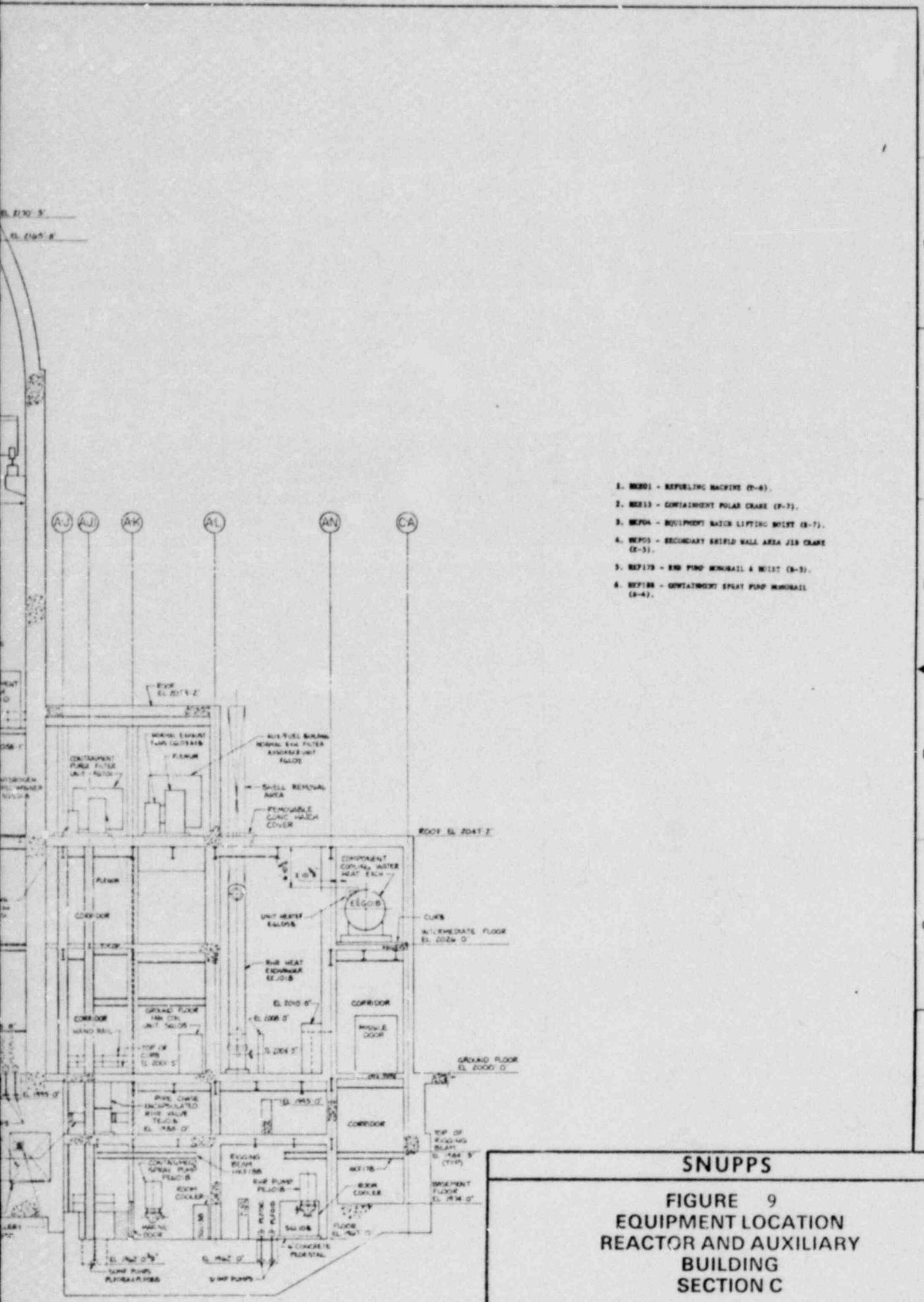
FIGURE 8
EQUIPMENT LOCATION
REACTOR AND AUXILIARY
BUILDING
SECTION B

M-3028



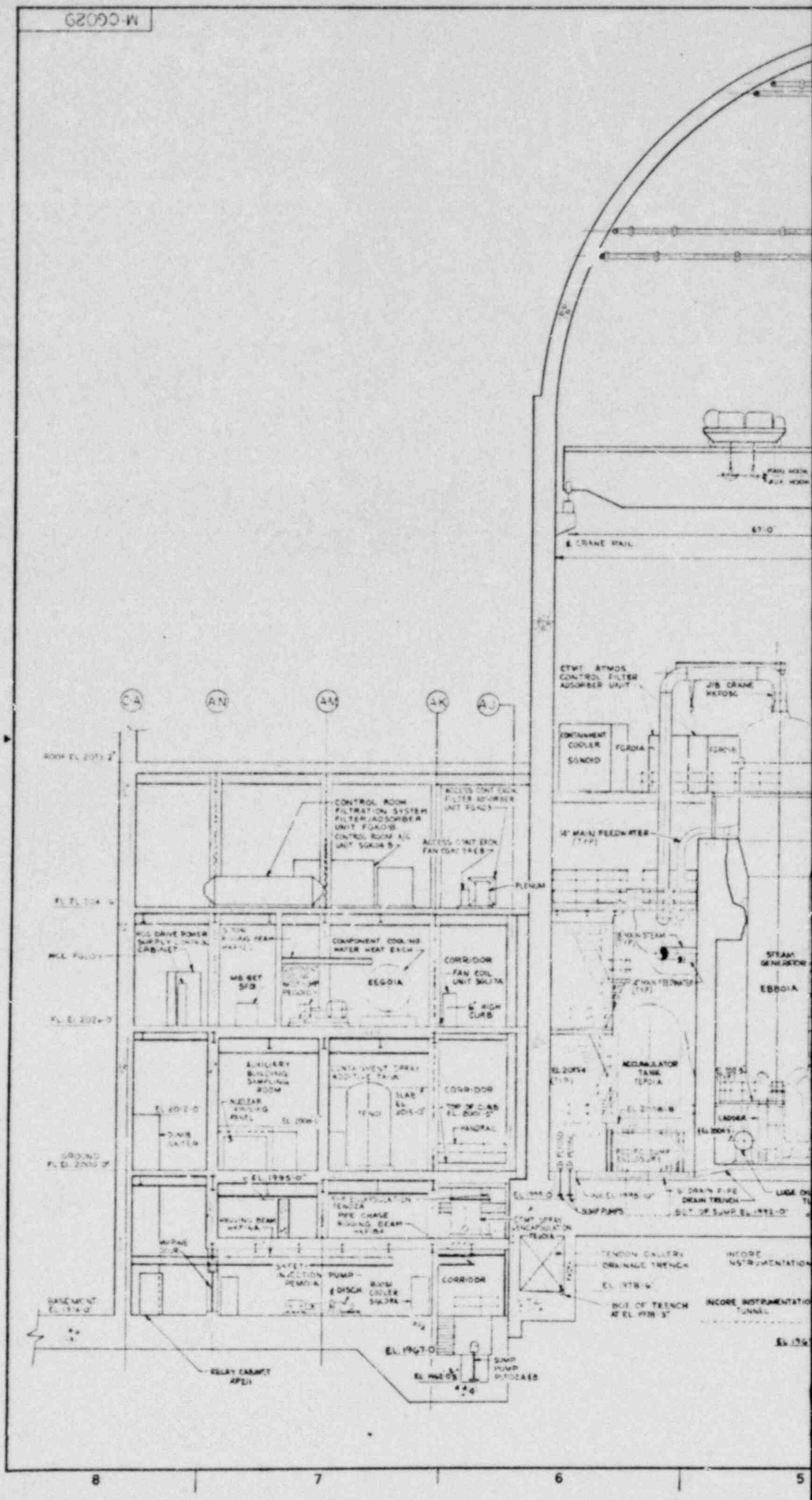
SECTION C
LOOKING SOUTH M-[illegible]
(SEE DWGS. M-00220 THRU M-00225)

8 | 7 | 6 | 5

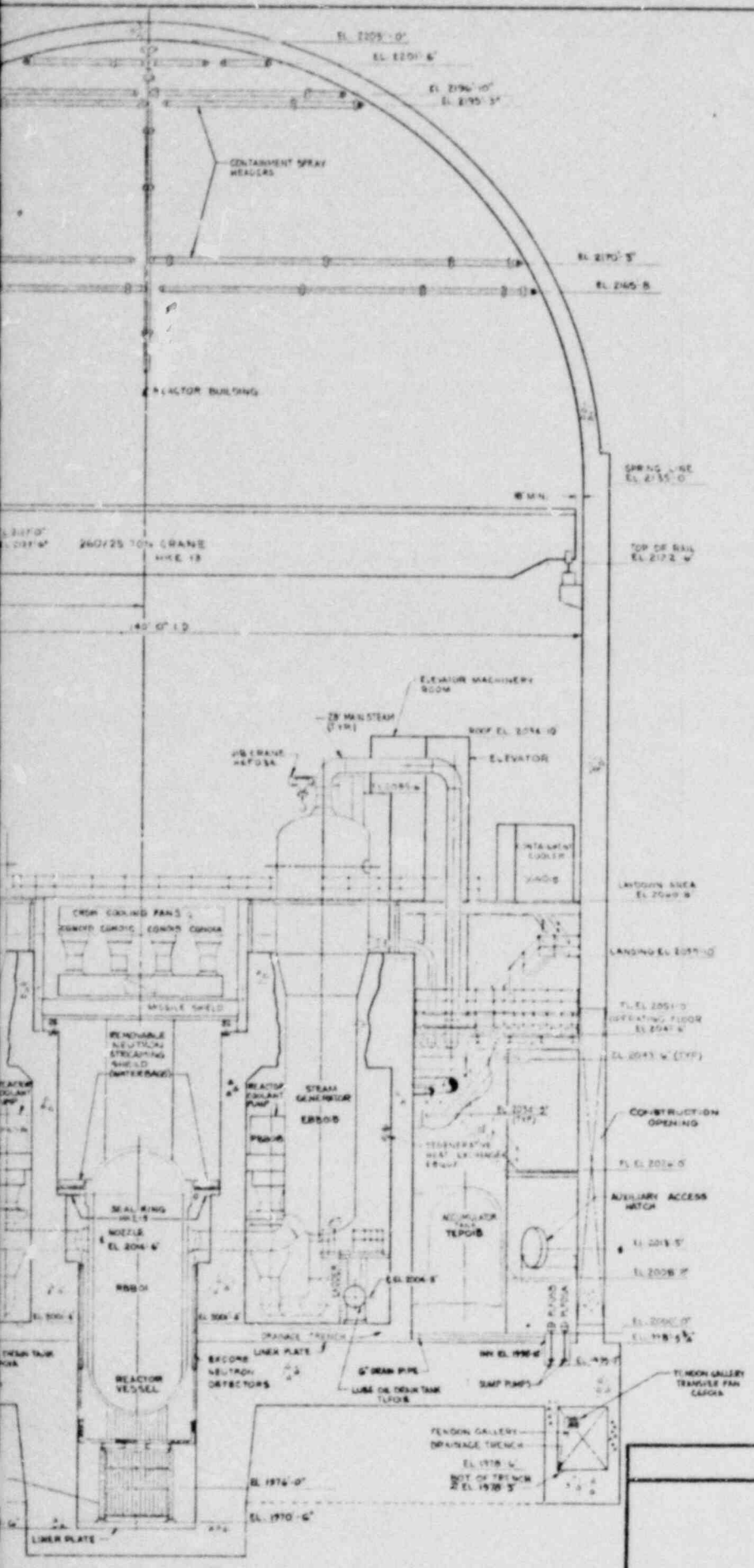


SNUPPS

FIGURE 9
EQUIPMENT LOCATION
REACTOR AND AUXILIARY BUILDING
SECTION C



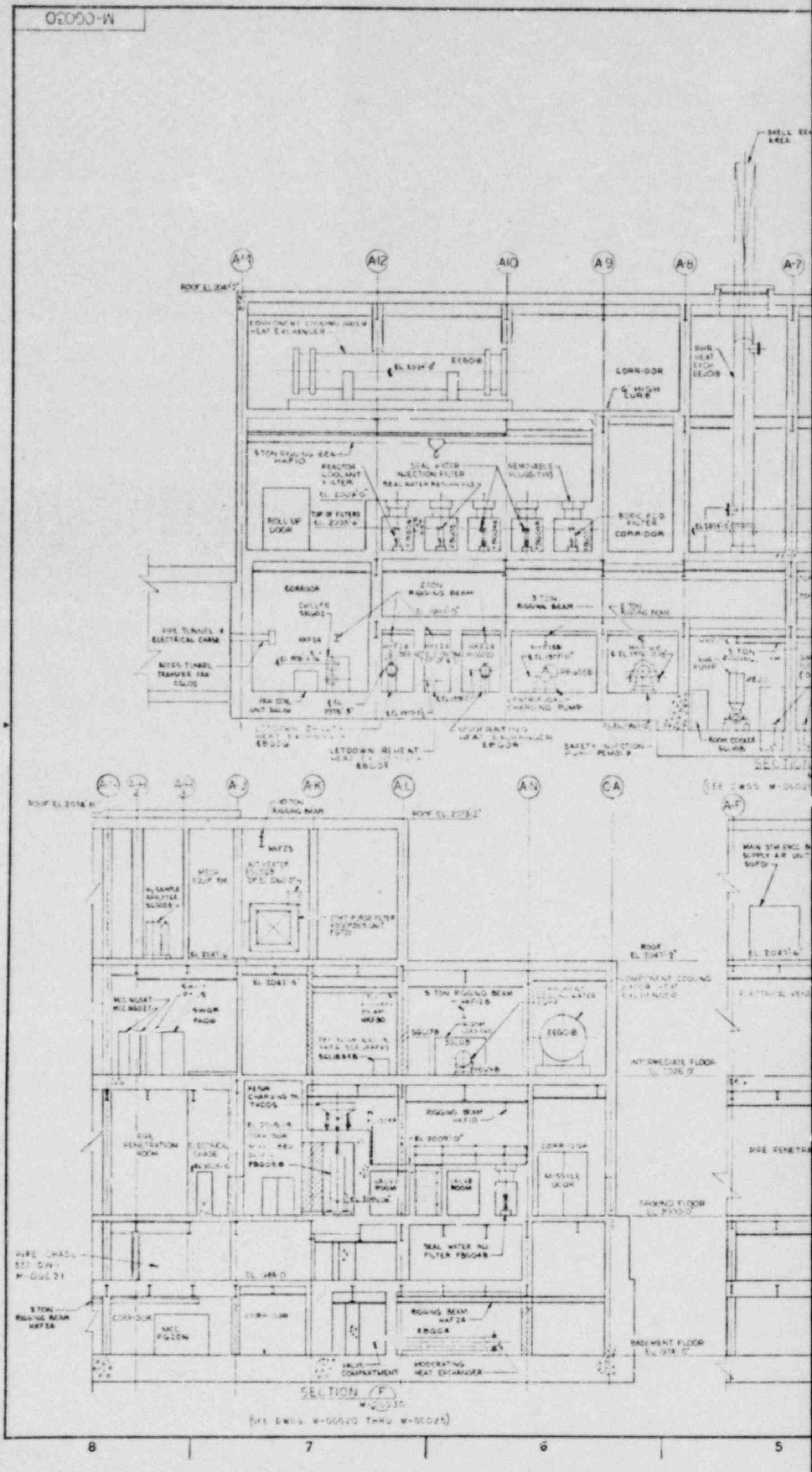
CRANE RAIL
CTMT ATMOS CONTROL FILTER ADSORBER UNIT
JIB CRANE
CONTAINMENT COOLER
ROOF EL 2073'-2"
CONTROL ROOM FILTRATION SYSTEM FILTER/ADSORBER UNIT
ACCESS CONT EXCH FILTER ADSORBER UNIT
PLENUM
18" MAIN FEEDWATER (TYP)
COMPONENT COOLING WATER HEAT EXCH
CORRIDOR
FAN COIL UNIT
6" HIGH CURB
MG SET
STEAM GENERATOR
AUXILIARY BUILDING SAMPLING ROOM
CONTAINMENT SPRAY ADDITIVE TANK
CORRIDOR
ACCUMULATOR TANK
HANDRAIL
LADDER
GROUND FL EL 2000'-0"
EL 1995'-0"
PIPE CHASE
SUMP PUMPS
TENDON GALLERY DRAINAGE TRENCH
INCORE INSTRUMENTATION
SAFETY INJECTION PUMP
CORRIDOR
BOT OF TRENCH
INCORE INSTRUMENTATION TUNNEL
BASEMENT
EL 1967'-0"
SUMP PUMP
RELAY CABINET
8
7
6
5

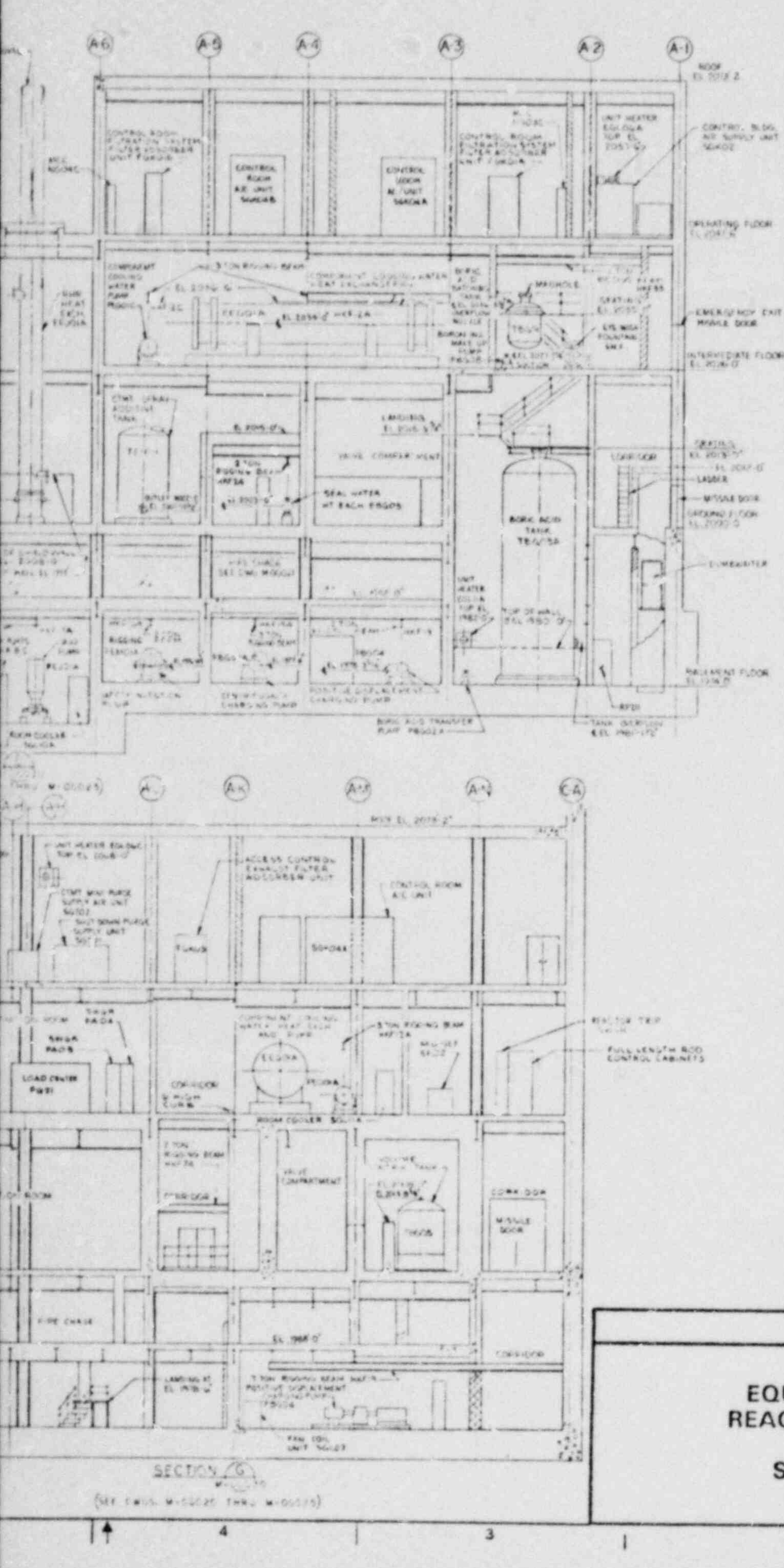


1. RB(1) - CONTAINMENT POLAR CRANE (F-5).
2. RB(2)A,C - CONTAINMENT JIB CRANES (E-4), (B-5).
3. RB(2)C - COMPONENT COOLING WATER PUMP MONORAIL & HOIST (C-7).
4. RB(2)A - CONTAINMENT SPRAY PUMP MONORAIL & HOIST (B-7).

SNUPPS

FIGURE 10
EQUIPMENT LOCATION
REACTOR AND AUXILIARY BUILDING
SECTION D


M-00030
A12
A10
A9
A8
A-7
AJ
AK
AL
AN
CA
A-F
CORRIDOR
ROLL UP DOOR
BORIC ACID FILTER CORRIDOR
CENTRIFUGAL CHARGING PUMP
MODERATING HEAT EXCHANGER
LETDOWN REHEAT HEAT EXCHANGER
INTERMEDIATE FLOOR
PIPE PENETRATION ROOM
ELECTRICAL CHASE
VALVE ROOM
MISSILE DOOR
GROUND FLOOR
SEAL WATER INJ FILTER
RIGGING BEAM
VALVE COMPARTMENT
BASEMENT FLOOR
SECTION (F)
(SEE DWGS M-00020 THRU M-00025)
8
7
6
5



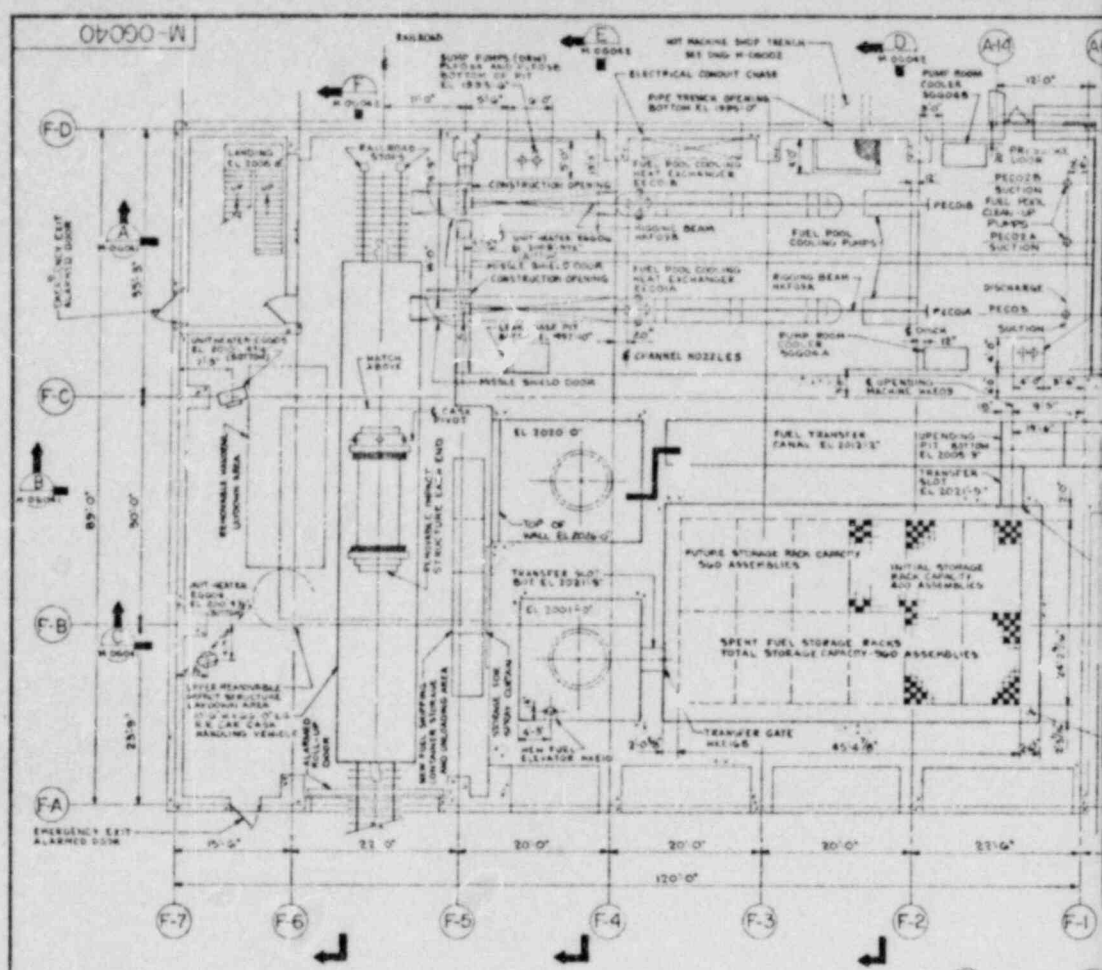
1. KLF10 - AUXILIARY BUILDING FILTER ROOM MONORAIL & HOIST (F-6), (A-6).
2. HKF12A-C - COMPONENT COOLING WATER PUMP MONORAIL & HOIST (G-6), (C-4), (C-6).
3. HKF15A,B - CENTRIFUGAL CHARGING PUMP MONORAIL & HOIST (E-4), (F-6).
4. HKF16A,B - SAFETY INJECTION PUMP MONORAIL & HOIST (E-4), (E-6).
5. HKF17A,B - RHR PUMP MONORAIL & HOIST (E-5).
6. HKF19 - RECIPROCATING CHARGING PUMP MONORAIL & HOIST (E-3), (A-3).
7. HKF23 - AUXILIARY BUILDING HVAC MONORAIL & HOIST (D-7).
8. HKF24 - MOD. HEAT EXCHANGE MONORAIL & HOIST (E-4), (F-4), (B-4), (A-8).
9. HKF30 - RESIN CHARGING TANK AREA MONORAIL & HOIST (C-7).
10. HKF33 - BORIC ACID BATCH TANK MONORAIL & HOIST (G-3).

BLOCKOUT
BLOCK WALL

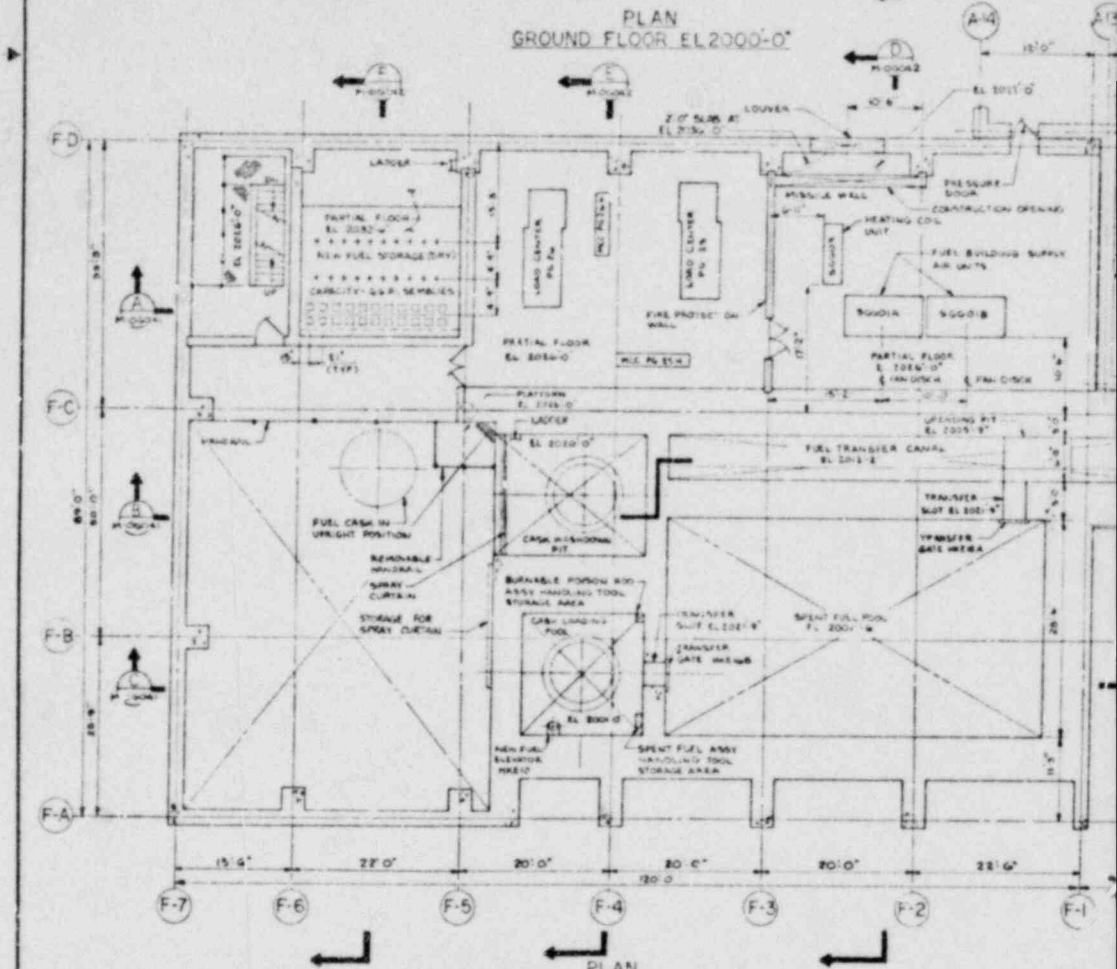
SNUPPS

FIGURE 11
EQUIPMENT LOCATION
REACTOR AND AUXILIARY
BUILDING
SECTIONS E, F, & G

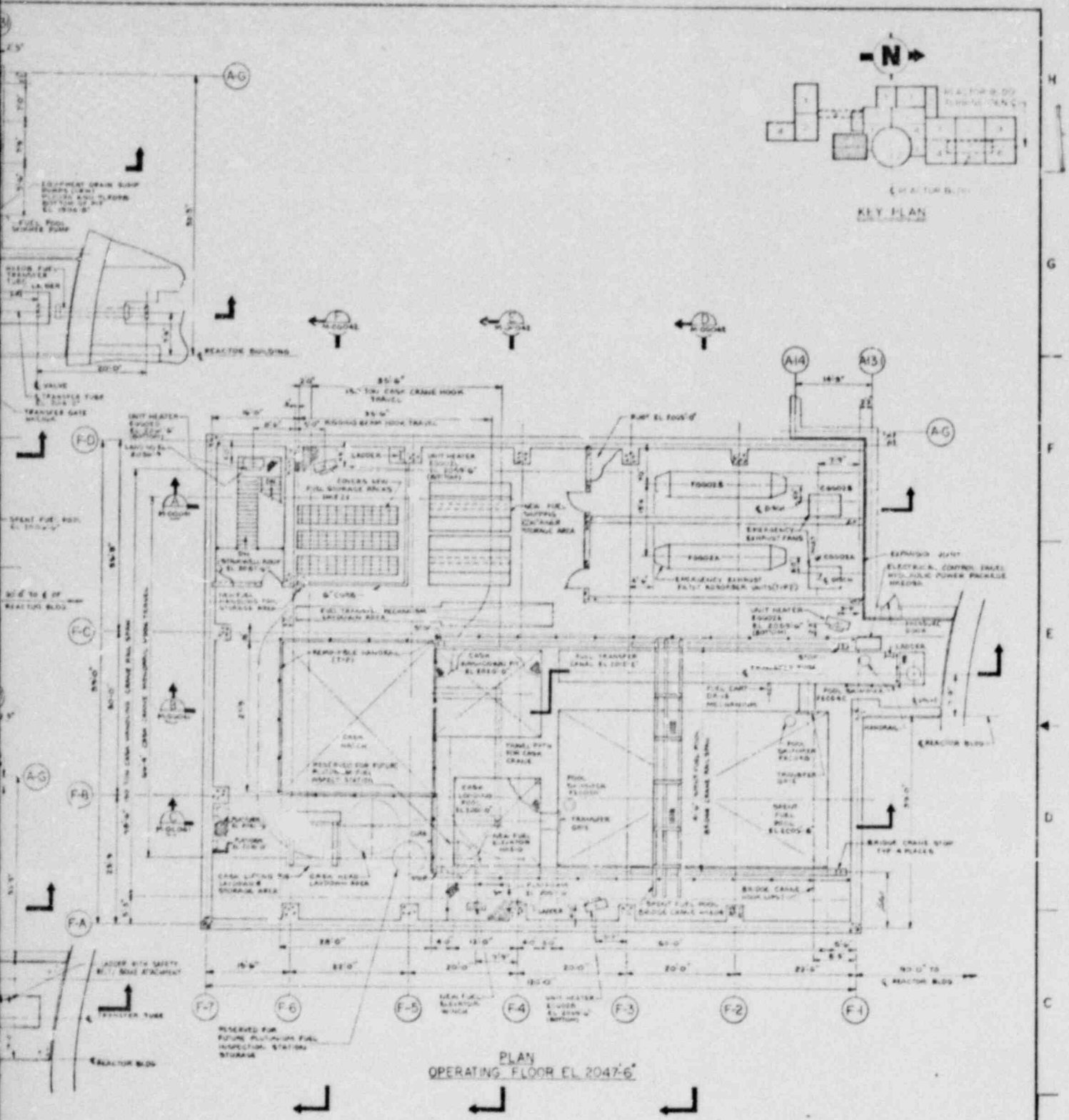
M-06040



PLAN
GROUND FLOOR EL 2000'-0"



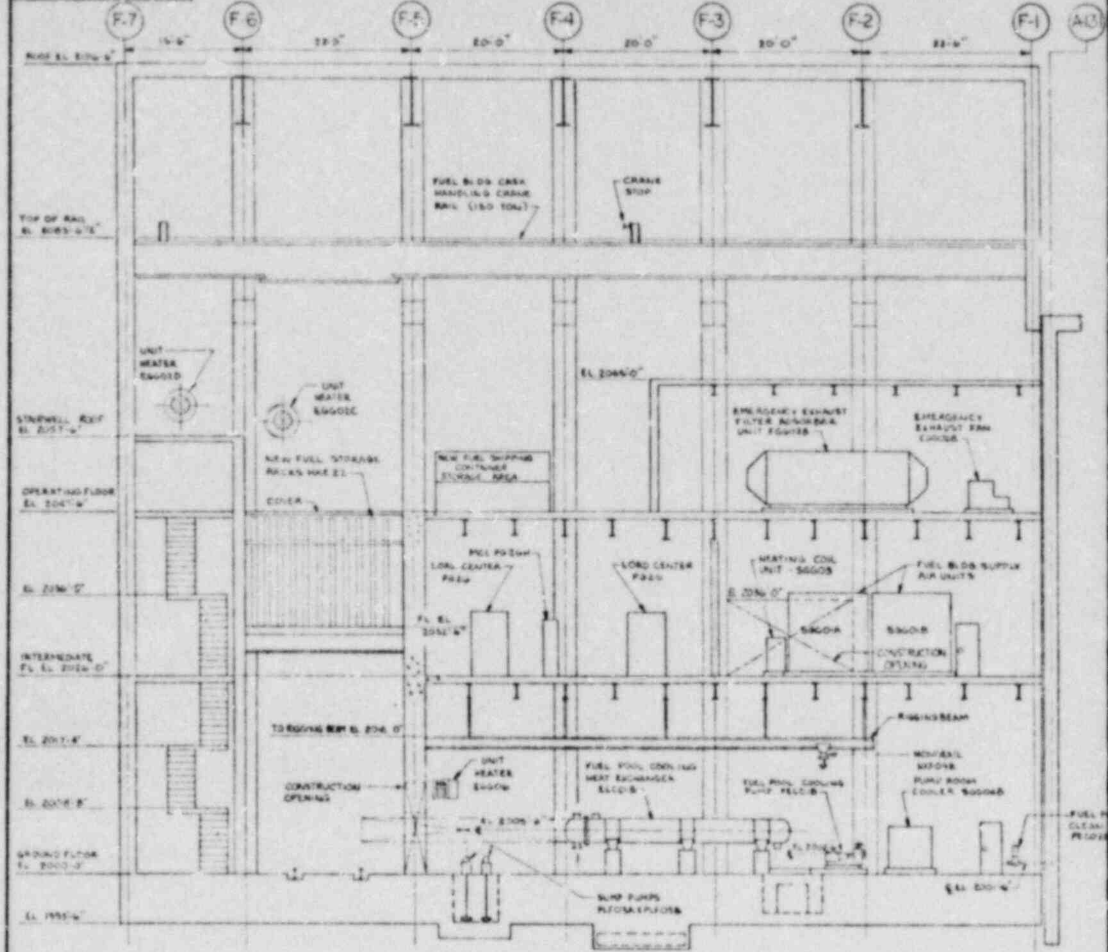
PLAN
INTERMEDIATE FLOOR EL 2026'-0"



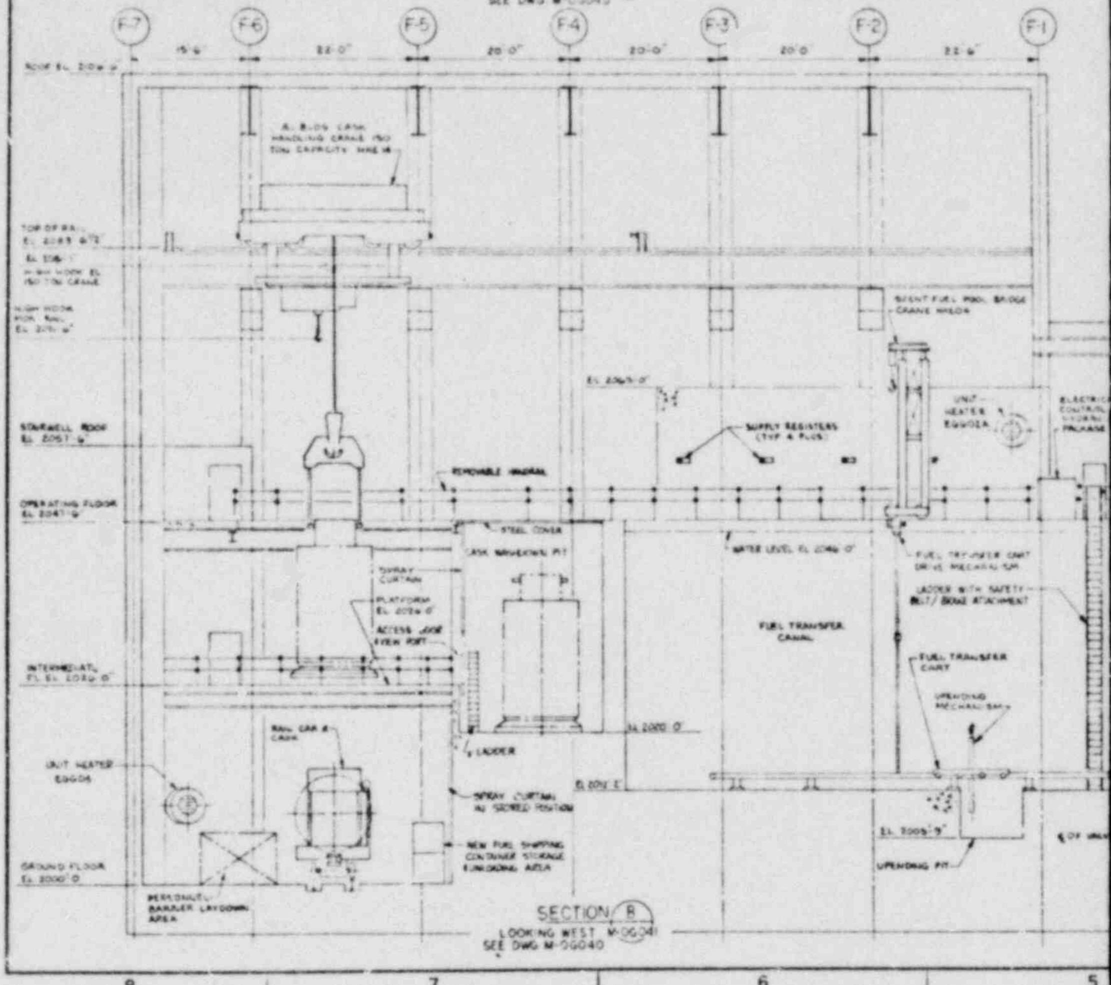
SNUPPS

FIGURE 12
EQUIPMENT LOCATION
FUEL BUILDING PLAN
ELEVATION 2000'-0", 2026'-0" &
2047'-6"

M-0G041

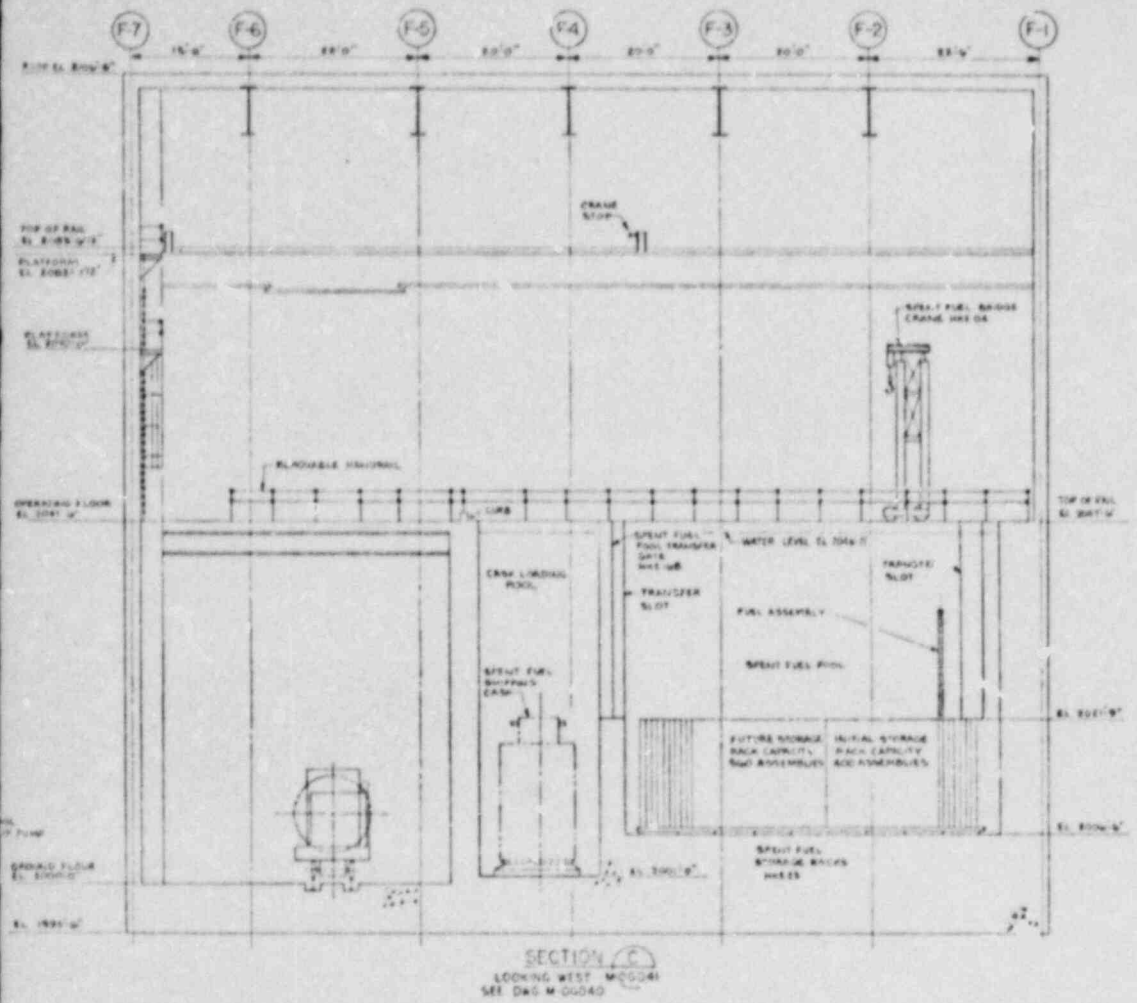


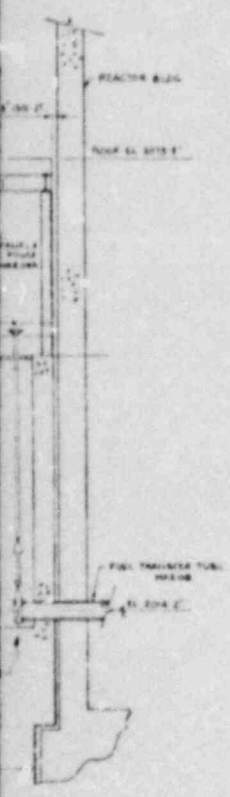
SECTION A
LOOKING WEST M-0G041
SEE DWG M-0G040



SECTION B
LOOKING WEST M-0G041
SEE DWG M-0G040

8 | 7 | 6 | 5



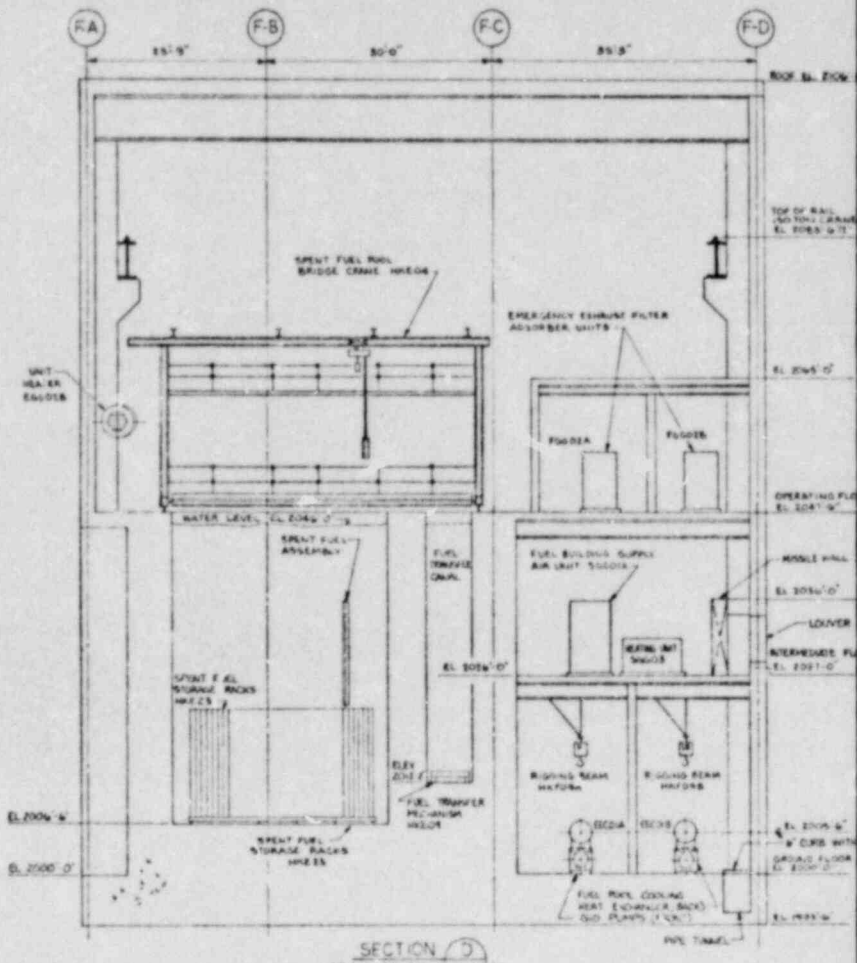


1. MH-04 - SPENT FUEL POOL BRIDGE CRANE (F-7), (C-6).
2. MH-14 - FUEL HOIST ON CASK HANDLING CRANE (C-7), (F-7).
3. MH-09 - FUEL POOL GOR... MONORAIL & HOIST (E-6).

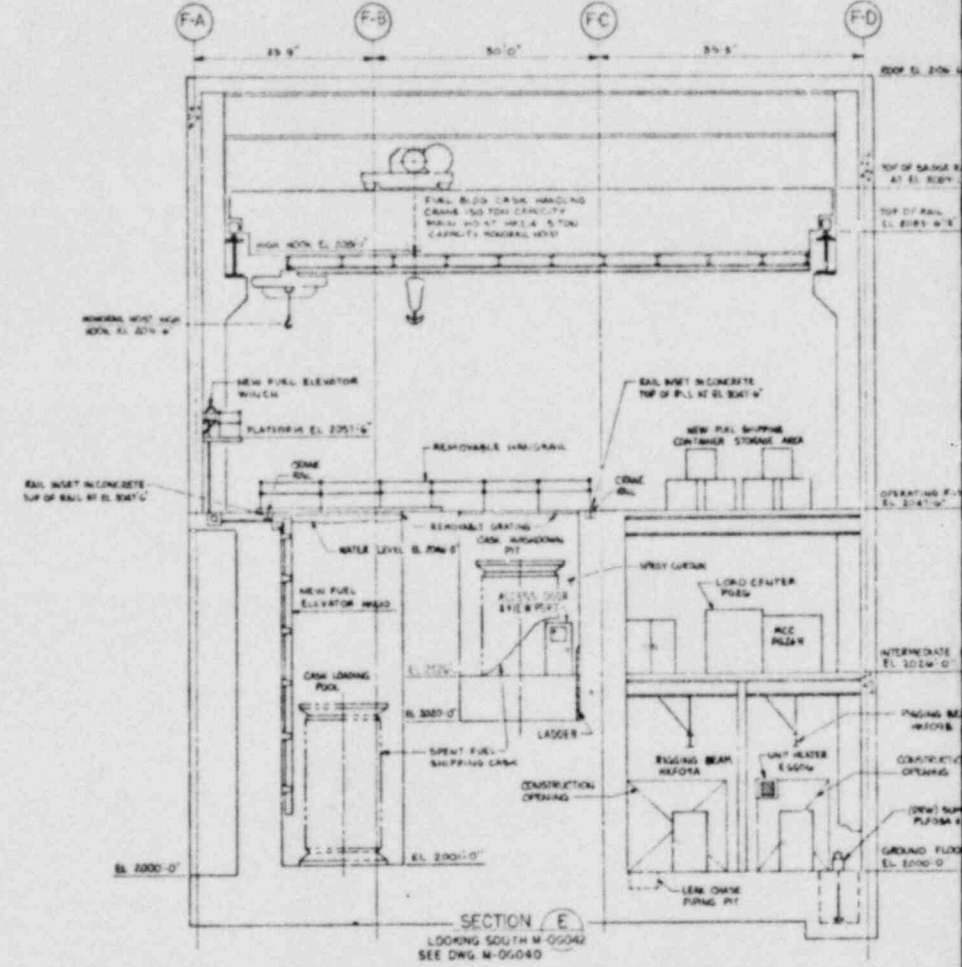
SNUPPS

FIGURE 13
EQUIPMENT LOCATION
FUEL BUILDING
SECTIONS A, B, & C

M 06042

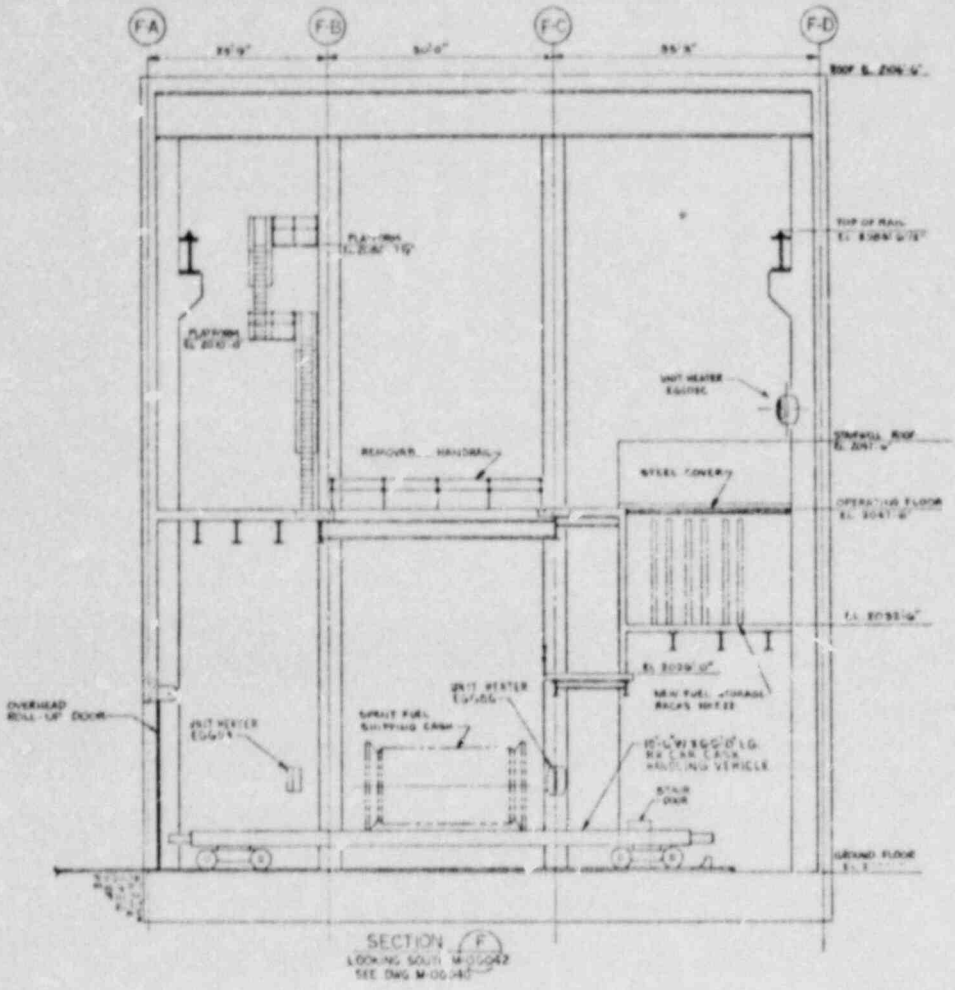


SECTION D
LOOKING SOUTH M-06042
SEE DWG M-06010



SECTION E
LOOKING SOUTH M-06042
SEE DWG M-06040

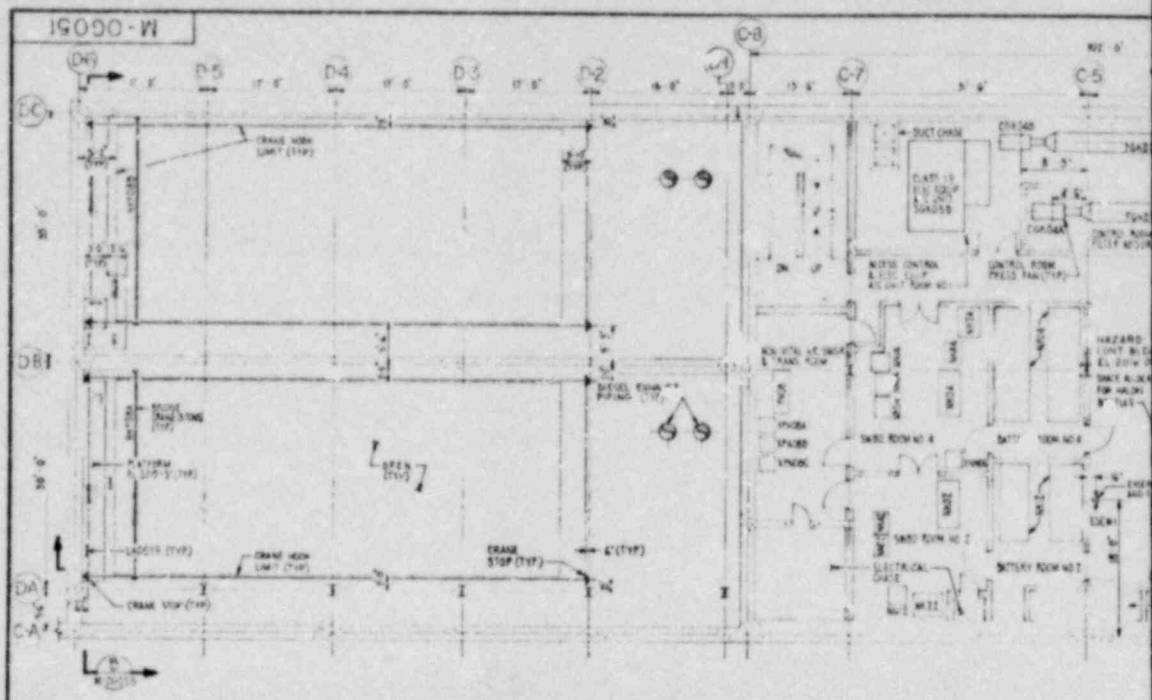
8 7 6



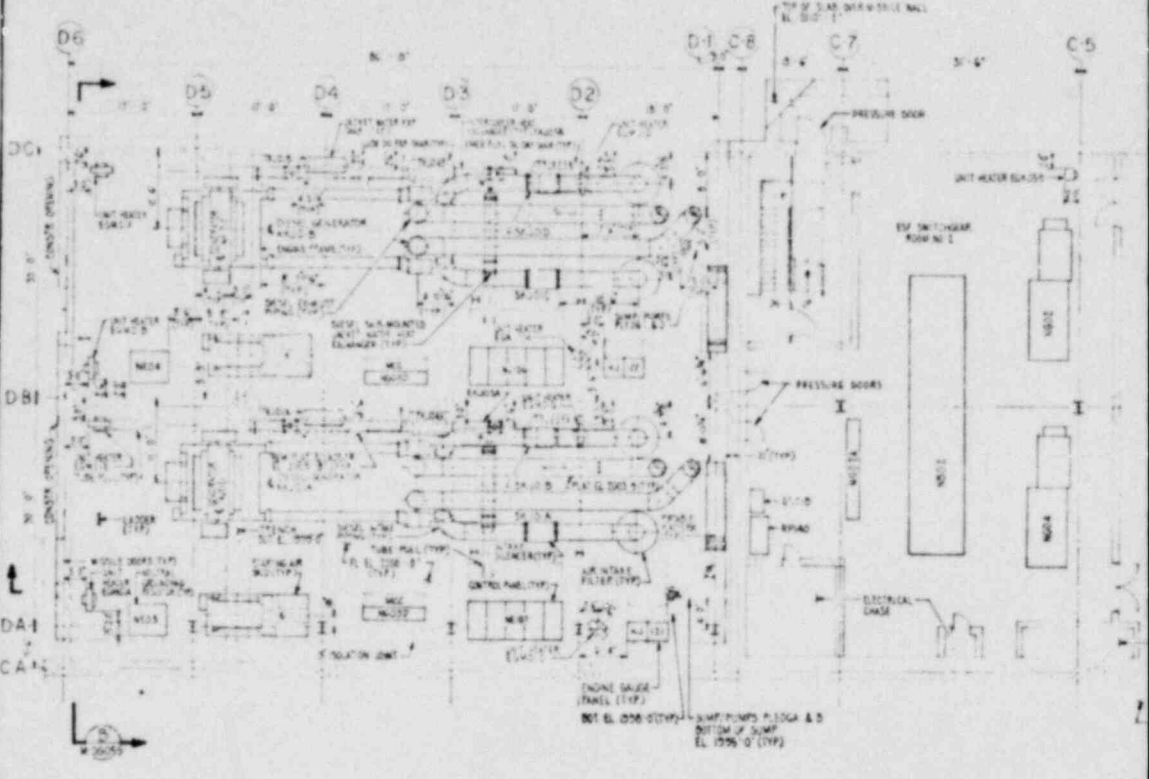
1. [illegible] - SPENT FUEL POOL BRIDGE CRANE (G-7).
2. [illegible] - FUEL BUILDING CASK HANDLING CRANE (G-7).
3. [illegible] - FUEL POOL COOLING PUMP MONORAIL & HOIST (A-6), (E-6).

SNUPPS

FIGURE 14
EQUIPMENT LOCATION
FUEL BUILDING
SECTIONS D, E & F

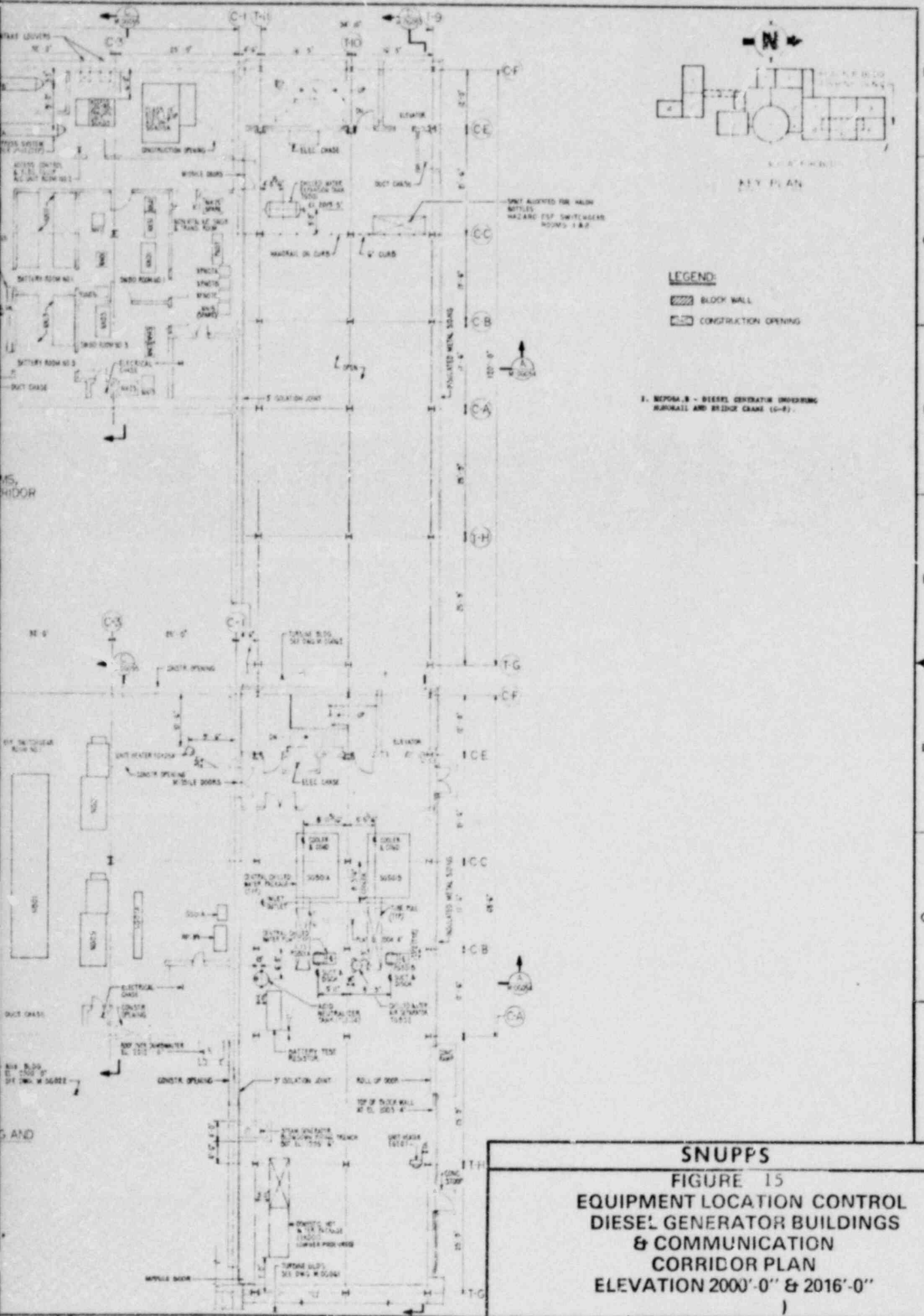


ELECTRICAL & MECHANICAL EQUIPMENT ROO
DIESEL GENERATORS BLDG & COMMUNICATION CO
PLAN EL. 2016'-0"



SWITCHGEAR ROOM, DIESEL GENERATORS BLD
COMMUNICATION CORRIDOR
PLAN EL. 2000'-0"

8 7 6 5

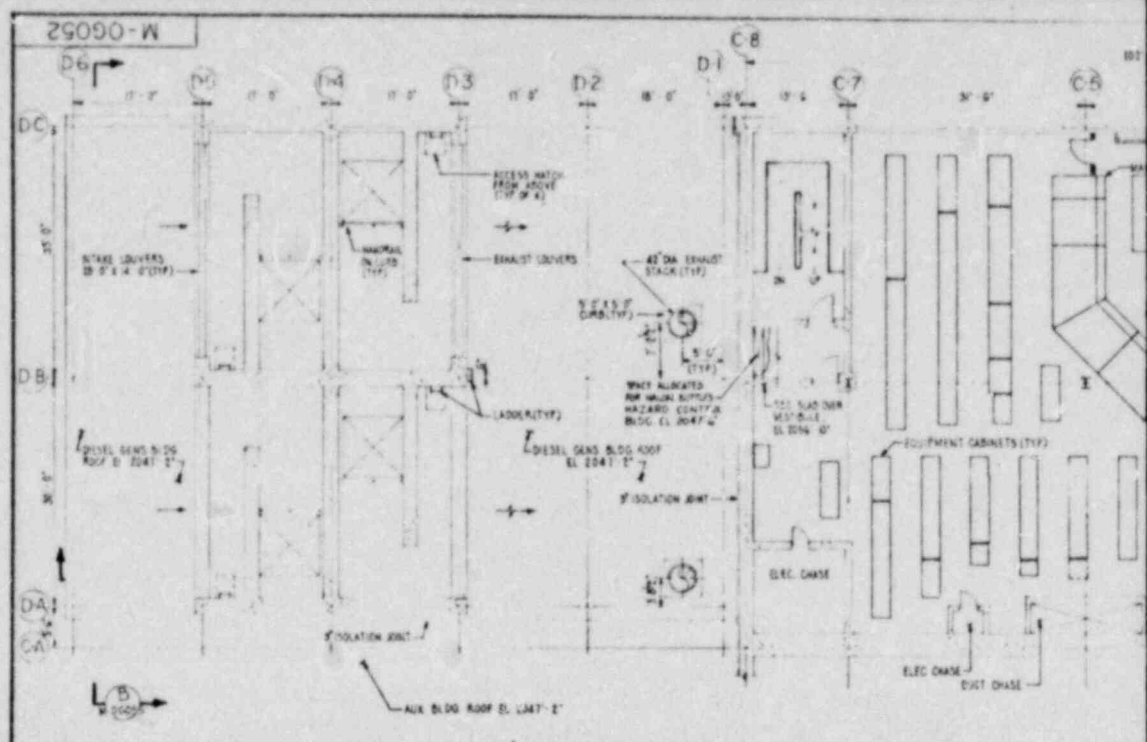


SNUPPS

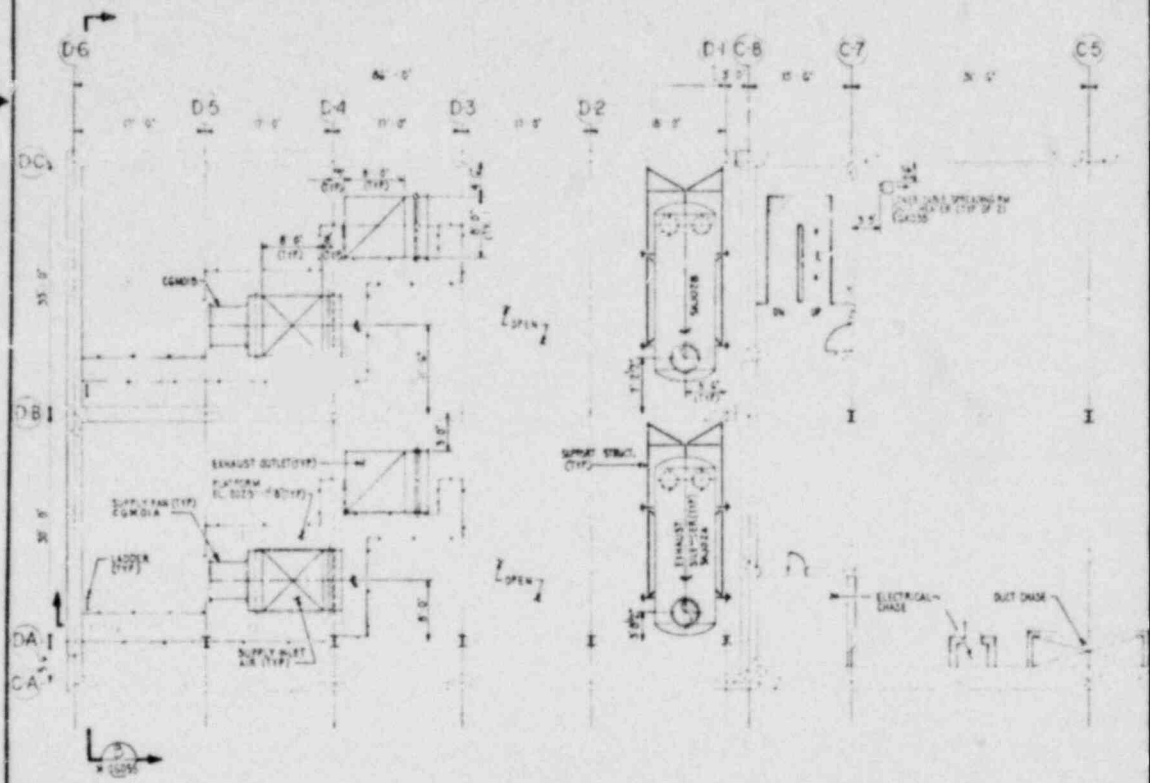
FIGURE 15

EQUIPMENT LOCATION CONTROL DIESEL GENERATOR BUILDINGS & COMMUNICATION CORRIDOR PLAN ELEVATION 2000'-0" & 2016'-0"

M-06052

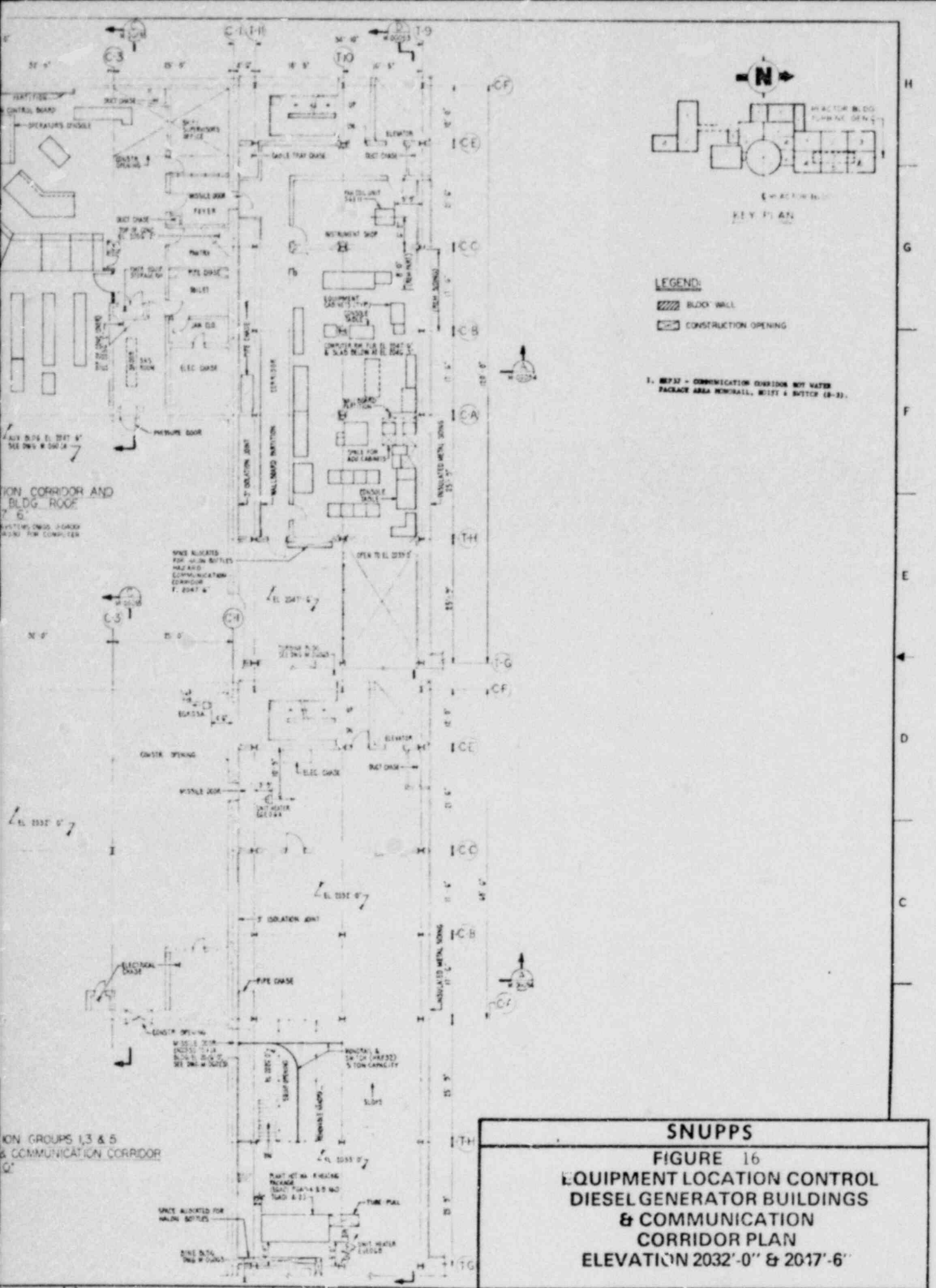


CONTROL ROOM, COMMUNICA
DIESEL GENERATOR
PLAN EL 20



LOWER CABLE SPREADING SEPARA
DIESEL GENERATORS BLDG EQUIP ROOM
PLAN EL 2032

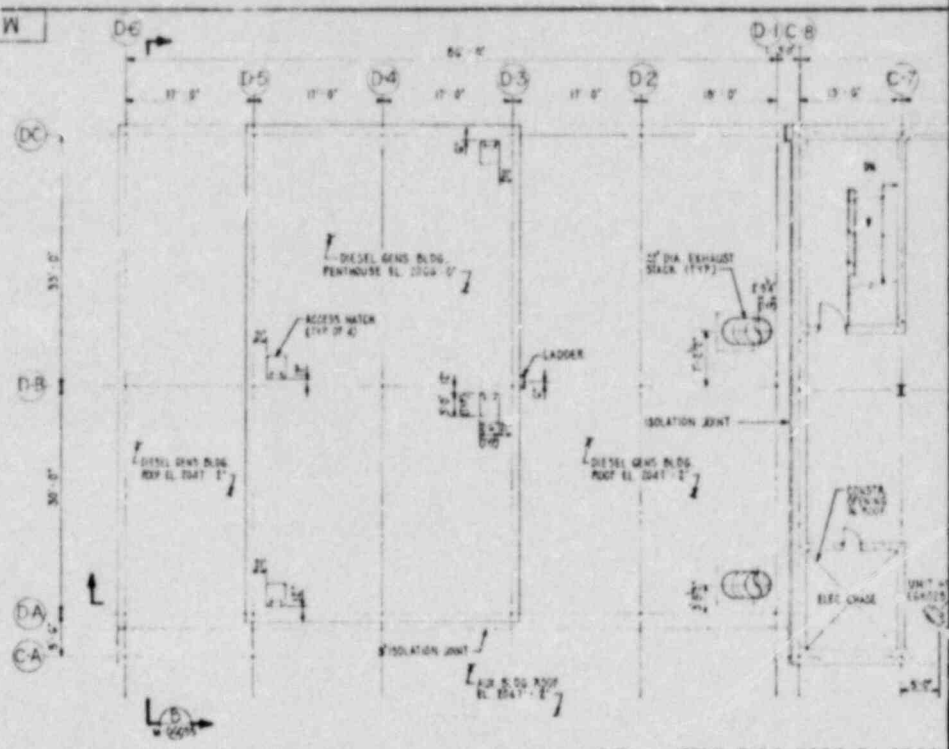
8 | 7 | 6 | 5



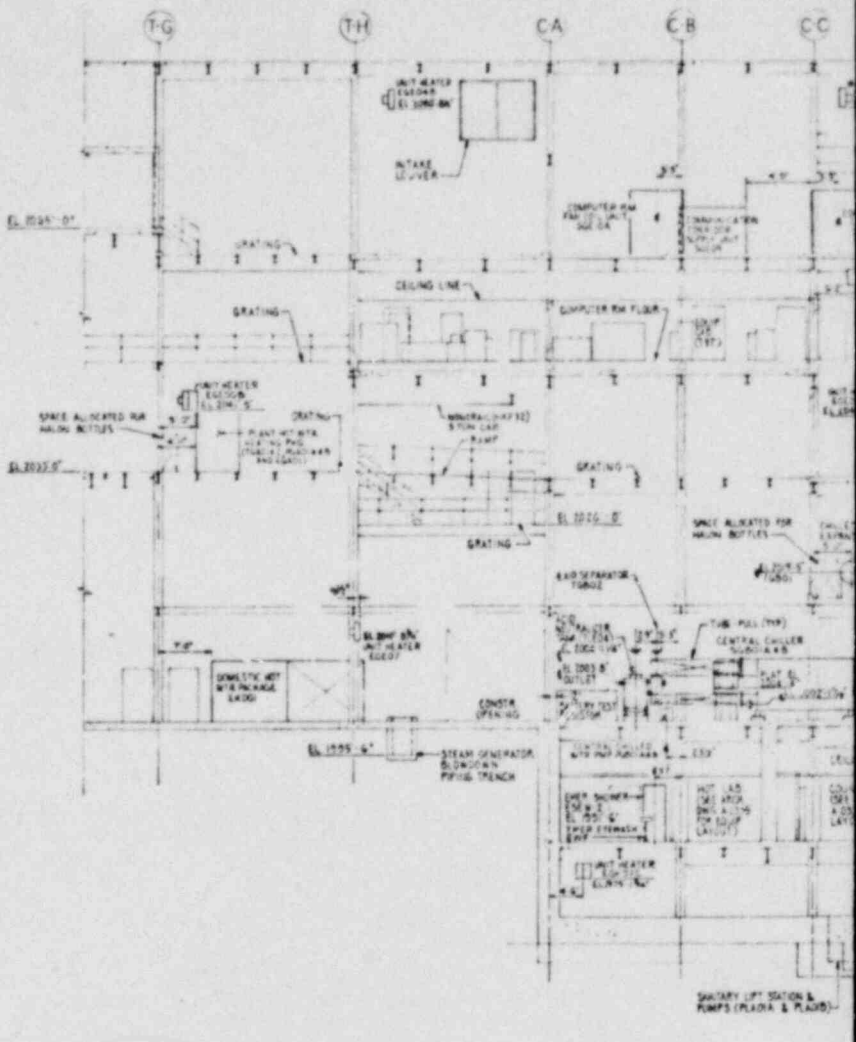
SNUPPS

FIGURE 16
EQUIPMENT LOCATION CONTROL DIESEL GENERATOR BUILDINGS & COMMUNICATION CORRIDOR PLAN ELEVATION 2032'-0" & 2047'-6"

M-00053

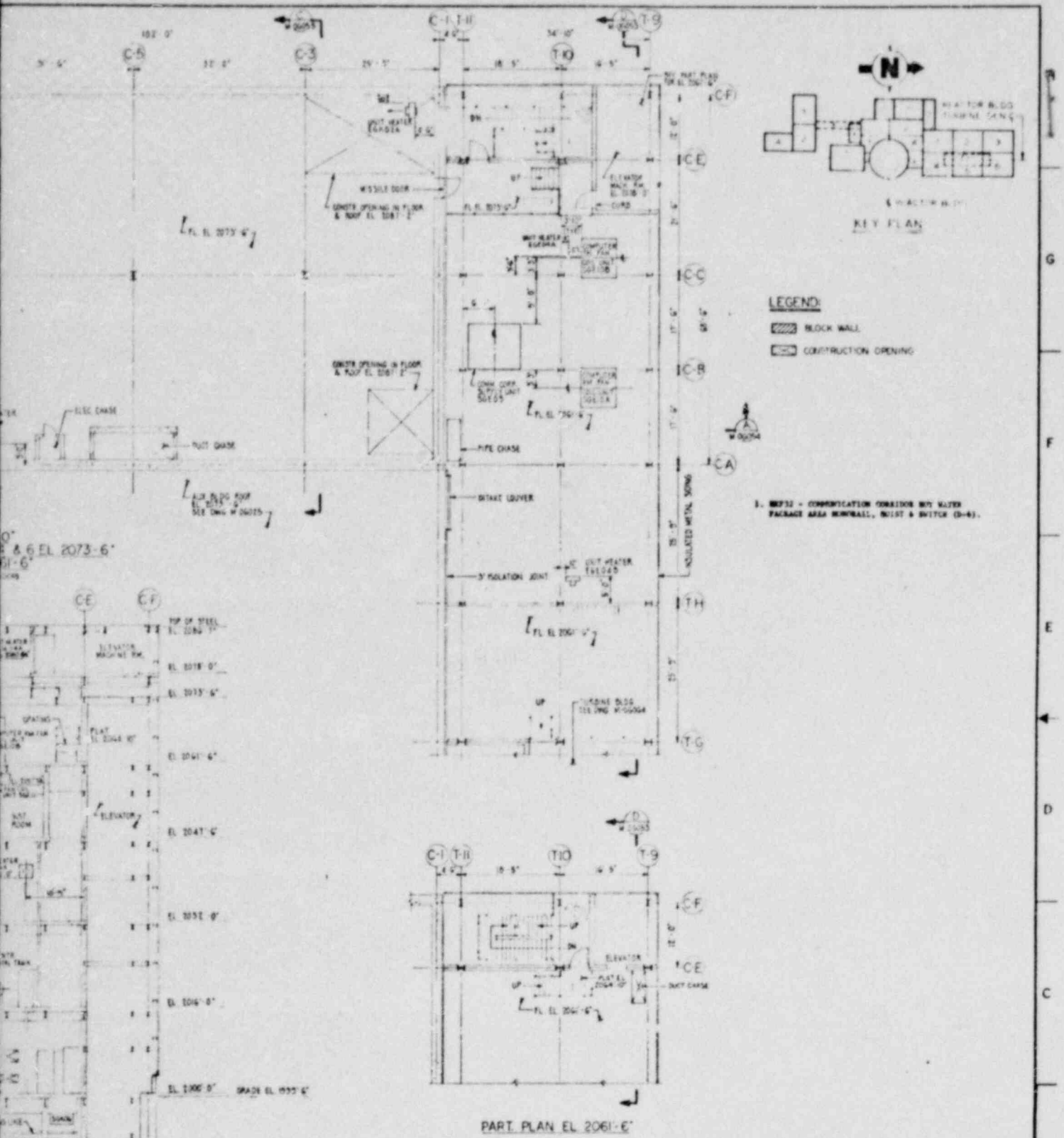


DIESEL GENS BLDG ROOF EL 2066'
UPPER CABLE SPREADING SEPARATION GROUPS 2
AND COMMUNICATION CORRIDOR EL. 2



SECTION (D)
LOOKING SOUTH
(SEE DWGS M-00050 THRU M-00053)

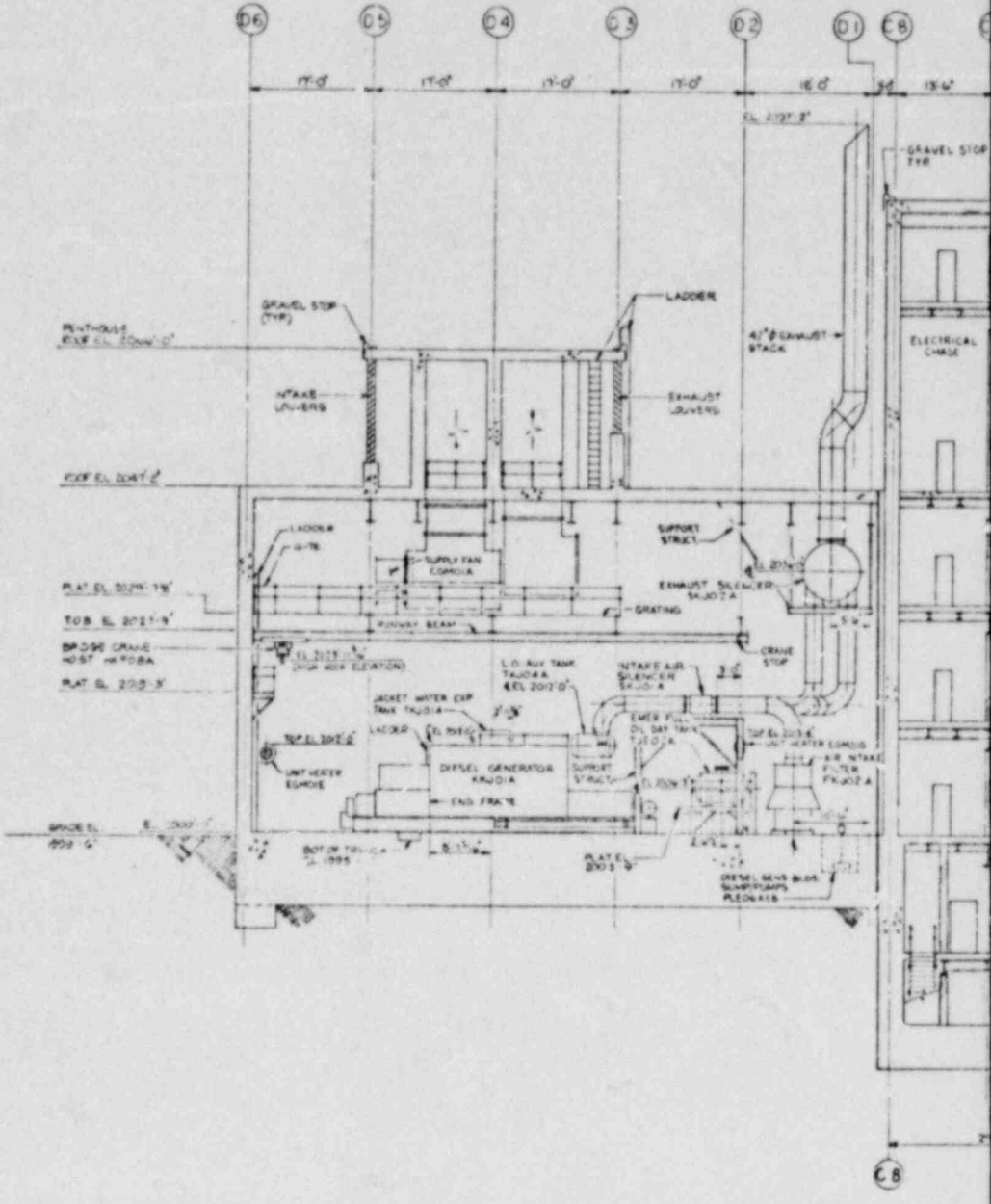
8 | 7 | 6 | 5



SNUPPS

FIGURE 17
EQUIPMENT LOCATION CONTROL
DIESEL GENERATOR BUILDINGS
& CORRIDOR PLAN ELEVATION
2061'-6", 2066'-0" & 2073'-6" &
SECTION D

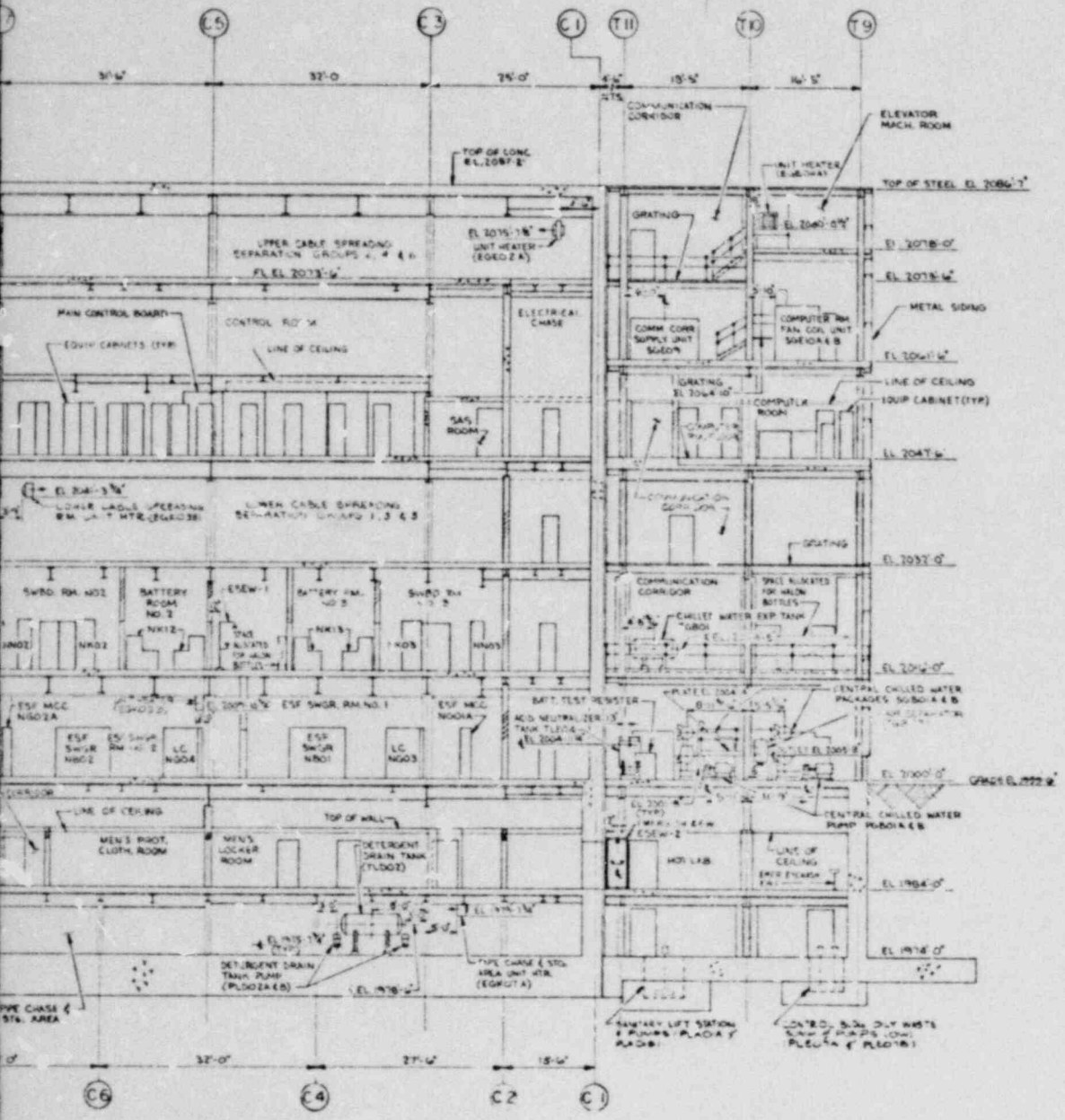
M-00054



SECTION

(SEE DWG'S. M-00050

8 7 6

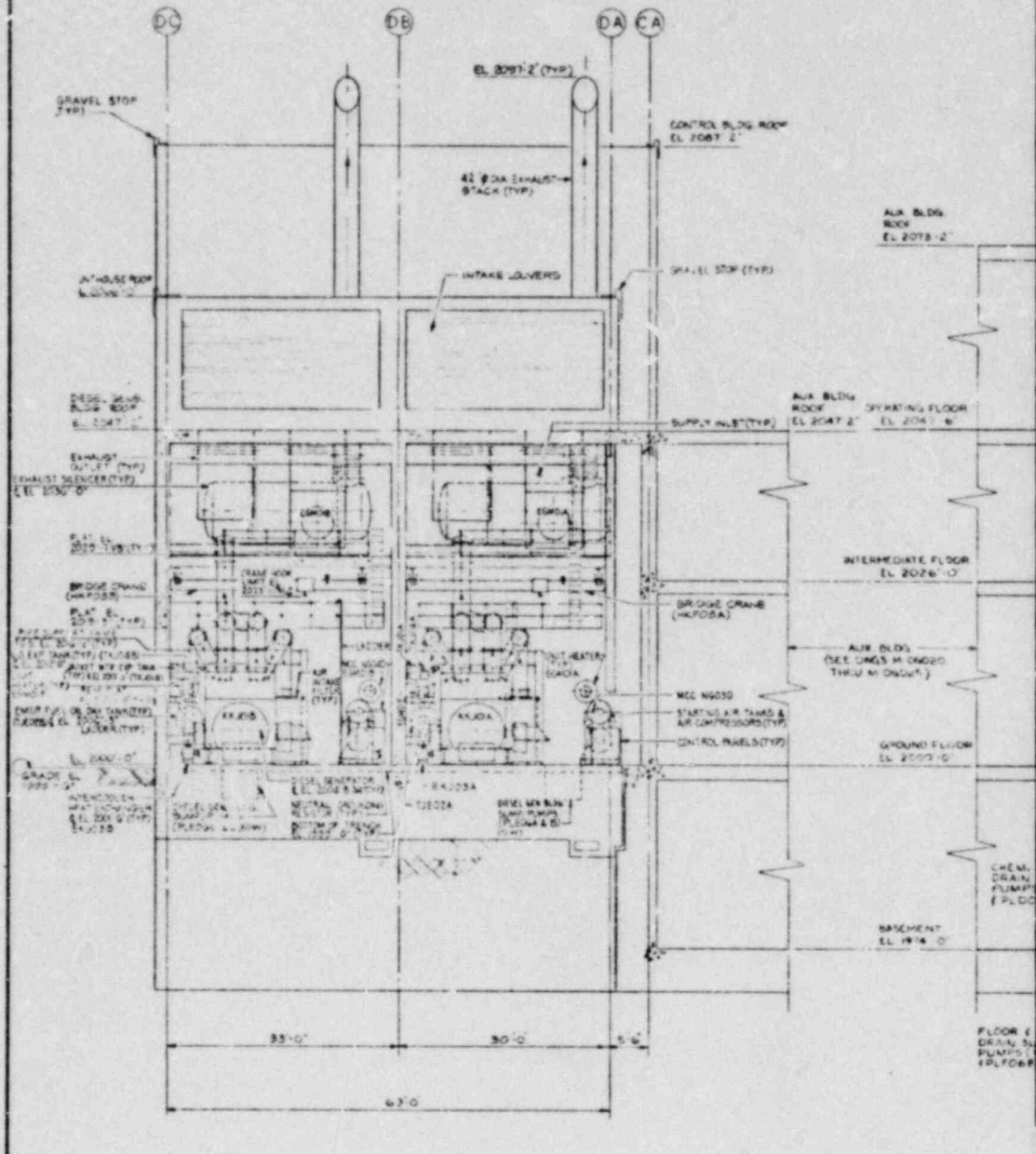


*. MP046 - DIESEL GENERATOR ENCLOSING MONORAIL & BRIDGE CRANE (E-7).

SNUPPS

FIGURE 18
EQUIPMENT LOCATION
CONTROL DIESEL
GENERATOR BUILDING &
COMMUNICATION CORRIDOR
SECTION A

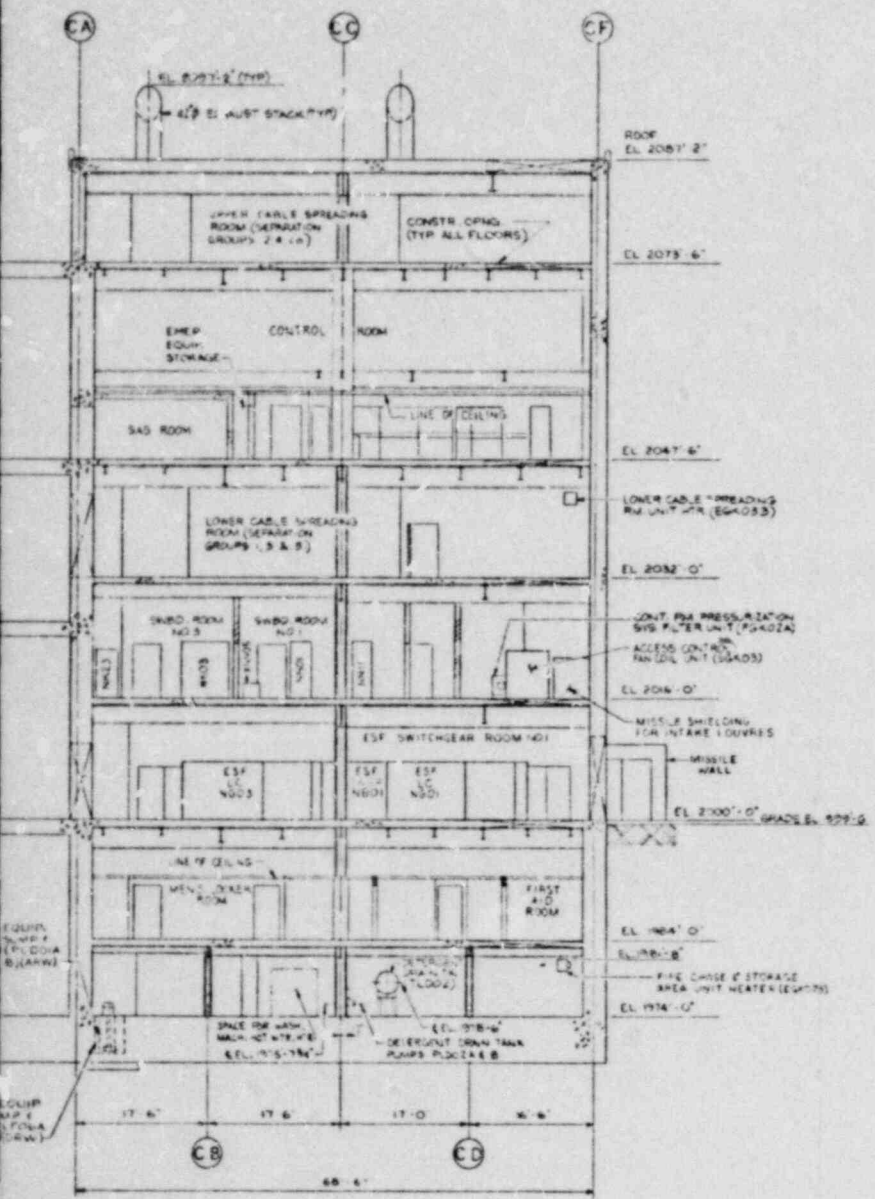
M-06055



SECTION B
LOOKING NORTH M 06055

(SEE DWGS M 06050 THRU M 06053)

8 | 7 | 6 | 5



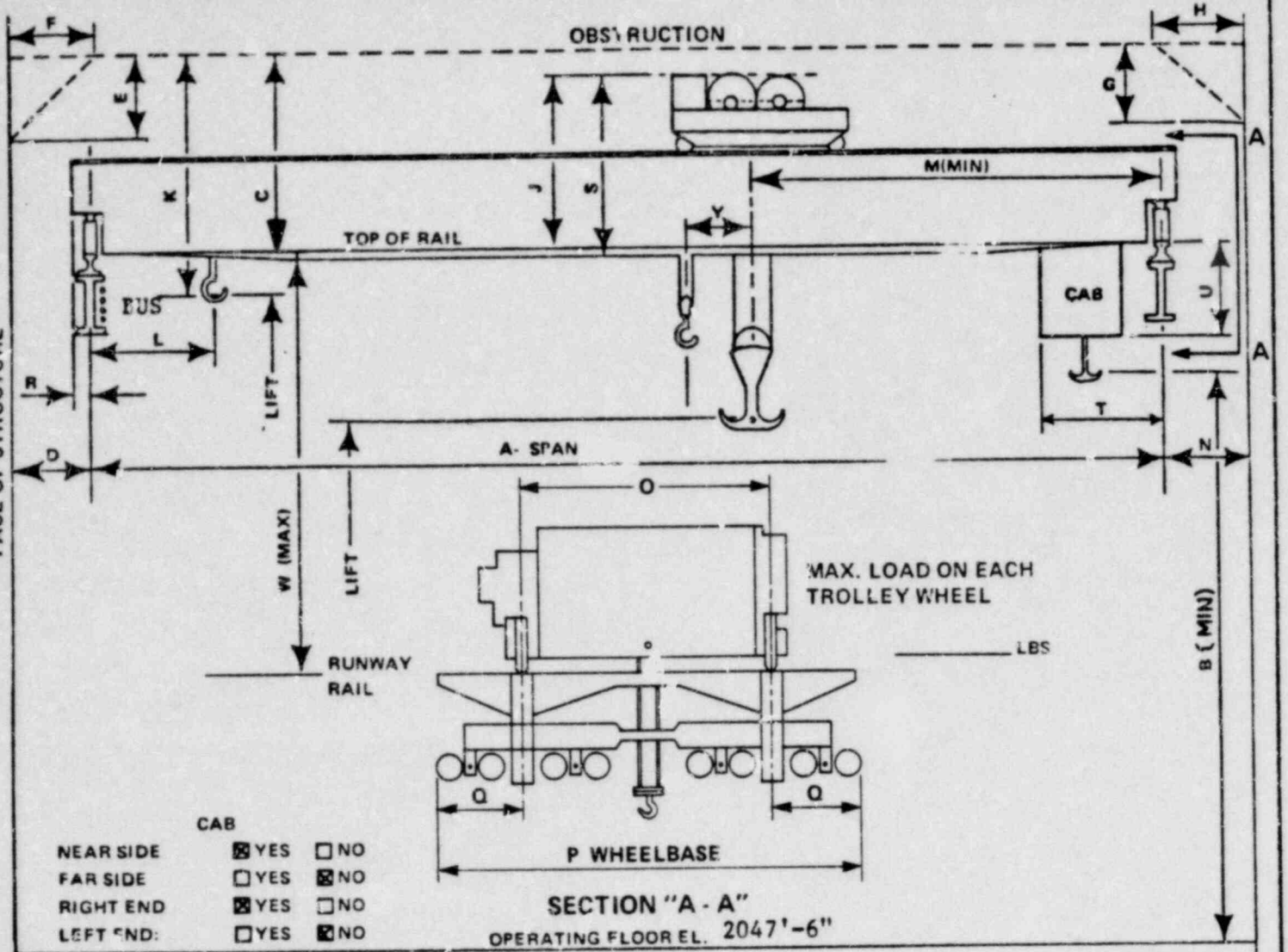
SECTION C
LOOKING SOUTH M 0G055

(SEE DWGS. M 0G050 THRU M 0G053)

1. DEPOSE - DIESEL GENERATOR UNDERSLUNG MONORAIL & BRIDGE CRANE (E-7).

SNUPPS

FIGURE 19
EQUIPMENT LOCATION
CONTROL DIESEL
GENERATOR BUILDING
SECTIONS B & C



SECTION "A - A"

OPERATING FLOOR EL. 2047'-6"

CAPACITY - MAIN 260 TONS
CAPACITY - AUX. 25 TONS
LIFT - MAIN 127 FT 0 IN
LIFT - AUX. 154 FT 0 IN
A 134 FT 0 IN
B 72 FT 10 IN (HIGH HOOK)
C N/A FT N/A IN
D 3 FT 0 IN
E 0 FT 0 IN
F 0 FT 0 IN
G 0 FT 0 IN

H 0 FT 0 IN
J 18 FT 6 IN
K N/A FT N/A IN
L 9 FT 9 IN
M 9 FT 6 IN
N 3 FT 0 IN
O 25 FT 0 IN
P 45 FT 0 IN
Q 10 FT 0 IN
R 1 FT 6 IN
S FT IN
T 14 FT 9 IN

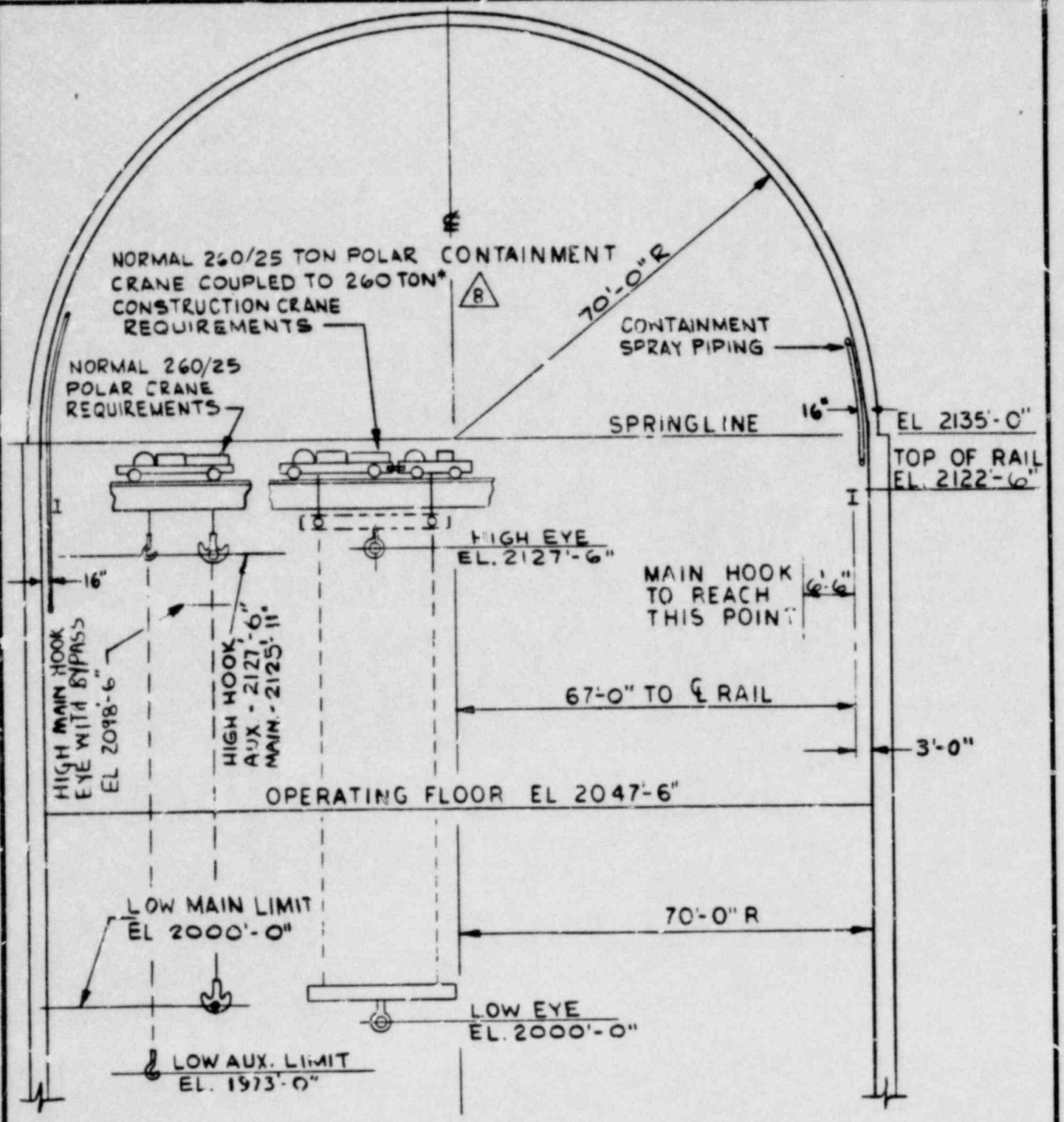
U 9 FT 0 IN
W 121 FT 0 IN
Y 4 FT 6 IN
LENGTH OF MAIN LINE RUNWAY N/A FT N/A IN
MAX. LOAD ON EACH WHEEL 180,300 LBS
RUNWAY RAIL 175 LBS

NOTE: "NEAR SIDE" & "LEFT/RIGHT" - FACING CRANE DRIVE SIDE.
Top of Rail Elevation 2122'-6" "N" is 1'-8" to Obstruction

SNUPPS

FIGURE 20

ARRANGEMENT DRAWING CONTAINMENT BUILDING POLAR CRANE



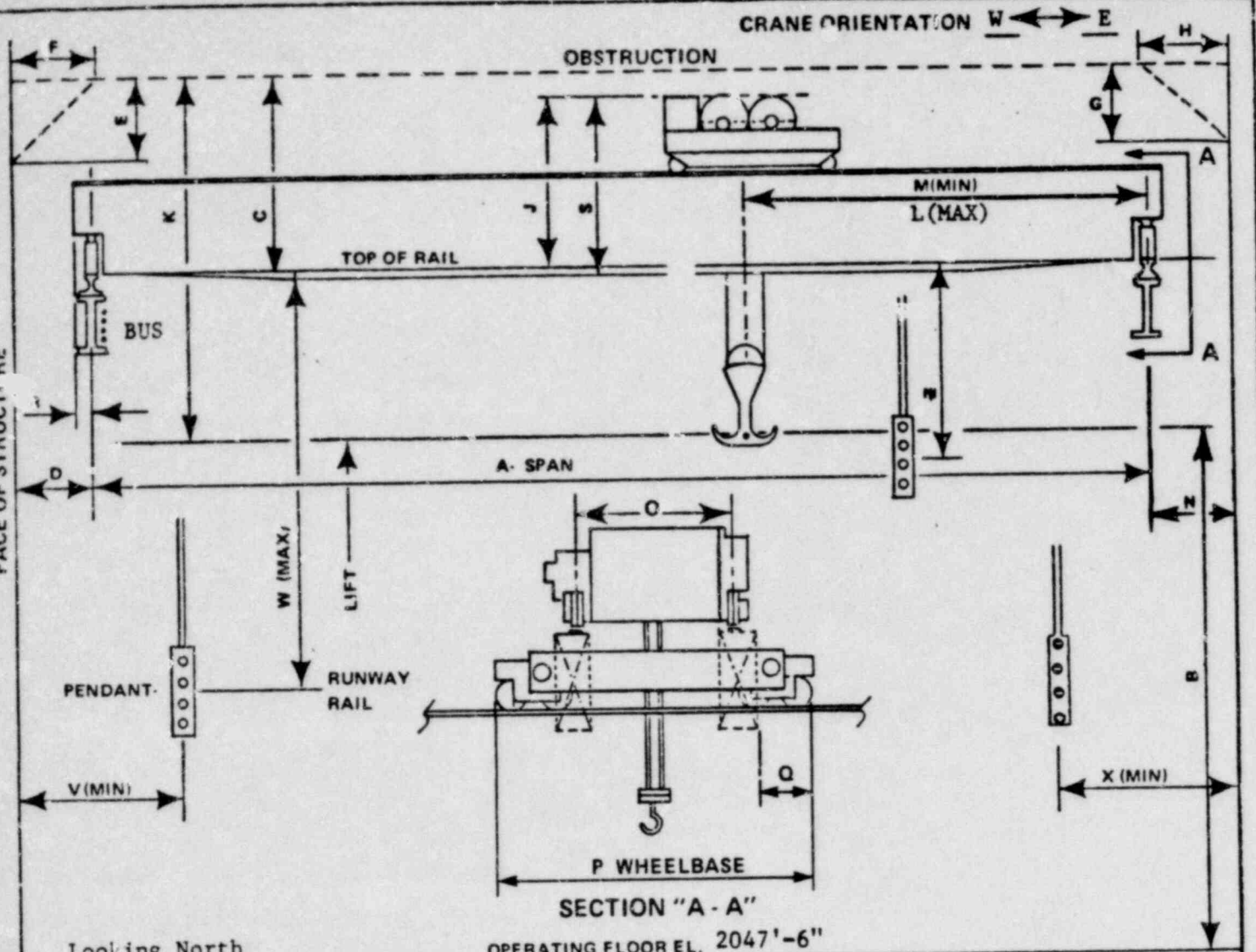
ACCESS TO CRANE IS AT ELEVATION 2113' 8"

* 260 TON DESIGN, 220 TON RATED

SNUPPS

FIGURE 21

HOOK LIMITS FOR CONTAINMENT BUILDING POLAR CRANE



CAPACITY - MAIN 150 TONS
Aux 5 Tons**

LIFT - MAIN 82 FT 0 IN
Lift-Aux. 71 Ft. 0 In.

A	78 FT 6 IN	H	0 FT 0 IN
B	35 FT 0 IN (HIGH HOOK)	J	11 FT. 8-1/2 IN (MAX. ALLOWABLE)
C	11 FT 11-1/2 IN	K	14 FT 5 IN
D	2 FT 1 IN	L	49 FT 6 IN
E	0 FT 0 IN	M	14 FT 0 IN
F	0 FT 0 IN	N	2 FT 1 IN
G	0 FT 0 IN	O	N/A FT N/A IN
		P	23 FT 0 IN
		Q	N/A FT N/A IN
		R	1 FT 1 IN
		S	N/A FT N/A IN

V	5 FT 1 IN
W	80 FT 6 IN
X	5 FT 1 IN

LENGTH OF MAIN LINE
RUNWAY 100 FT 0 IN
MAX. LOAD ON EACH
WHEEL _____ LBS
RUNWAY RAIL
Size 175 LBS
Z 8 FT 0 IN *

NOTE: "NEAR SIDE" & "LEFT/RIGHT" - FACING CRANE DRIVE SIDE.
Top of Rail - 2083'-6 1/2"

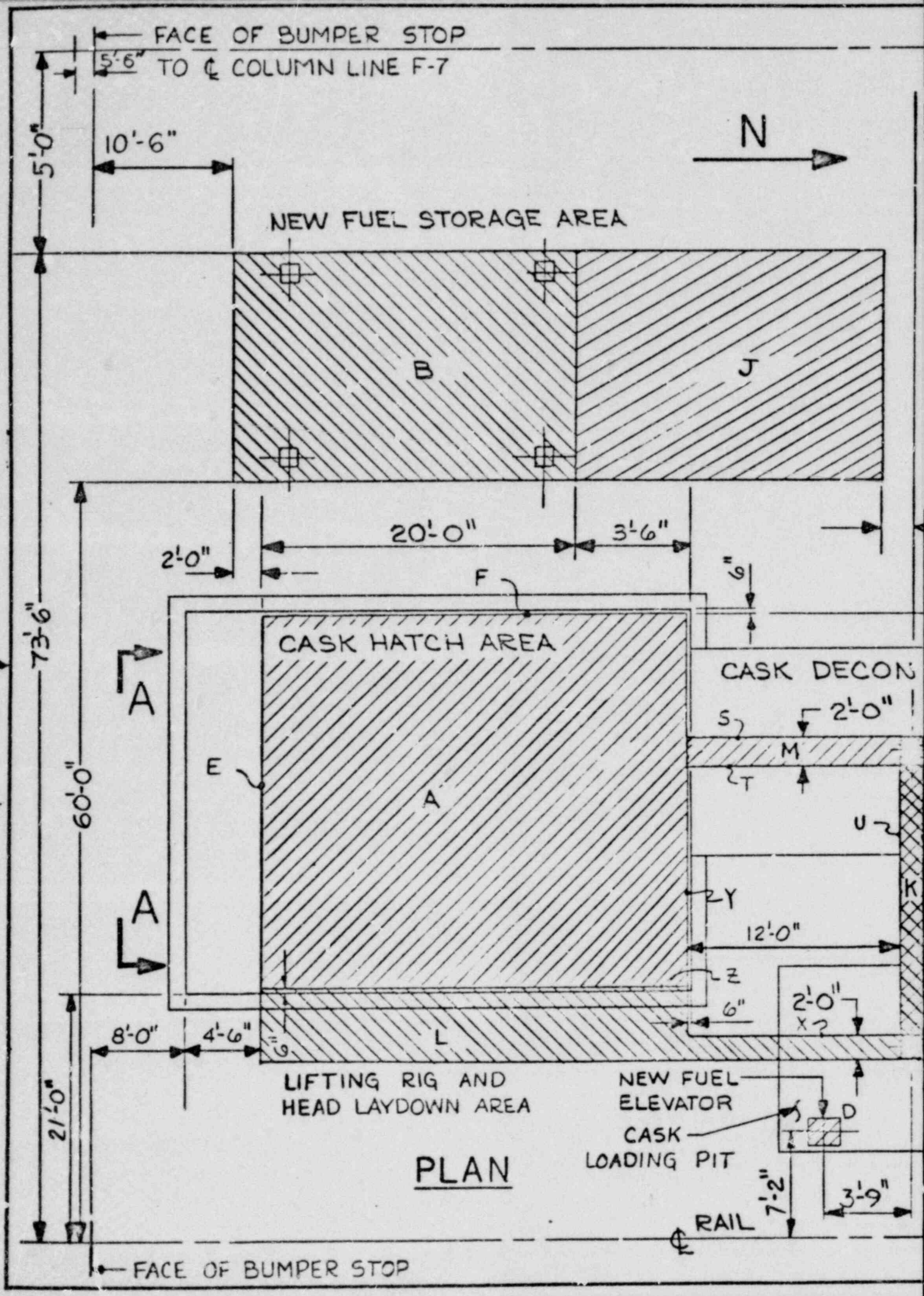
* HIGH PENDANT

** 5 tons, 2 tons over new fuel storage area
Aux. hoist is bridge mounted monorail system

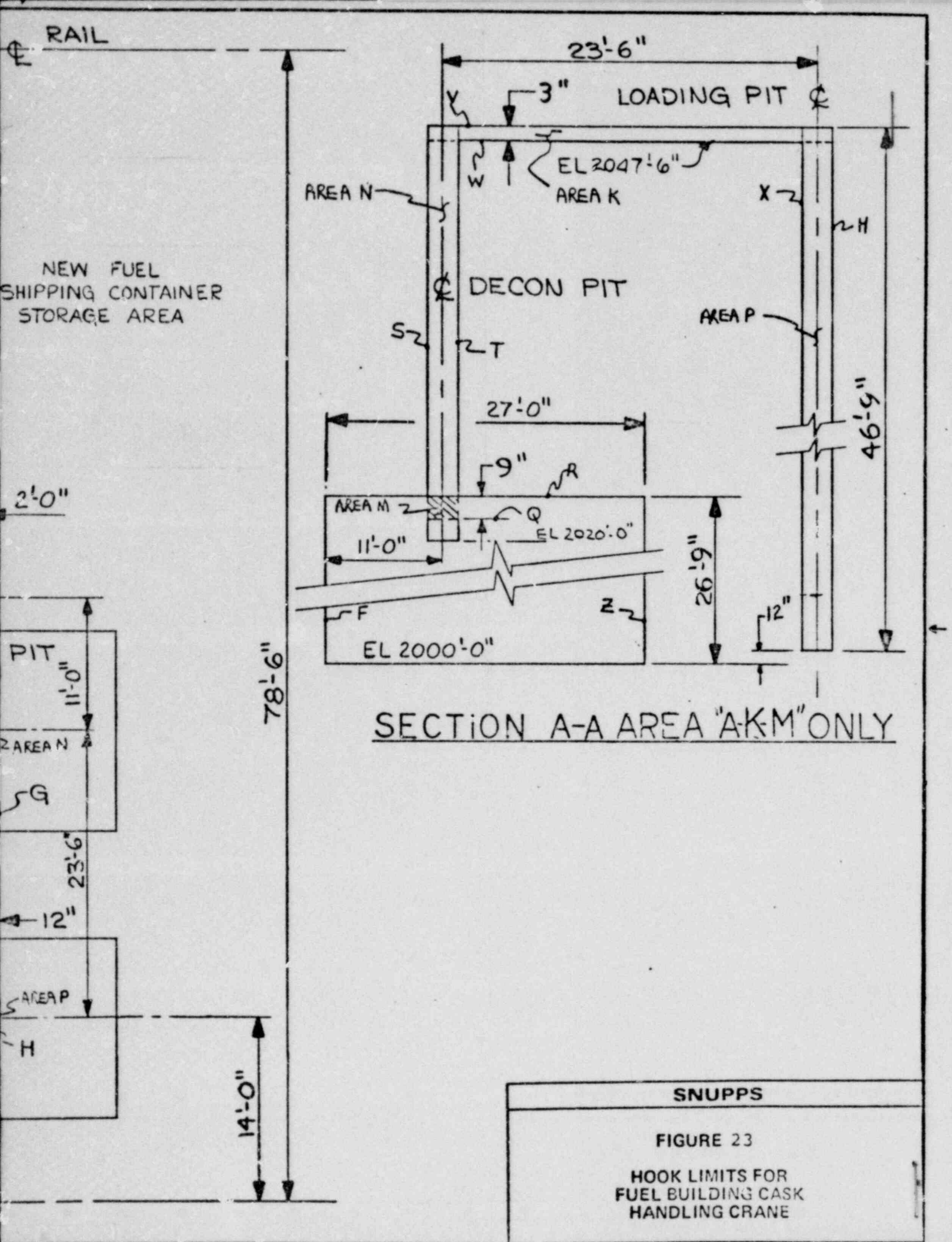
SNUPPS

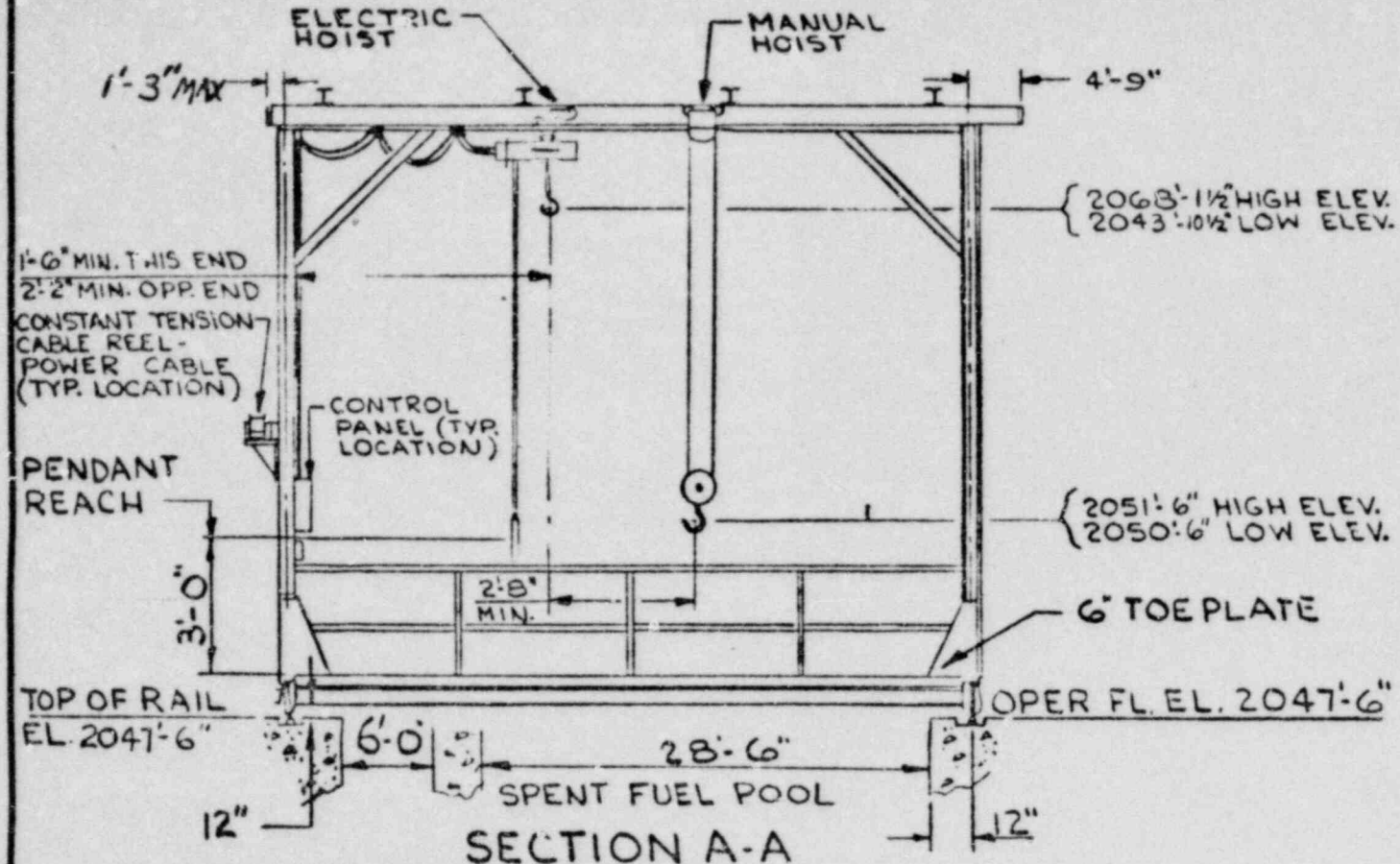
FIGURE 22

ARRANGEMENT DRAWING
FUEL BUILDING CASK
HANDLING CRANE

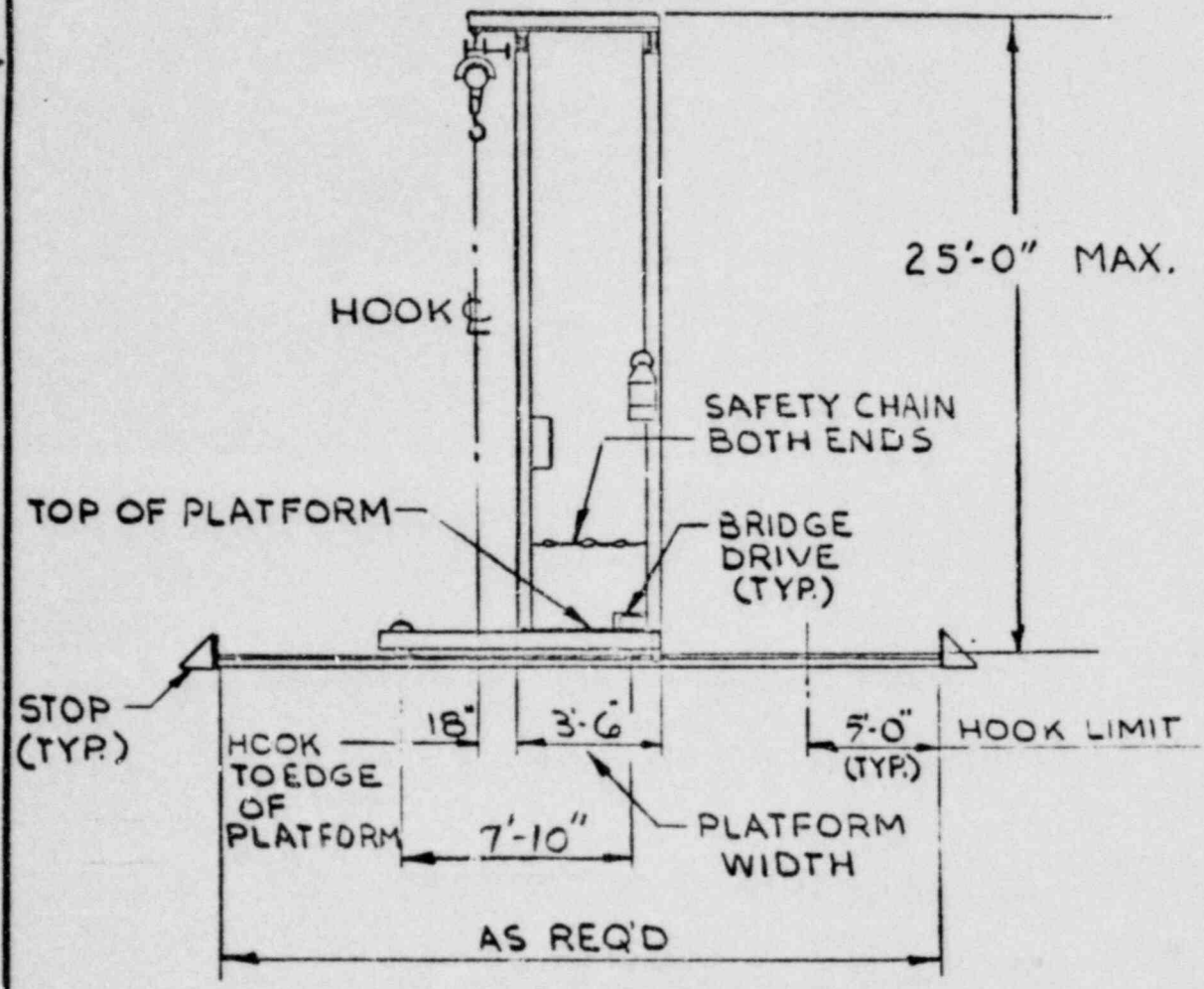

FACE OF BUMPER STOP
5'-6" TO ℄ COLUMN LINE F-7
N
5'-0"
10'-6"
NEW FUEL STORAGE AREA
B
J
20'-0"
3'-6"
2'-0"
F
6"
CASK HATCH AREA
CASK DECON
A
A
E
A
S
2'-0"
M
T
U
Y
K
12'-0"
Z
6"
2'-0"
X2
73'-6"
60'-0"
21'-0"
8'-0"
4'-6"
6"
L
LIFTING RIG AND
HEAD LAYDOWN AREA
NEW FUEL
ELEVATOR
D
CASK
LOADING PIT
7'-2"
3'-9"
RAIL
℄
FACE OF BUMPER STOP

PLAN


℄ RAIL
NEW FUEL
SHIPPING CONTAINER
STORAGE AREA
23'-6"
3"
LOADING PIT ℄
V
W
EL 2047'-6"
AREA K
AREA N
X
H
℄ DECON PIT
AREA P
S
T
27'-0"
46'-6"
9"
R
2'-0"
AREA M
Q
EL 2020'-0"
11'-0"
26'-9"
F
Z
12"
EL 2000'-0"
78'-6"
PIT
11'-0"
AREA N
G
23'-6"
12"
AREA P
H
14'-0"
SECTION A-A AREA "A-K-M" ONLY
SNUPPS
FIGURE 23
HOOK LIMITS FOR
FUEL BUILDING CASK
HANDLING CRANE



SECTION A-A



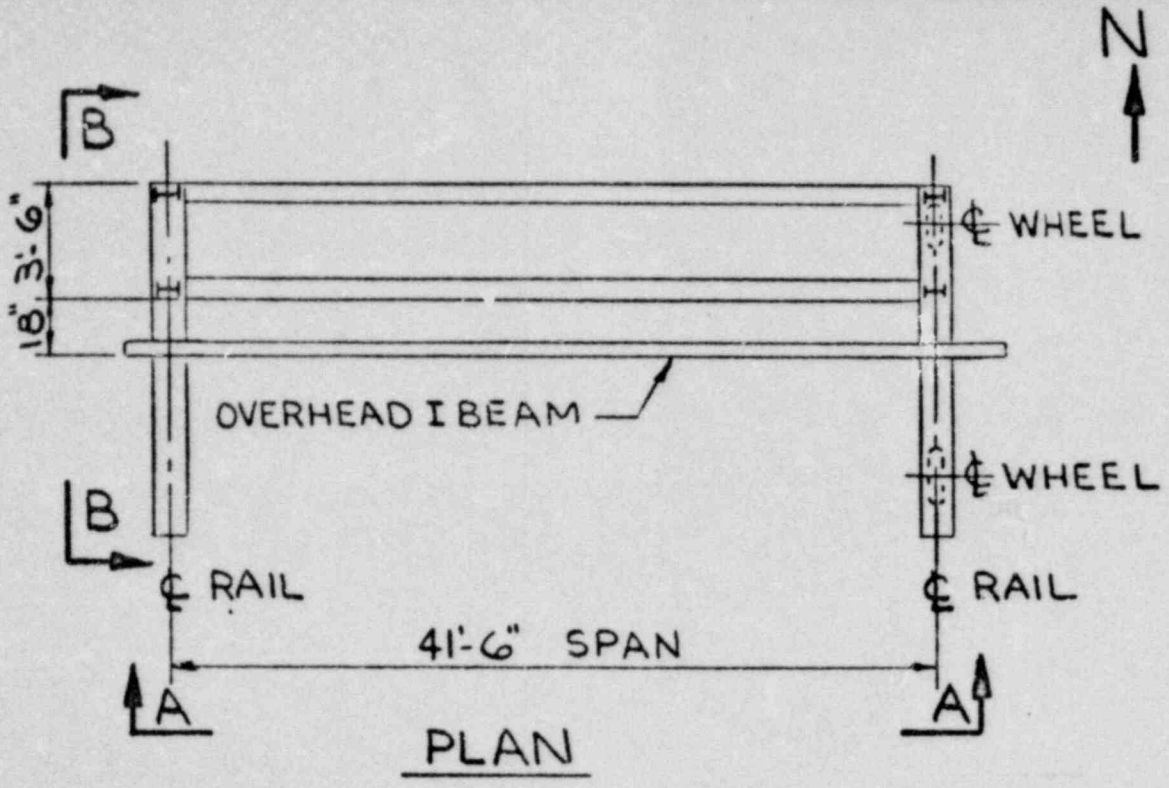
SECTION B-B

CAPACIT

MAX. LI
MIN. L
MAX. B
MIN. BR

MAX TR
MIN TH

MAINTENA
TOP OF RA



PLAN

Y: BRIDGE -5 TON
ELEC. HOIST -2 TON
MANUAL HOIST -5 TON

FT SPEED - 21FPM ± 10%
FT SPEED - 7FPM ± 10%
RIDGE SPEED - 30FPM ± 10%
IDGE SPEED - 10FPM ± 10%

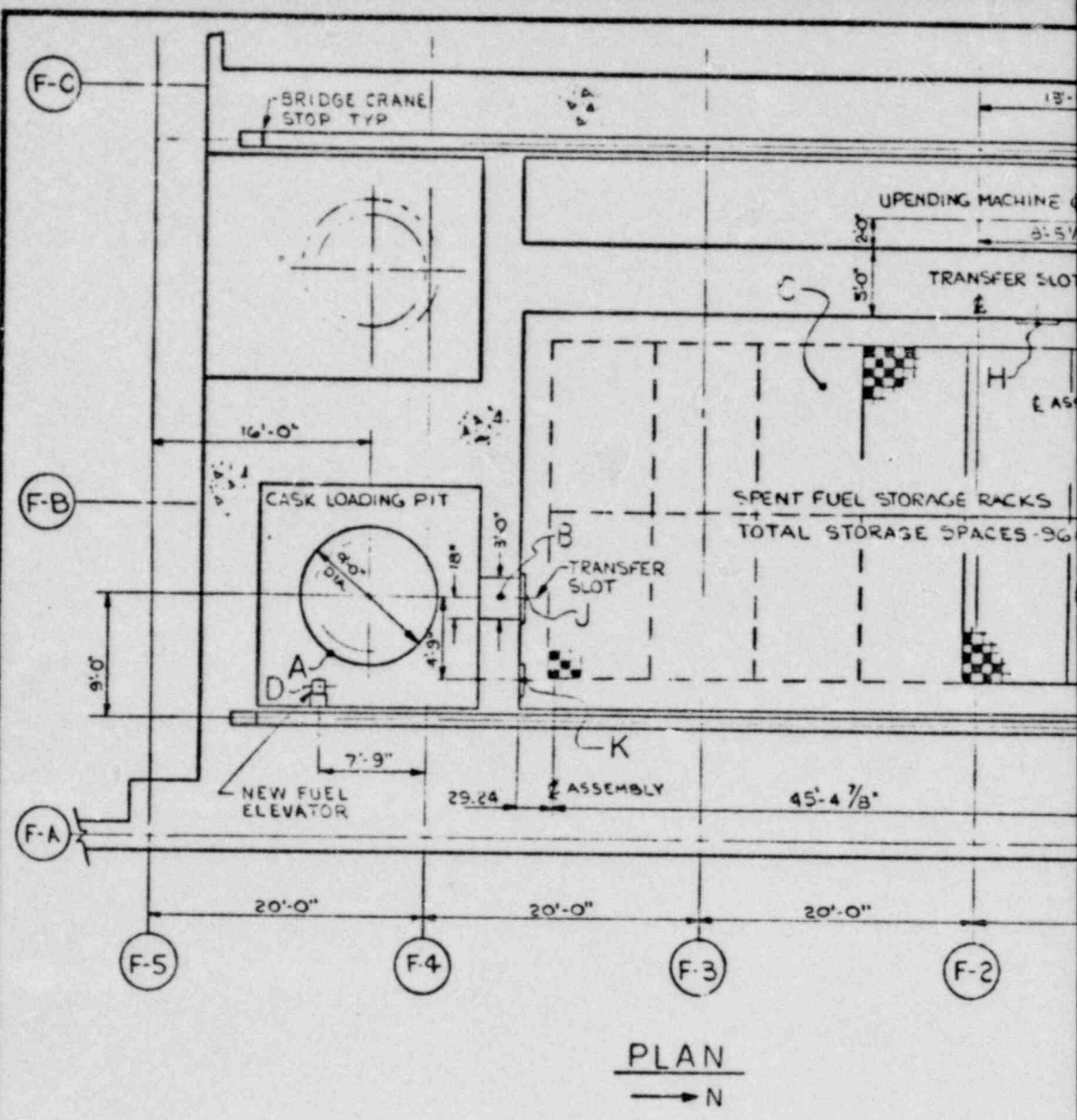
OLLEY SPEED 30FPM ± 10%
OLLEY SPEED 10FPM ± 10%

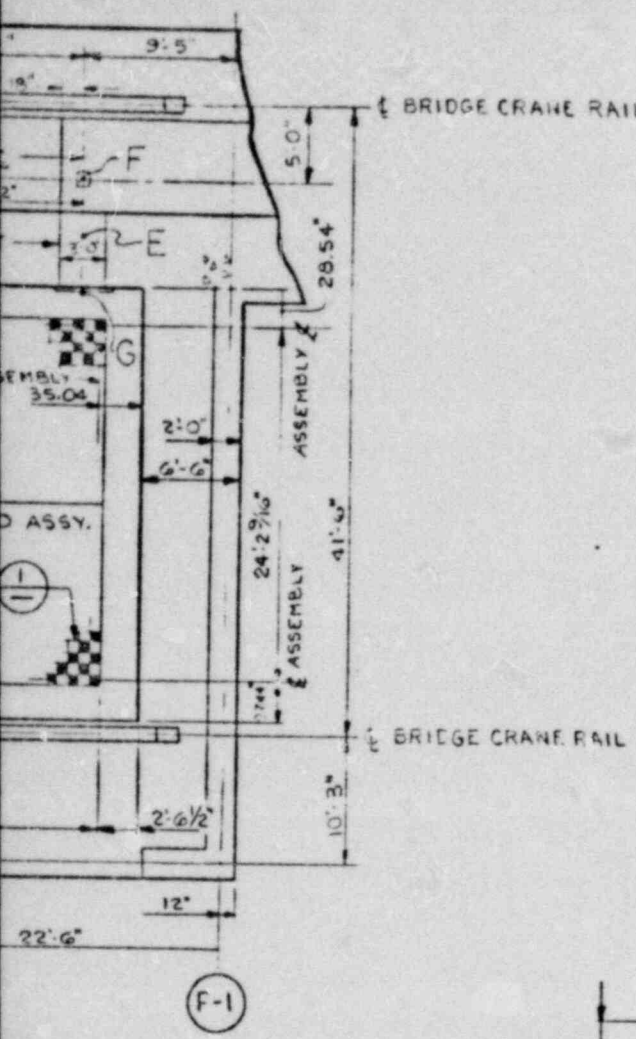
ANCE PLATFORM - NOT SHOWN
L ELEVATION HAS NOT BEEN FINALIZED

SNUPPS

FIGURE 24

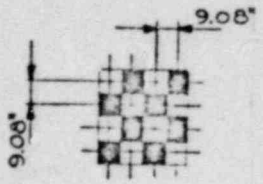
ARRANGEMENT DRAWING
SPENT FUEL BRIDGE CRANE


F-C
BRIDGE CRANE STOP TYP
UPENDING MACHINE
TRANSFER SLOT
C
H
16'-0"
F-B
CASK LOADING PIT
SPENT FUEL STORAGE RACKS
TOTAL STORAGE SPACES-96
B
TRANSFER SLOT
J
A
D
K
9'-0"
7'-9"
NEW FUEL ELEVATOR
29.24
ASSEMBLY
45'-4 7/8"
F-A
20'-0"
20'-0"
20'-0"
F-5
F-4
F-3
F-2
PLAN
N



NOTES

1. SPACING BETWEEN FUEL ELEMENT ASSEMBLIES TO BE 9.08" ON CENTER. INDEX POSITIONING OF CRANE TO BE DESIGNED TO HANDLE ASSEMBLIES.

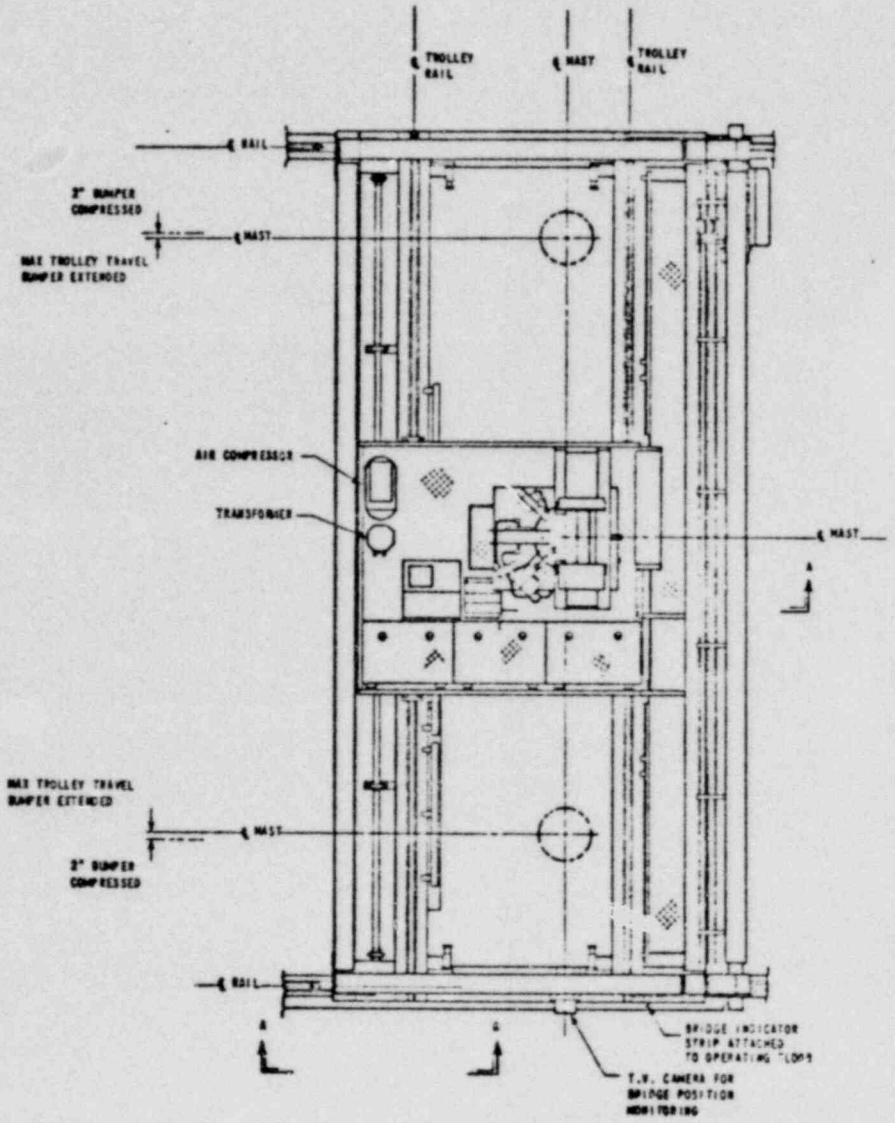


DETAIL 1 — 1¼" = 1'-0"

SNUPPS

FIGURE 25

HOOK LIMITS FOR
SPENT FUEL POOL
BRIDGE CRANE



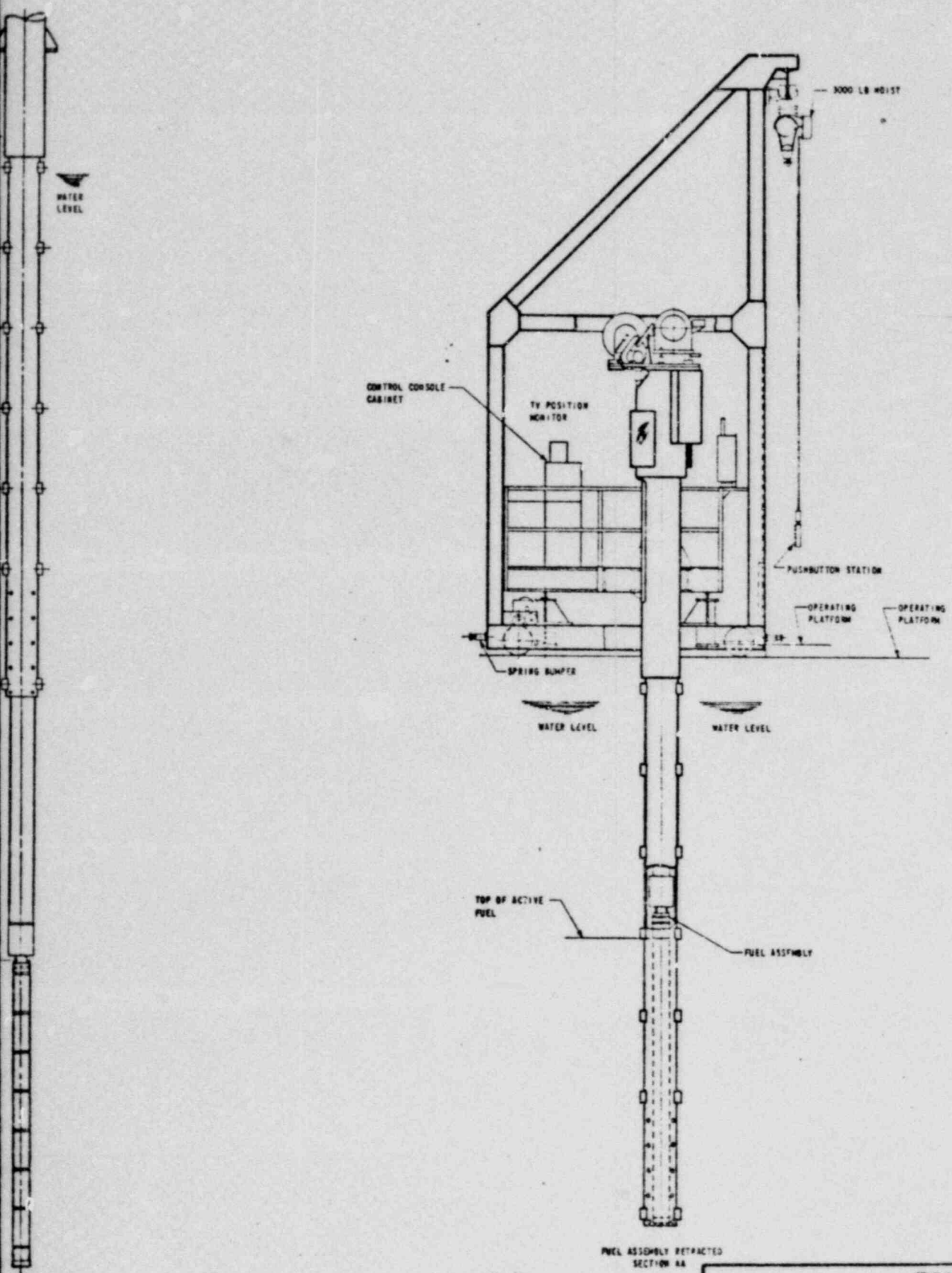
PLAN VIEW

OPERATING FLOOR

WATER LEVEL

TOP SURFACE OF PADS OF TOP NOZZLE OF FUEL ASSEMBLY

FUEL ASSEMBLY EXTENDED



SNUPPS

FIGURE 26

REFUELING MACHINE