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 RECIP. NAME: CRUTCHFIELD, D. RECIPIENT AFFILIATION: Operating Reactors Branch 5

SUBJECT: Forwards supplemental response to NRC 820819 technical evaluation re: "Control of Heavy Load - NUREG-0612." Part two response will be submitted 831201. Util will develop load handling procedures for 10 sys within NUREG Scope.

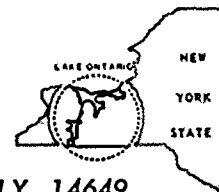
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JOHN E. MAIER
Vice President

TELEPHONE
AREA CODE 716 546-2700

March 2, 1983

50-244

Director of Nuclear Reactor Regulation
Attention: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: "Control of Heavy Loads"
Supplemental Report Addressing
Technical Evaluation Report, Dated August 19, 1982

Dear Mr. Crutchfield:

Enclosed please find our response to your letter
of August 19, 1982, "Control of Heavy Loads - NUREG 0612."
A part two response, "NRC Request for Additional Information
on Control of Heavy Loads," will be submitted December 1, 1983.

Very truly yours,

John E. Maier
J. E. Maier

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SUPPLEMENTAL REPORT ON CONTROL OF HEAVY LOADS

RESPONSE TO THE DRAFT TECHNICAL EVALUATION REPORT
PREPARED BY FRANKLIN RESEARCH CENTER CONCERNING
"CONTROL OF HEAVY LOADS - NUREG 0612" AT
R. E. GINNA NUCLEAR POWER STATION

REFERENCED LETTERS

1. NRC GENERIC LETTER 81-07
DATED DECEMBER 22, 1980
2. NRC GENERIC LETTER 81-07
DATED FEBRUARY 3, 1981
3. LETTER TO MR. DARRELL G. EISENHUT (NRC)
FROM MR. JOHN E. MAIER (RG&E)
DATED FEBRUARY 1, 1982
4. LETTER TO MR. JOHN E. MAIER (RG&E) FROM
MR. DENNIS M. CRUTCHFIELD (NRC)
DATED AUGUST 19, 1982 (TECHNICAL EVALUATION REPORT)

R. E. GINNA NUCLEAR POWER STATION
ROCHESTER GAS AND ELECTRIC CORPORATION
DOCKET NO. 50-244
MARCH 1, 1983

THE UNITED STATES OF AMERICA

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INTRODUCTION AND BACKGROUND

On February 1, 1982 Rochester Gas and Electric Corporation submitted a report stating the extent of compliance with general load-handling policies and procedures at the R. E. Ginna Nuclear Power Plant with NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants", Section 5.1.1.

A Technical Evaluation Report (TER) was prepared and returned to Rochester by the NRC and its consultants. Enclosed in this report are responses to open items in this TER, schedules for implementation of procedures and training programs to assure compliance with NUREG-0612 and justification for exceptions taken to NUREG 0612.

RESPONSE TO THE DRAFT TECHNICAL EVALUATION REPORT PREPARED BY
FRANKLIN RESEARCH CENTER CONCERNING "CONTROL OF HEAVY
LOADS - NUREG 0612" AT R. E. GINNA NUCLEAR POWER STATION

TER Section 2.1.1c "Overhead Heavy Load Handling Systems"
Conclusions and Recommendations

The Licensee should identify overhead handling systems excluded from compliance with NUREG-0612 and verify that such exclusion was based on one or more of the following:

1. No safety-related equipment or irradiated fuel is located in close proximity or sufficient physical separation exists.
2. The systems are sole-purpose systems and are used only when the equipment is out of service.
3. Heavy loads are not carried by the excluded system. (A heavy load for R. E. Ginna Nuclear Power Station is taken as 1500 lbs.)

RG&E Response

In response to "Conclusions and Recommendations" listed for this section RG&E has provided an enclosed list of all Overhead Handling Systems at R. E. Ginna Nuclear Power Station (Attachment 1). The list of overhead handling systems within the scope of NUREG-0612 provided in RG&E's February 1, 1982 submittal has been reduced by using the exclusion criteria shown above.

Attachment 2 shows the physical location of each overhead handling system identified.

TER Section 2.1.2 "Safe Load Paths [Guideline 1, NUREG-0612, Section 5.1.1(1)] Conclusions and Recommendations

The Licensee partially complies with Guideline 1 for the Ginna plant. In order to comply fully with the criteria of this guideline, the Licensee should perform the following:

1. Provide suitable visual aids to assist the crane operator in the areas where loads are handled by all equipment that is not excluded from compliance with NUREG-0612, as specified in 2.1.1.c.
2. Define all safe load paths in procedures.
3. Incorporate safe load paths into equipment layout drawings.
4. Verify that deviations from established load paths require written alternatives to be approved by the plant safety review committee.

RG&E Response

In response to "Conclusions and Recommendations" listed for this section RG&E will: 1) define specific heavy load safe load paths, 2) define "generic" heavy load safe load paths, 3) incorporate safe load paths into load handling procedure A-1305, 4) establish a deviation of safe load path control procedure, 5) provide suitable visual aids to assist crane operators properly handle heavy loads where practical.

The above procedures will be implemented for the following Overhead Handling Systems:

<u>Crane No.</u>	<u>Overhead Handling System</u>
7	100(2) Ton O.H. Crane in CTMT
29	40(5) Ton O.H. Crane Auxiliary Bldg.
32	7 1/2 Ton Screenhouse Crane (East)

The remaining 7 overhead handling systems within the scope of NUREG-0612 (Attachment 1, Page 6 of 6) are restricted by the physical capabilities of the system and therefore require no additional work regarding safe load paths.

RG&E will have these procedures in place by September 1, 1983.

TER Section 2.1.3 "Load Handling Procedures" [Guideline 2, NUREG-0612, Section 5.1.1(2)] Conclusions and Recommendations

The Ginna plant does not comply with Guideline 2. Load-handling procedures should clearly identify inspection and acceptance criteria, steps, and proper sequence, and clearly define the safe load paths for the various heavy loads listed.

RG&E Response

In response to "Conclusions and Recommendations" listed for this section RG&E will develop Load Handling Procedures for the 10 Load Handling Systems within the scope of NUREG 0612. The program will identify specific and "generic lifts", insure the proper equipment is utilized for the lift and that the load is handled properly. This development of Load Handling Procedures will be done in administrative procedure A-1305 accompanied by a qualifying rigger program.

RG&E will have these procedures in place by December 31, 1983.

TER 2.1.5 "Special Lifting Devices" [Guideline 4, NUREG-0612, Section 5.1.1(4)] Conclusions and Recommendations

A conclusion regarding compliance with this guideline must be deferred until the Licensee completes the analysis of their special lifting devices. However, this analysis should address the specific items identified in this independent evaluation.

RG&E Response

A comparison analysis for the Special Lifting Devices used at R. E. Ginna Nuclear Power Plant to determine the compliance with NUREG-0612 has been completed by Westinghouse Corp. This analysis encompasses the following special lifting devices: Reactor Head Lifting Rig, The Upper and Lower Internals Lifting Assembly and The Reactor Coolant Pump Motor Sling. The evaluation shows that the stress limit criteria of ANSI N14.6-1978 associated with certain stress design factors for tensile and shear stresses are adequately satisfied.

Enclosed is justification for dynamic load factors considered in the analysis of these special lifting devices. (Attachment 3)

RG&E has implemented an inspection, testing and maintenance program to insure continued compliance with ANSI N14.6-1978. This program will require visual inspections annually (not to exceed 15 months, consistent with permissible extensions for Technical Specification surveillance). Nondestructive examination of critical welds will also be done every ten years.

At this time the analysis is based on the original design drawings. During our spring outage 1983 "as built" sketches of any modifications or additions to the special lifting devices will be made, reviewed and analyzed to determine if the evaluation performed is effected. RG&E will submit this information by August 1, 1983.

TER 2.1.6 "Lifting Devices" (Not Specially Designed) [Guideline 5, NUREG-0612, Section 5.1.1(5)] Conclusions and Recommendations

Determination of compliance with Guideline 5 must be deferred until RG&E provides specific information concerning:

1. Installation and use of slings (in accordance with ANSI B30.9-1971)
2. Selection of slings (based upon the sum of the static and maximum dynamic loads)
3. Sling markings and sling restrictions, where appropriate

RG&E Response

In response to "conclusions and recommendations" listed for this section RG&E will implement a rigger qualification program to insure that slings are selected and used in accordance with ANSI B30.9-1971.

At this time sling selection and use at R.E. Ginna Station is the responsibility of each individual rigger. The "Handbook for Riggers" by W. G. Newberry, Calgary, Alberta, Canada is currently used and believed to be equivalent to ANSI B30.9-1971.

All slings used at Ginna Station have load ratings marked on them.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the transparency and accountability of the organization. This section also outlines the various methods used to collect and analyze data, ensuring that the information is reliable and up-to-date.

2. The second part of the document focuses on the financial aspects of the organization. It provides a detailed overview of the budget, including the projected income and expenses for the upcoming year. This section also discusses the various financial risks and how they are being managed to ensure the organization's financial stability.

3. The third part of the document addresses the human resources of the organization. It discusses the current staffing levels, the skills and qualifications of the employees, and the plans for future recruitment and training. This section also highlights the importance of maintaining a positive work environment and fostering a sense of team spirit among the employees.

4. The fourth part of the document discusses the organization's marketing and sales strategy. It outlines the various marketing channels being used to reach the target audience and the sales goals for the upcoming year. This section also discusses the importance of monitoring and evaluating the effectiveness of the marketing and sales efforts.

5. The fifth part of the document discusses the organization's legal and regulatory compliance. It outlines the various laws and regulations that the organization is subject to and the steps being taken to ensure compliance. This section also discusses the importance of maintaining accurate records of all legal and regulatory activities.

6. The sixth part of the document discusses the organization's environmental and social responsibility. It outlines the various initiatives being implemented to reduce the organization's carbon footprint and improve its social impact. This section also discusses the importance of maintaining accurate records of all environmental and social responsibility activities.

7. The seventh part of the document discusses the organization's overall performance and future prospects. It provides a summary of the key findings from the various sections and outlines the organization's vision for the future. This section also discusses the importance of maintaining accurate records of all performance and future prospects activities.

RG&E believes that adding additional factors to consider dynamic loads above the 5:1 safety factors for slings already considered is impractical and provides no justifiable cushion of safety. Dynamic loads are negligible and only static loads are considered.

RG&E will have the qualified rigger program in place by December 31, 1983.

TER 2.1.7 "Cranes" (Inspection, Testing, and Maintenance)
[Guideline 6, NUREG-0612, Section 5.1.1(6)] Conclusions and Recommendations

The Ginna plant will comply with Guideline 6 upon implementation of proposed revisions to inspection, testing, and maintenance programs.

RG&E Response

Revisions are being made to the existing RG&E inspection, testing, and maintenance programs listed in the February 1, 1982 submittal to insure full compliance with ANSI B30.2-1976, Chapter 2-2.

Additional programs are being developed for jibs and monorails to insure that inspection, testing, and maintenance procedures comply with ANSI B30.11-1980 "Monorails and Underhung Cranes" Chapter 11-2. All procedures will be in place by September 31, 1983.

In response to a question concerning the Auxiliary Building overhead crane and a "rated load test", the February 1, 1982 submittal stated that this crane was load tested prior to lifting a spent fuel cask in 1973. This is correct. The 40 ton auxiliary crane was load tested using a 40 ton test load.

TER 2.1.8 "Crane Design" [Guideline 7, NUREG 0612, Section 5.1.1(7)] Conclusion

The Ginna Auxiliary Building crane complies with Guideline 7. The Reactor Building substantially complies with this guideline; however, the Licensee should be ready to provide suitable documentation to justify the location and moment of inertia of the actual longitudinal stiffeners.

RG&E Response

Justification for the location and moment of inertia of the longitudinal stiffeners used on the crane bridge of the Containment Overhead Crane is provided in Attachment 4.

In response to a question concerning the horsepower rating for the main hoist of the 100 ton containment overhead crane it is a 5 H.P. motor. This capacity was omitted in error in the February 1, 1982 submittal.

1. The first part of the document is a list of names and addresses of the members of the committee. The names are listed in alphabetical order, and the addresses are given in full, including the street, city, and state.

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3. The third part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the secretary.

4. The fourth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the treasurer.

5. The fifth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the clerk.

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7. The seventh part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the assistant treasurer.

8. The eighth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the assistant secretary.

9. The ninth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the assistant chairman.

10. The tenth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the assistant assistant clerk.

11. The eleventh part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the assistant assistant treasurer.

12. The twelfth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the assistant assistant secretary.

13. The thirteenth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the assistant assistant chairman.

14. The fourteenth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the assistant assistant assistant clerk.

TER Interim Protection Measures Conclusions and Recommendations

Insufficient information has been provided to clearly determine compliance with this interim measure. The Licensee should review and determine whether current technical specifications meet the intent of this guideline.

RG&E Response

RG&E has reviewed the technical specifications which limit travel of the Auxiliary Building overhead crane over the spent fuel area and has found them to be adequate interim protection. No other overhead handling systems can physically move over the spent fuel area except the spent fuel manipulator crane. This crane has undergone analysis for a single spent fuel assembly handling accident and has been deemed not to require further evaluation.

TER Special Review for Heavy Loads Handled Over the Core [Interim Protection Measure 6, NUREG-0612, Section 5.3(6)] Evaluation, Conclusion and Recommendations

The Licensee has made no statements or conclusions regarding this interim protection measure. The Licensee should report the completion of the special review identified in this interim measure.

RG&E Response

Safe load paths for heavy load lifts made in containment at Ginna Station are physically restricted. Procedure A-1305 is currently the controlling load-handling procedure, the crane is inspected according to ANSI and the crane operators are trained according to ANSI. Further analysis of handling of heavy loads in this area is required to satisfy NUREG-0612 and shall be included in the load-drop analysis submittal.

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2. The second part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the chairman. The names are listed in alphabetical order, and the addresses are given below each name. The list includes names such as Mr. J. H. Smith, Mr. J. B. Jones, and Mr. W. C. Brown.

3. The third part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the secretary. The names are listed in alphabetical order, and the addresses are given below each name. The list includes names such as Mr. J. H. Smith, Mr. J. B. Jones, and Mr. W. C. Brown.

4. The fourth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the treasurer. The names are listed in alphabetical order, and the addresses are given below each name. The list includes names such as Mr. J. H. Smith, Mr. J. B. Jones, and Mr. W. C. Brown.

ATTACHMENT 1

TOTAL LIST OF OVERHEAD HANDLING SYSTEMS AT
R. E. GINNA NUCLEAR POWER STATION

<u>No.</u>	<u>Building</u>	<u>Overhead Handling System</u>
1	Containment	3 Ton Jib
2	Containment	1 Ton Jib (E)
3	Containment	1 Ton Jib (W)
4	Containment	1 1/2 Ton Fuel Manipulator Bridge
5	Containment	Aux. Trolley on Fuel Manipulator Bridge
6	Containment	10 Ton Jib
7	Containment	100(20) Ton Overhead Crane
8	Containment	2 Ton Jib
9	Containment	1/4 Ton Jib on Overhead Crane
10	Containment	3 Monorail Hoists on Reactor Head Monorail
11	Containment	Jib on Overhead
12,13	Turbine	(2) Monorails Over Feed-water Pumps (Basement)
14	Turbine	2 Ton Jib -- Turbine Oil Part
15,16,17	Turbine	(3) Monorails -- Condenser Parts
18	Turbine	(1) Monorail -- Feed-water Heater Parts
19,20,21,22	Turbine	(4) Monorails -- Moisture Separator Parts
23	Turbine	Turbine Overhead 125 Ton (25 Ton)
24	Turbine	3 Ton Movable Gantry
25,26	Auxiliary	(2) Monorails RHR Pit (Basement)
27	Auxiliary	(1) Monorail (Basement)
28	Auxiliary	2 Ton Spent Fuel Crane
29	Auxiliary	40(5) Ton Overhead Crane
30	Auxiliary	5 Ton Drumming Crane
31	*Screenhouse	7 1/2 Ton Screenhouse (W)
32	*Screenhouse	7 1/2 Ton Screenhouse (E)
33	Service	2 Ton -- Steamfitting Shop
34	Service	2 Ton -- Hot Shop
35	Service	5 Ton -- Machine & Elect. Shop
36	Service	2 Ton -- Machine & Elec. Shop
37	Service	2 Ton -- Meter Shop

1. The first part of the document is a list of names and addresses of the members of the committee.

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18. The eighteenth part of the document is a list of names and addresses of the members of the committee.

<u>No.</u>	<u>Building</u>	<u>Overhead Handling System</u>
38,39	Intermediate	(2) Monorails -- MDAFWP
40	Intermediate	(1) Monorail -- TDAFWP
41	Intermediate	(1) Monorail -- M.S. Header
42	Intermediate	3 Ton Monorail Upper Level
43	Intermediate	(1) Monorail A F.W. Line
44	Standby Aux F.W. Pump Bldg.	(1) Monorail
45	Diesel Gen.	(1) Monorail DG1
46	Diesel Gen.	(1) Monorail DG2
47	AVT Bldg.	1 Ton Stairwell Monorail
48	Oil Storage Building	(1) Monorail
49	Plant Exterior	18 Ton Mobile Crane
50	Containment	Reactor Vessel Stud Cleaning Crane
51	Containment	Base Mounted Pillar Jib Crane
52	Containment	Jib at Equipment Hatch (On Wall)

*Screenhouse crane is classified as two different cranes, however, there is only one crane for two areas which are separated by a track switch

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OVERHEAD HANDLING SYSTEMS EXCLUDED FROM COMPLIANCE WITH
NUREG 0612 BASED ON: "NO SAFETY-RELATED EQUIPMENT OR
IRRADIATED FUEL IS LOCATED IN CLOSE PROXIMITY OR SUFFICIENT
PHYSICAL SEPARATION EXISTS"

<u>No.</u>	<u>Building</u>	<u>Overhead Handling System</u>
12,13	Turbine	(2) Monorails Over Feed-water Pumps (Basement)
14	Turbine	2 Ton Jib -- Turbine Oil Part
15,16,17	Turbine	(3) Monorails -- Condenser Parts
18	Turbine	(1) Monorail -- Feed-water Heater Parts
19,20,21,22	Turbine	(4) Monorails -- Moisture Separator Parts
23	Turbine	125(25) Turbine O.H. Crane
24	Turbine	3 Ton Gantry
30	Auxiliary	5 Ton Drumming Crane
31	Screenhouse	7 1/2 Ton Screenhouse (W)
33	Service	2 Ton -- Steamfitting Shop
34	Service	2 Ton -- Hot Shop
35	Service	5 Ton -- Machine & Elect. Shop
36	Service	2 Ton -- Machine & Elec. Shop
37	Service	2 Ton -- Meter Shop
47	AVT Bldg.	1 Ton Stairwell Monorail
48	Oil Storage Building	(1) Monorail
49	Plant Exterior	18 Ton Mobile Crane
50	Containment	Reactor Vessel Stud Cleaning Crane

TOTAL = 24

1. The first part of the report is a summary of the work done during the year.

2. The second part is a detailed account of the work done during the year.

3. The third part is a summary of the work done during the year.

4. The fourth part is a summary of the work done during the year.

5. The fifth part is a summary of the work done during the year.

6. The sixth part is a summary of the work done during the year.

OVERHEAD HANDLING SYSTEMS EXCLUDED FROM COMPLIANCE WITH
NUREG 0612 BASED ON: "SOLE PURPOSE SYSTEMS AND ARE
USED ONLY WHEN THE EQUIPMENT IS OUT OF SERVICE"

<u>No.</u>	<u>Building</u>	<u>Overhead Handling System</u>
10	Containment	(3) Monorail Hoists on Reactor Head Monorail
25, 26	Auxiliary	(2) Monorails RHR Pit Basement
38, 39	Intermediate	(2) Monorails -- TDAFWP
40	Intermediate	(1) Monorail -- TDAFWP
41	Intermediate	Monorail Over Main Steam Header
43	Intermediate	Monorail Over "A" F.W. Line
44	Standby Aux F.W. Pump Bldg.	(1) Monorail
45	Diesel Gen. Bldg. A	(1) Monorail
46	Diesel Gen. Bldg. B	(1) Monorail
<u>TOTAL = 11</u>		

All of the above overhead handling systems are used only when the safety related equipment below them or within their proximity is out of service. Each monorail will be posted to prohibit its use while the systems below are in operation and each will be locked to insure that this restriction is adhered to.

The first part of the report deals with the general situation of the country. It is a very interesting and informative study of the country's development. The second part of the report deals with the specific details of the country's development. It is a very detailed and thorough study of the country's development. The third part of the report deals with the specific details of the country's development. It is a very detailed and thorough study of the country's development. The fourth part of the report deals with the specific details of the country's development. It is a very detailed and thorough study of the country's development. The fifth part of the report deals with the specific details of the country's development. It is a very detailed and thorough study of the country's development. The sixth part of the report deals with the specific details of the country's development. It is a very detailed and thorough study of the country's development. The seventh part of the report deals with the specific details of the country's development. It is a very detailed and thorough study of the country's development. The eighth part of the report deals with the specific details of the country's development. It is a very detailed and thorough study of the country's development. The ninth part of the report deals with the specific details of the country's development. It is a very detailed and thorough study of the country's development. The tenth part of the report deals with the specific details of the country's development. It is a very detailed and thorough study of the country's development.

OVERHEAD HANDLING SYSTEMS EXCLUDED FROM COMPLIANCE WITH
NUREG 0612 BASED ON: "HEAVY LOADS ARE NOT CARRIED BY
THE EXCLUDED SYSTEM" (A HEAVY LOAD AS DEFINED BY
NUREG 0612 FOR R. E. GINNA STATION IS 1500 LBS.)

<u>No.</u>	<u>Building</u>	<u>Overhead Handling System</u>
2	Containment	1 Ton Jib (E)
3	Containment	1 Ton Jib (W)
5	Containment	Aux. Trolley on Fuel Manipulator Bridge
9	Containment	1/4 Ton Jib on Overhead Crane
11	Containment	Jib on Overhead CTMT Crane
51*	Containment	Base Mounted Pillar Jib Crane
52	Containment	Jib at Equipment Hatch (On Wall)

TOTAL = 7

* Designed, not installed, on hold.

All of the overhead handling systems above will be derated and posted so as to prevent the lifting of any heavy loads. (>1500 lbs.)

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the integrity of the financial system and for the ability to detect and prevent fraud.

2. The second part of the document outlines the specific requirements for record-keeping. It states that all transactions must be recorded in a timely and accurate manner, and that the records must be maintained for a minimum of five years.

3. The third part of the document discusses the role of the auditor in verifying the accuracy of the records. It states that the auditor must perform a thorough review of the records and must report any discrepancies to the appropriate authorities.

4. The fourth part of the document discusses the consequences of failing to comply with the record-keeping requirements. It states that individuals or organizations that fail to comply may be subject to fines, penalties, and even criminal prosecution.

5. The fifth part of the document discusses the importance of training and education in ensuring compliance with the record-keeping requirements. It states that individuals involved in the financial system must receive appropriate training and education to ensure that they are able to perform their duties accurately and in accordance with the requirements.

Total identified Overhead Handling Systems	52
Total eliminated by "Physical Separation"	24
Total eliminated by "Sole Purpose"	11
Total eliminated by "No Heavy Load Lifted"	<u>7</u>

<u>TOTAL OVERHEAD HANDLING SYSTEMS THAT MUST COMPLY WITH NUREG 0612</u>	10
-----------------------------------------------------------------------------	----

<u>No.</u>	<u>Building</u>	<u>Overhead Handling System</u>
1	Containment	3 Ton Jib
4	Containment	1 1/2 Ton Fuel Manipulator Bridge
6	Containment	10 Ton Jib
7	Containment	100(20) Ton O.H. Crane
8	Containment	2 Ton Jib
27	Auxiliary	(1) Monorail (Basement)
28	Auxiliary	2 Ton Spent Fuel Crane
29	Auxiliary	40(5) Ton O.H. Crane
32	Screenhouse	7 1/2 Ton Screenhouse (E)
42	Intermediate	3 Ton Monorail -- Upper Level

Total = 10



1. *Chlorophyll a* and *Chlorophyll b* were determined using a spectrophotometer (Shimadzu UV-1601) at 663 nm and 646 nm, respectively. The concentrations were calculated using the following equations: $\text{Chlorophyll } a = 12.7 \times \text{OD}_{663} - 2.13 \times \text{OD}_{646}$ and $\text{Chlorophyll } b = 21.6 \times \text{OD}_{663} - 51.6 \times \text{OD}_{646}$.

[illegible]

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 10

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1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Arar and Collins (1971) using a Shimadzu 1010 spectrophotometer.

[illegible][illegible]

1990

FIRE AREA CODES

AB - AUXILIARY BUILDING

DG - DIESEL GENERATOR

SAF - STANDBY AUXILIARY FEEDWATER PUMP BUILDING

TB - TURBINE BUILDING

AVT - CONDENSATE DEMINERALIZER BUILDING

IB - INTERMEDIATE BUILDING




SB - SERVICE BUILDING

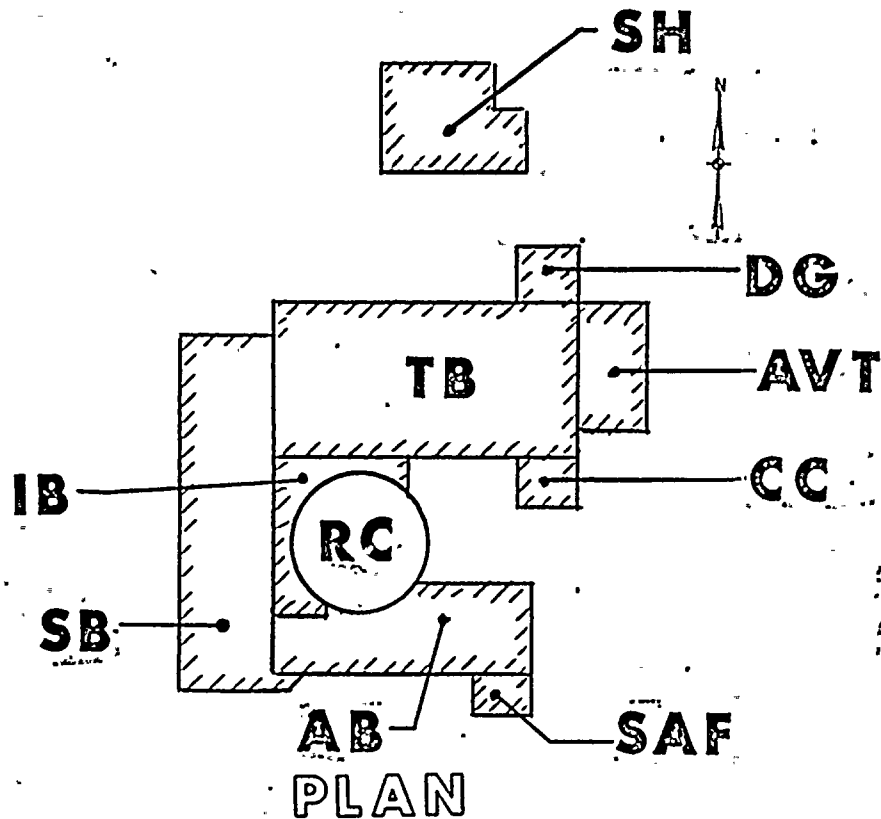
CC - CONTROL ROOM AREA

RC - REACTOR CONTAINMENT

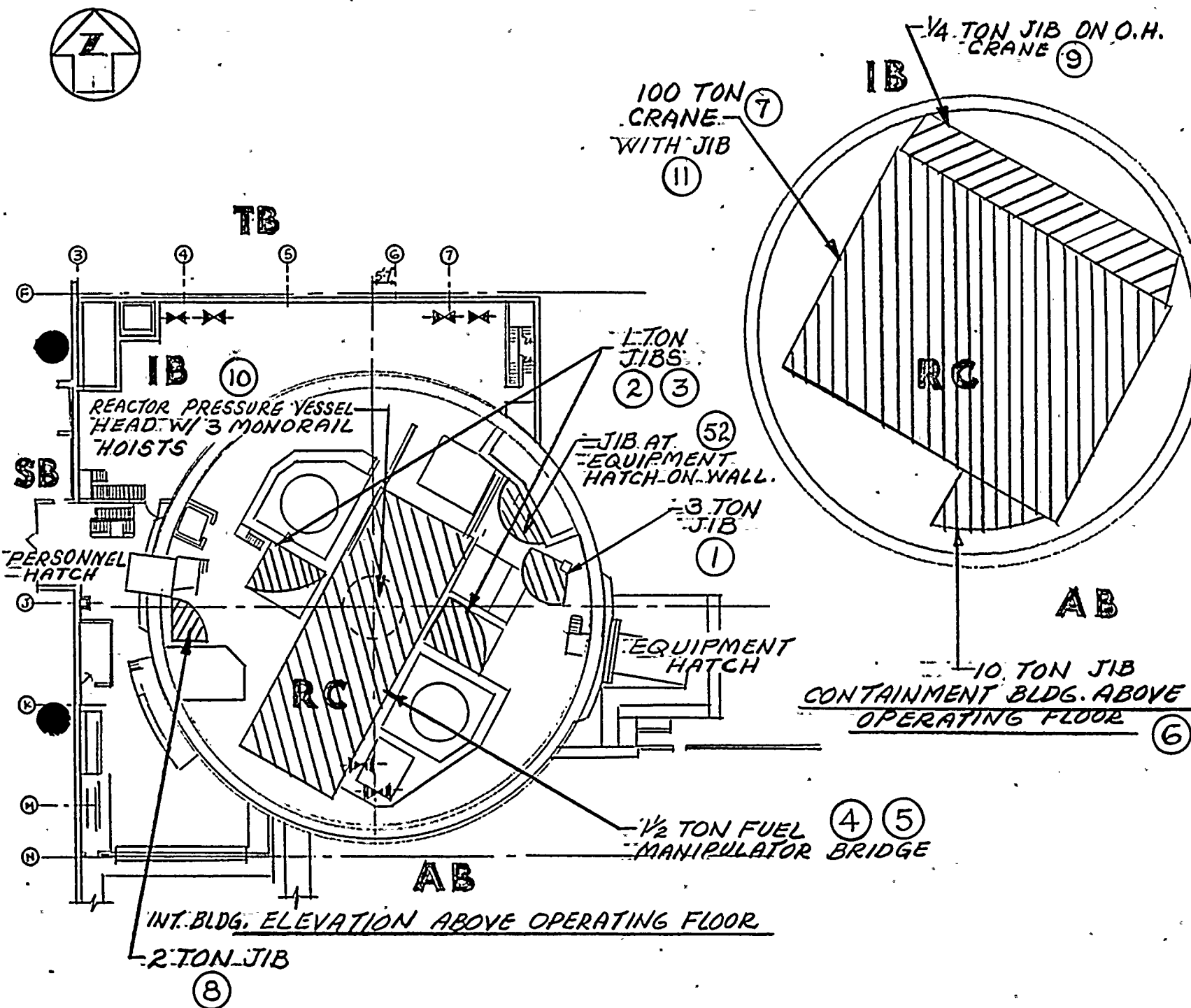
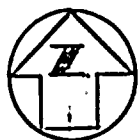
SH - SCREEN HOUSE

LEGEND

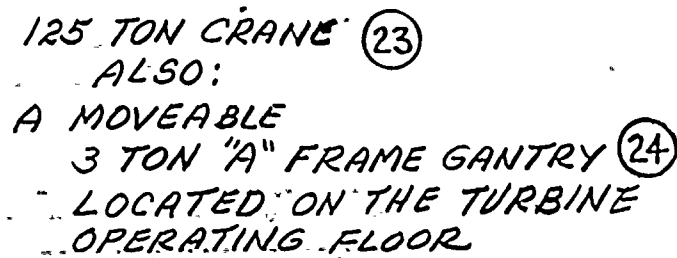
1.  SAFE SHUTDOWN EQUIPMENT
2.  SAFE SHUTDOWN VALVES
3.  TRAVEL RANGE FOR OVERHEAD HANDLING SYSTEMS



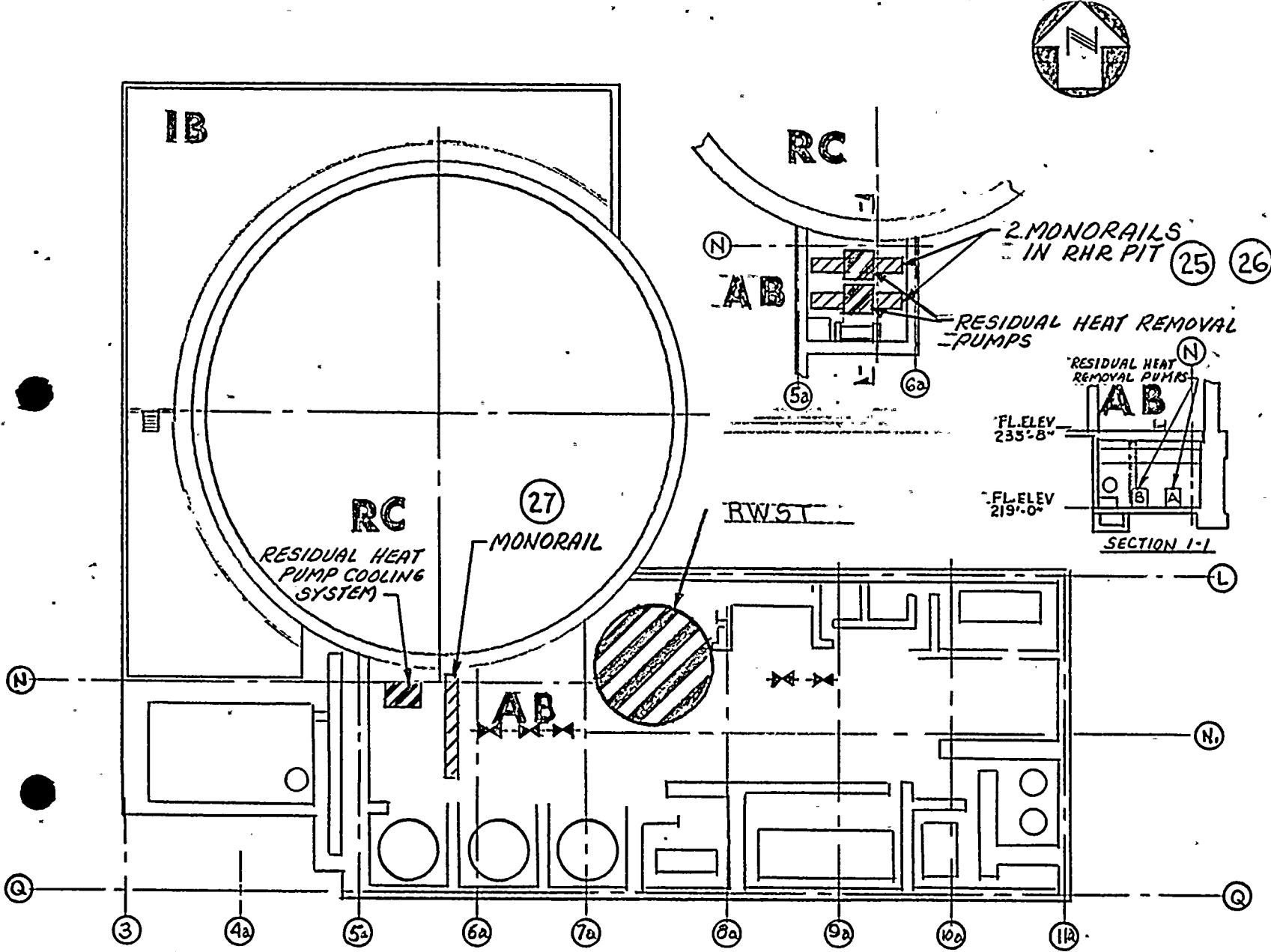
O	ORIGINAL	INITIAL DATE	MBF 6/30/81	DW 7-1-81
NUMBER	REVISION	DRAWN BY	RESP. ENG.	ENG. MANG'R.
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK		BUILDING LOCATION OVERHEAD HANDLING SYSTEMS		
		CHECKED BY	SCALE ~	
		NO. 29-81	NO. 03021-394	



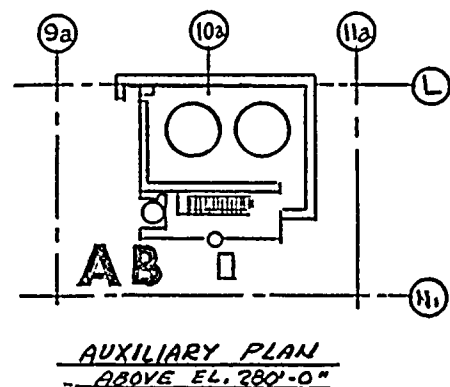
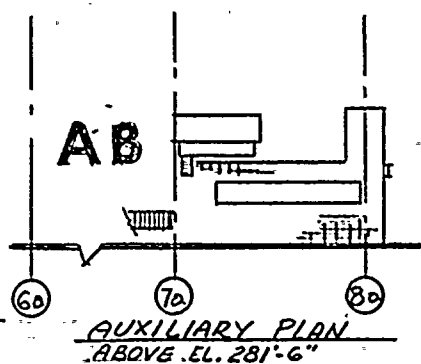
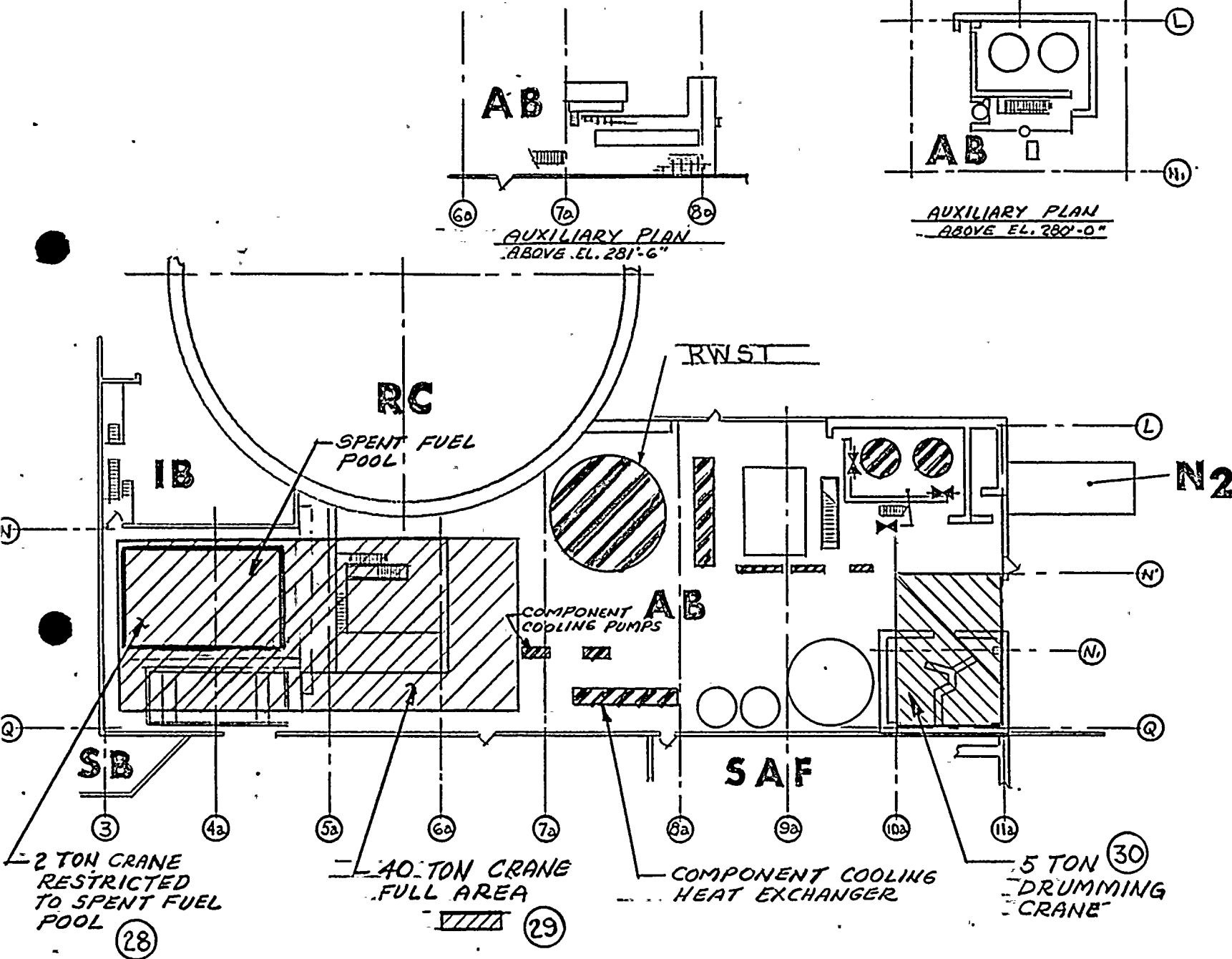
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0	ORIGINAL	N J A 2-16-81	Rmv 2-20-81 MBF	6/30/81	MBF 7-14-81
NUMBER	REVISION	DRAWN BY	CHECKED BY	RESP. ENG.	ENG. MANG'R.
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK			GINNA STATION OVERHEAD HANDLING SYSTEMS CONTAINMENT BLDG.		
			SCALE ~		
			NO. 03021-395		



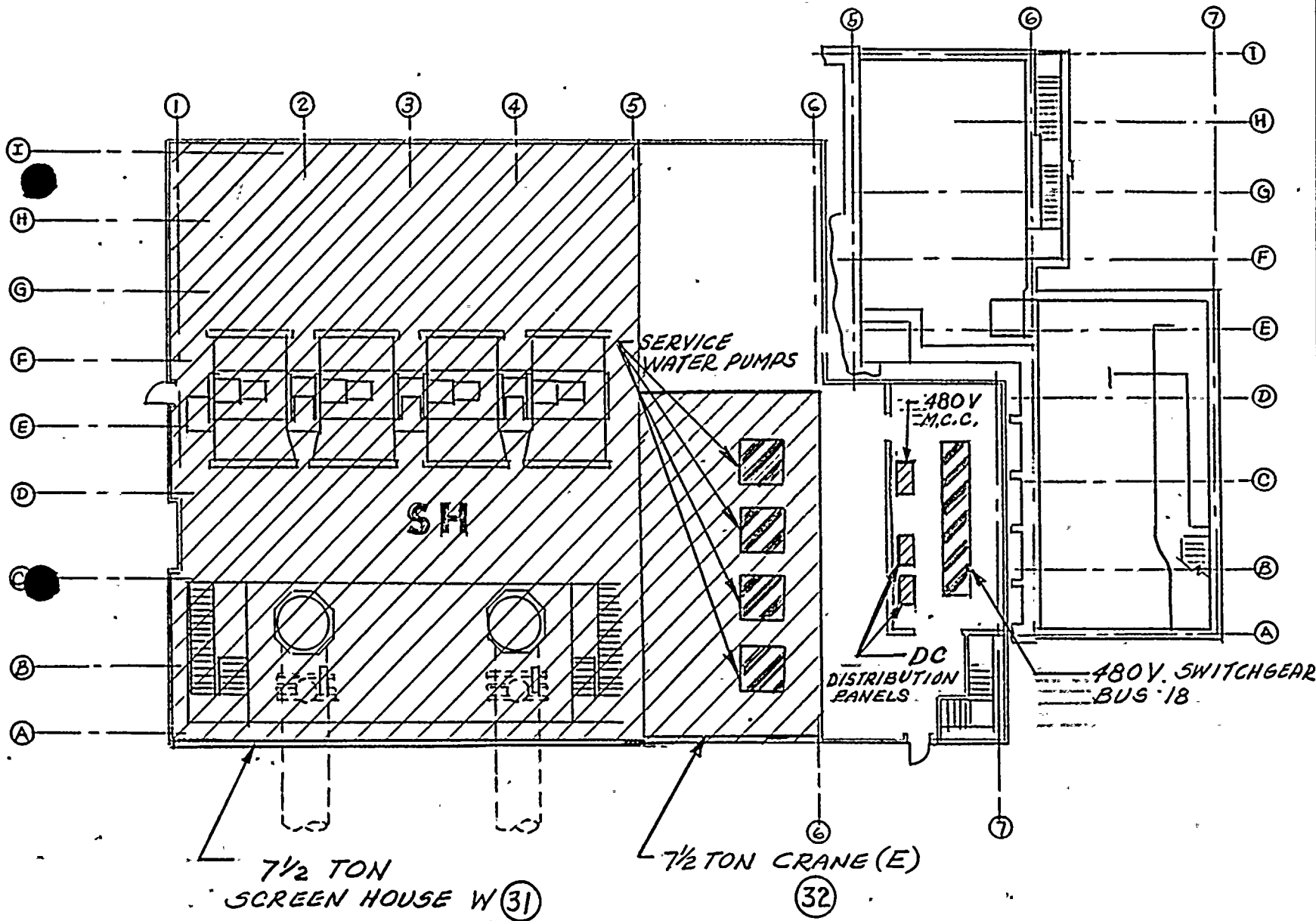
H. H. S. 19-1153



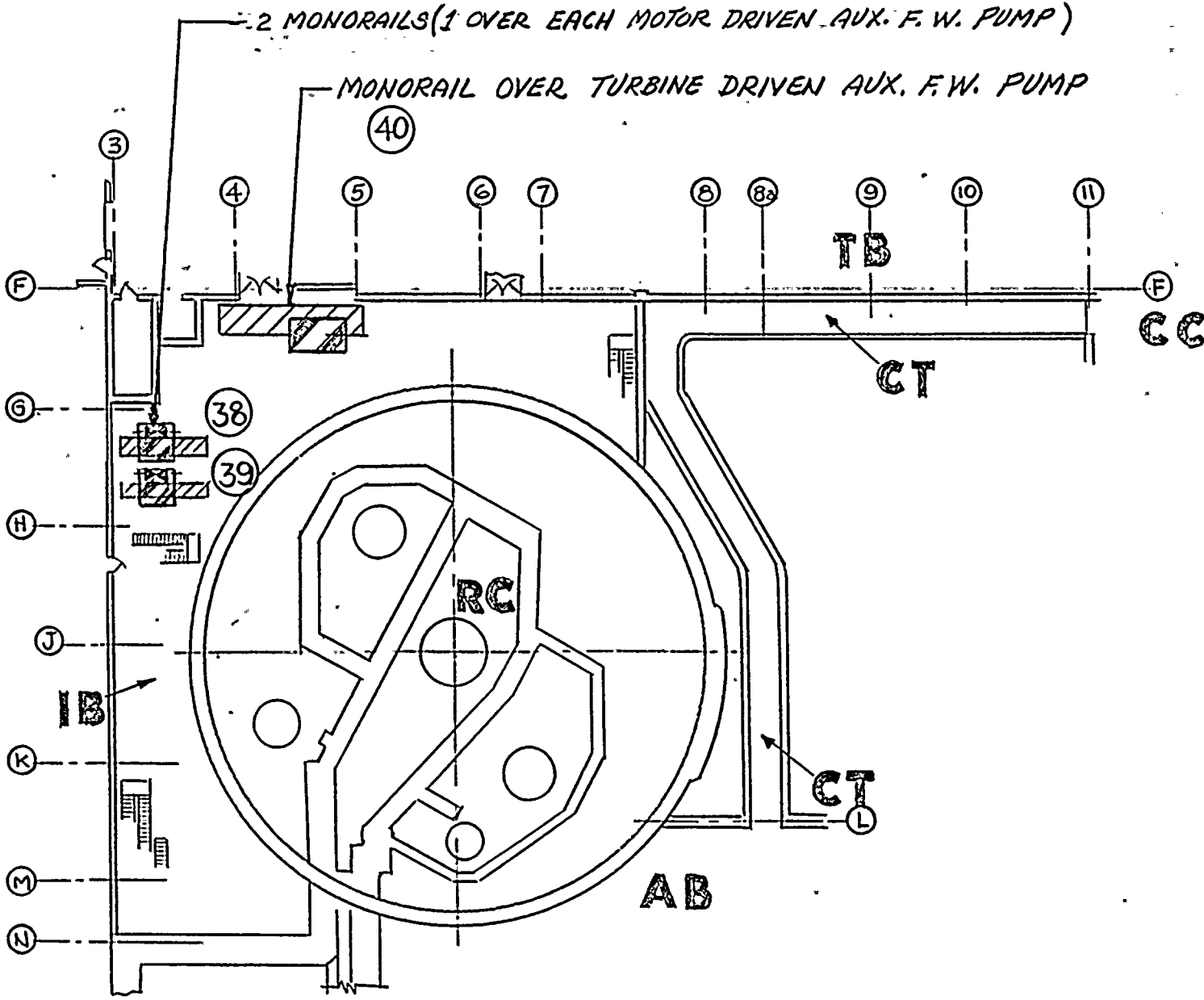
1	ADD. MONORAIL NUMBERS	N J H 2-18-83	Pm 2-18-83	MBF 2/18/83	QW 2-12-83
O	ORIGINAL	N J A 6-29-81	Pm 6-29-81	MBF 6/30/81	TOW 7-1-81
NUMBER	REVISION	DRAWN BY	CHECKED BY	RESP. ENG.	ENG. MANG'R.
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK		GINNA STATION OVERHEAD HANDLING SYSTEMS		SCALE ~	
		AUX. BLDG. BASEMENT		NO. 03021-397	



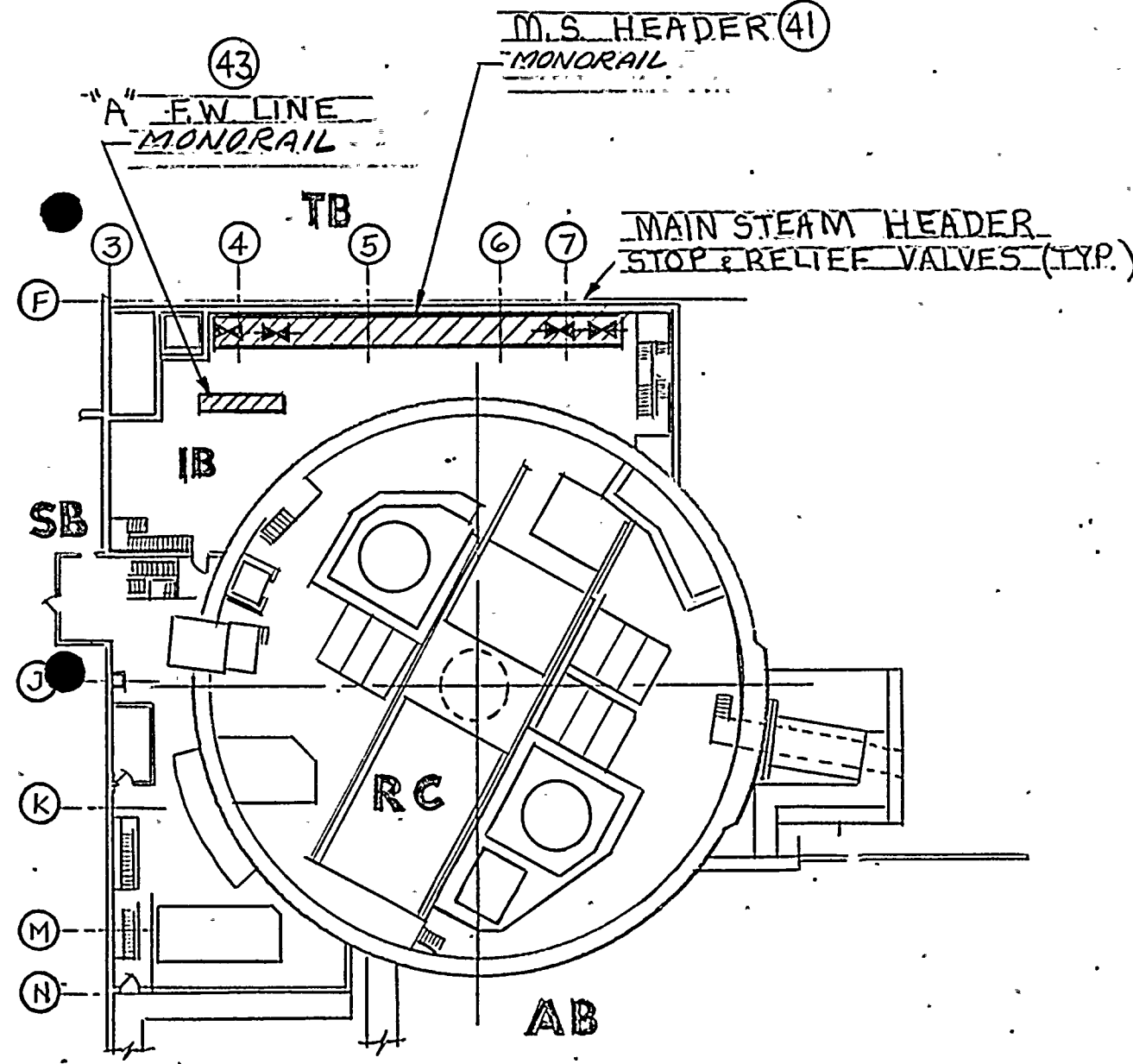
1	ADD. CRANE NUMBERS	2-17-83	2-17-83	MBF 2/10/83	MBF 2-18-83
0	ORIGINAL	2-29-81	2-29-81	MBF 6/30/81	MBF 7-1-81
NUMBER	REVISION	INITIAL DATE	DRAWN BY	CHECKED BY	RESP. ENG.
					ENG. MANG'R.
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK					
GINNA STATION OVERHEAD HANDLING SYSTEMS AUX-BLDG (OPERATING)					
SCALE NO. 03021-378					



1	ADD. NUMBER TO CRANE	NJ A 2-18-83	Rev 2-18-83	MBF 2/18/83	MBF 2-18-83
0	ORIGINAL	NJ A 6-29-81	Rev 6-30-81	MBF 6/30/81	MBF 7-1-84
NUMBER	REVISION	DRAWN BY	CHECKED BY	RESP. ENG.	ENG. MANG'R.
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK		GIMNA STATION OVERHEAD HANDLING SYSTEMS SCREENHOUSE		SCALE	NO. 03021-399

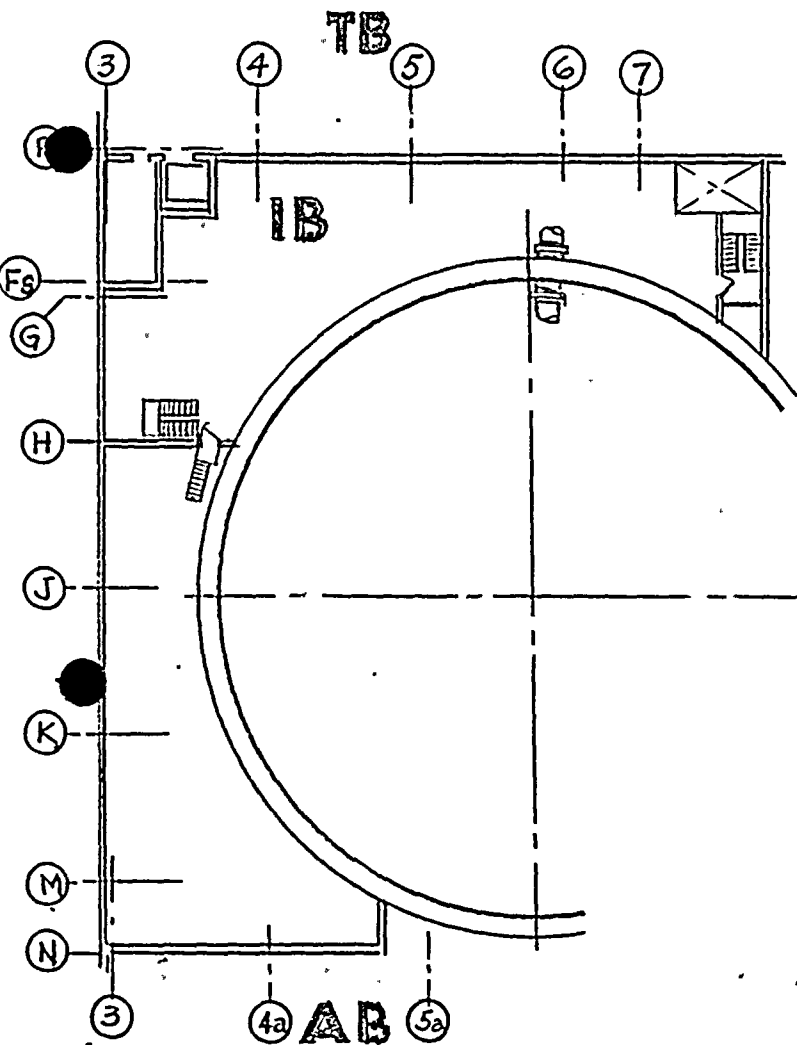


1	ADD. NUMBERS TO MONORAILS	NJA 2-15-83	Rev 2-18-93	MBF 2/18/83	Rev 2-18-83
0	ORIGINAL	NJA 6-29-81	Rev 6-30-81	MBF 6/30/81	Rev 7-1-81
NUMBER	REVISION	INITIAL DATE	DRAWN BY	CHECKED BY	RESP. ENG. MAN'G'R.
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK		GINNA STATION OVERHEAD HANDLING SYSTEMS INTERMEDIATE BLDG. (BASEMENT)			
		SCALE ~		NO. 03021-400	

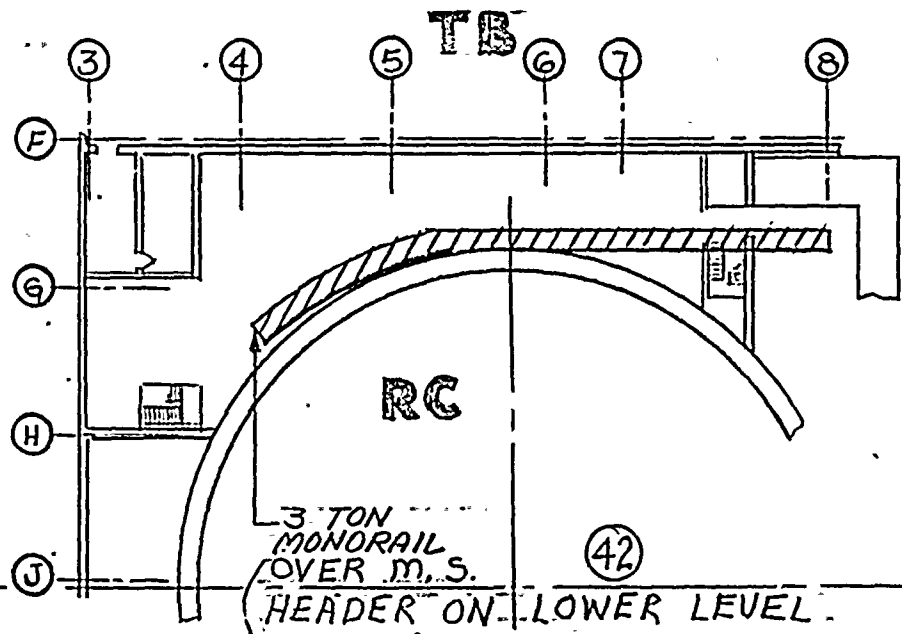


1	ADD NUMBER TO MONORAILS	N 5 A 2-16-83	Rev. 2-14-81	MBF 2/18/83	DN 2-16-83
0	ORIGINAL	N 5 A G-29-81	Rev. 6-30-81	MBF 6/30/81	DN 7-1-81
NUMBER	REVISION	DRAWN BY	CHECKED BY	RESP. ENG.	ENG. MANG'R.
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK		GINNA STATION OVERHEAD HANDLING SYSTEMS INTERMEDIATE BLDG., FLR. EL. 278'-4"		SCALE 2	NO. 03021-401





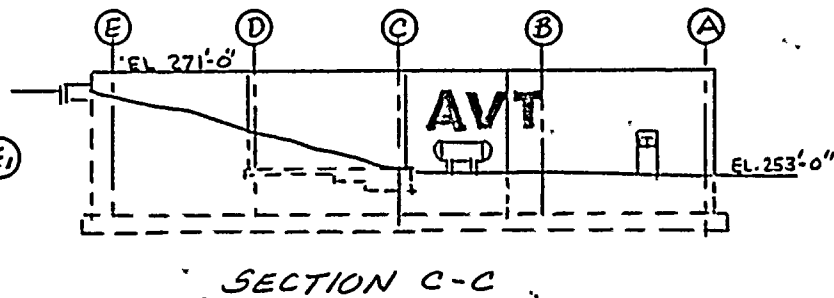
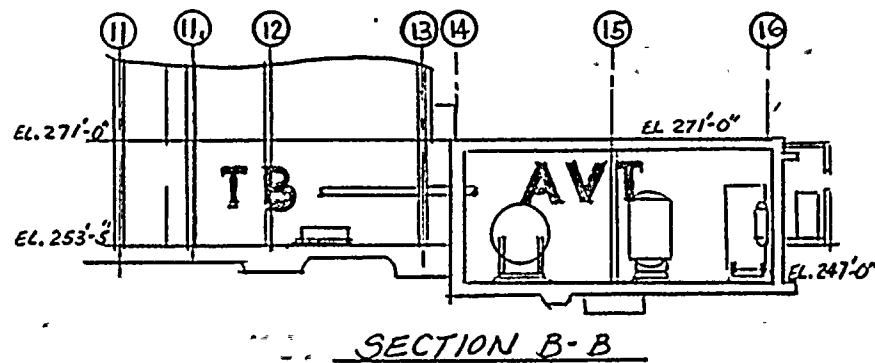
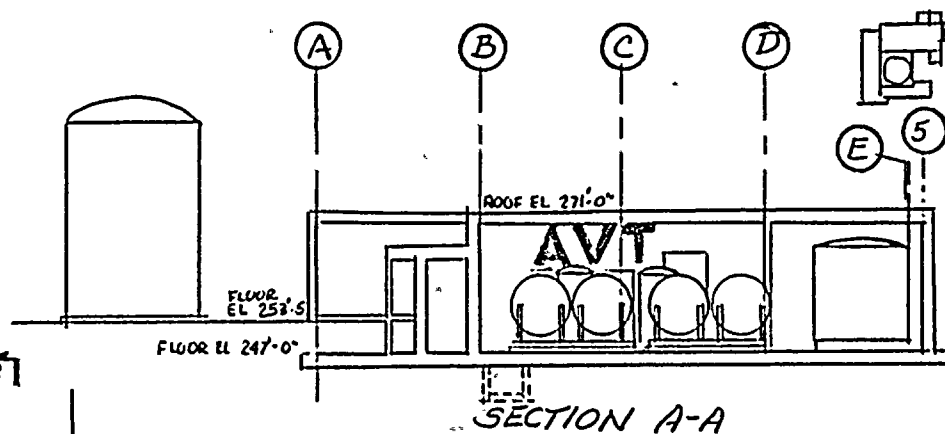
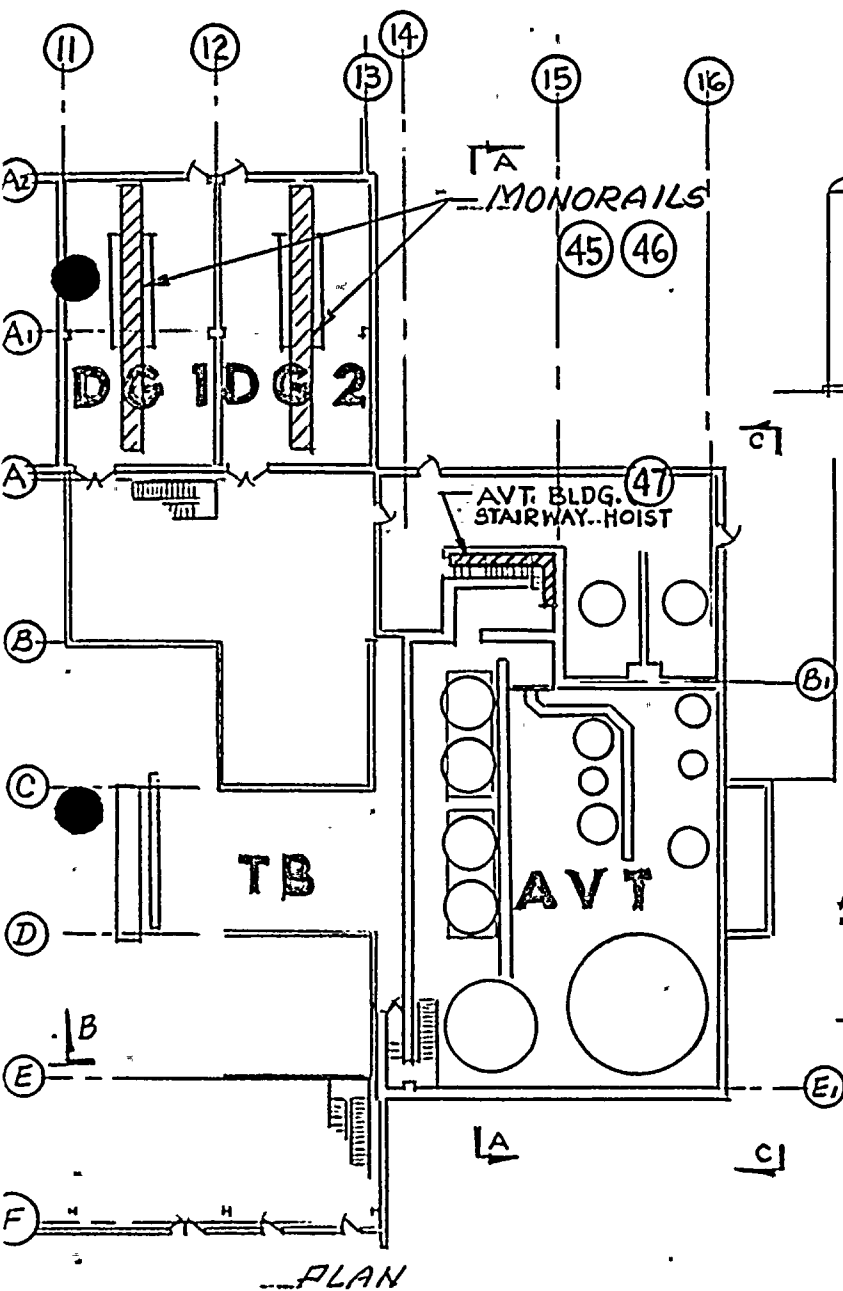
PLAN ABOVE FLR. EL. 293'-0" & 298'-4"



PLAN ABOVE FLR. EL. 315'-4"

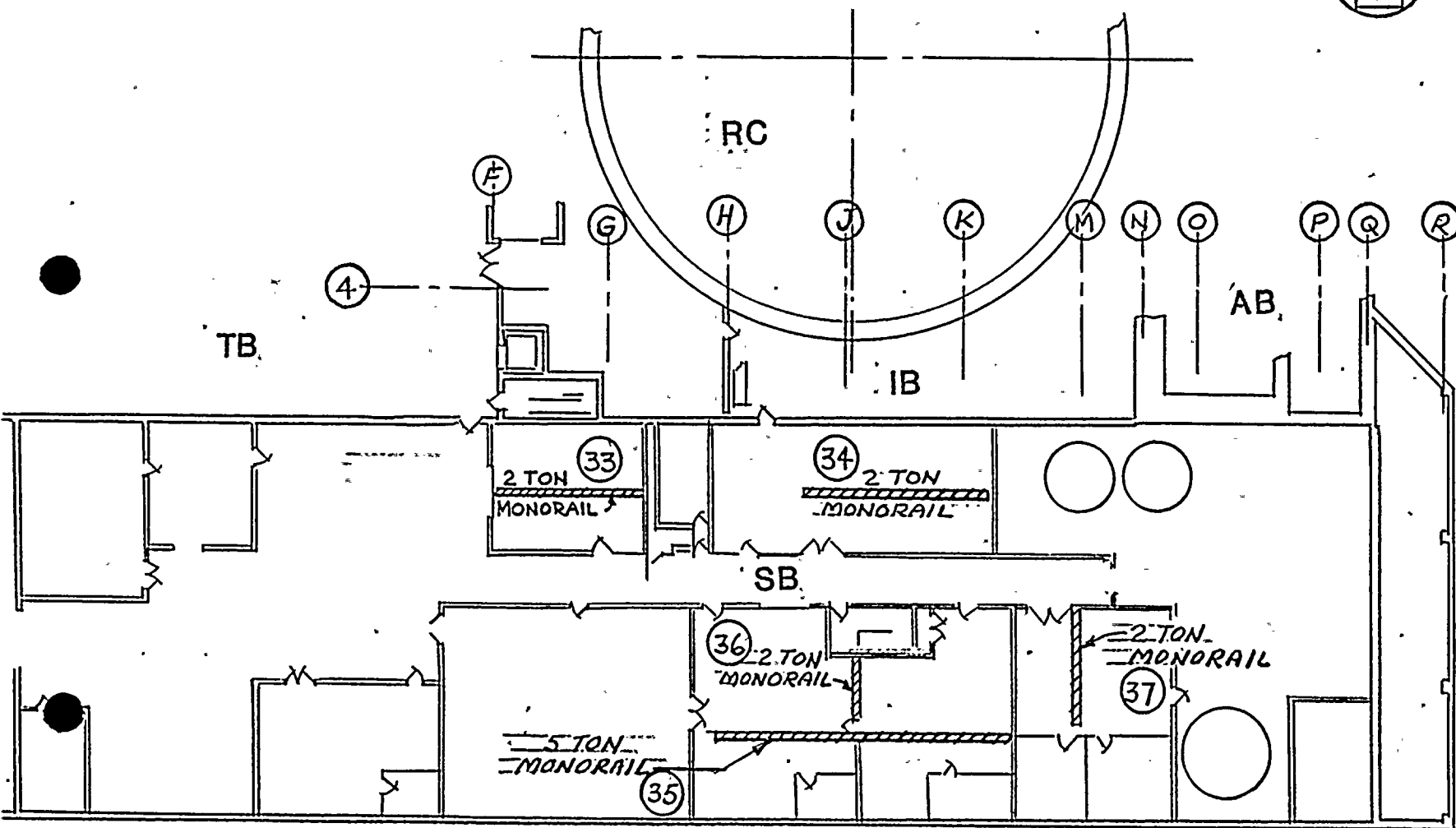


1	ADD NUMBER TO MONORAIL	N.J.A. 2-16-83	Rm 2-16-83	MBF 2/16/83	DW 2-185
0	ORIGINAL	N.J.A. 6-29-81	Rm 6-30-81	MBF 6/30/81	TOW 7-1-81
NUMBER	REVISION	DRAWN BY	CHECKED BY	RESP. ENG.	ENG. MANG'R.
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK					SCALE ~
GINNA STATION OVERHEAD HANDLING SYSTEMS INTERMEDIATE BLDG. (UPPER)					NO. 03021-402

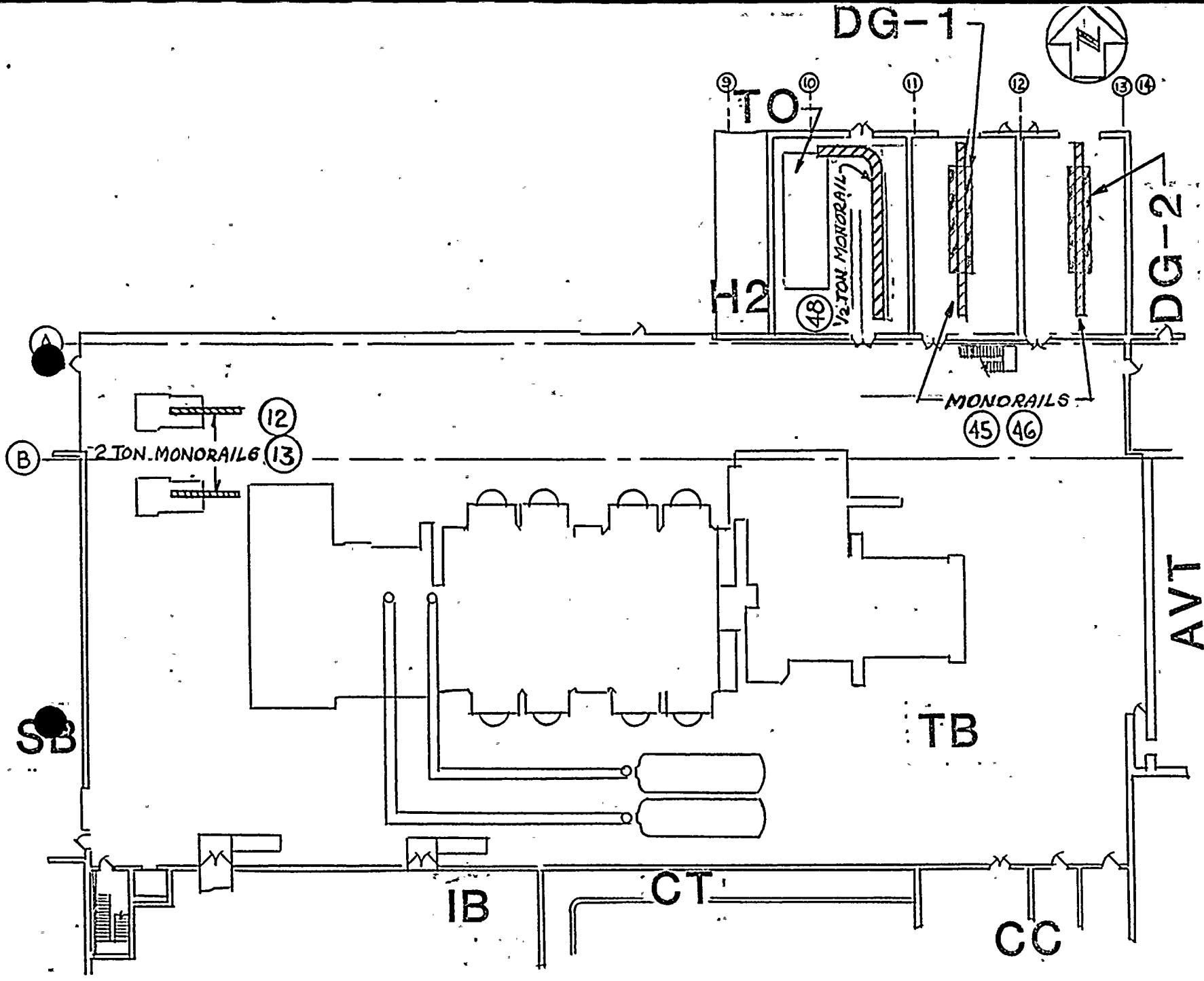


1	ADD. NUMBER TO HOIST & MONORAIL	N.Y.A. 1-16-83	MBF 2-17-83	MBF 2/16/83	DM 2-16-83
0	ORIGINAL	INITIAL DATE	6-29-81	MBF 6/30/81	TCN 7-1-81
NUMBER	REVISION	DRAWN BY	CHECKED BY	RESP. ENG.	ENO. MANG'R.
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK					
GINNA STATION OVERHEAD-HANDLING SYSTEMS DIESEL GENERATION ROOMS					
SCALE ~ NO. 03021-404					

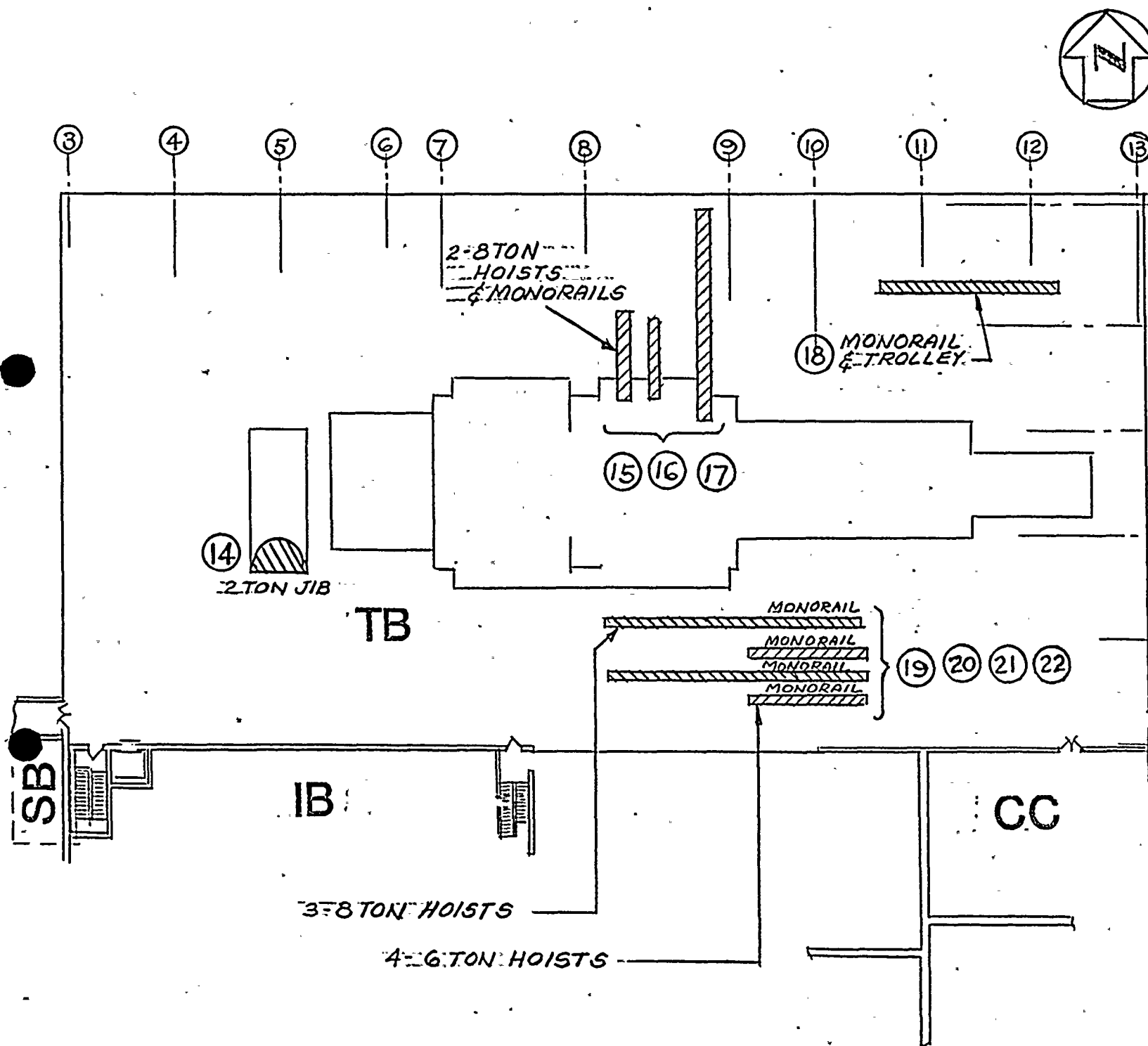




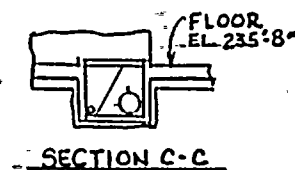
O	ORIGINAL	INITIAL DATE		N J A 2-16-83	2-18-83	MBF 2/16/83			2-16-83
NUMBER	REVISION			DRAWN BY	CHECKED BY	RESP. ENG.	ENG. MANG'R.		
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK			GINNA STATION OVERHEAD HANDLING SYSTEMS SERVICE BLDG. ELEV. 253'-6"						
			SCALE 1/4"						
			NO. 03021-410						



O	ORIGINAL	INITIAL DATE	NJA 2-15-83	Rm2-16.83	MBF 2/16/83	20-2169
NUMBER	REVISION	DRAWN BY	CHECKED BY	RESP. ENG.	ENG. MANG'R.	
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK			GINNA: STATION OVERHEAD HANDLING SYSTEM TURBINE BUILDING ELEV. 253'-6"			SCALE ~ NO. 03021-4.11

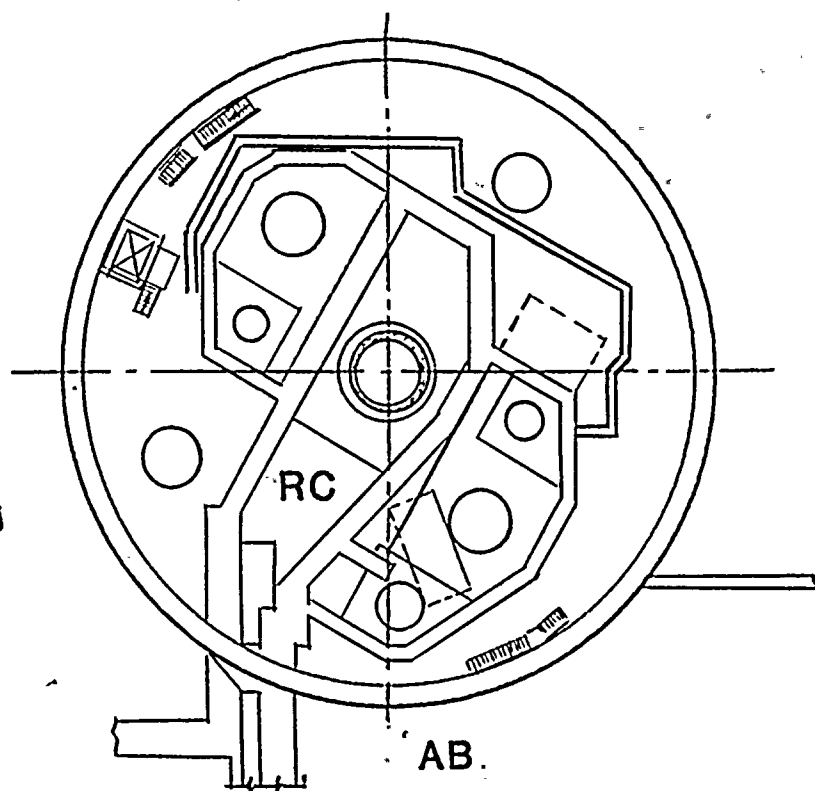


O	ORIGINAL	INITIAL DATE	N. J. A. 2/16/83	2-18-83	MBF 2/16/83							
	REVISION		DRAWN BY	CHECKED BY	RESP. ENG.							
NUMBER												
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK												
GINNA STATION. OVERHEAD HANDLING SYSTEMS MEZZANIN FL. TURB. BLDG. ELEV. 271'-0"												
SCALE ~												
NO. 03021-412												
ENG. MANG'R.												

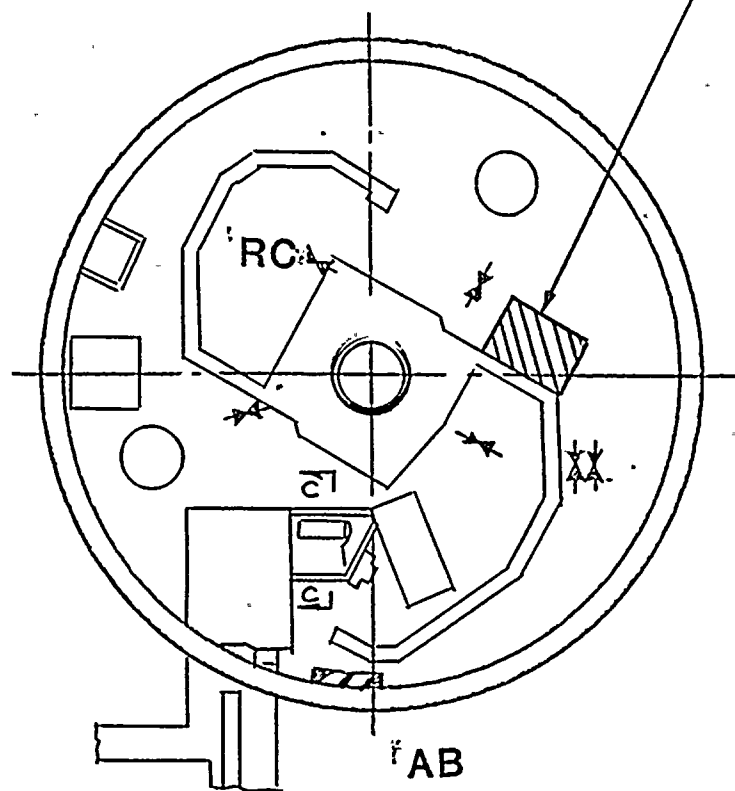


SECTION D-D

REACTOR VESSEL
STUD CLEANING CRANE



PLAN BELOW INTERMEDIATE FLOOR



PLAN AT BASEMENT FLOOR

O	ORIGINAL	INITIAL DATE	N.J.A. 2-16-83	2-18-83	MBF 2/16/83	ENG. MANG'R.			
NUMBER	REVISION		DRAWN BY	CHECKED BY	RESP. ENG.		SCALE		
ROCHESTER GAS & ELECTRIC CORP. ROCHESTER, NEW YORK									
GINNA STATION OVERHEAD HANDLING SYSTEM-REACTOR CONTAINMENT VESSEL-EL ABOVE BASINMENT FL.									
NO. 03021-413									

SPECIAL LIFTING DEVICESITEM 1: STRESS DESIGN FACTOR

FROM NUREG 0612

The stress design factor stated in Section 3.2.1.1 of ANSI N14.6 should be based on the combined maximum static and dynamic loads that could be imparted on the handling device based on characteristics of the crane which will be used. This is in lieu of the guideline in Section 3.2.1.1 of ANSI N14.6 which bases the stress design factor on only the weight (static load) of the load and of the intervening components of the special handling device.

DISPOSITION OF DYNAMIC LOADS IN WESTINGHOUSE ANALYSIS OF LIFTING DEVICES

It can be inferred from this paragraph that the stress design factors specified in Section 3.2.1.1 of ANSI N14.6 (3 and 5) are not all inclusive. Also, it can be inferred that the specified ANSI N14.6 stress design factors should be increased by any amount based on the crane dynamic characteristics. The dynamic characteristics of the crane would be based on the main hook and associated wire ropes holding the hook. Most main containment cranes use sixteen (16) or more wire ropes to handle the load. Should the crane hook suddenly stop during the lifting or lowering of a load, a shock load could be transmitted to the connected device. Because of the elasticity of the sixteen or more wire ropes, the dynamic factor for a typical containment crane is not much larger than 1.0. The maximum design factor that is recommended by most design texts [7, 8, 9] is a factor of 2 for loads that are suddenly applied. The stress design factors required in Section 3.2.1.1 of ANSI N14.6 are:

$$\begin{aligned} 3 \text{ (weight)} &< \text{Yield Strength} \\ 5 \text{ (weight)} &< \text{Ultimate Strength} \end{aligned}$$

The factor of 3 specified, certainly, includes consideration of suddenly applied loads for cases where the dynamic impact factor may be as high as 2.0. Thus, we feel that the use of the design criteria in ANSI N14.6 satisfies the NUREG requirement.

CMAA #70 IMPACT LOAD CRITERIA

3.3.2.1.1.3 Impact Allowance: For cranes operating on runways as described in Section 1.4, the impact allowance of the rated capacity shall be taken as 1/2% of the load per foot per minute of hoisting speed, but not less than 15% nor more than 50%, except for bucket and magnet cranes for which the impact value shall be taken as 50% of the rated capacity.

RG&E DISPOSITION

Since all three of our special lifting devices are operated only with the main hoist of the containment overhead crane, which has a hoist speed of 3"/min., the following maximum impact load has been calculated:

Rated Capacity = 100 Tons
Hoist Speed = 3 inches/minute

Impact Allowance = I

$I = 1/2\% (100 \text{ tons}) / 3 \text{ inches per minute}$

$I = 4000 \#$

or

2% (15% equals 30,000 lbs.)

Westinghouse has determined that the three special lifting devices analyzed are within the 3 and 5 strength factors for static loading. Based on this analysis, the nature of the crane used with these devices, and their actual impact allowance we have determined that our special lifting devices conform to NUREG 0612.

ATTACHMENT 4

CRANE DESIGN (CTMT OVERHEAD)

ITEM 1: LONGITUDINAL STIFFENERS

FROM NUREG 0612 SECTION 5.1.1 (7)

The crane should be designed to meet the applicable criteria and guidelines of Chapter 2-1 of ANSI B30.2-1976, "Overhead and Gantry Cranes" and of CMAA-70, "Specifications for Electric Overhead Travelling Cranes." An alternative to a specification in ANSI B30.2 or CMAA-70 may be accepted in lieu of specific compliance if the intent of the specification is satisfied.

CRANE COMPARISON ANALYSIS RESULTS

A comparison analysis was done on the containment overhead crane to determine its extent of compliance to CMAA-70. The longitudinal stiffeners are not located as specified in CMAA-70. When two longitudinal stiffeners are used, they shall be located as stated in Section 3.3.3.1.2.2 of CMAA-70. Each shall have a moment of inertia of 2.07 in.⁴ (calculated) the existing moments of inertia are .68 in.⁴ as stated in the "Whiting" crane comparison analysis.

TECHNICAL EVALUATION REPORT COMMENTS

Although not in verbatim compliance with CMAA-70 requirements concerning location and moment of inertia, the use of longitudinal stiffeners in the containment building crane is judged to meet the intent of this guideline. Longitudinal stiffeners are used, in conjunction with transverse stiffeners or diaphragms, to allow the use of thin web plates (i.e., web plates with large h/t ratios where h = web depth, and t = web thickness.) CMAA-70 allows for h/t ratios of up to 188 for girders with no longitudinal stiffener, and of up to 376 for girders with a single longitudinal stiffener. Were such a single stiffener used in the Ginna containment crane, a moment of inertia about the web face of approximately 1.8 in.⁴ would be required. The Ginna design employs two longitudinal stiffeners, each with a moment of inertia of approximately 0.46 in.⁴ about the web face, in conjunction with a web h/t ratio of 236. Although judged to meet the intent of this guideline, the Licensee should provide suitable documentation to justify the location and moment of inertia of the installed stiffeners.

RG&E DISPOSITION

The location of the installed stiffeners in the containment building crane are shown on a Westinghouse Shop Drawing, U-55964 which is a permanent RG&E record. (See attached sketch for stiffener location).

1. The first part of the report discusses the general situation of the country and the progress of the work. It also mentions the results of the survey and the conclusions drawn from it.

2. The second part of the report deals with the specific details of the work, including the methods used, the data collected, and the analysis of the results. It also mentions the difficulties encountered and the measures taken to overcome them.

3. The third part of the report summarizes the findings of the survey and presents the conclusions drawn from them. It also mentions the recommendations made for future work.

4. The fourth part of the report contains the appendix, which includes the raw data, the tables, and the figures used in the report.

5. The fifth part of the report is the bibliography, which lists the sources of information used in the report.

6. The sixth part of the report is the index, which provides a quick reference to the various parts of the report.

7. The seventh part of the report is the list of abbreviations, which explains the meaning of the symbols and abbreviations used in the report.

8. The eighth part of the report is the list of symbols, which explains the meaning of the symbols used in the report.

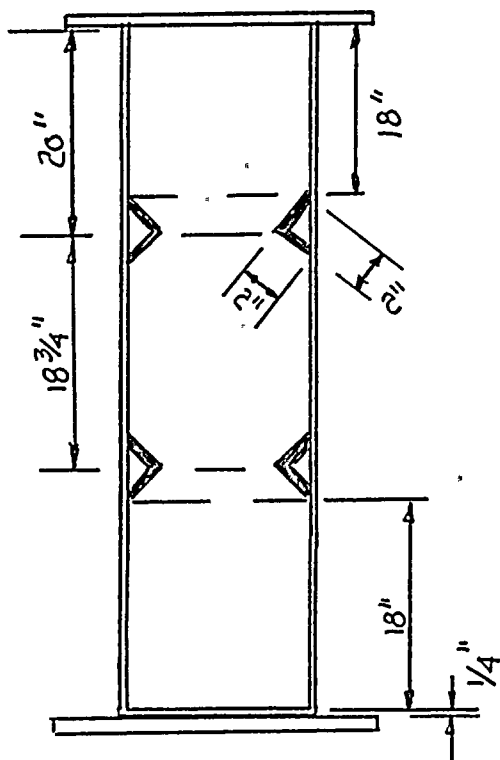
9. The ninth part of the report is the list of figures, which explains the meaning of the figures used in the report.

10. The tenth part of the report is the list of tables, which explains the meaning of the tables used in the report.

Calculations for the moment of inertia of the stiffeners are shown on pages 15 and 16 of the Whiting Comparison Report (February 1, 1982 submittal, Attachment 5).

The crane girder was designed under EOCI-C1 specifications using sound engineering practices. There is simply no indication that the crane is in jeopardy of structural failure or any overstress due to the location and size of the existing longitudinal stiffeners.

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LOCATION OF LONGITUDINAL STIFFENERS IN
THE CONTAINMENT BRIDGE CRANE AS SHOWN
ON WESTINGHOUSE DWG. U-55964.

DESIGN ANALYSIS

REV. _____

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DATE _____

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